September 24, 2013

Ontario Energy Board
2300 Yonge Street
Suite 2700
Toronto, Ontario
M4P 1E4

Attention: Ms. Kirsten Walli, Board Secretary

RE: EB-2013- 0109 – Union Gas Limited
2012 Earnings Sharing and Disposition of Deferral Account and Other Balances – Interrogatory Responses

Dear Ms. Walli,

Please find attached a revised package of Union's responses to interrogatories in the above case. Union has realized that the attachments provided for Exhibit D4.2 d) and e) filed on July 24, 2013 contain customer names and sensitive commercial information for Union's customers that was not intended to be filed publicly and should have been provided in a redacted form. Union asks that the Board and all parties to EB-2013-0109 destroy previous electronic and paper copies of the attachments to Exhibit D4.2 d) and e).

Confidential copies of these attachments will be provided to the Board under separate cover. Union requests the Board maintain these documents, in addition to the attachments previously provided for Exhibit D1.3 b) and Exhibit D4.2 c) as confidential per the Practice Direction on Confidential Filings. Intervenors wishing to view these unredacted documents must execute a Declaration and Undertaking and forward it to Union.

Also enclosed are Union's responses to further interrogatories received in the above case.

Due to technical issues, Union did not receive Energy Probe's interrogatories within the timeframe prescribed in Procedural Order 1. The Federation of Rental-housing Providers of Ontario (FRPO) provided supplemental interrogatories to Union prior to the Settlement Conference, although this was not contemplated in the Procedural Order.

Union agreed to provide responses to Energy Probe's interrogatories and FRPO's supplemental interrogatories on a best-efforts basis prior to the commencement of the oral hearing, now scheduled for October 22-24, 2013. The Energy Probe interrogatory responses are included as Exhibit D10.1 through D10.12. The FRPO supplemental interrogatory responses are included as Exhibit D8.42 through D8.44.

If you have any questions with respect to this submission please contact me at (519) 436-5334.

Yours truly,

[original signed by]

Vanessa Innis
Manager, Regulatory Initiatives

cc: Crawford Smith, Torys
All Intervenors

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit A, Tab 1, Appendix A, Schedule 4, Page 2

Preamble: The evidence indicates that in accordance with previous Board-approved practice, Union is proposing to clear the recorded LRAM balance related to unaudited 2012 DSM activities.

a) Please indicate when the audited balances will be available and filed with the Board.

b) Please explain the reason for the decrease in 2012 unaudited LRAM volumes of 109,246 10^3m^3 from 2011 audited LRAM volumes of 163,703 10^3m^3.

Response:

a) Union's DSM Audit Committee is working to finalize and file with the Board, the audited 2012 DSM Annual Report, which contains the audited LRAM balance, by the end of August 2013.

b) The 2012 unaudited LRAM volume of 109,246 10^3m^3 represents the first year volumetric reduction calculated utilizing the methodology in section 10.1 of the EB-2011-0327 Settlement Agreement, January 31, 2012. For the first year, LRAM is based on the volumetric reductions for the month each measure is implemented and for the remaining months of the year. It does not represent a full year volumetric reduction.

The 2011 audited LRAM volume of 163,703 10^3m^3 represents the full year impact of m^3 volumetric savings. The equivalent 2012 LRAM volumetric savings for an entire year is 158,138 10^3m^3.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit A, Tab 2, Appendix A, Schedule 13

a) Please provide details of the changes in O&M expenses for the following lines from 2011 (actual) to 2012 (actual):

i. Line 1 – Salaries / Wages;
ii. Line 2 – Benefits;
iii. Line 4 – Employee Training;
iv. Line 5 – Contract Services;
v. Line 18 – Cost Recovery from Third Parties;
vi. Line 21 – Outbound Affiliate Services;
vii. Line 22 – Inbound Affiliate Services; and
viii. Line 23 – Bad Debt.

Response:

a) Please see Attachment 1.

UNION GAS LIMITED
Operating and Maintenance Expense by Cost Type
Calendar 2012 Actual vs. Calendar 2011 Actual

Line No.	Notes:	($ 000's)
1	Salaries & Wages	
	2012 Actual	183,418
	2011 Actual	191,837
	Difference	(8,419)
	Reasons:	
	Merit increase	5,800
	Severances in 2011	(800)
	Short term incentive decrease	(13,400)
	Other	(19)
	Total 2012 Actual vs. 2011 Actual Difference	(8,419)
2	Benefits	
	2012 Actual	83,891
	2011 Actual	81,179
	Difference	2,712
	Reasons:	
	Higher pension expense	1,700
	WSIB Surcharge in 2012 (vs. rebate in 2011)	1,500
	Taxable benefit on Long Service Awards	400
	Benefit plan contribution holiday	(800)
	Other	(88)
	Total 2012 Actual vs. 2011 Actual Difference	2,712
3	Employee Expenses / Training	
	2012 Actual	12,043
	2011 Actual	13,514
	Difference	(1,471)
	Reasons:	
	Lower spend on travel and training	(1,471)
	Total 2012 Actual vs. 2011 Actual Difference	(1,471)
4	Contract Services	
	2012 Actual	65,002
	2011 Actual	63,608
	Difference	1,394

Reasons:	
More line locate work	1,500
Increased Banner contract costs (billing system)	700
Less Pipeline Integrity work	(1,200)
Other	394
Total 2012 Actual vs. 2011 Actual Difference	1,394

5 Cost Recovery From Third Parties

2012 Actual	(7,981)
2011 Actual	(5,869)
Difference	(2,112)

Reasons:	
Compressor failure	(900)
Hurricane Sandy Relief	(400)
Natural Gas Advocacy Campaign	(500)
Other	(312)
Total 2012 Actual vs. 2011 Actual Difference	(2,112)

6 Outbound Affiliate Services

2012 Actual	(13,812)
2011 Actual	(11,697)
Difference	(2,115)

Reasons:	
Centralization of Accounts Payable	(791)
Capital Project Construction Services	(510)
Increase in allocation of IT services	(278)
Supply Chain Corporate re-organization	(212)
Other	(324)
Total 2012 Actual vs. 2011 Actual Difference	(2,115)

7 Inbound Affiliate Services

2012 Actual	9,995
2011 Actual	8,956
Difference	1,039

Reasons:	
Depreciation on BIS modules implemented in 2012	637
Supply Chain Corporate re-organization	529
Other	(127)
Total 2012 Actual vs. 2011 Actual Difference	1,039

8 Bad Debt

2012 Actual	4,957
2011 Actual	4,455
Difference	502

Reasons:	
2011 Collection of previously allowed for accounts	1,000
Decrease in bad debt estimate for 2012	(498)
Total 2012 Actual vs. 2011 Actual Difference	502

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit A, Tab 2

a) Please provide the December 31, 2012 audited consolidated financial statements of Union Gas Limited.

b) Please provide the financial statements of each of the corporate entities that are consolidated into the Union Gas Limited December 31, 2012 consolidated financial statements requested above.

c) Please reconcile the 2012 actual revenues, expenses and income figures in the EB-2013-0109 schedules to the 2012 audited financial statements.

d) Please provide a reconciliation of the Statement of Utility Income for the year ended December 31, 2012 that is used in the Earnings Sharing calculations to the 2012 audited consolidated income statement. Please explain any significant differences.

e) Please provide all the background information and calculations used to determine the benchmark ROE.

Response:

a) Please see Attachment 1.

b) Filed under separate confidential cover.

c) Please see Attachment 2.

d) Please refer to c) above.

e) The benchmark return on equity of 7.67% is based on the October 2011 Formula Based ROE as calculated in the table below.

Line No.			**Oct-11**	
1	10 Year Consensus Forecast			
2		3 Month	2.30%	
3		12 Month	2.60%	
4	Average		2.45%	
5	Average Spread on 10 & 30 year Canadian Bonds		0.63%	
6	Long Canada		3.08%	A
7	Risk Premium		3.55%	B
8	Adjustment Factor		1.04%	C
9	**Formula Based ROE**		**7.67%**	(A+B+C)


uniongas
A Spectra Energy Company

Stephen W. Baker
President

March 8, 2013

Dear Shareholder:

I am pleased to forward you a copy of the Union Gas Limited (Union Gas) 2012 Annual Report. It contains Union Gas' Management's Discussion and Analysis, Management Responsibility for Financial Reporting, Consolidated Financial Statements, and Corporate Directory. I invite you to visit www.sedar.com for electronic versions of Union Gas' Consolidated Financial Statements, Management's Discussion and Analysis, and other filings throughout the year.

Stephen W. Baker
President

INTRODUCTION

The terms ("we," "our," "us" and "Union Gas") as used in this report refer collectively to Union Gas Limited and its subsidiary unless the context suggests otherwise. These terms are used for convenience only and are not intended as a precise description of any separate legal entity within Union Gas.

Management's Discussion and Analysis (MD&A) for the twelve months ended December 31, 2012, should be read in conjunction with the audited Consolidated Financial Statements and accompanying notes prepared in accordance with generally accepted accounting principles in the United States (U.S. GAAP). All amounts are presented in millions of Canadian dollars except where noted. Additional information relating to us, including our most recent Annual Information Form can be found at www.sedar.com.

In 2011, Canadian securities regulators approved our election to report our financial statements in accordance with U.S. GAAP instead of International Financial Reporting Standards, effective January 1, 2012 through December 31, 2014, at which point our intention is to reapply for exemptive relief to continue reporting under U.S. GAAP. For all periods up to and including the year ended December 31, 2011, we prepared our Consolidated Annual and Interim Financial Statements in accordance with Part V – Pre-changeover Canadian generally accepted accounting principles (CGAAP). For periods on or after January 1, 2012, we have prepared our financial statements to comply with U.S. GAAP. The adoption of U.S. GAAP has been made on a retrospective basis. The financial statements for prior periods have been restated in accordance with U.S. GAAP in effect at that time. The term "adjusted" is used throughout this report to highlight changes in comparative figures upon adoption of U.S. GAAP. Our date of transition to U.S. GAAP is January 1, 2011. See Note 2 to the December 31, 2012 audited Consolidated Financial Statements for further details.

CAUTIONARY STATEMENT REGARDING FORWARD LOOKING INFORMATION

This document includes forward-looking statements. Forward-looking statements are based on management's beliefs and assumptions. These forward-looking statements are identified by terms and phrases such as: anticipate, believe, intend, estimate, expect, continue, should, could, may, plan, project, predict, will, potential, forecast, and similar expressions. Forward-looking statements involve risks and uncertainties that may cause actual results to be materially different from the results predicted. Factors used to develop these forward-looking statements and that could cause actual results to differ materially from those indicated in any forward-looking statement include, but are not limited to:

- local, provincial and federal legislative and regulatory initiatives that affect cost and investment recovery, have an effect on rate structure, and affect the speed at and degree to which competition enters the natural gas industries;
- outcomes of litigation and regulatory investigations, proceedings or inquiries;
- weather and other natural phenomena, including the economic, operational and other effects of storms;
- the timing and extent of changes in commodity prices and interest rates;
- general economic conditions, including the risk of a prolonged economic slowdown or decline, or the risk of delay in a recovery, which can affect the long-term demand for natural gas and related services;
- potential effects arising from terrorist attacks and any consequential or other hostilities;
- changes in environmental, safety and other laws and regulations;
- the development of alternative energy resources;

- results of financing efforts, including the ability to obtain financing on favourable terms, which can be affected by various factors, including credit ratings and general market and economic conditions;
- increases in the cost of goods and services required to complete capital projects;
- declines in the market prices of equity and debt securities and resulting funding requirements for defined benefit pension plans;
- growth in opportunities, including the timing and success of efforts to develop pipeline, storage, and other related infrastructure projects and the effects of competition;
- the performance of natural gas storage, transmission and distribution facilities;
- sensitivity to variances in the commodity measurement process;
- the extent of success in connecting new natural gas supplies to Ontario transmission systems and in connecting to expanding gas markets;
- the effects of accounting pronouncements issued periodically by accounting standard-setting bodies;
- conditions of the capital markets during the periods covered by these forward-looking statements; and
- the ability to successfully complete merger, acquisition or divestiture plans; regulatory or other limitations imposed as a result of a merger, acquisition or divestiture; and the success of the business following a merger, acquisition or divestiture.

In light of these risks, uncertainties and assumptions, the events described in the forward-looking statements might not occur or might occur to a different extent or at a different time than we have described. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable securities law.

GENERAL

Union Gas, one of Canada's Top 100 Employers for 2012, is a major Canadian natural gas storage, transmission and distribution company based in Ontario with over 100 years of experience and service to customers. The distribution business serves about 1.4 million residential, commercial and industrial customers in more than 400 communities across northern, southwestern and eastern Ontario. Union Gas' growing storage and transmission business offers premium storage and transportation services to customers at the Dawn Hub (Dawn). Dawn is the largest underground storage facility in Canada and one of the largest in North America. It offers customers an important link in the movement of natural gas from Western Canadian and United States (U.S.) supply basins to markets in central Canada and the northeast U.S.

Our distribution system consists of approximately 63,200 kilometres of main and service pipelines. Distribution pipelines carry or control the supply of natural gas from the point of local supply to customers. Our underground natural gas storage facilities have a working capacity of approximately 155 billion cubic feet (Bcf) in 23 underground facilities located in depleted gas fields. The transmission system consists of approximately 4,800 kilometres of high-pressure pipeline and five mainline compressor stations.

Union Gas' common stock is held by Great Lakes Basin Energy L.P. (GLBE), a wholly-owned limited partnership of Westcoast Energy Inc. (Westcoast). Westcoast is an indirect wholly-owned subsidiary of Spectra Energy Corp (Spectra Energy).

Spectra Energy is a Delaware corporation that is a public company in the U.S. and whose common stock is listed on the New York Stock Exchange.

Our board of directors is comprised of at least one-third independent directors with the remainder consisting of officers of Union Gas, Westcoast or Spectra Energy and there is no audit committee of the board. The function of an audit committee is carried out at the level of Spectra Energy during the review of its Consolidated Financial Statements.

HIGHLIGHTS

($millions except where noted)	For the Years Ended December 31, **2012**	2011 Adjusted	2010 (CGAAP)
Income			
Total operating revenues	**1,662**	1,813	1,830
Net income applicable to common stock	**167**	199	204
Dividends			
Dividends on preferred stock	**3**	2	2
Dividends on common stock	**162**	145	190
Assets and long-term liabilities			
Total assets	**5,783**	5,664	5,585
Total long-term liabilities	**3,427**	3,400	2,935
Volumes of gas (10^6m^3)[1]			
Distribution volumes	**13,895**	14,133	13,314
Transportation volumes	**22,764**	23,619	25,577
Total throughput	**36,659**	37,752	38,891
Customers *(thousands)*	**1,379**	1,360	1,344
Heating degree days[2] *(degree Celsius)*			
Actual	**3,547**	3,957	3,796
Normal[3]	**4,045**	4,075	4,056

[1] 10^6m^3 equals millions of cubic meters. One cubic meter is equivalent to 35.31467 cubic feet.
[2] A heating degree day is a measure of temperature that identifies the need for heating. A degree day occurs when the average temperature falls below 18 degrees Celsius. A temperature of zero degrees Celsius equals 18 heating degree days.
[3] As per Ontario Energy Board approved methodology used in setting rates.

RESULTS OF OPERATIONS

($millions)	Three Months Ended December 31, 2012	2011 Adjusted	Increase (Decrease)	Years Ended December 31, 2012	2011 Adjusted	Increase (Decrease)
Gas sales and distribution revenue	438	404	**34**	1,365	1,468	**(103)**
Cost of gas	212	209	**3**	638	755	**(117)**
Gas distribution margin	226	195	**31**	727	713	**14**
Storage and transportation revenue	25	78	**(53)**	269	311	**(42)**
Other revenue	11	13	**(2)**	28	34	**(6)**
	262	286	**(24)**	1,024	1,058	**(34)**
Expenses	172	165	**7**	658	646	**12**
Interest expense	39	40	**(1)**	156	153	**3**
Income taxes	4	16	**(12)**	40	58	**(18)**
Net income	47	65	**(18)**	170	201	**(31)**
Net income applicable to common stock	46	65	**(19)**	167	199	**(32)**

Three months ended December 31, 2012 compared to three months ended December 31, 2011

Gas sales and distribution revenue. The $34 million increase was mainly driven by:

- a $27 million increase in customer usage of natural gas primarily due to weather that was 10% colder than the same quarter in 2011,
- a $19 million increase due to lower earnings to be shared with customers,
- a $15 million increase due to lower earnings to be shared with customers as a result of an unexpected decision by the Ontario Energy Board (OEB) in November 2012 requiring certain revenues realized from the optimization of upstream transportation contracts be refunded to customers, and
- a $5 million increase from growth in the number of customers, partially offset by
- a $36 million decrease from lower natural gas prices[4] passed through to customers without a mark-up.

Cost of gas. The $3 million increase was mainly driven by:

- a $23 million increase in customer usage of natural gas primarily due to colder weather,
- an $8 million increase in operating fuel costs, and
- a $4 million increase from growth in the number of customers, partially offset by
- a $36 million decrease from lower natural gas prices passed through to customers.

Storage and transportation revenue. The $53 million decrease was primarily a result of an unexpected decision by the OEB in November 2012 requiring certain revenues realized from the optimization of upstream transportation contracts be refunded to customers.[5]

[4] Natural Gas prices passed through to customers without a mark-up are adjusted quarterly based on the 12 month New York Mercantile Exchange.

[5] We have appealed this decision to the Ontario Divisional Court (the Court) on the basis of impermissible retroactive ratemaking. A hearing and decision by the Court is expected by the end of 2013.

Expenses. The $7 million increase was primarily due to higher depreciation expense as a result of new projects placed into service.

Income taxes. The $12 million decrease was due to a lower pre-tax income as well as a lower effective tax rate.

Twelve months ended December 31, 2012 compared to twelve months ended December 31, 2011

Gas sales and distribution revenue. The $103 million decrease was mainly driven by:

- a $92 million decrease from lower natural gas prices passed through to customers without a mark-up, and
- a $68 million decrease in customer usage of natural gas primarily due to weather that was more than 10% warmer than in 2011, partially offset by
- a $16 million increase due to lower earnings to be shared with customers,
- a $16 million increase from growth in the number of customers and
- a $15 million increase due to lower earnings to be shared with customers as a result of an unexpected decision from the OEB in November 2012 requiring certain revenues realized from the optimization of upstream transportation contracts be refunded to customers.

Cost of gas. The $117 million decrease was mainly driven by:

- a $92 million decrease from lower natural gas prices passed through to customers, and
- a $43 million decrease due to lower volumes of natural gas sold primarily due to warmer weather, partially offset by
- a $9 million increase from growth in the number of customers.

Storage and transportation revenue. The $42 million decrease was mainly driven by:

- a $54 million decrease as a result of an unexpected decision from the OEB in November 2012 requiring certain revenues realized from the optimization of upstream transportation contracts be refunded to customers, and
- a $6 million decrease as a result of an unfavourable decision by the OEB affecting 2010 and 2011 storage revenues, partially offset by
- an $18 million increase in short-term transportation service.

Expenses. The $12 million increase was primarily due to higher depreciation expense as a result of new projects placed into service.

Income taxes. The $18 million decrease was due to lower pre-tax income as well as a lower effective tax rate.

QUARTERLY RESULTS

($millions)	Q1 2011	Q2 2011	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012
	----------Adjusted----------							
Gas sales and distribution revenue	599	276	189	404	507	241	179	438
Storage and transportation revenue	83	78	72	78	85	78	81	25
Other revenue	5	7	9	13	6	5	6	11
Total operating revenues	687	361	270	495	598	324	266	474
Net income	96	36	4	65	88	21	14	47
Net income applicable to common stock	95	36	3	65	87	21	13	46

Seasonal Trends

The natural gas distribution business is highly seasonal due to volume-based rates and the significant effect of the winter heating season on volumes. This is typically reflected in strong first quarter results, second and third quarters that show either small profits or losses and strong fourth quarter results, subject to the impact of weather variations relative to demand during the winter heating season. Changes in natural gas rates that are charged to customers result in corresponding changes in gas sales and distribution revenue. These increases or decreases in gas sales revenue are completely offset in the cost of gas, as a result of the associated regulatory recovery and refund mechanisms.

RATE REGULATION

Union Gas is regulated by the OEB pursuant to the provisions of the *Ontario Energy Board Act, (1998)*, which is part of a package of legislation known as the *Energy Competition Act, (1998)*. This legislation provides for different forms of regulation and competition in the energy (electricity and natural gas) industry in Ontario. We are subject to regulation with respect to the rates that we may charge our customers, system expansion or facility abandonment, adequacy of service, public safety aspects of pipeline system construction and certain accounting practices.

Incentive Regulation

Our distribution rates, beginning January 1, 2008 are set under a multi-year incentive regulation framework. The incentive regulation framework establishes new rates at the beginning of each year through the use of a pricing formula rather than through the examination of revenue and cost forecasts. The incentive regulation framework allows for annual inflationary rate increases, offset by a productivity factor of 1.82% that is fixed for each year. The framework also allows for rate increases in the small volume customer classes where average use is declining, a five-year term, certain adjustments to base rates, the continued pass-through of gas commodity, upstream transportation and demand side management costs, an allowance for unexpected cost changes that are outside of management's control, and earnings sharing between Union Gas and our customers beyond specified earnings levels and equal sharing of tax changes between Union Gas and our customers.

As 2012 was the final year of our current multi-year incentive regulation framework, we filed an application with the OEB in November 2011 to set our distribution rates effective January 1, 2013. As part of the 2013 rates hearing process, we conducted settlement negotiations with intervening parties. A settlement agreement was reached on most capital and rate base issues, and on all operating costs. That settlement agreement was accepted by the OEB on July 10, 2012. The unsettled issues, including operating revenue, cost of capital, and rate design, were the subjects of a hearing. On October 25, 2012, the OEB issued its decision on the unsettled issues. The average annual impact on a customer's total bill will range from 0% - 6% depending on their location and customer class. The draft rate order was filed with the OEB in December 2012, and approved in January 2013. Union Gas implemented the approved OEB rate order in February 2013. During 2013, Union Gas intends to apply to the OEB for another incentive regulation framework effective for 2014 and beyond.

Non-Commodity Deferral Account Disposition

In April 2011, we applied to the OEB for the annual disposition of the 2010 non-commodity deferral account balances. A decision on that application was issued by the OEB in January 2012, and a final rate order was approved in March 2012. In May 2012, pursuant to certain intervenor correspondence, the OEB commenced a proceeding to reconsider the sharing of short-term storage margins between ratepayers and Union Gas. Written submissions were made on May 11, 2012 and a second decision on this matter was issued by the OEB on July 18, 2012. In that revised decision, the OEB directed Union Gas to dispose of an incremental credit balance of $3 million to ratepayers as part of the October 2012 Quarterly Rate Adjustment Mechanism. On August 24, 2012, we filed a motion to review and vary the July 18, 2012 decision which was dismissed by the OEB without a hearing.

In April 2012, we applied to the OEB for the annual disposition of the 2011 non-commodity deferral account balances. The combined impact on customers, including the impact of incentive regulation earnings sharing for 2011 is a refund payable to customers of approximately $3 million. The OEB decision on the sharing of short-term storage margins, discussed above, increased this refund payable to customers to $6 million.

In August 2012, the OEB determined that it would review the treatment of 2011 revenues derived from the optimization of our upstream transportation contracts as part of the application to dispose of the 2011 non-commodity deferral account balances. We have historically recorded the optimization of upstream transportation contracts as revenues based on rates approved by the OEB. However, the OEB decision on our 2013 rates application issued October 25, 2012 found that, among other things, the revenues associated with the optimization of upstream transportation contracts effective in 2013 are to be considered a reduction of natural gas supply costs, 90% of which are to be credited to customers.

On November 19, 2012, the OEB issued its decision on the treatment of 2011 revenues derived from the optimization of our upstream transportation contracts. Similar to its finding in the 2013 rates application, the OEB determined retroactively that certain optimization revenue for 2011 will be treated as a reduction to natural gas supply costs. The result of this decision is to further increase the refund payable to customers for the 2011 non-commodity deferral account balances by $5 million to an approximate total of $11 million. We have appealed this decision to the Ontario Divisional Court (the Court) on the basis of impermissible retroactive ratemaking. A hearing and decision by the Court is expected by the end of 2013.

In November 2012, a settlement conference was held on the remaining issues in the 2011 non-commodity deferral account balances proceeding. A partial settlement was reached with intervenors, with a hearing on two unsettled issues being held in December 2012. On February 5, 2013 the OEB issued their decision on the unsettled issues, approving the issues as proposed by Union Gas. Implementation of the refund to customers will commence on April 1, 2013.

With respect to 2012, the above-mentioned finding on the treatment of certain revenues derived from the optimization of our upstream transportation contracts resulted in a payable to customers of approximately $34 million. This amount has been recorded as part of our 2012 financial results.

Commodity Rates

Union Gas and the OEB have a mechanism in place to change gas commodity rates on a quarterly basis (Quarterly Rate Adjustment Mechanism), to ensure that customers' rates reflect future expected prices to the extent reasonably possible. The difference between the approved and the actual cost of gas incurred is deferred for future recovery from or repayment to customers. These differences are included in quarterly gas commodity rates and recovered from or refunded to customers over the subsequent twelve months. This allows us to adjust customer rates closer to the time of incurrence.

Cost of Capital

In December 2009, the OEB issued its policy report on the Cost of Capital for Ontario's Regulated Utilities. In that report, the OEB determined that Union Gas' utility return on equity should be increased by approximately

125 basis points and will continue to be tied to bond rates. The OEB also determined that it would only apply the conclusions from its policy report during cost-of-service applications. As we were under a five-year incentive regulation framework during 2012, we incorporated the OEB's policy report determinations in our cost-of-service application for 2013 rates. Based on the September 2012 actual and forecast bond yields, the OEB's formula produces a return on equity to be reflected in 2013 rates of 8.93%.

Sale of the St. Clair Line

In December 2011, the proposed sale of the St. Clair Line was cancelled. In March 2012, the OEB approved the return of the St. Clair Line to regulated rate base, effective January 1, 2013.

Jacob Pool

In June 2010, Union Gas purchased a depleted gas reservoir in the Municipality of Chatham-Kent from Torque Energy Inc. and Liberty Oil & Gas Ltd., known as Jacob Pool. In July 2011, the OEB approved Jacob Pool to be designated as a gas storage area and authorized the injection, storage and removal of gas from this area. Further development of Jacob Pool has been suspended given current storage market conditions. When these conditions improve, Union Gas intends to re-apply to the OEB for approval to develop the pool.

Demand Side Management

On June 30, 2011, the OEB issued guidelines for the next multi-year Demand Side Management (DSM) framework for the natural gas utilities. The guidelines allow for annual inflationary increases to the DSM budget, and introduce some changes to the program portfolio. In September 2011, Union Gas filed its DSM plan for 2012-2014 for approval by the OEB. Settlement conferences were held in December 2011 and January 2012. These discussions resulted in a comprehensive three-year settlement on most issues. In February 2012, the OEB accepted the settlement agreement and issued its decision on the unsettled issues. The decision included a requirement to renegotiate the terms of a single program for 2013-2014. The proceeding for this issue has commenced with a decision expected in 2013. No material impact on Union Gas is expected to result from that decision.

Generally Accepted Accounting Principles of the United States of America (U.S. GAAP)

Union Gas' 2013 rates application uses U.S. GAAP as the basis for the revenue and cost forecasts contained in that application. Since the OEB only approved the use of Canadian GAAP as the appropriate basis for setting rates and for regulatory reporting, the OEB set out a process to hear submissions on the use of U.S. GAAP as a preliminary matter in Union Gas' 2013 rates application. In March 2012, the OEB approved the use of U.S. GAAP for regulatory purposes.

Parkway West

In January 2013, Union Gas applied for OEB approval to construct Parkway West, a new compressor station and related facilities, adjacent to the existing Parkway compressor station (Parkway) site. The purpose of these facilities is to provide increased service reliability to shippers and to develop a new site to accommodate future growth. The total capital cost of the facilities included in the application is approximately $200 million. As a result of the significant level of capital expenditure and the fact that there are no incremental revenues associated with these facilities, Union Gas has also requested advance OEB approval for the rate impacts related to these facilities.

LIQUIDITY AND CAPITAL RESOURCES

We manage cash to ensure appropriate amounts are available as required. We invest our available cash in high-quality money market securities. Such money market securities are designed for the safety of principal and for liquidity, and accordingly do not include equity-based securities.

We meet our short-term cash requirements through funds generated from operations, the issuance of commercial paper and the utilization of loans from Westcoast. Long-term capital requirements for expansion, maintenance and investments are met through the combination of cash flow from operations, available debt facilities and preferred stock.

Changes in Cash Flow

	For The Years Ended December 31,	
($millions)	**2012**	2011 (Adjusted)
Operating activities	**433**	359
Investing activities	**(271)**	(290)
Financing activities	**(160)**	(74)

Operating Activities

Union Gas' heating season extends from approximately November through March. We begin the heating season with near-capacity natural gas inventory levels which are drawn throughout the heating season. Inventory levels decrease from December and thus contribute to a positive cash flow from operations during the first quarter. After the heating season ends, inventory is replenished for the next heating season. During the third quarter, gas inventory injections typically exceed withdrawals, negatively affecting cash flows. During the fourth quarter inventory decreases as withdrawals exceed injections.

Some of our customers purchase gas directly from marketers. Marketers typically deliver gas to us evenly throughout the year, whereas most of their customers use gas based on seasonality. As part of our normal billing process, we bill the marketers' customers as gas is used and remit this cash to the marketer when gas is delivered to us. Therefore, during the first and fourth quarters of the year, customers typically use more gas than is delivered to us and we collect cash from the marketers' customers creating a positive cash flow. During the second and third quarters, marketers deliver more gas than their customers use, thus creating a significant cash outflow. These are normal seasonal trends.

The primary factors increasing cash flow from operations for 2012 compared to 2011 include the effects of warmer weather primarily resulting in lower commodity purchases, lower commodity rates charged to customers and lower pension plan contributions, partially offset by a final tax payment in the first quarter of 2012 for 2011 taxes.

Investing Activities

The table below is a summary of capital expenditures:

	For The Years Ended December 31,		
	2013	2012	2011
	(estimated)		
Storage and transmission projects	31%	20%	34%
Distribution	57%	66%	51%
General equipment	12%	14%	15%
	100%	100%	100%
Total capital expenditures *($millions)*	364	271	290

The table below is a summary of capital project type:

	For The Years Ended December 31,		
	2013	2012	2011
	(estimated)		
Maintenance projects[6]	85%	97%	98%
Expansion projects	15%	3%	2%
	100%	100%	100%

Capital expenditures for 2012 were lower compared to 2011 primarily due to the completion of two large multi-year projects in 2011, partially offset by an increase in customer attachments. Total projected 2013 capital expenditures include approximately $55 million for expansion capital expenditures and $309 million for maintenance and upgrades of existing pipelines and infrastructure to serve growth. The 2013 expansion capital expenditures reflect our continued assessment of the timing of projected long-term market requirements and general economic conditions. Based on our current assessment, we believe that expansion opportunities will continue to exist in the future.

As outlined in the financing activities discussion that follows, we have sufficient financing available to meet our investing requirements. Management expects that financing of 2013 projects will be done through a combination of cash generated from operations and available debt facilities.

Financing Activities

In order to maintain the common equity component of the capital structure at the level approved by the OEB, we typically pay dividends to our parent company. During 2012, we paid dividends to our parent company totalling $162 million (2011 – $145 million).

Available Credit Facility and Restrictive Debt Covenants

			Commercial Paper Outstanding at	
($millions)	**Expiration Date**	**Credit Facility Capacity**	**December 31, 2012**	December 31, 2011
Multi-year syndicated [(a)]	2016	400	**374**	279

[(a)] The credit facility contains a covenant requiring the debt-to-total capitalization ratio to not exceed 75% and a provision which requires Union Gas to repay all borrowings under the facility for a period of two days during the second quarter of each year. The ratio was 68% at December 31, 2012 (2011 – 68%; adjusted).

The issuance of commercial paper, letters of credit and revolving borrowings reduce the amount available under the credit facility. As of December 31, 2012 and 2011 there were no letters of credit issued under the credit facility or revolving borrowings outstanding.

Our credit agreement contains various financial and other covenants, including the maintenance of certain financial ratios. Failure to meet those covenants beyond applicable grace periods could result in accelerated due dates and/or termination of the agreement. As of December 31, 2012 and 2011, we were in compliance with those covenants. In addition, the credit agreement allows for the acceleration of payments or termination of the agreement due to non-payment, or in some cases, due to the acceleration of other significant indebtedness of the borrower or some of its subsidiaries.

This facility is intended to be used primarily to manage the significant changes in working capital experienced by Union Gas as a result of volumes and prices associated with natural gas purchases and sales. Most of the short-term cash requirements are funded through issuing commercial paper at rates generally below the lender's

[6] Maintenance projects include costs incurred for new customer attachments. Maintenance projects also include expansion capital for in-franchise customers.

prime rate. Our 2012 commercial paper peaked in December at $374 million (2011 – peaked in December at $279 million).

Other Financing Matters

We maintain a current base shelf prospectus with the Canadian securities regulators, which enables ready access to Canadian public debt capital markets. On October 11, 2012, we filed a new $800 million base shelf prospectus which provides for the issuance of medium-term note debentures. The new shelf prospectus replaces the previous one that expired on October 10, 2012. As of the date of this filing, we have $800 million available for the issuance of medium-term note debentures under the new base shelf prospectus, which expires on November 11, 2014.

In 2013, we plan to issue approximately $250 million of medium-term note debentures.

OUTSTANDING STOCK

	December 31, 2012	December 31, 2011
Preferred stock		
Class A, Series A, 5.5%	**47,672**	47,672
Class A, Series B, 6.0%	**90,000**	90,000
Class A, Series C, 5.0%	**49,500**	49,500
Class B, Series 10, 4.88%	**4,000,000**	4,000,000
Common stock	**57,822,650**	57,822,650

FINANCIAL CONDITION

Ratings Summary

	Standard & Poor's	**DBRS**
Commercial paper	A – 1 (low)[7]	R – 1 (low)
Debentures	BBB+	A
Preferred stock	P – 2 (low)[8]	Pfd – 2

Our credit ratings remain unchanged from those reported in the 2011 Annual Report.

The above credit ratings are dependent upon, among other factors, the ability to generate sufficient cash to fund capital and investment expenditures, our results of operations, market conditions and other factors. Our credit ratings could impact our ability to raise capital in the future, impact the cost of our capital and, as a result, have an impact on our liquidity.

[7] Represents Canadian National Scale Commercial Paper Rating.
[8] Represents Canadian Preferred Stock Rating.

CONTRACTUAL OBLIGATIONS

The table below is a summary of our contractual payment obligations, due by period.

($millions)	Total	2013	2014-2015	2016-2017	Thereafter
Long-term debt[9]	4,247	150	573	552	2,972
Operating leases	35	6	13	12	4
Purchase obligations[10]	886	532	223	60	71
Environmental obligations[11]	12	2	4	6	–
Retirement plan contributions[12]	59	59	–	–	–
Total contractual obligations[13]	5,239	749	813	630	3,047

RELATED PARTY TRANSACTIONS

We purchase gas, storage and transportation services at prevailing market prices and under normal trade terms from related parties. During 2012, these purchases totalled $41 million (2011 – $56 million). We also provide storage and transportation services to related parties which totalled $1 million during 2012 (2011 – $1 million).

We provided administrative, management and other services to related parties totalling $14 million during 2012 (2011 – $12 million), which were billed and recovered at cost. Charges from related parties for administrative and other goods and services were $10 million during 2012 (2011 – $9 million).

At December 31, 2012 we had receivable balances of $4 million (2011 – $4 million) and payable balances of $10 million (2011 – $7 million) with related parties, all of which are recorded in Accounts receivable, net and Accounts payable and accrued charges, respectively.

In the normal course of operations, we provide or obtain funds from Westcoast on an unsecured basis. During 2012, we did not provide funds to Westcoast. The balance outstanding at December 31, 2012 was a payable of $9 million (2011 – $99 million payable). During 2012, interest paid on amounts owing totalled less than $1 million (2011 – less than $1 million). Interest on these loans is calculated based on the monthly average of 30-day banker's acceptance rates.

In addition, we made dividend payments to GLBE of $162 million during 2012 (2011 – $145 million).

GAS SUPPLY

The gas supply portfolio of Union Gas primarily includes contracts with pricing mechanisms that reflect monthly and daily variations in the price of gas. These contracts are indexed to either the New York Mercantile Exchange natural gas futures contracts, the Canadian Gas Price Reporter that publishes Alberta index prices or the Platt's Inside FERC Dawn Monthly Index.

[9] Includes: estimated scheduled interest payments over the life of the associated debt.

[10] Includes: firm capacity payments that provide us with uninterrupted firm access to natural gas transportation and storage; contractual obligations to purchase physical quantities of natural gas; contracts for software and consulting or advisory services; contractual obligations for engineering, procurement and construction costs for pipeline projects.

[11] Includes capital, operating and maintenance expenditures related to the comprehensive certificate of approval.

[12] We are unable to reasonably estimate retirement plan contributions beyond 2013 due primarily to uncertainties about market performance of plan assets.

[13] Excludes cash obligations for asset retirement activities. The amount of cash flows to be paid to settle the asset retirement obligations is not known with certainty as Union Gas may use internal resources or external resources to perform retirement activities. Amounts also exclude reserves for litigation, environmental remediation, annual insurance premiums that are necessary to operate the business and regulatory liabilities because Union Gas is uncertain as to the amount and/or timing of when cash payments will be required. Also, amounts exclude deferred income taxes and investment tax credits on the Consolidated Balance Sheets since cash payments for income taxes are determined based primarily on taxable income for each discrete fiscal year. Our analysis also indicated that there are no expected payments and interest related to uncertain tax positions for 2013. We are unable to reasonably estimate the timing of uncertain tax positions and interest payments in years beyond 2013 due to uncertainties in the timing of cash settlements with taxing authorities.

Natural gas markets in North America have been substantially transformed in recent years by the decline of traditional supply basins, such as the Western Canadian Sedimentary Basin and the emergence of unconventional supplies, such as Marcellus Shale gas and U.S. Rocky Mountain gas. At the same time that conventional Alberta production has declined, there has been an increase in demand for gas within Alberta from new oil sands development. The result of these two factors is that the amount of gas available for export from Alberta on TransCanada PipeLines Limited's (TCPL) mainline has been in steady decline. Supplies from the shale gas plays in the East are displacing western supplies and, as a result, are changing the way gas has been traditionally transported.

We continue to monitor and evaluate the new and changing natural gas supply dynamics to determine what opportunities exist for our customers. We have taken steps to allow for the emerging Marcellus Shale gas supplies to serve our Ontario system customers beginning in the fourth quarter of 2012, including contracting for firm transportation capacity on other pipelines to facilitate moving this supply to Dawn and ultimately to our customers.

The overall increase in domestic natural gas supply in North America resulting from shale gas development has lead to the current and projected historically low and significantly more stable natural gas prices.

OUTLOOK

Gas Sales and Distribution

We expect that the long-term demand for natural gas in Ontario will remain stable with continued growth in peak day demands. Growth related to the replacement of coal-fired generation, will occur based upon announced projects by the Province of Ontario, including a greater role for natural gas-fired generation in balancing new sources of renewable power generation. Outside of the power market, growth driven by continued lower natural gas prices is expected to be offset in the near term by lower distribution throughput as a result of energy conservation initiatives, declining normalized use per customer and a general trend toward warmer weather.

Union Gas continues to focus on promoting conservation and energy efficiency through our DSM programs. In 2012, Union Gas began operating under a new three year plan, under which we spent $31 million. In 2013, this figure will increase to approximately $32 million to reflect an adjustment for inflation.

Storage and Transportation

The storage and transportation marketplace continues to respond to changing natural gas supply dynamics including a robust supply environment. Weak commodity prices as a result of a more robust North American gas supply balance and narrower seasonal price spreads in the marketplace are resulting in lower unregulated storage values. North American natural gas supplies continue to increase as a result of new supply attachment including development in the U.S. Rocky Mountains, and various new shale gas resource projects such as the Barnett, Fayetteville, Woodford and the Marcellus and Utica Shale areas. The development of these new resources has increased overall North American gas supply reserves and is leading to significant new pipeline infrastructure to connect these new supplies to the North American pipeline grid and the associated natural gas consuming market areas. Assuming new infrastructure is approved and constructed, these new supply sources will be available to serve Ontario and Eastern Canadian markets.

Accordingly, we are experiencing a change in traditional natural gas flow patterns as these new shale gas supplies continue to develop. This will continue to provide Union Gas opportunities and challenges for new storage and pipeline infrastructure projects. Union Gas applied to the OEB, during 2010 and again in 2011, for transportation service enhancements to respond to these changing flow patterns. These services were approved by the OEB and will enhance access to emerging supply basins and provide enhanced flexibility to attract gas to Dawn, where it can be stored and delivered to downstream eastern markets. In order to allow for additional gas flow to Dawn from the Marcellus Shale area, Union Gas updated its facilities in 2012 to allow for bi-directional flow at its Kirkwall Station.

The location of our storage and transportation facilities, with interconnections between major U.S. markets in the Great Lakes region and the U.S. Northeast continues to support long-term growth opportunities for us. It is our expectation that demand for natural gas in North America will continue to have low growth over the long-term with continued growth in peak day demands.

In September 2011, TCPL filed a proposal with the National Energy Board (NEB) to modify their tolling framework. TCPL's tolls hearing with the NEB has now ended and a decision is expected in the first quarter of 2013. With the potential for additional long-haul and/or short-haul toll changes, customers may continue to pursue alternative or less expensive sources of delivered supply. If customers convert from TCPL long-haul transportation and Alberta-based gas supply, to short-haul transportation and Dawn-based gas supply, there may be increased use of the Union Gas transportation system to move the supply from Dawn to the TCPL interconnect we have at the Parkway site. Also, declining supply into Dawn from the TCPL system and constraints in takeaway capacity downstream of Union Gas' Parkway site on the TCPL system may affect liquidity at Dawn and storage pricing as well as future growth opportunities. To address these concerns, we will continue to focus on adding new services to attract new supply to Dawn. We are also evaluating new infrastructure projects that can more directly connect downstream markets and upstream supply at Dawn.

In November 2012, the OEB issued a decision on the treatment of revenues derived from the optimization of certain upstream transportation contracts. The OEB ruled retroactively that certain net optimization revenues shall be treated as natural gas supply cost reductions, with a 10% incentive accruing to Union Gas for having generated these net revenues. The result of this decision is that Union Gas is recognizing a significantly lower amount of revenue on optimization related activities than it would have absent this decision and, in the fourth quarter of 2012, Union Gas recorded an adjustment to credit 90% of these net revenues for 2011 and 2012 to customers.

As a result of the OEB decision on the treatment of certain optimization revenues, Union Gas expects a reduced level of optimization activity going forward, which may reduce natural gas market activity and overall market liquidity in Ontario.

Environmental, Health and Safety

In 2008, we obtained approval from the Ontario Ministry of the Environment (MOE) for a multi-site comprehensive certificate of approval (CC of A) for the permitting of our air and noise emission sources. The CC of A treats Union Gas as a single integrated natural gas storage, transmission and distribution system incorporating all storage pools, metering and regulating stations, compressor stations and buildings into a single environmental permit. The terms and conditions of the CC of A include significant financial obligations for capital, operating and maintenance expenditures over a period of approximately ten years, and the total estimated obligation has been included in the Contractual Obligations section of this document. Under the terms of the CC of A, we will be allowed to add and modify facilities without prior approval from the MOE, thereby reducing the risk of delays associated with obtaining environmental permits. Union Gas remains on target to meet the current ten year plan.

The current CC of A expires at the end of 2013. Union Gas is currently in the process of preparing the renewal application which will be submitted to the MOE by the first quarter of 2013. Once renewed, the CC of A will be referred to as an Environmental Compliance Approval.

The MOE requires third party audits to confirm that our facilities are operating in accordance with the conditions specified in the CC of A. There have been no major findings to date from these audits.

RISK FACTORS

Our earnings are affected by the risks inherent in the natural gas industry and energy marketplace. In general, our business and earnings level may be adversely affected by a number of risks as described below.

Market Risk

Sales to industrial customers are affected by general economic conditions, the absolute and relative price of alternative energy sources, foreign exchange rates and global competition. In 2013, we expect that the North American economy will experience modest growth.

Sales to Union Gas' residential, small commercial and small industrial customers are affected by the number of new customer additions to the system, the price of natural gas, the warming trend in weather that is not fully reflected in rates, and the continued shift to higher efficiency. New customer additions are expected to remain flat, however, the ongoing trend towards energy efficiency will continue to put pressure on usage.

A large quantity of our transportation capacity is subject to renewal on an annual basis. Our standard contract terms provide automatic renewal of contracts, after the initial term, for one year at a time unless the customer provides two years prior notice of termination. Due to changing gas supply patterns we have received notice of termination for some capacity in 2013 and 2014 and have continued risk of further contract termination beyond 2014. Union Gas has been working to re-sell the capacity that is being terminated, to markets downstream of our interconnect with TCPL at Parkway. Given the TCPL system is at capacity and constrained at Parkway, TCPL will need to expand their system in a timely fashion downstream of Parkway to allow more gas to flow east of Parkway. To support the need for TCPL expansion downstream of Parkway, Union Gas committed to new capacity on TCPL in the second quarter of 2012 for incremental service from Parkway to both our northern and eastern franchise delivery areas for service starting in 2014. During the third quarter of 2012, TCPL advised Union Gas that the incremental capacity would not be available until 2015.

For storage contracts, our standard contract terms do not allow for renewals but will typically have contract terms of one to five years. Storage prices are subject to market conditions at the time the contracts are renewed.

Commodity Price Risk

Fluctuations in natural gas prices affect our gas purchase costs for our own operating requirements as well as for the gas supply costs we incur for and collect from our system customers. Our gas procurement policy primarily includes contracts with pricing mechanisms that reflect monthly and daily variations in the price of gas. Commodity price volatility and absolute price levels also impact the amount of natural gas used by customers.

Credit Risk

Credit risk represents the loss that we could incur if a counterparty fails to perform under its contractual obligations. We analyze the customer's financial condition prior to entering into an agreement, obtain collateral when appropriate, establish credit limits and monitor the appropriateness of those limits on an ongoing basis.

Our credit exposure consists of both the risk of collecting receivables for services provided as well as the risk related to gas imbalances that occur as a regular part of the services provided in both the direct purchase market and ex-franchise market.

In the normal course of operations, we provide gas loans to other parties from our holdings of gas in storage. The replacement cost of the gas on loan at December 31, 2012 was $61 million (2011 – $64 million). We manage our credit exposure related to gas loans by subjecting these parties to the same credit policies used for all customers.

Weather Risk

As the primary component of Union Gas rates is volume based, the revenue levels approved by the OEB are impacted by weather. The volume forecasts used to determine the rates approved by the OEB assume normal weather conditions. Normal weather, as mandated by the OEB, is based on a 55:45 weighting of the 30-year

average forecast and 20-year trend forecast respectively, for 2008 through 2012. For 2013 going forward, normal weather is based on a 50:50 weighting of these forecasts. Since a large portion of the gas distributed to the residential and commercial markets is used for space heating and is charged using volume-based rates, differences from normal weather have a significant effect on the consumption of gas and on our financial results.

Regulatory Risk

Our natural gas assets and operations are subject to regulation by federal, provincial and local authorities including the OEB and by various federal and provincial authorities under environmental laws. Regulation affects almost every aspect of our business, including the ability to determine terms and rates for services, acquisitions, construction, expansion and operation of facilities, issuance of equity or debt securities, and dividend payments.

In addition, regulators in Canada have taken actions to strengthen market forces in the gas pipeline industry, which have led to increased competition. In a number of key markets, natural gas pipeline and storage operators are facing competitive pressure from a number of new industry participants, such as alternative suppliers as well as traditional pipeline competitors. Increased competition driven by regulatory changes could have a material effect on our business, earnings, financial condition and cash flows.

Most of our pipelines are also regulated by the Ontario Technical Standards and Safety Authority (TSSA) while a few are regulated by the NEB. Through our participation on the TSSA Natural Gas Advisory Council and associated Risk Reduction Groups we have the opportunity to provide input on the direction of regulatory changes. Union Gas currently has a robust integrity management program, however amendments to the Ontario regulations made by the TSSA will have an impact on our Integrity Management Program and the direction the U.S. industry is taking may prompt some further regulatory requirements. We have very limited NEB regulated assets, so the amendments to the NEB Management Systems and Performance Measures are not expected to have a significant impact on our business.

Competition Risk

As our distribution business is regulated by the OEB, it is generally not subject to third-party competition within our distribution franchise area. However, as a result of a 2006 decision by the OEB, physical bypass of Union Gas' system may be permitted, even within our franchise area. In addition, other companies could enter our markets or regulations could change.

Union Gas competes with other forms of energy available to its customers and end-users, including electricity, coal, propane and fuel oils. Factors that influence the demand for natural gas include price changes, the availability of natural gas and other forms of energy, the level of business activity, conservation, legislation, governmental regulations, the ability to convert to alternative fuels, weather and other factors.

Storage Market Risk

We use market based prices for some of our storage operations and sell our storage services based on natural gas market spreads and volatility. If natural gas market spreads or volatility deviate from historical norms or there is significant growth in the amount of storage capacity available to natural gas markets relative to demand, our approach to managing our market-based storage capacity portfolio may not protect us from significant variations in storage revenues, including possible declines as contracts renew.

Gas Measurement Risk

In determining the quantities of gas delivered and received, differences arise from the measurement process. The cost of these differences is referred to as unaccounted for gas (UFG). Rates for storage, transmission and distribution of gas, approved by the OEB effective January 2013, were reset to recover an estimate of UFG based on actual experience in the previous three years, which was lower than amounts previously included in rates. Variances between the estimate included in rates and the actual cost of UFG result from measurement

and estimation errors. If actual UFG is different from the approved level included in rates, it could have a significant impact on our financial results.

Permit Fees Risk

Effective January 1, 2007, the Government of Ontario granted municipalities the right to charge a fee to recover the costs of issuing a permit to access pipelines located within a municipal roadway. During 2012, permit fees levied by municipalities against Union Gas did not have a significant impact on our Consolidated Financial Statements. Should more municipalities start implementing a permit fee or if the amounts increase and these assessments become significant in the future, Union Gas will apply to the OEB to recover the annual cost of these fees in rates.

Financing Risk

Our business is financed to a large degree through debt. The maturity and repayment profile of debt used to finance investments often does not correlate to cash flows from assets. Accordingly, we rely on access to both short-term and long-term capital markets as a source of liquidity for capital requirements not satisfied by the cash flow from operations and to fund investments originally financed through debt. Our long-term debt is currently rated investment-grade by various rating agencies. If the rating agencies were to rate us below investment-grade, our borrowing costs would increase, perhaps significantly. In addition, we would likely be required to pay a higher interest rate in future financings, and our potential pool of investors and funding sources could decrease.

We are subject to long-term debt covenants that include a limitation on the payment of dividends, and requirements for specific interest coverage ratios prior to the issuance of additional long-term debt. Although we do not anticipate any impact to our current financing plans, reduced earnings may limit the payment of future dividends and the level of new long-term debt available to us. We maintain a revolving credit facility to backstop our commercial paper programs for short-term borrowings. This facility includes a financial covenant which limits the amount of debt that can be outstanding as a percentage of total capital. Failure to maintain this covenant could preclude us from issuing commercial paper or borrowing under the revolving credit facility and could require immediate pay down of any outstanding drawn amounts under other revolving credit agreements, which could adversely affect our cash flow.

If we are not able to access capital at competitive rates, our ability to finance operations and implement our strategy may be adversely affected. Restrictions on our ability to access financial markets may also affect our ability to execute our business plan as scheduled. An inability to access capital may limit our ability to pursue improvements or acquisitions that we may otherwise rely on for future growth. Any downgrade or other event negatively affecting the credit ratings could make our costs of borrowing higher or access to funding sources more limited.

Human Resources Risk

Union Gas' workforce consists of both unionized and non-unionized employees. Labour disruptions associated with the collective bargaining process can affect our ongoing operations. Projected changes in workforce demographics and a future shortage of skilled trades represent an issue that is being addressed by Union Gas.

Performance Risk

We have extensive contractual relationships with natural gas producers, customers, marketers, commercial enterprises, industrial companies, and others. The risk of non-performance by a contracting party may be analyzed and reduced but it cannot be entirely eliminated. Ongoing consolidation of customers and partners may increase the severity of a default.

Litigation Risk

Union Gas, in the course of its operations, is subject to environmental and other claims, lawsuits and contingencies. Although it is possible that liabilities may be incurred in instances for which no accruals have been made, we have no reason to believe that the ultimate outcome of such matters currently known to us could have a material effect on our Consolidated Financial Statements.

Facility Risk

We carry on business through a large and complex array of natural gas transmission, storage and distribution assets. These facilities, like any other industrial operations, are subject to outages from time to time. Depending on circumstances, such outages may result in loss of revenues and/or increased maintenance costs.

Political Risk

The province of Ontario is operating with a large financial deficit and significant spending commitments. As such, it is expected that the Ontario Liberal Government will continue to search for new sources of revenues including non-tax revenue streams such as fees and levies.

Estimates of increases in electricity rates in Ontario over the next 5 years are expected to result in some of the highest electricity rates in North America. The political and regulatory pressures to attempt to manage the impacts of these increases on end-use consumers and businesses are substantial. There is a risk that natural gas delivery rates may also become the subject of political focus and energy policy, as government and regulators may attempt to offset the significant upward bill impacts associated with electricity rates.

Environmental, Health and Safety Risk

There are a variety of hazards and operating risks inherent in natural gas storage, transmission, and distribution activities, such as leaks, explosions and mechanical problems that could cause substantial financial losses. In addition, these risks could result in significant injury, loss of human life, significant damage to property, environmental pollution and impairment of operations, any of which could result in substantial losses. For pipeline and storage assets located near populated areas, including residential areas, commercial business centres, industrial sites and other public gathering areas, the level of damage resulting from these risks could be greater. We do not maintain insurance coverage against all of these risks and losses, and any insurance coverage we might maintain may not fully cover the damages caused by these risks and losses. Therefore, should any of these risks materialize, it could have a material adverse effect on our business, earnings, financial condition and cash flows.

Protecting Against Potential Terrorist Activities

The potential for terrorism because of the high profile of the natural gas industry has subjected our operations to increased risks that could have a material adverse effect on our business. This risk is particularly great for companies, like ours, operating in any energy infrastructure industry that handles volatile gaseous and liquid hydrocarbons. The potential for terrorism, including cyber-terrorism has subjected our operations to increased risks that could have a material effect on our business. In particular, we may experience increased capital and operating costs to implement increased security for our facilities and pipelines, such as additional physical facility and pipeline security and additional security personnel. Moreover, any physical damage to high profile facilities resulting from acts of terrorism may not be covered, or covered fully, by insurance. We may be required to expend material amounts of capital to repair any facilities, the expenditure of which could adversely affect our cash flows and business.

Changes in the insurance markets attributable to terrorist attacks may make certain types of insurance more difficult for us to obtain. Moreover, the insurance that may be available to us may be significantly more expensive than our existing insurance coverage. Instability in the financial markets as a result of terrorism or war could also affect our ability to raise capital.

Pension Risk

Our costs of providing defined benefit pension plans are dependent upon a number of factors, such as the rates of return on plan assets, discount rates used to measure pension liabilities, actuarial gains and losses, future government regulation and our contributions made to the plans. Without sustained growth in the pension plan investments over time to increase the value of our plan assets, and depending upon the other factors impacting our costs as listed above, we could experience net asset, expense and funding volatility. This volatility could have a material effect on our earnings and cash flows.

Land Rights

Certain aboriginal groups in Ontario have claimed aboriginal and treaty rights in areas where Union Gas' Dawn storage and transmission assets are located and also in areas where the Dawn-Trafalgar pipeline route is located. The existence of these claims could give rise to future uncertainty regarding land tenure depending upon their negotiated outcome.

CERTIFICATION OF DISCLOSURE CONTROLS AND PROCEDURES AND INTERNAL CONTROLS OVER FINANCIAL REPORTING

Disclosure Controls and Procedures

We have established and maintained disclosure controls and procedures designed to provide reasonable assurance that: (a) material information required to be disclosed by us is accumulated and communicated to management to allow timely decisions regarding required disclosure; and (b) information required to be disclosed by us is recorded, processed, summarized, and reported within the time periods specified in applicable securities legislation.

Our management, with the participation of the President and the Chief Financial Officer, has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2012, and, based upon this evaluation, the President and the Chief Financial Officer have concluded that these disclosure controls and procedures, as defined by National Instrument 52-109, Certification of Disclosure in Issuers' Annual and Interim Filings (NI 52-109), are effective for the purposes set out above.

Internal Control over Financial Reporting

Our management is responsible for designing, establishing and maintaining an adequate system of internal control over financial reporting. Our internal control system was designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes, in accordance with U.S. GAAP. Because of inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies and procedures may deteriorate.

Our management, with the participation of our President and the Chief Financial Officer, has conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2012 based on the framework in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on that evaluation, management concluded that our internal control over financial reporting, as defined by NI 52-109, is effective to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements in accordance with U.S. GAAP.

Changes in Internal Control over Financial Reporting

Under the supervision and with the participation of management, including the President and Chief Financial Officer, we have evaluated changes in internal control over financial reporting that occurred during the fiscal quarter and year ended December 31, 2012 and found no change that has materially affected, or is reasonably likely to materially affect, internal control over financial reporting.

Our Board of Directors has reviewed and approved this MD&A and the attached Audited Consolidated Financial Statements prior to their release.

CRITICAL ACCOUNTING POLICIES & ESTIMATES

The application of accounting policies and estimates is an important process that continues to evolve as Union Gas' operations change and accounting guidance is issued. Union Gas has identified a number of critical accounting policies and estimates that require the use of significant estimates and judgments.

Management bases its estimates and judgments on historical experience and on other various assumptions that they believe are reasonable at the time of application. The estimates and judgments may change as time passes and more information becomes available. If estimates and judgments are different than the actual amounts recorded, adjustments are made in subsequent periods to take into consideration the new information. Union Gas discusses its critical accounting policies and estimates and other significant accounting policies with senior members of management and the Board of Directors.

Regulatory Accounting

The economic effects of regulation can result in a regulated company recording assets for costs that have been or are expected to be approved for recovery from customers or recording liabilities for amounts that are expected to be returned to customers or for instances where the regulator provides current rates that are intended to recover costs that are expected to be incurred in the future. Accordingly, we record assets and liabilities that result from the regulated ratemaking process that may not be recorded under U.S. GAAP for non-regulated entities. We continually assess whether regulatory assets are probable of future recovery by considering factors such as applicable regulatory changes, recent rate orders to other regulated entities and the effect of competition. Based on this assessment, we believe our existing regulatory assets are probable of recovery.

Unbilled Revenue

Revenues from the transportation, storage, distribution and sales of natural gas are recognized when either the service is provided or the product is delivered. Revenues related to these services provided or products delivered but not yet billed are estimated each month. Gas sales and distribution revenue and Cost of gas are recorded on the basis of regular meter readings and estimates of the unbilled customer usage. The unbilled estimate covers the period of the last meter reading date to the end of each month and is calculated using the number of days unbilled, heating degree-days and historical consumption per heating degree-day. Unbilled revenue recorded at December 31, 2012 was $108 million (2011 – $116 million). Differences between actual and estimated unbilled revenues are not material to net income. Included in unbilled revenue are natural gas costs passed through to customers without a mark-up. At December 31, 2012 $65 million (2011 – $74 million) was included in unbilled revenue for the cost of natural gas.

Pension and Other Post-Retirement Benefits

The calculations of pension and other post-retirement expense and liabilities require the use of numerous assumptions. Changes in these assumptions can result in different reported expense and liability amounts, and future actual experience can differ from the assumptions. We believe that the most critical assumptions used in the accounting for pension and other post-retirement benefits are the expected long-term rate of return on plan assets, the assumed discount rate, and medical and prescription drug cost trend rate assumptions.

Future changes in plan asset returns, assumed discount rates and various other factors related to the participants in our pension and post-retirement plans will impact future pension expense and funding.

The expected return on plan assets is important since certain of our pension plans are funded. Expected long-term rates of return on plan assets are developed by using a weighted average of expected returns for each asset class to which the plan assets are allocated. For 2012, the assumed average return for the pension plan assets was 7.1%. A change in the rate of return of 25 basis points for these assets would impact annual benefit expense by approximately $1 million before tax. The other post-retirement benefit plans are not funded.

Since pension and other post-retirement benefit liabilities are measured on a discounted basis, the discount rate is also a significant assumption. Discount rates used for our defined benefit and other post-retirement benefit plans are based on the yields constructed from a portfolio of high-quality bonds for which the timing and amount of cash outflows approximate the estimated payouts of the plans. The average discount rate of 4.30% used to calculate 2012 plan expense represents a weighted average of the applicable rates. The applied discount rate decreased approximately 0.15% in 2012 compared to 2011, resulting in a significant increase in total benefit liabilities. A 25 basis-point change in the discount rates would impact annual benefit expense for Canadian plans by approximately $2 million before tax.

NEW ACCOUNTING PRONOUNCEMENTS

There were no significant accounting pronouncements adopted during 2012 or 2011 that had a material impact on our Consolidated Financial Statements.

The Consolidated Financial Statements and all information in this report have been prepared by and are the responsibility of management. The Consolidated Financial Statements have been prepared in conformity with generally accepted accounting principles in the United States and include certain estimated amounts, which are based on informed judgements to ensure fair representation in all material respects. When alternative accounting methods exist, management has chosen those it considers most appropriate.

Management depends upon Union Gas' system of internal controls and formal policies and procedures to ensure the consistency, integrity and reliability of accounting and financial reporting, and to provide reasonable assurance that assets are safeguarded and that transactions are properly executed in accordance with management's authorization. Management is also supported and assisted by a program of internal audit services.

The Board of Directors is responsible for ensuring that management fulfils its responsibility for financial reporting and for final approval of the Consolidated Financial Statements.

The Board of Directors meets regularly with management, the internal auditors and the shareholders' auditors to review the Consolidated Financial Statements, the Independent Auditor's Report and other auditing and accounting matters to ensure that each group is properly discharging its responsibilities.

The shareholders' auditors have full and free access to the Board of Directors, as does the Director of Internal Audit Services.

Deloitte LLP performed an independent audit of the 2012 and 2011 Consolidated Financial Statements in this report. Their independent professional opinion on the fairness of these Consolidated Financial Statements is included in the Independent Auditor's Report.

March 8, 2013

Stephen W. Baker
President

J. Patrick Reddy
Chief Financial Officer

Deloitte LLP
150 Ouellette Place
Suite 200
Windsor ON N8X 1L9
Canada

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Independent Auditor's Report

To the Shareholders of
Union Gas Limited

We have audited the accompanying consolidated financial statements of Union Gas Limited, which comprise the consolidated balance sheets as at December 31, 2012 and December 31, 2011, and the consolidated statements of operations and comprehensive income, equity, and cash flows for the years then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

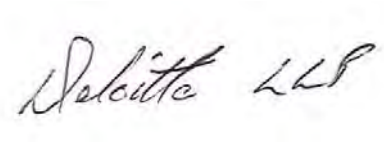
Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained in our audits is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of Union Gas Limited as at December 31, 2012 and December 31, 2011 and the results of its operations and its financial performance and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.



Chartered Accountants
Licensed Public Accountants
March 8, 2013

CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE INCOME

For the Years Ended December 31 ($millions)	**2012**	2011 (note 2)
Gas sales and distribution revenue	**1,365**	1,468
Cost of gas (note 14)	**638**	755
Gas distribution margin	**727**	713
Storage and transportation revenue (note 14)	**269**	311
Other revenue	**28**	34
	1,024	1,058
Expenses		
Operating and maintenance (note 14)	**380**	379
Depreciation and amortization	**213**	205
Property and other taxes	**65**	62
	658	646
Income before interest and income taxes	**366**	412
Interest expense (notes 7 and 14)	**156**	153
Income before income taxes	**210**	259
Income taxes (note 13)	**40**	58
Net income	**170**	201
Preferred stock dividends	**3**	2
Net income applicable to common stock	**167**	199
Other comprehensive income (loss), net of tax		
Pension and benefits impact (note 12)	**19**	(83)
Comprehensive income applicable to common stock	**186**	116

(*See accompanying notes)*

CONSOLIDATED STATEMENTS OF EQUITY

($millions)	Common Stock	Retained Earnings	Accumulated Other Comprehensive Loss	Non-controlling Interest	Total
December 31, 2011 (note 2)	627	764	(272)	9	1,128
Net income	–	170	–	–	170
Other comprehensive income	–	–	19	–	19
Dividends					
Preferred stock	–	(3)	–	–	(3)
Common stock	–	(162)	–	–	(162)
December 31, 2012	627	769	(253)	9	1,152
December 31, 2010 (note 2)	627	710	(189)	9	1,157
Net income	–	201	–	–	201
Other comprehensive loss	–	–	(83)	–	(83)
Dividends					
Preferred stock	–	(2)	–	–	(2)
Common stock	–	(145)	–	–	(145)
December 31, 2011	627	764	(272)	9	1,128

(See accompanying notes)

CONSOLIDATED BALANCE SHEETS

As at December 31 ($millions)	**2012**	2011 (note 2)
Assets		
Current assets		
Cash and cash equivalents	**9**	7
Accounts receivable, net (notes 4 and 14)	**588**	536
Inventories (note 5)	**199**	263
Deferred income taxes (note 13)	**14**	8
Total current assets	**810**	814
Property, plant and equipment (note 6)		
Cost	**6,803**	6,615
Accumulated depreciation	**2,236**	2,120
Property, plant and equipment, net	**4,567**	4,495
Regulatory and other assets (note 12)	**406**	355
Total Assets	**5,783**	5,664
Liabilities and Equity		
Current liabilities		
Short-term borrowings (note 14)	**9**	99
Commercial paper (note 7)	**374**	279
Accounts payable and accrued charges (notes 4 and 14)	**685**	622
Income taxes payable (note 13)	**26**	26
Total current liabilities	**1,094**	1,026
Long-term liabilities		
Long-term debt (note 7)	**2,287**	2,287
Deferred income taxes (note 13)	**352**	293
Asset retirement obligations (note 9)	**143**	134
Regulatory and other liabilities (note 12)	**645**	686
Total long-term liabilities	**3,427**	3,400
Total Liabilities	**4,521**	4,426
Preferred stock (note 8)	**110**	110
Equity		
Common stock,		
Unlimited shares authorized, 57,822,650 outstanding	**627**	627
Retained earnings	**769**	764
Accumulated other comprehensive loss	**(253)**	(272)
Non-controlling interest	**9**	9
Total Equity	**1,152**	1,128
Total Liabilities and Equity	**5,783**	5,664

(See accompanying notes)

Approved by the Board

Director

Director

CONSOLIDATED STATEMENTS OF CASH FLOWS

For the Years Ended December 31 ($millions)	**2012**	2011 (note 2)
Operating Activities		
Net income	**170**	201
Items not affecting cash		
Depreciation and amortization	**213**	205
Deferred income taxes	**(8)**	8
Changes in working capital		
Accounts receivable	**(6)**	(15)
Inventories	**49**	(85)
Account payables, accrued charges and other	**15**	45
	433	359
Investing Activities		
Capital expenditures	**(271)**	(290)
Financing Activities		
Net decrease in short-term borrowings	**(90)**	(99)
Net increase in commercial paper	**95**	122
Long-term debt issued	**–**	300
Long-term debt repayment	**–**	(250)
Dividends paid	**(165)**	(147)
	(160)	(74)
Change in cash and cash equivalents, during the year	**2**	(5)
Cash and cash equivalents, beginning of year	**7**	12
Cash and cash equivalents, end of year	**9**	7
Supplementary Disclosure of Cash Flow Information:		
Cash payments of interest	**153**	154
Cash payments of income taxes	**67**	8

(See accompanying notes)

UNION GAS LIMITED
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2012 AND 2011

1. Summary of Operations and Significant Accounting Policies

The terms ("Union Gas" or "the Company") as used in these Consolidated Financial Statements refer collectively to Union Gas Limited and its subsidiary unless the context suggest otherwise. These terms are used for convenience only and are not intended as a precise description of any separate legal entity within Union Gas. Union Gas' common stock is held by Great Lakes Basin Energy L.P. (GLBE), a wholly-owned limited partnership of Westcoast Energy Inc. (Westcoast). Westcoast is an indirect wholly-owned subsidiary of Spectra Energy Corp (Spectra Energy).

Nature of Operations

Union Gas owns and operates natural gas distribution, storage and transmission facilities in Ontario. The Company distributes natural gas to customers in northern, southwestern and eastern Ontario and provides natural gas storage and transportation services for other utilities and energy market participants. The property, plant and equipment of the Company consist primarily of pipeline, storage and compression facilities used in the distribution, storage and transportation of natural gas. In total, the Company has approximately 4,800 kilometres of high-pressure transmission pipeline and approximately 63,200 kilometres of distribution main and service pipelines. The Company's underground natural gas storage facilities have a working capacity of approximately 155 billion cubic feet (Bcf).

Basis of Presentation

The Consolidated Financial Statements of the Company include the accounts of Union Gas and its subsidiary, Huron Tipperary Limited Partnership I, of which the Company owns 75%.

The Consolidated Financial Statements of Union Gas have been prepared in accordance with generally accepted accounting principles in the United States (U.S. GAAP). All amounts are presented in millions of Canadian dollars except where noted.

In 2011, Canadian securities regulators approved the Company's election to report its financial statements in accordance with U.S. GAAP instead of International Financial Reporting Standards, effective January 1, 2012 through December 31, 2014, at which point the Company's intention is to reapply for exemptive relief to continue reporting under U.S. GAAP. For all periods up to and including the year ended December 31, 2011, the Company prepared its Consolidated Annual and Interim Financial Statements in accordance with Part V – Pre-changeover Canadian generally accepted accounting principles (CGAAP). For periods on or after January 1, 2012, the Company has prepared its financial statements to comply with U.S. GAAP. The adoption of U.S. GAAP has been made on a retrospective basis. The Financial Statements for prior periods have been restated in accordance with U.S. GAAP in effect at that time. The Company's date of transition to U.S. GAAP is January 1, 2011. See Note 2 for further details.

Use of Estimates

The preparation of Consolidated Financial Statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amount of assets, liabilities, revenues, expenses and disclosure of contingent assets and liabilities. Actual amounts could differ from these estimates. Management's significant estimates include unbilled revenue, income tax expense, employee future benefit expense, estimated useful life of property, plant and equipment and asset retirement obligations.

Regulation

The Company is regulated by the Ontario Energy Board (OEB) pursuant to the provisions of the *Ontario Energy Board Act, (1998)*, which is part of a package of legislation known as the *Energy Competition Act,*

(1998). This legislation provides an opportunity for different forms of regulation and increased competition in the energy (electricity and natural gas) industry in Ontario. The Company is subject to regulation with respect to the rates that it may charge its customers, with the exception of the items noted below, system expansion or facility abandonment, adequacy of service, public safety aspects of pipeline system construction and certain accounting principles. The OEB has determined that it will forbear from regulating the prices for long-term storage services. The Storage Forbearance Decision created an unregulated storage operation within Union Gas and provides the framework required to support new storage investments.

The OEB is mandated to approve rates that are just and reasonable. Utility earnings are regulated by the OEB under cost of service regulation, on the basis of a return on rate base for a future period. Under cost of service regulation, a rate application process leads to the implementation of new rates intended to provide a utility with the opportunity to earn an allowed rate of return. The actual rate of return achieved by the Company may vary from the rate allowed by the OEB as a result of unexpected changes in weather, average use per customer, inflation, the price of competing fuels, interest rates, general economic conditions and its ability to achieve forecast revenues and manage costs.

Rates effective January 1, 2007 were approved by the OEB on the basis of the traditional cost of service framework. Effective January 1, 2008, the Company began a five year incentive regulation term. The incentive regulation framework establishes new rates at the beginning of each year through the use of a pricing formula rather than through the examination of revenue and cost forecasts. The Company has set rates for 2013 on a cost of service basis.

The Company follows U.S. GAAP, which may differ for regulated operations from those otherwise expected in non rate-regulated businesses. As a result, the Company records assets and liabilities that result from the regulated ratemaking process that may not be recorded under U.S. GAAP for non rate-regulated entities. Regulatory assets generally represent incurred costs that have been deferred because they are probable of future recovery in customer rates. Regulatory liabilities generally represent obligations to make refunds to customers for previous collections for costs that are not likely to be incurred, or for certain net revenues beyond a pre-established threshold. Management continually assesses whether the regulatory assets are probable of future recovery by considering factors such as applicable regulatory changes and recent rate orders to other regulated entities. Management believes the existing regulatory assets are probable of recovery. This determination reflects the current political and regulatory climate at the provincial and national levels, and is subject to change in the future. If future recovery of costs ceases to be probable, the asset write-offs could be recognized in current period earnings.

Revenue Recognition

Revenues from the transportation, storage, distribution and sales of natural gas are recognized when either the service is provided or the product is delivered. Revenues related to these services provided or products delivered but not yet billed are estimated each month.

Gas Sales and Cost of Gas

Gas sales revenue is recorded on the basis of regular meter readings and estimates of customer volume usage since the last meter reading date to the end of the reporting period applied using OEB approved rates. Cost of gas is recorded using amounts approved by the OEB in the determination of customer sales rates. Differences between the OEB approved reference amounts and those costs actually incurred are deferred on the Consolidated Balance Sheets for future disposition subject to approval by the OEB.

In determining the quantities of gas delivered and received, differences arise from the measurement process. The Company includes in the Cost of gas an estimated amount of these differences based upon the methodology used by the OEB in the determination of rates for storage, transmission and distribution of gas. Annual fluctuations from the estimated level are recognized in earnings during the year.

As part of the Company's OEB-approved incentive regulation framework, an earnings sharing mechanism exists whereby earnings above an allowable return on equity are shared with ratepayers as a reduction in earnings during the year, if applicable.

Cash and Cash Equivalents

Cash and cash equivalents consist of cash and short-term investments, with an original maturity of three months or less.

Income Taxes

Deferred income taxes are recognized for differences between the financial reporting and tax bases of assets and liabilities at enacted statutory tax rates in effect for the years in which the differences are expected to reverse. The effect on deferred taxes of a change in tax rates is recognized in income in the period that includes the enactment date. Actual income taxes could vary from these estimates due to the future changes in income tax law or results from the final review of tax returns by federal and provincial tax authorities.

Financial statement effects on tax positions are recognized in the period in which it is more likely than not that the position will be sustained upon examination, the position is effectively settled or when the statute of limitations to challenge the position has expired. Interest related to the unrecognized tax benefits is recorded as Interest expense.

Inventories

Gas in storage for resale to customers is carried at weighted average cost approved by the OEB in the determination of customer sales rates. The difference between the approved cost and the actual cost of the gas purchased is deferred on the Consolidated Balance Sheets for future disposition subject to approval by the OEB. Inventories of materials and supplies are valued at the lower of average cost or net realizable value.

Property, Plant and Equipment and Depreciation

Property, plant and equipment is stated at historical cost less accumulated depreciation and amortization. The Company capitalizes all construction-related direct labour and material costs, as well as indirect construction costs. Indirect costs include general engineering and the cost of funds used during construction. The costs of renewals and betterments that extend the useful life or increase the expected output of property, plant and equipment are also capitalized. The cost of repairs, replacements and major maintenance projects that do not extend the useful life or increase the expected output of property, plant and equipment are expensed as incurred.

Regulated depreciation is computed based on the asset's average service life using the straight-line method. Unregulated depreciation is computed based on management's assumption of useful life using the straight-line method.

When regulated property, plant and equipment is retired, the original cost plus the cost of retirement, less salvage value, is charged to accumulated depreciation and amortization. When entire regulated operating units are sold or non-regulated property, plant and equipment is retired, the cost is removed from the property account and the related accumulated depreciation and amortization accounts are reduced. Any gain or loss is recorded in earnings, unless otherwise required by the applicable regulatory body.

Asset Retirement Obligations

The Company recognizes asset retirement obligations (AROs) for legal commitments associated with the retirement of long-lived assets that result from the acquisition, construction, development and/or normal use of the asset and conditional AROs in which the timing or method of settlement are conditional on a future event that may or may not be within the Company's control. The fair value of a liability for an ARO is recognized in the period in which it is incurred if a reasonable estimate of fair value can be made and is added to the carrying amount of the associated asset. This additional carrying amount is depreciated over the estimated useful life of the asset.

Stock-Based Compensation

Union Gas employees participate in a stock-based compensation plan sponsored by Spectra Energy. For employee awards, equity classified and liability classified stock-based compensation cost is measured at the grant date based on the fair value of the award. Liability classified stock-based compensation cost is re-measured at each reporting period until settlement. The compensation cost is recognized as an expense over the requisite service period, which generally begins on the date the award is granted through the earlier of the date the award vests or the date the employee becomes retirement eligible. Awards, including stock options, granted to employees that are already retirement eligible are deemed to have vested immediately upon issuance, and therefore, compensation cost for those awards is recognized on the date such awards are granted.

In addition, certain Union Gas employees that previously participated in the Company's 1989 Long Term Incentive Share Plan have the ability to receive a portion of their converted stock option awards as a stock appreciation right (SAR) paid in cash. Union Gas accounts for these by measuring the amount by which the quoted market price of the underlying stock exceeds the SAR base stock price at the balance sheet date.

New Accounting Pronouncements

There were no significant accounting pronouncements adopted during 2012 or 2011 that had a material impact on the Company's Consolidated Financial Statements.

2. First Time Adoption of U.S. GAAP

In 2011, Canadian securities regulators approved the Company's election to report its Consolidated Financial Statements in accordance with U.S. GAAP instead of International Financial Reporting Standards effective January 1, 2012. In March 2012, the OEB approved the use of U.S. GAAP for regulatory purposes.

For all periods up to and including the year ended December 31, 2011, the Consolidated Annual and Interim Financial Statements were prepared in accordance with Part V – Pre-changeover accounting standards of the CICA Handbook.

The Consolidated Financial Statements have been prepared to comply with U.S. GAAP applicable for periods on or after January 1, 2012. The adoption of U.S. GAAP has been made on a retrospective basis. The Consolidated Financial Statements for prior periods have been restated in accordance with U.S. GAAP in effect at that time. The date of transition to U.S. GAAP is January 1, 2011. This note explains the principal adjustments made in restating the Consolidated Balance Sheets as of January 1, 2011 and as of December 31, 2011, the Consolidated Statement of Operations and Comprehensive Income for twelve months ended December 31, 2011 and the Consolidated Statement of Cash Flows for twelve months ended December 31, 2011.

The following reconciliations provide details of the impact of the transition to U.S. GAAP on:

- Consolidated Balance Sheet at January 1, 2011;
- Consolidated Balance Sheet at December 31, 2011;
- Consolidated Statement of Operations and Comprehensive Income for twelve months ended December 31, 2011 and
- Consolidated Statement of Cash Flows for twelve months ended December 31, 2011.

RECONCILIATION OF CONSOLIDATED BALANCE SHEET

As of January 1, 2011 ($millions)	Previously Reported Under CGAAP	Deferred Financing Costs	Employee Future Benefits	Preferred stock	Income Taxes	Other	Total Adjustments	Restated Under U.S. GAAP
Assets								
Current assets								
Cash and cash equivalents	**12**	–	–	–	–	–	–	**12**
Accounts receivable, net	**516**	–	–	–	–	–	–	**516**
Income taxes receivable	**–**	–	–	–	17	–	17	**17**
Inventories	**174**	–	–	–	–	–	–	**174**
Deferred income taxes	**14**	–	–	–	–	–	–	**14**
Total current assets	**716**	–	–	–	17	–	17	**733**
Property, plant and equipment								
Cost	**6,370**	–	–	–	–	–	–	**6,370**
Accumulated depreciation	**1,994**	–	–	–	–	–	–	**1,994**
Property, plant and equipment, net	**4,376**	–	–	–	–	–	–	**4,376**
Regulatory and other assets	**493**	9	(137)	–	–	(1)	(129)	**364**
Total Assets	**5,585**	9	(137)	–	17	(1)	(112)	**5,473**
Liabilities and Equity								
Current liabilities								
Short-term borrowings	**198**	–	–	–	–	–	–	**198**
Commercial paper	**157**	–	–	–	–	–	–	**157**
Accounts payable and accrued charges	**586**	–	–	–	1	(1)	–	**586**
Income taxes payable	**8**	–	–	–	(8)	–	(8)	**–**
Long-term debt	**250**	–	–	–	–	–	–	**250**
Total current liabilities	**1,199**	–	–	–	(7)	(1)	(8)	**1,191**
Long-term liabilities								
Long-term debt	**1,978**	9	–	–	–	–	9	**1,987**
Mandatorily redeemable preferred stock	**5**	–	–	(5)	–	–	(5)	**–**
Deferred income taxes	**361**	–	–	–	(63)	–	(63)	**298**
Asset retirement obligations	**123**	–	–	–	–	–	–	**123**
Regulatory and other liabilities	**468**	–	115	–	24	–	139	**607**
Total long-term liabilities	**2,935**	9	115	(5)	(39)	–	80	**3,015**
Total Liabilities	**4,134**	9	115	(5)	(46)	(1)	72	**4,206**
Preferred stock	–	–	–	110	–	–	110	**110**
Equity								
Share capital	**732**	–	–	(105)	–	–	(105)	**627**
Retained earnings	**710**	–	–	–	–	–	–	**710**
Accumulated other comprehensive loss	**–**	–	(252)	–	63	–	(189)	**(189)**
Non-controlling interest	**9**	–	–	–	–	–	–	**9**
Total Equity	**1,451**	–	(252)	(105)	63	–	(294)	**1,157**
Total Liabilities and Equity	**5,585**	9	(137)	–	17	(1)	(112)	**5,473**

RECONCILIATION OF CONSOLIDATED BALANCE SHEET

As of December 31, 2011 ($millions)	Previously Reported Under CGAAP	Opening Balance Adjustment	Deferred Financing Costs	Employee Future Benefits	Income Taxes	Cash Pooling	Total Adjustments	Restated Under U.S. GAAP
Assets								
Current assets								
Cash and cash equivalents	**2**	–	–	–	–	5	5	**7**
Accounts receivable, net	**533**	–	–	3	–	–	3	**536**
Inventories	**263**	–	–	–	–	–	–	**263**
Deferred income taxes	**7**	–	–	–	1	–	1	**8**
Total current assets	**805**	–	–	3	1	5	9	**814**
Property, plant and equipment								
Cost	**6,615**	–	–	–	–	–	–	**6,615**
Accumulated depreciation	**2,120**	–	–	–	–	–	–	**2,120**
Property, plant and equipment, net	**4,495**	–	–	–	–	–	–	**4,495**
Regulatory and other assets	**545**	(129)	1	(62)	–	–	(190)	**355**
Total Assets	**5,845**	(129)	1	(59)	1	5	(181)	**5,664**
Liabilities and Equity								
Current liabilities								
Short-term borrowings	**99**	–	–	–	–	–	–	**99**
Commercial paper	**279**	–	–	–	–	–	–	**279**
Accounts payable and accrued charges	**618**	–	–	–	(1)	5	4	**622**
Income taxes payable	**53**	(25)	–	–	(2)	–	(27)	**26**
Total current liabilities	**1,049**	(25)	–	–	(3)	5	(23)	**1,026**
Long-term liabilities								
Long-term debt	**2,277**	9	1	–	–	–	10	**2,287**
Mandatorily redeemable preferred stock	**5**	(5)	–	–	–	–	(5)	**–**
Deferred income taxes	**383**	(63)	–	–	(27)	–	(90)	**293**
Asset retirement obligations	**134**	–	–	–	–	–	–	**134**
Regulatory and other liabilities	**492**	139	–	52	3	–	194	**686**
Total long-term liabilities	**3,291**	80	1	52	(24)	–	109	**3,400**
Total Liabilities	**4,340**	55	1	52	(27)	5	86	**4,426**
Preferred stock	**–**	110	–	–	–	–	110	**110**
Equity								
Share capital	**732**	(105)	–	–	–	–	(105)	**627**
Retained earnings	**764**	–	–	–	–	–	–	**764**
Accumulated other comprehensive loss	**–**	(189)	–	(111)	28	–	(272)	**(272)**
Non-controlling interest	**9**	–	–	–	–	–	–	**9**
Total Equity	**1,505**	(294)	–	(111)	28	–	(377)	**1,128**
Total Liabilities and Equity	**5,845**	(129)	1	(59)	1	5	(181)	**5,664**

RECONCILIATION OF CONSOLIDATED STATEMENT OF OPERATIONS AND COMPREHENSIVE INCOME

Twelve Months Ended December 31, 2011 ($millions)	Previously Reported Under CGAAP	Employee Future Benefits	Income Taxes	Total Adjustments	Restated Under U.S. GAAP
Gas sales and distribution revenue	**1,468**	–	–	–	**1,468**
Cost of gas	**755**	–	–	–	**755**
Gas distribution margin	**713**	–	–	–	**713**
Storage and transportation revenue	**311**	–	–	–	**311**
Other revenue	**34**	–	–	–	**34**
	1,058	–	–	–	**1,058**
Expenses					
Operating and maintenance	**379**	–	–	–	**379**
Depreciation and amortization	**205**	–	–	–	**205**
Property and other taxes	**61**	–	1	1	**62**
	645	–	1	1	**646**
Income before interest and income taxes	**413**	–	(1)	(1)	**412**
Interest expense	**152**	–	1	1	**153**
Income before income taxes	**261**	–	(2)	(2)	**259**
Income taxes	**60**	–	(2)	(2)	**58**
Net income	**201**	–	–	–	**201**
Preferred stock dividends	**2**	–	–	–	**2**
Net income applicable to common stock	**199**	–	–	–	**199**
Other comprehensive loss, net of tax					
Pension and benefits impact	**–**	(83)	–	(83)	**(83)**
Comprehensive income applicable to common stock	**199**	(83)	–	(83)	**116**

RECONCILIATION OF CONSOLIDATED STATEMENT OF CASH FLOWS

Twelve Months Ended December 31, 2011 ($millions)	Previously Reported Under CGAAP	Cash Pooling Adjustment	Restated Under U.S. GAAP
Cash Flows from Operating Activities			
Net income	**201**	–	**201**
Items not affecting cash			
Depreciation and amortization	**205**	–	**205**
Deferred income taxes	**8**	–	**8**
Changes in working capital			
Accounts receivable	**(15)**	–	**(15)**
Inventories	**(85)**	–	**(85)**
Accounts payable, accrued charges and other	**40**	5	**45**
	354	5	**359**
Cash Flows from Investing Activities			
Capital expenditures	**(290)**	–	**(290)**
Cash Flows from Financing Activities			
Net decrease in short-term borrowings	**(99)**	–	**(99)**
Net decrease in commercial paper	**122**	–	**122**
Long-term debt issued	**300**	–	**300**
Long-term debt repayment	**(250)**	–	**(250)**
Dividends paid	**(147)**	–	**(147)**
	(74)	–	**(74)**
Change in cash and cash equivalents, during the period	**(10)**	5	**(5)**
Cash and cash equivalents, beginning of period	**12**	–	**12**
Cash and cash equivalents, end of period	**2**	5	**7**
Supplementary Disclosure of Cash Flow Information:			
Cash payments of interest	**154**		**154**
Cash payments of income taxes	**8**		**8**

Notes to Transitional Adjustments from CGAAP to U.S. GAAP

Deferred Financing Costs

Under CGAAP, deferred financing costs are classified within the balance of Long-term debt. On transition to U.S. GAAP, deferred financing costs of $9 million as of January 1, 2011 and $10 million as of December 31, 2011 have been reclassified from Long-term debt to Regulatory and other assets.

Employee Future Benefits

Under CGAAP, the pension asset or liability is recorded at the net balance of cumulative benefit costs and the cumulative contributions to the plan. Unamortized actuarial gains and losses and prior service costs are not recorded in the pension asset or liability. Under U.S. GAAP, the pension asset or liability is recorded at the present value of the defined benefit obligation less the fair value of plan assets. The pension asset or liability includes unrecognized actuarial gains or losses and prior service costs or credits with an offset to Accumulated other comprehensive loss (AOCL).

On transition, the adjustments made to comply with U.S. GAAP as of January 1, 2011 resulted in a decrease of $137 million to Regulatory and other assets, an increase of $115 million to Regulatory and other liabilities and a loss of $252 million to AOCL. As of December 31, 2011, the adjustments resulted in an increase of $3 million

to Accounts receivable, a decrease of $199 million to Regulatory and other assets, an increase of $167 million to Regulatory and other liabilities and a loss of $363 million to AOCL.

Preferred Stock

Under CGAAP, the Company's Class A, Series A and C preferred stock were reported as Long-term debt and the Company's Class A, Series B and Class B, Series 10 preferred stock were reported as Share capital. Under U.S. GAAP, since all of Company's preferred stock are not solely within the Company's control they are reported as temporary equity. On transition to U.S. GAAP, $5 million of preferred stock were reclassified from Mandatorily redeemable preferred stock to Preferred stock and $105 million were reclassified from Share capital to Preferred stock.

Income Taxes

The change in deferred income taxes represents the tax effect of the U.S. GAAP transition adjustments discussed above. U.S. GAAP also requires certain tax reserves to be classified as current and only allows the use of enacted tax rates as opposed to substantively enacted. As of January 1, 2011, this resulted in a decrease of $8 million to Income taxes payable, an increase of $17 million to Income taxes receivable, a decrease of $63 million to Deferred income taxes (liability), an increase of $1 million to Accounts payable and accrued charges, an income of $63 million to AOCL, and an increase of $24 million to Regulatory and other liabilities. As of December 31, 2011, U.S. GAAP adjustments resulted in an increase of $1 million to Deferred income taxes (asset), a decrease of $27 million to Income taxes payable, a decrease of $90 million to Deferred income taxes (liability), an income of $91 million to AOCL, and an increase of $27 million to Regulatory and other liabilities.

Cash Pooling

Under CGAAP, negative book balances may be included as a component of Cash and cash equivalents. Under U.S. GAAP, these balances are reported as liabilities. As of December 31, 2011 negative book balances of $5 million were reclassified from Cash and cash equivalents to Accounts payable and accrued charges.

3. Regulatory Matters

The Company recorded the following assets and liabilities that result from the regulated ratemaking process that would not be recorded under U.S. GAAP for non-regulated entities. See note 1 for further discussion.

($millions)	Financial Statement Location	**December 31, 2012**	December 31, 2011 (note 2)	Recovery/Settlement Period
Regulatory assets				
Customer deferrals	Accounts receivable, net	**44**	36	Less than 1 year
Gas in storage inventory	Inventories	**15**	54	Less than 1 year
Other deferrals – long-term	Regulatory and other assets	**1**	9	1 – 3 years
Deferred income taxes – long-term	Regulatory and other assets	**298**	235	2 years to exceeds remaining life of asset
Total regulatory assets		**358**	334	
Regulatory liabilities				
Other deferrals – current	Accounts payable and accrued charges	**9**	9	Less than 1 year
Customer deferrals	Accounts payable and accrued charges	**58**	33	Less than 1 year
Gas cost deferrals	Accounts payable and accrued charges	**49**	54	Less than 1 year
Asset removal costs	Regulatory and other liabilities	**444**	427	Exceeds remaining life of asset
Total regulatory liabilities		**560**	523	

Rate Related Information

As 2012 was the final year of the Company's current multi-year incentive regulation framework, the Company filed an application with the OEB in November 2011 to set its distribution rates effective January 1, 2013. As part of the 2013 rates hearing process, the Company conducted settlement negotiations with intervening parties. A settlement agreement was reached on most capital and rate base issues, and on all operating costs. That settlement agreement was accepted by the OEB on July 10, 2012. The unsettled issues, including operating revenue, cost of capital, and rate design, were the subjects of a hearing. On October 25, 2012, the OEB issued its decision on the unsettled issues. The average annual impact on a customer's total bill will range from 0% - 6% depending on their location and customer class. The draft rate order was filed with the OEB in December 2012, and approved in January 2013. The Company implemented the approved OEB rate order in February 2013. During 2013, the Company intends to apply to the OEB for another incentive regulation framework effective for 2014 and beyond.

Non-Commodity Deferral Account Disposition

In April 2011, the Company applied to the OEB for the annual disposition of the 2010 non-commodity deferral account balances. A decision on that application was issued by the OEB in January 2012, and a final rate order was approved in March 2012. In May 2012, pursuant to certain intervenor correspondence, the OEB commenced a proceeding to reconsider the sharing of short-term storage margins between ratepayers and Union Gas. Written submissions were made on May 11, 2012, and a second decision on this matter was issued by the OEB on July 18, 2012. In that revised decision, the OEB directed Union Gas to dispose of an incremental credit balance of $3 million to ratepayers as part of the October 2012 Quarterly Rate Adjustment Mechanism. On August 24, 2012, the Company filed a motion to review and vary the revised decision which was dismissed by the OEB without a hearing.

In April 2012, the Company applied to the OEB for the annual disposition of the 2011 non-commodity deferral account balances. The combined impact on customers, including the impact of incentive regulation earnings sharing for 2011 is a refund payable to customers of approximately $3 million. The OEB decision on the sharing of short-term storage margins, discussed above, increased this refund payable to customers to $6 million.

In August 2012, the OEB determined that it would review the treatment of 2011 revenues derived from the optimization of the Company's upstream transportation contracts as part of the application to dispose of the 2011 non-commodity deferral account balances. The Company has historically recorded the optimization of upstream transportation contracts as revenues based on rates approved by the OEB. However, the OEB decision on the Company's 2013 rates application issued October 25, 2012 found that, among other things, the revenues associated with the optimization of upstream transportation contracts effective in 2013 are to be considered a reduction of natural gas supply costs, 90% of which are to be credited to customers.

On November 19, 2012, the OEB issued its decision on the treatment of 2011 revenues derived from the optimization of the Company's upstream transportation contracts. Similar to its finding in the 2013 rates application, the OEB determined retroactively that certain optimization revenue for 2011 will be treated as a reduction to natural gas supply costs. The result of this decision is to further increase the refund payable to customers for the 2011 non-commodity deferral account balances by $5 million to an approximate total of $11 million. The Company has appealed this decision to the Ontario Divisional Court (the Court) on the basis of impermissible retroactive ratemaking. A hearing and decision by the Court is expected by the end of 2013.

With respect to 2012, the above-mentioned finding on the treatment of certain revenues derived from the optimization of the Company's upstream transportation contracts resulted in a payable to customers of approximately $34 million. This amount has been recorded in the 2012 Consolidated Financial Statements.

Management believes that the effects of the above matters will not have a material adverse effect on the Company's future Consolidated Financial Statements.

4. Gas Imbalances

The Company, in the normal course of its operations, experiences imbalances in natural gas volumes between interconnecting pipelines and provides gas balancing services to customers. Natural gas volumes owed to or from the Company are valued at natural gas market prices as of the Consolidated Balance Sheet dates. As the settlement of imbalances is done with gas volumes, changes in the balances do not have an impact on the Company's cash flow from operating activities.

At December 31, 2012 Accounts receivable, net and Accounts payable and accrued charges include $250 million (2011 – $195 million) related to gas imbalances and gas balancing services.

5. Inventories

Gas in storage includes gas for delivery to customers and for use in the Company's operations. Inventories of materials and supplies are for use in Company's operations.

($millions)	**December 31, 2012**	December 31, 2011
Gas in storage	**182**	247
Materials and supplies	**17**	16
	199	263

6. Property, Plant and Equipment, net

($millions)	Useful Life	December 31, 2012	December 31, 2011
	(years)		
Plant			
Natural gas transmission	30 – 50	**1,653**	1,642
Natural gas distribution	27 – 60	**3,824**	3,680
Storage	5 – 50	**853**	845
Land rights and rights of way	45 – 60	**107**	106
Other buildings and improvements	10 – 38	**49**	43
Equipment	4 – 15	**87**	81
Vehicles	10	**48**	52
Land	—	**42**	42
Construction in progress	—	**52**	39
Software	4	**65**	60
Other	15 – 20	**23**	25
Total Property, plant and equipment		**6,803**	6,615
Total accumulated depreciation		**2,180**	2,062
Total accumulated amortization		**56**	58
Total Property, plant and equipment, net		**4,567**	4,495

The Company had no capital leases at December 31, 2012 or 2011.

Almost 95% of the Company's property, plant and equipment is regulated with estimated useful lives based on rates approved by the OEB. Composite weighted-average depreciation rates were 3.25% for 2012 and 3.25% for 2011.

Amortization expense of intangible assets totalled $15 million in 2012 and $16 million in 2011. Estimated amortization expense for the next five years follows:

($millions)	2013	2014	2015	2016	2017
Estimated amortization expense	13	11	8	4	2

7. Debt and Credit Facilities

Long-term Debt

		December 31, 2012	December 31, 2011
($millions)			(note 2)
7.90%	1994 Series debentures, due February 24, 2014	**150**	150
11.50%	1990 Series debentures, due August 28, 2015	**150**	150
4.64%	Series 5, due June 30, 2016	**200**	200
9.70%	1992 Series II debentures, due November 6, 2017	**125**	125
5.35%	Series 6, due April 27, 2018	**200**	200
8.75%	1993 Series debentures, due August 3, 2018	**125**	125
8.65%	Senior debentures, due October 19, 2018	**75**	75
4.85%	Series 7, due April 25, 2022	**125**	125
8.65%	1995 Series debentures, due November 10, 2025	**125**	125
5.46%	Series 6, due September 11, 2036	**165**	165
6.05%	Series 7, due September 2, 2038	**300**	300
5.20%	Series 8, due July 23, 2040	**250**	250
4.88%	Series 9, due June 21, 2041	**300**	300
		2,290	2,290
Less: unamortized debt discount		**3**	3
		2,287	2,287

The Company's long-term debt is unsecured. The weighted average cost of long-term debt as at December 31, 2012 was 6.6% (2011 – 6.6%). Principal repayment requirements on long-term debt are as follows:

($millions)	**Total**	**2013**	**2014**	**2015**	**2016**	**2017**	**Thereafter**
Long-term debt	2,290	–	150	150	200	125	1,665

Under the terms of the trust indentures relating to certain debentures, the Company has agreed to several covenants including a limitation on the payment of dividends. As of December 31, 2012 and 2011, the Company is in compliance with all such covenants.

Total interest paid on long-term debt in 2012 was $150 million (2011 – $151 million).

Available Credit Facility and Restrictive Debt Covenants

			Commercial Paper Outstanding at	
($millions)	**Expiration Date**	**Credit Facility Capacity**	**December 31, 2012**	December 31, 2011
Multi-year syndicated [(a)]	2016	400	374	279

[(a)] The credit facility contains a covenant requiring the debt-to-total capitalization ratio to not exceed 75% and a provision which requires Union Gas to repay all borrowings under the facility for a period of two days during the second quarter of each year. The ratio was 68% at December 31, 2012 (2011 – 68%, as adjusted per note 2).

The issuance of commercial paper, letters of credit and revolving borrowings reduce the amount available under the credit facility. As of December 31, 2012 and 2011 there were no letters of credit issued under the credit facility or revolving borrowings outstanding.

The Company's credit agreement contains various financial and other covenants, including the maintenance of certain financial ratios. Failure to meet those covenants beyond applicable grace periods could result in

accelerated due dates and/or termination of the agreement. As of December 31, 2012 and 2011, the Company was in compliance with those covenants. In addition, the credit agreement allows for the acceleration of payments or termination of the agreement due to non-payment, or in some cases, due to the acceleration of other significant indebtedness of the borrower or some of its subsidiaries.

A majority of the Company's short-term cash requirements are funded through the issuance of commercial paper. The weighted average rate on outstanding commercial paper as of December 31, 2012 was 1.12% (2011 – 1.05%).

Total interest paid on short-term debt in 2012 was $4 million (2011 – $3 million).

8. Preferred Stock

		Outstanding			
	Authorized	**December 31, 2012**	December 31, 2011 (note 2)	**December 31, 2012**	December 31, 2011 (note 2)
	(shares)	*(shares)*		*($millions)*	
Class A	202,072				
Series A, 5.5%		**47,672**	47,672	**3**	3
Series B, 6%		**90,000**	90,000	**5**	5
Series C, 5%		**49,500**	49,500	**2**	2
Class B, Series 10, 4.88%	Unlimited	**4,000,000**	4,000,000	**100**	100
				110	110

The Class A, Series A and C Preferred stock are cumulative and redeemable at $50.50 per share. The Company is obligated to offer to purchase $170,000 of Series A and $140,000 of Series C shares annually at the lowest price obtainable, but not exceeding $50 per share.

The Class A, Series B Preferred stock are cumulative and redeemable at $55 per share at the option of the Company.

The Class B, Series 10 Preferred stock are cumulative and redeemable at $25 per share at the option of the Company and, at the option of the holders, convertible back into Series 11 shares every five years commencing January 1, 2014. Union Gas may redeem at any time all, but not less than all, of the outstanding Series 10 Shares. The dividend rate of the Series 10 Shares is floating at an annual rate equal to 80% of the prime rate until December 31, 2013.

The Company has an unlimited number of authorized 4.79% Class B, Series 11 Preferred stock. These shares are cumulative and redeemable at $25 per share at the option of the Company, and at the option of the holders, convertible back into Series 10 shares every five years. At December 31, 2012 and December 31, 2011 none of these shares were issued or outstanding.

The shares are not subject to any sinking fund or mandatory redemption and are not convertible into any other type of securities other than preferred stock. As these shares are not solely in the control of the Company, they have been classified as temporary equity on the Consolidated Balance Sheets.

9. Asset Retirement Obligations

The Company's asset retirement obligations relate to the legal obligation to disconnect, purge and cap abandoned pipelines, capping abandoned storage wells, and in some buildings, special handling and disposition of asbestos if it is disturbed.

The Company has non-asbestos AROs which include easements and some railway license agreements relating to pipeline assets located on land which the Company does not own. The Company has not recognized a liability in regard to the non-asbestos ARO because the fair value of the ARO cannot be reasonably estimated.

The Company's pipeline system is considered a critical component of its business and is expected to be maintained and remain in place indefinitely. Natural gas supplies are also considered sufficient for the Company to operate in the long-term. The Company has determined that sufficient information to estimate the fair value of an ARO is not available because the assets are considered permanent with indeterminate useful lives and that sufficient information is not available to estimate a range of potential settlement dates in order to employ a present value technique to estimate fair value.

Asset retirement obligations are adjusted each period for liabilities incurred or settled during the period, accretion expense and any revisions made to the estimated cash flows.

Reconciliation of Changes in Asset Retirement Obligation Liabilities

($millions)	**December 31, 2012**	December 31, 2011
Balance, beginning of year	**134**	123
Accretion expense	**7**	6
Liabilities incurred	**3**	5
Liabilities settled	**(1)**	–
Balance, end of year	**143**	134

10. Stock-Based Compensation

Under the Long Term Incentive Share Option Plan 1989 (1989 Plan), the Company's parent company, Westcoast has granted certain stock options to its employees, including employees of Union Gas. Stock options are granted at an exercise price that equals the market price as defined in the 1989 Plan of Westcoast's shares on the date of grant. The 1989 Plan also provides for share appreciation rights under which the holder of a stock option may, in lieu of exercising the option, exercise the share appreciation right.

The Spectra Energy 2007 Long-Term Incentive Plan (the 2007 LTIP), as amended and restated, provides for the granting of stock options, restricted stock awards and units, unrestricted stock awards and units, and other equity-based awards, to employees and other key individuals who perform services for Spectra Energy. A maximum of 40 million shares of common stock may be awarded under the 2007 LTIP. Union Gas employees participate in the 2007 LTIP.

Options granted under the 2007 LTIP are issued with exercise prices equal to the fair market value of Spectra Energy common stock on the grant date, have ten year terms and generally vest over a three year term. Compensation expense related to stock options is recognized over the requisite service period. The requisite service period for stock options is the same as the vesting period, with the exception of retirement eligible employees, who have shorter requisite service periods ending when the employees become retirement eligible. Spectra Energy issues new shares upon exercising or vesting of share-based awards. The Black-Scholes option-pricing model is used to estimate the fair value of options at grant date.

Restricted, performance and phantom stock awards granted under the 2007 LTIP typically become 100% vested on the three-year anniversary of the grant date. The equity-classified and liability-classified stock-based compensation cost is measured at the grant date based on the fair value of the award. Liability-classified stock-based compensation cost is re-measured at each reporting period until settlement. Related compensation expense is recognized over the requisite service period which is the same as the vesting period.

At the time of the Spectra Energy spin-off from Duke Energy Corporation (Duke Energy), Duke Energy converted stock options, restricted stock awards, performance awards and phantom stock awards (collectively, Stock-Based Awards) of Duke Energy common stock held by Spectra Energy employees and Duke Energy employees. One replacement Duke Energy Stock-Based Award and one-half Spectra Energy Stock-Based Award were distributed to each holder of Duke Energy Stock-Based Awards for each award held at the time of the spin-off. The Spectra Energy Stock-Based Awards resulting from the conversion are considered to have been issued under the 2007 LTIP.

Spectra Energy allocated pre-tax stock-based compensation expense included in continuing operations to Union Gas for 2012 and 2011 as follows, the components of which are further described below:

($millions)	**2012**	2011
Phantom stock	**1**	1
Performance awards	**1**	2
Total	**2**	3

The Company recognized a nominal tax benefit in Net income associated with stock-based compensation expense in 2012. The Company did not recognize a tax benefit in 2011.

Stock Options

	Options	**Weighted-Average Exercise Price U.S. $**	**Weighted-Average Remaining Life (in years)**	**Aggregate Intrinsic Value (millions U.S. $)**
Outstanding, beginning of year	160,115	24	4.2	1
Transfers out	(36,900)	22		
Exercised	(28,562)	25		
Forfeited	(6,753)	32		
Outstanding, end of year	87,900	25	3.8	–
Options exercisable at year-end	87,900	25	3.8	–

The Company did not award non-qualified stock options to employees during 2012 or 2011. As of December 31, 2012 all stock options are fully vested, and as a result, the Company does not expect to recognize future compensation costs related to stock options.

Stock Awards

	Performance Awards		**Phantom Stock Awards**	
	Units	**Weighted-Average Grant Date Fair Value U.S. $**	**Units**	**Weighted-Average Grant Date Fair Value U.S. $**
Outstanding, beginning of year	184,669	25	170,109	20
Transfers out	(33,700)	31	(49,700)	20
Granted	48,600	28	29,900	31
Vested	(63,134)	15	(45,220)	13
Outstanding, end of year	136,435	28	105,089	26
Awards expected to vest	132,161	28	102,010	26

Performance Awards

Under the 2007 LTIP, the Company can also grant stock-based and cash-based performance awards. The performance awards generally vest over three years at the earliest, if performance metrics are met. The cash-based awards will be settled in cash at vesting. The Company granted 24,300 stock-based awards in 2012 and 31,800 stock-based awards in 2011, with fair values of U.S. $1 million for each of the grants to employees. The Company granted 24,300 cash-based awards in 2012 and 31,800 cash-based awards in 2011, with fair values of less than $1 million in 2012 and U.S. $1 million in 2011. The unvested and outstanding performance awards granted contain market conditions based on the total shareholder return of Spectra Energy common stock relative to a pre-defined peer group. The stock-based and cash-based awards are valued using the Monte Carlo valuation method. The cash-based awards are re-measured at each reporting period until settlement.

Weighted-Average Assumptions for Stock-Based Performance Awards

	2012	2011
Risk free interest rate	**0.4%**	1.2%
Expected life (years)	**3**	3
Expected volatility Spectra Energy	**25.1%**	37.7%
Expected volatility Peer Group	**15.8-41.5%**	21.2-59.6%
Market Index	**20.3%**	30.3%

The risk-free rate of return was determined based on a yield of three year U.S. Treasury bonds on the grant date. The expected volatility was established based on historical volatility over three years using daily stock price observations. A shorter period was used if three years of data was not available. Because the award payout includes dividend equivalents, no dividend yield assumption is required.

The total fair value of the performance shares vested was U.S. $1 million in both 2012 and 2011. As of December 31, 2012, the Company expects to recognize U.S. $1 million of future compensation cost related to stock awards over a weighted-average period of less than two years.

Phantom Stock Awards

Stock-based phantom awards granted under the 2007 LTIP generally vest over three years. The Company granted 29,900 phantom awards in 2012 and 47,200 phantom awards in 2011, with fair values of U.S. $1 million in both 2012 and 2011.

The total fair value of the phantom shares vested was U.S. $1 million in both 2012 and 2011. As of December 31, 2012, the Company expects to recognize U.S. $1 million of future compensation cost related to stock awards over a weighted-average period of less than two years.

11. Fair Value Measurements

Financial instruments recorded at fair value on the Consolidated Balance Sheets are valued using a fair value hierarchy that reflects the significance of the inputs used in making the measurements. The fair value hierarchy has the following levels:

Level 1

Level 1 valuations represent quoted unadjusted prices for identical instruments in active markets.

Level 2 Valuation Techniques

Fair values of the Company's financial instruments that are actively traded in the secondary market, including Long-term debt, are determined based on market-based prices. These valuations may include inputs such as quoted market prices of the exact or similar instruments, broker or dealer quotations, or alternative pricing sources that may include models or matrix pricing tools, with reasonable levels of price transparency.

Level 3 Valuation Techniques

Level 3 valuation techniques include the use of pricing models, discounted cash flow methodologies or similar techniques where at least one significant model assumption or input is unobservable. Level 3 financial instruments also include those for which the determination of fair value requires significant management judgment or estimation.

Financial Instruments

The fair values of financial instruments that are recorded and carried at book value are summarized in the following table. Judgment is required in interpreting market data to develop the estimates of fair value. These estimates are not necessarily indicative of the amounts that could have been realized in current markets.

	December 31, 2012		December 31, 2011	
($millions)	**Book Value**	**Approximate Fair Value**	Book Value	Approximate Fair Value
Long-term debt, including current maturities[(a)]	**2,290**	**2,844**	2,290	2,849

[(a)] Excludes unamortized items.

The fair value of the Company's Long-term debt is determined based on market-based prices as described in the Level 2 valuation technique above.

The fair values of Cash and cash equivalents, Accounts receivable, net and Accounts payable and accrued charges, Short-term borrowings and Commercial paper are not materially different from their carrying amounts because of the short-term nature of these instruments or because the stated rates approximate market rates.

Credit risk

Credit risk is the risk of financial loss to the Company if a customer or counterparty to a financial instrument fails to meet its contractual obligation. The maximum exposure to credit risk of the Company at period end is the carrying value of its financial assets. The Company's principal customers for natural gas transportation and storage services are industrial end-users, marketers, local distribution companies and utilities. The Company's distribution customers are primarily industrial and residential end-users. These concentrations of customers may affect the Company's overall credit risk.

The Company, in the normal course of its operations, provides gas loans to other parties from its holdings of gas in storage. The replacement amount of gas loans at December 31, 2012 is $61 million receivable (2011 - $64 million receivable). The Company manages its credit exposure related to gas loans by subjecting these parties to the same credit policies it uses for all customers, and obtaining collateral when appropriate.

The Company manages its credit risk on Cash and cash equivalents by dealing solely with reputable banks and financial institutions. To manage its credit risk on Accounts receivable, net the Company performs ongoing credit reviews of all its customers. In cases where the credit quality of a customer does not meet the Company's requirements, a cash deposit, letter of credit or parental guarantee is required. Deposits held by the Company at December 31, 2012 amounted to $40 million (2011 - $48 million). Significant financial difficulties of the debtor, the probability that the debtor will enter bankruptcy or financial reorganization, and default or delinquency in payments are considered indicators that the account receivable may be uncollectible and therefore should be included in the allowance for doubtful accounts.

Union Gas continues to utilize its established risk management policies and procedures to ensure the appropriate monitoring of customer credit positions and, based on current evaluations, does not expect any significant negative impacts associated with these positions.

The following table sets forth details of the age of trade receivables that are not impaired as well as the allowance for the doubtful accounts:

($millions)	**December 31, 2012**	December 31, 2011
Current	**249**	263
30 Days over due	**9**	10
60 Days over due	**3**	4
90+ Days over due	**6**	7
Total trade accounts receivable	**267**	284
Allowance for doubtful accounts	**(5)**	(4)
Total trade accounts receivable, net[14]	**262**	280

For the years ended December 31, 2012 and 2011, no one customer accounted for more than 10% of sales or 10% of receivables.

Liquidity risk

Liquidity risk is the risk that the Company will not be able to meet its obligations as they become due. The Company manages its liquidity risk by forecasting cash flows from operations and anticipated investing and financing activities. The Company has credit facilities available to help meet short-term financing needs (note 7).

The following are the contractual maturities of the undiscounted cash flows of financial liabilities as at December 31, 2012:

($millions)	Total	2013	2014–2015	2016–2017	Thereafter
Short-term borrowings	9	9	–	–	–
Commercial paper	374	374	–	–	–
Accounts payable and accrued charges	685	685	–	–	–
Long-term debt (including principal and interest)	4,247	150	573	552	2,972
Total	5,315	1,218	573	552	2,972

12. Employee Benefit Plans

Retirement Plans

The Company maintains registered and non-registered, contributory and non-contributory defined benefit (DB Plans) and defined contribution (DC Plan) retirement plans covering substantially all employees. The DB Plans provide retirement benefits based on each plan participant's years of service and final average earnings. Under the DC Plan, company contributions are determined according to the terms of the plan and based on each plan participant's age, years of service and current eligible earnings. The Company also provides non-registered DB Plans to all employees who retire under a registered DB Plan and whose pension is limited by the maximum pension limits under the Income Tax Act.

The Company's policy is to fund the retirement plans, where applicable, on an actuarial basis to provide assets sufficient to meet benefits to be paid to plan participants or as required by legislation or plan terms. Total contributions to the DB Plans were $59 million in 2012 and $89 million in 2011. Contributions of $5 million in 2012 and $5 million in 2011 were made to the Company's DC Plan. The Company anticipates that in 2013 it will make total contributions of approximately $59 million to its DB Plans and $6 million to its DC Plan.

[14] The carrying amount of accounts receivable is impacted by changes in gas prices, which may fluctuate significantly from year to year.

Actuarial gains and losses are amortized over the average remaining service period of active employees. The average remaining service periods of active employees covered by the registered and non-registered DB Plans are 10 years and 14 years respectively. The Company determines the market-related value of plan assets using a calculated value that recognizes changes in fair value of the plan assets over three years.

Registered and Non-registered Pension Plans

Change in Projected Benefit Obligation and Change in Fair Value of Plan Assets

($millions)	**2012**	2011 (note 2)
Change in Projected Benefit Obligation		
Projected benefit obligation, beginning of year	**745**	637
Service cost	**18**	12
Interest cost	**32**	33
Actuarial loss	**21**	92
Participant contributions	**3**	3
Benefits paid	**(32)**	(32)
Projected benefit obligation, end of year	**787**	745
Change in Fair Value of Plan Assets		
Plan assets, beginning of year	**591**	529
Actual return on plan assets	**37**	2
Benefits paid	**(32)**	(32)
Employer contributions	**59**	89
Plan participants' contributions	**3**	3
Plan assets, end of year	**658**	591
Net amount recognized[(a)]	**(129)**	(154)
Accumulated Benefit Obligation	**734**	695

[(a)] Recognized in Regulatory and other liabilities on the Consolidated Balance Sheets.

The DB Plans had accumulated benefit obligations in excess of plan assets.

Amounts Recognized in Accumulated Other Comprehensive Income (AOCI)

($millions)	**December 31, 2012**	December 31, 2011 (note 2)
Net actuarial loss	**328**	327
Prior service costs	**8**	10
Total amounts recognized in AOCI	**336**	337

Components of Net Periodic Pension Costs

($millions)	**2012**	2011 (note 2)
Net Periodic Pension Cost		
Service cost benefit earned	**18**	12
Interest cost on projected benefit obligation	**32**	33
Expected return on plan assets	**(43)**	(34)
Amortization of prior service cost	**2**	1
Amortization of loss	**26**	21
Net periodic pension cost	**35**	33
Other Changes in Plan Assets and Benefit Obligations Recognized in Other Comprehensive Income		
Current year actuarial loss	**27**	124
Amortization of actuarial loss	**(26)**	(21)
Amortization of prior service cost	**(2)**	(1)
Total recognized in other comprehensive income	**(1)**	102
Total Recognized in Net Periodic Pension Cost and Other Comprehensive Income	**34**	135

At December 31, 2012, approximately $25 million of actuarial losses will be amortized from AOCI on the Consolidated Balance Sheets into net periodic pension cost in 2013.

At December 31, 2012, approximately $2 million of prior service costs will be amortized from AOCI on the Consolidated Balance Sheets into net periodic pension costs in 2013.

Assumptions Used for Pension Benefits Accounting

	2012	2011
Benefit Obligations		
Discount rate	**4.15%**	4.30%
Salary increase	**3.25%**	3.25%
Net Periodic Benefit Cost		
Discount rate	**4.30%**	5.25%
Salary increase	**3.25%**	3.25%
Expected long-term rate of return on plan assets	**7.10%**	7.00%

The discount rates used to determine the benefit obligations are the rates at which the benefit obligations could be effectively settled. The discount rates are developed from yields on available high-quality bonds and reflect each plan's expected cash flows.

The long-term rates of return for the plan assets as of December 31, 2012 were developed using weighted-average calculations of expected returns based primarily on future expected returns across classes considering the use of active asset managers applied against the plans' respective targeted asset mix.

Registered Pension Plan Assets

Asset Category	Target Allocation	**December 31, 2012**	December 31, 2011
U.S. equity securities	14%	**14%**	14%
Canadian equity securities	28%	**28%**	27%
Other equity securities	13%	**13%**	13%
Fixed income securities	45%	**45%**	46%
Total	100%	**100%**	100%

Pension plan assets are maintained in a master trust. The investment objective of the master trust is to achieve reasonable returns on trust assets, subject to a prudent level of portfolio risk, for the purpose of enhancing the security of benefits for plan participants. The asset allocation targets were set after considering the investment objective and the risk profile with respect to the trust. Equities are held for their high expected return. Other equity and fixed income securities are held for diversification. Investments within asset classes are diversified to achieve broad market participation and reduce the effects of individual managers or investments. The Company regularly reviews its actual asset allocation and periodically rebalances its investments to the targeted allocation when considered appropriate.

The following table summarizes the fair values of pension plan assets recorded at each fair value hierarchy level, as determined in accordance with the valuation techniques described in note 11:

($millions)	**Total**	**Level 1**	**Level 2**	**Level 3**
December 31, 2012				
Cash and cash equivalents	4	4	–	–
Fixed income securities	297	287	10	–
Equity securities	356	258	98	–
Other	1	–	–	1
Total	658	549	108	1
December 31, 2011				
Cash and cash equivalents	4	4	–	–
Fixed income securities	268	257	11	–
Equity securities	317	227	90	–
Other	2	–	–	2
Total	591	488	101	2

Expected Benefit Payments

($millions)	**2013**	**2014**	**2015**	**2016**	**2017**	**2018–2022**
Expected benefit payments	35	37	38	40	41	177

Other Post-Retirement Benefit Plans

The Company provides health care and life insurance benefits for retired employees on a non-contributory basis predominantly under defined contribution plans. Employees are eligible for these benefits if they have met age and service requirements at retirement, as defined in the plans. The other post-retirement benefit plans are not funded.

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EB-2013-0109
Exhibit D1.3
Attachment 1

Other Post-Retirement Benefit Plans – Change in Projected Benefit Obligation and Fair Value of Plan Assets

($millions)	**2012**	2011 (note 2)
Change in Benefit Obligation		
Accumulated post-retirement benefit obligation, beginning of year	**81**	68
Service cost	**3**	2
Interest cost	**3**	4
Actuarial loss (gain)	**(17)**	9
Benefits paid	**(3)**	(2)
Accumulated post-retirement benefit obligation, end of year	**67**	81
Change in Fair Value of Plan Assets		
Plan assets, beginning of year	**–**	–
Benefits paid	**(3)**	(2)
Employer contributions	**3**	2
Plan assets, end of year	**–**	–
Net amount recognized[(a)]	**67**	81

[(a)] Recognized in Regulatory and other liabilities on the Consolidated Balance Sheets.

Other Post-Retirement Benefit Plans – Amounts Recognized in AOCI

($millions)	**December 31, 2012**	December 31, 2011 (note 2)
Net actuarial loss recognized in AOCI	**8**	26

($millions)	**2012**	2011 (note 2)
Other Post-Retirement Benefit Plans – Components of Net Periodic Benefit Cost		
Service cost benefit earned	**3**	2
Interest cost on accumulated post-retirement benefit obligation	**3**	4
Amortization of loss	**1**	–
Net periodic other post-retirement benefit cost	**7**	6
Other Changes in Plan Assets and Benefit Obligations Recognized in Other Comprehensive Income		
Current year actuarial loss (gain)	**(17)**	9
Amortization of actuarial gain	**(1)**	–
Total recognized in other comprehensive income	**(18)**	9
Total recognized in Net Periodic Benefit Cost and Other Comprehensive Income	**(11)**	15

Other Post-Retirement Benefits Plans – Assumptions Used for Benefits Accounting

	2012	2011
Benefit Obligations		
Discount rate for post-retirement plans	**4.20%**	4.33%
Salary increase	**3.25%**	3.25%
Net Periodic Benefit Cost		
Discount rate for post-retirement plans	**4.33%**	5.31%
Salary increase	**3.25%**	3.25%

The discount rates used to determine the post-retirement obligations are the rates at which the benefit obligations could be effectively settled. The discount rates for the plans are developed from yields on available high-quality bonds in each country and reflect each plan's expected cash flows.

Assumed Health Care Cost Trend Rates

	2012	2011
Health care cost trend rate assumed for next year	**7.00%**	7.50%
Rate to which the cost trend rate is assumed to decline	**5.00%**	5.00%
Year that the rate reaches the ultimate trend rate	**2017**	2017

Sensitivity to Changes in Assumed Health Care Cost Trend Rates

($millions)	**1% Point Increase**	1% Point Decrease
Effect on total service and interest costs	**1**	(1)
Effect on post-retirement benefit obligations	**5**	(4)

Other Post-Retirement Benefit Plans – Payments and Receipts

The Company expects to make future benefit payments, which reflect expected future service, as appropriate. The following benefit payments are expected to be paid over each of the next five years and thereafter.

($millions)	**2013**	**2014**	**2015**	**2016**	**2017**	**2018–2022**
Expected benefit payments	3	3	3	3	3	19

Retirement Savings Plan

The Company has employee savings plans available to eligible employees. Employees may participate in a matching contribution where the Company matches a certain percentage of before-tax employee contributions of up to 5% of eligible pay per pay period. The Company expensed pre-tax employer matching contributions of $7 million in 2012 and $7 million in 2011.

13. Income Taxes

Income Tax Expense Components

($millions)	**2012**	2011 (note 2)
Current		
Federal	**30**	36
Provincial	**18**	14
Total current tax expense	**48**	50
Deferred		
Federal	**(7)**	2
Provincial	**(1)**	6
Total deferred tax expense	**(8)**	8
Total Income taxes	**40**	58

Reconciliation of Income Tax Expense at the Combined Federal and Ontario Statutory Tax Rate to Actual Income Tax Expense

($millions)	**2012**	2011 (note 2)
Income before income taxes	**210**	259
Statutory income tax rate	**26.5%**	28.25%
Statutory income tax rate applied to accounting income	**55**	73
Increase/(decrease) resulting from:		
Deferred tax expense resulting from Ontario tax rate change	**4**	–
Deferred regulatory income tax payable/receivable recorded through tax expense	**(23)**	(19)
Other – net	**4**	4
Total income tax expense	**40**	58
Effective rate of income tax	**19.0%**	22.4%

Net Deferred Income Tax Liability Components

($millions)	**December 31, 2012**	December 31, 2011 (note 2)
Deferred income tax liabilities		
Accelerated depreciation rates	**316**	286
Regulatory asset	**79**	59
Other	**(43)**	(52)
Total deferred income tax liabilities	**352**	293
Deferred income tax assets		
Reserves	**11**	6
Regulatory liability	**2**	2
Other	**1**	–
Total deferred income tax assets	**14**	8
Net deferred income tax liabilities	**338**	285

The above deferred tax amounts have been classified in the Consolidated Balance Sheets as follows:

($millions)	**December 31, 2012**	December 31, 2011 (note 2)
Current assets	**14**	8
Long-term liabilities	**(352)**	(293)
	(338)	(285)

Reconciliation of Gross Unrecognized Income Tax Benefits

($millions)	**December 31, 2012**	December 31, 2011 (note 2)
Balance, beginning of year	**22**	22
Increases related to prior year tax positions	**3**	3
Decreases related to prior year tax positions	**–**	(3)
Increases related to current year tax positions	**1**	1
Reductions due to lapse of statute of limitations	**–**	(1)
Balance, end of year	**26**	22

Unrecognized tax benefits totalled $26 million at December 31, 2012. Of this, $17 million would reduce the effective tax rate if recognized on or after January 1, 2013. The Company recorded an increase of $4 million in gross unrecognized tax benefits during 2012. This resulted in a $4 million increase in tax expense.

The Company recognized potential accrued interest related to unrecognized tax benefits as interest expense. $1 million of interest expense was recognized in both 2012 and 2011. Accrued interest totalled $4 million at December 31, 2012 and $3 million at December 31, 2011.

Although uncertain, the Company believes it is reasonably possible that the total amount of unrecognized tax benefits could decrease by $19 million prior to December 31, 2013. The anticipated changes in unrecognized tax benefits relate to the expiration of statutes of limitations, expected audit settlements and expected changes to legislation.

The Company remains subject to examination for income tax returns for years 2006 through 2011.

14. Related Party Transactions

The Company purchases gas, storage and transportation services at prevailing market prices and under normal trade terms from related parties. During 2012, these purchases totalled $41 million (2011 – $56 million). The Company also provides storage and transportation services to related parties which totalled $1 million during 2012 (2011 – $1 million).

The Company provided administrative, management and other services to related parties totalling $14 million during 2012 (2011 – $12 million), which were billed and recovered at cost. Charges from related parties for administrative and other goods and services were $10 million during 2012 (2011 – $9 million).

At December 31, 2012 the Company had receivable balances of $4 million (2011 – $4 million) and payable balances of $10 million (2011 – $7 million) with related parties, all of which are recorded in Accounts receivable, net and Accounts payable and accrued charges, respectively.

In the normal course of operations, the Company provides or obtains funds from Westcoast on an unsecured basis. During 2012, the Company did not provide funds to Westcoast. The balance outstanding at December 31, 2012 was a payable of $9 million (2011 – $99 million payable). During 2012, interest paid on amounts owing totalled less than $1 million (2011 – less than $1 million). Interest on these loans is calculated based on the monthly average of 30-day banker's acceptance rates.

In addition, the Company made dividend payments to GLBE of $162 million during 2012 (2011 – $145 million).

15. Guarantees

The Company has various financial guarantees which are issued in the normal course of business. The Company enters into these arrangements to facilitate a commercial transaction with a third party by enhancing the value of the transaction to the third party. To varying degrees, these agreements involve elements of performance and credit risk, which are not included on the Consolidated Balance Sheets. The possibility of having to perform under these guarantees is largely dependent upon future operations of other third parties or the occurrence of certain future events. The Company's potential exposure under these agreements can range from a specific dollar amount to an unlimited dollar amount depending on the nature of the claim and the particular transaction. The Company is unable to estimate the total potential amount of future payments under these agreements due to several factors, such as unlimited exposure under certain guarantees.

16. Contingencies

The Company, in the course of its operations, is subject to environmental and other claims, lawsuits and contingencies. Accruals are made in instances where it is probable that liabilities will be incurred and where such liabilities can be reasonably estimated. The Company has no reason to believe that the ultimate outcome of these matters could have a significant impact on its Consolidated Financial Statements.

17. Subsequent Events

Management has evaluated significant events and transactions that occurred from January 1, 2013 through March 8, 2013, the date the financial statements were filed, and no subsequent events requiring disclosure were noted.

DIRECTORS

David G. Unruh

Stephen W. Baker

Bruce E. Pydee

OFFICERS

Stephen W. Baker
Chair and President

J. Patrick Reddy
Chief Financial Officer

M. Richard Birmingham
Vice President, Regulatory Affairs and Lands

Bruce E. Pydee
Vice President and General Counsel

Janice L. Ferguson
Vice President, Human Resources

Menelaos Ydreos
Vice President, Government, Aboriginal and Public Affairs

Mark J. Isherwood
Vice President, Business Development – Storage and Transmission

Paul Rietdyk
Vice President, Engineering, Construction and Storage and Transmission Operations

Michael P. Shannon
Vice President, Distribution Operations

Joe R. Martucci
Vice President, Finance

Guy G. Buckley
Vice President and Treasurer

Timothy J. Kennedy
Vice President, Federal Government Affairs

Paul K. Haralson
Assistant Treasurer

Patricia M. Rice
Corporate Secretary

Leigh A. Hodgins
Assistant Secretary

Joseph Marra
Assistant Secretary

CORPORATE INFORMATION

Transfer Agent and Registrar **CIBC Mellon Trust Company**

Union Gas Limited preferred stock are listed on the Toronto Stock Exchange
Class A Preferred, Series A – 5½% (UNG.PR.C)

Class A Preferred, Series B – 6% (UNG.PR.D)

REGISTERED OFFICE

50 Keil Drive North
Chatham, Ontario N7M 5M1

UNION GAS LIMITED
Reconciliation of Statement of Utility Income to Audited Consolidated Income Statement
Year Ended December 31

Line No.	Particulars ($000s)	EB-2013-0109 Exhibit A, Tab 2 Appendix B, Schedule 1, & Exhibit A, Tab 2 Appendix D, Schedule 19 2012 (a)	Audited Financial Statements 2012 (b)	Difference	
	Operating Revenues:				
1	Gas Sales and distribution	$ 1,349	$ 1,365	(16)	[1]
2	Storage & Transportation	269	269	0	
3	Other	29	28	1	[2]
4		1,647	1,662	(15)	
	Operating Expenses:				
5	Cost of gas	638	638	(0)	
6	Operating and maintenance expenses	380	380	(0)	
7	Depreciation	212	213	(1)	[2]
8	Other financing	-	-	-	
9	Property taxes	63	65	(2)	[2]
10		1,293	1,296	(3)	
	Other				
11	Gain / (Loss) on sale of assets	(1)	-	(1)	[2]
12	Other / HTLP	(1)	-	(1)	[2]
13	Gain / (Loss) on foreign exchange	(1)	-	(1)	[2]
14		(3)	-	(3)	
15	Earning Before Interest and Taxes	$ 351	$ 366	(15)	

[1] Earnings Sharing Adjustment and rounding
[2] Presentation re-classes and rounding

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit A, Tab 2, Appendix B, Schedule 1

Preamble: Board staff notes that Union has made a number of adjustments (Column "C") to the revenues and expense line items in the ESM calculation.

a) Please provide a detailed explanation and the rationale for each adjustment.

Response:

a) Please refer to Exhibit A, Tab 2, page 3, Line 16 to page 7, Line 13 for a detailed explanation of all adjustments to the revenues and expenses in the ESM calculation.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit A, Tab 2, Appendix D, Schedule 19

Preamble: Board staff notes that Union has made a number of adjustments (Column "C") to the revenues and expense line items in the ESM calculation.

a) Please provide a detailed explanation and the rationale for each adjustment.

Response:

a) The adjustments identified in Exhibit A, Tab 2, Appendix D, Schedule 19, Column (c) are captured in the Notes section of that same schedule. A description of most of these adjustments can be found at Exhibit A, Tab 2, pages 3 through 7, in reference to Appendix B, Schedule 1. The remaining adjustments that are not addressed in the evidence are described below:

Note ii) – Removal from utility earnings the 10% shareholder incentive of $3.718 million related to the 2012 Upstream Transportation FT-RAM Optimization revenue.

Note ii) – Reversal of avoided costs – Adjustment to deferral: An adjustment was made to reduce the 2012 Upstream Transportation FT-RAM Optimization Deferral by $0.308 million to reverse the recording of fuel cost savings as revenue.

Note iv) – Fuel costs related to FT-RAM optimization: Cost of gas expense has been reduced by $0.636 million for fuel costs related to Upstream Transportation FT-RAM Optimization.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 2, Page 28

Preamble: In its evidence Union has indicated that it sells transportation exchange services for one month or the entire season, taking the risk that a design day will not occur during that time and that there will be upstream transportation that is surplus to the market requirements. If sustained cold weather or a design day does occur, the S&T group would take action to serve both the in-franchise firm customers and firm transportation exchange services.

a) Please provide instances in the past 5 years when the S&T group of Union had to purchase transportation services because Union had sold transportation exchange services for the month or the entire winter season.

b) Did Union undertake any probability analysis of a design day not occurring prior to selling the excess transportation capacity? Please provide a detailed response.

Response:

a) During the past 5 years, the S&T Group incurred incremental costs relating to upstream transportation resources and also purchased new services to facilitate the sale of firm winter transportation exchange services for one month or more. These costs were incurred on many occasions to manage the risk of weather that was colder or warmer than expected, possible demand fluctuations, or capacity constraints on upstream pipelines. All costs were accounted for against S&T revenue.

   Please see Attachment 1 for a summary of these costs for the past 5 winters.

b) Union evaluates the historical and recent market area consumption and variations to that consumption prior to selling transportation exchanges as a means of evaluating the likelihood of temporary surplus capacity. A mathematical probability model is not used. The risk evaluation is discussed in Exhibit B, Tab 2, Section 8.

   For example, referring to Exhibit B, Tab 2, page 41, Case 2, to evaluate the sale of a Dawn to Enbridge CDA exchange for the month of November, Union reviews the Union EDA market to determine if there may be temporary surplus capacity. This review includes market activity in the previous month (October), and in the previous Novembers. In addition, Union reviews weather forecasts, operational constraints and mitigation options. If Union determines that

there may be some temporary surplus capacity available, and suitable mitigation options are available, Union proceeds with the transportation exchange service.

Purchased Transportation Services
Relating to Monthly and Seasonal Winter Transportation Sold

$Millions	**Winter 08/09**	**Winter 09/10**	**Winter 10/11**	**Winter 11/12**	**Winter 12/13**
Incremental costs incurred on existing services *	$1.40	$2.10	$0.70	$0.50	$0.20
STFT Empress-Iroquois				$0.30	$0.40
Firm exchange SSMDA - Dawn		$0.08	$0.04	$0.10	$0.20
Firm exchange NDA/WDA - Dawn/EDA			$0.10		
Total	**$1.40**	**$2.18**	**$0.84**	**$0.90**	**$0.80**

* Includes incremental costs on existing capacities, such as diversions, STS injections, STS withdrawals, STS overrun, transportation fuel, and balancing fees.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit B, Tab 2, Page 71 and Exhibit B, Tab 3, Page 18

Preamble: In Union's 2013 Rebasing Application (EB-2011-0210), Union indicated that it had assigned 20,000 GJ/day of transportation capacity for 2009/10 and 2010/11.

a) Please provide all transportation capacity that was assigned (including transportation exchange services) by Union for a period of 12 months or for the entire winter season within the past 5 years (2008-2012).

b) In Exhibit B, Tab 3, Page 8, Union has indicated that its gas supply plan is appropriately sized and there are no assets in the Plan in excess of those necessary to meet firm customer requirements. If Union's plan is appropriately sized, how was Union able to assign transportation capacity for the entire year or for the entire winter season for 2009/10 and 2010/11?

Response:

a) Please see Attachment 1.

b) As described in the response to Exhibit D3.12, the size of Union's Gas Supply portfolio is a function of design day, not optimization.

Union's Gas Supply Plan contracts for sufficient capacity to meet all in-franchise firm demands in the Union EDA on a 47 HDD design day. This contracting practice is in accordance with Union's Gas Supply Guiding Principles (Exhibit B, Tab 3, page 12) and was confirmed in the review completed by Sussex Economic Advisors (Exhibit C, Tab 2). On any day that the 47 HDD does not occur, there will be temporary surplus.

The referred to assignment of Empress to Union EDA transportation capacity does not engage the question of the appropriateness of the Gas Supply Plan. The assignment was based on the level of acceptance of risk by the S&T Group. For the 2009/2010 and 2010/2011 gas years only, the S&T Group assigned transportation of 20,000 GJ/d of the Empress to Union EDA path for the entire year, and accepted the risk of a 47 HDD occurring in the Union EDA. As discussed during the EB-2011-0210 proceeding, FT-RAM was a new concept in the natural gas industry. Union (and others) learned and tried different products and services to earn transportation exchange revenue through optimization of FT-RAM. As a result of FT-RAM, earnings grew rapidly from 2008 through 2012. Although annual assignments were tried on a limited basis, it was not continued after two trial years because of the risk. As a result, there

were no annual assignments in either calendar 2012 or 2013.

This change in practice is addressed at Exhibit B, Tab 2, page 71, Case 6.

Capacity Assignments
Seasonal and Annual

GJ/d

Line No.	Receipt Point	Delivery Area		Winter 07/08 Nov '07	Dec '07	Jan '08	Feb '08	Mar '08
2	Empress	Eastern Zone	Seasonal	-	-	-	-	-
3			Annual	-	-	-	-	-
5	Empress	Northern Zone	Seasonal	-	-	-	-	-
6			Annual	-	-	-	-	-
8	Empress	Western Zone	Seasonal	-	-	-	-	-
9			Annual	-	-	-	-	-

				Winter 08/09 Nov '08	Dec '08	Jan '09	Feb '09	Mar '09
11	Empress	Eastern Zone	Seasonal	-	-	-	-	-
12			Annual	28,000	28,000	28,000	28,000	28,000
14	Empress	Northern Zone	Seasonal	8,000	8,000	8,000	8,000	8,000
15			Annual	-	-	-	-	-
17	Empress	Western Zone	Seasonal	-	-	-	-	-
18			Annual	-	-	-	-	-

				Winter 09/10 Nov '09	Dec '09	Jan '10	Feb '10	Mar '10
20	Empress	Eastern Zone	Seasonal	20,000	20,000	20,000	20,000	20,000
21			Annual	60,000	60,000	60,000	60,000	60,000
23	Empress	Northern Zone	Seasonal	-	-	-	-	-
24			Annual	-	-	-	-	-
26	Empress	Western Zone	Seasonal	-	-	-	-	-
27			Annual	-	-	-	-	-

				Winter 10/11 Nov '10	Dec '10	Jan '11	Feb '11	Mar '11
29	Empress	Eastern Zone	Seasonal	-	-	-	-	-
30			Annual	60,000	60,000	60,000	60,000	60,000
32	Empress	Northern Zone	Seasonal	-	-	-	-	-
33			Annual	-	-	-	-	-
35	Empress	Western Zone	Seasonal	-	-	-	-	-
36			Annual	-	-	-	-	-

				Winter 11/12 Nov '11	Dec '11	Jan '12	Feb '12	Mar '12
38	Empress	Eastern Zone	Seasonal	-	-	-	-	-
39			Annual	-	-	-	-	-
41	Empress	Northern Zone	Seasonal	-	-	-	-	-
42			Annual	-	-	-	-	-
44	Empress	Western Zone	Seasonal	-	-	-	-	-
45			Annual	-	-	-	-	

				Winter 12/13 Nov '12	Dec '12	Jan '13	Feb '13	Mar '13
47	Empress	Eastern Zone	Seasonal	-	-	-	-	-
48			Annual	-	-	-	-	-
50	Empress	Northern Zone	Seasonal	-	-	-	-	-
51			Annual	-	-	-	-	-
53	Empress	Western Zone	Seasonal	-	-	-	-	-
54			Annual	-	-	-	-	-

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit C, Tab 2, page 15, Union Gas Supply Planning Review, April 2013

Preamble: Sussex Economic Advisors has compared Union's methodology of determining the peak design day, based on the coldest day in the last 50 years, with other heat-sensitive distributors in North America.

a) Sussex Economic Advisors has provided a list of utilities in Appendix C which shows the peak design day planning approach for other heat-sensitive utilities. Please confirm whether utilities that use the coldest day in 20 years for design day planning purposes were able to meet their delivery commitments to all customers on the coldest days within the past 10 years.

b) Please provide the total transportation capacity required for the last three years (2010-2012) if Union were to use the coldest day in the last 20 years for design day planning purposes. In addition, please provide the total transportation capacity under the current design day conditions for the same period.

Response:

Union's design day methodology is based on the historic coldest day observed. This methodology provides a fixed and reasonable value for planning purposes.

a) The following response was provided by Sussex Economic Advisors:

There is only one utility (i.e., Gaz Métro) listed in Appendix C that uses the coldest day in 20 years for design day planning purposes. Although Sussex Economic Advisors, LLC has not reviewed Gaz Métro's delivery data, it is our understanding that Gaz Métro has been able to meet their delivery requirements to all firm customers on the coldest days within the past ten years.

b) Union North:

In four of the six gas supply delivery areas that comprise Union North the coldest observed temperature has occurred within the last twenty years. Therefore, for these delivery areas, the current design day conditions are consistent with the coldest day in the last 20 years.

In the case of the Union NDA, the coldest day in the last 20 years was only 0.1 HDD different from the current design standard and would therefore have a negligible impact on the design

day demand.

For the Union EDA the coldest day in the last 20 years was warmer than the design day (coldest day recorded). This difference was 3.5 HDD (43.6 for the coldest day in last 20 years and 47.1 for the current design assumption), which results in a demand impact of approximately 11 TJ/d.

This demand reduction is not sufficient to cause a change in the amount of upstream transportation contracted, but rather would result in more STS withdrawals from Parkway to the Union EDA that would be pooled and sent to the Union NDA on a cold day. This, in turn, would result in the reduction in the Union NDA on the reliance on the TCPL Empress to Union CDA diversion on that cold day, by the same 11 TJ/d.

Union South:

If Union were to use the coldest day in the last 20 years for design day planning purposes, there would be no impact on the Union South upstream transportation capacity. Union structures its South portfolio to utilize upstream capacity at 100% load factor to meet average annual demands.

As noted at Exhibit B, Tab 3, page 25, line 18-21, Union South design day demands in excess of average annual demands are met through additional withdrawals from storage. Given the coldest day in Union South is within 0.3 HDD of the new proposed standard and the coldest day within the past 31 years is within 0.1 HDD – there is no impact to either storage withdrawals or upstream transportation.

Attachment 1 outlines the contracted upstream transportation capacity for Union North and Union South under the current design day assumptions. Any changes in transportation capacity year over year are a result of changes in temporary capacity assignments or capacity turned back from customers that was not required by Union to meet annual demand requirements for its bundled system sales and direct purchase customers.

As indicated above, the result of adopting the coldest day in the last 20 years as the design day planning assumption would not lead to any change in the upstream transportation capacity that was held to meet the current design day planning assumption.

Union North Transportation Capacity
(TJ/d) as at January

	2010	2011	2012
TCPL long haul from Empress	168	168	160
Great Lakes from MichCon	-	-	6
TCPL short haul from Parkway	35	35	35
TCPL STS withdrawals from Parkway/Dawn	197	197	197
Total Transportation Capacity - North	400	400	398

Union South Transportation Capacity
(TJ/d) as at January

	2010	2011	2012
TCPL long haul from Empress	71	69	69
Trunkline	21	21	21
Panhandle	26	26	46
Alliance/Vector	84	84	84
Vector	85	100	95
ANR Great Lakes/ANR Michcon	-	21	-
Total Transportation Capacity - South	287	321	315

Transportation capacity for Union North and Union South will remain the same under both the current design day conditions and using the coldest observed temperature in the last 20 years.

Changes in transportation capacity year over year are a result of changes in temporary capacity assignments or capacity turned back from customers that was not required by Union to meet annual demand requirements for its bundled system sales and direct purchase customers.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit C, Tab 2, page 20, Union Gas Supply Planning Review, April 2013

a) Please confirm if Union uses weather information from the same weather stations for its weather methodology calculations and to determine the design day weather standard. If Union uses different weather stations for weather methodology calculations and design day analysis, please provide reasons for doing so.

Response:

a) For weather methodology calculations and design day weather standard, Union uses weather stations from within each analysis area. Where there is a single weather station, Union uses the same weather station for both processes. Where there are multiple weather stations per analysis area, the weather methodology calculations and design day weather standard are slightly different. While the differences are minor, Union is investigating whether there is value in harmonizing the approach.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit C, Tab 2, Page 22, Union Gas Supply Planning Review, April 2013

Preamble: In terms of the weather standard, there are two main approaches utilized by LDCs for determining design day weather. The first approach is to use the coldest observed temperature over a certain period of time while the second approach is to use probability (i.e., frequency of occurrence).

a) If the second approach was used (frequency of occurrence) what would the design day weather be for Union North and South?

Response:

a) Union is unable to answer the question without a defined frequency of occurrence. Union has adopted the recommendation by Sussex to use the coldest observed temperature for Union South of 43.1 Degree Days, which occurred in 1982. Based on a statistical analysis, using weather data from 1953 to 2012, the probability of a 43.1 Degree Day is 1.3%. Union feels this is a reasonable frequency of occurrence.

Union's design day temperatures for Union North are also based on coldest observed temperature. Statistical analysis was not performed due to the significant level of work required to assess each individual location.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit C, Tab 2, Union Gas Supply Planning Review, April 2013

a) Although Union considers the long-term warming trend in weather for average use and weather methodology calculations, there is no such consideration for gas supply planning purposes. Please explain the reasons for not considering the warming weather trend for gas supply planning purposes.

Response:

a) The warming trend is considered for gas supply planning purposes. The purpose of the Gas Supply Plan is to determine the appropriate level of assets required to meet firm customer demands for annual, seasonal and design day requirements for Union's system sales and bundled direct purchase customers.

The average use and weather methodology calculations are the basis for the development of the general service annual demand forecast. This demand forecast is a key input into the Gas Supply Planning process. Therefore a warming trend that causes a reduction in annual general service demands will translate into lower annual gas supply needs, which will be incorporated in the Gas Supply Plan. However an offsetting trend is the additional new customers that are added by Union each year and more recently by the trend of return to system. The Gas Supply Plan takes all of these factors into consideration in determining how much upstream capacity and supply is required.

UNION GAS LIMITED

Answer to Interrogatory from
Board Staff

Reference: Exhibit C, Tab 2, Union Gas Supply Planning Review, April 2013

a) Please provide the total transportation capacity utilized for the 10 coldest days within the past 20 years. In addition, please provide the excess transportation capacity that includes assignments or exchanges for the same days.

Response:

a) Union does not have 20 years of data available, but has provided the 10 coldest days within any of Union's delivery areas over the last 10 years.

On all ten days, Union used 100% of the FT contracted capacity available. STS capacity was used where it is contracted in the NDA and the WDA. S&T transactions allowed for additional gas to be delivered to the delivery areas (lines 18 & 19), reducing the need for diversions and STS withdrawals. Finally, the remaining market demands were served through Diversions, LBA and Balancing Services.

Please see Attachment 1.

Total Transportation Capacity Utilized (GJ/day)

	a	b	c	d	e	f	g	h	i	j	k
1	Date	28/01/2004	29/01/2004	19/12/2004	23/12/2004	15/01/2005	16/01/2005	13/01/2009	02/01/2010	03/01/2010	20/01/2011
2	Delivery Area	MDA	MDA	NDA	WDA	WDA	MDA	MDA	MDA	MDA	MDA
3	Avg24HoursHDD	50.1	49.8	49.3	49.4	50.2	52.6	49.9	49.7	49.3	48.9
4	Temperature °C	-32.1	-31.8	-31.3	-31.4	-32.2	-34.6	-31.9	-31.7	-31.3	-30.9
5	Total Market	59,154	63,638	265,745	131,697	143,742	61,611	41,192	44,811	44,809	32,816
6	Less: T-service Supply	51,596	55,721	124,703	63,034	58,241	54,444	28,640	42,373	36,430	24,576
7	Union Market Demand (1)	7,558	7,917	141,042	68,663	85,501	7,167	12,552	2,438	8,379	8,240
8	Contracted FT Capacity	4,522	4,522	87,165	63,957	63,957	4,522	4,522	4,522	4,522	4,522
9	Less: DP Assignments (2)	-	-	39,379	30,684	30,684	-	-	-	-	-
10	Total FT Capacity Available	4,522	4,522	47,786	33,273	33,273	4,522	4,522	4,522	4,522	4,522
11	Utilized FT Capacity	4,522	4,522	47,786	33,273	33,273	4,522	4,522	4,522	4,522	4,522
12	FT Surplus Capacity	-	-	-	-	-	-	-	-	-	-
13	Contracted STS Withdrawal Capacity	-	-	48,375	31,420	31,420	-	-	-	-	-
14	Utilized STS Withdrawals (3)	-	-	58,472	15,390	31,420	-	-	-	-	-
15	Utilized STS Overrun	-	-	7,103	-	3,350	-	-	-	-	-
16	STS Surplus Capacity	-	-	-	16,030	-	-	-	-	-	-
17	Market Demand Served by S&T Transactions:										
18	IT using RAM Credits (4)	-	-	-	-	-	-	-	-	-	5,000
19	S&T Exchange to Delivery Area (5)	-	-	-	20,000	20,000	-	-	-	-	-
20	Market Demand Served by Diversions, LBA and Balancing Services (6)	3,036	3,395	27,681	-	(2,542)	2,645	8,030	(2,084)	3,857	(1,282)

Unit of Measure GJ/d

(1) Includes system supply and bundled Direct Purchase

(2) Assignments for Direct Purchase

(3) STS withdrawals greater than contracted capacity are related to STS pooling capability

(4) Supply flowing into the MDA using optimized FT-RAM credits, reducing the need for diversions

(5) WDA to Parkway exchange reducing amount of STS withdrawals in the WDA

(6) Represents market demand less use of firm contracted capacity and impact of S&T transactions. Calculated as Line 7 – (Line 11+ Line 14 + Line 15 + Line 18 + Line 19).
A positive result indicates market demand > contracted capacity

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 1, pages 39-41

a) Please provide the completion date for the disposition of deferral account balances for each of 2010, 2012 and 2012.

b) Please provide the most recent projected under or over recovery of the deferral account balances for 2011, similar to the $1.3 million excess refunded for 2010. Please break the estimate out by rate class for each rate class that contributes to the variance.

c) Was the primary cause for the over refund in 2010 and the projected over refund in 2011 volume forecast error over the refund period?

d) Was the over refund limited to the M1, M1, 01 and 10 rate classes, or was there an over refund associated with the contract rate classes? If not, please explain why not.

e) Given this potential issue should have been known to Union based on the difference between forecast and actual volumes in the general service rate classes, why did Union not propose to refund/collect the balances in the same manner as for contract rate customers?

f) Please confirm that the requested deferral account would be used for both the 2011 and 2012 deferral account, ESM and other balances disposition.

g) Will the deferral account be used for 2013 or subsequent year disposals?

Response:

a) Please see the table below for the completion date for disposition of deferral account balances for 2010, 2011 & 2012 (Proposed):

Year	Disposition Recovery/Refund Period	Variance (000's)
2012 (Proposed)	Oct 2013 - Mar 2014	N/A
2011(i)	Apr 2013 - Sept 2013	($4,605)
2010 (ii)	Oct 2012 - Mar 2013	($70)
2010 (ii)	Apr 2012 - Sept 2012	($1,323)

(i): Estimated variance as per Exhibit D2.1 b).
(ii): 2010 disposition of deferral account balances occurred over the period of April to Sept 2012. The adjustment to the Short-term storage Deferral was disposed of Oct 2012 to Mar 2013.

b) Please see the table below for the projected 2011 over refund amount by rate class.

Rate Class	Projected Refund Variance (000's)
Rate 01	($1,891)
Rate 10	(860)
Rate M1	(1,399)
Rate M2	(368)
Rate M4	(51)
Rate M5	(36)
Total	($4,605)

c) Please see the detailed response at Exhibit A, Tab 1, page 41 Line 1 to 22.

d) The 2010 over refund was limited to M1, M2, 01 & 10 rate classes. Contract rate classes were subject to one-time adjustments.

e) Union's Customer Information System (Banner), does not have the functionality to process one-time adjustments. The implementation of functionality to enable one-time adjustments in Banner would involve significant effort and cost.

Union's practice of disposing of the non-commodity deferral account balances to general service rate classes on a prospective basis is consistent with Union's approach to the disposition of gas supply-related deferral accounts in the QRAM. Implementing two different disposition methodologies of deferral account balances for general service rate classes is not appropriate.

f) Confirmed.

g) Yes.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 2

Is the calculation of utility earnings and earnings sharing consistent with the methodology used to calculate the 2011 earnings sharing in EB-2012-0087? If not, please explain any differences, other than the treatment of FT-RAM optimization revenue.

Response:

The calculation is consistent other than the treatment of FT-RAM optimization revenue.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 2, page 2

Please show the calculation of the benchmark return on equity for 2012 of 7.67%.

Response:

Please refer to Exhibit D1.3 e).

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 2, page 4

What is the rate base amount associated with the St. Clair Transmission Line that has been excluded from the earnings sharing calculation for 2012?

Response:

The amount excluded from 2012 rate base related to the St.Clair Transmission Line is $4.6 million.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 2, page 7

Please explain how the cancellation of the proposed decrease in the Ontario corporate tax rate results in increases to distribution revenue and storage & transportation revenue.

Response:

As noted at Exhibit A, Tab 1, page 39, Union recorded a debit of $0.132 million in 2012, which represents 50% of the tax cost arising from the elimination of the previously enacted 0.5% decrease in the Ontario corporate tax rate.

The proposed recovery of the Ontario corporate tax reduction included in rates was not recorded in corporate earnings in 2012. As a result, an adjustment was made to Distribution, and Storage & Transportation revenue for purposes of calculating 2012 utility income.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 2, page 9

a) What is Union's normalized actual return on equity for 2012?

b) At what level would the X factor have had to been in 2012 to result in a normalized return on equity equal to the benchmark ROE of 7.67%?

Response:

a) The weather normalized ROE before earnings sharing for 2012 is 12.38%.

b) The X factor would have had to be 11.97%.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 3, page 4

a) Has Union disposed of any balances in the Gas Distribution Access Rule Costs Deferral Account (179-112) in prior proceedings? If yes, please explain the allocation methodology used in those dispositions.

b) Please explain why Union proposes to allocate the costs in this account in proportion to the Board-approved number of customers in Rate 01 and Rate M1.

c) Did Union consider any other allocation methodology other than that proposed? If yes, please explain why the other methodology was rejected in favour of that proposed by Union.

d) Please explain why no GDAR related costs are allocated to Rates 10, M2 and other rather classes.

Response:

a) Yes. Union disposed of the balance in the Gas Distribution Access Rule Costs Deferral Account (179-112) in Union's 2007 Deferral Account Disposition proceeding (EB-2008-0109). In the 2007 deferral disposition, the balance in the GDAR deferral account was allocated to rate classes in proportion to the allocation of GDAR costs in approved 2007 rates.

b) Union is proposing to allocate the balance in the GDAR Costs Deferral Account in proportion to the Board-approved number of customers in Rate 01 and Rate M1 to align the proposed recovery with the GDAR service amendments that caused the costs to be incurred.

As described in Exhibit A, Tab 1, pages 18 to 22, the GDAR service amendments were related to residential and low-income customers. The majority of residential and low-income customers are in the Rate 01 and Rate M1 rate classes. Accordingly, recovery of the GDAR Costs Deferral Account balance from the Rate 01 and Rate M1 rate classes based on the Board-approved number of customers is appropriate.

c) Yes. Union considered the allocation methodology approved in the 2007 Deferral Account Disposition proceeding described in part (a) above. Union rejected this allocation methodology for the 2012 GDAR Costs Deferral Account balance as the GDAR costs in 2012

are different than GDAR costs incurred in 2007. The 2007 GDAR costs were incurred to implement the process and system changes for electronic business transactions standards and Rate-ready ABC service for large volume customers. Accordingly, recovery of 2007 GDAR costs from general service and bundled contract rate customers was appropriate.

d) Please see b) above.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 3, page 6

a) Has Union disposed of any balances in the Pension Charge on Transition to US GAAP Account (179-127) in prior proceedings? If yes, please explain the allocation methodology used in those dispositions.

b) Please explain why Union proposes to allocate the costs in this account in proportion to the Board-approved allocation of Employee Benefits expense in Administrative & General O&M Expense.

c) Did Union consider any other allocation methodology other than that proposed? If yes, please explain why the other methodology was rejected in favour of that proposed by Union.

Response:

a) No.

b) Union is proposing to allocate the balance in the Pension Charge on Transition to US GAAP Deferral Account to rate classes in proportion to the 2007 Board-approved allocation of Employee Benefits expense in Administrative & General O&M Expense as this allocation methodology is consistent with the manner in which Employee Benefits costs are recovered in Board-approved rates.

c) No. Please see b) above.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 3, Appendix A, Schedule 1 & Exhibit A, Tab 3, Appendix B, Schedule 1.

Please provide a table that shows by rate class, the allocation of the earnings sharing amount of $15,730 as shown in Exhibit A, Tab 3, Appendix A, Schedule 1 & the allocation of the amount in the Upstream Transportation FT-RAM Optimization Account (179-130) amount of $32,977 shown in Exhibit A, Tab 3, Appendix B, Schedule 1.

Response:

Please see Attachment 1.

UNION GAS LIMITED
Comparison of 2012 Earnings Sharing Amounts and FT-RAM Deferral Amounts to Rate Classes

Line No.	Particulars	Rate Class	Earnings Sharing ($000's) (a)	FT-RAM Deferral ($000's) (b)	Difference ($000's) (c) = (b-a)
	Union North				
1	Small Volume General Firm Service	01	(2,701)	(9,477)	(6,776)
2	Large Volume General Firm Service	10	(499)	(3,854)	(3,355)
3	Medium Volume Firm Service	20	(258)	(1,621)	(1,362)
4	Large Volume High Load Factor Firm Service	100	(342)	-	342
5	Large Volume Interruptible Service	25	(116)	(287)	(171)
6	Wholesale Transportation Service	77	(0)	-	0
7	Total Northern & Eastern Operations Area		(3,917)	(15,239)	(11,322)
	Union South				
8	Small Volume General Service Rate	M1	(6,313)	(14,559)	(8,245)
9	Large Volume General Service Rate	M2	(960)	(3,026)	(2,066)
10	Firm Industrial and Commercial Contract Rate	M4	(256)	(79)	177
11	Interruptible Industrial & Commercial Contract Rate	M5A	(157)	(74)	83
12	Special Large Volume Industrial & Commercial Contract Rate	M7	(159)	-	159
13	Large Wholesale Service Rate	M9	(13)	-	13
14	Small Wholesale Service Rate	M10	(1)	(0)	0
15	S & T Rates for Contract Carriage Customers	T1	(778)	-	778
16	S & T Rates for Contract Carriage Customers	T3	(94)	-	94
	Storage and Transportation				
17	Cross Franchise Transportation Rates	C1	(11)	-	11
18	Storage & Transportation Rates	M12	(3,065)	-	3,065
19	Transportation of Locally Produced Gas	M13	(2)	-	2
20	Storage & Transportation Services - Transportation Charges	M16	(3)	-	3
21	Total Southern Operations Area		(11,813)	(17,738)	(5,925)
22	Total		(15,730)	(32,977)	(17,247)

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit A, Tab 3, pages 8 and 10-11

Union provides the impact on a typical residential customer in both Union South and Union North for both sales service and direct purchase customers under two competing scenarios reflected in Appendix A (Union proposal for FT-RAM optimization revenue) and Appendix B (Board approved methodology for 2011 FT-RAM optimization revenue). Please provide a similar comparison for a typical commercial customer in both Rates M1 and 01 and Rates M2 and 10.

Response:

Please see Attachment 1.

UNION GAS LIMITED
2012 Deferral Disposition
General Service Bill Impacts for a Typical Commercial Customer

Line No.	Particulars	Rate Component	Volume for 2012 Deferral Disposition (m^3) (1)	Earnings Sharing Unit Rate for Recovery/(Refund) (cents/m^3)	Earnings Sharing Bill Impact ($)	FT-RAM Deferral Unit Rate for Recovery/(Refund) (cents/m^3)	FT-RAM Deferral Bill Impact ($)	Difference ($)
			(a)	(b)	(c) = (a x b) / 100	(d)	(e) = (a x d) / 100	(f) = (e - c)
1	Rate 01 - Commercial	Delivery	6,300	(0.3399)	(21.41)	0.0379	2.39	
2	(Annual volume of 8,000 m³)	Commodity	6,300	-	-	-	-	
3		Transportation	6,300	(0.3779)	(23.81)	(1.7034)	(107.31)	
4				(0.7178)	(45.22)	(1.6655)	(104.93)	
5	Sales Service				(45.22)		(104.93)	(59.71)
6	Direct Purchase Bundled T				(45.22)		(104.93)	(59.71)
7	Rate 10 - Commercial	Delivery	66,961	(0.6614)	(442.88)	(0.4552)	(304.80)	
8	(Annual volume of 93,000 m³)	Commodity	66,961	-	-	-	-	
9		Transportation	66,961	(0.3578)	(239.58)	(1.9529)	(1,307.67)	
10				(1.0192)	(682.46)	(2.4081)	(1,612.48)	
11	Sales Service				(682.46)		(1,612.48)	(930.01)
12	Direct Purchase Bundled T				(682.46)		(1,612.48)	(930.01)
13	Rate M1 - Commercial	Delivery	6,104	0.1076	6.57	0.3903	23.82	
14	(Annual volume of 8,000 m³)	Commodity	6,104	0.0944	5.76	(0.6389)	(39.00)	
15				0.2020	12.33	(0.2486)	(15.17)	
16	Sales Service				12.33		(15.17)	(27.50)
17	Direct Purchase				6.57		23.82	17.26
18	Rate M2 - Commercial	Delivery	55,772	0.1650	92.02	0.2853	159.12	
19	(Annual volume of 73,000 m³)	Commodity	55,772	0.0944	52.65	(0.6389)	(356.33)	
20				0.2594	144.67	(0.3536)	(197.21)	
21	Sales Service				144.67		(197.21)	(341.88)
22	Direct Purchase				92.02		159.12	67.09

Notes:
(1) Based on average consumption per customer, for the period October 1, 2013 to March 31, 2014.
(2) Based on annual volumes.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 1, page 1

When did Union review the Gas Supply planning process, as directed by the Board in EB-2011-0210?

Response:

As described in Exhibit B, Tab 5 Union drafted a RFP for the Gas Supply Plan review in November 2012 and the RFP was sent to consultants in December 2012. Union contracted with Sussex Economic Advisors and Concentric Energy Advisors in January and February of 2013. The Gas Supply Plan was reviewed as per direction from the Board's EB-2011-0210 Decision and final reports were sent to intervenors on April 20, 2013. These reports are filed at Exhibit C, Tab 2 and Exhibit C, Tab 3.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 1, page 6

Point 6 on page 6 states that Union's proposed treatment of net FT-RAM revenue will ensure that a robust and active secondary market for transportation services will continue to exist and provide ongoing benefits to Ontario.

a) When will FT-RAM credits no longer be available to Union Gas?

b) Based on the above response please explain how Union's proposal will affect the future of the secondary market in Ontario after the FT-RAM credits no longer exist.

Response:

a) The FT-RAM program ended June 30, 2013.

b) The referenced Point 6 should include all net optimization revenue, rather than just net FT-RAM revenue.

As stated in Exhibit B, Tab 2, page 17 the size and depth of the secondary market will ultimately depend on the financial opportunity available for all market participants. A robust secondary market benefits all participants in the Ontario natural gas industry (e.g. residential, commercial and industrial customers, and power producers). Optimization introduces risk to Union, and without the appropriate incentives in place Union's participation in the secondary market would be diminished.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 1, page 18 & Exhibit A, Tab 1, pages 39-41

a) At page 18 of Exhibit B, Tab 1, Union states that it believes that all of the components of the IRM should remain together. Please explain how Union's request for a deferral account is consistent with "all components of the IRM should remain together".

b) Was there any such true-up mechanism, as that now requested by Union, in place during the IRM plan for 2008, 2009 or 2010 balances that were disposed of?

Response:

a) One of the components of Union's IRM settlement agreement provided that deferral accounts would be treated as Y factors in the plan. Union and ratepayers agreed, and the Board subsequently approved, that the amounts associated with approved deferral accounts would be passed through to ratepayers. Deferral accounts protect the ratepayer and the shareholder from potential gains or losses due to forecast variances.

Prior to the 2010 deferral disposition the amount of the clearing variance was not significant and a true-up account was not required. Recent changes in the timing of the disposition of deferral account balances, the forecast uncertainty related to new rate classes and the establishment of the FT-RAM Optimization account to be treated as a gas cost pass through have increased the risk that a material variance will result from the disposition of the deferral account balances.

The projected variance related to the disposition of the 2011 deferral accounts is $4.6 million primarily related to the variance in gas supply and transportation volumes. Two of the largest account balances are in gas supply related deferral accounts (179-108 -Unabsorbed Demand Cost (UDC) and 179-130 -Upstream Transportation FT-RAM Optimization) which if included in the QRAM process would be subject to true-up.

Exposing Union to material variances related to the disposition of deferral accounts is not consistent with the Y factor treatment in the IRM.

b) No.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 1

Some suppliers offer a discount on their invoice for service provided for early payment of the invoice.

a) Does Union have any suppliers that offer this option? If yes, does Union take advantage of the discount available by paying the invoice earlier than it otherwise would?

b) If Union does take advantage of the early payment discount, how does Union account for this discount? Does it get recorded as a reduced cost or as a cost and a revenue equal to the discount received?

Response:

a) & b) Union does not have any suppliers that offer an early payment discount option for gas supply or transportation. To the extent that this was offered and Union was able to meet the time line to take advantage of the discount, the discount would be recognized as a reduced cost in gas costs and would go through the Purchase Gas Variance Account (PGVA) mechanism.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 1, page 38

The evidence states that "all upstream assets in the Gas Supply Plan serve the purpose of meeting design day market demands and annual customer requirements."

a) Please explain how these upstream assets contracted by Union meet the design day market demands of each of system gas customers, bundled direct purchase customers, unbundled direct purchase customers and T-service customers. How are the costs associated with these upstream assets recovered from each of these four types of customers?

b) Please explain how the upstream assets contracted by Union are used to meet the annual customer requirements of system gas customers, bundled direct purchase customers , unbundled direct purchase customers and T-service customers. How are the costs associated with upstream assets recovered of these four types of customers?

c) How do the upstream assets referred to that serve the purpose of meeting design day market demands and annual customer requirements impact on ex-franchise customers, such as those served under M12. In particular, what portion of the associated costs of these upstream assets are allocated to and recovered from the ex-franchise rate customers?

d) Please confirm that under Union's proposal to include the transportation exchange revenue in earnings sharing, that system gas customers, bundled direct purchase customers, unbundled direct purchase customers, T-service customers and ex-franchise customers will all share in this revenue. If this cannot be confirmed, please show the allocation of the earnings sharing amount associated with the transportation exchange revenues (as an incremental amount to the remaining earnings sharing) by both rate class and by the type of customer. If the latter is not possible, please indicate for each rate class which of the types of customers will share in the amount allocated to the rate class.

Response:

a) Union North:

The Union North upstream transportation assets are outlined in Exhibit B, Tab 3, pages 31-43 and include TCPL long haul firm transport, TCPL Storage Transportation Service ("STS"), TCPL short haul firm transport and TCPL upstream diversions.

Exhibit B, Tab 3, page 29, Table 2 outlines the role that these upstream transportation assets play in meeting Union North firm design day demands for those customers Union is responsible for serving (system sales and bundled direct purchase). These assets flow at 100% load factor on a design day.

In Union North, the costs associated with gas supply purchases are recovered from sales service customers only in the gas commodity rate. The costs associated with upstream transportation assets are recovered from sales service and bundled direct purchase customers in gas supply transport and storage rates. In addition, STS costs are recovered from T-Service customers that have specifically contracted for the bundled storage service.

Union South:

In Union South the upstream transportation assets include long haul firm transport from a number of supply basins including the WCSB (TCPL Empress, Alliance/Vector), Gulf of Mexico (Trunkline), Mid-Continent (Panhandle), Marcellus/Utica (TCPL Niagara), Chicago (Vector) and Dawn.

In Union South design day demands are met through a combination of gas flowing on upstream transportation, purchases at Dawn and storage withdrawals. Upstream transportation capacity flows at 100% load factor on design day.

In Union South, the costs associated with gas supply purchases and upstream transportation assets are recovered from sales service customers only in gas commodity and gas supply transport rates.

b) The upstream transportation assets contracted by Union are used in the same manner to meet annual customer requirements as they are to meet design day requirements. The only difference is that average annual demands will be less on a daily basis then design day demands.

Union North:

In Union North the upstream transportation is sized first to meet design day demand requirement. This means that a portion of the contracted capacity is planned to be unutilized during the year which results in unutilized capacity or UDC. The 2013 Gas Supply Plan included a planned amount of UDC of 9.3 PJ's (Exhibit B, Tab 3, page 30). The UDC in Union North is allocated to both sales and bundled T customers and recovered in the gas supply transport and storage rates.

Please see part (a) above for the recovery of costs.

Union South:

In Union South average annual demands are met through a combination of gas flowing on upstream transportation, purchases at Dawn and storage injections/withdrawals. Upstream transportation capacity flows at 100% load factor throughout the year and variances to average demands are managed through storage injections and withdrawals and adjustments to Dawn purchases.

Please see part (a) above for the recovery of costs.

c) The upstream transportation assets referred to in Exhibit B, Tab 1, page 38 have no impact on ex-franchise customers, and therefore none of these costs are recovered from them.

d) Confirmed.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 2, page 2

a) Please provide a breakdown of the transportation exchange revenue into two categories, the first of which is the movement of gas between a location not located on the Union transmission system and the second point is a location on the Union transmission system and the second of which is the movement of gas between two locations, both of which are not located on the Union transmission system.

b) For each location utilized to generate transportation exchange revenue that is not located on the Union transmission system, please indicate how Union holds capacity at that location and who ultimately pays for that capacity through their delivery and/or gas commodity/transportation charges to Union.

Response:

a)

Category	**Revenue Total (Millions)**
One point on Union's system	$ 49.3
No point on Union's system	$ 2.3
Total	$ 51.6

b) To provide transportation exchange services to or from any location not on Union's system, Union uses a combination of temporary surplus upstream transportation, incremental interruptible transportation and incremental firm transportation to provide the transportation exchange service. Please refer to Exhibit D2.15 a) for the recovery of costs for upstream transportation. The cost of any incremental services is offset against transportation exchange revenue.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 2, page 19

Please provide a breakdown of the transportation exchange revenue into categories that reflect each of the potential combinations of the three types of resources (from 1 alone to all 3) used to provide transportation exchange services.

Response:

As noted in Exhibit B, Tab 2, pages 19-22, Union utilizes three types of resources to provide transportation exchange services:

1. Union Transportation – this includes usage of Dawn to Parkway transportation
2. Upstream Transportation – this includes all of the firm transportation contracts that are within the Gas Supply Plan.
3. Purchased Resources – this includes additional transportation contracts that are purchased to facilitate transportation exchanges.

Attachment 1 outlines the four combinations of resources that are used to provide transportation exchange services. With respect to line 4, upstream transportation, this is entirely related to FT-RAM and will not continue beyond 2013.

2012 Exchange Revenue by Category

Line	Category	$000's
1	Union Transportation, Upstream Transportation, Purchased Resource	$ 14,108
2	Union Transportation, Upstream Transportation	$ 5,654
3	Upstream Transportation, Purchased Resource	$ 1,469
4	Upstream Transportation	$ 30,324
5	Total	$ 51,554

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 2, page 21

In the case of a temporary surplus of upstream transportation capacity that is related to demands in the market area, and not to the supply to be delivered pursuant to the Gas Supply Plan, please indicate:

a) Is the cost of the transportation associated with the temporary surplus upstream transportation capacity flowed through to gas costs through a PGVA mechanism? If so, please explain.

b) If there are costs in addition to the gas supply that is purchased as the planned location to get the gas at the required locations to meet the needs of the system sales and bundled direct purchase customers, are these costs flowed through the gas costs through a PGVA mechanism? If so, please explain.

Response:

a) and b) Costs for upstream transportation capacity in the Gas Supply Plan are included as part of Union's forecast gas costs. Variances between actual gas costs and forecast costs reflected in the Gas Supply Plan and rates are captured through the gas cost deferral accounts.

When Union incurs incremental costs to provide a transportation exchange service, these costs are attributed to transportation exchange revenue, not to the PGVA.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 2, page 79

The evidence indicates the Board approved treatment of Union's optimization activity for 2013. What will be the proposed treatment of Union's optimization activity for 2014 through 2018 under the next IRM plan? Please highlight any differences between the 2014 through 2018 treatment with that approved by the Board for 2013.

Response:

The treatment of transportation exchange revenue in 2014 and beyond will be addressed in Union's next IRM proceeding (EB-2013-0202). Union expects to file its IRM application and supporting evidence by the end of July.

UNION GAS LIMITED

Answer to Interrogatory from
London Property Management Association ("LPMA")

Reference: Exhibit B, Tab 4, Schedules 1 & 2

Please expand Schedules 1 and 2 to include ex-franchise rates.

Response:

Please see Attachment 1.

Exhibit B, Tab 4, Schedule 1 has been expanded to include the deferral account balances for all ex-franchise rate classes. Union has not expanded Exhibit B, Tab 4, Schedule 2 as there are no meaningful rate class averages for ex-franchise customers. The bill impacts for ex-franchise customers will vary significantly based on contract parameters and the level of activity.

UNION GAS LIMITED

Calculation of 2012 Deferral Impacts by Rate Class

Line No.	Rate Class	Particulars ($)	Customers	Consumption (10^3m^3)		Earnings Sharing	FT-RAM Deferral	Difference
			(a)	(b)		(c)	(d)	(e) = (d-c)
	Union South							
1	M1	Sales Service		1,985,247	(1)	4,008,467	(4,936,769)	(8,945,237)
2		Direct Purchase		247,631	(1)	266,330	966,506	700,175
3				2,232,879	(1)	4,274,798	(3,970,263)	(8,245,061)
4	M2	Sales Service		412,655	(1)	1,070,472	(1,459,254)	(2,529,726)
5		Direct Purchase		385,090	(1)	635,587	1,098,844	463,257
6				797,745	(1)	1,706,059	(360,410)	(2,066,469)
7	M4	Sales Service	15	20,353	(2)	97,564	30,845	(66,719)
8		Direct Purchase	146	408,288	(2)	1,753,575	1,997,268	243,693
9			161	428,641	(2)	1,851,140	2,028,113	176,973
10	M5	Sales Service	10	19,039	(2)	21,573	(45,849)	(67,423)
11		Direct Purchase	134	451,207	(2)	286,303	436,827	150,524
12			144	470,246	(2)	307,876	390,978	83,102
13	M7	Direct Purchase	4	141,165	(2)	(361,267)	(202,623)	158,644
14			4	141,165	(2)	(361,267)	(202,623)	158,644
15	M9	Direct Purchase	3	57,878	(2)	(3,960)	9,330	13,291
16			3	57,878	(2)	(3,960)	9,330	13,291
17	M10	Sales Service	3	118	(2)	20	(59)	(79)
18		Direct Purchase	1	79	(2)	(26)	228	254
19			4	197	(2)	(6)	169	175
20	T1	Direct Purchase	60	5,023,637	(2)	1,956,488	2,734,706	778,218
21			60	5,023,637	(2)	1,956,488	2,734,706	778,218
22	T3	Direct Purchase	1	239,361	(2)	3,876	97,624	93,748
23			1	239,361	(2)	3,876	97,624	93,748
24		**Total Sales Service**				**5,198,097**	**(6,411,086)**	**(11,609,183)**
25		**Total Direct Purchase**				**4,536,906**	**7,138,710**	**2,601,804**
26	**Total Union South (line 24 + line 25)**					**9,735,003**	**727,624**	**(9,007,380)**
	Union North							
27	Rate 01	Sales Service & Bundled T		714,975	(1)	(5,131,651)	(11,907,714)	(6,776,063)
28				714,975	(1)	(5,131,651)	(11,907,714)	(6,776,063)
29	Rate 10	Sales Service & Bundled T		241,642	(1)	(2,463,032)	(5,819,038)	(3,356,006)
30		T-Service		427	(1)	(2,823)	(1,943)	880
31				242,068	(1)	(2,465,855)	(5,820,981)	(3,355,126)
32	Rate 20	Sales Service	2	6,471	(2)	(1,992)	(101,753)	(99,761)
33		Bundled DP	18	96,026	(2)	(29,558)	(1,509,969)	(1,480,411)
34		T-Service	36	552,219	(2)	458,914	676,916	218,003
35			56	654,716	(2)	427,364	(934,806)	(1,362,170)
36	Rate 100	T-Service	17	1,912,232	(2)	374,384	716,413	342,029
37			17	1,912,232	(2)	374,384	716,413	342,029
38	Rate 25	Sales Service	58	44,659	(2)	(18,576)	(280,969)	(262,394)
39		T-Service	43	162,978	(2)	(67,790)	23,267	91,058
40			101	207,636	(2)	(86,366)	(257,702)	(171,336)
41		**Total Sales Service & Bundled T**				**(7,644,809)**	**(19,619,444)**	**(11,974,635)**
42		**Total T-Service**				**762,685**	**1,414,654**	**651,090**
43	**Total Union North (line 41 + line 42)**					**(6,882,124)**	**(18,204,789)**	**(11,323,545)**
44	**Total Infranchise (line 26 + line 43)**					**2,852,879**	**(17,477,166)**	**(20,330,925)**
	Ex-Franchise							
45	Rate M12					(2,626,936)	438,461	3,065,397
46	Rate M13					(2,714)	(340)	2,374
47	Rate M16					(21,649)	(10,364)	11,285
48	Rate C1					(2,487)	844	3,331
49	**Total Ex-Franchise**					**(2,653,786)**	**428,600**	**3,082,386**
50	**Total Company (line 44 + line 49)**					**199,093**	**(17,048,566)**	**(17,248,539)**

Notes:

(1) Based on forecast consumption for the period October 1, 2013 to March 31, 2014.

(2) Based on 2012 actual annual volume.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Could you please provide the Retainer Letters or their equivalents with Sussex Economic Advisors, LLC, Concentric Energy Advisors Inc., and Stephen M. Acker?

Response:

Please see Attachments 1-3.

Filed: 2013-07-24
EB-2013-0109
Exhibit D3.1
Attachment 1

UNION GAS LIMITED

REQUEST FOR PROPOSAL
Gas Supply Plan Review

SERVICES AGREEMENT

THIS AGREEMENT dated this 14th day of January 2013, (hereinafter referred to as the "**Agreement**")

B E T W E E N:

UNION GAS LIMITED, a company incorporated under the laws of the Province of Ontario, having its head office in the Municipality of Chatham-Kent, in the Province of Ontario

hereinafter referred to as "**Union**"

- and -

Sussex Economic Advisors, a company incorporated under the laws of the State of Massachusetts, having its head office in Framingham, Massachusetts.

hereinafter referred to as "**Consultant**"

WHEREAS Union has retained Consultant to undertake a Gas Supply Plan Review, as requested by Union;

NOW THEREFORE, IN CONSIDERATION of the mutual covenants herein contained and the exchange of One Dollar ($1.00) and other good and valuable consideration, the exchange, receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Services and Term

1.1 Consultant shall provide the Services described in Schedule "A" of this Agreement (herein referred to as the "Services").

1.2 Subject to the provisions of this Agreement, this Agreement will commence on the 14th day of January, 2013 and expire on the 31st day of December, 2014 unless terminated by either party pursuant to the provisions of this Agreement.

1.3 If it is intended, as evidenced in Schedule "A" that Consultant shall provide a single set of Services, then a Purchase Order ("**PO**") will be issued for Union for the Services described in Schedule "A".

1.4 If it is intended, as evidenced in Schedule "A", that Consultant shall provide multiple sets of Services as requested by Union from time to time, then Union shall create a separate PO for each separate set of Services, each such PO to also be subject to this Agreement.

2. Compensation

2.1 Union shall pay Consultant for Services in accordance with the rate schedule and payment provisions detailed in Schedule "B" of this Agreement.

3. Representations

3.1 The Consultant represents and warrants that it is fully qualified to perform the Services in accordance with the terms and conditions of this Agreement within the time specified. The Services to be performed hereunder shall be done in proficient manner and shall conform to the highest professional standards and shall comply with all applicable laws, orders, regulations, ordinances and other rules of all lawful authorities acting within their power, including the obtaining of all permits which may be required for the performance of work under this Agreement. The Consultant hereby acknowledges that it shall comply with all workplace rules of Union including the Spectra Energy Code of Business Ethics available at www.spectraenergy.com .

4. Confidential Information

4.1 Definition

As used herein, the term "Confidential Information" shall mean all information which Consultant, directly or indirectly, acquires from Union or Union's suppliers concerning the technical, manufacturing, processing and business activities of Union or the suppliers, except information falling into one of the following categories:

a) Information which, prior to the time of disclosure or acquisition hereunder, is lawfully in the public domain;

b) Information which, after disclosure or acquisition hereunder, lawfully enters the public domain, except where such entry is the result of Consultant's breach of the Agreement;

c) Information, other than obtained from third parties, which, prior to disclosure or acquisition hereunder, was already lawfully in Consultant's possession either without limitation on disclosure to others or which subsequently becomes free of such limitations; or

d) Information obtained by Consultant from a third party who to Consultant's reasonable knowledge is lawfully in possession of such information and not subject to contractual or fiduciary relationship with Union with respect to said information. Consultant may use and disclose such information in accordance with the terms under which it was provided by such third party.

Confidential Information shall not be deemed to be within the foregoing categories merely because such information is embraced by more general information lawfully in the public domain or in Consultant's possession.

4.2 **Non-Disclosure**

Consultant will keep all Confidential Information in strictest confidence and will only disclose such information to those people specifically named by Union. The Consultant represents and warrants that it will ensure that the confidentiality provisions of this Article 4 shall be binding on its employees.

4.3 **Third Parties**

Consultant agrees that it will not disclose any Confidential Information to any third party nor use Confidential Information other than on Union's behalf except as Union may authorize in writing.

If disclosure to a third party is so authorized, Consultant shall enter into a Confidentiality Agreement, which shall be subject to review and approval by Union, with said party containing the same terms and conditions with respect to use or disclosure of Confidential Information as this article contains and naming Union as third party beneficiary.

Consultant also agrees to enter into Confidentiality Agreements with third parties at Union's request and to keep in force Confidentiality Agreements concerning third party's Confidential Information, which agreements will permit Consultant's use of such party's Confidential Information in the completion of the Services.

4.4 **Safeguard of Confidential Information**

Consultant also agrees to use best efforts to safeguard all documents containing Confidential Information hereunder and all other documents containing Confidential Information whether prepared by Consultant or another. Consultant may make copies of such documents only to the extent necessary for the performance of Services. Consultant shall prevent access to all such documents by third parties. On completion of Services, Consultant agrees to return to Union all such documents containing Confidential Information and to destroy copies thereof. However, should Consultant desire to retain certain documents and receive Union's written approval therefore, Consultant shall continue to treat said documents within the terms of this clause.

4.5 **Survival**

The provisions of this Article 4 shall survive termination or expiration of this Agreement for any cause whatsoever for a period of five (5) years thereafter unless otherwise authorized in writing by Union.

5. Property of Services

All Services performed, including but without limiting the generality of the foregoing, all notes, reports, documents, calculations, and graphs prepared and/or provided by Consultant in the course of Services or as a result of performing the Services, shall be the property of Union and all property rights therein shall be vested in Union and may be used by Union for any purposes whatsoever. Consultant shall not release to any third party, any portion of the material prepared for Union or provided to Union in the course of, or as a result of performing Services, unless specifically otherwise authorized by Union.

6. Publicity

Consultant shall not use Union's name or the fact that Consultant is performing Services for Union in any press releases, media statements or public communications. Consultant shall not use Union's name, logos, copyrights, trademarks, service marks, trade names or trade secrets in any way, and Union shall not be deemed to have granted Consultant a license of, or granted Supplier any rights in, any of the foregoing by entering into this Agreement.

7. Termination

7.1 Termination for Cause

It is agreed and understood that in the event that Consultant violates any terms of this Agreement, Union may terminate this Agreement forthwith. Such termination does not preclude Union from initiating legal proceedings against Consultant to recover losses resulting from breach of contract.

7.2 Early Termination

Union has the right, at any time, to terminate this Agreement with or without cause, upon thirty (30) days' written notice to Consultant. Upon receipt of such notice, Consultant shall stop work on the cancelled project as directed in the notice and forward to Union all completed or incomplete reports, data and other documents (including but not limited to computerized data, video data or any other recorded data) pertaining to such cancelled project, or portion thereof if Union so requests. Consultant shall be entitled to full payment for Services performed by it as completed, or performed under the terms and conditions of this Agreement up to the effective date of such termination. Union shall not be held liable for damages or loss of anticipated profits on account of such termination.

8. Right to Set-Off

Union reserves the right to set off any money owed by Union to Consultant under this Agreement or other agreement against any amounts owed by Consultant or any affiliate of Consultant to Union under any agreement.

9. Applicable Law

This Agreement shall be interpreted and construed in accordance with the laws of the Province of Ontario and the courts of the Province of Ontario shall have exclusive jurisdiction in all matters contained herein, unless specified otherwise. Furthermore, this Agreement and the rights and obligations of the Parties hereto, are subject to all present and future laws, rules, regulations, and orders of any legislative body or duly constituted authority having jurisdiction, now or hereafter.

10. Entire Agreement, No Waiver, Headings, and Enurement

This Agreement, the attached schedules, and the related PO constitute the entire Agreement of the parties hereto relating to the subject matter hereof, and there are no written or oral terms or representations made by either party other than those contained herein. No provision of this Agreement may be modified or waived unless such modification

or waiver is authorized in writing by the parties to the Agreement. No waiver by either party hereto of any breach by the other party of any condition or provision of this Agreement to be performed by such other party shall be deemed to be a waiver of similar or dissimilar conditions or provisions at the same or any prior or subsequent time. The headings contained herein are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement. This Agreement shall enure to the benefit of and be binding upon the parties hereto and their respective successors and permitted assigns.

11. Environmental Health and Safety Standards

The Consultant acknowledges and agrees that all Services, or other matters, to be completed by the Consultant, pursuant to the terms and conditions of this Agreement, shall be completed in full compliance with the following standards, which shall be in addition to and not substituted for, any other standards or requirements set out in this Agreement or attached Schedules:

11.1 Compliance with applicable laws and standards

Consultant shall perform all Services in compliance with all applicable federal, state and local laws, orders, codes, rules, and regulations relating to health and safety and such Union health and safety procedures as required by Union.

11.2 Compliance with Consultant's health and safety plan

Consultant shall initiate and maintain all necessary safety precautions and programs to conform with all applicable health and safety laws or other requirements, including requirements of Union, wherever the Services are performed, that are designed to prevent injury to persons or damage to property on, about, or adjacent to the site. Consultant shall strictly conform to Consultant's safety programs as submitted and accepted by Union.

11.3 Compliance with Consultant's project-specific health and safety plan

In addition to Consultant's safety programs required herein, Consultant shall develop, maintain, and adhere to a project-specific safety plan for the Services subject to review and acceptance by Union.

11.4 Consultant training requirements

Consultant shall ensure that all Consultant personnel and any party to whom some or all of the Services has been subcontracted (a "**Subconsultant**") has received all training regarding health and safety or any other matters required by applicable law or applicable governmental authorizations. Training or implementation of any additional health and safety measures appropriate for the Services will be specified by Union. Consultant shall provide Union written documentation of said training and worker qualifications.

11.5 Inspection/audit

Consultant will allow Union, or a representative designated by Union, access to any facility related to the Services in order to monitor/audit Consultant's compliance with the health and safety requirements of this Agreement.

11.6 Health and safety statistics

Consultant shall provide Union health and safety statistics related to its prosecution of the Services from time to time, as so directed by Union, and at completion of the Services.

11.7 Initial reports

Consultant will immediately report to Union any incident or incident without loss involving Consultant personnel, the public, or property, arising from Consultant's execution of the Services. Consultant shall provide a written initial report to Union of its investigation of said incident within 24 hours. The report shall provide a schedule for completion of the investigation.

11.8 Final reports

Consultant shall provide to Union a final report showing the cause of the incident and any corrective action.

11.9 Stop work/suspension

Whenever Consultant has not complied with its obligations set forth in this Agreement and creates a circumstance requiring immediate action to ensure the health and safety of all persons on at the site, including stoppage of Services, until the circumstance is remedied, Union may take or require Consultant to take such reasonable precautions. The taking of such action or actions by Union (or its failure to do so) shall not limit Consultant's liability or its obligations under this Agreement. Consultant shall reimburse Union for all reasonable costs incurred by Union in taking such precautions and any costs incurred by Consultant for such precautionary action and any subsequent remedial action shall be paid by Consultant.

11.10 Removal of Consultant employee

Union reserves the right to require the Consultant to remove from the site any personnel not properly observing or complying with the prescribed health and safety requirements of this Agreement.

11.11 Termination

In addition to Union's right to terminate this Agreement contained in Article 7, Union may terminate this Agreement at any time by written notice for Consultant's failure to comply with the terms of this Article.

11.12 Independent Consultant

Consultant shall be solely responsible for the safety of all persons employed by it or its Subconsultants or any other person on the site for any purpose relating to Consultant's carrying out the Services.

11.13 EHS Professional

When requested by Union, Consultant shall provide a dedicated, qualified health and safety professional to monitor the Services being performed under this Agreement.

11.14 Meeting Requirements

Unless Union directs otherwise, Consultant shall attend the following health and safety meetings: (a) pre-job orientation; (b) an orientation prior to entering the worksite; (c) daily tailgate briefings; and (d) such other meetings at such times that worksite conditions change to review the status of the Services and Consultant's use of the health and safety measures required for the changed conditions.

11.15 Subconsultant matters

Prior to execution, Consultant shall ensure Subconsultants are appropriately reviewed, and that all subcontracts are consistent with, and in no way contrary to or inconsistent with, any of the terms or provisions of this Article.

11.16 No Relief Subconsultant

Entry into any subcontract shall not relieve Consultant of any of its obligations in accordance with the terms of this Article.

11.17 Responsibility for Subconsultant

Consultant shall be fully responsible to Union for the acts and omissions of Subconsultants and of persons directly or indirectly employed by them, as it is for the acts or omissions of persons directly employed by Consultant for any failure to comply with the terms of this Article.

12. Independent Consultant

The parties agree that no oral agreement or provisions to this Agreement shall be construed so as to constitute Consultant as being the agent, servant or employee of Union and the instruction, management and control of Consultant's employees shall always remain with the Consultant, and Consultant shall be deemed to be an independent Consultant. Consultant shall have no authority to make statements, representations or commitments of any kind, or to take any actions which shall be binding upon Union, except as provided for herein or authorized in writing by Union. The Consultant further agrees and acknowledges that it shall not be considered an employee of Union and as such it will not be entitled to any benefits or compensation to which employees of Union are entitled.

13. Defects

The Consultant, at no cost to Union, shall remedy any defect in the Services caused by the negligent act or omission of the Consultant or by any failure on the part of the Consultant to carry out the Services in accordance with the provisions of this Agreement. Union reserves the right to deduct that portion of fees for which Services were deemed to not comply with the Request to the satisfaction of Union.

14. Indemnity

Except to the extent of Union's negligence, Consultant shall indemnify, defend, protect and hold harmless Union from any and all actions, claims, costs, damages, demands, expenses, fees (including reasonable lawyer's fees), investigations, liabilities, losses or suits of any kind or nature which may be brought against Union or which Union may sustain, incur or pay arising out of or in any way related to this Agreement including, but not limited to, those which (1) involve any actual or alleged injuries or death to any person or property damage resulting in whole or part from defective or allegedly defective services provided in a negligent or allegedly negligent manner; (2) involve actual or alleged infringement of any letters patent, trademarks, copyrights, or other intangible rights; (3) involve actual or alleged violations of any law, regulation, rule or ordinance relating to the use or sale of any goods; (4) involve claims of Consultant, its agents, contractors or employees relating to personal injuries or property damage; or (5) involve damages incurred by Union, as a result of any breach by the Consultant of this Agreement. This indemnity is intended to survive the termination of this Agreement.

15. Conflict of Interest

The Consultant covenants and agrees that it is not aware of the existence of any relationship, family, business, contractual or otherwise, between themselves, their principals, officers or employees and Union, its directors, officers or employees; and it will not perform any Services for or enter into any contract with others that may conflict with its contractual, professional, equitable or other obligations to Union without first obtaining the written approval of Union.

16. Consultant Contributions

The Consultant shall pay all royalties and license fees on any equipment and materials to be furnished by it and shall pay all workers' compensation contributions, unemployment insurance contributions, Canada/Quebec Pension Plan and employees' income tax deductions together with all other taxes and payroll contributions now or hereafter imposed by any lawful authority and indemnify and save harmless Union from any and all claims, penalties, interest and cost and any of the same which may be made or assessed against Union in respect thereof.

17. Insurance

In this section, for matters related to insurance for services, any party defined as "Seller", "Supplier", "Consultant", "Contractor", or similar term, shall hereby be deemed to be included with the meaning of Consultant, as defined herein.

In this section, for matters related to insurance for services, any party defined as "Buyer", "Union", BU", "Company" or "Spectra", shall be deemed to be included within the meaning of Union as defined herein.

Consultant and each of its subcontractors, of every tier, shall, at its own expense, obtain the insurance described below on or before commencement of the Services and thereafter maintain such insurance until the end of the warranty period prescribed herein:

Commercial General Liability insurance of not less than $1,000,000 per occurrence covering bodily injury, death and property damage including products and completed operations liability.

Applicable to Consulting Services only: If the Consultant's commercial general liability insurance excludes professional liability claims that could arise out of the scope of Services under this Purchase Order, Consultant shall then also carry Professional Liability insurance, with a limit of not less than $1,000,000 per occurrence.

Consultant shall meet all statutory requirements in respect of Auto Liability and Workers Compensation coverage in the jurisdiction where the Services are to be performed.

Upon request, Consultant shall provide proof, satisfactory to Buyer, of the above required insurance. Buyer shall not be obligated to review any of Consultant's certificates of insurance, insurance policies and/or endorsements or to advise Consultant of any deficiencies in such documents, and any receipt of copies or review by Buyer shall not relieve Consultant from or be deemed a waiver of Buyer's right to insist on strict fulfillment of Consultant's obligations hereunder.

Consultant's compliance with the provisions of this section shall not constitute a limitation of Consultant's liability for its acts or omissions or in any way limit, modify, or otherwise affect Consultant's indemnification obligation pursuant to this Purchase Order. The insolvency, bankruptcy, or failure of any insurance company carrying insurance for Consultant, or failure of any such insurance company to pay claims asserted, shall not abrogate, waive or alter any of Consultant responsibilities or liabilities hereunder.

18. Priority

Consultant shall give the Services the highest classification and priority and no other job taken by Consultant shall displace the Services during the term hereof.

19. Currency

The parties hereto agree and acknowledge that all reference to dollars in this Agreement shall be construed to mean the currency of the United States.

20. Notices

Any notice, demand, request or other instrument, which may be or are required to be given under this Agreement shall be delivered in person or sent by telex or telecopy, or mailed by prepaid registered post and shall be addressed as follows:

If to Union:

Union Gas Limited
PO Box 2001
50 Keil Drive North,
Chatham, Ontario, Canada
N7M 5M1

Attention: Mr. Chris Ripley, Manager, Regulatory Applications

or at such other address as Union may designate by written notice.

If to CONSULTANT:

James M. Stephens, Partner
Sussex Economic Advisors, LLC.
161 Worcester Road, Suite 503
Framingham, MA
01701

or at such other address as Consultant may designate by written notice.

Any such notice, demand, request or other instrument shall conclusively be deemed to have been received on the day of such personal service or on the day of the receipt of the facsimile notice, or on the third day following the date of posting in the case of mailing as aforesaid, provided the postal service is not disrupted.

21. Severability

The invalidity or unenforceability of any portion or provision of this Agreement shall in no way affect the validity or enforceability of any other portion or provision hereof. Any invalid or unenforceable portion or provision shall be severed from this Agreement and the balance of this Agreement shall be construed and enforced as if this Agreement did not contain such invalid or unenforceable portion or provision.

22. Time of Essence

Time is of the essence in all matters referred to in this Agreement.

23. Schedules

Schedule "A" - description of Services
Schedule "B" –compensation

In the event of any conflict or inconsistency between the Schedules, and any provision of the Agreement, the provisions of the Section 1 to 25 of the Agreement and the PO shall prevail over Schedules "A" and "B".

24. Taxes

If Consultant is a non-resident of Canada, and payments are made in respect of services rendered in Canada, of any nature whatsoever, Union is required by the Income Tax Act

(Canada) to withhold a percentage in accordance with the legislation from each payment in respect of services rendered in Canada, and remit this amount to the Receiver-General. No withholding is required where the non-Resident Consultant has received a waiver from the Canada Revenue Agency.

In recognition of the fact that Union is subject to certain United States tax reporting requirements for specified payments to specified persons, Consultant shall immediately (a) provide any information in this regard requested by Union including residency, legal status, and location of provision of goods or services, and (b) fill out and return to Union or Union's designated agent any applicable US tax form. Failure to provide information or to fill out and return any forms required hereunder may result in a withholding of applicable US taxes from any future payments made to Consultant and/or termination of this agreement without further notice. Notwithstanding Consultant's compliance with the foregoing, withholding will be applied to any invoice if Union is directed to make such withholding by Canadian or US tax authorities.

25. Audit

Union or any person designated by Union may at any and all reasonable times for a period of sixty (60) months after the date of delivery of the Services have access to Consultant's books and records relative to the Services, for the purpose of auditing and verifying such amounts. Union may make copies of such books and records as reasonably required by Union in performing such audit. Consultant shall promptly review and settle with Union all matters arising from such audit including the refunding of monies where applicable.

IN WITNESS WHEREOF the parties hereto have duly executed this Agreement as of the day and year first above written.

UNION GAS LIMITED
Per:

Authorized Signatory
Name: Rick Birmingham
Position: VP Regulatory Affairs, Union Gas

Per:

Authorized Signatory
Name: James M. Stephens
Position: Partner
Sussex Economic Advisors LLC

Schedule "A"

Please note that in lieu of Schedules "A" and "B", Schedule "A" attached, including amending Memorandum, includes all details of scope and compensation. Only those portions of Schedule "A" which apply to "Gas Supply Planning/Peak (Design) Day Practice" shall apply.

SUSSEX ECONOMIC ADVISORS, LLC
CONFIDENTIAL MEMORANDUM

TO: Mr. Chris Ripley, Manager, Regulatory Applications

FROM: Sussex Economic Advisors, LLC

SUBJECT: Amendment to Sussex Economic Advisors' Proposal

DATE: 1/8/2013

On behalf of Sussex Economic Advisors, LLC ("Sussex"), I would like to thank you for providing feedback regarding the Sussex Gas Supply Plan Review Proposal.

As discussed during our conference call, the original Sussex proposal regarding Task 1 (i.e., Gas Supply Planning Principles and Processes) and Task 2 (i.e., Peak (Design) Day Practice) reflected a fairly detailed "bottom-up" approach. In our revised approach Sussex has utilized a "top-down" methodology, which has resulted in a significant reduction in the expected hours and associated budget. Specifically, please find below revised budget estimates for Task 1 – Gas Supply Planning Principles and Processes and Task 2 – Peak (Design) Day Practice, which better reflects the Sussex "top-down" approach:

Proposed Budget - Revised						
			Hours			
	Stephens	Newman	Voss	Perry	Nguyen	Total
Task 1 - Gas Supply Planning Principles and Processes						
Review Gas Supply Plan	24	12	4	4	4	48
Determine if Plan is "Right Sized"	16	8	4	8	8	44
Does the Plan Reflect Peak Day	16	8	4	4	4	36
De-contracting / Re-contracting	24	16	6	4	4	54
Transportation Path Analysis	20	10	6	8	8	52
Sub-total Hours	100	54	24	28	28	234
Sub-total Budget	$ 27,500	$ 13,500	$ 6,000	$ 6,300	$ 6,300	$ 59,600

Proposed Budget - Revised						
	Hours					
	Stephens	Newman	Voss	Perry	Nguyen	Total
Task 2 - Peak (Design) Day Practice						
Analyze Peak Day Methodologies	16	8	4	8	8	44
Should Approaches be aligned	16	8	2	4	4	34
Benchmarking	24	16	8	40	40	128
Sub-total Hours	56	32	14	52	52	206
Sub-total Budget	$ 15,400	$ 8,000	$ 3,500	$ 11,700	$ 11,700	$ 50,300

As stated in the original Sussex proposal, we would be happy to revisit the budget estimates subsequent to the project kickoff meeting as the information that is available and the definition of the final work product will better inform the Sussex Scope of Work, approach, and budget.

Also please note that the Commercial Terms as outlined in the original proposal would apply to this revision (e.g., 5% hourly rate discount should Union award all three categories of work to Sussex).

In advance, thank you for your time and consideration; and please do not hesitate to contact me should you have any questions or require clarifications regarding this revised budget estimate.

CONFIDENTIAL

SUSSEX
ECONOMIC ADVISORS

Proposal
Prepared in Response
to
Union Gas Limited
Request for Proposal – Gas Supply Plan Review

January 4, 2013

EXECUTIVE SUMMARY

Sussex Economic Advisors, LLC ("Sussex") is pleased to provide this response to the Union Gas Limited ("Union") Request For Proposal – Gas Supply Plan Review ("Gas Supply Plan RFP") to develop an independent report regarding certain Union gas supply related activities. Specifically, pursuant to the Ontario Energy Board ("OEB") Decision and Order in EB-2011-0210, Union was directed to undertake an expert, independent review of, "...its gas supply plan, its gas supply planning process and gas supply planning methodology."[1] In the EB-2011-0210 Decision and Order, the OEB identified eleven specific elements that should be addressed by the independent review, and outlined a stakeholder participation process: "The results of the review are to be subject to a stakeholder information process and then be submitted in conjunction with Union's next rates proceeding (cost of service or incentive regulation regime)."[2] The eleven elements identified in the OEB EB-2011-0210 Decision and Order associated with the expert, independent review have been grouped by Union into the following three categories: (i) Gas Supply Planning Principles and Processes; (ii) Peak (Design) Day Practice; and (iii) Cost Allocation/Rate Design and Deferral Accounting. These three categories and the associated tasks comprise the Project Specifications section of the Union Gas Supply Plan RFP issued on December 10, 2012, and form the basis of the Sussex proposal.

In addition to this Executive Summary, the Sussex response includes the following sections:

1. Introduction to Sussex
2. Scope of Work
    a. Sussex Approach/Work Product
    b. Project Team/Relevant Experience
    c. Project Schedule/Budget
    d. References
3. Commercial Terms

As discussed in more detail below, Sussex proposes to develop an expert, independent review for all three categories of work detailed in the Union Gas Supply Plan RFP Part 3 – Project Specifications (i.e., Gas Supply Planning Principles and Processes, Peak (Design) Day Practice, and Cost Allocation/Rate Design and Deferral Accounting). In addition, Sussex

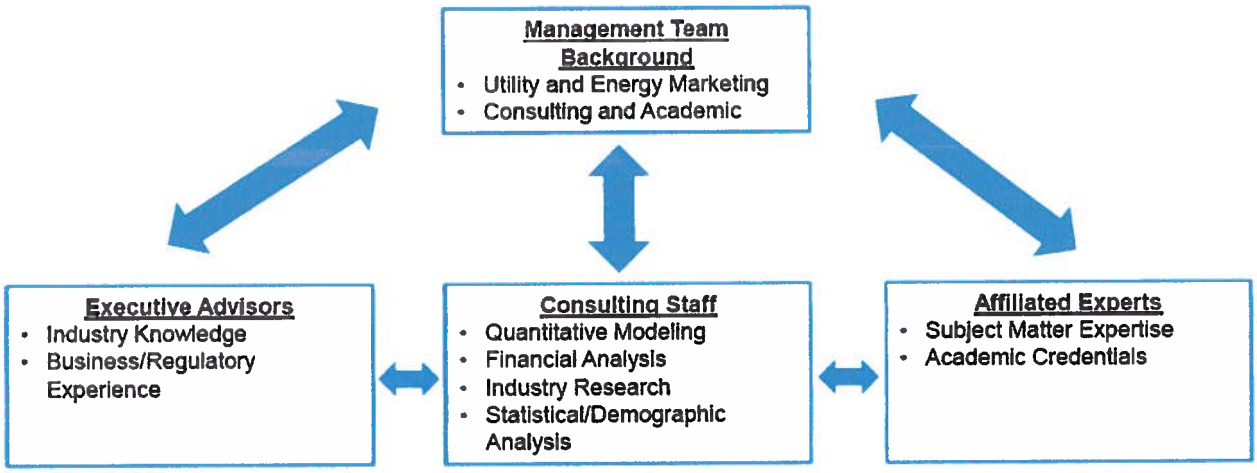
[1] Ontario Energy Board Decision and Order, EB-2011-0210, October 25, 2012 at 40.
[2] *Ibid.*, at 42.

understands that the consultant chosen for this assignment will present the findings and conclusions of the independent review to stakeholders and the OEB via a stakeholder information process and rates proceeding, respectively.

The Sussex team proposed for this project has: (i) broad knowledge of the Canadian and U.S. natural gas markets and has conducted numerous energy market analyses and assessments for a variety of industry participants; (ii) significant experience in gas supply planning activities including demand forecasting, resource portfolio development and optimization, planning and accounting/rates. Specifically, several members of the proposed Sussex project team have managed the demand forecasting function and natural gas supply portfolios for local distribution companies ("LDCs") and energy marketers; (iii) recent regulatory proceeding experience regarding LDC capacity availability and utilization, which included significant interaction with Ventyx regarding inputs/outputs associated with the SENDOUT optimization model; (iv) long standing working relationships with numerous Canadian and U.S. LDCs that will facilitate data acquisition and validation; (v) quantitative skills required to organize, analyze and evaluate natural gas demand/supply and accounting/rate information; (vi) verbal and written skills required to effectively and concisely communicate technical information and analysis to various stakeholders; and (vii) an understanding of the regulatory process and requirements as members of the proposed Sussex project team have presented or testified at various regulatory bodies and agencies, including the OEB.

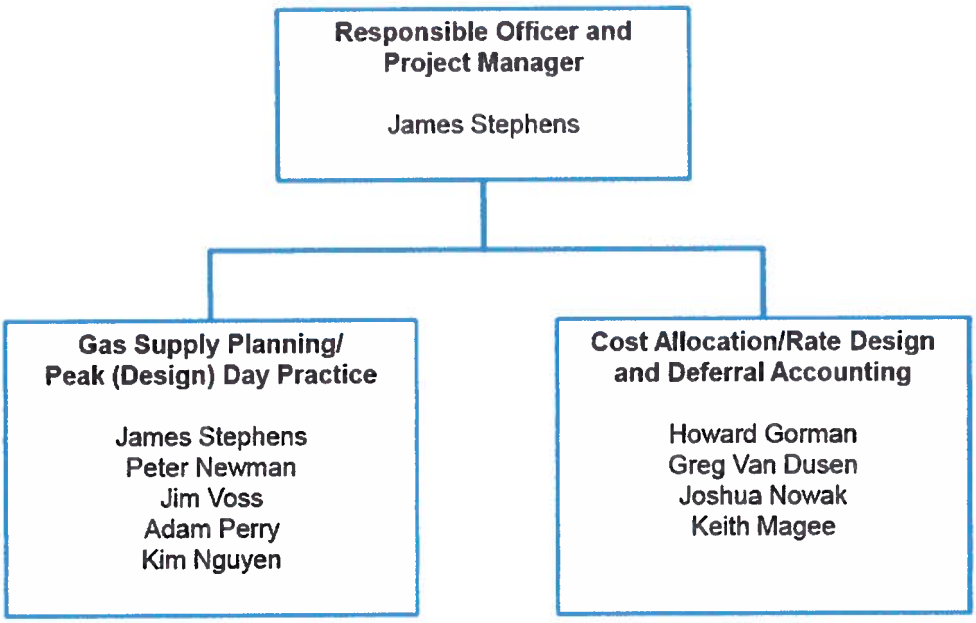
INTRODUCTION AND PROJECT TEAM

Sussex Economic Advisors, LLC is a management consulting and economic advisory firm, located in Framingham, MA, providing consulting services to market participants that are active in regulated industries such as natural gas, electricity and water. The Sussex management team has held senior positions in utility companies, competitive energy suppliers, management consulting firms, and business-focused academic institutions. In addition, Sussex has established relationships with certain Executive Advisors and Affiliated Experts that provide Sussex with significant industry experience, subject matter expertise and academic credentials. The following chart illustrates how Sussex integrates our internal expertise and skill sets with the knowledge and experience of our Executive Advisors and Affiliated Experts:



The proposed Sussex project team has substantial experience and training in matters relating to regulatory strategy and policy development, gas supply planning and capacity portfolio optimizing, rates proceedings and regulatory compliance, market analysis and assessments, financial and economic analyses, due diligence and valuation, management review and audits, and quantitative analysis and modeling. Sussex has developed a substantial list of clients including natural gas distribution companies, electric utilities, combination utilities, electric transmission providers, natural gas pipeline companies and non-regulated energy market participants.

The proposed Sussex project organization and approach with respect to the issues outlined in the Union Gas Supply Plan RFP is based on the following four main themes: (i) leveraging our technical knowledge and subject matter expertise; (ii) utilizing our detailed understanding of energy markets, demand forecasting, gas supply and cost allocation/rate design; (iii) on-site time/meetings with the Union team to ensure that the work product is completed by March 29, 2013; (iv) developing work product that is complete and concise and will facilitate the stakeholder and regulatory review processes. Based on these main themes, the proposed Sussex project team is comprised of individuals that have extensive experience in the energy industry in general, and gas supply, in particular. The following chart is a summary of the proposed Sussex project team by task:



Mr. Stephens will serve as the Responsible Officer and Project Manager and will have overall responsibility for client work product, communications and schedule. In addition, Mr. Stephens will serve as the manager for the Gas Supply Planning and Peak (Design) Day Practice tasks. Mr. Gorman will serve as the manager for the Cost Allocation/Rate Design and Deferral Accounting task.

In terms of the proposed Sussex project team members, Messrs. Stephens, Newman and Voss[3] have significant natural gas demand forecasting and gas supply experience not only as a result of consulting project work, but also from prior LDC/energy marketer work experience. Specifically, Messrs. Stephens,[4] Newman and Voss have been responsible for natural gas demand forecasting processes and results, the development of natural gas portfolios (physical and financial), and the management of the gas supply function for LDCs and energy marketers. Mr. Gorman[5] has an extensive background in utility matters including electric and gas utility accounting and cost of service modeling. Mr. Gorman has also provided expert testimony on a

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[3] Messrs. Newman and Voss, who are independent consultants and are Executive Advisors with Sussex, have significant LDC and energy marketer operating and gas supply experience as senior managers for Wisconsin Gas Company a WE Energy subsidiary, and Kaztex Energy Management.

[4] Mr. Stephens was the Director, Gas Supply Planning and Acquisition for a natural gas distribution company that is now a subsidiary of National Grid; and was president of a retail energy marketing company.

[5] Mr. Gorman, an independent consultant, is an Executive Advisors with Sussex, and served as an officer for Trigen Energy Corporation.

variety of rate and regulatory matters at various jurisdictions, including the OEB. Mr. Van Dusen has over thirty years of experience in the Ontario energy industry and has assisted utilities with a variety of regulatory issues including: regulatory strategy, business planning, and internal control and asset management practices and processes. Similar to Mr. Gorman, Mr. Van Dusen has appeared as an expert witness before the OEB. In addition, the proposed Sussex project team includes the Sussex consulting staff, which is comprised of experienced professionals with significant experience and capability in data analysis, regulatory research, modeling and risk identification and assessment. In addition, Mr. Perry and Ms. Nguyen have assisted energy market participants with demand forecasts/market assessments ranging from broad inter-regional market studies to specific LDC demand forecasts. Biographies for the proposed Sussex project team are provided in the specific Scope of Work sections.

SCOPE OF WORK

Sussex proposes to conduct the expert, independent review for all three categories of work identified in the Union Gas Supply Plan RFP Part 3 – Project Specifications (i.e., Gas Supply Planning, Peak (Design) Day Practice, and Cost Allocation/Rate Design and Deferral Accounting). The Sussex proposal for each of the three categories of work is described in detail below and includes our approach, work product, description of the project team, relevant experience, illustrative schedule, estimated budget, and references.

Task 1 – Gas Supply Planning Principles and Processes

In the first category of work (i.e., Gas Supply Planning Principles and Processes), Union has identified the following five items that need to be reviewed and analyzed:

1. Verify that Union's gas supply planning process, methodology and plan reflects appropriate planning principles, including a reference to cost.
2. Determine whether planning principles are objectively applied and result in a gas supply plan that is "right-sized".
3. Determine whether the peak day in the North and South Delivery Areas are appropriately/consistently reflected in the gas supply plan, and if not, recommend remedial action.
4. Determine whether Union is conducting sufficient due diligence with respect to the cost benefit analysis associated with de-contracting a particular gas transportation route and re-contracting on an alternative route, and recommend remedial action, if required.

5. Determine whether Union is using the transportation portion of the gas supply portfolio to favor the transportation paths of entities in which Union or its parent has (or will have in the future) an economic interest, and recommend remedial action, if required.

The Sussex approach to the first category of work is to group items 1, 2 and 3 into one task – Gas Supply Plan-Development and group items 4 and 5 into a second task-Gas Supply Plan-Implementation.

The following chart is a graphic representation of the Sussex approach to the first category of work:

Union RFP Requirement	Sussex Task Grouping
1 – Review Gas Supply Plan 2 – Determine if Plan is "Right Sized" 3 – Does the Plan Reflect Peak Day	Gas Supply Plan-Development
4 – De-Contracting/Re-Contracting 5 – Transportation Path Analysis	Gas Supply Plan-Implementation

In the first task (i.e., Gas Supply Plan-Development) the initial step in the Sussex approach consists of a review of the current Union gas supply planning process to determine if that process reflects appropriate principles, including cost. Since a gas supply planning process usually consists of multiple steps or procedures, and includes various data sources and communication protocols that will need to be evaluated and documented, Sussex will utilize the following approach to assess the Union gas supply planning process:

- Interview the appropriate Union gas supply staff to understand the existing gas supply planning process including data inputs and sources, analysis and data utilization, and data outputs and reporting.
- Leverage the material submitted and the record developed in EB-2011-0210.
- Document/map the gas supply planning process via a flow chart model with responsibilities, data sources, software utilized and work product clearly identified.
- Review the flow chart with the appropriate Union staff and edit/review the documentation.

- Compare the Union gas supply planning process to other LDCs and the past practices utilized by the proposed Sussex project team to identify areas that may need improvement.
- Recommend process changes with supporting rationale.

The next step in the Gas Supply Plan-Development task is to review the Union gas supply plan methodology (i.e., the application of the planning principles to develop the gas supply plan) to determine if the methodology used by Union to develop the gas supply plan reflects appropriate principles, including cost. Prior to the analysis of the gas supply plan methodology and to provide a framework for the evaluation, Sussex will fully describe and document the Union gas supply principles using the information submitted by Union in EB-2011-0210. Specifically, Union has indicated that the gas supply plan reflects the following five principles:[6]

- Ensure secure and reliable gas supply to Union's service territory.
- Minimize risk by diversifying contract terms, supply basins and upstream pipelines.
- Encourage new sources of supply as well as new infrastructure to Union's service territory.
- Meet planned peak day and seasonal gas delivery requirements.
- Deliver gas to various receipt points on Union's system to maintain system integrity.

Once the Union gas supply principles have been fully described and documented, Sussex will evaluate if and how each of the gas supply planning principles influenced or is reflected in the Union gas supply plan methodology. In addition, Sussex will discuss the Union gas supply planning principles relative to the approach and guidelines of other LDCs and the past practices of the proposed Sussex project team.

In the third step, Sussex will review the current Union gas supply plan to assess whether the gas supply plan reflects the documented Union gas supply planning principles, process, and methodology. Stated differently, Sussex will review the Union work product (i.e., the gas supply plan) to ascertain whether that work product is the result of the appropriate application of the Union gas supply planning principles, process, and methodology. Sussex will document

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[6] Union Gas Limited, EB2011-0210, Exhibit D1 p.2 of 16.

proposed revisions to the Union gas supply planning principles, process and methodology with supporting rationale and analysis.

The second item to be evaluated in the Gas Supply Plan-Development task is whether the Union gas supply planning process has resulted in a supply plan that is "right sized". In other words, has the Union gas supply planning process/methodology resulted in a gas supply plan that is appropriate for the Union circumstances. To evaluate this issue, Sussex will develop a detailed understanding of the existing Union gas supply portfolio, the optionality/benefits of the portfolio and the demand requirements that the portfolio needs to serve. To facilitate this analysis, Sussex will rely upon on-site interviews, information that is available in EB-2011-0210 and our knowledge of the Ventyx SENDOUT software specifically the scenario analyses and reporting capability of the SENDOUT model.

The last item to be reviewed in the Gas Supply Plan-Development task is to determine whether the peak day in the North and South Delivery Areas are appropriate and are reflected in the gas supply plan. To evaluate this item, Sussex will first document and describe the current process utilized by Union to develop the peak day and/or seasonal requirements for the North and South Delivery Areas. As part of this analysis, Sussex will document how the peak day/seasonal planning process evolved for each delivery area and the market/capacity considerations that influenced the process.[7] Next, Sussex will evaluate whether Union has appropriately and consistently reflected the North and South Delivery Areas peak day and seasonal load requirement in the gas supply plan. Stated differently, the Sussex approach will not only analyze the Union models, assumptions, estimates used to develop the peak day/seasonal requirements for appropriateness, but also will assess whether the results of that process are reflected in the gas supply plan.

In the second task (i.e., Gas Supply Plan-Implementation), Sussex will address items 4 and 5, which identify certain Union gas supply activities that require evaluation. In terms of item 4 (i.e., determine whether Union is conducting sufficient due diligence with respect to the cost benefit analysis associated with de-contracting/re-contracting decisions), Union and Sussex will first identify recent or upcoming Union de-contracting/re-contracting decisions to develop the

[7] Please note that certain overlap may exist between this analysis and the Peak (Design) Day Practice Scope of Work.

boundaries of the analysis. Next, Sussex will document the approach utilized (or planned to be utilized) by Union to evaluate the cost and benefits with respect to the identified de-contracting/re-contracting decisions. Sussex will evaluate the Union assumptions, sources of the underlying data, scenarios reviewed, and portfolio implications of each decision. The objective of this analysis is not to evaluate the decision but rather the process used by Union to arrive at the decision. Sussex will document all process improvement recommendations with supporting rationale.

The last item in the Gas Supply Plan-Implementation task is to determine whether Union is using the transportation portion of the gas supply portfolio to favor the transportation paths of entities in which Union or its parent has (or will have in the future) on economic interest. This item is essentially an audit of Union transportation activities to determine if certain transportation paths were favored over other paths. Therefore, Sussex will conduct a review of certain transportation capacity decisions, the circumstances and information known to Union at the time of the decisions and the reasonableness of the decisions. Sussex will rely heavily on the gas supply portfolio experience of our proposed project team as well as market information and service flexibility (e.g., TCPL FT-RAM) to analyze these transportation path decisions.

The final work product for the first category of work (i.e., Gas Supply Planning Principles and Processes) will consist of a narrative report, and will include:

1. Summarize conclusions and findings
2. Detailed description regarding the approach utilized by Sussex including: interviews, research, benchmarking analysis, etc.
3. Detailed review of conclusions and findings with rationale/support
4. Source documents and materials
5. Working spreadsheet models, if developed

Sussex Project Team and Relevant Experience

As discussed above, the proposed Sussex project team will consist of Mr. Stephens as the manager of this task with Messrs. Newman, Voss, Perry and Ms. Nguyen as the project team. The proposed Sussex project team has significant gas supply experience from both a regulated (i.e., LDC perspective) and non-regulated (i.e., competitive energy supplier perspective), recent experience using the Ventyx SENDOUT model to assess the level and utilization of an LDC's capacity portfolio, and significant experience with stakeholder and regulatory processes.

Please find below biographical summaries of the proposed Sussex project team followed by relevant project and work experience.

James M. Stephens, Partner

Mr. Stephens, a Partner with Sussex, has twenty-five years of experience in the energy industry and he has held senior management positions at consulting firms, energy marketing companies and natural gas utilities. Most recently, Mr. Stephens served as Senior Vice President for Concentric Energy Advisors, Inc. He has assisted numerous clients with regulatory policy strategy/tactics and energy market analyses/assessments including: the analysis of regional energy market dynamics and the associated drivers for new natural gas infrastructure (e.g., pipeline expansions); the evaluation of new markets/opportunities (e.g., distributed LNG); market entry/exit strategies (e.g., service territory or product/service expansions); market implications of new energy infrastructure (e.g., LNG facilities and pipelines); integrated resource plans (e.g., natural gas demand forecasting and resource portfolio analysis); natural gas supply portfolio evaluation and optimization (e.g., asset management agreements); and management prudence (e.g., implementation of risk management/portfolio strategies). In addition to his consulting experience, Mr. Stephens served as President of a retail energy marketing firm where he was responsible for all aspects of business unit management including front, mid and back office functions. Mr. Stephens was also responsible for Gas Supply Procurement and Portfolio Optimization for a local distribution company. Mr. Stephens holds a B.S. in Management and an M.B.A. with a concentration in Operations Management from Bentley College.

Peter Newman, Executive Advisor

Mr. Newman, who is an Executive Advisor with Sussex, has over thirty-five years of experience in various natural gas supply management roles for WE Energies. Specifically, Mr. Newman was responsible for managing all the natural gas supply functions including: long term supply planning and acquisition; natural gas purchasing strategies and execution; capacity portfolio optimization; development and implementation of risk management objectives and policies; and management of the gas control function. In addition, Mr. Newman participated in numerous Federal Energy Regulatory Commission proceedings with respect to natural gas pipeline rates, services and other regulatory issues. Mr. Newman was also a key member of the management team that developed and built the Guardian Pipeline, in that role Mr. Newman contributed to a

variety of activities, including: market development and project management activities, market assessment, regulatory strategy and proceedings, capacity marketing and tariff development. Mr. Newman is an engineering graduate of the University of Wisconsin-Platteville.

Jim Voss, Executive Advisor

Mr. Voss, who is an Executive Advisor with Sussex, has twenty-five years of experience in the natural gas industry having held management positions at major Midwestern LDCs as well as unregulated energy marketing firms. He has extensive background and knowledge of gas trading and asset optimization, nominating and scheduling operations, pipeline-LDC system interfaces, gas supply portfolio planning, and related Federal and State regulatory oversight. Mr. Voss is a graduate of the University of Wisconsin-Madison with a Masters in Finance from the University of Wisconsin-Milwaukee.

Adam Perry, Managing Consultant

Mr. Perry's experience in the energy industry is wide-ranging, including work related to regulatory proceedings, rate design, cost of service, cost of capital and financial valuations. His regulatory work has involved development of minimum filing requirements, demand forecasts, return on equity analyses, class cost of service and allocation factor analyses, and market-based rates evaluations. In addition, Mr. Perry has developed expert testimony, prepared financial models for valuation purposes, and performed regulatory and market research. Mr. Perry holds a B.S. in Economics from Northeastern University, where he graduated magna cum laude and was a member of the Omicron Delta Epsilon Society.

Kim Nguyen, Consultant

Ms. Nguyen has experience in providing economic and strategic advisory services to clients in the energy and utility industries. She has contributed to engagements involving regulatory support, energy market assessments, and benchmarking analysis. Ms. Nguyen also has extensive experience in database development, researching regulatory and energy market issues, performing statistical analysis, and modeling and analyzing financial data. Ms. Nguyen holds a B.A. in Economics from Clark University, where she graduated summa cum laude and was a member of the Omicron Delta Epsilon Society.

Relevant Sussex Project Experience

New England Gas Company – Certain members of the proposed Sussex project team assisted New England Gas Company ("NEGas"), a subsidiary of Southern Union Gas, with gas supply analysis in the last three NEGas integrated resource plan filings. Specifically, Mr. Stephens served as an expert witness on behalf of NEGas with respect to general natural gas market issues, NEGas gas supply planning process, and NEGas gas portfolio utilization. Mr. Stephens was the primary contact with Ventyx (i.e., SENDOUT model) and was responsible for supporting the various SENDOUT reports submitted to the Massachusetts Department of Public Utilities as part of these proceedings.

Spectra Energy – Certain members of the proposed Sussex project team assisted Spectra Energy with the development of energy market assessments for the New York City/New Jersey and New England regions. These studies included an evaluation of natural gas demand by segment, natural gas pricing implications associated with new natural gas infrastructure and potential benefits to various market segments should new natural gas infrastructure be developed. The results of these analyses were detailed in written narrative reports and summary presentations. Mr. Stephens presented the results of these analyses to various stakeholder audiences including New Jersey, New York and Massachusetts regulatory agencies and public utility commissions.

Confidential Company – For a Mid-Atlantic energy company, certain members of the proposed Sussex project team assisted the company with an evaluation of the Mid-Atlantic and New England natural gas markets. This assessment was utilized by the company in analyzing whether to support certain Mid-Atlantic natural gas pipeline expansions with a long-term capacity contract. The final work product consisted of a written report that was distributed to the senior management team of the company.

AES Sparrow Point LNG – Certain members of the proposed Sussex project team assisted AES Sparrow Point LNG with an evaluation of the Mid-Atlantic natural gas market in support of the company's filing at the Federal Energy Regulatory Commission ("FERC"). The final work product was a written report that was submitted to FERC as part of the certificate application for AES Sparrow Point LNG.

Confidential Company – For a wholesale energy marketing company, certain members of the proposed Sussex project team assisted the company with an evaluation of the New England and Mid-Atlantic markets in support of company growth objectives (i.e., geographic and service/product expansion). The analyses included a review of the market participants, regional infrastructure, asset values and new market opportunities. The final work product was a presentation that was provided to the company's Board of Directors.

Confidential Client – Sussex has been retained by a private development company to assist it with the commercialization of certain patented intellectual property associated with the energy industry. Specifically, Sussex has been retained to develop business/marketing communication materials, identify potential investors, and to conduct a market assessment of the applicability of the patented intellectual property.

Confidential Client – For a wholesale marketing company, Sussex developed an overview of the New England and eastern Canadian natural gas markets with a particular emphasis on pipeline capacity/flows and natural gas prices/basis spreads. The final work product was a presentation to the senior management of the client.

Confidential Company – For a Southeast U.S. LDC certain members of the proposed Sussex project team conducted a management audit of the monthly cashout and imbalance procedures utilized by the company. The final work product consisted of a narrative report that included process flow diagrams and recommendations to improve the calculations of monthly balances for retail marketers.

Confidential Company – On behalf of an energy company Mr. Stephens developed and managed a stakeholder outreach process associated with the appropriate regulatory jurisdiction for a market area natural gas pipeline. The process resulted in a stakeholder settlement submitted and approved by the appropriate regulatory agencies.

Project Schedule and Budget

Based on the Gas Supply Planning Principles and Processes Scope of Work described above Sussex has developed the following illustrative project schedule:

- January 10, 2013 – Union awards Gas Supply Planning Principles and Processes to consultant

- January 15, 2013 – Data requests and issues list developed and forwarded to Union
- January 17, 2013 – Project kickoff meeting main objectives include: identify primary Union contacts; review/develop detailed timeline/schedule; and initial review of source material
- January 22, 2013 – Begin initial on-site interviews and process documentation
- January 31, 2013 – Project status meeting/conference call
- February 13, 2013 – Project meeting to review outline of final report; follow-up interviews begin
- February 28, 2013 – Initial draft of work product
- March 6, 2013 – Project meeting/conference call to review initial work product
- March 20, 2013 – Revised draft of work product
- March 26, 2013 – Project status meeting to review revised work product
- March 29, 2013 – Issue final draft of work product
- April, 2013 – Begin the development and implementation of the stakeholder review process

As illustrated by the proposed schedule, Sussex has identified certain dates for project status meetings and/or calls. To maximize the value of these meetings/calls while managing the other time commitments of Union, Sussex will utilize the following meeting/call process: (i) all materials will be circulated prior to the meeting; (ii) the information will be presented in summary format for ease of review with supporting analysis and/or narrative provided, as necessary; (iii) the Sussex project manager and content expert(s) will attend and facilitate the meeting; (iv) follow-up issues will be documented and addressed as soon as practicable.

In addition, the proposed project schedule includes interviews with certain Union staff that have responsibility/knowledge of the areas under review. Sussex will utilize the following process to conduct the Union interviews:

- All interviews will be scheduled in advance
- Topics and materials expected to be discussed will be circulated prior to the meeting
- Sussex may have more than one person at the interview to document the discussion
- Sussex will circulate meeting notes to the Union attendees for review and clarifications

In terms of budget for the Gas Supply Planning Principles and Processes category of work and to comply with the Gas Supply Plan RFP Part 3 – Section 4.2 (i.e., provide a time estimate for each project team member) please find below the estimated hours for each proposed Sussex project team member as well as the estimated budget:

Proposed Budget						
	Hours					
	Stephens	Newman	Voss	Perry	Nguyen	Total
Task 1 – Gas Supply Planning Principles and Processes						
Review Gas Supply Plan	80	40	8	16	16	160
Determine if Plan is "Right Sized"	20	20	4	8	8	60
Does the Plan Reflect Peak Day	20	12	4	8	8	52
De-contracting / Re-contracting	30	20	8	12	12	82
Transportation Path Analysis	20	10	40	16	16	102
Sub-total Hours	170	102	64	60	60	456
Sub-total Budget (U.S. Dollars)	$ 46,750	$ 25,500	$ 16,000	$ 13,500	$ 13,500	$115,250

Sussex has estimated 456 hours for the Gas Supply Planning Principles and Processes category of work, or 1.0 full time equivalent for the eleven week project duration. The estimated budget for this task is approximately $115,250, which reflects a composite billing rate of $253 per hour. As discussed, this is an estimated budget for the development of the expert, independent review, which has a deadline of March 29, 2013. Please note that the estimated hours associated with the de-contracting/re-contracting and transportation analysis have the most variability as the amount of work will vary based on the number of contracting decisions and transportation path transactions that will need to be evaluated. As such, Sussex would be happy to work with Union to provide a revised budget estimate once the Scope of Work for each activity has been defined in more detail.

Finally, Sussex proposes that all work after the submission of the expert independent review to Union on March 29, 2013 would be billed on a time and materials basis, using the hourly billing rates[8] summarized in the table below (all rates are expressed in U.S. dollars).

[8] Please note that the hourly rates for the development of the independent review and the stakeholder process are the same.

SUSSEX PROJECT TEAM	RATE/HOUR
Responsible Officer/Project Manager	$275
Executive Advisor	$250
Consulting Staff	$225

In addition, please note that Sussex will charge Union for all out-of-pocket expenses (e.g., travel) at cost (i.e., no markup).

References

With respect to references and recognizing the confidential nature of the experience provided by Sussex, please find below references for the proposed Sussex project team. Additional references will be provided if necessary.

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Task 2 - Peak (Design) Day Practice

The second category of work (i.e., Peak (Design) Day Practice) consists of the following items from the Union Gas Supply Plan RFP:

- Determine whether Union's differing peak-day methodologies in the North and South Delivery Areas are appropriate, and if not, recommend alternative approaches.
- Recommend whether the two approaches should be aligned.
- Compare the methodology of determining the peak design day, based on the coldest day in the last 50 years, with other heat-sensitive distributors in North America.

The Sussex approach to analyze the three Peak (Design) Day Practice items will consist of the following four main tasks: (i) document the Union process and practices utilized to develop the peak day forecast for the North and South Delivery Areas; (ii) review whether the methodologies utilized by Union for the North and South Delivery Areas are appropriate; (iii) determine whether the approaches for the North and South Delivery Areas should be aligned; and (iv) benchmark the approach used by Union to other LDCs.

In the first task (i.e., document the process utilized by Union to develop the peak day forecast for the North and South Delivery Areas), Sussex will develop documentation of the current demand forecasting process used by Union including data inputs; sources of data, model assumptions and scenarios, and informational outputs/reports. The Union peak day process will be summarized using a flow chart diagram.

In the second task (i.e., review whether the methodologies utilized by Union for the North and South Delivery Areas are appropriate), Sussex will evaluate whether the specific peak day methodologies utilized by Union for the North and South Delivery Areas are appropriate for the circumstances for each region. Specifically, Sussex will document how the peak day/seasonal planning process evolved for each delivery area and the market/capacity considerations that influenced the process.[9] Next, Sussex will review the accuracy of the North and South Delivery Area peak day models by conducting an analysis of the model "back cast" results focusing on the demand under extreme cold weather days. In addition to the quantitative analysis of the forecast results, Sussex will evaluate certain quantitative aspects of the North and South Delivery Area peak day models, such as: the consideration of regional factors including unique customer profiles or concentration of load; growth trends, usage/consumption trends, and availability of resources/price of resources.

In the third task, (i.e., should the North and South Delivery Area approaches regarding peak day be aligned), Sussex will evaluate the benefits of a consistent approach compared to the costs of integrating the approaches. For example, if the forecast approaches were aligned and one process was used for both the North and South Delivery Areas the resulting consistency would allow for common data inputs/assumptions (i.e., eliminate the time and resources used to develop and support different approaches). However, the integrated or aligned forecasts may lose important regional considerations that could reduce the overall effectiveness of the forecast. In other words, in this task Sussex will address and analyze the value drivers and negative issues associated with a consistent approach to forecasting versus a customized approach to forecasting.

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[9] Please note that certain overlap may exist between this analysis and the Gas Supply Planning Principles and Processes Scope of Work.

In the last task (i.e., peak day benchmarking), Sussex will utilize a four step process to analyze the peak day methodologies of other heat-sensitive natural gas distributors in North America relative to Union. In the first step Sussex will utilize certain LDC specific metrics (e.g., number of customers, annual sales/throughput, geographic location) to identify the appropriate peer group for the benchmarking analysis. In the second step Sussex will research and document the specific peak day planning approaches utilized by each peer group LDC (e.g., coldest day in x number of years, probability of occurrence, other). In the next step, Sussex will provide market and company context for each LDC in the peer group to provide a framework for the benchmarking analysis. Stated differently, the market circumstances for the individual LDCs in the peer group will provide the necessary context to better understand the results of the benchmarking analysis. Lastly, Sussex will provide additional information on a subset of the peer group that is most similar to Union as this may provide additional insight.

The final work product for the second category of work (i.e., Peak (Design) Day Practice) will consist of a narrative report and include:

1. Summarized conclusions and findings
2. Detailed description regarding the approach utilized by Sussex including: interviews, research, benchmarking analysis, etc.
3. Detailed review of conclusions and findings with rationale/support
4. Source documents and materials
5. Working spreadsheet models, if developed

Sussex Project Team and Relevant Experience

As discussed above, the proposed Sussex project team will consist of Mr. Stephens as the manager of this task with Messrs. Newman, Voss, Perry and Ms. Nguyen as the project team. The proposed Sussex project team has significant experience with respect to LDC demand forecasting issues as a result of direct operating responsibilities and project work.

Since the proposed project team is the same team proposed for the Gas Supply Planning Principles and Processes, please see that section for the biographies of the proposed project team. However, please find below certain relevant project experience.

Relevant Sussex Project Experience

Spectra Energy – Certain members of the proposed Sussex project team assisted Spectra Energy with the development of energy market assessments for the New York City/New Jersey and New England regions. These studies included an evaluation of natural gas demand by segment, natural gas pricing implications associated with new natural gas infrastructure and potential benefits to various market segments should new natural gas infrastructure be developed. The results of these analyses were detailed in written narrative reports and summary presentations. Mr. Stephens presented the results of these analyses to various stakeholder audiences including New Jersey, New York and Massachusetts regulatory agencies and public utility commissions.

Confidential Company – Certain members of the proposed Sussex project team assisted an LDC review geographic expansion. Specifically, different regions were reviewed to assess the potential demand available to support investment in new distribution infrastructure. As part of this analysis, each region was reviewed using demographic data and estimated consumption information to develop potential peak day, seasonal, and annual demand. The final work product consisted of a narrative report and summary presentation that was provided to the senior management of the LDC and the state regulatory commission.

Confidential Company – Certain members of the proposed Sussex project team assisted a combination utility with an evaluation of the customer conversion opportunity within the franchise area of the utility. This analysis included a review of each city/town in the utility franchise area on a variety of demographic and economic metrics utilizing statistical techniques. The results of the analysis were presented to the senior management of the company as part of the overall strategic growth plan for the utility.

Massachusetts/New Hampshire/Maine LDCs – Certain members of the proposed Sussex project team have assisted several New England LDCs with the development of integrated resource plans including demand forecast model development and supply portfolio analysis and evaluation. The final work product consisted of analysis, workpapers and a narrative report submitted as part of the LDC integrated resource plan.

Confidential Company – Certain members of the proposed Sussex project team on behalf of an international energy company conducted an analysis regarding the viability of developing LNG

peaking facilities in various regions of the U.S. Specifically, the natural gas demand profile for the various regions was evaluated relative to the attributes associated with LNG Peaking Facilities. The final work product was a written report distributed to the company's senior management team.

Confidential Company – Certain members of the Sussex proposed project team assisted a natural gas pipeline company with an evaluation of regional natural gas demand. Specifically, the current peak day demand for several LDCs was developed and based on LDC specific growth estimates a ten-year peak day forecast was estimated. The final work product consisted of a narrative report and summary presentation that was provided to the senior management of the company.

Confidential Company – For a west coast U.S. LDC certain members of the proposed Sussex project team conducted a management audit of the data and process used by the company to support natural gas sales to large, high volume customers. The final work product was a detailed process flow chart that documented the sources/uses of information and recommended process improvements.

Project Schedule and Budget

Based on the Peak (Design) Day Practice Scope of Work described above, Sussex has developed the following illustrative project schedule:

- January 10, 2013 – Union awards Peak (Design) Day Practice to consultant
- January 15, 2013 – Data requests and issues list developed and forwarded to Union
- January 17, 2013 – Project kickoff meeting main objectives include: identify primary Union contacts; review/develop detailed timeline/schedule; and initial review of source material
- January 22, 2013 – Begin initial on-site interviews and process documentation
- January 31, 2013 – Project status meeting/conference call
- February 13, 2013 – Project meeting to review outline of final report; follow-up interviews begin
- February 28, 2013 – Initial draft of work product
- March 6, 2013 – Project meeting to review initial work product
- March 20, 2013 – Revised draft of work product
- March 26, 2013 – Project status meeting to review revised work product

- March 29, 2013 – Issue final draft of work product
- April, 2013 – Begin the development and implementation of the stakeholder review process

The schedule proposed for the Peak (Design) Day Practice is similar to the schedule outlined for the Gas Supply Planning Principles and Processes, as the Sussex project team is the same for both tasks and there are benefits from a time and cost perspective of an integrated schedule. In terms of the Peak (Design) Day Practice project meetings and interviews, Sussex would utilize a similar process as discussed in the Gas Supply Planning Principles and Processes Scope of Work.

In terms of the budget for the Peak (Design) Day Practice Scope of Work and to comply with the Gas Supply Plan RFP Part 3 – Section 4.2 (i.e., provide a time estimate for each project team member) please find below the estimated hours for each proposed Sussex project team member as well as an estimated budget:

Proposed Budget						
	Hours					
	Stephens	Newman	Voss	Perry	Nguyen	Total
Task 2 – Peak (Design) Day Practice						
Analyze Peak Day Methodologies	40	20	12	12	12	96
Should Approaches be aligned	30	20	8	8	8	74
Benchmarking	24	16	10	40	40	130
Sub-total Hours	94	56	30	60	60	300
Sub-total Budget (U.S. Dollars)	$ 25,850	$ 14,000	$ 7,500	$ 13,500	$ 13,500	$ 74,350

Sussex has estimated 300 hours for the Peak (Design) Day Practice category of work or approximately 0.7 full time equivalent for the eleven week duration of the project. The estimated budget for this task is approximately $74,350, which reflects a composite billing rate of $248 per hour. As discussed, this is an estimated budget for the development of the expert, independent review, which has a deadline of March 29, 2013. As such, Sussex would be happy to work with Union to provide a revised budget estimate once the Scope of Work has been defined in more detail.

Finally, Sussex proposes that all work after the submission of the expert independent report to Union on March 29, will be billed on a time and materials basis, using the hourly billing rates summarized in the table below (all rates are expressed in U.S. dollars).

SUSSEX PROJECT TEAM	RATE/HOUR
Responsible Officer/Project Manager	$275
Executive Advisor	$250
Consulting Staff	$225

In addition, please note that Sussex will charge Union for all out-of-pocket expenses (e.g., travel) at cost (i.e., no markup).

References

Please see the Gas Supply Planning Principle and Processes section for the proposed Sussex project team references.

Task 3 – Cost Allocation/Rate Design and Deferral Accounting

As outlined in the Union Gas Supply Plan RFP, the third category of work (i.e., Cost Allocation/Rate Design and Deferral Accounting) is comprised of the following three tasks:

1. Examine the cost allocation and rate design used by Union to allocate the cost of gas supply to in-franchise customers in the North and South to ensure that it is appropriate and reflects regulatory principles.
2. Examine the structure of the current natural gas supply deferral and variance accounts, with a view to simplifying and standardizing these accounts in the North and South Delivery Areas.
3. Determine whether the structure and text of the various natural gas supply deferral and variance accounts is consistent with the principles of the Decisions and Orders that provided the authorization for these accounts and consistent with the findings of the Board in this proceeding, and recommend remedial action, if required.

The Sussex approach to analyze the Cost Allocation/Rate Design and Deferral Accounting tasks is to address each issue separately (i.e., Cost Allocation/Rate Design followed by Deferral Accounting). To address the first issue (i.e., Cost Allocation/Rate Design) Sussex will utilize the following four-step process.

In Step One, Sussex will need to obtain certain data and information from Union, including:

- Description of gas supply plan, identifying the assets (e.g., flowing gas, off-system storage, on-system storage, LNG, interruptible customers) available to meet annual, seasonal and daily demands by delivery area and understanding how the assets will be used
- Calculation of the cost of the assets, including fixed and variable components, including what drives each component of the cost
- Determination of the drivers of annual, seasonal and daily demands by delivery area

Step Two will consist of developing the appropriate principles for allocation of gas supply costs, and for designing rates to recover the costs, based on OEB practice and precedent as well as other industry resources.

In Step Three, Sussex will review the allocation of each cost component identified in Step One, based on the allocation principles developed in Step Two. In most circumstances, cost drivers are selected based on cost causation, and the following considerations will be applied:

- Direct assignment – When possible, assigns costs directly to a rate class
- Practicality – The cost driver should be understandable, obtainable at reasonable cost and objectively verifiable
- Stability – Cost driver values should be reasonably stable from year to year; when estimates are used, the cost driver should be able to be estimated with reasonable accuracy, and estimates should be unbiased
- Materiality – When choosing between cost drivers, small differences can often be ignored in favor of Practicality and Stability (see above)
- Benefits received – In some cases, cost causation cannot be easily established or implemented, in which cases selecting cost drivers based on benefits received is a fair treatment

In the final step, for each cost component identified in Step One, Sussex will evaluate the allocator used by Union Gas, to determine if the allocator is: the most appropriate; appropriate but not the most appropriate; not appropriate. Finally, Sussex will discuss the reasons for the determination with regard to each cost component / allocator.

In terms of the second issue (i.e., Deferral Accounting) Sussex will utilize the following three-step process. For context, Sussex notes in Union Gas' most recent case, i.e., EB-2011-0210, the OEB confirmed Union Gas' Normalized Average Consumption ("NAC") forecast for gas sales, but noted that because the forecast reflected a much larger decrease than historic rates of decline, Union Gas was directed to continue the use of the Average Use Account for 2013. In addition, separate NAC forecasts are prepared for Residential North, Residential South and the different commercial classes.

In Step One, Sussex will obtain and review the methodology for the following deferral accounts, including an understanding of how variances are refunded or charged to different customer classes:

- Gas Supply
- Unabsorbed Demand Charges
- Historical storage and transportation exchange services
- Upstream optimization and exchange activity
- LT Transport revenue (proposed by intervenors)

In Step Two Sussex will evaluate the deferral accounts with regard to the following:

- Are the deferral accounts being operated according to OEB Decisions and Orders
- Do the deferral accounts create or mitigate inter-class subsidies due to differences between cost causation and the operation of the accounts

In Step Three, Sussex will recommend approaches for the different cost items, with the goals of:

- Minimizing the differences between the total charged to each rate class (i) as commodity rates, base rates and deferral refunds/charges; and (ii) if actual costs and volumes had been known and reflected in commodity rates and base rates
- Simplifying and standardizing the operation of the different deferral accounts, including considering various methods of allocating among the rate classes the deferral amounts to be refunded/charged, as well as seasonal differences between commodity units, base rate units and deferral refund/charge units
- Evaluate the effect making deferral refunds/charges over a longer or shorter period than is currently used

The Sussex project deliverables will consist of interim and final work products. The interim work product will consist of PowerPoint presentations and narrative reports and will include:

1. Purpose of the work and our qualifications
2. Information on which we relied
3. Statement of the current situation
4. Our finding and the basis for our conclusions, with reference to OEB Orders, other precedent and other authoritative sources
5. Supporting schedules

The final work product will consist of a written report consistent with the Union Gas Supply Plan RFP requirement.

Sussex Project Team and Relevant Experience

As discussed above, the proposed Sussex project team will consist of Mr. Gorman as the manager of this task with Messrs. Van Dusen, Nowak and Magee as the project team. Mr. Gorman has extensive experience in utility accounting and cost allocation for North American natural gas and electric utilities; and has developed an Allocate Cost of Service Model (ACOS), which has been used in rate cases in several jurisdictions. Mr. Gorman has also assisted Ontario utilities on cost allocation studies related to shared services and shared assets.

Please find below biographical summaries of the proposed Sussex project team followed by relevant project and work experience.

Howard Gorman, Executive Advisor

Mr. Gorman, who is an Executive Advisor with Sussex, has more than twenty-five years of experience in the energy industry, including fifteen years in rate and regulatory proceedings, and more than thirty years experience overall in accounting, finance and rate and regulatory matters. He has extensive experience in utility accounting and cost allocation for North American natural gas and electric utilities. Mr. Gorman has testified as an expert witness regarding utility revenue requirements, class cost of service, revenue allocation and rate design. He has testified as an expert witness before the Massachusetts Department of Public Utilities, New Jersey Board of Public Utilities, New York State Public Service Commission, Ontario Energy Board, Pennsylvania Public Utility Commission and Rhode Island Public Utilities Commission. Mr. Gorman has developed an Allocated Cost of Service ("ACOS") model to

perform class cost allocation for natural gas and electric utilities. The ACOS model has been presented and accepted in several jurisdictions; and the gas supply-related costs are analyzed in detail, including separation between fixed costs related to capacity (i.e., firm supply, firm transportation agreements and storage service) and variable costs related to firm and spot commodity volumes. Allocators are assigned based on cost causation.

Mr. Gorman also has experience in financial accounting, as Controller and Treasurer of Trigen Energy Corporation, where he built the finance function, managed subsidiary controllers and supported an IPO with NYSE listing. Mr. Gorman has an MBA from Harvard Business School and holds a B. S. in Accounting from New York University.

Greg Van Dusen, Executive Advisor

Mr. Van Dusen has over thirty years of experience in the Electric Utility industry in Ontario, Canada. He worked for Ontario Hydro for twenty years in the areas of fuel procurement, design and development, financial planning and reporting and regulatory affairs. Mr. Van Dusen has been an expert witness at the Ontario Energy Board in rate applications for Hydro One in both Cost of Service and Incentive Regulation proceedings.

Mr. Van Dusen currently serves on the Board of Directors of Ontario's second largest electricity distribution system utility (Hydro One Brampton) and as the Chair of the Finance, Regulatory and Policy Committee for this utility. He has detailed experience and expertise in Regulatory Submissions, Regulatory Strategy and Witnessing, Cost of Capital, Risk Management, Business Planning, Internal Control and Asset Management practices and processes.

Mr. Van Dusen has an MBA from York University, Toronto, Canada specializing in Finance, Accounting and Information Management and has an Honors BA from York University, Toronto, Canada specializing in Mathematics.

Joshua Nowak, Principal

Mr. Nowak has extensive experience in providing economic, financial, and strategic advisory services to clients in regulated industries. His experience includes financial analysis, expert testimony preparation, and litigation support. Mr. Nowak has performed financial modeling, statistical analysis, and policy assessments. He has worked with gas and electric utilities to develop benchmarking, affiliate-cost studies, and lead-lag studies in regulatory proceedings. In

addition, he has provided support for expert witnesses and developed a number of analyses for issues ranging from cost of capital to operational efficiency. Mr. Nowak previously worked as an Economist, providing policy guidance and analytical support to government clients. Mr. Nowak holds a B.A. in Economics and History from Boston College.

Keith Magee, Consultant

Mr. Magee is a management consultant to the energy industry with a focus on financial modeling, risk assessment and regulatory analysis. He has experience consulting to regulated utilities and industry investors in the areas of cost of capital, capital structure, asset valuation, operational and financial benchmarking and utility rate design. Earlier in his career, Mr. Magee worked with senior level management to build, execute and analyze business development programs in a wide array of industries. Mr. Magee holds a B.A. in Economics from Whitman College and an M.B.A. with a concentration in Finance from Babson College. He has also completed the Level I CFA exam.

Relevant Project Experience

PECO Gas – Mr. Gorman prepared class cost allocation studies for this natural gas distribution utility in 2008 (its first base rate case in over 15 years) and again in 2010. He developed and testified to the allocation of the revenue requirement among the rate classes, including selecting the allocator for each component, developing the allocator values and computing the allocation of each component. He also advised and assisted Company witnesses in determining the revenue allocation and in designing the rates for each class. The rate classes included firm sales, interruptible sales, firm transportation, interruptible transportation and other classes.

Duquesne Light Company – Mr. Gorman prepared class cost allocation studies for this electric distribution utility in 2006 (its first distribution base rate case since 1987) and again in 2010. He developed and testified to the allocation of the revenue requirement among the rate classes, including selecting the allocator for each component, developing the allocator values including a minimum system study, and computing the allocation of each component. He also advised and assisted Company witnesses in determining the revenue allocation, in designing the rates for each class and in proposing changes to some of the rate classes. The rate classes included residential and small commercial, commercial and residential at various voltage levels, and lighting and unmetered classes.

Hydro One Networks, Inc. – In 2004, Mr. Gorman developed a best practice methodology to distribute the costs of providing shared services and common assets among the business units of Hydro One Networks, Inc. The methodology was adopted by Hydro One and accepted by the Ontario Energy Board. The methodology included analyzing the components of the shared costs and determining the appropriate direct assignment or cost driver (allocator). The methodology was also applied by Hydro One, and reviewed by Mr. Gorman, in filings before the OEB in 2006, 2008, 2009, 2010 and 2012.

Project Schedule and Budget

Based on the Cost Allocation/Rate Design and Deferral Accounting Scope of Work described above, Sussex has developed the following illustrative project schedule:

- January 10, 2013 – Union awards Cost Allocation/Rate Design and Deferral Accounting work to consultant
- January 15, 2013 – Data and information requests forwarded to Union
- January 17, 2013 – Project kickoff meeting
- Week of January 21, 2013 – Initial interviews of Union staff (on-site or via telephone)
- January 31, 2013 – Project status meeting/conference call; continuation of interviews and additional data/information requests
- February 13, 2013 – Circulate outline of preliminary findings and recommendations
- February 21, 2013 – Present and review preliminary findings
- March 14, 2013 – Circulate updated findings and recommendations
- March 20, 2013 – Review final findings and recommendations
- March 29, 2013 – Submit independent review to Union
- April, 2013 – Begin the development and implementation of stakeholder review process

Project Budget

In terms of the budget for the Cost Allocation/Rate Design and Deferral Accounting category of work and to comply with the Gas Supply Plan RFP Part 3 – Section 4.2 (i.e., provide a time estimate for each project team member) please find below the estimated hours for each proposed Sussex project team member as well as an estimated budget:

Proposed Budget						
	Hours					
	Stephens	Gorman	Van Dusen	Nowak	Magee	Total
Task 3 – Cost Allocation/Rate Design and Deferral Accounting						
Examine existing cost allocation and rate design	2	62	6	6	6	82
Review structure of deferral accounts	2	60	6	6	6	80
Review compliance to OEB authorization	2	54	12	6	6	80
Sub-total Hours	6	176	24	18	18	242
Sub-total Budget (U.S. Dollars)	$ 1,650	$ 44,000	$ 6,000	$ 4,050	$ 4,050	$ 59,750

Sussex has estimated 242 hours for the Cost Allocation/Rate Design and Deferral Accounting category of work or approximately 0.5 full time equivalent for the eleven week duration of the project. The estimated budget for this task is approximately $59,750, which reflects a composite billing rate of $247 per hour. As discussed, this is an estimated budget for the development of the expert, independent review, which has a deadline of March 29, 2013. As such, Sussex would be happy to work with Union to provide a revised budget estimate once the Scope of Work has been defined in more detail.

Finally, Sussex proposes that all work after the submission of the expert independent review to Union on March 29, 2013 will be billed on a time and materials basis, using the hourly billing rates summarized in the table below (all rates are expressed in U.S. dollars).

SUSSEX PROJECT TEAM	RATE/HOUR
Responsible Officer/Project Manager	$275
Executive Advisor	$250
Consulting Staff	$225

In addition, Sussex will change Union for all out-of-pocket expenses (e.g., travel) at cost (i.e., no markup).

References

Please find below references for Mr. Gorman:

Alan Cohn
Manager of Revenue Analysis, Regulatory Group
PECO Energy Company
2301 Market Street
Philadelphia, PA 19101
215-841-5769
alan.cohn@peco-energy.com

William Pfrommer
Manager, Rates and Tariff Services
Duquesne Light Company
411 Seventh Avenue
Pittsburgh, PA 15219
412-393-3623
wpfrommer@duqlight.com

Randy Pugh
Vice President, Regulatory Affairs
Ontario Power Generation
700 University
Toronto, ON M5G 1X6 Canada
416-592-3546
randy.pugh@opg.com

Sussex would be happy to provide additional references for Mr. Gorman or other members of the project team if requested by Union.

COMMERCIAL TERMS

As discussed above, Sussex is providing Union a proposed Scope of Work for all three categories of work outlined in the Union Gas Supply Plan RFP Part 3 – Project Specifications. Sussex is prepared to provide Union with the final report for all three categories of work by March 29, 2013. Should Union award Sussex all three categories of work (i.e., Gas Supply Planning Principles and Processes, Peak (Design) Day Practice, and Cost Allocation/Rate Design and Deferral Accounting), Sussex will provide Union with a 5% discount (i.e., the Sussex hourly billing rates will be reduced by 5%).

Given the deadline of March 29, 2013, Sussex would expect that Union would facilitate the completion of the Sussex work product by:

- Appointing a Union contact/project manager for each category of work
- Providing Sussex with all relevant documents and material in electronic format as soon as practicable
- Responding to Sussex information requests in a timely manner
- Participating in interviews, meetings, and conference calls
- Timely review and feedback on all Sussex interim work product
- Providing overall project direction and feedback, as needed

Pursuant to the requirements of the Union Gas Supply Plan RFP, Sussex has reviewed Part 4 – Services Agreement and we do not have any concerns regarding the Union terms and conditions. In addition, Sussex confirms that it meets the insurance requirements as outlined in the Union Gas Supply Plan RFP.

If Sussex has not correctly interpreted the requirements or expectations of Union as outlined in the Gas Supply Plan RFP, Sussex would be happy to restructure this proposal to better meet the Union objectives.

Finally, Sussex very much appreciates the opportunity to provide this proposal to Union and please do not hesitate to contact me should you have any questions or require clarifications regarding this proposal.

James M. Stephens
Partner
Sussex Economic Advisors, LLC
161 Worcester Road, Suite 503
Framingham, MA 01701
Office: 508-202-7920
Mobile: 508-341-2487
jstephens@sussex-advisors.com

UNION GAS LIMITED

REQUEST FOR PROPOSAL
Gas Supply Plan Review

SERVICES AGREEMENT

THIS AGREEMENT dated this 7th day of February 2013, (hereinafter referred to as the "**Agreement**")

B E T W E E N:

UNION GAS LIMITED, a company incorporated under the laws of the Province of Ontario, having its head office in the Municipality of Chatham-Kent, in the Province of Ontario

hereinafter referred to as "**Union**"

- and -

Concentric Energy Advisors Inc., a company incorporated under the laws of the State of Massachusetts, having its head office in Marlborough, Massachusetts.

hereinafter referred to as "**Consultant**"

WHEREAS Union has retained Consultant to undertake a Gas Supply Plan Review, as requested by Union;

NOW THEREFORE, IN CONSIDERATION of the mutual covenants herein contained and the exchange of One Dollar ($1.00) and other good and valuable consideration, the exchange, receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Services and Term

1.1 Consultant shall provide the Services described in Schedule "A" of this Agreement (herein referred to as the "Services").

1.2 Subject to the provisions of this Agreement, this Agreement will commence on the 14th day of January, 2013 and expire on the 31st day of December, 2014 unless terminated by either party pursuant to the provisions of this Agreement.

1.3 If it is intended, as evidenced in Schedule "A" that Consultant shall provide a single set of Services, then a Purchase Order ("**PO**") will be issued for Union for the Services described in Schedule "A".

1.4 If it is intended, as evidenced in Schedule "A", that Consultant shall provide multiple sets of Services as requested by Union from time to time, then Union shall create a separate PO for each separate set of Services, each such PO to also be subject to this Agreement.

2. **Compensation**

2.1 Union shall pay Consultant for Services in accordance with the rate schedule and payment provisions detailed in Schedule "B" of this Agreement.

3. **Representations**

3.1 The Consultant represents and warrants that it is qualified to perform the Services in accordance with the terms and conditions of this Agreement within the time specified. The Services to be performed hereunder shall be done in proficient manner and shall conform to professional standards and shall comply with all applicable laws, orders, regulations, ordinances and other rules of all lawful authorities acting within their power, including the obtaining of all permits which may be required for the performance of work under this Agreement. The Consultant hereby acknowledges that it shall comply with all workplace rules of Union including the Spectra Energy Code of Business Ethics available at www.spectraenergy.com .

4. **Confidential Information**

4.1 **Definition**

As used herein, the term "Confidential Information" shall mean all information which Consultant, directly or indirectly, acquires from Union or Union's suppliers concerning the technical, manufacturing, processing and business activities of Union or the suppliers, except information falling into one of the following categories:

a) Information which, prior to the time of disclosure or acquisition hereunder, is lawfully in the public domain;

b) Information which, after disclosure or acquisition hereunder, lawfully enters the public domain, except where such entry is the result of Consultant's breach of the Agreement;

c) Information, other than obtained from third parties, which, prior to disclosure or acquisition hereunder, was already lawfully in Consultant's possession either without limitation on disclosure to others or which subsequently becomes free of such limitations; or

d) Information obtained by Consultant from a third party who to Consultant's reasonable knowledge is lawfully in possession of such information and not subject to contractual or fiduciary relationship with Union with respect to said information. Consultant may use and disclose such information in accordance with the terms under which it was provided by such third party.

Confidential Information shall not be deemed to be within the foregoing categories merely because such information is embraced by more general information lawfully in the public domain or in Consultant's possession.

4.2 **Non-Disclosure**

Consultant will keep all Confidential Information in strictest confidence and will only disclose such information to those people specifically named by Union. The Consultant represents and warrants that it will ensure that the confidentiality provisions of this Article 4 shall be binding on its employees.

4.3 **Third Parties**

Consultant agrees that it will not disclose any Confidential Information to any third party nor use Confidential Information other than on Union's behalf except as Union may authorize in writing.

If disclosure to a third party is so authorized, Consultant shall enter into a Confidentiality Agreement, which shall be subject to review and approval by Union, with said party containing the same terms and conditions with respect to use or disclosure of Confidential Information as this article contains and naming Union as third party beneficiary.

Consultant also agrees to enter into Confidentiality Agreements with third parties at Union's request and to keep in force Confidentiality Agreements concerning third party's Confidential Information, which agreements will permit Consultant's use of such party's Confidential Information in the completion of the Services.

4.4 **Safeguard of Confidential Information**

Consultant also agrees to use best efforts to safeguard all documents containing Confidential Information hereunder and all other documents containing Confidential Information whether prepared by Consultant or another. Consultant may make copies of such documents only to the extent necessary for the performance of Services. Consultant shall prevent access to all such documents by third parties. On completion of Services, Consultant agrees to return to Union all such documents containing Confidential Information and to destroy copies thereof. However, should Consultant desire to retain certain documents and receive Union's written approval therefore, Consultant shall continue to treat said documents within the terms of this clause.

4.5 **Survival**

The provisions of this Article 4 shall survive termination or expiration of this Agreement for any cause whatsoever for a period of two (2)years thereafter unless otherwise authorized in writing by Union.

5. Property of Services

All Services performed, including but without limiting the generality of the foregoing, all notes, reports, documents, calculations, and graphs prepared and/or provided by Consultant in the course of Services or as a result of performing the Services, shall be the property of Union and all property rights therein shall be vested in Union and may be used by Union for any purposes whatsoever. Consultant shall not release to any third party, any portion of the material prepared for Union or provided to Union in the course of, or as a result of performing Services, unless specifically otherwise authorized by Union.

6. Publicity

Consultant shall not use Union's name or the fact that Consultant is performing Services for Union in any press releases, media statements or public communications. Consultant shall not use Union's name, logos, copyrights, trademarks, service marks, trade names or trade secrets in any way, and Union shall not be deemed to have granted Consultant a license of, or granted Supplier any rights in, any of the foregoing by entering into this Agreement.

7. Termination

7.1 Termination for Cause

It is agreed and understood that in the event that Consultant violates any terms of this Agreement, Union may terminate this Agreement forthwith. Such termination does not preclude Union from initiating legal proceedings against Consultant to recover losses resulting from breach of contract.

7.2 Early Termination

Union has the right, at any time, to terminate this Agreement with or without cause, upon thirty (30) days' written notice to Consultant. Upon receipt of such notice, Consultant shall stop work on the cancelled project as directed in the notice and forward to Union all completed or incomplete reports, data and other documents (including but not limited to computerized data, video data or any other recorded data) pertaining to such cancelled project, or portion thereof if Union so requests. Consultant shall be entitled to full payment for Services performed by it as completed, or performed under the terms and conditions of this Agreement up to the effective date of such termination. Union shall not be held liable for damages or loss of anticipated profits on account of such termination.

8. Right to Set-Off

Union reserves the right to set off any money owed by Union to Consultant under this Agreement or other agreement against any amounts owed by Consultant or any affiliate of Consultant to Union under any agreement.

9. Applicable Law

This Agreement shall be interpreted and construed in accordance with the laws of the Province of Ontario and the courts of the Province of Ontario shall have exclusive jurisdiction in all matters contained herein, unless specified otherwise. Furthermore, this Agreement and the rights and obligations of the Parties hereto, are subject to all present and future laws, rules, regulations, and orders of any legislative body or duly constituted authority having jurisdiction, now or hereafter.

10. Entire Agreement, No Waiver, Headings, and Enurement

This Agreement, the attached schedules, and the related PO constitute the entire Agreement of the parties hereto relating to the subject matter hereof, and there are no written or oral terms or representations made by either party other than those contained herein. No provision of this Agreement may be modified or waived unless such modification

or waiver is authorized in writing by the parties to the Agreement. No waiver by either party hereto of any breach by the other party of any condition or provision of this Agreement to be performed by such other party shall be deemed to be a waiver of similar or dissimilar conditions or provisions at the same or any prior or subsequent time. The headings contained herein are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement. This Agreement shall enure to the benefit of and be binding upon the parties hereto and their respective successors and permitted assigns.

11. Environmental Health and Safety Standards

The Consultant acknowledges and agrees that all Services, or other matters, to be completed by the Consultant, pursuant to the terms and conditions of this Agreement, shall be completed in full compliance with the following standards, which shall be in addition to and not substituted for, any other standards or requirements set out in this Agreement or attached Schedules:

11.1 Compliance with applicable laws and standards

Consultant shall perform all Services in compliance with all applicable federal, state and local laws, orders, codes, rules, and regulations relating to health and safety and such Union health and safety procedures as required by Union.

11.2 Compliance with Consultant's health and safety plan

Consultant shall initiate and maintain all necessary safety precautions and programs to conform with all applicable health and safety laws or other requirements, including requirements of Union, wherever the Services are performed, that are designed to prevent injury to persons or damage to property on, about, or adjacent to the site. Consultant shall strictly conform to Consultant's safety programs as submitted and accepted by Union.

11.3 Compliance with Consultant's project-specific health and safety plan

In addition to Consultant's safety programs required herein, Consultant shall develop, maintain, and adhere to a project-specific safety plan for the Services subject to review and acceptance by Union.

11.4 Consultant training requirements

Consultant shall ensure that all Consultant personnel and any party to whom some or all of the Services has been subcontracted (a "**Subconsultant**") has received all training regarding health and safety or any other matters required by applicable law or applicable governmental authorizations. Training or implementation of any additional health and safety measures appropriate for the Services will be specified by Union. Consultant shall provide Union written documentation of said training and worker qualifications.

11.5 Inspection/audit

Consultant will allow Union, or a representative designated by Union, access to any facility related to the Services in order to monitor/audit Consultant's compliance with the health and safety requirements of this Agreement.

11.6 Health and safety statistics

Consultant shall provide Union health and safety statistics related to its prosecution of the Services from time to time, as so directed by Union, and at completion of the Services.

11.7 Initial reports

Consultant will immediately report to Union any incident or incident without loss involving Consultant personnel, the public, or property, arising from Consultant's execution of the Services. Consultant shall provide a written initial report to Union of its investigation of said incident within 24 hours. The report shall provide a schedule for completion of the investigation.

11.8 Final reports

Consultant shall provide to Union a final report showing the cause of the incident and any corrective action.

11.9 Stop work/suspension

Whenever Consultant has not complied with its obligations set forth in this Agreement and creates a circumstance requiring immediate action to ensure the health and safety of all persons on at the site, including stoppage of Services, until the circumstance is remedied, Union may take or require Consultant to take such reasonable precautions. The taking of such action or actions by Union (or its failure to do so) shall not limit Consultant's liability or its obligations under this Agreement. Consultant shall reimburse Union for all reasonable costs incurred by Union in taking such precautions and any costs incurred by Consultant for such precautionary action and any subsequent remedial action shall be paid by Consultant.

11.10 Removal of Consultant employee

Union reserves the right to require the Consultant to remove from the site any personnel not properly observing or complying with the prescribed health and safety requirements of this Agreement.

11.11 Termination

In addition to Union's right to terminate this Agreement contained in Article 7, Union may terminate this Agreement at any time by written notice for Consultant's failure to comply with the terms of this Article.

11.12 Independent Consultant

Consultant shall be solely responsible for the safety of all persons employed by it or its Subconsultants or any other person on the site for any purpose relating to Consultant's carrying out the Services.

11.13 EHS Professional

When requested by Union, Consultant shall provide a dedicated, qualified health and safety professional to monitor the Services being performed under this Agreement.

11.14 Meeting Requirements

Unless Union directs otherwise, Consultant shall attend the following health and safety meetings: (a) pre-job orientation; (b) an orientation prior to entering the worksite; (c) daily tailgate briefings; and (d) such other meetings at such times that worksite conditions change to review the status of the Services and Consultant's use of the health and safety measures required for the changed conditions.

11.15 Subconsultant matters

Prior to execution, Consultant shall ensure Subconsultants are appropriately reviewed, and that all subcontracts are consistent with, and in no way contrary to or inconsistent with, any of the terms or provisions of this Article.

11.16 No Relief Subconsultant

Entry into any subcontract shall not relieve Consultant of any of its obligations in accordance with the terms of this Article.

11.17 Responsibility for Subconsultant

Consultant shall be fully responsible to Union for the acts and omissions of Subconsultants and of persons directly or indirectly employed by them, as it is for the acts or omissions of persons directly employed by Consultant for any failure to comply with the terms of this Article.

12. Independent Consultant

The parties agree that no oral agreement or provisions to this Agreement shall be construed so as to constitute Consultant as being the agent, servant or employee of Union and the instruction, management and control of Consultant's employees shall always remain with the Consultant, and Consultant shall be deemed to be an independent Consultant. Consultant shall have no authority to make statements, representations or commitments of any kind, or to take any actions which shall be binding upon Union, except as provided for herein or authorized in writing by Union. The Consultant further agrees and acknowledges that it shall not be considered an employee of Union and as such it will not be entitled to any benefits or compensation to which employees of Union are entitled.

13. Defects

The Consultant, at no cost to Union, shall remedy any defect in the Services caused by the negligent act or omission of the Consultant or by any failure on the part of the Consultant to carry out the Services in accordance with the provisions of this Agreement. Union reserves the right to deduct that portion of fees for which Services were deemed to not comply with the Request to the satisfaction of Union.

14. Indemnity

Except to the extent of Union's negligence, Consultant shall indemnify, defend, protect and hold harmless Union from any and all actions, claims, costs, damages, demands, expenses, fees (including reasonable lawyer's fees), investigations, liabilities, losses or suits of any kind or nature which may be brought against Union or which Union may sustain, incur or pay arising out of or in any way related to this Agreement including, but not limited to, those which (1) involve any actual or alleged injuries or death to any person or property damage resulting in whole or part from defective or allegedly defective services provided in a negligent or allegedly negligent manner; (2) involve actual or alleged infringement of any letters patent, trademarks, copyrights, or other intangible rights; (3) involve actual or alleged violations of any law, regulation, rule or ordinance relating to the use or sale of any goods; (4) involve claims of Consultant, its agents, contractors or employees relating to personal injuries or property damage; or (5) involve damages incurred by Union, as a result of any breach by the Consultant of this Agreement. Consultants liabilities for errors and omissions shall be limited to (i) for matters where Consultant's insurance is not applicable, the value of the Contract, and (ii) for matters where Contractor's insurance is applicable, Consultant's insurance coverage. This indemnity is intended to survive the termination of this Agreement.

15. Conflict of Interest

The Consultant covenants and agrees that it is not aware of the existence of any relationship, family, business, contractual or otherwise, between themselves, their principals, officers or employees and Union, its directors, officers or employees; and it will not perform any Services for or enter into any contract with others that may conflict with its contractual, professional, equitable or other obligations to Union without first obtaining the written approval of Union.

16. Consultant Contributions

The Consultant shall pay all royalties and license fees on any equipment and materials to be furnished by it and shall pay all workers' compensation contributions, unemployment insurance contributions, Canada/Quebec Pension Plan and employees' income tax deductions together with all other taxes and payroll contributions now or hereafter imposed by any lawful authority and indemnify and save harmless Union from any and all claims, penalties, interest and cost and any of the same which may be made or assessed against Union in respect thereof.

17. Insurance

In this section, for matters related to insurance for services, any party defined as "Seller", "Supplier", "Consultant", "Contractor", or similar term, shall hereby be deemed to be included with the meaning of Consultant, as defined herein.

In this section, for matters related to insurance for services, any party defined as "Buyer", "Union", BU", "Company" or "Spectra", shall be deemed to be included within the meaning of Union as defined herein.

Consultant and each of its subcontractors, of every tier, shall, at its own expense, obtain the insurance described below on or before commencement of the Services and thereafter maintain such insurance until the end of the warranty period prescribed herein:

Commercial General Liability insurance of not less than $1,000,000 per occurrence covering bodily injury, death and property damage including products and completed operations liability.

Applicable to Consulting Services only: If the Consultant's commercial general liability insurance excludes professional liability claims that could arise out of the scope of Services under this Purchase Order, Consultant shall then also carry Professional Liability insurance, with a limit of not less than $1,000,000 per occurrence.

Consultant shall meet all statutory requirements in respect of Auto Liability and Workers Compensation coverage in the jurisdiction where the Services are to be performed.

Upon request, Consultant shall provide proof, satisfactory to Buyer, of the above required insurance. Buyer shall not be obligated to review any of Consultant's certificates of insurance, insurance policies and/or endorsements or to advise Consultant of any deficiencies in such documents, and any receipt of copies or review by Buyer shall not relieve Consultant from or be deemed a waiver of Buyer's right to insist on strict fulfillment of Consultant's obligations hereunder.

Consultant's compliance with the provisions of this section shall not constitute a limitation of Consultant's liability for its acts or omissions or in any way limit, modify, or otherwise affect Consultant's indemnification obligation pursuant to this Purchase Order. The insolvency, bankruptcy, or failure of any insurance company carrying insurance for Consultant, or failure of any such insurance company to pay claims asserted, shall not abrogate, waive or alter any of Consultant responsibilities or liabilities hereunder.

18. Priority

Consultant shall give the Services the classification and priority necessary to perform the work as required under the Agreement.

19. Currency

The parties hereto agree and acknowledge that all reference to dollars in this Agreement shall be construed to mean the currency of the United States.

20. Notices

Any notice, demand, request or other instrument, which may be or are required to be given under this Agreement shall be delivered in person or sent by telex or telecopy, or mailed by prepaid registered post and shall be addressed as follows:

If to Union:

Union Gas Limited
PO Box 2001
50 Keil Drive North,
Chatham, Ontario, Canada
N7M 5M1

Attention: Mr. Chris Ripley, Manager, Regulatory Applications

or at such other address as Union may designate by written notice.

If to CONSULTANT:

David Heintz, Project Manager
Concentric Energy Advisors Inc.
293 Boston Post Road West, Suite 500
Marlborough, MA
01752

or at such other address as Consultant may designate by written notice.

Any such notice, demand, request or other instrument shall conclusively be deemed to have been received on the day of such personal service or on the day of the receipt of the facsimile notice, or on the tenth business day following the date of posting in the case of mailing as aforesaid, provided the postal service is not disrupted.

21. Severability

The invalidity or unenforceability of any portion or provision of this Agreement shall in no way affect the validity or enforceability of any other portion or provision hereof. Any invalid or unenforceable portion or provision shall be severed from this Agreement and the balance of this Agreement shall be construed and enforced as if this Agreement did not contain such invalid or unenforceable portion or provision.

22. Time of Essence

Time is of the essence in all matters referred to in this Agreement.

23. Schedules

Schedule "A" - description of Services
Schedule "B" –compensation

In the event of any conflict or inconsistency between the Schedules, and any provision of the Agreement, the provisions of the Section 1 to 25 of the Agreement and the PO shall prevail over Schedules "A" and "B".

24. Taxes

If Consultant is a non-resident of Canada, and payments are made in respect of services rendered in Canada, of any nature whatsoever, Union is required by the Income Tax Act

(Canada) to withhold a percentage in accordance with the legislation from each payment in respect of services rendered in Canada, and remit this amount to the Receiver-General. No withholding is required where the non-Resident Consultant has received a waiver from the Canada Revenue Agency.

In recognition of the fact that Union is subject to certain United States tax reporting requirements for specified payments to specified persons, Consultant shall immediately (a) provide any information in this regard requested by Union including residency, legal status, and location of provision of goods or services, and (b) fill out and return to Union or Union's designated agent any applicable US tax form. Failure to provide information or to fill out and return any forms required hereunder may result in a withholding of applicable US taxes from any future payments made to Consultant and/or termination of this agreement without further notice. Notwithstanding Consultant's compliance with the foregoing, withholding will be applied to any invoice if Union is directed to make such withholding by Canadian or US tax authorities.

25. Audit

Union or any person designated by Union may at any and all reasonable times for a period of six (6) months after the date of delivery of the Services have access to Consultant's books and records relative to the Services, for the purpose of auditing and verifying such amounts. Union may make copies of such books and records as reasonably required by Union in performing such audit. Consultant shall promptly review and settle with Union all matters arising from such audit including the refunding of monies where applicable.

IN WITNESS WHEREOF the parties hereto have duly executed this Agreement as of the day and year first above written.

APPROVED FOR EXECUTION
DRJ
CR

UNION GAS LIMITED
Per:

Authorized Signatory
Name: ~~Rick Birmingham~~ JOSEPH MARRA
Position: ~~VP Regulatory Affairs, Union Gas~~ ASSISTANT SECRETARY

Per: CONCENTRIC ENERGY ADVISORS INC.
David A. Heintz

Authorized Signatory
Name: DAVID A. HEINTZ
Position: VICE PRESIDENT

Schedule "A"

Please note that in lieu of Schedules "A" and "B", Schedule "A" attached includes all details of scope and compensation. Only those portions of Schedule "A" which apply to "Cost Allocation/Rate Design and Deferral Accounting" shall apply.

PROPOSAL FOR:
GAS SUPPLY PLAN REVIEW

PREPARED FOR:

JANUARY 4, 2013

CONFIDENTIAL

TABLE OF CONTENTS

ATTACHMENTS

I. INTRODUCTION

Concentric Energy Advisors, Inc. ("Concentric") appreciates the opportunity to respond to Union Gas Limited's ("Union's" or the "Company's") Gas Supply Plan Review Request for Proposal (the "RFP"). We understand that in October 2012, Union's regulator, the Ontario Energy Board ("OEB" or the "Board"), issued a decision ordering Union to undertake an expert, independent review of its gas supply plan, gas supply planning process, and gas supply planning methodology. Therefore, Union is seeking support from a consultant in three main areas: (i) Gas Supply Planning Principles and Processes, (ii) Peak (Design) Day Practice and (iii) Cost Allocation/Rate Design and Deferral Accounting. Concentric is well qualified to undertake all three segments of work; however, due to a client conflict we are submitting a proposal for two of the three areas: Peak (Design) Day Practice and Cost Allocation/Rate Design and Deferral Accounting.

Concentric is an employee-owned management consulting and financial advisory firm that is focused on the North American energy industry. We specialize in utility regulation (including cost of service studies, rate design and integrated resource plan filings, among other matters), gas and electric markets, management operations and planning, finance and M&A, as well as litigation.

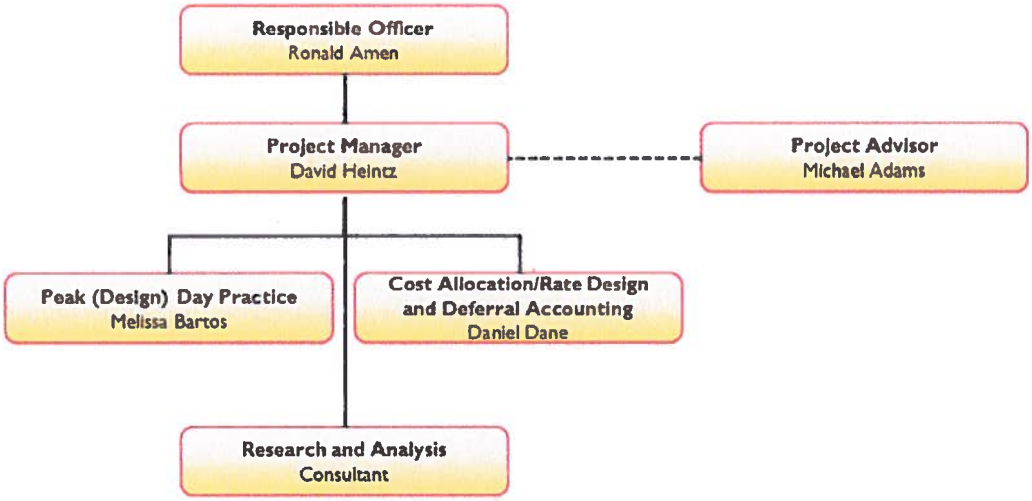
Our regulatory consulting team has worked closely with a broad spectrum of energy industry participants, providing insight and assistance concerning virtually all areas of public utility regulation, resource planning, financing and public policy. We have more than twenty individuals who have appeared as experts in regulatory proceedings across North America on topics ranging from broad regulatory and economic policy, to virtually all elements of the utility ratemaking process.

Our staff has recent and extensive experience helping utilities develop demand forecasts, defend energy supply management practices, enhance energy supply performance, and explore structures to reward energy supply performance. We also have experience preparing and presenting independent reports before the OEB as well as presenting to, and working with, the Ontario stakeholders. Examples of our relevant experience and client references are provided in Section III.

II. PROPOSED PROJECT TEAM

The proposed project team for this engagement is comprised of experts in gas supply planning, demand forecasting, as well as cost allocation/rate design and deferral accounting. Ronald Amen will serve as the Responsible Officer and oversee the project in its entirety. David Heintz will serve as the Project Manager and manage the day-to-day activities of the project team. Melissa Bartos, who has deep experience preparing econometric forecasts for utilities, will support the Peak (Design) Day Practice work and Daniel Dane, a certified public accountant and regulated ratemaking expert, will support the Cost Allocation/Rate Design and Deferral Accounting work. Michael Adams, Senior Vice President, is also a certified public accountant and utility regulation expert and will be serving in an advisory role to the core project team. The team will also draw from our pool of experienced consultants, as needed, for research and analysis support. A project team organization chart is provided below in Figure 1 followed by short biographies for the core team members. Lastly, résumés for the core team members are included as Attachment A.

Figure 1: Project Team Org Chart



Ronald J. Amen, Vice President, provides financial, regulatory, strategic, operation and litigation support to his energy clients. Mr. Amen has over thirty-four years of combined experience in utility management and consulting in the areas of regulatory affairs, resource planning and acquisition, organizational development, distribution operations and customer service, marketing and sales, and systems administration. He has particular expertise in the following areas: cost allocation and pricing issues; regulatory strategy; resource strategy, planning and financial analysis; and expert witness testimony. Prior to joining Concentric, Mr. Amen was a Director with Navigant Consulting, Inc. His prior utility experience includes Manager of Federal Regulatory Affairs at Puget Sound Energy, Inc., Director of Rates at Washington Natural Gas Company, Regional Director - Operations and Director of Rates for Indiana Energy (now Vectren), and management positions in distribution operations and information systems at Ohio Valley Gas Corporation. Mr. Amen is a graduate of the University of Nebraska. Mr. Amen is an Associate Member of the American Gas Association.

David A. Heintz, Vice President, has over thirty years of experience working with regulated rates and tariffs at both the federal and state levels. He also provides clients with analyses of natural gas projects, markets and issues. Mr. Heintz's areas of expertise include cost of service, allocation and rate design, tariff terms and conditions, rate case preparation and regulatory issues. Prior to joining Concentric Energy Advisors, Mr. Heintz was a Managing Consultant with Navigant Consulting, Inc. and has worked for the Federal Energy Regulatory Commission, interstate pipelines and a local distribution company. Mr. Heintz holds an M.B.A. from the University of Pittsburgh and a B.S. in Economics from the Pennsylvania State University.

Michael J. Adams, Senior Vice President, provides financial, regulatory, strategic, operational and litigation support to his energy clients. Mr. Adams has over twenty-five years of direct experience in the public utility industry. He has worked for an investor-owned utility, a regulatory agency, and most recently as a consultant to the utility industry. As a consultant, Mr. Adams has provided expert testimony or reports before the Arkansas Public Service Commission, the City of El Paso, Texas, the

Hawaii Public Utility Commission, the Illinois Commerce Commission, the Massachusetts Department of Telecommunications and Energy, the Missouri Public Service Commission, the Oklahoma Corporation Commission, the Ontario Energy Board, and the Pennsylvania Public Utility Commission. Prior to joining Concentric, Mr. Adams was a Managing Director of Navigant Consulting, Inc. Mr. Adams is a Certified Public Accountant, a graduate of the Illinois College and holds an M.B.A. from the University of Illinois, Springfield. Mr. Adams is a member of the Energy Bar Association and an Advisory Board Member at the Center for Public Utilities at New Mexico State University.

Melissa F. Bartos, Assistant Vice President, is a financial and economic consultant with more than fifteen years of experience in the energy industry. She has conducted comprehensive demand forecast analyses including data collection and validation, design day and design year planning standards development, model building using various statistical and econometric approaches, and developing presentations, reports and testimony to communicate results. Ms. Bartos has also designed, built, and enhanced numerous financial and statistical models to support clients in asset-based transactions, energy contract negotiations, reliability studies, asset and business valuations, rate and regulatory matters, cost-of-service analysis, and risk management. Her modeling experience includes building Monte-Carlo simulation models, designing an allocated cost-of-service model, statistical modeling using SPSS, and programming using Visual Basic for Applications ("VBA"). Ms. Bartos has also provided expert testimony regarding natural gas demand forecasting issues. Ms. Bartos previously consulted with Reed Consulting Group and Navigant Consulting, Inc.; she has an M.S. in Mathematics (Statistics) from the University of Massachusetts at Lowell, a B.A. from the College of the Holy Cross in Worcester, MA, and is a member of the American Statistical Association.

Daniel S. Dane, Senior Project Manager, has ten years of experience in the energy and financial services industries. Mr. Dane has provided advisory services in the areas of litigation support, generating asset divestitures, utility regulation and ratemaking, valuation, financial statement audits and analysis, and the examination of financial reporting systems and controls. He has also provided expert testimony on regulated ratemaking matters for an investor-owned utility. Mr. Dane has an MBA from Boston College in Chestnut Hill, Massachusetts and a BA in Economics from Colgate University in Hamilton, New York. Mr. Dane is a certified public accountant, and is a licensed securities professional (Series 7, 28, 63, and 79). Mr. Dane also serves as the Financial and Operations Principal of CE Capital Advisors, a FINRA-Member firm and a subsidiary of Concentric.

III. RELEVANT EXPERIENCE AND REFERENCES

A. Overview

Concentric's regulatory consulting team has worked closely with a broad spectrum of energy industry participants, providing insight and assistance concerning virtually all areas of public utility regulation, resource planning, financing and public policy.

Concentric's regulatory experts are closely attuned to the latest rate-setting practices, policies and trends in North America, including the interface of integrated resource planning with ratemaking, the application of complex rate designs to achieve policy objectives, resource planning and

development practices to achieve environmental and economic policy goals, and alternative regulation mechanisms, including vertical segregation, the introduction of competitive forces into regulated markets, and efficiency-based regulatory incentive mechanisms.

Concentric has performed a significant amount cost of service work for both natural gas and electric companies in North America. Concentric's approach to projects that involve embedded cost of service studies begins with gaining a thorough understanding of the client's overall strategic, operating and regulatory goals and objectives. We review the documents from prior rate cases, and we work closely with our clients to determine the best approaches to use in preparing the cost studies.

Below are examples of our: (i) peak (design) day, (ii) cost allocation/rate design and deferral accounting, and (iii) Canadian regulatory and stakeholder experience. In addition, we have provided client references in this section.

B. Client Examples and References

Utilizing a customized demand model, Concentric develops demand forecasts by customer class. Concentric also analyzes historical weather data and relevant precedent to provide recommendations regarding appropriate planning standards (*i.e.*, design day, design year, and cold snap weather conditions for which the utility should design its gas supply portfolio). Concentric also provides an independent review of utility-produced forecast models and input data. Below are examples of our forecasting work and client contact information, which we would be pleased if you contacted as reference for our work.

Table 1: Peak (Design) Day Practice Experience

Company Name	Description of Work
CenterPoint Energy	Concentric reviewed the methodologies used by CenterPoint Energy and the Minnesota Department of Commerce for determining design day planning criteria; reviewed CenterPoint Energy's methodology for forecasting design day demand; provided a report with recommendations for best practice methodologies to determine: design day planning standard, forecast design day demand methodologies, and use of a reserve margin.
Berkshire Gas Company ("Berkshire") Reference: Jennifer Boucher Manager Regulatory Economics Berkshire Gas Company 413-445-0353 jboucher@berkshiregas.com	Concentric was responsible for Berkshire's 2010 and 2012 Long Range Forecast and Supply Plans filed with the Massachusetts Department of Public Utilities. Concentric (i) prepared gas demand forecasts based on customer and use per customer econometric models under normal year, design year, design day and cold snap conditions, (ii) determined Berkshire's design day and design year planning standards and (iii) wrote the forecast section of Berkshire's Forecast and Supply Plan report. Concentric also responded to discovery, testified at hearings, and prepared portions of the Company briefs.

Company Name	Description of Work
New England Gas Company ("NEGC") Reference: James Sweeney Sr. Director and General Manager New England Gas Company 508-730-1049 james.sweeney@sug.com	Concentric was responsible for NEGC's 2008, 2010 and 2012 Long Range Forecast and Supply Plans filed with the Massachusetts Department of Public Utilities. Specifically, Concentric: (i) prepared demand forecasts based on customer and use per customer econometric models (ii) determined NEGC's design day and design year planning standards, (iii) wrote NEGC's Forecast and Supply Plan report and (iv) managed the gas dispatch model optimization simulations that were prepared by an outside vendor. Concentric also responded to discovery, testified at hearings, and prepared portions of the Company briefs.
Northwest Natural Gas	Concentric assisted Northwest Natural Gas in the preparation of an Integrated Resource Plan. Concentric worked with Ventyx to develop a long-term load forecast and to specify all existing and potential future gas supply and demand side resources available to Northwest Natural Gas over the planning horizon.
Fitchburg Gas & Electric Company ("FG&E")	Concentric developed natural gas demand forecasts for FG&E's 2003 and 2008 Forecast and Supply Plan filings with the Massachusetts Department of Public Utilities. Specifically, Concentric: (i) developed customer and use per customer econometric forecast models, (ii) wrote the forecast section of FG&E's Forecast and Supply Plan report and (iii) responded to discovery and testified at hearings. Concentric also reviewed and provided guidance to the FG&E forecast group for the 2010 Forecast and Supply Plan.
Northern Utilities	Concentric was responsible for the natural gas demand forecasts that were included in the Northern Utilities Maine and Northern Utilities New Hampshire 2011 Integrated Resource Plans. Concentric developed the customer and use per customer econometric forecast models, developed design day and design year forecasts, and wrote the forecast section of the report that was filed with the Maine and New Hampshire Public Utilities Commissions.
NSTAR	Concentric provided technical, statistical and forecasting consulting and advisory assistance to NSTAR's forecast group related to the preparation of NSTAR's 2012 natural gas Forecast and Supply Plan filed with the Massachusetts Department of Public Utilities.
Columbia Gas of Massachusetts	Concentric provided technical, statistical and forecasting consulting and advisory assistance to the Columbia Gas of Massachusetts' forecast group related to the preparation of their 2011 Forecast and Supply Plan filed with the Massachusetts Department of Public Utilities.

We have assisted numerous gas and electric utilities with all aspects of developing, preparing and supporting a rate case filing. Our assistance has ranged from a high level rate case management role (*e.g.*, case management, regulatory strategy, witness training) to the specific technical rate case requirements (*e.g.*, rate design, cost of service and cost of capital). Below are examples of our cost allocation/rate design and deferral accounting experience and client contact information, which we would be pleased if you contacted as reference for our work.

Table 2: Cost Allocation/Rate Design and Deferral Accounting Experience

Company Name	Description of Work
Virginia Natural Gas Company	Concentric prepared the allocated cost study (class and jurisdictional) and designed rates. Concentric prepared analysis and testimony in support of proposals to recover carrying costs on gas cost deferred balances, shifts in class responsibility for revenue requirement, change in treatment of interruptible margins and changes in charges for other services.
Confidential Natural Gas Pipeline Company	Concentric advised the pipeline company on accounting treatment regarding the recording of the deferred regulatory asset (for FERC reporting purposes) related to rate levelization.
New England Gas Company Reference: Vincent Duffy Director, Controller New England Gas Company 508-676-7599 vincent.duffy@sug.com	Rate case witness for: – All rate design, customer impact matters – Allocated embedded and marginal cost studies – Rate consolidation and restructuring proposal Preparation and support for all rate-related regulatory filings including seasonal cost of gas adjustment filings, and monthly deferred gas cost analysis.
National Grid Massachusetts (gas)	Rate case witnesses for: – All rate design, customer impact matters – Allocated embedded and marginal cost studies – Rate consolidation and restructuring proposal
National Grid – Rhode Island (gas)	Rate case witness for: – Revenue decoupling mechanism – Allocated cost study
Northern Indiana Public Service Company (electric and gas)	Rate case witnesses for: – All rate design, customer impact matters – Allocated cost studies – Rate restructuring proposal
Arkansas Oklahoma Gas Corp	Rate case witnesses for: – All rate design, customer impact matters – Decoupling – Weather normalization – Allocated cost studies

Concentric has considerable experience with regulatory and stakeholder communications, especially in Canada. Many of Concentric's projects have involved stakeholder facilitation/consensus-building assignments. For example, Concentric has led stakeholder meetings/conference calls on behalf of clients, conducted presentations before stakeholders concerning a number of regulatory issues, conducted interviews with interested parties, solicited input from stakeholders to help our clients address certain key operational and regulatory matters, and provided written comments on behalf of interested stakeholders in regulatory proceedings. Below are examples of our regulatory and stakeholder experience in Canada and client contact information, which we would be pleased if you contacted as reference for our work.

Table 3: Canadian Regulatory and Stakeholder Experience

Company Name	Description of Work
Fortis BC Energy Inc. Reference: Clarke Ross FortisBC Energy, Inc. 604-592-8269 clarke.ross@fortisbc.com (or) Tania Specogna, Manager, Midstream Services FortisBC Energy Inc. 604-592-7865 tania.specogna@fortisbc.com	Concentric supported Fortis BC with the development of a modified gas incentive program to respond to the requirements that the British Columbia Utilities Commission established, and concerns expressed by interveners. Concentric served as a resource both for the Company and the stakeholder working group ordered by the Commission. Concentric identified alternative gas supply mitigation incentive plan program features and presented the results of the research and analysis to the client and the working group to facilitate discussion and identification of preferred program features. Concentric provided an independent analysis of the utility's management of capacity and supply. Part of this work entailed a review of the major markets in which the utility transacted, reviewing the size of trading activity at the major market hubs and reviewing the price indices for these markets. Concentric then developed a model to provide a method of measuring the opportunities available in the market in any given time period to better judge the performance of the Company in capturing those opportunities.

Company Name	Description of Work
Enbridge Gas Distribution	Concentric prepared a benchmarking analysis and participated as expert witnesses for Enbridge's 2013 rate rebasing proceeding; for the same proceeding, Concentric also prepared supporting evidence and participated as expert witnesses on capital structure issues. Concentric is also assisting with analysis and supporting evidence for Enbridge's 2013 Incentive Regulation filing, including assisting the company with leading stakeholder discussions and responding to stakeholder issues. Concentric provided written comments on behalf of Enbridge to the Ontario Energy Board concerning the impact of current economic and financial market conditions on the Cost of Capital parameter values calculated in accordance with the Board's established Cost of Capital methodology; Concentric also provided comments on appropriate adjustments to those parameter values.
Gaz Métro	Concentric provided Gaz Métro with an expert opinion regarding an incentive regulation proposal that was filed with the Régie. Concentric (i) reviewed the prior incentive regulation plan, drawing upon research on other North American plans, (ii) analyzed and critiqued the proposed "X Factor" and other key plan parameters, and (iii) assessed the interaction of the various plan elements and the overall package of incentives. Concentric researched allowed ROEs for Gaz Métro in comparison to those of other Canadian gas LDCs.
ATCO	Concentric provided regulatory assistance to ATCO on issues related to an appropriate return on equity for ATCO's Alberta utilities. Specifically, Concentric: (i) prepared a recommended generic ROE and capital structure for each of the four utility sectors[1] operating in Alberta: (ii) prepared detailed financial, operating, and regulatory risk comparisons between U.S., Canadian, and Alberta utilities in support of the recommended ROEs; (iii) developed an alternative ROE formula based on an average of utility corporate bond yields and authorized returns in the US and (iv) prepared a study on the theoretical underpinnings of a targeted capital structure and the interaction between leverage in the capital structure and ROE. Concentric prepared a study on behalf of ATCO, AltaLink, and Fortis Alberta concerning the comparability of Canadian and U.S. utilities for purposes of establishing a fair ROE for Alberta utilities.

[1] Gas transmission, gas distribution, electric transmission, and electric distribution.

Company Name	Description of Work
Ontario Energy Board	Concentric critically reviewed, compared, and assessed the Ontario Demand Side Management ("DSM") framework for natural gas distributors with respect to best practices in selected North American and other jurisdictions and to make recommendations on what changes, if any, should be made to the DSM framework for 2011 and beyond. Concentric drafted a report which made many specific recommendations for changes to the DSM framework in Ontario, including adopting a different cost effectiveness test, considering different methods for measuring program success, adopting a different approach to recovering lost revenues, revising the incentive structure for achieving program targets, and increasing the budget for DSM programs as a percentage of distribution revenues. This report was presented during a stakeholder meeting in Toronto, where Concentric explained its research, listened to stakeholder concerns, and ultimately prepared a set of recommendations which underlied the Staff's recommendations to the Board.

IV. PROJECT SCOPE

A. Peak Design Day Practice

Concentric understands that the scope of work for this category of work includes: (i) determining if Union's differing peak day methodologies for its North and South Delivery Areas are appropriate, and if not, recommend alternative approaches, (ii) recommendations as to whether the two approaches should be aligned, and (iii) comparing Union's peak day methodology with other heat-sensitive distributors in North America.

Concentric will begin with an on-site project kick-off meeting and situational assessment with Union Gas personnel to gain a complete understanding of all relevant background material related to Union's 2013 rate proceeding in docket number EB-2011-2010, and to better understand the Board's key preferences and positions regarding appropriate planning standards for design day. We understand that Union is currently using the coldest day in the last 50 years as the design day planning standard in the North, and a fixed design day planning standard in the South. We will discuss the genesis of these design day standards and conduct further review and analysis, which will include the source and use of all data elements, methods of calculation, and points of differences in the methodologies. During this same time, Concentric will conduct a review of the design day planning standards used by other similarly situated heat sensitive gas distribution utilities. This research will be used to benchmark Union's approaches with those used by other utilities.

Based on Concentric's experience in demand forecasting, benchmarking data and best practices from prior engagements on this topic, and the results of the review of Union's current methodologies, Concentric will recommend any appropriate changes. This will include whether the continued use of separate North and South system methodologies is appropriate, and if not what

changes should be made and the timing of the changes. The specific tasks related to this scope of work are listed below and in the associated timeline shown in Section VI.

1. Preliminary project planning, including an on-site situational assessment with Union Gas.
2. Research and data development, including document requests to Union Gas:
    a. Current design day planning standard methodology.
    b. Database of historical daily weather for the longest period possible for both the North and South regions.
    c. Copies of the relevant Board Decisions, Orders and findings related to Union's demand forecasting and design day planning standard methodology.
    d. Other relevant documents from the situational assessment.
3. Conduct a review of other gas utility design day planning standard methodologies, benchmarking information and industry best practices.
4. Analyze Union's methodology for determining design day planning standards. We will compare methodologies used by a sample of similarly situated gas distribution utilities and provide Union with a summary of best practices.
5. Provide a draft report to Union that includes its recommendations for methodologies to determine the appropriate peak design day planning standard. The report will compare and contrast the respective methodologies described in Task 4, and explain trade-offs between various peak design day planning standards.
6. Conduct an on-site review of Concentric's findings and recommendations with Union.
7. Prepare final report.

In its report, Concentric will provide recommendations for peak day planning standards, which Concentric deems appropriate for Union's customer demand, and its North and South geographical systems. Concentric will support its recommendations for methodology with qualitative and quantitative analysis. However, Concentric's proposed scope of work and cost estimate does not contemplate that it will perform modeling of Union's current demand forecasting equation performance or modeling of Union's peak day demand under alternative methodologies. Following the completion of Concentric's initial scope of work, if Union wishes Concentric to provide such modeling services, Concentric will provide a supplemental scope of work and cost estimate.

B. Cost Allocation/Rate Design and Deferral Accounting

Concentric understands that the scope of work for this category of work includes: (i) examination of the cost allocations and rate design used by Union to allocate gas supply costs to its North and South Delivery Areas, (ii) determination if these practices are appropriate and reflect regulatory principles, (iii) examination of structure of the current natural gas supply deferral and variance accounts to determine any necessary changes which would simplify and standardize these accounts in the North and South Delivery Areas, (iv) review of the structure and text of the various natural gas supply deferral and variance accounts, and (v) determination if the structure and text of these accounts are consistent with the principles of the Decisions, Orders and findings of the Ontario Energy Board which established these accounts and making recommendations for any necessary remedial action.

The specific tasks related to this scope of work are listed below and in the associated timeline shown in Section VI.

1. Obtain copies of the relevant Board Decisions, Orders and findings which established the various gas supply deferral and variance accounts.
2. Obtain copies of the cost allocation and rate design spreadsheets used to produce the entries to the accounts.
3. Review the supporting data inputs, calculations, results and journal entries to these accounts.
4. Based on this review make any necessary recommendation for simplification and standardization between the North and South Delivery Area accounts.
5. Based on this review determine if the calculations are consistent with the regulatory principles and the Board's Decisions, Orders and findings.
6. Prepare a draft report detailing recommendations, if any, for changes or remedial action and the reasons for these changes.
7. Conduct an on-site review of Concentric's findings and recommendations with Union.
8. Prepare final report.

C. Union's Responsibilities

In addition to the need for the appropriate Union personnel to be available for an on-site project kick-off and situational assessment, we expect that Union personnel will gather and compile most of the relevant Company documents and underlying peak design day data, gas cost allocation, rate design, deferred account balances, supporting analyses and journal entries required for input into Concentric's analyses, under our direction.

V. POST-REVIEW CONCENTRIC SUPPORT

As anticipated by Section III.2 of the RFP, the results of the review will be subject to a stakeholder information process and will be filed with the Board as part of future rate application. As part of that process and as requested by Union, Concentric will participate in the stakeholder information and hearing process, as outlined in Section 3.2.1 of the RFP.

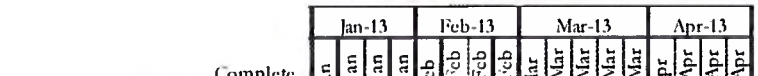
VI. PROJECT SCHEDULE

The project schedules in Table 4 and Table 5 below are Concentric's estimate of the project timing and milestones through the final report which will be delivered to Union no later than March 29, 2013. Concentric proposes to begin each project with a kick-off meeting with Union in mid-January shortly after awarding of the contract. At this meeting Concentric and Union will identify Company personnel in the gas supply, rate, accounting and other areas who have access to data or information related to the peak design day and cost allocation/rate design and deferral accounting methodologies. Interviews will be scheduled with those individuals to begin the review processes.

Concentric proposes that bi-weekly progress reports/meetings be held to keep all participants informed, identify problems, and keep the project on track. Concentric proposes to provide draft reports by March 13, 2013 with final reports delivered to Union by no later than March 29, 2013.

Table 4: Concentric's Peak Day Review Project Schedule

		Start Work	Complete Work
Task 1	Project Planning and Administration	1/15/13	3/14/13
	Preliminary Project Planning	1/15/13	1/22/13
	Ongoing Planning and Administration[1]	1/15/13	3/14/13
Task 2	Research / Data Development	1/15/13	2/18/13
	Issue data requests to Union	1/15/13	1/17/13
	Current design day planning standard	1/15/13	1/17/13
	Database of daily weather	1/15/13	1/22/13
	Interview Union personnel	1/16/13	1/17/13
	Analyze data, prepare follow up requests	2/4/13	2/18/13
Task 3	Review of other utility planning standards	1/21/13	3/4/13
	Research	1/21/13	2/18/13
	Compile Findings	2/25/13	3/4/13
Task 4	Analyze Design Day Standards	1/21/13	2/22/13
	Analyze Union methodology	1/21/13	2/4/13
	Compare to other utilities	2/4/13	2/11/13
	Determine best practices	2/11/13	2/22/13
Task 5	Draft Report	2/25/13	3/11/13
Task 6	Review findings, recommendations	3/13/13	3/14/13
Task 7	Prepare final report	3/14/13	3/28/13



[1] Ongoing planning and administration tasks will include internal Concentric Team meetings and meetings with Union personnel.

Table 5: Concentric's Allocation, Rate Design and Deferral Project Schedule

		Start Work	Complete Work
Task 1	Project Planning and Administration	1/15/13	3/28/13
	Preliminary Project Planning	1/15/13	1/22/13
	Ongoing Planning and Administration[1]	1/15/13	3/28/13
Task 2	Research / Data Development	1/15/13	1/29/13
	Issue data requests to Union	1/15/13	1/17/13
	Interview Union personnel	1/15/13	1/17/13
	Obtain Board Decisions, Orders & findings	1/15/13	1/22/13
	Obtain supporting accounting data	1/15/13	1/29/13
Task 3	Review Other Utility Standards	1/21/13	3/4/13
	Calls/research	1/21/13	2/18/13
	Summarize Findings	2/25/13	3/4/13
Task 4	Review data sources, prepare analyses, uses	1/21/13	3/4/13
	Review/analyze sources, inputs, uses of data	1/21/13	2/18/13
	Examine North/South difference	2/4/13	2/18/13
	Summarize Findings	2/25/13	3/4/13
Task 5	Draft Report	2/25/13	3/11/13
Task 6	Review findings, recommendations	3/13/13	3/14/13
Task 7	Prepare fianl report	3/14/13	3/28/13

[1] Ongoing planning and administration tasks will include internal Concentric Team meetings and meetings with Union personnel.

VII. PROJECT BUDGET

Concentric has prepared supporting peak design day and cost allocation/rate design and deferral accounting budgets by task that correspond to the project schedules. As shown in Table 6 and Table 7 below, Concentric's proposed professional services budget for the Peak Design Day Practice review is $52,220 and the proposed budget for the Cost Allocation/Rate Design and Deferral Accounting review is $52,990. The foregoing budget estimates reflect a 10% discount from Concentric's standard hourly billing rates and are offered on a not-to-exceed without prior consultation basis. Post-review consulting support provided by Concentric as part of the stakeholder information process, including presentation of the results of the review to stakeholders, preparation of a written report as part of a rate case application with the OEB, and responding to interrogatories and undertakings, as described in Section V, above, will be billed to Union on a time-and-materials basis at the same discounted hourly billing rates[2], with the exception of appearance as an expert witness providing oral testimony at hearing. Time spent preparing for and providing expert testimony at hearing by senior members of Concentric's project team will be billed at our standard hourly billing rates shown in Attachment B.

Table 6: Union Gas Limited
Peak Day Practice Review

	Task Description	R Amen, Vice President	D. Heintz, Vice President	M. Bartos, Asst. Vice President	Concentric Analyst	Project Assistant	Total Hours	Total Dollars
Task 1	Project Planning and Administration Includes Meetings with client	8		8		4	20	$5,988
Task 2	Research / Data Development			8	12		20	$5,464
Task 3	Review design day planning standard of other utilities, benchmarking, and industry best practices	2		6	20		28	$7,394
Task 4	Conduct analyses of peak day planning criteria methodology	2		12	32	4	50	$12,402
Task 5	Prepare draft report of finding and recommendations	2		20	16		38	$11,206
Task 6	Review draft report with Union	4		4			8	$2,884
Task 7	Prepare final report of findings and recommendations	2		12	8	4	26	$6,882
	TOTAL Hours	20	0	70	88	12	190	
	Hourly Rate	$ 383.00	$ 383.00	$ 338.00	$ 230.00	$ 55.00		
	TOTAL $ Estimate for Consulting Hours	$ 7,660	$ 0	$ 23,660	$ 20,240	$ 660		$ 52,220
	Misc copying and supplies @cost							$ 50
	Travel @ cost							$ 3,400
	Total Other Direct Costs							$ 3,450
	Other Direct Costs							$ 3,450
	GRAND TOTAL	**$7,660**	**$0**	**$23,660**	**$20,240**	**$660**		**$ 55,670**

[2] In the event a member of Concentric's staff is promoted, the billing rate for that individual will be updated accordingly for any work done under the time and materials portion of the project.

Table 7: Union Gas Limited
Cost Allocation/Rate Design and Deferral Accounting

	Task Description	M. Adams, Senior Vice President	D. Heintz, Vice President	D. Dane, Senior Project Manager	Concentric Analysts	Project Assistant	Total Hours	Total Dollars
Task 1	Project Planning and Administration Includes Meetings with client		8	8		4	20	$5,804
Task 2	Research / Data Development Includes time spent at client site			8	12		20	$5,280
Task 3	Review of Board Decisions, Orders and Finding		2	6	8		16	$4,496
Task 4	Review data sources, analyses, uses and journal entries	2	2	12	48	4	68	$16,706
Task 5	Prepare draft report of finding and recommendations	2	2	16	16		36	$10,386
Task 6	Review draft report with Union		4	4			8	$2,792
Task 7	Prepare final report of findings and recommendations		2	12	12	4	30	$7,526
	TOTAL Hours	4	20	66	96	12	198	
	Hourly Rate	$ 450.00	$ 383.00	$ 315.00	$ 230.00	$ 55.00		
	TOTAL $ Estimate for Consulting Hours	$ 1,800	$ 7,660	$ 20,790	$ 22,080	$ 660		$ 52,990
	Misc copying and supplies @cost							$ 50
	Travel @ cost							$ 3,400
	Total Other Direct Costs							$ 3,450
	Other Direct Costs							$ 3,450
	GRAND TOTAL	**$1,800**	**$7,660**	**$20,790**	**$22,080**	**$660**		**$ 56,440**

In addition to our fees for professional service, reasonable and customary travel and administrative expenses will be billed at actual costs. Our estimate of travel expenses included in Table 6 and Table 7 anticipates two on-site meetings at Union's offices for each category of work, to be attended by two members of Concentric's project team.

Please feel free to contact me at 217-787-5180 or madams@ceadvisors.com with any questions that you may have about our proposal. We look forward to working with you on this important assignment.

Very truly yours,

CONCENTRIC ENERGY ADVISORS, INC.

Michael J. Adams

Michael J. Adams
Senior Vice President

Michael J. Adams
Senior Vice President

Michael J. Adams has over twenty-five years of direct experience in the public utility industry. He has worked for an investor-owned utility, a regulatory agency, and most recently as a consultant to the utility industry. As a consultant, Mr. Adams has provided expert testimony or reports before the Arkansas Public Service Commission, the City of El Paso, Texas, the Hawaii Public Utility Commission, the Illinois Commerce Commission, the Massachusetts Department of Telecommunications and Energy, the Missouri Public Service Commission, the Oklahoma Corporation Commission, the Ontario Energy Board, and the Pennsylvania Public Utility Commission.

REPRESENTATIVE PROJECT EXPERIENCE

Rates/Regulatory/Strategy Projects

- Provided regulatory strategy support to a Midwestern electric utility regarding potential strategies for an upcoming rate proceeding. The Company had not filed a rate case in over 20 years. NCI was retained to provide insights, research and expert advise as to potential issues to pursue in the upcoming rate proceeding.
- Performed a review of shared service costs for a large Midwestern combination utility. Evaluated the reasonableness of allocated costs to those of other utilities and outsource providers. Provided expert testimony before the regulator regarding the appropriateness of the costs.
- Retained by Hawaii Electric Light Company to provide an assessment of the reasonableness of AFUDC charges accrued associated with the installation of two combustion turbines.
- Provided strategic and business planning services to a public traded company which is attempting to enter the utility financing business. Continue to work with the company to refine the service offerings within a regulated utility environment and to identify new business opportunities.
- Provided rate case support for two combination utilities. The primary objective of the filings was to unbundle the costs of the electric business to establish delivery service rates. During the engagement, assisted the Companies with the functionalization of plant and common costs; preparation of minimum filing requirements; preparation of direct testimony; and response to data requests.
- Assisted with the preparation of a gas rate case filing for a Midwestern gas utility. The project included the determination of the revenue requirement including an assessment of the proper level of cash working capital. Prepared the filing requirements associated with the rate case.
- Provided assistance to a large Midwestern combination utility in developing a response to a regulator-initiated complaint case pertaining to the Company's existing rates and alternative regulation mechanism. Provided testimony on issues related to cash working capital.
- Reviewed the credit and collection practices of a large Midwestern gas company. Advised client as to regulatory environment and potential changes that could be made to existing regulations.
- Provided assistance to an investor-owned combination utility on a number of occasions. He has performed the following tasks:
    - Examined the rate base and operating statements of the Company to determine the costs associated with the distribution business. This unbundling effort examined the method by which administrative and general expenses were allocated as well as the assignment of

general and intangible plant. Provided support responding to staff and intervenor inquiries related to the cost unbundling process.
    - Submitted testimony on behalf of the Company related to an A&G study introduced in conjunction with the delivery services cost unbundling proceeding.
    - Provided regulatory support for the preparation of a filing to create a fossil-generation subsidiary.
    - Consulted with the Company regarding a pending Commission-mandated management audit. Developed strategies for improving the likelihood of obtaining beneficial results for both parties.
- Provided assistance to a large northwest combination utility in preparation for a rate filing. Provided an independent assessment of the Company's requested revenue requirement.
- Assisted a Midwestern gas company with the preparation of a rate filing. The filing introduced new concepts pertaining to alternative regulatory mechanisms, lost and unaccounted for gas, and weather normalization.
- Prepared a cost of service model for a medium-sized municipally owned electric utility. The project included recommendations related to rate design and alternative cost recovery mechanisms.
- Provided regulatory assistance to a large Midwestern electric company on issues related to the level of capital and operations and maintenance expenses to be included in an unbundled distribution rate.
- Assisted a large east coast combination utility with an analysis of various utility services. Examined the Company's internal costs of providing the services versus those of external providers. Developed strategies to expand, divest, or make more competitive the Company's services.
- Consultant for business and cost separations study performed for a Canadian gas utility which will culminate in evidentiary hearings and evidence associated with the creation of a non-regulated subsidiary.

Cash Working Capital

Have performed and supported cash working capital requirements of regulated utilities on behalf of:

- AmerenUE – Missouri
    - Electric
    - Gas
- Ameren Illinois Companies (AmerenCILCO, AmerenCIPS, AmerenIP)
    - Electric
    - Gas
- Arkansas Oklahoma Gas Corporation
- Centerpoint Energy
- Hydro One
    - Distribution Business
    - Transmission Business
- Illinois Power Company
    - Electric
    - Gas
- Integrys Energy
    - Peoples Gas
    - North Shore Gas
- Missouri Gas Energy
- Toronto Hydro
- T.W. Phillips Gas and Oil Company

Accounting/Budgeting Assignments

- Reviewed the time and materials charging practices of a large east coast utility. The review led to the revision of charging practices.
- Reviewed the indirect charges practices of a large east coast utility. Provided recommendations modifying the charging practices between capital and expense.
- Reviewed the charging practices of a large electric power authority related to the charging of storm restoration expenses. Identified expensed activities which could be capitalized.
- Evaluated a large eastern combination utility's efforts to implement activity-based management principles.

Reliability-Related Projects

- Provided expert testimony on behalf of Allegheny Power regarding the appropriateness of reliability standards which had been recently established by the Pennsylvania Public Utilities Commission.
- Researched and summarized all regulatory initiatives related to service quality measures across the country on behalf of the Massachusetts distribution companies. Developed a report, which was presented to the Massachusetts Department of Telephone and Energy, outlining existing standards and the applicability of such standards for benchmarking the performance of the distribution companies against available information pertaining to such standards.
- Assisted with the review of historical reliability performance for two Midwestern combination utilities. Analysis required identification and mitigation of drivers of interruptions, both in terms of frequency and duration. Employed structured analytical approach to estimate costs of complying with Commission-established reliability "sets".
- Provided regulatory support for a Midwestern combination utility on issues related to electric distribution system reliability. Assisted with development and presentation of responses to regulatory requests.
- Prepared alternative mechanisms for a Midwestern utility's consideration pertaining to alternative forms of regulation on issues related to electric distribution reliability.
- Assisted with the preparation of a Midwestern utility's annual report to the regulator on issues related to electric distribution reliability.
- Assisted a Midwestern combination utility prepare for and respond to a management review of the Company's transmission and distribution system reliability. Prepared a synopsis of the Company's historical performance and key initiatives designed to maintain or improve reliability performance.
- Advised senior management on regulatory strategies for responding to numerous inquiries by/presentations to state regulators on issues related to supply-side and delivery service reliability.
- Assisted a Midwestern combination utility develop an Operations Compliance program for its electric distribution business.
- Assisted an investor-owned combination utility with evaluation and response to Commission rulemaking proceedings related to state-wide reliability rules.
- Prepared a status report for a municipality pertaining to the progress of reliability-related initiatives on behalf of a large Midwestern utility.

Litigation/Audit Support Projects

- Performed a review of the customer service functions of a medium sized natural gas company in the eastern United States. The review included an assessment of the company's compliance with existing PSC rules and regulations.
- Developed a methodology to assess the level of potential damages related to the delayed start-up of a landfill gas-to-energy facility.

- Performed an assessment of a large gas company's PBR mechanism. Regulators alleged that the mechanism had been manipulated to benefit the Company. Reviewed and analyzed documents and assisted with the legal defense on behalf of the Company.
- Project Manager for an effort to assist regulated telephone company during a PSC-ordered management audit. Prepared and debriefed witnesses to be interviewed by PSC auditors. Prepared responses to document requests. Analyzed company data to identify trends and areas of concern that could be identified during PSC audit. Briefed company senior management as to status of audit and potential findings and recommendations. Reviewed and commented on factual accuracy and reasonableness of draft management audit report.
- Assisted a sewer district prepare for a management audit initiated by the governing board of the district. Providing audit training as well as pre-audit assistance.
- Managed and served as lead consultant during a diagnostic and focused review of a mid-sized electric and gas company on the east coast. Served as lead consultant on areas related to Finance and Accounting.
- Served as lead and engagement director during a focused management audit of a mid-sized gas company on the east coast. Served as lead consultant on issues related to capital budgeting.
- Served as lead consultant during a litigation effort to evaluate the prudence and reasonableness of efforts related to the construction of a multi-state pipeline.
- Support consultant in the areas of Plant Management and Operations for a southwestern electric company.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2007 – Present)
Vice President

Navigant Consulting, Inc. (1995 – 2007)
Managing Director

Illinois Commerce Commission (1983 – 1995)
Deputy Executive Director

Illinois Power Company (1981 – 1983)

EDUCATION

M.B.A., Finance, University of Illinois, Springfield
B.S., Accounting, Illinois College

DESIGNATIONS AND PROFESSIONAL AFFILIATIONS

Certified Public Accountant
American Institute of Public Accountants
Illinois Society of Certified Public Accountants
Member, Energy Bar Association
Member, Center for Public Utilities Advisory Council at New Mexico State University

AVAILABLE UPON REQUEST

Extensive client and project listings, and specific references.

Ronald J. Amen
Vice President

Ronald J. Amen provides financial, regulatory, strategic, operation and litigation support to his energy clients. Mr. Amen has over thirty-three years of combined experience in utility management and consulting in the areas of regulatory affairs, resource planning, organizational development, distribution operations and customer service, marketing and sales, and systems administration. He has particular expertise in the following areas: cost allocation and pricing issues; regulatory strategy; resource strategy, planning and financial analysis; and expert witness testimony. Prior to joining Concentric, Mr. Amen was a Director with Navigant Consulting, Inc. His prior utility experience includes Manager of Federal Regulatory Affairs at Puget Sound Energy, Inc., Director of Rates at Washington Natural Gas Company, Regional Director - Operations and Director – Rates for Indiana Energy (now Vectren), and management positions in Information Systems and Distribution Operations at Ohio Valley Gas Corporation. Mr. Amen is a graduate of the University of Nebraska. He is an Associate Member of the American Gas Association.

REPRESENTATIVE PROJECT EXPERIENCE

Resource Planning, Strategy and Financial Analysis

» Engaged as a member of a consultant team that served as the independent evaluator in a *Western electric utility's* competitive solicitation for non-intermittent generation resources. Jointly recommended by the utility client, the staff of the utility commission, and the state attorney general, the consulting team acted as an agent of the public utility commission monitoring and overseeing the solicitation, which included reviewing the request for proposals and solicitation process, including provisions of the PPA, preliminary review (economic and contractual) of bids received from the request for proposals, initial modeling of bids for screening, selection of bidders with whom to conduct negotiations and oversight of the negotiation process, and the ultimate selection of the winning bid. Provided due diligence review of all input data, preliminary and final model output, and output summaries. The team produced bi-weekly confidential reports to the commission regarding the process and its results.

» Assisted a *Pacific Northwest gas utility* with the development of its long-term Integrated Resource Plan ("IRP") for its Oregon and Washington service territories. The IRP includes the evaluation of incremental inter- and intra-state pipeline capacity, underground storage, and two proposed LNG plants under development in the region.

» Engaged by a *Pacific Northwest electric/gas utility* to assist the client with the development of a natural gas resource efficiency and direct end-use strategy, an interdepartmental initiative focused on preparing a natural gas resource efficiency plan that optimizes customers' end-use energy consumption while furthering corporate customer, financial, environmental, and social responsibilities.

» As part of a review of a *Pacific Northwest electric/gas utility's* gas procurement strategy and hedging analytics, provided gas LDC case studies for gas procurement and risk management practices, including identification of risk management best practices across the industry.

» For a *Pacific Northwest electric/gas utility*, provided resource planning strategy and analysis for the Company's Least Cost Plan, including a review of the company's underlying 20-year electric and gas demand forecasts.

» Engaged by a *Pacific Northwest electric/gas utility* as a member of a consulting team serving as the client's financial advisor for the acquisition of new electric power supply resources. Conducted a multi-track solicitation process for and evaluation of generation assets and purchase power agreements. Provided regulatory support for the acquisition in a subsequent power cost rate proceeding.

» Provided an evaluation of the functions provided by a *Midwestern gas/electric utility*'s underground storage facilities for the purpose of assigning cost responsibility to the various customer groups, which had been challenged by parties in the company's general rate proceeding.

» For a *Southern gas/electric utility*, conducted an evaluation of two gas operating subsidiaries, their capital planning, asset management strategy, and customer growth practices. Formulated a strategy for improving the profitability of the entities, with regulatory strategies for its two jurisdictions that included a special cost recovery mechanism for accelerated infrastructure replacement programs.

» Engaged by a *Midwestern municipal electric utility* as a member of three-consultant team that established a self-sustaining energy services business to replace its rebate-based, demand-side management programs. Area of focus included the finance and administrative functions as well as the employee evaluation and recruitment process.

» For a *European electric utility*, provided strategy and analysis support, including a review of the natural gas value chain in the U.S., as part of an overall project scope focusing on the evaluation of retail multi-energy strategies for the client.

Cost Allocation, Pricing Issues and Rate Design

» Supported a *Northeastern electric utility* in its decoupling proposal for the Company's general rate case. Work included: (1) research on the financial implications of decoupling; (2) identification of decoupling mechanism details to address company and regulatory requirements and objectives; (3) identification of rate adjustment mechanisms that would work together with the Company's proposed decoupling mechanism; and (4) preparing pre-filed testimony and testifying at hearings in support of the Company's decoupling and rate adjustment proposals. The proposed rate adjustment mechanisms included an inflation adjustment mechanism based on a statistical analysis, and a capital spending mechanism to recover the costs associated with capital plant investment targeted to improving service reliability.

» For a *Northeastern gas/electric utility*, conducted class allocated cost of service studies for the client's New England natural gas operations. This included combined gas cost of service studies for the consolidation of four gas service territories into two gas utility subsidiaries. During interrogatories, performed four separate allocated cost of service studies for each gas service territory. Work included reconfiguring the Company's commercial and industrial customer classes according to size of load and customer-related facilities. Served as an expert witness on behalf of the client in consolidated general rate cases before the Massachusetts Department of Public Utilities.

» For a *Midwestern energy company*, class allocated cost of service studies were conducted for the client's natural gas (including two other affiliate gas utilities) and electric operations. Work included reconfiguring the Company's commercial and industrial customer classes according to size of load and customer-related facilities. Rate design was modernized to recover a greater portion of fixed costs via fixed monthly customer and demand based charges, a transition to a "Straight-Fixed Variable" form of rate design. Industry research was provided on alternative rate designs for the electric service, including Time-of-Use rates and Critical Peak Pricing. Served as an expert witness on behalf of the client in three general rate cases before the Indiana Utility Regulatory Commission.

» Conducted class allocated cost of service studies for a *Midwestern electric utility's* Minnesota electric operations. Work included reconfiguring the Company's customer classes for cost of service purposes to collapse end-use based classes with the classes to which they would be eligible. Cost of service studies were performed on a before-and-after basis for the existing and proposed classes. The cost of service studies included a Fixed/Variable study for Production costs, and a Primary – Secondary study for poles, transformers and conductors. Concentric performed a Time of Use analysis to determine the appropriate rate differentials for its Peak and Off-peak rates. Served as an expert witness on behalf of the client in a general rate case before the Minnesota Public Service Commission.

» On behalf of a *Midwestern gas utility*, provided cost of service and rate design support for the Company's general rate case filings in its two State jurisdictions and in support of a Section 311 transportation filing before the Federal Energy Regulatory Commission (FERC). Provided related research, design and expert

witness testimony in support of a Revenue Decoupling mechanism in one jurisdiction and a Weather Normalization Adjustment (WNA) mechanism in the other jurisdiction, along with a significant increase in fixed charges and the introduction of demand charges for the Company's largest customer classes. Conducted a pre-filing "Decoupling" workshop for the utility commission staff.

» Provided Cost of Service and Rate Design support for a *Pacific Northwest gas utility*'s general rate case, including expert witness testimony. Assisted the client with an earlier revenue neutral reconfiguration of its Commercial / Industrial sales and transportation service offerings. The earlier initiative included collaborative work with an industrial customer stakeholder group.

» For a *Midwestern energy company* assisted the client with the pursuit of alternative regulatory initiatives in conjunction with company's expansion of its energy efficiency and conservation programs. Supported the research, design, and selection of Revenue Decoupling mechanisms for its two regulated gas utility subsidiaries. Served as the cost of service witness in two general rate case filings.

» Representing a *Pacific Northwest electric/gas utility* in two general rate proceedings, provided Cost of Service and Rate Design support, including expert witness testimony in support of the utility's proposed gas Revenue Decoupling mechanism. Conducted research on accelerated cost recovery mechanisms for Infrastructure Replacement, Electric Power Cost Adjustment mechanisms and Gas Supply Pricing Options of utilities in North America.

» Engagement director for Cost of Service and Rate Design support for the general rate proceedings of a U.S. Energy Company's *Midwestern and Northeastern gas utilities*, including expert witness testimony on cost of service, rate design and declining use-per-customer. Rate design support included a proposed ten-year weather normal, and the introduction of straight-fixed variable rates (*Midwestern* LDC). This was the third consecutive rate case engagement for the *Northeastern* LDC.

» For a *Midwestern gas/electric utility* assisted the Company with the preparation of a retail customer choice filing for one of its gas distribution jurisdictions. Provided support for the development ancillary service costs, the design of program cost recovery mechanisms, and tariff structure for service offerings.

» Served as engagement manager for cost of service and rate design support for a *Western Canadian gas utility* client. Represented the client in its capital investment recovery proceeding for a major pipeline project, a cross-provincial transmission pipeline. The three-phase project included regulatory strategy support for executive management regarding the integration of the pipeline proposal with the utility's PBR and unbundling initiatives and a global rate design proceeding. Cost of service support included a review of its gas cost portfolio allocation to firm sales customer classes, a survey of the trends in gas cost allocations and incentive mechanisms in North America, and serving as a facilitator for an all-party cost allocation and rate design workshop.

» For a *Northeastern gas utility*, served as engagement manager for cost of service and rate design support, including expert witness testimony, for the client's participation in a state-wide gas unbundling proceeding. Subsequent projects included analysis of the client's demand forecasting capability, implementation of an algorithm-based balancing service and a cost of service studies related to transportation related administrative costs, resources supporting system reliability and recovery of potentially stranded costs.

» Engagement manager for cost of service and rate design support, including expert witness testimony, for client's asset separation and unbundling proceeding as well as a subsequent general rate case for a *Midwest gas transmission/distribution utility*. Integrated gas utility (wellhead to burner-tip) unbundled upstream services (production and gathering, storage, and intra-state transmission) from its distribution business.

» For a *South American gas utility*, an affiliate of a major U.S. energy company, conducted a cost of service and rate design training for management personnel engaged in the planned restructuring of the rate-setting processes for three gas utilities in Brazil.

» For a *Canadian energy marketer*, provided consulting support and position paper on cost allocation and pricing issues for Canadian gas marketer's participation in a restructuring collaborative sponsored by the intra-provincial pipeline and local distribution utility in Saskatchewan.

» For a *Pacific Northwest gas utility*, negotiated and obtained regulatory approval of a 20-year contract with the company's largest industrial customer, which avoided bypass of 14 primary plant facilities within the service territory, prevented loss of 48.5MM therms of annual throughput, and maintained contribution to system costs.

» For a *Pacific Northwest gas utility*, obtained regulatory approval of unbundled, cost-based transportation services to meet large commercial and industrial customer needs and re-designed rates of other classes to better align with new cost of service methodology. The project required the facilitation of a collaborative working group of key industrial customers, customer associations, commission staff, and consumer advocacy agencies.

Regulatory Policy, Strategy and Analysis

» Provided case management, revenue requirement, cost of service and rate design support for a *Southwestern electric/gas utility's* general rate cases in its two State regulatory jurisdictions. Issue management and policy development included an electric fuel and purchased power cost mechanism, recovery of environmental remediation costs for a coal-fired power plant, and the valuation of renewable energy credits related to a wind power facility.

» Provided regulatory due diligence support for a *confidential energy company* client related to a proposed merger with a multi-jurisdictional gas/electric company, including an evaluation of the regulatory landscape in the various applicable State jurisdictions, recent regulatory decisions, and current regulatory issues.

» Provided management of an *Eastern electric/gas utility* with an evaluation of its line extension practices for both its gas and electric services and an earnings impact assessment using a proprietary evaluation model. Conducted a workshop for management on the results of the evaluation and recommendations for consideration in the areas of revenue enhancements, modification of internal policies and procedures and construction cost control areas.

» Provided management of an *Eastern gas utility* with an evaluation of the policies, procedures and tools presently used in its new customer addition process, an assessment of the impact of new customer growth on NOI, and regulatory solutions to accelerate recovery of new customer costs that best meet the regulatory requirements of its three state jurisdictions.

» Engaged by a *Canadian gas utility* to assist with the development of a Transmission asset ownership strategy. The project included researching examples from other jurisdictions in North America for transmission ownership structures, the supporting rationale, and the resulting regulatory treatment.

» Provided expert witness testimony for an *Eastern gas utility* on the subject of new area expansion programs in the U.S. for the client's general rate case proceeding. As part of a negotiated settlement of the case, the client was permitted to establish a new area expansion pilot program.

» For a *Pacific Northwest electric/gas utility*, redesigned gas line extension policy based on financial investment criteria, standardized construction costs, and revenue contributions derived from the client's residential end-use data (building type/size/vintage, appliance type, etc.). Introduced a new customer rate option for customers whose facilities extensions did not meet the target rate of return requirement, which significantly reduced earnings attrition caused by rapid customer growth. In a later general rate proceeding, testimony support was provided regarding the modifications and revisions to the facilities extension program.

» Provided case strategy and cost of service support for the biennial cost allocation proceedings of *two utility subsidiaries of a Western U.S. energy company.*

Utility Distribution System Operations

» For a *Midwestern energy company*, provided audit support for one of the Company's gas and electric utilities during a management audit ordered by one of its two regulatory jurisdictions. Conducted a pre-audit of distribution operations and resource planning process to provide the client with potential audit issues. Assisted the client throughout the audit process in responding to information requests, preparing personnel for audit interviews, and management of preliminary audit issues and findings by the independent audit firm.

» For a *Midwestern energy company*, performed a number of benchmark analyses to compare each of the client's A&G and O&M expenses, on a per-customer basis, to various peer groups conducted for the client's natural gas and electric operations. Analyses were performed for natural gas utilities, electric utilities, and combination utilities with both electric and gas operations. Various iterations of the analyses were prepared to make the peer group of utilities more comparable to the characteristics of the client's utility operations. Served as an expert witness on behalf of the client in a consolidated general rate case proceeding of its three utility subsidiaries before the Illinois Commerce Commission.

» For a *Northwestern gas/electric utility*, conducted an evaluation of the Company's key accounts (Top 100) and business account services organization. Work included compilation of "best practices" from peer group utilities, recommendations related to staffing levels, roles and responsibilities, and the interrelationships with the customer service (call center), revenue management and community relations organizations of the utility.

» For an *Eastern gas utility*, provided market monitoring strategies and action plans based on an analysis of competitive threats and discussions with the client's customers and other utilities facing similar issues. Intent of recommended monitoring strategies and corresponding action plans to result in increased customer growth (meters) and/or customer retention, including a prioritized implementation approach to the monitoring strategies and action plans, based on benefits to the client and time to implement.

» Provided research and consulting support for a *Midwestern gas/electric utility* to establish performance metrics and benchmarks from peer group companies for the client's performance management system.

» For a *Midwestern energy company*, Mr. Amen was responsible for marketing, customer service, distribution system construction, operation and maintenance, for a regional operating service territory of the company's gas utility. Among other gas operations responsibilities, Mr. Amen managed a field sales force responsible for sales plan development, including market analysis, program design, and cost-effectiveness evaluations for the following customer segments and/or trade alley groups: residential home builders and commercial developers; HVAC contractors; large commercial and industrial key accounts; public institutions; and governmental facilities.

Expert Witness Testimony Presentation

» Arkansas Public Service Commission
» British Columbia Utility Commission (Canada)
» Connecticut Department of Public Utility Control
» Delaware Public Service Commission
» Illinois Commerce Commission
» Indiana Utility Regulatory Commission
» Massachusetts Department of Utilities
» Minnesota Public Utilities Commission
» Missouri Public Service Commission
» Oklahoma Corporation Commission
» Pennsylvania Public Utility Commission
» Washington Utilities and Transportation Commission

» Federal Energy Regulatory Commission

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2007 – Present)
Vice President

Navigant Consulting, Inc. (1997 – 2007)
Director

Puget Sound Energy, Inc. (1997)
Manager – Federal Regulatory Affairs

Washington Natural Gas Company (1993 – 1997)
(merged with Puget Power and Light to form Puget Sound Energy in 1997)
Director – Rates and Tariffs

Indiana Energy (now Vectren) (1984 – 1993)
Regional Director - Operations
Director – Rates

Ohio Valley Gas Corporation (1978 – 1984)
Data Processing Manager
Assistant District Manager – Operations

EDUCATION

B.S., Business Administration (Finance and Economics), College of Business Administration, University of Nebraska, 1978

PROFESSIONAL ASSOCIATIONS

American Gas Association
Past Member, Marketing & Regulatory Committees of the Pacific Coast Gas Association
Past Member, Rate Committee of the American Gas Association
Past Member, Statistics and Load Forecasting Methods Committee of the American Gas Assocation
Past Chairman, Rate Committee of the Indiana Gas Assocation

PUBLICATIONS/PRESENTATIONS

"Enhancing the Profitability of Growth," American Gas Association, Rate and Regulatory Issues Seminar, April 4 - 7, 2004

"Regulatory Treatment of New Generation Resource Acquisition: Key Aspects of Resource Policy, Procurement and New Resource Acquisition," Law Seminars International, Managing the Modern Utility Rate Case, February 17 - 18, 2005

"Managing Regulatory Risk – The Risk Associated with Uncertain Regulatory Outcomes," Western Energy Institute, Spring Energy Management Meeting, May 18 - 20, 2005

"Capital Asset Optimization – An Integrated Approach to Optimizing Utilization and Return on Utility Assets," Southern Gas Association, July 18 - 20, 2005

"Resource Planning as a Cost Recovery Tool," Law Seminars International, Utility Rate Case Issues & Strategies, February 22 - 23, 2007

"Natural Gas Infrastructure Development and Regulatory Challenges," Southeastern Association of Regulatory Utility Commissioners, Annual Conference, June 4 – 6, 2007

"Resource Planning in a Changing Regulatory Environment," Law Seminars International, Utility Rate Cases – Current Issues & Strategies, February 7 - 8, 2008

"Natural Gas Distribution Infrastructure Replacement," American Gas Association, Rate Committee Meeting and Regulatory Issues Seminar, April 11 – 13, 2010

David A. Heintz
Vice President

Mr. Heintz is a Vice President who has over 30 years of experience working with regulated rates and tariffs at both the federal and state levels. He also provides clients with analyses of natural gas projects, markets, and issues. Mr. Heintz's areas of expertise include cost of service, allocation and rate design, tariff terms and conditions, rate case preparation, and regulatory issues.

REPRESENTATIVE PROJECT EXPERIENCE

Regulatory Analysis, Ratemaking, Cost of Service

- Filed testimony on the proper design of Kern River Gas Transmission Period Two rates in Docket RP04-274-023 on behalf of a Kern River shipper.
- Prepared a cost of service study for Atlanta Gas Light Company.
- Project manager for preparation of Granite State Gas Transmission FERC rate filing, Docket No. RP10-896. Witness on issues of billing determinants, revenues, cost allocation and rate design.
- Participated in the development of a gas cost of service and rate re-redesign for Northern Indiana Public Service Company.
- Assisted a customer group served by Southern Natural Gas Company in a FERC rate proceeding.
- Assisted ISO-NE in the evaluation of de-list bids and new capacity offers for the first two Forward Capacity Auctions conducted by ISO-NE.
- Prepared a cost of service study and rate design proposals for National Grid Rhode Island (Gas).
- Prepared cost of service studies for New England Gas Company in two Massachusetts rate filings.
- Assist New England Gas in the preparation of periodic filings before the Massachusetts Department of Public Utilities including Gas Cost and Local Distribution Adjustment filings.
- Prepared cost of service studies for Connecticut Natural Gas Corporation and Southern Connecticut Gas Company in their Phase 2 rate design proceeding before the Connecticut Department of Public Utility Control.
- Prepared a cost of service study and rate design proposals for Northwest Natural Gas Company (WA) which included the phase out a commercial rate class.
- Prepared a cost of service study for Puget Sound Energy and assisted in the development of a revenue decoupling mechanism.
- Prepared cost of service studies for Peoples Gas Light and Coke Company and North Shore Gas Company. Assisted in the development of a revenue decoupling mechanism for these companies.
- Performed a cost of service study for Arkansas Oklahoma Gas Corporation. Provided testimony on cost of service and rate design.
- Participated in the development of the revenue requirements for the gas and electric operating companies of a major mid-west utility.
- Participated in a review of the cost of service and rate design methodologies for the natural gas transmission affiliate of a Canadian Crown Corporation.
- Performed an electric cost of service and rate review for the City of Vero Beach, Florida.
- Performed a cost of service study for Chesapeake Utility Corporation, Delaware Division, and provided testimony on rate design issues.

- Performed cost of service and rate design studies integrating the rates and tariffs of Providence Gas Company and Valley Gas Company. Provide testimony on cost of service and proposed new rate designs for the integrated company.
- Performed cost of service study for an investor owned Canadian electric utility.
- Reviewed and provided support for the deferred purchased gas balances of a Louisiana local distribution company.
- Provided support and cost of service analysis for a Pennsylvania electric utility in a FERC complaint case.
- Assisted a Canadian marketing company in its intervention in Northern Border Pipeline Company FERC rate proceeding. Filed testimony on various cost-of-service and rate design issues.
- Assisted an Indiana local distribution company in the preparation of a general rate case and unbundling filing. Assisted in the development of the proposed unbundled services and tariffs.
- Assisted a New Jersey local distribution company with its initial filing under New Jersey's Electric Discount and Energy Competition Act.
- Assisted a major Southwest utility in the preparation of a cost of service and rate design study for filing with the regulatory commission.
- Reviewed and evaluated an electric cost-of-service and unbundling model for the Ontario Energy Board. This model is to be used by the municipal electric utilities in their filings to the Board.
- Assisted a group of Midwest local distribution companies served by Northern Natural Gas Company in a FERC rate proceeding. Filed testimony on various cost-of-service and rate design issues.
- Reviewed the rate harmonization proposal of a major Canadian gas utility for potential shortcomings alternative approaches.
- Responsible for the development, defense, implementation and administration of the Boston Gas Company's rates in rate cases and CGA filings. Prepared annual sales, revenue, margin and gas cost forecasts for budgeting and financial reporting. Directed the company's load research project. Represented the company in regulatory proceedings.
- Responsible for all aspects of United Gas Pipeline Company's rate department, including cost-of-service allocation and rate design, certificates and analysis of other pipeline FERC filings. Represented the company and supported its positions through testimony and negotiations with regulatory agencies, customers and intervenors.
- Responsible for the development of cost-of-service, allocation and rate design studies and filings for Consolidated Natural Gas Company. Analyzed supplier rate and certificate filings. Represented the company and supported its position in negotiations with regulatory agencies, customers and intervenors.
- Responsible for the development and support of FERC staff's position on allocation and rate design issues in pipeline rate and certificate filings.

Valuation and Appraisal

Assisted in the preparation of a report to the FERC on appraised value and insurance recommendations in a certificate proceeding.

Market Analysis

Assisted the Province of New Brunswick in the preparation of its Stage I document for the establishment of natural gas distribution within the Province.

Expert Witness Testimony Presentation

- Federal Energy Regulatory Commission
- Arkansas Public Service Commission

- Connecticut Department of Public Utility Control
- Delaware Public Service Commission
- Georgia Public Service Commission
- Illinois Commerce Commission
- Massachusetts Department of Public Utilities
- New York State Public Service Commission
- New Jersey Board of Public Utilities
- Pennsylvania Public Utility Commission
- State of Rhode Island and Providence Plantations Public Utility Commission
- Washington Utilities and Transportation Commission

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2006 – Present)
Vice President
Assistant Vice President

Navigant Consulting (1998 – 2006)
Managing Consultant

Boston Gas Company (1993 – 1998)
Director, Rates and Revenue Analysis

United Gas Pipeline Company (1992 – 1993)
Director, Rates and Regulatory Affairs

Consolidated Natural Gas Company (1985 – 1992)
Manager, Regulatory Projects

Federal Regulatory Energy Commission (1979 – 1985)
Industry Economist, Allocation and Rate Design Branch

EDUCATION

M.B.A., Katz Graduate School of Business, University of Pittsburgh, 1989
B.S., Economics, Behrend College, Pennsylvania State University, 1978

Melissa F. Bartos
Assistant Vice President

Ms. Bartos has over ten years of financial and economic consulting experience in the energy industry. A project manager with experience in quantitative analysis, energy related research and the preparation of testimony and reports on a wide range of energy and economic issues. Topics have included demand forecasting for resource planning, utility ratemaking (including cost allocation, rate design, marginal cost studies, and cost of capital), valuation for damages assessment, management prudence, market power, gas and electric restructuring and broad regulatory and economic policy. Expertise in conducting comprehensive quantitative analysis including data validation and model development using various statistical, econometric and quantitative approaches. Ms. Bartos also has significant experience with regulatory and litigation cases including position development, testimony preparation, management of discovery requests and drafting of briefs. Ms. Bartos has also provided expert testimony regarding natural gas demand forecasting issues.

REPRESENTATIVE PROJECT EXPERIENCE

Demand Forecasting

- Developed the demand forecast models which included number of customers and use per customer and assisted with the evaluation of natural gas resource plans for multiple northeast gas utilities;
- Provided litigation support regarding demand forecasting techniques with respect to certain natural gas pipeline and storage decisions for a mid-west gas utility;
- Reviewed demand forecasting practices and procedures and recommended certain changes to improve the methodology and accuracy of the forecast for a multi-state utility;
- For a mid-west gas utility, developed a natural gas demand forecast that was utilized for supply and capacity decisions;

Utility Ratemaking

- Developed a marginal cost study, including data collection, analysis and testimony development, in support of a rate case filing for a New England utility;
- Provided comprehensive analysis, testimony and litigation support regarding the appropriate return on equity for a water utility and for proposed wind and coal electric generation facility additions for a mid-west combination utility;
- For several utilities, designed and developed an allocated cost-of-service model as well as rate design models:
- For a mid-Atlantic utility, reviewed and enhanced a rate design model in order to explore alternatives for recovering post-divestiture stranded costs through CTC charges in preparation for a regulatory filing and to investigate seasonal market credit options;
- For a New England utility, assisted with preparation and drafting of testimony in support of an unbundling filing including preparing a gas-only cost-of-service study, assisting with development of transportation programs, allocation of costs, and development of rates. Also analyzed customer migration and assisted with the preparation of interrogatories.

Energy Efficiency

- On behalf of multiple New England gas companies, participated in the 2009 Avoided Energy Supply Cost Study Group (for New England), which worked with third-party consultants to develop the

marginal energy supply costs that will be avoided due to reductions in the use of electricity, natural gas, and other fuels resulting from energy efficiency programs.

- Conducted a study to determine the cost of significantly reducing peak day natural gas demand for a northeast gas utility through conservation and demand management measures. Project involved researching natural gas energy efficiency plans in multiple U.S. states and Canadian provinces, reviewing energy efficiency potential studies, and exploring geothermal, peak pricing and direct load control options.

Valuation

- Prepared valuations of numerous generation facilities, supply portfolios, and PPAs utilizing the income (DCF), cost, and comparable sales approaches. Specific circumstances have included valuing the benefit of fuel switching capabilities as well as Monte-Carlo risk analysis to consider uncertain operating conditions and market prices. Also assisted in writing valuation reports and testimony;
- Sample assignments include valuing generation assets for strategic planning purposes and conducting valuations of purchase power contracts, analyzing bids from potential acquirers, assessing credit issues, and analyzing VaR for the selling utility in a sale of purchase power contracts.

Market Power Analysis

- For a northeast utility merger, performed market power analysis in support of the proposed merger in accordance with FERC guidelines. Evaluated the applicants' uncommitted capacity, total capacity, economic capacity, and available economic capacity;
- Other market power analysis experience includes preparing studies in support of a utility purchase of a generation asset in New York City; and a market based rate application for a cogeneration facility in New York.

Other Experience

- Conducted numerous energy market studies regarding the future demand/capacity balance for natural gas by developing demand forecasts for each LDC and for natural gas fired generation in the relevant market area. In addition, conducted reviews of the current and future capacity projects including pipelines, LNG and underground storage.
- Assisted with ISO-NE's LICAP proposal including performing market research to estimate cost of new entry for electric generating capacity in New England, writing testimony and responding to discovery in the FERC proceeding;
- Conducted extensive research in support of expert reports and testimony. Topics have included: decoupling mechanisms; details of electric restructuring including migration rates and retail and wholesale marketer saturation rates; RTO/ISO related issues; industry mergers and acquisitions; gas unbundling topics, including exiting the merchant function, supplier of last resort, after merchant service, balancing, nominations, and cashouts; pipeline rate cases to determine business risks associated with rate of return on equity; standard offer rate provisions for utilities in the Northeast; the regulatory treatment of divestiture proceeds; and various generation asset transactions;
- Designed and developed numerous models including an optimization model to test various electricity send-out strategies based on market prices and available transmission capacity; a natural gas portfolio model to determine potential revenue opportunities and to evaluate asset manager performance; a model to compare current and projected pipeline capacity with forecast demand in order to determine operational implications and possible strategic initiatives for a Northeast pipeline; risk management models to evaluate utility exposure under several rate strategies; and a model to evaluate gas supply outsourcing proposals received by a New England utility using the Monte Carlo simulation process to test the proposals under various risk scenarios including hub price, basis

differential, and customer demand changes, to determine which would be the least cost and least risk option;

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2002 – Present)
Assistant Vice President
Project Manager
Senior Consultant

Navigant Consulting, Inc. (1996 – 2002)
Senior Consultant

PROFESSIONAL ASSOCIATIONS

Member of the American Statistical Association

EDUCATION

M.S., Mathematics (Statistics), University of Massachusetts at Lowell, 2003
B.A., Mathematics and Psychology, Computer Science minor, College of the Holy Cross, magna cum laude, 1998

Daniel S. Dane, CPA
Senior Project Manager

Daniel S. Dane has 12 years of experience in the energy and financial services industries providing advisory services to natural gas pipelines, local gas distribution companies, and electric utilities in the areas of regulation and ratemaking, litigation support, generating asset divestitures, valuation, financial statement audits and analysis, and the examination of financial reporting systems and controls. Mr. Dane has also provided expert testimony on regulated ratemaking matters for investor-owned utilities. Mr. Dane has an MBA from Boston College in Chestnut Hill, Massachusetts and a BA in Economics from Colgate University in Hamilton, New York. Mr. Dane is a certified public accountant, and is a licensed securities professional (Series 7, 28, 63, 79, and 99). Mr. Dane also serves as the Financial and Operations Principal of CE Capital Advisors, a FINRA-Member firm and a subsidiary of Concentric.

REPRESENTATIVE PROJECT EXPERIENCE

Ratemaking and Utility Regulation Assignments

Natural Gas Pipeline Advisory

- Developed cost of service and rate design financial models for natural gas pipeline, treatment, and gathering facilities to be used in Federal and state regulatory filings and open seasons for the following clients:
    - Alaska Stand-Alone Pipeline, and proposed $7.5 million natural gas pipeline from the North Slope of Alaska to the Cook Inlet.
    - A confidential developer of a multi-billion dollar Greenfield natural gas pipeline. Services also included the provision of research and advice related to cost tracking and the accounting treatment of construction and financing costs.
    - Inergy L.P.'s interstate transportation pipelines in New York and Pennsylvania.
- Developed market power studies, including Herfindahl–Hirschman Index ("HHI") and market share analyses, along with supporting testimony, on multiple occasions for developers and operators of natural gas storage facilities.

Expert Testimony

- Submitted expert direct testimony on behalf of Northern States Power, a wholly-owned subsidiary of Xcel Energy Inc., to present evidence and provide an opinion regarding the company's proposed ROE in South Dakota Public Utilities Commission Docket No. EL11-019.
- Submitted expert direct and rebuttal testimony on behalf of Ameren's Illinois utilities regarding ratemaking policy issues specifically related to regulated rate base (Illinois Commerce Commission Docket No. 09-0306 through 09-0311 (Cons.)).

Mega Project Prudence Reviews

- Performed prudence reviews for regulated developers of nuclear generating capacity expansions and new nuclear facilities.

Regulatory Support

- For utilities developing decoupling proposals, developed financial models to back-cast and forecast the effects of various types of decoupling mechanisms, capital expenditure tracking mechanisms, and inflation tracking mechanisms.

- Supported expert testimony related to corporate cost allocations on behalf of Constellation Energy Group as part of the Maryland Public Service Commission's 2009 review of the merger between Constellation Energy Nuclear Group and E.D.F. International SA.
- Preparation of multiple rounds of testimony in support of a group of utilities, including Oncor Electric Delivery Company, AEP and MidAmerican Energy, seeking to construct over $5 billion of new transmission in Texas as part of the state's Competitive Renewable Energy Zone process.
- For Oncor Electric Delivery Company's 2008 rate case, supported the development of written direct and rebuttal testimony and analyses regarding the return of and on capital, as well as the effects of recent merger activity, the 2008/2009 credit crisis, and changing business and operating environments thereon.
- For the Ontario Energy Board ("OEB"), performed a comparison of authorized equity returns for natural gas utilities in Canada and the U.S., including an analysis of cross-border differences in access to capital and the effect of firm size on required returns on equity. Presented findings to the OEB and the Ontario Energy Association ("OEA") at the 2007 OEA ROE Seminar.

Litigation Advisory Assignments

Prepared analyses and reports in a variety of proceedings related to energy, economic, and litigation issues. Clients in these matters have included international diversified energy companies and electric distribution companies.

- For a diversified energy company involved in litigation related to the lease-leaseback of a gas-fired combined heat and power plant, performed appraisal review services, created an economic model to test the sensitivity of the plant's valuation model to changes in economic drivers, and supported the development of expert testimony.
- Spent nuclear fuel litigation. For three utilities involved in litigation with the U.S. Department of Energy regarding breach of contract for the removal of spent nuclear fuel from nuclear reactor sites, performed pro-forma valuations of generating facilities to quantify diminished sale value due to breach and supported the development of written testimony regarding the analyses.

Financial Advisory Assignments

As part of electric generating and transmission asset divestitures, responsibilities have included marketing, due diligence support, drafting of transaction agreements, bid evaluation, and closing/regulatory approval assistance. Transactions included nuclear, coal, gas-fired, and hydroelectric generating assets. Performed independent valuations, appraisals, and market analyses in support of asset and equity acquisitions and divestitures. Performed financial audits for public and private companies. Performed attestation services for a global public company as part of the implementation of Sarbanes-Oxley Section 404 regulations.

Mergers & Acquisitions

- Sell-side support provide for approximately $2 billion in generating asset transactions, including nuclear, natural gas, and coal generating facilities.
- Provided buy-side support to an international developer of wind generation targeting investment in U.S. wind properties. Engagement included valuing wind assets in various stages of development and evaluating multiple ownership/tax-equity structures.
- For an international diversified company investing in a Texas pipeline and natural gas marketer, performed accounting-related due diligence, developed an opening balance sheet in accordance with U.S. GAAP, and performed subsequent tests for impairment of Goodwill and intangible assets.

Valuation Services

- Participated in or managed the development of fairness opinions issued by CE Capital Advisors, Inc. to Boards of Directors of companies entering into asset purchases and sales.
- For a desalination plant developer, appraised desalination facilities in California for corporate accounting purposes. Appraisal included providing a going concern valuation and opinion.
- For a hedge fund, performed a valuation of a generating company to provide support for investment decision making.
- For a confidential Transmission & Distribution ("T&D") company, developed an application for Department of Energy loan guarantees pursuant to the American Recovery and Reinvestment Act of 2009.

Management and Operations Consulting Assignments

- For the owners of the Palo Verde Nuclear Generating Station, performed a comprehensive study of the costs being incurred by Arizona Public Service to support operations of the plant, including a benchmarking study.
- For We Energies, performed a synergies analysis to quantify benefits of a recent merger.

PRESENTATIONS

"A Comparative Analysis of Return on Equity of Natural Gas Utilities" (with Jim Coyne and Julie Lieberman), presented to the Ontario Energy Association, June, 2007.

PROFESSIONAL HISTORY

Concentric Energy Advisors, Inc. (2004 – Present)
CE Capital Advisors, Inc.
Senior Project Manager (Concentric)
Financial and Operations Principal (CE Capital)

Ernst & Young (2000 – 2001, 2003 – 2004)
Staff Auditor and Database Management Associate

ZIA Information Analysis Group (1997 – 2000)
Senior Consultant

EDUCATION AND CERTIFICATIONS

M.B.A., Boston College, 2003
B.A., Economics, Colgate University, 1996
Licensed Securities Professional: NASD Series 7, 28, 63, and 79 Licenses

DESIGNATIONS AND PROFESSIONAL AFFILIATIONS

Certified Public Accountant, 2004
Massachusetts Society of Certified Public Accountants, 2004
American Institute of Certified Public Accountants, 2011

CONCENTRIC ENERGY ADVISORS, INC.
HOURLY RATE SCHEDULE

TITLE	DISCOUNTED HOURLY RATE FOR ALL TASKS EXCEPT EXPERT TESTIMONY	HOURLY RATE FOR TESTIFYING AND ASSOCIATED PREPARATION
CHAIRMAN AND CHIEF EXECUTIVE OFFICER	$630	$700
SENIOR VICE PRESIDENT	$450	$500
VICE PRESIDENT, EXECUTIVE ADVISOR	$383	$425
ASSISTANT VICE PRESIDENT	$338	$375
SENIOR PROJECT MANAGER	$315	$350
PROJECT MANAGER	$293	NA
SENIOR CONSULTANT	$270	NA
CONSULTANT	$261	NA
ASSISTANT CONSULTANT	$230	NA
ANALYST	$194	NA
ASSOCIATE	$126	NA
PROJECT ASSISTANT	$50	NA

Union Gas Limited
Exceptions to Terms of Service

Section	Original Language	Proposed Change	Rationale
3.1 Representations	The consultant represents and warrants that it is **fully** qualified to perform the Services . . .	The consultant represents and warrants that it is qualified to perform the Services . . .	The word "fully" is open to interpretation.
3.1 Representations	. . .proficient manner and shall conform to **the highest** professional standards . . .	. . .proficient manner and shall conform to professional standards . . .	The words "the highest" are open to interpretation.
4.5 Confidentiality	The provisions of this Article 4 shall survive termination or expiration of this Agreement for any cause whatsoever for a period of **five (5)** years thereafter . . .	. . . period of two (2) years thereafter. . .	Concentric's terms are two (2) years after termination or expiration of an agreement.
14. Indemnity	Insert additional language	Consultant's assumed liabilities under this agreement, including its obligation to indemnify the counterparty, are limited to: (i) the amount the Consultant has been paid as compensation for services performed pursuant to this agreement, and/or (ii) Consultant's insurance coverage (see Consultant's specimen certificate of insurance as Attachment D).	Concentric does not accept open ended indemnity clauses.
18. Priority	Consultant shall give the Services **the highest classification and priority and no other job taken by Consultant shall displace the Services during the term hereof.**	Consultant shall give the Services the classification and priority necessary to perform the work as required under the Agreement.	. . . "the highest classification and priority and no other job taken by Consultant shall displace the Services during the term hereof" is open to interpretation.
19. Currency	. . . all references to dollars in this Agreement shall be construed to mean the currency of **Canada.**	. . . all references to dollars in this Agreement shall be construed to mean the currency of the United States of America.	Concentric bills and accepts payment in U.S. dollars only.
20. Notices	. . . or on the **third** day following the date of posting in the case of mailing . . .	. . . or on the **tenth business** day following the date of posting in the case of mailing . . .	It can take up to two weeks for mail to reach the U.S. from Ontario.
25. Audit	Union or any person designated by Union may at any and all reasonable times for a period of **sixty (60)** months after the date of delivery of the Services have access to Consultant's books and records relative to the Services for the purpose of auditing . .	Union or any person designated by Union may at any and all reasonable times for a period of **six (6)** months after the date of delivery of the Services have access to Consultant's books and records relative to the Services for the purpose of auditing . .	Concentric's Terms & Conditions allow audits up to six (6) months after the delivery of services.

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 7/11/2012

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Select Work ext. 66807
Eastern Insurance Group LLC - Main 233 West Central Street Natick MA 01760	PHONE (A/C, No, Ext): 508-651-7700 FAX (A/C, No): 508-653-8089 E-MAIL ADDRESS: selectwork@easterninsurance.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A : American Casualty Co	20427
INSURER B : Transportation Insurance Co	20494
INSURER C : Gemini Insurance	
INSURER D :	
INSURER E :	
INSURER F :	

INSURED 39380
Concentric Energy Advisors, Inc.
293 Boston Post Road West
Suite 500
Marlboro MA 01752

COVERAGES **CERTIFICATE NUMBER: 983481600** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY	Y	Y	2086889479	3/1/2012	3/1/2013	EACH OCCURRENCE	$2,000,000
	X COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence)	$300,000
	CLAIMS-MADE X OCCUR						MED EXP (Any one person)	$10,000
							PERSONAL & ADV INJURY	$2,000,000
							GENERAL AGGREGATE	$4,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG	$4,000,000
	X POLICY PRO-JECT LOC							$
A	AUTOMOBILE LIABILITY	Y	Y	2086889479	3/1/2012	3/1/2013	COMBINED SINGLE LIMIT (Ea accident)	$1,000,000
	ANY AUTO						BODILY INJURY (Per person)	$
	ALL OWNED AUTOS / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS / X NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB / OCCUR						EACH OCCURRENCE	$
	EXCESS LIAB / CLAIMS-MADE						AGGREGATE	$
	DED / RETENTION $							$
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	N/A		2054624594	3/1/2012	3/1/2013	X WC STATU-TORY LIMITS / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N: N						E.L. EACH ACCIDENT	$500,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$500,000
							E.L. DISEASE - POLICY LIMIT	$1,000,000
C	Professional Liability			VPL005948	7/19/2012	7/19/2013	$1,000,000 $1,000,000	each claim aggregate

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

For information purposes only.

CERTIFICATE HOLDER

Concentric Energy Advisors, Inc.
293 Boston Post Road West, Suite 500
Marlborough MA 01752

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Regina E. Fennell

SERVICES AGREEMENT

THIS AGREEMENT dated this 05 day of March 2013, (hereinafter referred to as the "**Agreement**")

B E T W E E N:

UNION GAS LIMITED, a company incorporated under the laws of the Province of Ontario, having its head office in the Municipality of Chatham-Kent, in the Province of Ontario

hereinafter referred to as "**Union**"

- and -

Stephen M. Acker

hereinafter referred to as "**Consultant**"

WHEREAS Union has retained Consultant to undertake a review of the secondary gas market in Ontario and the role of exchanges within this market, as requested by Union;

NOW THEREFORE, IN CONSIDERATION of the mutual covenants herein contained and the exchange of One Dollar ($1.00) and other good and valuable consideration, the exchange, receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. **Services and Term**

1.1 Consultant shall provide the Services described in Schedule "A" of this Agreement (herein referred to as the "Services").

1.2 Subject to the provisions of this Agreement, this Agreement will commence on the 01 day of March and expire on the 30th day of June, 2013 unless terminated by either party pursuant to the provisions of this Agreement.

1.3 If it is intended, as evidenced in Schedule "A" that Consultant shall provide a single set of Services, then a Purchase Order ("**PO**") will be issued for Union for the Services described in Schedule "A".

1.4 If it is intended, as evidenced in Schedule "A", that Consultant shall provide multiple sets of Services as requested by Union from time to time, then Union shall create a separate PO for each separate set of Services, each such PO to also be subject to this Agreement.

2. **Compensation**

2.1 Union shall pay Consultant for Services in accordance with the rate schedule and payment provisions detailed in Schedule "B" of this Agreement.

3. Representations

3.1 The Consultant represents and warrants that it is fully qualified to perform the Services in accordance with the terms and conditions of this Agreement within the time specified. The Services to be performed hereunder shall be done in proficient manner and shall conform to the highest professional standards and shall comply with all applicable laws, orders, regulations, ordinances and other rules of all lawful authorities acting within their power, including the obtaining of all permits which may be required for the performance of work under this Agreement. The Consultant hereby acknowledges that it shall comply with all workplace rules of Union including the Spectra Energy Code of Business Ethics available at www.spectraenergy.com .

4. Confidential Information

4.1 Definition

As used herein, the term "Confidential Information" shall mean all information which Consultant, directly or indirectly, acquires from Union or Union's suppliers concerning the technical, manufacturing, processing and business activities of Union or the suppliers, except information falling into one of the following categories:

a) Information which, prior to the time of disclosure or acquisition hereunder, is lawfully in the public domain;

b) Information which, after disclosure or acquisition hereunder, lawfully enters the public domain, except where such entry is the result of Consultant's breach of the Agreement;

c) Information, other than obtained from third parties, which, prior to disclosure or acquisition hereunder, was already lawfully in Consultant's possession either without limitation on disclosure to others or which subsequently becomes free of such limitations; or

d) Information obtained by Consultant from a third party who to Consultant's reasonable knowledge is lawfully in possession of such information and not subject to contractual or fiduciary relationship with Union with respect to said information. Consultant may use and disclose such information in accordance with the terms under which it was provided by such third party.

Confidential Information shall not be deemed to be within the foregoing categories merely because such information is embraced by more general information lawfully in the public domain or in Consultant's possession.

4.2 Non-Disclosure

Consultant will keep all Confidential Information in strictest confidence and will only disclose such information to those people specifically named by Union. The

Consultant represents and warrants that it will ensure that the confidentiality provisions of this Article 4 shall be binding on its employees.

4.3 **Third Parties**

Consultant agrees that it will not disclose any Confidential Information to any third party nor use Confidential Information other than on Union's behalf except as Union may authorize in writing.

If disclosure to a third party is so authorized, Consultant shall enter into a Confidentiality Agreement, which shall be subject to review and approval by Union, with said party containing the same terms and conditions with respect to use or disclosure of Confidential Information as this article contains and naming Union as third party beneficiary.

Consultant also agrees to enter into Confidentiality Agreements with third parties at Union's request and to keep in force Confidentiality Agreements concerning third party's Confidential Information, which agreements will permit Consultant's use of such party's Confidential Information in the completion of the Services.

4.4 **Safeguard of Confidential Information**

Consultant also agrees to use best efforts to safeguard all documents containing Confidential Information hereunder and all other documents containing Confidential Information whether prepared by Consultant or another. Consultant may make copies of such documents only to the extent necessary for the performance of Services. Consultant shall prevent access to all such documents by third parties. On completion of Services, Consultant agrees to return to Union all such documents containing Confidential Information and to destroy copies thereof. However, should Consultant desire to retain certain documents and receive Union's written approval therefore, Consultant shall continue to treat said documents within the terms of this clause.

4.5 **Survival**

The provisions of this Article 4 shall survive termination or expiration of this Agreement for any cause whatsoever for a period of five (5) years thereafter unless otherwise authorized in writing by Union.

5. Property of Services

All Services performed, including but without limiting the generality of the foregoing, all notes, reports, documents, calculations, and graphs prepared and/or provided by Consultant in the course of Services or as a result of performing the Services, shall be the property of Union and all property rights therein shall be vested in Union and may be used by Union for any purposes whatsoever. Consultant shall not release to any third party, any portion of the material prepared for Union or provided to Union in the course of, or as a result of performing Services, unless specifically otherwise authorized by Union.

6. Publicity

Consultant shall not use Union's name or the fact that Consultant is performing Services for Union in any press releases, media statements or public communications. Consultant shall not use Union's name, logos, copyrights, trademarks, service marks, trade names or trade

secrets in any way, and Union shall not be deemed to have granted Consultant a license of, or granted Supplier any rights in, any of the foregoing by entering into this Agreement.

7. Termination

7.1 Termination for Cause

It is agreed and understood that in the event that Consultant violates any terms of this Agreement, Union may terminate this Agreement forthwith. Such termination does not preclude Union from initiating legal proceedings against Consultant to recover losses resulting from breach of contract.

7.2 Early Termination

Union has the right, at any time, to terminate this Agreement with or without cause, upon thirty (30) days' written notice to Consultant. Upon receipt of such notice, Consultant shall stop work on the cancelled project as directed in the notice and forward to Union all completed or incomplete reports, data and other documents (including but not limited to computerized data, video data or any other recorded data) pertaining to such cancelled project, or portion thereof if Union so requests. Consultant shall be entitled to full payment for Services performed by it as completed, or performed under the terms and conditions of this Agreement up to the effective date of such termination. Union shall not be held liable for damages or loss of anticipated profits on account of such termination.

8. Right to Set-Off

Union reserves the right to set off any money owed by Union to Consultant under this Agreement or other agreement against any amounts owed by Consultant or any affiliate of Consultant to Union under any agreement.

9. Applicable Law

This Agreement shall be interpreted and construed in accordance with the laws of the Province of Ontario and the courts of the Province of Ontario shall have exclusive jurisdiction in all matters contained herein, unless specified otherwise. Furthermore, this Agreement and the rights and obligations of the Parties hereto, are subject to all present and future laws, rules, regulations, and orders of any legislative body or duly constituted authority having jurisdiction, now or hereafter.

10. Entire Agreement, No Waiver, Headings, and Enurement

This Agreement, the attached schedules, and the related PO constitute the entire Agreement of the parties hereto relating to the subject matter hereof, and there are no written or oral terms or representations made by either party other than those contained herein. No provision of this Agreement may be modified or waived unless such modification or waiver is authorized in writing by the parties to the Agreement. No waiver by either party hereto of any breach by the other party of any condition or provision of this Agreement to be performed by such other party shall be deemed to be a waiver of similar or dissimilar conditions or provisions at the same or any prior or subsequent time. The headings contained herein are for reference purposes only and shall not in any way affect the

meaning or interpretation of this Agreement. This Agreement shall enure to the benefit of and be binding upon the parties hereto and their respective successors and permitted assigns.

11. Environmental Health and Safety Standards

The Consultant acknowledges and agrees that all Services, or other matters, to be completed by the Consultant, pursuant to the terms and conditions of this Agreement, shall be completed in full compliance with the following standards, which shall be in addition to and not substituted for, any other standards or requirements set out in this Agreement or attached Schedules:

11.1 Compliance with applicable laws and standards

Consultant shall perform all Services in compliance with all applicable federal, state and local laws, orders, codes, rules, and regulations relating to health and safety and such Union health and safety procedures as required by Union.

11.2 Compliance with Consultant's health and safety plan

Consultant shall initiate and maintain all necessary safety precautions and programs to conform with all applicable health and safety laws or other requirements, including requirements of Union, wherever the Services are performed, that are designed to prevent injury to persons or damage to property on, about, or adjacent to the site. Consultant shall strictly conform to Consultant's safety programs as submitted and accepted by Union.

11.3 Compliance with Consultant's project-specific health and safety plan

In addition to Consultant's safety programs required herein, Consultant shall develop, maintain, and adhere to a project-specific safety plan for the Services subject to review and acceptance by Union.

11.4 Consultant training requirements

Consultant shall ensure that all Consultant personnel and any party to whom some or all of the Services has been subcontracted (a **"Subconsultant"**) has received all training regarding health and safety or any other matters required by applicable law or applicable governmental authorizations. Training or implementation of any additional health and safety measures appropriate for the Services will be specified by Union. Consultant shall provide Union written documentation of said training and worker qualifications.

11.5 Inspection/audit

Consultant will allow Union, or a representative designated by Union, access to any facility related to the Services in order to monitor/audit Consultant's compliance with the health and safety requirements of this Agreement.

11.6 Health and safety statistics

Consultant shall provide Union health and safety statistics related to its prosecution of the Services from time to time, as so directed by Union, and at completion of the Services.

11.7 Initial reports

Consultant will immediately report to Union any incident or incident without loss involving Consultant personnel, the public, or property, arising from Consultant's execution of the Services. Consultant shall provide a written initial report to Union of its investigation of said incident within 24 hours. The report shall provide a schedule for completion of the investigation.

11.8 Final reports

Consultant shall provide to Union a final report showing the cause of the incident and any corrective action.

11.9 Stop work/suspension

Whenever Consultant has not complied with its obligations set forth in this Agreement and creates a circumstance requiring immediate action to ensure the health and safety of all persons on at the site, including stoppage of Services, until the circumstance is remedied, Union may take or require Consultant to take such reasonable precautions. The taking of such action or actions by Union (or its failure to do so) shall not limit Consultant's liability or its obligations under this Agreement. Consultant shall reimburse Union for all reasonable costs incurred by Union in taking such precautions and any costs incurred by Consultant for such precautionary action and any subsequent remedial action shall be paid by Consultant.

11.10 Removal of Consultant employee

Union reserves the right to require the Consultant to remove from the site any personnel not properly observing or complying with the prescribed health and safety requirements of this Agreement.

11.11 Termination

In addition to Union's right to terminate this Agreement contained in Article 7, Union may terminate this Agreement at any time by written notice for Consultant's failure to comply with the terms of this Article.

11.12 Independent Consultant

Consultant shall be solely responsible for the safety of all persons employed by it or its Subconsultants or any other person on the site for any purpose relating to Consultant's carrying out the Services.

11.13 EHS Professional

When requested by Union, Consultant shall provide a dedicated, qualified health and safety professional to monitor the Services being performed under this Agreement.

11.14 Meeting Requirements

Unless Union directs otherwise, Consultant shall attend the following health and safety meetings: (a) pre-job orientation; (b) an orientation prior to entering the worksite; (c) daily tailgate briefings; and (d) such other meetings at such times that worksite conditions change to review the status of the Services and Consultant's use of the health and safety measures required for the changed conditions.

11.15 Subconsultant matters

Prior to execution, Consultant shall ensure Subconsultants are appropriately reviewed, and that all subcontracts are consistent with, and in no way contrary to or inconsistent with, any of the terms or provisions of this Article.

11.16 No Relief Subconsultant

Entry into any subcontract shall not relieve Consultant of any of its obligations in accordance with the terms of this Article.

11.17 Responsibility for Subconsultant

Consultant shall be fully responsible to Union for the acts and omissions of Subconsultants and of persons directly or indirectly employed by them, as it is for the acts or omissions of persons directly employed by Consultant for any failure to comply with the terms of this Article.

12. Independent Consultant

The parties agree that no oral agreement or provisions to this Agreement shall be construed so as to constitute Consultant as being the agent, servant or employee of Union and the instruction, management and control of Consultant's employees shall always remain with the Consultant, and Consultant shall be deemed to be an independent Consultant. Consultant shall have no authority to make statements, representations or commitments of any kind, or to take any actions which shall be binding upon Union, except as provided for herein or authorized in writing by Union. The Consultant further agrees and acknowledges that it shall not be considered an employee of Union and as such it will not be entitled to any benefits or compensation to which employees of Union are entitled.

13. Defects

The Consultant, at no cost to Union, shall remedy any defect in the Services caused by the negligent act or omission of the Consultant or by any failure on the part of the Consultant to carry out the Services in accordance with the provisions of this Agreement. Union reserves the right to deduct that portion of fees for which Services were deemed to not comply with the Request to the satisfaction of Union.

14. Indemnity

Except to the extent of Union's negligence, Consultant shall indemnify, defend, protect and hold harmless Union from any and all actions, claims, costs, damages, demands, expenses, fees (including reasonable lawyer's fees), investigations, liabilities, losses or suits of any kind or nature which may be brought against Union or which Union may sustain, incur or pay arising out of or in any way related to this Agreement including, but not limited to, those which (1) involve any actual or alleged injuries or death to any person or property damage resulting in whole or part from defective or allegedly defective services provided in a negligent or allegedly negligent manner; (2) involve actual or alleged infringement of any letters patent, trademarks, copyrights, or other intangible rights; (3) involve actual or alleged violations of any law, regulation, rule or ordinance relating to the use or sale of any goods; (4) involve claims of Consultant, its agents, contractors or employees relating to personal injuries or property damage; or (5) involve damages incurred by Union, as a result of any breach by the Consultant of this Agreement. This indemnity is intended to survive the termination of this Agreement.

15. Conflict of Interest

The Consultant covenants and agrees that it is not aware of the existence of any relationship, family, business, contractual or otherwise, between themselves, their principals, officers or employees and Union, its directors, officers or employees; and it will not perform any Services for or enter into any contract with others that may conflict with its contractual, professional, equitable or other obligations to Union without first obtaining the written approval of Union.

16. Consultant Contributions

The Consultant shall pay all royalties and license fees on any equipment and materials to be furnished by it and shall pay all workers' compensation contributions, unemployment insurance contributions, Canada/Quebec Pension Plan and employees' income tax deductions together with all other taxes and payroll contributions now or hereafter imposed by any lawful authority and indemnify and save harmless Union from any and all claims, penalties, interest and cost and any of the same which may be made or assessed against Union in respect thereof.

17. Insurance

In this section, for matters related to insurance for services, any party defined as "Seller", "Supplier", "Consultant", "Contractor", or similar term, shall hereby be deemed to be included with the meaning of Consultant, as defined herein.

In this section, for matters related to insurance for services, any party defined as "Buyer", "Union", BU", "Company" or "Spectra", shall be deemed to be included within the meaning of Union as defined herein.

Consultant, shall, at its own expense, obtain the insurance described below on or before commencement of the Services and thereafter maintain such insurance until the end of the warranty period prescribed herein:

General Liability insurance of not less than $500,000 per occurrence covering bodily injury, death and property damage.

Consultant shall meet all statutory requirements in respect of Auto Liability and Workers Compensation coverage in the jurisdiction where the Services are to be performed.

18. Priority

Consultant shall give the Services the highest classification and priority and no other job taken by Consultant shall displace the Services during the term hereof.

19. Currency

The parties hereto agree and acknowledge that all reference to dollars in this Agreement shall be construed to mean the currency of Canada.

20. Notices

Any notice, demand, request or other instrument, which may be or are required to be given under this Agreement shall be delivered in person or sent by telex or telecopy, or mailed by prepaid registered post and shall be addressed as follows:

If to Union:
Union Gas Limited
P.O. Box 2001, 50 Keil Drive North
Chatham, Ontario N7M 5M1
Fax: 519-436-4641

or at such other address as Union may designate by written notice.

If to CONSULTANT:

Any notice, demand, request or other instrument, which may be or are required to be given under this Agreement shall be delivered in person or sent by receipt acknowledged e-mail, or mailed by prepaid registered post and shall be addressed as follows:

Stephen M. Acker
203-20 Midpark C., SE
Calgary, Alberta
T2X 1P3
Phone: 403-815-4608
E-mail: smacker@shaw.ca

or at such other address as Consultant may designate by written notice.

21. Severability

The invalidity or unenforceability of any portion or provision of this Agreement shall in no way affect the validity or enforceability of any other portion or provision hereof. Any invalid or unenforceable portion or provision shall be severed from this Agreement and the balance of this Agreement shall be construed and enforced as if this Agreement did not contain such invalid or unenforceable portion or provision.

22. **Time of Essence**

Time is of the essence in all matters referred to in this Agreement.

23. **Schedules**

Description of services and compensation are accepted as documented in the letter of agreement dated March 4, 2013.
March 1st

24. **Taxes**

If Consultant is a non-resident of Canada, and payments are made in respect of services rendered in Canada, of any nature whatsoever, Union is required by the Income Tax Act (Canada) to withhold a percentage in accordance with the legislation from each payment in respect of services rendered in Canada, and remit this amount to the Receiver-General. No withholding is required where the non-Resident Consultant has received a waiver from the Canada Revenue Agency.

In recognition of the fact that Union is subject to certain United States tax reporting requirements for specified payments to specified persons, Consultant shall immediately (a) provide any information in this regard requested by Union including residency, legal status, and location of provision of goods or services, and (b) fill out and return to Union or Union's designated agent any applicable US tax form. Failure to provide information or to fill out and return any forms required hereunder may result in a withholding of applicable US taxes from any future payments made to Consultant and/or termination of this agreement without further notice. Notwithstanding Consultant's compliance with the foregoing, withholding will be applied to any invoice if Union is directed to make such withholding by Canadian or US tax authorities.

25. **Audit**

Union or any person designated by Union may at any and all reasonable times for a period of twenty-four (24) months after the date of delivery of the Services have access to Consultant's books and records relative to the Services, for the purpose of auditing and verifying such amounts. Union may make copies of such books and records as reasonably required by Union in performing such audit. Consultant shall promptly review and settle with Union all matters arising from such audit including the refunding of monies where applicable.

IN WITNESS WHEREOF the parties hereto have duly executed this Agreement as of the day and year first above written.

UNION GAS LIMITED
Per:

Authorized Signatory
Name: Mark Kitchen
Position: Director, Regulatory Affairs

CONSULTANT
Per:

Authorized Signatory
Name: Stephen M. Acker
Position: Independent Consultant

Stephen M. Acker
203-20 Midpark Cr., SE
Calgary, Alberta
T2X 1P3

March 1, 2013

BY E_MAIL

Mark Kitchen, Director, Regulatory Affairs
Union Gas Limited
PO Box 2001
50 Keil Drive north
Chatham, Ontario
N7M 5M1

Dear Mr. Kitchen:

This letter confirms my agreement to serve as a Secondary Natural Gas Market witness on behalf of Union Gas Limited ("Union Gas" or "the Company") as part of Union's 2012 Deferral Disposition Proceeding ("the Proceeding"). I confirm that my responsibilities will include preparing written evidence consistent with the Scope of Work provided in Schedule A. I also confirm my agreement to respond to interrogatory questions and provide oral testimony, as required.

Work: I will work with the staff and attorneys of Union Gas as required throughout the duration of the Proceeding. I understand the Company's final evidence submission must be filed with the Ontario Energy Board ("the OEB) on or near the date of April 30, 2013. In preparing my written evidence I agree to provide the initial draft of my evidence to Union Gas on or near the date of March 29, 2013. I further accept my responsibility to participate in the oral hearing for the Proceeding which is expected to take place sometime during the Spring of 2013.

Fee: My fee is $10,000 for the services related to the preparation and submission of my comments. My fee for travel expenses, preparation for, and providing evidence and testifying at, any hearing will be $200 per hour.

Confidentiality: During the course of performing the work set forth above, I may receive, deliver, prepare, review, analyze, reproduce, summarize, or otherwise work with confidential, proprietary, and/or secret information. I will treat all such confidential information that I receive from the Company, or obtain or generate as part of my work, as strictly confidential and privileged.

If these terms are acceptable to the Company, please forward a Services Agreement acceptable to Union Gas for my review and execution.

Yours truly,

403-815-4608

Incl: Schedule A (Scope of Work)

cc: Ms. Patti Piett, Union Gas Limited

Schedule A

Scope of Work

It is my understanding that Union Gas Limited ("Union Gas" or "the Company") is considering submitting third party evidence in support of the Company's upcoming 2012 Deferral Disposition Proceeding before the Ontario Energy Board ("the Board" or "the OEB"). It is also my understanding that such evidence would consist of descriptions and explanations of how natural gas marketers evaluate and participate in the secondary natural gas market in and around the Province of Ontario, and how such markets are essential to the efficient and competitive operation of the unregulated portion of the natural gas marketplace in Ontario.

I am prepared to draft a paper describing the Secondary Natural Gas Market as it currently exists in Ontario, and to offer my point of view with respect to the impact on the market place of Union Gas' upstream transportation contract optimization, including both outright releases and by providing exchange services. I would address the importance of transportation optimization in maintaining a deep, liquid, and efficient natural gas market in Ontario. I would not be offering an opinion on the appropriateness of any particular sharing formula regarding proceeds from the optimization of the Company's transportation portfolios. I would also make myself available to appear before the Board in order to be questioned about my submission.

For your consideration I offer a draft of the Executive Summary of my proposed submission on the following page.

The Secondary Natural Gas Transportation Marketplace in Ontario

EXECUTIVE SUMMARY

The October 31, 1985 Agreement on Natural Gas Markets and Pricing (the "Halloween Agreement") marked a fundamental change in the way Ontario natural gas consumers were able to purchase their natural gas supplies. No longer tied to the Local Distribution Companies ("LDC's"), consumers were free to purchase natural gas supplies from whomever they chose. From the early days of natural gas commodity price deregulation, where consumers were largely only able to purchase their gas supply at the Empress, Alberta inlet into the TransCanada Pipeline System ("TCPL"), to today's environment where Ontario natural gas consumers are free to purchase their gas supply at any number of points on the North American natural gas pipeline grid, the Direct Purchase Market for natural gas has evolved into one of the more efficient commodity markets in North America. Today, Ontario natural gas consumers are not only free to purchase natural gas from suppliers of their choosing, including the LDC, but they are also free to purchase natural gas under a myriad of prices, terms, and at multiple locations. This is the legacy of the Halloween Agreement, and its success, or failure, is due in large part to the existence of the secondary market for transportation and transportation services in Ontario. An active and competitive secondary market for natural gas supply and transportation services ensures that both the successful supply and transportation of natural gas will be the result of agreements reached between willing sellers and willing buyers. From the earliest days of deregulation where producers competed amongst themselves to sell natural gas to the largest industrial end users and LDCs at Empress, to today's environment where producers, pipelines, agents, brokers, marketers, industrials of all sizes, commercial operations, institutions, municipalities, and LDCs are all involved in the buying, selling, and/or transporting of natural gas, the foundation for this activity has been an active and efficient secondary market for natural gas transportation and associated transportation services. As the North American pipeline industry has evolved over the last 25 plus years, and the economics of contracting for and holding term, firm transportation has alternated between positive and negative over this period, the constant and continued participation of the Ontario LDCs in the holding and optimization of pipeline transportation has facilitated the secondary markets, and by default, supported the continued ability of Ontario natural gas consumers to benefit from having multiple, competitively priced options for gas supply and transportation services.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Union's evidence suggests that Union included revenue from Exchanges, including FT-RAM enhanced exchanges in its S&T activity. How much did Union include in rates for base exchanges and FT-RAM enhanced exchanges in its 2007 rebasing case? How did Union determine the amount of revenue that it included in 2007 rates?

Response:

As per Exhibit A, Tab 2, Appendix A, Schedule 11, line 5, Board Approved exchange revenue for 2007 is $1.242 million. This forecast did not include any revenue related to TCPL's FT-RAM program, as when the 2007 forecast was prepared, Union had not used and did not expect to use the FT-RAM program. The forecast took into account the market trends present at the time of the forecast and historical S&T transactional services.

The total revenue for short term transportation and exchanges for the 2007 Board Approved forecast was $3.7 million, equating to $2.6 million in margin. In 2008, an additional $4.3 million of margin was added to reflect the elimination of the S&T deferral accounts for a total of $6.9 million of short term transportation and exchanges margin built into rates during the IRM period.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit B, Tab 1, page 5 of 39

Preamble: Union states that:

> "A key premise of the Board's EB-2012-0087 Decision with respect to the treatment of net FT-RAM revenues is that Union's Gas Supply Plan was driven, in part, by optimization opportunities".

Please provide evidence from the Board's EB-2012-0087 Decision, including appropriate quotations, to demonstrate that (a) the Board considered that the Union "gas supply plan" was driven, in part, by optimization opportunities; (b) that Union had a gas supply plan; (c) that the details of the Board's "gas supply plan" were a critical factor in the Board's decision to characterize the FT-RAM enhanced optimization revenues as gas cost reductions.
Please confirm that TransCanada's FT-RAM program (since discontinued by the National Energy Board's RH-003-2011 decision) is no longer in effect.

Response:

a) to c) The Board's EB-2012-0087 Decision on page 26 concludes that Union created optimization opportunities in relation to its upstream transportation arrangements on a planned basis. On page 28 the Board states "with a balanced gas supply portfolio there will be few, if any, firm assets available to support transactional services on a future planned basis". The Board then discusses the concept of temporary surplus and concludes a "clear distinction can be made between Union's transactional services (including exchanges) and Union's FT-RAM related activities" (page 28). Finally, the Board states optimization activities are in the Board's view "reductions to upstream transportation costs that result in an overall reduction to the cost of achieving Union's gas supply plan, and are subject to pass-through treatment in the IRM Framework".

As further described at Exhibit B, Tab 1, page 13 and in response to Exhibit D3.6, Union respectfully disagrees with the Board's conclusions in EB-2012-0087.

Union confirms the FT-RAM program ended June 30, 2013.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit A, Tab 1, page 3, lines 10-11

a) Please provide the dollar value of the offset to the LDC variance for 2012 of Union's purchase of gas from customers that returned to system gas during the year.

b) Is that amount included on p4, Table 1, to reduce the actual LDC costs incurred? Please redo the table showing the impact of the supplemental gas purchases.

c) Please show where the incremental gas purchase costs are accorded, if not, or other than, on Table 1.

Response:

a) to c) Union did not purchase gas from customers that returned to system sales during 2012.

Union does not segregate the dollar amount of gas purchases it makes throughout the year between return to system sales and existing system sales. Had Union not experienced the return to system, there would have been approximately 8.0 PJ of additional UDC.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit B, Tab 1, page 6 of 39, paragraph 3

Preamble: Union states that:

"The Board's October 25, 2012 EB-2012-0055 Decision (Enbridge Gas Distribution Deferral Account Disposition Proceeding) finding that temporarily surplus upstream assets may be used to support transportation exchange is consistent with how Union generation transportation exchange revenue".

In EB-2012-0055, the Board dealt with the characterization of capacity release related revenues, on page 13:
"For the reasons set out below, the Board finds that the capacity release related revenues should be treated as gas cost reductions. As such, the Board finds that the capacity release related revenues should be passed-through, in their entirety, to ratepayers in accordance with Enbridge's IRM Framework.

The Board notes that in a capacity release, the gas purchased by Enbridge at Empress is required to serve its customers. Enbridge could use the underlying assets, which support the capacity release transaction, to transport the purchased gas to its customers. Instead, Enbridge utilizes an exchange to ensure that the gas purchased for its customers is delivered to the location where it requires that gas; these transactions are not relying on temporarily surplus assets.

The Board finds that there are fundamental similarities between capacity release transactions and Enbridge's own use of STS-RAM credits. In both situations, Enbridge purchases gas at Empress for delivery to Enbridge for use by its ratepayers. In the STS-RAM own use situation, Enbridge reduces the cost of the delivered gas through its use of the credits. In the case of the capacity releases, Enbridge reduces the cost of the delivered gas through the capacity release transaction. The outcome of both situations is that the landed price of the gas to be used by Enbridge's ratepayers is reduced. Therefore, the Board finds that similar treatment of the gas cost reductions from both of these types of activities is warranted.

The Board does not agree that Enbridge's capacity release activities occur on a planned basis. The Board notes that, in this proceeding, there is no evidence that Enbridge generated revenue by managing its upstream transportation arrangements on a truly planned basis. Rather, they are a function of circumstances that arise, and factors taken into account by Enbridge's Gas Control group, as the gas supply plan is implemented.

Regardless of the Board's conclusion that Enbridge's capacity releases occur on an unplanned

basis, the outcome of these transactions is that gas, which is required by Enbridge's customers, is delivered to these same customers at a reduced cost. Therefore, it is clear to the Board that the revenues generated from capacity release transactions should be treated as gas cost reductions.

The Board notes that in Enbridge's 2013 rebasing proceeding (EB-2011-0354) the Board accepted that going forward all transactional services net revenues will be shared 90/10 between ratepayers and Enbridge's shareholder; however the specific issue in this proceeding is framed to determine the treatment of transactional services revenues in 2011 "in the context of Enbridge's existing IRM agreement". In finding that capacity releases are to be classified and treated as gas cost reductions and in accordance with Section 5.1 of the existing IRM agreement, the capacity release related net revenues, in their entirety, should be passed onto ratepayers. Therefore, the Board will not provide a 10% incentive on the net revenues generated by Enbridge from the capacity release activities in 2011."

Does Union agree that, with respect to revenues obtained from transactions which have as one component, a capacity release of existing TCPL capacity, the Board characterized such revenues as reduction to gas costs that should be passed through to ratepayers, absent even any "incentive retention" by Enbridge?

Response:

Union agrees the Board reached that conclusion in that case.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Preamble: p6

In EB-2011-0210, the Board stated (p39):

"Consistent with the long-standing principle that a gas utility should not profit from the procurement of gas supply for its in-franchise customers, and to eliminate the creation of inappropriate incentives during the test year, the Board finds that the optimization activities, as defined below, are to be considered part of gas supply, not part of transactional services.
* * * * *

Consistent with the description provided by Union, the Board will define optimization as any market-based opportunity to extract value from the upstream supply portfolio held by Union to serve in-franchise bundled customers, including, but not limited to, all FT-RAM activities and exchanges. The Board finds that 90% of all optimization net revenues shall accrue to ratepayers and 10% shall accrue to Union as an incentive to continue to undertake these activities on behalf of ratepayers. Although Union has undertaken optimization activities for a lengthy period of time, it has indicated that absent an incentive, these types of activities may not occur. The Board has not considered the issue of whether optimization is an integral part of prudent utility practice that should be undertaken by Union without the payment of an incentive. Absent consideration of this issue by the Board in the context of this proceeding, the Board is of the view that it is appropriate for an incentive to be continued, at a 10% rate. This level of incentive is consistent with that associated with short-term storage and balancing."

In EB-2012-0087, the Board stated, inter alia:

"The Board finds that Union has used TCPL's FT-RAM program to create a profit from the upstream transportation portfolio and has treated this profit as utility earnings, subject only to the provisions of the earnings sharing mechanism.

The Board finds that this treatment is inconsistent with the Settlement Agreement on the IRM Framework and contrary to long standing regulatory principle inherent in the IRM Framework that the cost of gas and upstream transportation are to be treated as pass-through items, and therefore that Union cannot profit from the procurement of gas supply for its customers.

As such, the Board finds that Union's upstream transportation FT-RAM optimization revenues are gas cost reductions, and are properly considered Y-factor items in accordance with Union's IRM Framework. The Board directs Union to confirm that the net revenue amount related to FT-RAM optimization activities for 2011 is $22 million." (p26-27)

"The Board does not agree that these optimization activities are sustainable efficiency improvements found during the IRM term as argued by Union. They are clearly reductions to upstream transportation costs that result in an overall reduction to the cost of achieving Union's gas supply plan, and are subject to pass-through treatment in the IRM Framework." (p28)

"The Board has found that the FT-RAM optimization activities associated with Union's upstream transportation services represent a departure from long-standing regulatory principle that the cost of gas and upstream transportation are treated as pass-throughs. The Board finds that Union must be mindful of the information asymmetry that exists between it and ratepayers. In particular, the Board finds that Union has an obligation to disclose departures or potential departures that it intends to make from regulatory principle inherent in the IRM Framework during the term of the IRM. The Board finds that the nature of Union's FT-RAM optimization activities and its treatment of the resulting revenue is an example of the type of departure that warrants a much higher level of disclosure than was produced in prior proceedings." (p29)

"Consistent with the treatment of Union's short-term storage transactions during the IRM period, the Board is of the view that it is appropriate for Union to receive a 10% incentive for having generated these net revenues in 2011. Ratepayers are thus entitled to 90% of the $22 million net revenue amount related to Union's 2011 FT-RAM activities in the form of an offset to gas supply costs." (p31)

Given these two recent Board decisions, dated October 24, 2012 and November 19, 2012, respectively, what are the new circumstances that would apply in 2012 that were not present in 2011, or not anticipated in 2013, that would justify the Board taking a different view of the matter than it did in the previous two Union decisions?

Response:

For the reasons outlined in its application, Union respectfully disagrees with the Board's Decision in EB-2012-0087 and believes that a result that is consistent with the treatment of upstream transportation optimization revenues for 2008, 2009 and 2010 should be determined.

Union submits that the EB-2011-0210 Decision was specific to 2013 Rebasing and should not be retroactively applied to 2012 net transportation exchange revenues, which are the subject of the 2008-2012 IRM parameters.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit B, Tab 5, page 6

Preamble: Union states that:

"Union accepts Sussex's recommendations as they relate to: the documentation and analysis of the design day process and review; the development of a Gas Supply Plan memorandum or narrative; the common process regarding contracting; and the periodic review of the St. Clair and Bluewater contracts".

For each of the Sussex's recommendations that Union did not accept, please provide the recommendation and the reasons why Union did not accept each of them. Please discuss the reasons fully.

Response:

Union accepts all of Sussex's recommendations.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit C, Tab 2, page 7

How many of the utilities surveyed develop an integrated resource plan or use integrated resource planning principles in the development of the gas supply plan? Please provide details.

Response:

The following response was provided by Sussex Economic Advisors:

The table below is a summary of the documents or context utilized to develop the benchmarking analysis as presented in Appendix C of the Sussex report. As indicated in the summary table, the design day demand information for 12 of the 21 local distribution companies in the benchmarking analysis was developed from integrated resource plans.

Company	**State/Province**	**Document/Context**
Enbridge Gas Distribution	Ontario	Rate Application for the sale, distribution, transmission, and storage of gas
Centra Gas Manitoba	Manitoba	Centra Gas Manitoba 2013/14 General Rate Application
FortisBC	British Columbia	FortisBC Executive Summary to 2012/13 Annual Contracting Plan
Gaz Metro	Quebec	Peak Gas Day Analysis, May 2005
NSTAR	Massachusetts	NSTAR Gas 2012 Forecast and Supply Plan
National Grid	Massachusetts	Boston Gas and Colonial Gas 2013 Long-Range Resource and Requirements Plan
Bay State d/b/a Columbia Gas of MA	Massachusetts	Bay State Gas Company 2011 Long Range Integrated Forecast and System Gas Supply Resource Plan
Southern	Connecticut	SCG 2012 Biennial Forecast Demand & Supply

Connecticut Gas		
Connecticut Natural Gas	Connecticut	CNG 2012 Biennial Forecast Demand & Supply
Yankee Gas	Connecticut	Yankee Gas 2012 Biennial Forecast Demand & Supply
National Grid	Rhode Island	2011/12 to 2015/16 Long-Term Gas Supply Plan
National Grid (Brooklyn Union Gas)	New York	Downstate Service Territory Technical Conference January 9, 2013
National Grid (Niagara Mohawk)	New York	Proceeding on the Motion of the Commission as to the rates, charges, rules and regulations of Niagara Mohawk Power Corp. For electric and gas service
Consolidated Edison	New York	ConEd Integrated Long-Range Plan 2012 and ConEd Gas Long Range Plan 2010-2030 December 2010
Northern Utilities	Maine/New Hampshire	Northern Utilities 2011 Integrated Resource Plan
National Grid	New Hampshire	National Grid NH 2010 Integrated Resource Plan
Michigan Consolidated Gas	Michigan	MichCon Gas Cost Recovery Plan
Consumers Energy	Michigan	Consumers Energy Gas Cost Recovery Plan
Cascade Natural Gas	Washington/Oregon	Cascade Natural Gas Corporation 2012 Integrated Resource Plan
NW Natural	Washington/Oregon	2013 Integrated Resource Plan
Pacific Gas & Electric	California	2012 California Gas Report

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit C, Tab 2, page 6

Preamble: Sussex states that:

"In addition, the OEB outlined eleven specific elements, that should be included in the independent review; eight of those elements are addressed by Sussex herein".

a) What are the three elements that Sussex did not address?

b) Why did it not address each of the three elements? Please discuss fully.

Response:

a) The three elements that Sussex did not address are:
   1. Examine the cost allocation and rate design used by Union to allocate the cost of gas supply to in-franchise customers in Union North and Union South to ensure that it is appropriate and reflects regulatory principles;

   2. Examine the structure of the current natural gas supply deferral and variance accounts, with a view to simplifying and standardizing these accounts in the Union North and Union South Delivery Areas; and

   3. Determine whether the structure and text of the various natural gas supply deferral and variance accounts is consistent with the principles of the Decisions and Orders that provided.

b) The reason Sussex did not address the three elements discussed in part a) above, is because Union contracted with Concentric Energy Advisors' to discuss these three elements. Concentric was awarded Task 3 of the Gas Supply Plan Review Request for Proposal. Please refer to Exhibit C, Tab 3 for Concentric's report on these three elements.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit C, Tab 2, page 1

a) Please explain the significance of the comment that "Sussex recognizes that the Union North forecasted design day demand becomes a direct impact into the gas supply design day plan, while the Union South forecasted demand day is an input into the storage and transportation plan". What are practical consequences of Union's practice in the South?

b) How does the storage and transportation system plan differ from a gas supply plan? Is it derived from the gas supply, and how?

c) Did Sussex examine Union's storage and transportation plan? Does such a plan exist? In what form?

Response:

a) The following response was provided by Sussex Economic Advisors:

It is the understanding of Sussex Economic Advisors, LLC ("Sussex") that certain Union South assets (e.g., natural gas storage and transmission infrastructure) provide not only gas supply to Union in-franchise customers, but also provide service to ex-franchise customers. As such, the demand requirements of Union South as well as other information (e.g., Union ex-franchise storage and/or transmission firm obligations) are inputs into the Union storage and transmission system planning model.

b) Design day demand requirements for Union South and Union North use a combination of upstream transportation capacity, storage, transmission and distribution assets. Since Union's storage and transmission assets reside within its Union South franchise area, the role of the gas supply portfolio is different on a design day in Union South and Union North.

Union's Gas Supply Plan determines the volumes required to flow on the upstream transportation capacity (including purchases at Dawn) to meet annual demands in Union South (Average day supplies are 1/365 of annual demands). In Union South the transportation portfolio is structured to flow at a 100% load factor throughout the year.

The upstream transportation volumes (including Dawn purchases) from the Gas Supply Plan are inputs into the storage and transmission planning network models. These models

determine the demands on Union's transmission systems on design day and the volume of gas required from storage to meet these demands. The "Storage and Transmission Plan" identifiefd in the review refers to the results of the transmission planning network models.

c) The following response was provided by Sussex Economic Advisors:

Sussex did not review the Union storage and transmission system planning model, which is referenced on pages 21 and 23 of the Sussex report. It is the understanding of Sussex that the referenced model is the Union storage and transmission planning network modeling process, which is performed using proprietary software (i.e., SynerGEE Gas).

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit C, Tab 2, page 3

Sussex states:

"While there are various alternatives used by LDCs to extract value from portfolio assets, the current approach utilized by Union leverages the core competencies of the Gas Supply and Storage and Transportation group, is consistent with other approaches used by LDCs (eg. asset management arrangements), and is reasonable".

For each of the LDCs included in the benchmark against which Union's practices were measured, please provide:

1. the methods used to record exchange and other "optimizations" transaction.

2. the nature of the activities undertaken, both transportation and storage related.

3. the revenues accrued from these activities in each of the last five years (versus the amounts included in rates).

4. the arrangement for sharing of those revenues with ratepayers, including the percentages allocated to ratepayers and the shareholders.

5. the use of deferral accounts to hold the revenues.

6. the degree to which these revenues were characterized as gas cost reductions.

Response:

The following response was provided by Sussex Economic Advisors:

1. to 6. Sussex Economic Advisors, LLC did not collect the requested information as part of the benchmarking analysis.

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit C, Tab 2, paragraph 3, pages 2 and 3

Preamble: In EB-2011-0210 (p35), the Board stated:

"Although the issues of optimization and natural gas supply planning are listed separately on the issues list, it is evident to the Board from this proceeding that the issues are, in fact, interrelated".

In concluding that the gas supply portfolio (including transportation) is "appropriately sized", did Sussex examine the impact on the gas supply plan of Union's "optimization activities", including the use of FT-RAM? Please discuss in detail. If Sussex did not examine the plan from this perspective, please explain why it did not.

Response:

The following response was provided by Sussex Economic Advisors:

Sussex is aware that Union undertakes optimization activities and has done so in the past including through the use of FT-RAM. The level of natural gas supply assets in an LDC portfolio is driven by expected design day demand. Accordingly, with respect to determining if the Union gas supply portfolio was appropriately sized, Sussex focused on this issue and not the impact of optimization activities.

Specifically, as outlined in the Sussex report, Sussex utilized the following approach to determine if the Union gas supply portfolio was appropriately sized:

- A review of the Union gas supply principles, which are primarily driven by reliability and cost
- A review of the process utilized by Union to forecast design day demand (i.e., design day weather standard and calculated firm customer use per degree day), as the natural gas supply portfolio will be developed to meet the expected demand under peak weather and load conditions
- A comparison of the Union natural gas supply resources to the forecasted design day demand
- A benchmarking analysis comparing the process used by Union for forecasting design day to the process utilized by other LDCs

UNION GAS LIMITED

Answer to Interrogatory from
Building Owners and Managers Association ("BOMA")

Reference: Exhibit C, Tab 1

Mr. Acker testifies to the benefits of an "active and efficient" secondary market to Ontario customers and utilities, and the importance of LDC participation in that market to its continued vitality. Does Mr. Acker agree that, provided the LDCs are given an appropriate incentive to participate in the secondary market, the characterization by the Board of the utility revenues accruing from that optimization activity as reduction to customers gas costs (including gas transportation costs) should not have a material impact on the market? Please provide reasons.

Response:

The following response was provided by Stephen Acker:

Mr. Acker does not have an opinion on what the LDCs define as an appropriate incentive, or how the revenue associated with optimization activity should be treated. Every deal is different, and all deals have different risk parameters. An active and efficient secondary market for natural gas sales and associated services in Ontario benefits all participants by virtue of increased price transparency and access to competitively priced incremental services.

Currently, as holders of large volumes of service on the TCPL system, participation by the LDCs in the secondary market is integral to its continued vitality. If the LDCs are, by their own criteria, appropriately incented by the Board to participate in the secondary market, then all participants will benefit; if they are not appropriately incented, they will participate to a lesser extent with one result being that the Ontario natural gas marketplace will be less competitive.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Reference: Exhibit A, Tab 1, page 17

Please reconcile the $600,000 IEMS budget and the $178,000 actual 2012 spend with the $122,000 treated as "unspent". Please explain how, if the overall spend on DSM was above the total budget, and IEMS was underspent by $422,000, there was not a shift of at least $300,000 to other programs.

Response:

As outlined in Section 6.1 (b) of the EB-2011-0327 Settlement Agreement, Union transferred only the maximum allowable $300K or 50% of the IEMS budget to Commercial Industrial Incentives. As Union did not shift more than 50% of the IEMS budget to other programs, the 2012 Resource Acquisition targets were not adjusted. Please refer to the table below for the reconciliation.

2012 IEMS Budget	$600,000
Amount Spent on IEMS	$178,000
[1]Allowable Amount Transferred	$300,000
[1]Unspent – credited to DSMVA	$122,000

[1] EB-2011-0327 Settlement Agreement – January 31, 2012 Section 6.1 (b)

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Reference: Exhibit A, Tab 1, page 22 and Appendix A, Tab 7

With respect to the true-up of the Shared Savings Mechanism Account 179-115 (as well as the Lost Revenue Adjustment Mechanism Account 179-75), please provide the following documents:

a) The Audited Demand Side Management 2011 Annual Report, including without limitation the report of the auditor, the Annual Report itself, and all attachments.

b) The Report by Navigant with respect to the selection of custom projects for verification.

c) The verification reports from Seeline Group and Energuy Canada.

d) The commercial Custom Projects Verification ("CPSV") Study from Michaels Energy.

e) The distribution contract Custom Projects Verification Study from Diamond Engineering.

f) The TRC spreadsheet (in live Excel format) showing the full calculation of TRC for the custom projects.

g) A table for each of the projects reviewed by Michaels or Diamond showing, for each material assumption needed to calculate the TRC or the lifetime m3:

   i. The original assumption in the application;

   ii. The assumption used by the CPSV contractor, and, if it was different, the reason why it was different, if known;

   iii. The final assumption approved by the auditor, and, if it was different from the assumption used by the CPSV contractor, the reason for the difference;

   iv. The process that resulted in each change in assumption or calculation method from the original application, including any input provided by Union to cause the change; and

   v. The impact (in TRC and, if available, lifetime m3) of each change in assumption or calculation method.

h) The time dockets or other records of work done for each of Michaels Energy and Diamond Engineering, including at a minimum:

i. All records of any contacts with Union Gas during the course of carrying out the CPSV studies;
ii. All records of any contacts with the Auditor during the course of carrying out the CPSV studies; and
iii. All records of any contacts with the Evaluation and Audit Committee during the course of carrying out the CPSV studies.

i) The report, if any, of the Evaluation and Audit Committee with respect to the audit.

Response:

The true-up of the Shared Savings Mechanism Account 179-115 (as well as the Lost Revenue Adjustment Mechanism Account 179-75) is based on the fully audited and filed 2011 DSM Annual Report. Union worked in consultation with the Auditor and Evaluation and Audit Committee (EAC) to resolve any concerns in the Auditor's report and reached consensus on the results of the Audit within the June 29th 2012 filing deadline.

a) Please see Attachment 1.

b) Please see Attachment 2.

c) Please see Attachments 3 and 4. The verification reports from Seeline Group Ltd and Energuy Canada have been redacted to remove customer identifiers to maintain confidentiality of the customers involved. Unredacted copies of these 2 reports will be filed with Board in confidence under separate cover.

d) Please see Attachment 5.

e) Please see Attachment 6. The Custom Projects Verification Study prepared by Diamond Engineering Company has been provided in redacted form. The report as provided by Diamond did not contain customer names or locations. Union further redacted any customer identifier (including customer number, and site specific information) and employee contact information. Union will file this report without the Union Gas redactions, in confidence with the Board.

f) Please see Attachments 7, 8 and 9.

g) Please see Attachment 10.

h) Please see Attachment 11.

i) Please see Attachment 1.

June 29, 2012

Ms. Kirsten Walli
Board Secretasry
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Ms. Walli:

Re: Union Gas Limited – 2011 Demand Side Management Audit and Results

In accordance with the EB-2006-0021 Decision with Reasons, please find attached Union's 2011 Demand Side Management ("DSM") Annual Report, the 2011 Audit Report, and the Evaluation & Audit Committee Summary Results and Responses to the Audit of Union's 2011 DSM Annual Report.

On April 2, 2012, Union circulated its Draft DSM 2011 Annual Report to the DSM Consultative and the Auditor, ECONorthwest.

On May 16, 2012 ECONorthwest provided the draft Audit Report to Union and Union's Evaluation and Audit Committee ("EAC"). Union worked in consultation with the Auditor and EAC to resolve any concerns in the Auditor's report and reached consensus on the results of the Audit within the June 29th filing deadline.

Yours truly,

[Original signed by]

Marian Redford
Manager, Regulatory Applications

c.c.: C. Smith (Torys)

Final Audited
Demand Side Management
2011 Annual Report

June 29, 2012

uniongas
A Spectra Energy Company

Glossary of Terms

Adjustment Factor An adjustment factor is the percentage of participants who install a measure and keep it installed. Adjustment factors are established through the interviewing of a random sample (statistically significant) of program participants conducted by a third party in order to validate measure installation. The adjustment factor is applied to an initiative's gross savings results

Avoided Costs Avoided costs are a measurement of the reduction in the delivered costs of supplying resources (natural gas, electricity and water) to customers as a consequence of a program which reduces resource use by customers.

Base Case A base case reflects a projection of the future without the effects of the utility's DSM program. "Base cases" are required for each and every DSM scenario, even those which are just a single technology or a single participant. The difference between the base case and the energy efficient case represents the saving attributable to the energy efficient measure.

Building Envelope The building envelope refers to the exterior surfaces (such as walls, windows, roof and floor) of a building that separate the conditioned space from the outdoors.

Channel Partner A Channel Partner is a company that in the course of its business can influence consumers to choose gas over competing fuels. Examples include appliance retailers, HVAC contractors, engineers, and architects.

Cost Effectiveness Cost effectiveness refers to an analysis performed to determine whether the benefits of a project are greater than the costs. It is based on the net present value of savings over the equipment life of the measures.

Demand Side Management Variance Account (DSMVA) The existence and use of a DSM variance account provides a degree of flexibility for utilities as they undertake DSM investment. A DSM variance account may be used to rebate ratepayers at year end for unused budget allocation or to recover from ratepayers additional costs incurred for DSM programs.

Free Ridership Free riders are program participants who would have installed the energy efficient measure without the influence of Union's DSM program. Free rider rates are estimated based on research, market penetration studies or through negotiations in prior evaluation processes. The free rider rates are applied to the gross program savings results to derive actual savings.

Incentive An incentive is a transfer payment from the utility to participants aimed at encouraging participation in a DSM program.

Incremental Cost The incremental cost is the difference in price between the efficient technology or measure and the base case technology. In some early retirements and retrofits, the full cost of the efficient technology is the incremental cost.

Lost Revenue Adjustment Mechanism (LRAM) *The* LRAM is the Ontario Energy Board approved method by which utilities recover the lost distribution revenues associated with DSM activity. These lost revenues are calculated for each rate class impacted by DSM energy efficiency programs.

Net Present Value (NPV) Net present value calculations rely on an discount rate to state, with a single number, what the value of a number of years of benefits are. The NPV then is the sum of the discounted yearly benefits arising from an investment over the life-time of that investment.

Net-to-Gross Ratio Gross impacts are the program impacts prior to accounting for program attribution effects. Net impacts are the program impacts once program attribution effects have been accounted for. The net-to-gross ratio is defined as 1 – (free ridership ratio) + (spill-over ratio).

Ontario Energy Board (OEB) A regulatory agency of the Ontario Government that is an independent, quasi-judicial tribunal created by the *Ontario Energy Board Act.* The OEB has regulatory oversight of both natural gas and electricity matters in the province.

Participants The units used by a utility to measure participation in its DSM programs; such units of measurement include customers, projects and measures or technologies installed. Not all participants result in energy savings.

a) **Participants (when natural gas savings are claimed)** include gas saving measures or equipment (i.e. Boilers), packages of measure (i.e. ESKs), custom applications and services such as water heater tank de-liming. These participants are tracked through the Demand Side Management Tracking System (DSMT).
b) **Participants (when no natural gas savings are claimed)** include Feasibility and DAP study participants, energy audit participants, those who receive educational material such as the Wise Energy Guide as well as those who attend training sessions. These participants are tracked through the DSMT.

Program A program is the utility's specifically designed approach to providing one or more demand-side options to customers.

Program Evaluation Program evaluation refers to activities related to the collection, analysis, and reporting of data for purposes of measuring program impacts from past, existing or potential program impacts.

Research Costs Research costs are the utility's costs associated with the research and evaluation of DSM programs. They are not included in direct costs because they may affect more than one program.

Spill-over Spillover represents energy savings that are due to the program but not counted in program records. Spillover can be broken out in three ways:

a) **Participant inside spill-over** represents energy savings from other measures taken by participants at participating sites not included in the program but directly attributable to the influence of the program.
b) **Participant outside spill-over** represents energy savings from measures taken by participants at non-participating sites not included in the program but directly attributable to the influence of the program.
c) **Non-participant spill-over** represents energy savings from measures that were taken by non-participating customers but are directly attributable to the influence of the program. Non-participant spill-over is sometimes called the "Free-Driver effect."

Shared Savings Mechanism (SSM) A Shared Savings Mechanism (SSM) is a financial tool that allows utilities and customers to "share" in the societal benefits that successful DSM programs generate. SSM can include incentives for both Resource Acquisition and Market Transformation DSM programs.

Total Resource Cost Test The Societal Cost Test provides a measure of the benefits and costs that accrue to society as a result of the installation of a DSM measure. The Societal Cost Test has a provision whereby externality benefits, when quantified, can be included in the result. The SCT at $0/tonne CO2 is also known as the Total Resource Cost Test (TRC).

Trade Allies Trade allies include organizations (e.g. architect and engineering firms, building contractors, appliance manufacturers and dealers, and banks) that affect the energy-related decisions of customers who might participate in DSM programs.

Executive Summary

2011 represents Union Gas' fourteenth year of delivering cost effective Demand Side Management (DSM) programs to its broad customer base. To date, Union Gas' commitment to DSM initiatives has translated to approximately 976 million m^3 of annual natural gas savings, equivalent to more than $2.060 billion in net Total Resource Cost (TRC) benefits.

Union is pleased to report that the 2011 DSM portfolio generated 163.703 million m^3 of natural gas savings from a program budget spend of $25.914 million, which equates to a Shared Savings Mechanism (SSM) incentive of $9.243 million. In 2011, Union had two initiatives measured by OEB approved performance scorecards: the Market Transformation and Low Income Weatherization programs. Having surpassed 100% of the performance metrics, the scorecard incentives total $500,000 for Market Transformation and $543,600 for Low Income Weatherization.

Union continued to deliver successful DSM activities in 2011 and pursue cost effective opportunities. Having surpassed the 100% TRC target within the program year, Union was able to access up to 15% additional funds over the DSM budget. The overall actual spend in 2011 was $27,970,646; including $1.025 million above the DSM budget of $24.890 million, and $2.056 spend of the $2.465 million incremental Low-Income Plan budget. The actual DSM spend will be included in the DSM Variance Account (DSMVA) to "true-up" the variance between the DSM budget included in rates for the year and the actual expenditures.

Union's results in 2011 set a new high in annual natural gas savings achieved through program delivery. As the final year within the constructs of EB-2006-0021, Union celebrates the gas, electricity, and water savings that have been generated for ratepayers over the course of this framework.

1. Introduction

Primarily authored to present an annual retrospective of Union's energy efficiency initiatives and DSM portfolio results in terms of TRC, budget spend, Shared Savings Mechanism (SSM), and Lost Revenue Adjustment Mechanism (LRAM), the 2011 DSM Annual Report also serves as a vehicle through which to benchmark the results, highlight Union's successes and lessons learned, and summarize evaluation work conducted in 2011.

Since the introduction of Union's current DSM framework, the DSM budget has increased from $17 million in 2007 by 10% in each subsequent year,[1] reaching $24.890 million in 2011. Of the 2011 budget, $1.464 million was included for Market Transformation programs and $1.903 million for programs delivered to Low-Income Helping Homes Conserve (HHC) customers. Following the formula for calculating the TRC target,[2] Union's 2011 Net TRC Target of $252,652,675 was filed with the OEB in Union's 2010 Annual DSM Report. Union surpassed that TRC target by $127 million, achieving $379,379,419 for the year's DSM portfolio at a total cost of $25,914,863.

In addition, to the filed 2011 DSM Plan with the OEB of April 30, 2010, on September 9, 2010 the OEB outlined expectations that Union would file an incremental Low-Income Plan with additional funding if required. Union filed and received approval for the incremental plan (EB-2010-0055) which established a budget of $2.465 million. Union developed in consultation with a sub-committee of stakeholder groups an incremental scorecard for its Home Weatherization program for low-income customers which included measurement of two equally weighted metrics: weatherization participants and total natural gas savings. Union achieved 136% of its scorecard, achieving an incentive payout of $543,600, at a total cost of $2,055,783.

Union's 2011 DSM portfolio included programs directed towards Residential, Low-Income, Commercial, and Distribution Contract (DC) markets as listed below:

Residential Markets (R):

- ESK Program
- Programmable Thermostat Rebate

Low-Income (LI):

- Helping Homes Conserve
- Home Weatherization program (Incremental Low-Income Plan)

Commercial (C):

- Cooking Equipment
- Laundry Equipment with Ozone
- Energy Star Dishwashers
- Condensing Make-up Air Units
- Hot Water Conservation Program
- Energy Recovery Ventilators
- Condensing Boilers
- Infrared Heaters

[1] As outlined in the OEB's Decision with Reasons dated August 25, 2006.
[2] As established in Phase 1 of the OEB DSM Generic Proceeding.

- Heat Recovery Ventilators
- De-stratification Fans
- Programmable Thermostats
- Efficient Pre-Rinse Spray Nozzles
- Demand Control Kitchen Ventilation
- Condensing Gas Water Heater s
- Front-Loading Clothes Washers CEE Tier2
- Steam Trap Survey
- Design Assistance Program
- Feasibility Studies
- Custom Projects

Distribution Contract (DC):

- Custom Projects

Major TRC drivers for the 2011 DSM efforts are outlined in figure 1.0 below:

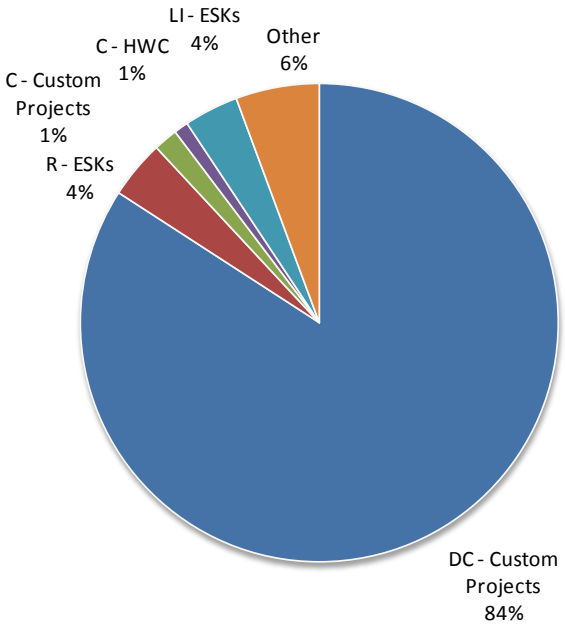


Figure 1.0, Major TRC Drivers

Program TRC results are presented in the body of this report and are benchmarked at the customer segment level against previous year's results in efficient technology units. Previously, Union's DSM Annual Report presented the year over year results in terms of TRC achieved, however input assumptions and adjustment factors for TRC vary from year to year, and as such, Union transitioned to tracking program success on a unit basis in 2009 in order to provide a clearer picture of milestones and achievements.

2. Planning and Evaluation Background

Operating within the evaluation parameters of the OEB approved 2007-2009 DSM Plan, Union continues to demonstrate its leadership role in the cultural shift towards energy efficiency and conservation. Union's DSM activities are driving market change through focused efforts on delivering natural gas savings and related customer benefits. Union's DSM portfolio includes a mix of Resource Acquisition and Market Transformation efforts.

With the exception of the Low-Income Incremental Plan Weatherization Program, all resource acquisition measures are screened for cost effectiveness using the TRC test as outlined in the Decision with Reasons EB-2006-0021 detailed in section 2.1 below. Union continued with the end-use customer funding approach in the Commercial Market, as well as advancing the multi-channel delivery methods to gain traction in the market. Programs that were less cost effective were scaled back or eliminated such as the commercial programmable thermostat offering.

Two sets of input assumptions form the basis for the 2011 DSM program evaluation as follows:

1) The planning input assumptions used in this report for natural gas m^3 savings, TRC results, and the SSM incentive are those filed by Union (EB-2010-0055) on May 18, 2010 and approved by the OEB on December 20, 2010. The 2011 Revised DSM Measures Update (EB-2011-0225) was filed on June 15, 2011 and approved by the OEB on July 13, 2011. The 2011 DSM New Measure Update (EB-2012-0053) was filed on February 8, 2012 and approved by the OEB on March 26, 2012. In addition, Union adopted measures that were filed by Enbridge (EB-2011-0254) and approved August 11, 2011.
2) For the LRAM section of the annual report, the m^3 savings have been calculated using the most current input assumptions available at the time the Annual Report was completed.

Input assumptions for SSM and LRAM are provided in Appendix A.

2.1 Cost Effectiveness Screening

As mentioned above, potential DSM measures face a TRC screening test, which measures the benefits and costs of DSM investments from a resource perspective. Benefits include avoided natural gas, electricity, and water resource use and their associated costs, while the costs relate to the incremental cost of energy efficient equipment in relation to its non-efficient equivalent and any associated program support costs. Costs and benefits are projected over the Effective Useful Life (EUL) of the measure and discounted to calculate the Net Present Value (NPV).[3] All TRC results reported are net of free rider calculations.[4]

Measures delivered through Union's DSM portfolio (with the exception of the Low-Income Weatherization and Market Transformation) must yield a benefit-cost ratio of 1.0 or more. Measures are evaluated annually to ensure they pass the cost effectiveness screening.

[3] A discount rate of 10% is used to calculate the net present value.
[4] Free riders are program participants who would have installed the energy efficient measure without the influence of Union's DSM program.

The Low-Income Weatherization program has an approved TRC threshold of 0.7. This lower threshold is intended to recognize that, while TRC captures all of the costs associated with deep measures, it does not capture non-energy benefits, which are difficult to quantify. Union follows the OEB approved file (EB-2010-0055) – Amendment to the 2011 Demand Side Management Plan – Incremental Low- Income Demand Side Management Plan.

In calculating the DSM associated avoided costs used in the TRC test, Union follows the methodology laid out by the OEB in the Phase 1 Decision of the DSM Generic Proceeding EB-2006-0021, as well as that approved by the OEB for Enbridge Gas Distribution in the EB-2005-0001/EB-2005-0437 proceeding. Calculating avoided costs for Union are related to customer rates as well as gas supply management policies and practices. The 2011 Union Gas Avoided Costs were included in the filing of the 2010 Union Gas DSM Annual Report.

2.2 Program Evaluation & Verification

There are two broad categories of evaluation activities: impact evaluation and formative evaluation. Impact evaluations focus on participation and related savings resulting from DSM programs. Among other things, formative evaluations focus on the effectiveness of program design and delivery to assess why effects occurred.

As part of Union's commitment to DSM, impact evaluation studies are performed annually to examine the accuracy of claimed savings. A summary of the impact evaluation studies undertaken in 2011 is provided in the Verification and Evaluation section (Section 9) of this report.

2.3 2011 Evaluation Priorities

Evaluation priorities are typically established through consultation with Union's Evaluation and Audit Committee (EAC), originally with the intention of evaluating input assumptions for each of the program measures included in the 2007-2009 DSM Plan over the course of the three years. While undertaking a third of measure evaluations annually was the initial strategy, many evaluation projects that might have been undertaken in 2009 were precluded by the OEB commissioning and approval of Navigant Consulting Inc.'s, *Measures and Assumptions for Demand Side Management (DSM) Planning*, dated April 16, 2009. In 2011, as Union entered the fifth year of a three year framework, this challenge remained unchanged. In addition, due to other competing priorities with the EAC, specifically new measure approvals and filing of the 2012-2014 DSM Plan, evaluation priorities were not identified for 2011.

2.5 2011 DSM Annual Report Audit

To substantiate Union's DSM Portfolio results, this DSM Annual Report is subject to an independent external audit, performed by ECONorthwest for the 2011 program year. The intention of the audit was to confirm to stakeholders that claimed DSM savings are correct and that the SSM, LRAM, Market Transformation, and Low Income incentive calculations are appropriate.

The Auditor was required to express an opinion on the appropriateness of claimed TRC, SSM, LRAM, Demand Side Management Variance Account (DSMVA), Market Transformation and Low Income based on their review of Union's Annual Report. The Auditor provided a final opinion on whether the

TRC Savings and amounts recoverable for SSM, LRAM, DSMVA, Market Transformation and Low Income have been correctly calculated using reasonable assumptions.

3. Overall 2011 DSM Program Results

In 2011, Union's DSM program generated net TRC benefits of $379,379,419 for customers and 163,702,231 m³ in natural gas savings.[5] Program spending in 2011 totalled $27,970,646, including $1.571 million for Market Transformation and $2.056 million for Low-Income Weatherization. The Distribution Contract (DC) market continued to deliver the largest portion of savings in 2011 followed by the Commercial, Residential and Low-Income markets respectively.

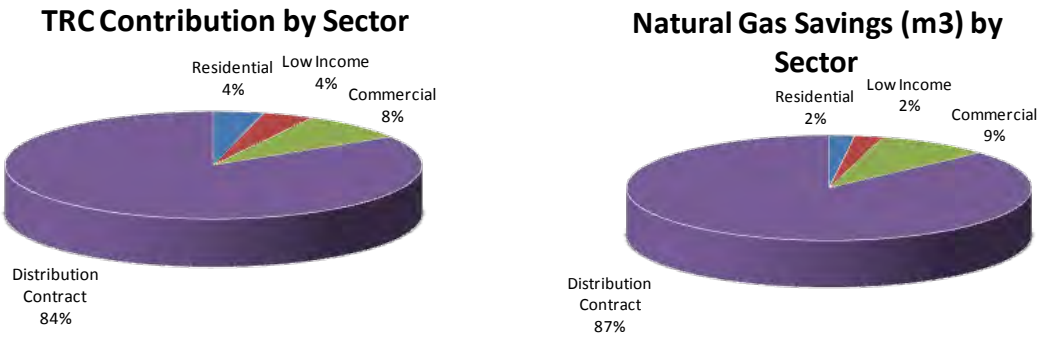


Figure 3.0, 2011 Results by Sector (Percentage)

Union's TRC target for 2011, as filed in the 2010 Annual Report, was established as $252,652,675. In an effort to achieve this target, Union focused on a balance of programs in each sector. Table 3.0 summarizes Union's overall DSM results for 2011 in comparison to 2009 and 2010.

Table 3.0 - Overall 2011 Program Results by Sector

Sector	Net TRC	Natural Gas Savings (m3)	Units	Expenditures	TRC per Dollar Spent
Residential	$ 15,105,081	3,346,580	331,921	$ 2,699,321	$ 5.60
Low Income - HHC	$ 15,068,454	3,179,042	123,038	$ 1,729,178	$ 8.71
Commercial	$ 32,586,182	14,909,914	75,402	$ 4,143,118	$ 7.87
Distribution Contract	$ 323,654,850	141,753,196	496	$ 8,736,579	$ 37.05
Low Income - Weatherization		514,499	450	$ 2,055,783	
Market Transformation				$ 1,571,520	
Other Direct Program Costs				$ 7,035,147	
2011 Results	**$ 379,379,419**	**163,703,231**	**531,307**	**$ 27,970,646**	$ 13.56
2010 Results	$ 284,132,964	121,115,763	446,425	$ 21,532,363	$ 13.20
2009 Results	$ 308,255,602	92,604,301	601,359	$ 22,222,457	$ 13.87

**Expenditures include program and incentive costs*

[5] m³ gas savings include Low Income weatherization program

DSM initiatives for 2011 were delivered through the sector-specific programs outlined in Table 3.1. These programs are designed to achieve savings in the areas of space heating, water heating, and the building envelope, as well as process-related energy applications.

Table 3.1 - Sector Programs

Sector	Program
Residential	New Home Construction
	Home Retrofit
	Market Transformation
	Drain Water Heat Recovery
Low Income	Helping Homes Conserve
	Weatherization
Commercial	New Building Construction
	Building Retrofit
Distribution Contract	Custom Projects

Union targets each customer sector with specific DSM programs, results for which are shown in Table 3.2 for TRC generating DSM programs.

Table 3.2 - Detailed 2011 Program Results by Sector

Sector	Program	Units	Natural Gas Savings (m3)	Program Costs	Program TRC
Residential	New Home Construction	383	5,417	$ 1,934	$ 31,132
	Home Retrofit	331,538	3,341,163	$ 955,596	$ 15,073,949
	Total Residential	**331,921**	**3,346,580**	**957,530**	**15,105,081**
Low Income	Low Income	123,038	3,179,042	$ 271,410	$ 15,068,454
	Total Low Income	**123,038**	**3,179,042**	**$ 271,410**	**$ 15,068,454**
Commercial	New Building Construction	989	4,459,258	$ 106,328	$ 7,866,472
	Building Retrofit	74,413	10,450,656	$ 413,473	$ 24,719,710
	Total Commercial	**75,402**	**14,909,914**	**$ 519,801**	**$ 32,586,182**
Distribution Contract	Distribution Contract	496	141,753,196	$ 721,779	$ 323,654,850
	Total Distribution Contract	**496**	**141,753,196**	**$ 721,779**	**$ 323,654,850**
Total Program Results		**530,857**	**163,188,732**	**$ 2,470,520**	**$ 386,414,566**

Other Direct Program Costs	**Salaries**	$ 5,716,463
	Administration	$ 48,946
	Research	$ 800,179
	Evaluation	
	Non-discretionary[1]	$ 388,809
	Discretionary	$ 80,750
	Total Other Program Costs	**$ 7,035,147**

TOTAL 2011 TRC RESULTS	**$ 379,379,419**

[1] Non-discretionary spend refers to evaluation work such as verification, sampling, annual DSM Audit, EAC and Consultative Meeting costs that are undertaken to support DSM savings claims and activities.

Table 3.3 - Detailed 2011 Program Results for Low-Income Weatherization

Sector	Program	Units	Natural Gas Savings (m3)	Program Costs	Program TRC
Low Income	Weatherization	450	514,499	$ 2,055,783	N/A
	Total Weatherization	**450**	**514,499**	**$ 2,055,783**	**N/A**

As illustrated in Figure 3.1, Union's 2011 total natural gas savings across all programs was approximately 163.703 million m³.

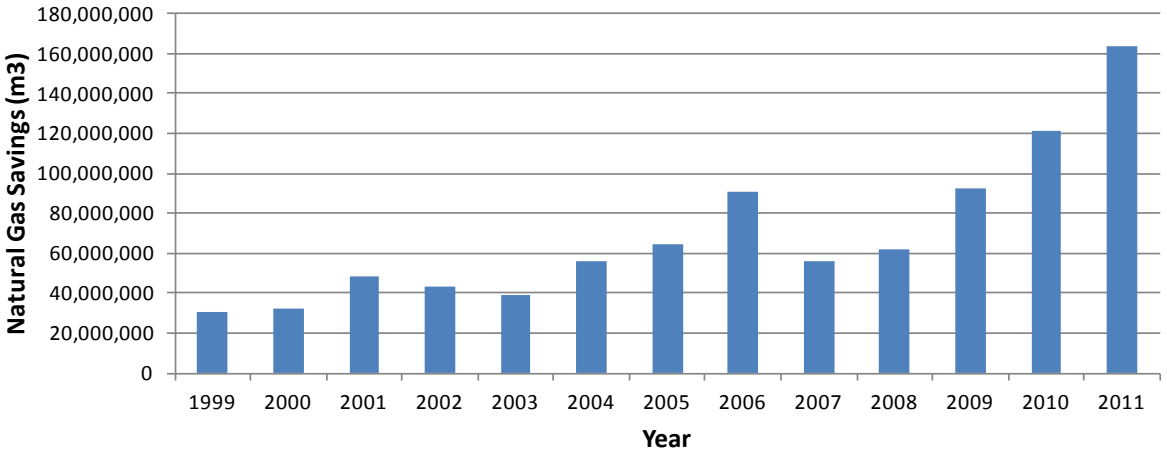


Figure 3.1, Historical Savings Results

The 2011 OEB approved budget of $27.355 million was 21% higher than the $22.627 million budget approved in 2010. The approved budget includes $2.465 million for the incremental Low-Income Plan. In 2011 Union spent over $27.971 million on DSM, including over $2.056 million on Low-income weatherization program and $1.571 million on Market Transformation. A breakdown of 2011 expenditures by sector, compared to expenditures for 2009 and 2010, is shown in Table 3.4 and Table 3.5.

Table 3.4 - Overall 2011 Direct DSM Program Costs

DSM Program Sector Costs	Incentives	Program Costs	2011 Total	2010 Total	2009 Total
Residential	$ 1,741,791	$ 957,530	$ 2,699,321	$ 2,888,286	$ 2,838,449
Low Income	$ 1,457,768	$ 271,410	$ 1,729,178	$ 1,575,064	$ 2,169,521
Commercial	$ 3,623,317	$ 519,801	$ 4,143,118	$ 3,932,266	$ 4,637,816
Distribution Contract	$ 8,014,800	$ 721,779	$ 8,736,579	$ 5,055,246	$ 5,022,108
Market Transformation	$ 1,385,764	$ 185,756	$ 1,571,520	$ 1,328,450	$ 1,175,296
Total Program Sector Costs	**$ 16,223,440**	**$ 2,656,276**	**$ 18,879,716**	**$ 14,779,312**	**$ 15,843,190**
Other Direct Program Costs			$ 7,035,147	$ 6,753,051	$ 6,379,267
Total Spending			**$ 25,914,863**	**$ 21,532,363**	**$ 22,222,457**

In keeping with the budget breakdown presented in the incremental Low-Income Plan, Table 3.5 presents the Low-Income weatherization expenditures.

Table 3.5 - Overall 2011 Direct Low-Income Weatherization Expenditures

Low-Income Initiatives		2011 Incremental Spend
Weatherization Program		
Measures/Audits and Program Administration	$	1,662,139.99
Marketing and Education	$	41,872.69
Data Analysis	$	290,300.00
Basic Audit		N/A
Other	$	22.02
Weatherization Program Subtotal	$	1,994,334.70
Research & Evaluation	$	61,447.99
Total Budget Spent	**$**	**2,055,782.69**

DSM Variance Account

The DSM Variance Account provides a budget true-up mechanism to rebate ratepayers at year end for unused budget allocation or to recover from ratepayers additional costs incurred for DSM programs. As currently defined, the recovery of such excess spending is limited to 15% budget over the OEB approved DSM Plan budget per the OEB Decision with Reasons. In addition, the Company may only recover the funds captured in the account if it has achieved 100% of its forecast energy savings, which is its volumetric savings target. All additional funding must be utilized on incremental program expenses including market transformation programs. Union accessed the DSMVA budget in 2011 as the 100% target was surpassed.

A breakdown of spending by program is contained in Appendix B. Specific details on program savings, participants,[6] and costs by sector are outlined in the next three sections of this report.

[6] Participant counts are equivalent to the number of measures installed for each program

4. Residential Market

Residential programs accounted for 4% of all DSM TRC in 2011, contributing 3.347 million m^3 of savings, and a net TRC of over $15 million. Direct program spending in the residential market was $2.699 million.

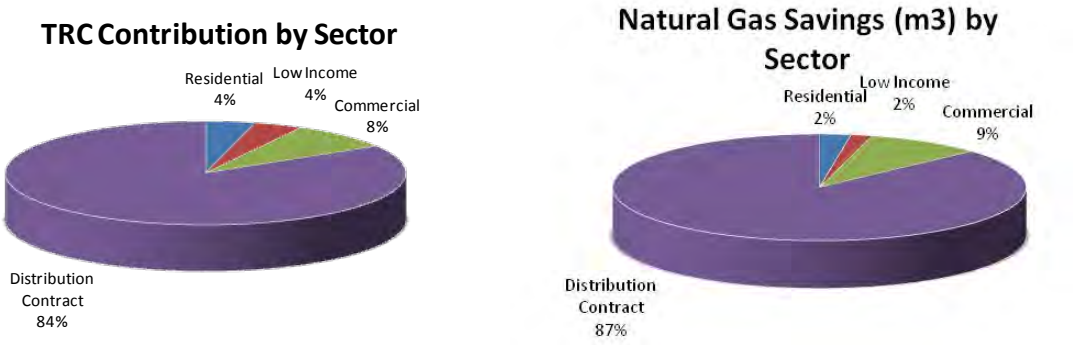


Figure 4.0, Results by Sector (Percentage)

The residential sector delivered natural gas savings through the home retrofit program in 2011, results for which are summarized in Table 4.0.

Table 4.0 - 2011 Residential Program Results

Residential	Net TRC	Natural Gas Savings (m3)	Units	Expenditures	TRC per Dollar Spent
New Home Construction	$ 31,132	5,417	383	$ 2,481	$ 12.55
Home Retrofit	$ 15,073,949	3,341,163	331,538	$ 2,696,840	$ 5.59
2011 Results	**$ 15,105,081**	**3,346,580**	**331,921**	**$ 2,699,321**	**$ 5.60**
2010 Results	$ 14,666,627	2,967,279	296,792	$ 2,888,286	$ 5.08
2009 Results	$ 26,073,066	4,515,861	363,922	$ 2,838,449	$ 9.19

**Expenditures include program and incentive costs*

Energy Savings Kits (ESK) are the largest driver of TRC in the residential portfolio with a total of 87,214 kits delivered in 2011 (see Table 4.2 for details).

4.1 Program Framework

Residential programs are designed to achieve savings related to space and water heating for Union Gas' residential individually metered residences. These programs are marketed to residential customers and are delivered through a variety of channels, including retail partnerships, builders, and third party delivery agents. New partnerships as well as working with existing trade allies, partners, and direct-to-customer promotions are strategically developed to cost-effectively promote energy efficiency within Union's residential customer base.

This section outlines the programs available to residential customers in 2011, including program changes, existing initiatives and delivery methods employed.

4.1.1 New Initiatives in 2011

Small Cities Radio & Newspaper Campaign

In 2011, Union Gas implemented radio and newspaper campaigns for customers living in smaller towns/cities who do not receive the same frequency of messaging with regards to ESKs or the same level of opportunity to visit a pick-up depot/location as those customers living in larger urban centres. Historically, most direct mails and retailer events have targeted larger cities where higher take-up can be generated. Due to the increased level of penetration in these larger urban centers, Union Gas developed a marketing campaign to target these smaller cities to create program awareness and to drive activity take-up. This campaign was piloted in select small cities in order to test the effectiveness of direct mail, newspaper and radio.

Radio Ad Script:

> *Did you know that Union Gas is giving away FREE Energy Saving Kits? That's right! Valued at $60 dollars, the kit includes an energy-efficient showerhead, aerators and pipe insulation. Installing it will instantly reduce your water use, water heating costs, and help you save up to one hundred dollars a year on your energy bills!*
>
> Tag: *To order your FREE Energy Saving Kit or to find a pick-up location near you go to uniongas.com/esk. Residential customers only. One per household… While quantities last. Some restrictions apply.*

The above 30 second radio ads were aired in the following communities:

- Bracebridge/Gravenhurst
- Brighton
- Iroquois Falls
- Saugeen Shores

Newspaper ad Artwork:

Figure 4.1, ESK Newspaper Ad

The newspaper campaign was featured in local publications across several small communities with a total circulation of over 46,000. The publications that featured this campaign include:

- Gazette (East Zorra-Tavistock)
- Chronicle (West Elgin)
- Progress (Atikokan)
- Topic (Petrolia)
- Forester (Huntsville)
- Journal (Prescott)
- Independent Express (Elmira/Woolwich)
- Shoreline Week (Tecumseh)

News-Canada Radio Campaign

As ESKs saturate the market, it is becoming more and more challenging to reach those "hard to get" customers who might be interested in receiving the kit but who may not have heard of the program through existing outreach strategies.

To try and reach these "hard to get" customers, Union Gas piloted a radio campaign with News Canada. News Canada is an agency that provides Canadian media outlets with ready-to-use copyright-free news content for television, print, radio and web. Broadcasters and editors from these various media outlets look to News Canada for stories when they have a gap in their current news line up or when they are looking for content that effectively enhances their broadcasts/publications. To leverage this channel of media, Union Gas provided News Canada with a radio interview that highlighted the benefits and savings associated with installing an ESK.

This approach was very successful. In the month of November alone, the campaign saw 25 radio stations from different cities 'pick-up' the radio ad/ interview – which amassed more than 1 million impressions in just one month.

Green Impact Guelph (GIG)

In 2011, Union partnered with City of Guelph, Guelph Hydro and Guelph Environmental Leadership (GEL) to launch the Green Impact Guelph (GIG). GIG is a delivery strategy that offers a free personalized in-home basic audit, completed by GEL. The audit aims at identifying water and energy saving opportunities and conducts retrofits on-site where appropriate and specifically the installation of ESK components. A pilot was launched October 2011 with a target of 250 home visits in Guelph's Hanlon Creek neighbourhood over a six month period ending March 2012.

Figure 4.2, Green Impact Guelph Program Overview

GIG Promotion and Marketing

The GIG pilot program is promoted using flyers, posters, door-to-door hangers and through collaboration with local neighbourhood groups and community groups/institutions (i.e. schools, churches, etc.). During the pilot phase, all promotions focused solely on the targeted neighbourhood and did not include the broader community.

To be eligible, a participant must be:

- A resident of a detached, semi-detached or townhouse/row-house located in the city of Guelph constructed prior to 1996, with permission from the owners;
- Be serviced by city of Guelph municipal water & wastewater system, Guelph Hydro Electric Systems Inc. and Union Gas.

Figure 4.3, Sample of GIG Marketing Material

Posters were used at workshops and community events to inform residents about the program and generate interest.

New ESK Box

In keeping with the environmental messaging we send to our customers, Union elected to replace existing plastic ESK box with a recyclable cardboard box.

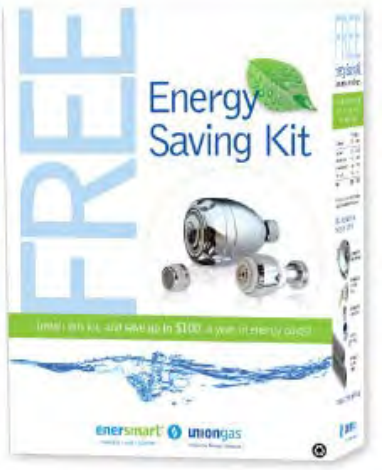


Figure 4.4a, Plastic ESK Box

Figure 4.4b, New Cardboard Box

Replacement Showerhead Measure

In 2011, Union began to track ESK uptake from previous program participants since their older, less efficient version had a higher Gallon per Minute (GPM) factor than the model currently offered. Savings associated with these 4,695 replacement showerheads are included in the program results using a 2.0 GPM showerhead as the base case.

4.1.2 Existing Initiatives

Energy Savings Kit (ESK)

ESKs have been distributed to Union's residential customers since 2000. ESKs are pre-packaged measures designed to reduce a customer's energy demand and water consumption, as well as provide information on the efficient use of energy. In 2011 Union continued use of a 1.25 GPM showerhead as a component of the ESK offering. The 1.25 GPM showerheads are not sold at retail outlets in Ontario and were manufactured as a special order for Union with high quality chrome casing aesthetics. The 2011 ESK consisted of:

- Energy efficient showerhead (1.25 GPM)
- Energy efficient kitchen aerator (1.50 GPM)
- Energy efficient bathroom aerator (1.50 GPM)
- Pipe wrap (two 1 meter lengths)
- 1 roll of Teflon tape for ease of showerhead installation

- ESK Installation Guide, (see Figure 4.5a, 4.5b, 4.5c)[7]
- $25 Programmable Thermostat coupon

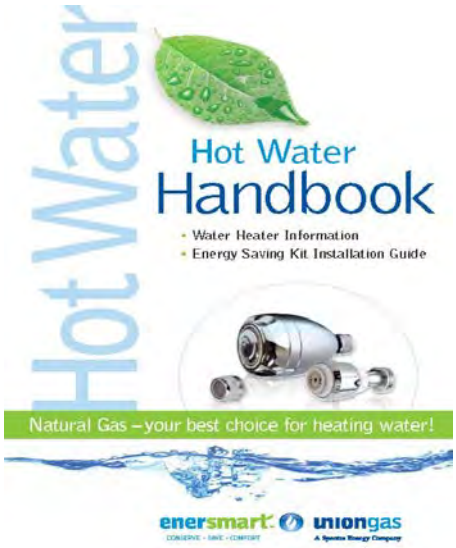


Figure 4.5a, 2011 ESK Installation Guide (front view)

Figure 4.5b, 2011 ESK Installation Guide

[7] The installation guide also directs our customer to an installation video on our website at uniongas.com

Figure 4.5c, 2011 ESK Installation Guide (reverse view)

Union Gas delivered ESKs to franchise customers through a variety of delivery methods; results for each are shown in Table 4.1.

Table 4.1 - 2011 ESK Summary of Delivery by Channel

2011 ESK Results by Delivery Channel

Residential Account Managers	Orders/Pick Up Depots	Market Driven	Conversion	HVAC / 3rd Party Program Install	HVAC / 3rd Party Program Distr	Builder Install	**Total**
6,789	58,931	5,552	7	583	15,256	96	**87,214**

In 2011 a total of 87,214 ESKs were distributed in Union's franchise area. This is approximately 15,000 more energy saving kits than the 72,000 ESKs in 2010.

Retailer ESK Distribution Events:

Over the last five years Union Gas has hosted ESK Distribution events in partnership with The Home Depot at various store locations across Union's franchise in the spring and fall. In 2009 Union Gas launched a pilot with Rona Home Hardware. In 2011 Union continued working with Home Depot and Rona and expanded these types of events to include Lowes. Union launched more than 30 distribution events in cities such as Milton, Guelph, Waterloo, Belleville, Sault Ste Marie, London, Burlington, Oakville, Windsor & Hamilton throughout 2011. Retailers view Union Gas as a key partner in advancing their customer's awareness and uptake of energy efficient products and contributing to their corporate energy conservation and environmental stewardship profiles.

Figure 4.6, 2011 ESK Packaging (Branded Per Distribution Event)

Radio Campaigns

Union Gas launched a series of radio campaigns to support retailers' events like Home Depot, Rona and Lowes. The radio ads generated greater awareness on the benefits and cost savings associated with the installation of the ESK. The ad also directed customers to pick up the kit on a specific date from a specific location. The campaign was successful as there were increased customer visits to the retailers' stores to receive the kit. Example of the script below:

Ad Script: *Did you know that this Saturday, Union Gas is giving away FREE Energy Saving Kits? That's right! Valued at $60 dollars, the kit includes an energy-efficient showerhead, aerators and pipe insulation. Installing it will instantly reduce your water use, water heating costs, and help you save up to one hundred dollars a year on your energy bills.*

Tag: *Pick up your FREE Energy Saving Kit this Saturday only, at xxxxx from 9 to 3. (While quantities last. Some restrictions apply.)*

Direct Mail Campaigns

In 2011 Union continued to launch direct mail campaigns targeting customers who had not yet received an ESK. By working with the DMTI (Desktop Mapping Technologies Inc) dashboard, Union was able to generate a database of customers who had not received an ESK in the past as well as eliminate low-income potential customers.

The direct mail provided information on the components of the ESK as well as how to receive one (online, pick-up depots, mail back coupon). More than 350,000 direct mail letters were sent out covering over 30 cities and municipalities in Kingston, Hamilton, Thunder Bay, Milton, Trenton, Guelph, Quinte West, Nappanee, and Belleville. The direct mail resulted in the distribution of approximately 14,000 ESKs (equating to a 4% direct mail response rate).

Figure 4.7, Direct Mail

New Home Construction Energy Saving Kits (ESKs)

In 2011, Union continued with the new home construction program working with Mattamy, Empire and other large home builders in Union's territory. Once the home was built and transferred to the homeowner, the builder's Warranty Specialist would complete a final inspection and install a showerhead, kitchen aerator and bathroom aerator. A promotional "door hanger" was also placed on the showerhead which explained the cost savings of the showerhead as well as providing additional energy saving tips for the homeowner.

In 2011, Union tracked the following installations:

- 234 Bath faucet aerator
- 53 Kitchen faucet aerator
- 96 Showerheads

Figure 4.8, New Build ESK "Door Hangers" (front and reverse view)

Residential Account Manager ESK Distribution:

Since program inception, regional Union Gas Account Managers have been working with local ESK distribution channels. These local ESK channels are in addition to the mass marketed ESK events. Examples of local events include home shows, trade shows, business partner sales events, community events and 'local' promotions. In 2011 Union Account Managers distributed approximately 5,500 ESKs in their territories.

HVAC Partnership Initiative

Designed to influence energy conservation decisions at the point of purchase, incentives are paid directly to the HVAC partners for the promotion, sale, and installation of an energy efficient measure through the HVAC Partnership. For 2011 the following incentives were available to qualified HVAC partners:

- $20 for the distribution of an energy saving kit to a qualified Union Gas customer;
- $40 for the installation of an energy saving kit to a qualified Union Gas customer;
- $25 for the sale and installation of a programmable thermostat.

The result of these HVAC partnership initiatives in 2011 amounted to 600 ESKs installed and more than 13,000 ESKs distributed. Those partners participating in the ESK installation component of the program also qualified to apply for incentives for installing programmable thermostats. HVAC partners were instructed that only sales to customers replacing a manual thermostat were counted as valid participants in the programmable thermostat offer.

Pick-up Depots Partnership Initiative

Union Gas continued to partner with strategically located retailer stores within its franchise area that served as a distribution arm. Examples of these stores are Home Depot, Sears as well as some HVACs who own a showroom. Although no financial incentives are offered to these depots, the promotional materials via bill inserts provided to Union's 1.1M residential customers directly led to increased traffic in retailer stores. In 2011, pick-up depots distributed more than 17,500 kits.

Figure 4.9, Pick-up Depot Promotional Material

Programmable Thermostat

In 2011, Union promoted a $25 on-bill rebate (Figure 4.10) for the purchase and installation of a programmable thermostat to its customers. This rebate, offered in the form of a coupon, was distributed through a number of channels:

- Bill inserts distributed to all Union residential customers
- ESK insert
- Home Depot, Lowes and Rona
- HVAC dealers
- Union Gas website

Figure 4.10, Programmable Thermostat: Bill Insert

Coupons were also provided to Home Depot and Rona as a form of promotion to their customers. Residential Account Managers maintained and monitored coupon inventory levels and refilled stock. In order to receive the on-bill rebate customers had to submit their active Union Gas account number on the completed coupon along with a copy of the bill of sale. Only coupon participants who indicated they were replacing a manual set- back thermostat were eligible to participate in the program.

4.1.3 Education and Awareness Efforts

While education efforts in the residential sector do not generate TRC, affecting consumer decisions relating to the benefits of DSM through awareness is crucial to gaining, and not losing, ground. Union targets educational outreach to customers to empower them to manage their energy costs. In 2011, Union continued to couple the promotion of existing TRC positive measures with educational tools such as the Wise Energy Guide. Union will continue to develop creative methods to make energy conservation education more effective.

In 2011 Union Gas continued to disseminate educational materials to inform customers and trade allies about energy efficiency through a variety of media:

- Interactive website
- Wise Energy Guides (WEG)
- InTouch monthly bill inserts
- Bi-Annual Residential HVAC Newsletter
- Energy conservation ESK events

Residential Energy Efficient Website

Energy Efficiency, environmental stewardship and conservation are a central focus of the Union Gas website. Within the residential section of the site, a dedicated Energy Conservation menu heading (uniongas.com/energyefficiency) has been created through which the following sub-sections can be viewed:

(a) Energy Saving Programs: Information and links to Union's different conservation initiatives (e.g. ESK, Drain Water Heat Recovery (DWHR), and the programmable thermostat rebate).
(b) Education: Information and links on buying a new home, energy efficient labels and a downloadable Wise Energy Guide.
(c) Industry Links and Programs: Information on Union's major partners, stakeholders and affiliates as well as links to conservation-related programs, both gas and non-gas focused, in the Ontario marketplace.
(d) Manage My Bill: 12 easy steps to help customers reduce their energy consumption and save money on their utility bill.
(e) Engee's Kids: Child-friendly section explaining natural gas, its use and how to conserve it.

Features on the site include:

- Online videos (topics include: the ESK, air sealing, and programmable thermostats)
- A downloadable programmable thermostat rebate coupon
- Downloadable educational materials
- Comparison tools on energy costs
- A listing of upcoming ESK events held by Union Gas
- A listing of ESK depots across Union's territory that customers can visit in order to pick-up a free kit
- An online order form for customers to request an ESK and have it delivered to their home
- An overview of energy efficiency rebate programs offered in the province, as well as links to third party organizations involved in energy conservation.

In 2011 alone, the energy conservation section of the residential website received almost 90,000 unique visitors and 260,000 page views. Those that visited stayed for an average of approximately six minutes and almost half returned for a recurring visit. These results clearly indicate that the content provided on the website is both informative and relevant to customers.

MyAccount

Launched in 2008, MyAccount is Union's online account management system for residential and small business customers (Figure 4.11). After logging into MyAccount, customers can assess personalized tools to help them better understand their energy use including:

- An archive containing 24 months of natural gas use and billing history
- A "compare bills" feature to graph consumption or bill amounts from two or more months

- A download feature to export energy data into a spreadsheet or energy management software

The synergies of these tools provide customers with feedback that can:

- Break “bad habits” related to energy use and form new, persistent habits
- Build a greater understanding of how actions/behaviours relate to energy consumption
- Influence motivations related to the use of energy

Figure 4.11, MyAccount

Wise Energy Guide (WEG)

In 2011, Union continued to distribute copies of the Wise Energy Guide (Figure 4.12). The guide includes up-to-date information on code changes, tips and solutions to reduce heat loss, manage bills, and an easy-to-use checklist to assist customers achieve energy efficiency in the home. The primary distribution method is Union’s website, where customers can view a digital copy or order a printed version to be delivered to their home.

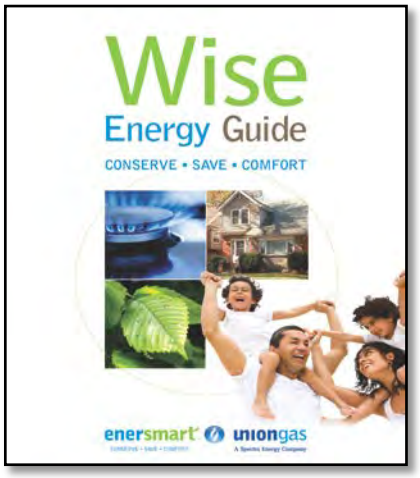


Figure 4.12, Wise Energy Guide

InTouch Monthly Newsletter

Union continued to distribute the monthly InTouch Newsletter in 2011 both in print (included as a bill insert) and online at www.uniongas.com/residential/eflyers/. These newsletters include educational messages related to residential energy efficiency (Figure 4.13). The messaging in 2011 included:

- The importance of regular equipment maintenance
- Tips to reduce heating and air conditioning use
- Purchasing tips for high efficiency equipment
- How to monitor natural gas consumption online
- Do-it-yourself energy efficiency improvements

Figure 4.13, InTouch Newsletter

Residential HVAC Newsletter

In 2011, Union continued to target residential Heating, Ventilation and Air Conditioning (HVAC) contractors through the GasFacts newsletter. This newsletter provides updates to the HVAC community related to Union's energy efficiency programs, codes and standards, and rebate offers from third party and government organizations, such as the ecoENERGY—HOMES retrofit program administered through Natural Resources Canada.

Dedicated HVAC Webpage

In the fall of 2011 Union Gas redesigned the HVAC partners section of the website (Figure 4.14). One goal of this targeted HVAC website is to drive further energy conservation messages and measures in the existing and retrofit markets.

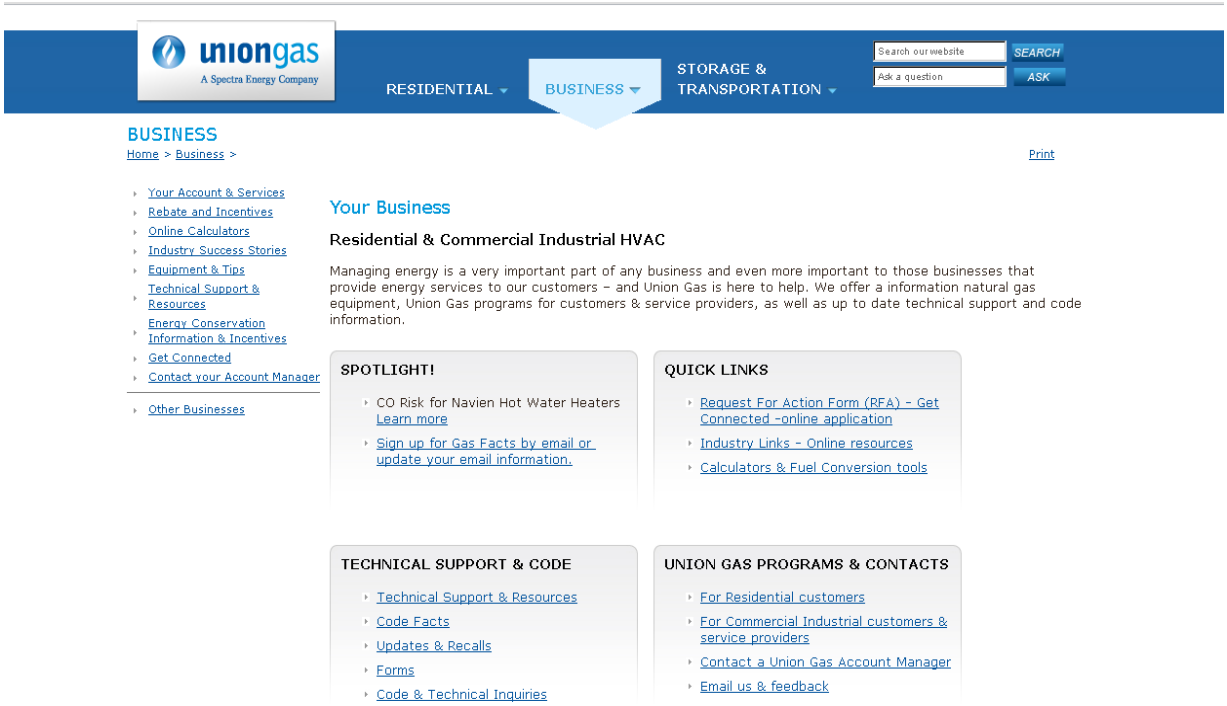


Figure 4.14, HVAC Webpage: www.uniongas.com/hvac

4.2 Program Results

The residential program contributed 3,346,580 m^3 in natural gas savings with a net program TRC of $15,105,081. As identified in Table 4.2, the greatest driver of the residential results was the Energy Saving Kit.

Table 4.2 - Major Residential Savings Drivers in 2011

Initiative	2011 TRC	2011 Units	2010 Units	2009 Units	2008 Units
Energy Savings Kit	$ 15,137,245.94	87,214	72,000	83,054	96,752
Programmable Thermostat	$ 925,364.94	10,717	8,878	17,460	9,296
High Efficiency Furnace	-	-	-	14,246	8,407
Total	**$ 16,062,610.89**	**97,931**	**80,878**	**114,760**	**114,455**

*Program costs not included in TRC results

Union annually commissions studies, based on ESK program delivery type, to verify that homeowners install the ESK measures. Adjustment factors applied to 2011 results reflect that only those participants who install the ESK measures, and keep them installed, are included in the savings calculations. The results of these 2011 verification studies are outlined in the Verification and Evaluation section (section 9) of this report.

4.3 Program Costs

Direct program spending in the residential market was over $2.699 million in 2011 as shown in Table 4.3 below.

Table 4.3 – Residential Program Costs

Residential	Incentives	Program Costs	Total Costs
New Home Construction	$ 547	$ 1,934	$ 2,481
Home Retrofit	$ 1,741,244	$ 955,596	$ 2,696,840
Total	**$ 1,741,791**	**$ 957,530**	**$ 2,699,321**

4.4 Lessons Learned

1. **Challenge in identifying positive TRC measures for the Residential Market**
    - The residential sector has limited measures which generate positive TRC results and the cost of delivering programs continues to rise in relation to the TRC earned. Both the continual downward pressure on achievable savings and the stricter codes and standards for energy efficiency are continuing to diminish measure opportunities for the residential market. Union's exploration of DSM measures for the residential segment has heightened since the 2009 removal of the Energy Star for New Homes program and the 2011 phase out for the high efficiency furnace measure. This underscores the unique challenge that Ontario's gas utilities are faced with in terms of identifying new viable technologies and strategies to incorporate into the residential DSM program portfolio using the TRC as a cost effectiveness screening test.

2. **Education**
    - Education initiatives to reach the residential sector do not in themselves generate TRC. In an effort to offer this service to Union's customer base and empower them to manage their energy costs in 2011, Union continued to couple promotion of existing positive TRC measures with educational tools such as the Wise Energy Guide. Union will continue to develop creative methods to make energy conservation education more effective.

3. **Leveraging the most cost effective channels**
    - In 2011, Union began using historical performance data to identify the most cost-effective channels and for ESKs and refine the delivery channel mix accordingly.

4. **Combining multiple forms of advertising for better results**
    - Union has found that spreading its advertising budget over several mediums works more effectively than concentrating on one. For example, Union has found that radio advertisements paired with radio and newspaper ads is the most effective means to promote ESK retail events and has applied this learning to other campaigns.

5. **HVAC Partnership**
    - In 2011, the HVAC partnership component of the program was modified in order to provide Union's HVAC partners with the option of either installing a showerhead for $40 or distributing an ESK for $20 as part of their service or sales calls. This dual approach and increased incentive resulted in a significant increase in distribution of ESK's through this channel. Providing additional opportunities to existing channels will help ensure the continued success of the program.

6. **Installation Program**
    - The number of kits installed by the HVAC installation program has been declining. One of the reasons is that HVACs service more or less the same customers in their territory. HVACs have previously promoted ESK to those customers and installed the kit for those customers who are interested. Union will evaluate whether continuing to run this type of HVAC program is beneficial, and will also look at focusing on other partners like municipalities (e.g. City of Guelph initiative).

7. **Retailer Event Greeters**
    - In fall of 2011, Union tested, for the first time, hiring greeters to promote ESK in the retailers' events (ex: Home Depot and Lowe's). The greeters' responsibility was to assist the residential account managers in engaging walk-in customers and explaining to them the benefits and cost savings associated with the installation of the ESK. The greeters assisted in distributing more kits as well as educating customers on the benefits of Union's offering. Union will look to continue having greeters at all events in 2012.

5. Low-Income Market

Low-Income Helping Homes Conserve (HHC) programs accounted for 4% of all DSM TRC in 2011, equating to a net TRC of over $15 million. Low-Income Helping Homes Conserve and Weatherization programs combined a total of 3.694 million m³ in savings. Direct program spending in the Low-Income market was $3.785 million.

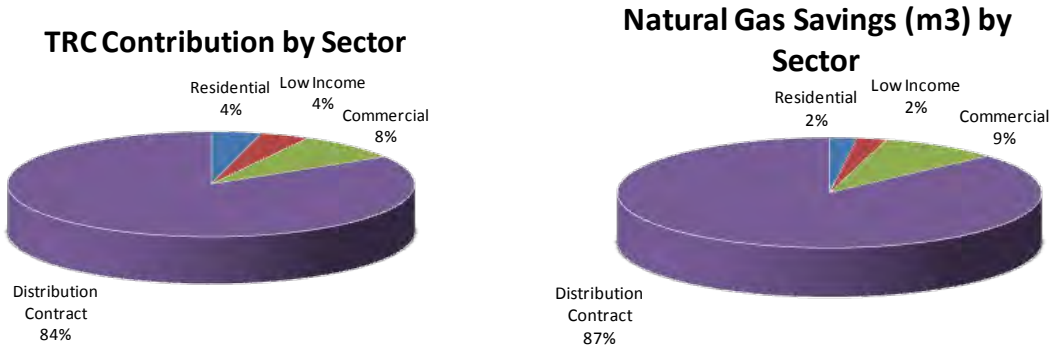


Figure 5.0, 2011 Results by Sector (Percentage)

Helping Homes Conserve

Since the HHC program launched in the fall of 2006, it has contributed to over 10 million m³ in natural gas savings and a net TRC of over $50 million. Table 5.0 summarizes the Helping Homes Conserve program results. In 2011, the program contributed 3.179 million m³ of savings with a net program TRC of $15.068 million, which reflects installation within 28,692 homes.

Table 5.0 - 2011 Helping Homes Conserve Program Results

Low Income	Net TRC	Natural Gas Savings (m3)	Units	Expenditures	TRC per Dollar Spent
2011 Results*	**$ 15,068,454**	**3,179,042**	**123,038**	**$ 1,729,178**	**$ 8.71**
2010 Results	$ 9,744,496	1,981,427	64,406	$ 1,575,064	$ 6.19
2009 Results	$ 13,497,387	2,746,452	87,549	$ 2,169,521	$ 6.22

**2011 Results do not include Weatherization*

Home Weatherization

In 2011, Union expanded its Low-Income Home Weatherization program both to increase the number of home retrofits and to provide for deeper weatherization to low-income households. The program contributed 514,599 m³ of savings at 450 homes. The scorecard results are presented in Table 5.1 below.

Table 5.1 - 2011 Home Weatherization Scorecard

Low Income Weatherization Scorecard							
Metrics Weighting	Metric Value Levels			Weight	Actual Results	Payout %	Score
	50%	100%	150%				
Weatherization Participants	300	400	450	50%	450	150.0	75/50
Total Natural Gas Savings (m3)	366,000	488,000	549,000	50%	514,499	121.7	60.9/50
Overall Results					$ 543,600	136%	135.9/100

5.1 Program Framework

Low-Income DSM programs are designed to reduce the energy burden facing low-income households. Union offers two programs for the low-income residential market: the TRC generating Helping Homes Conserve program and the revised Home Weatherization program. Helping Homes Conserve provides low-income customers with basic measures, while the Home Weatherization program addresses the building envelope more comprehensively. Given the changes resulting from the incremental low-income plan, the Home Weatherization program framework is described in greater detail in Section 5.1.1.

5.1.1 Incremental Low-Income Plan

On September 9th 2010, the OEB outlined expectations that Union would file an incremental Low-Income Plan with additional funding if required. Union filed and received approval for the incremental plan (EB-2010-0055) in late 2010 which allowed for an additional $2.465 million of available funds for low-income activity in 2011.

The additional $2.465 million in program spending was directed exclusively to the Low Income sector for the Home Weatherization program. With $1.65 million allocated to target driven activities and the remaining $0.815 million allocated to program development activities including: the addition of a basic audit in the Helping Homes Conserve program, research, data analysis, marketing and outreach, and education.

Incentive Impacts:

The incremental plan included a shift to a scorecard approach for measurement based on two equally weighted metrics: weatherization participants and total natural gas savings. Under this scorecard model, a maximum incentive of $600,000 could be achieved if the program reaches 150% of the overall scorecard performance level.

Screening Impacts

The TRC threshold used to screen potential upgrades was lowered to 0.7 for the Home Weatherization program. In addition, screening for this program was to be done at a household level as opposed to requiring TRC screening at a measure level (i.e. requiring basement insulation to be screened separately from attic insulation in the same home). The participant criteria was also increased to allow customers who have an income which is at or below 135% of Statistics Canada's pre-tax, post-transfer Low-Income Cut-Off (LICO) to be eligible for the program.

5.1.2 New initiatives in 2011

Partnership with the Ontario Non-Profit Housing Association (ONPHA):
Union Gas partnered with the Ontario Non-Profit Housing Association (ONPHA) in 2011 by placing advertisements in their bi-monthly newsletter, *Quick Connections* to advertise Union's applicable energy conservation programs to eligible Social and Assisted Housing Providers. Moreover, Union sponsored the ONPHA regional meetings in the following regions in order to further promote these programs: Hamilton, London, Windsor and North Bay. Union found that these channels were an effective means of educating social and assisted housing providers on the cost benefits of Union's energy conservation programs for multi-unit properties in the affordable housing market in order to drive installation appointments.

Conservation Demand Management (CDM) Collaboration - Hydro One Partnership:
In April of 2011, Union Gas partnered with Hydro One to deliver a collaborative basic measure program in Owen Sound and Timmins. Eligible Union Gas and Hydro One customers were offered free energy saving measures including the free installation of energy-efficient showerheads, pipe wrap, a programmable thermostat and up to four Compact Fluorescent Lights (CFL's). Bathroom and kitchen aerators and a power bar were left behind for self-installation. To be eligible, the recipient had to be an active Union Gas or Hydro One customer, be on a fixed or limited income, and pay their own gas and hydro bill.

Union gained valuable experience and insights in partnering with an electric utility. In addition to program management and administration, outreach requirements and customer intake, Union also acquired knowledge of the CDM measures and how they could be paired with DSM measures to maximize customer value. This partnership allowed for the delivery of a collaborative CDM/DSM program and was successful in providing 609 customers with a multi-fuel treatment of basic measures in their home. Union will continue to build on this experience as we work with other electric utilities to deliver conservation programs in the future.

Revised Home Weatherization - Incremental Low-Income Plan:
In 2011, Union expanded its Home Weatherization program both to increase the number of home retrofits and to provide for deeper weatherization to increase the average volume of natural gas conserved per home.

Basic Audit:
Union worked to develop a pre-screening process in the form of a basic audit throughout 2011 with the intention of recruiting eligible participants from the Helping Homes Conserve program into the deep-measure Home Weatherization program. This pre-screening concept was continuously improved upon throughout 2011 as the Low-Income team consulted with delivery agents to determine the most effective means to implement this process in the field. This concept will be re-visited as Union transitions away from the Helping Homes Conserve program in 2012.

Segmentation Research Initiative:

The primary objective of the 2011 low-income research was to identify key market differences across major geographic locations. Union hosted a mix of focus groups and in-depth telephone interviews with social service agencies in London, Hamilton, Windsor, Sudbury, Chatham, Kirkland Lake, New Liskeard and Cobalt. This research provided Union with invaluable information about how low-income customers interact with social service agencies in the community and how their behaviours vary between the North and the South.

Data Analysis:

Union contracted DMTI (Desktop Mapping Technologies Inc) to conduct data analysis on low-income customers to accurately identify homes and neighbourhoods with high probabilities to meet the Weatherization program's eligibility criteria. Various data points were examined, including demographic information of residents, consumption history and LICO propensity. Union also acquired licensing rights of Property Data from Municipal Property Assessment Corporation (MPAC) in order to look at core property attributes including age of home and size of home. These data points were overlaid to develop a customer index. This information provides Union the ability to appropriately target neighbourhoods that meet both the income and cost-effectiveness criteria.

Marketing and Outreach:

Union produced several printed marketing materials for the Weatherization program, including a four-panel brochure for end-use customers and a sell sheet for property managers. The weatherization web page on uniongas.com was updated to include registration functionality. Union also began producing weatherization videos to support customer understanding of the program.

Education:

Union ran a "Lunch and Learn" session in November of 2011 that targeted tenants of Hastings County Housing that had their home retrofitted through Union's Weatherization program. Participants were educated on the retrofit work that was done in their home and shown low-cost and no-cost ways to further reduce energy costs in the home without sacrificing comfort. Each participant was provided with a free weatherization kit and education literature in order to drive behavioural changes and encourage tenants to continue practising conservation after measure installation has been performed.

Evaluation Study:

An evaluation study was envisioned as part of the Low Income Incremental Plan. In an effort to define the intention and scope of study Union consulted with the Low-Income Working Group to outline next steps. At this juncture, next steps include an information exchange with Union's Home Weatherization delivery agent and the Low-Income Working Group which will take place in 2012.

5.1.3 Existing Initiatives

Helping Homes Conserve

Union continued to deliver the basic measure Low-Income program Helping Homes Conserve (HHC) across 43 communities. This program offered low-income customers the free installation of energy-efficient showerheads, pipe wrap, and a programmable thermostat. Bathroom and kitchen aerators were left with the customer for self-installation.

This program was targeted to customers who had an income at 135% or below the Statistics Canada pre-tax, post-transfer Low-Income Cut-Off (LICO).

To qualify for the program, customers had to meet the following criteria:

- Pay own Union Gas bill (unless a tenant is residing in social housing)
- Live in an individually metered low-rise dwelling or Part 9 building (three stories or less)
- Have a gas-fired water heater (for energy-efficient showerhead & aerator)
- Have a gas-fired furnace (for programmable thermostats)

Union's main approach to delivering HHC was through a targeted neighbourhood strategy. A target list of low-income customers was developed through third party postal code data that identified neighbourhoods with a high propensity of low-income residents. These postal codes were then cross-referenced against Union's internal customer data and target lists were created. To ensure the privacy of customers, customer names were never used on any marketing materials and were never supplied to Union's third-party installation contractor, Eco-Fitt. Instead, homes were always identified by address only.

Prior to a technician entering a neighbourhood, the identified customers were sent a direct mail awareness package providing information on the program benefits and notifying them that a technician would be visiting their neighbourhood in the next few weeks. Customers then received a notification flyer two to three days prior to a technician's visit to remind them that personnel would be in the neighbourhood performing installations. Technicians would then visit the homes offering customers installations and/or schedule for an installation at a more convenient time. Once the installation was completed, the customer would sign an acknowledgement form and receive a programmable thermostat instruction sheet and education guide which includes low cost energy conservation tips tailored to low-income customers. If a customer was not home, a door hanger would be left behind to let them know a representative offering HHC measures had visited and to encourage them to call the toll free number provided or visit the web to book an appointment.

Home Weatherization Program

In 2011, Union continued to deliver the Home Weatherization program to low-income customers residing in Windsor, and expanded the program to the Hamilton, Belleville and Trenton areas. This program offers low-income customers with a free home energy audit and building envelope upgrades, including: attic insulation, wall insulation, basement insulation and draft-proofing measures. The upgrades performed in the home were determined by the results of the home energy audit. Once the installation of measures was complete, another energy audit was then performed to assess the actual energy savings realized by the upgrades.

In 2011 Union built on the momentum gained in Windsor from the previous year and partnered with both Windsor Essex Homes and Windsor Homes Coalition. Union expanded the program to the Hamilton and Belleville/Trenton areas, working with City Housing Hamilton and Hastings County Housing respectively. In Hamilton, Union hired an ambassador to work with EnviroCentre in managing the customer experience of the Home Weatherization program. This individual was responsible for helping to prescreen homes, set process expectations with customers and deliver notices of upcoming audits and contractor visits. The role of this ambassador was crucial in gaining traction and building an infrastructure for the Home Weatherization program in Hamilton.

The expansion of the program into the Belleville and Trenton area proved to be very successful as it enabled program delivery within a new area of Union's franchise and gave Union more experience weatherizing single detached residential dwellings, townhouses and duplexes. It also allowed Union to grow capacity with our delivery agent, EnviroCentre, by developing delivery capabilities in the Belleville and Trenton areas.

5.1.4 Education and Awareness

In 2007, Union recognized that there was a need not only to provide conservation programs directed to low-income customers, but also to educate customers on the direct benefits of energy-efficient behaviour. Union also learned that there was a lack of awareness amongst low-income customers and stakeholders on conservation programs available to them. To address these issues, Union added an education and awareness component to the HHC program.

Education Guide

To provide further value to customers after installing the measures as part of the HHC program, Union provided each customer with an education guide specifically tailored to low-income customers that outlined low-cost and no-cost energy reduction tips for the home. Union utilized the services of an expert energy consultant to improve and revise the content of the Energy Saving Guide. The guide included energy tips for home heating, water heating, windows, doors & weather stripping and lighting. Every customer who participated in the HHC program or attended an energy clinic received an education guide with their installation.

Education Clinics

In 2011, Union hosted a total of twelve education clinics in collaboration with social service agency partners in London, North Bay and Windsor that reached approximately 190 participants; a 55% increase from the participation in 2010.

A local Union Gas Account Manager hosted each session and spoke to the attendees about various ways that they could save energy in their home. Attendees were encouraged to try out some of the products that were discussed, such as caulking and applying window film. A mock window was available at every session for the attendees to practice on.

By hosting an interactive session which allowed the attendees to try out the products, Union was able to provide customers with the knowledge and comfort level to perform these applications in their

home. At the end of the session, customers were provided with some home weatherization products such as caulking, window film and weather-stripping for installation in their home. These products were not distributed for TRC generation but rather as an added-value for those who took the time to attend the clinic. Union also provided education materials including the Energy Saving Guide and the Helping Homes Conserve program brochure.

Local Partnerships

Establishing local partnerships in the community is critical to the success of low-income programs. These partners have extensive knowledge, experience and understanding of low-income issues, the neighbourhoods and needs of the residents. They also have trusted relationships with numerous low-income customers. To bring further awareness of Union's program to low-income customers, Union partnered with various organizations in the communities to help deliver its message and build awareness of the 2011 programs. Union partnered with the following agencies as of 2011:

Hamilton

- Housing Help Centre
- Neighbour to Neighbour
- The Immigrant Women's Centre
- City Housing Hamilton

Windsor

- The Corporation of the City of Windsor, Housing & Children's Services
- Windsor Essex Housing Corporation
- Windsor Homes Coalition
- Youth and Family Resources Network
- United Way Windsor

Sudbury

- The Red Cross, Housing Division

London

- The Salvation Army of London
- Municipal Housing, London
- Families First
- LIFE*SPIN
- London Urban Services Organization (LUSO) Centre
- Intercommunity Health Centre
- Beacock Branch Library
- East London Branch Library
- Sherwood Branch Library

Cornwall

- Cornwall & Area Housing
- EnviroCentre
- Family Counselling Centre

North Bay

- North Bay Area and Social Planning Council

Brantford

- The Corporation of the City of Brantford, Social Housing

Dundas

- Dundas Community Services Centre

Cambridge

- Langs Farm Village Association

Belleville/Trenton

- Hastings County Housing

These partners have been invaluable in generating awareness for the program by distributing Union's program brochures, speaking to their clients about the program, and by allowing Union to host education clinics for their clients.

5.2 Program Results

Helping Homes Conserve

The Helping Homes Conserve program contributed 3.179 million m^3 of savings with a net program TRC of $15.068 million. The increased geographic reach and expansion of infrastructure allowed the program to see an increase in the number of customers that participated in the program in 2011 compared to 2010 (see details in Table 5.2).

Table 5.2 - Helping Homes Conserve Total Participant Summary

Measure	2011 Units	2010 Units	2009 Units
Energy-efficient Showerhead	28,692	14,384	20,061
Kitchen Aerator	28,866	14,508	18,478
Bathroom Aerator	28,866	14,443	18,478
Pipe Insulation	28,910	14,542	18,667
Programmable Thermostat	7,704	6,395	11,790
Weatherization	450	134	75

* *The Home Weatherization program results are tracked separately from the HHC program*

Home Weatherization

Union surpassed the 100% of the performance metric, reaching an incentive payout of $543,600 in 2011. Table 5.3 outlines the results achieved in the incremental Low Income Weatherization program in 2011.

Table 5.3 - Low Income Weatherization Scorecard

Low Income Weatherization Scorecard							
Metrics Weighting	Metric Value Levels			Weight	Actual Results	Payout %	Score
	50%	100%	150%				
Weatherization Participants	300	400	450	50%	450	150.0	75/50
Total Natural Gas Savings (m3)	366,000	488,000	549,000	50%	514,499	121.7	60.9/50
Overall Results					$ 543,600	136%	135.9/100

5.3 Program Costs

Helping Homes Conserve

Direct program spending in the low-income HHC program in 2011 was just over $1.729 million, below the planned expenditure of $1.903 million outlined in Section 3 of this report.

Home Weatherization

Low-income weatherization expenditures in 2011 equalled approximately $2.056 million, which is $0.409 million less than the allocated budget from the incremental plan. Table 5.4 outlines the 2011 expenditures for the Low-Income weatherization program.

Table 5.4 - Low Income Weatherization Expenditures

Low-Income Initiatives		2011 Incremental Spend
Weatherization Program		
Measures/Audits and Program Administration	$	1,662,139.99
Marketing and Education	$	41,872.69
Data Analysis	$	290,300.00
Basic Audit		N/A
Other	$	22.02
Weatherization Program Subtotal	$	1,994,334.70
Research & Evaluation	$	61,447.99
Total Budget Spent	**$**	**2,055,782.69**

5.4 Lessons Learned

1. Partnership Development

Continuing to foster and develop local partnerships within the community is key to providing access to information on low-income customers, promoting the program to their clients/contacts, and gaining trust within the community. Partnerships included property management firms, Social Service Agencies, Social Housing and Assisted Living Agencies and municipalities, a top down approach that engendered greater program traction.

2. Expansion of Service Provider Capacity within Franchise Area

Union was successful in achieving strong results in 2011 for both the Helping Homes Conserve and Home Weatherization program largely due to the expansion of service providers within Union's franchise area. The increased capacity of Union's delivery agent, Eco-fitt, allowed the Helping Homes Conserve program to be delivered in 27 new communities in 2011 for an overall reach of 43 communities. Union's Home Weatherization delivery agent, EnviroCentre, drove the expansion of this program to new municipalities in 2011 such as Belleville, Trenton and Hamilton. This was accomplished by sourcing local energy auditors and retrofit contactors in each municipality that could implement the program effectively.

3. Program Development Activities

Union was challenged in completing some of the program development activities that were set out under the incremental low-income plan. While Union was successful in completing projects for market segment research and data analysis as noted in Section 5.1.1, other activities around education, marketing, evaluation and the basic audit will be completed in 2012. For these reasons, the program did not spend all available funds relating to program development activities in 2011.

4. Enhancing Communication Tools

In order to drive greater awareness in outreach or "Lunch and Learn" sessions, Union would benefit from conducting additional outreach in order to foster participation, and opening up the session to all tenants under the partner housing provider (including those who have yet to participate). This would increase the size of the target audience, and provide the opportunity to promote Union's program to future target participants.

6. Commercial Market

Commercial energy efficiency programs accounted for 9% of DSM savings in 2011, totalling 15 million m^3 in natural gas savings with a net program TRC of $32.856 million. Direct program spending in the commercial market was just over $4.143 million.

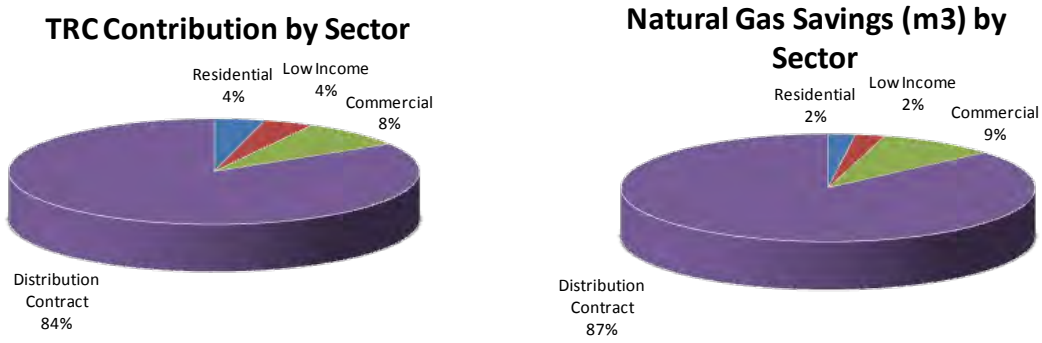


Figure 6.0, 2009 Results by Sector (Percentage)

In 2011, Union continued to offer commercial programs in the New Build Construction and Building Retrofit markets. Commercial savings driven through the building retrofit market represented 70% of sector savings in 2011. Table 6.0 summarizes the commercial market program results for 2011.

Table 6.0 - 2011 Commercial Program Results

Commercial	Net TRC	Natural Gas Savings (m3)	Units	Expenditures*	TRC per Dollar Spent
New Building Construction	$ 7,864,551	4,457,662	988	$ 758,616	$ 10.37
Building Retrofit	$ 24,721,631	10,452,252	74,414	$ 3,384,502	$ 7.30
2011 Results	**$ 32,586,182**	**14,909,914**	**75,402**	**$ 4,143,118**	**$ 7.87**
2010 Results	$ 34,397,361	10,997,192	84,870	$ 3,932,266	$ 8.75
2009 Results	$ 74,008,306	21,069,115	149,677	$ 4,637,816	$ 15.96

** Expenditures include direct program costs.*

Given the diverse nature of commercial custom projects and their importance to the overall DSM portfolio, in 2011 Union Gas continued with its quality control reviews process for custom project files as recommended during the audit of Union Gas's 2008 DSM Annual Report. Quality control management for custom projects came into effect in July of 2009 and has continued throughout 2011.

6.1 2011 Program Framework – Approach to Market

Union Gas uses a segmented approach to the commercial market based on industry type. Segmenting based on industry type means that Union approaches 'like' customers in a more harmonized way and targets each segment with more customized, relevant and valuable communications. The eleven main customer segments targeted in 2011 included: Office, Retail, Multifamily, Foodservice, Hotel/Motel, Manufacturing, Agriculture, Warehouse, Entertainment/Recreation, Education, and Healthcare. All segments were within the Commercial M1,

M2, R01 and R10 rate classes. This approach allows Union to utilize existing resources more effectively to educate business customers about potential energy savings. In addition, segmenting based on industry type has provided Union with market insights, allowing better understanding of Union's commercial customer base and barriers for DSM uptake.

When targeting each segment, Union's highly skilled team of Sales Account Managers and Marketing support execute on one or more of the following approaches to market:

- ***Direct Sales Approach***: With this approach, Union's Account Managers work directly with the end-user to educate them on potential options to improve the energy efficiency of their facilities, programs available to facilitate those options, and how the application process works. The direct sales approach requires working with multiple contacts within an organization as well as service providers, manufacturers and distributors who are instrumental in affecting a decision to install energy efficient technologies.
- ***Mass Market Approach***: Union Gas uses a number of mass marketing techniques to target the end-use customer such as direct mails, email blasts, and advertising as well as event based marketing including tradeshows and other similar events to reach a large number of customers and channel partners.
- ***National Account Approach***: Union's National Account Managers communicate and influence end-use customers using a top-down, centralized approach. National Account customers are those that have multiple property locations throughout Union's franchise area with similar design and use, such as retail chains, property management firms and foodservice chains.

Not only does Union reach and influence through the above direct sales, mass market and national account approaches, but support is also provided by a network of industry partners. These industry partners specify or install energy efficient equipment and/or directly educate or influence Union's customers to adopt natural gas energy efficient equipment. Maintaining and growing relationships with each of the following industry partners ensures that they are informed of Union's programs and that they can articulate the savings, benefits and incentives to customers.

  - ***Service Providers -*** Architectural consultants, builders, HVACs, engineering consultants and energy service companies.
  - ***Associations –*** Associations align with segment specific approach to market and provide industry insight necessary to designing programs that resonate with customers and drive action.
  - ***Manufacturers*** - Manufacturers of the technologies that Union promotes provide insight into products' key benefits, as well as an effective method to influence the market.
  - ***Distributors*** - Distributors influence the market and their contractor customers. Contractors then influence the end-use customers installing the equipment.

6.1.1 Commercial Program – 2011 Incentives

A portfolio of energy efficient technology related incentives were available to commercial customers in 2011 through the Commercial New Buildings and Commercial Existing Buildings programs. Union uses the EnerSmart Program brand platform to educate customers about, and promote the adoption

of, high efficiency natural gas technologies and/or processes, as well as audits, surveys, studies etc. Union's commercial EnerSmart programs are divided into 3 types, including:

1. ***Prescriptive Programs:*** These programs have predictable energy savings based on the size and classification of the equipment. The energy savings for these measures are prescriptive in nature and have been filed with, and approved by, the OEB.

2. ***Quasi-Prescriptive Programs:*** These programs, also approved by the OEB, are slightly different than the Prescriptive technologies. The key difference is that the potential energy savings for these technologies are 'quasi-prescriptive' not prescriptive. This means that the majority of the saving inputs will be prescriptive; however, there will be one or possibly few inputs that need to be customized for each installation to determine the TRC value. Examples of inputs that would have to be customized for each installation/claim are: where a piece of equipment is installed (new or existing building), type of business (e.g. Foodservice or Healthcare) and size of equipment (e.g. CFM or BTU).

3. **Custom Programs:** The Custom program pays for surveys and studies that identify energy efficiency projects that save money and reduce natural gas consumption. The Custom program also helps fund the purchase and installation of non-prescriptive/non-quasi-prescriptive equipment that make a company more energy efficient. Given the myriad of technologies and combinations, the TRC for each project is unknown; therefore, each project requires a unique calculation of expected TRC on a project-by-project basis.

End-Use Customer Funding Strategy

In 2011, Union continued the end-use customer funding approach where the bulk of the incentive is provided directly to the end-user. This approach is simple and transparent and it ensures not only that the customer is clearly aware of Union's involvement, but also that the incentive is rewarding those who are actually making the decision and adopting the energy efficient application and/or process.

While the bulk of the incentives are offered to the end-use customer, Union has built strong relationships among the industry partners, especially service providers to help generate program awareness. In support of this information transfer, Union continues to offer a Service Provider Incentive in 2011. The Service Provider incentive offers channel partners, such as architectural consultants, commercial builders, commercial HVACs, engineering consultants and energy service companies (ESCo's), suppliers, key associations, distributors and manufacturers a financial incentive for their influence in the sale and installation of all prescriptive programs with the exception of HWC and Pre-Rinse Spray Nozzles. Table 6.1 outlines the incentive levels for the commercial technologies supported in 2011.

Table 6.1 - Financial Incentives for 2011 Programs

Prescriptive Programs	Customer Incentive	Service Provider Incentive
Front-Loading Clothes Washer CEE Tier 2	$50	$50
Condensing Boilers Up to 299 MBtu/hr 300 – 999 MBtu/hr ≥ 1,000 MBtu/hr	 $250 per unit $1000 per unit $2500 per unit	$100
Condensing Gas Water Heater 1000 gal/day/tank	$100	$50
DCKV 0 - 4,999 cfm 5,000 - 9,999 cfm 10,000 - 15,000 cfm	 $1,000 $2,500 $2,000	$100
Destratification Fan	$500	$100
Energy Recovery Ventilator (ERV) Healthcare & Multifamily New & Existing Buildings ≤ 1,000 cfm > 1,000 cfm All non-Healthcare & Multifamily New & Existing Buildings ≤ 2,000 cfm > 2,000 cfm	 $250 per unit $1,000 per unit $100 per unit $500 per unit	$100
Heat Recovery Ventilator (HRV) Healthcare & Multifamily New & Existing Buildings Hotel/Motel, Foodservice, Retail or Entertainment New & Existing Buildings 500 to 1,999 cfm ≥2,000 cfm	 $250 per unit $100 per unit $250 per unit	$100
HWC – Showerheads & Faucet Aerators	1 Free Showerhead, Kitchen & Bathroom Aerator/unit + $3 installation incentive	N/A
Infrared Heaters 20-99 Mbtu/hr 100-300 Mbtu/hr	 $50 per unit $100 per unit	$100
Pre-Rinse Spray Nozzle	Free	N/A
Programmable Thermostat	Free P-Stat + Free Install OR Free P-Stat + $40 install incentive	$15 per stat

Condensing Make-up Air Unit **Improved efficiency units** Multifamily and Long Term care (minimum size 1,700 cfm) **Efficiency units with 2-speed motors or Variable Frequency Drives** All commercial segments Sizes >= 1,700cfm	$200 - $1,000 per unit $400 - $2,400 per unit	$100
Laundry with Ozone Equipment	$500-$4,000	$100
Cooking Equipment HE under-fired broiler Energy Star Convection Oven Energy Star steam cooker Energy Star fryer	$100	$50
Energy Star Dishwasher Under-counter Stationary rack Rack conveyor	$100 $100 $400	$100
Custom Project Equipment Incentives	15% of capital costs (up to $40,000)	N/A
Feasibility Study	30% of cost (up to $4,000)* **multisite cap of $4,000*	N/A
Steam Trap Survey	50% of cost (up to $6,000)	N/A
Design Assistance Program	N/A	$4,000/project
Industrial Process Study	66% of cost (up to $20,000)	N/A

6.1.2 New Initiatives in 2011

Cooking Equipment

High Efficiency and Energy Star Cooking Equipment are 20-50% more efficient than traditional cooking equipment. Eligible equipment includes Energy Star fryers, steam cookers, convection oven and high efficiency under-fired boilers. This program was targeted to all commercial kitchen customers.

Still in its infancy, marketing efforts for this initiative included mass marketing to commercial kitchen customers through direct mail, email blast, and association newsletters, as well as a direct marketing approach to the foodservice, hotel/motel, education and healthcare segments. Union also utilized a targeted National Accounts strategy to the foodservice segment to capitalize on program uptake from the key chains within Union's franchise. Relationships with manufacturers were built and actively managed in 2011 to support awareness of Union's program and to ensure the program was being promoted to their customers.

Laundry Equipment with Ozone

The ozone laundry system is a piece of auxiliary equipment added onto a new or existing commercial washing machine which reduces the amount of chemicals, detergents and hot washing and drying times required to achieve the same standard of cleaning. Union markets this program to customers with large volumes of laundry such as hotel/motel, laundry services and healthcare segments.

Marketing efforts included promotion through a direct sales approach by collaboration with technology manufacturers to effectively reach and influence early technology adopters. Additional marketing promotion included editorial opportunities through a hotel/motel association newsletter to build awareness of this technology.

Energy Star Dishwashers

Energy Star commercial dishwashers reduce energy, water consumption and improve performance. On average they are 25% more energy efficient and 25% more water efficient than standard models. Models include under counter, door and conveyor type as well as rack-less conveyor. Union Gas markets Energy Star dishwashers to all customers with commercial kitchens via a direct sales and mass market approach which include the foodservice, education, healthcare and hotel/motel segments.

Condensing Make-up Air

Condensing Make-up Air units are indirect gas fired and provide fresh air to common areas in commercial buildings. The majority of furnaces built into rooftop units are mid-efficiency units with efficiencies ranging from 78% - 82%. Condensing technology offers improved efficiencies of 90% plus and the high 'turn down' feature results in lower operating costs, and better control and comfort.

There are three sub-categories for this technology:

1. Improved efficiency
2. Efficiency + 2 speed
3. Efficiency + Variable Frequency Drives (VFDs)

Condensing technology is relatively new in the marketplace. As a new technology, the adoption rate was minimal in 2011 but momentum is expected to increase throughout 2012. The marketing of this program included a direct sales approach, educational workshop opportunities to create knowledge and awareness, as well as targeted marketing materials.

Hot Water Conservation – Non Multi-family

In 2011, the Hot Water Conservation (HWC) program was expanded to non multi-family segments targeted to: hotel/motel, long term care/retirement facilities, university residences/dormitories and "other" (such as food services, entertainment, etc). This program is designed to reduce hot water consumption, and more specifically, the corresponding natural gas required to heat the water, through the installation of energy efficient showerheads and faucet aerators. Union achieved consensus with its EAC on the technical input assumptions for these offerings and additionally, conducted verification for these new segments.

6.1.3 Existing Initiatives/Offerings

The following outlines details of Union's existing Prescriptive and Quasi-Prescriptive Water and Space Heating programs in addition to Union's Custom Programs.

Water Heating Programs - Prescriptive

The technologies supported in this area include:

- Efficient Pre-Rinse Spray Nozzles
- Showerheads and Aerators (Hot Water Conservation Program)
- Condensing Gas Water Heaters
- Front Load Clothes Washers

Pre-Rinse Spray Nozzle

This technology involves a high-pressure 0.64gpm nozzle. This is the most efficient spray nozzle available in North America and can save up to $850 per year in gas energy costs. In 2011, Union continued to deliver this program through third party delivery with Ecolab Corporation (Ecolab). Union maintained this partnership given the success achieved in working with Ecolab since 2009, and given Ecolab's presence in the foodservice segment. This has allowed Ecolab's field service representatives to both capitalize on their long standing business relationships with foodservice establishments and form new relationships across the Union franchise area to deliver this program. In 2011, a number of customers who previously participated in Union's pre-rinse spay nozzle program became eligible to replace their nozzles since their older, higher flow (1.24gpm) models had reached the end of their useful life.

Union promoted the benefits of energy-efficient pre-rinse spray nozzles through:

- direct sales approach with Ecolab (delivery partner) representatives
- mass marketing initiatives such as direct mails and email blasts
- key associations and national accounts

Figure 6.1, Pre-rinse Spray Nozzle Promotional Literature (front and back)

Hot Water Conservation Program

This program was designed to reduce hot water consumption and the corresponding natural gas required to heat the water through the installation of energy efficient showerheads and faucet aerators. Union supplied the measures at no charge to customers for self-installation. Midyear in 2011, Union introduced an installation rebate to encourage immediate installation of the HWC products and collected additional end-user information. A $3 per product installation incentive was offered to the participants if the equipment was installed within eight weeks of shipment.

This program targeted property managers and multi-family facilities by offering a free 1.25gpm showerhead, a 1.5gpm kitchen aerator and a 1.0gpm bathroom aerator for each shower and sink contained within each unit of their building. In 2011, the HWC program expanded to non multi-family facilities including hotel/motels, university dorms/residences, long-term care/retirement facilities, and 'other' (such as food services, entertainment, etc).

In 2011, customers who previously participated in Union's HWC Multi-family program became eligible to replace their showerheads since their older models had a higher GPM factor than the current model delivered for this program.

Union continued to deliver this program through Eco-Fitt Corporation (Eco-Fitt) in 2011. Eco-Fitt was responsible for tracking and managing all orders generated by Union's mass market campaigns through Eco-Fitt's online system or by fax, mail or phone.
In 2011, Union distributed 41,571 units within the multi-family segment, a marked decline from 78,263 in 2010. As the market gets saturated, this program continues to become more challenging, however opportunities remain in the non multi-family segment for showerheads.

The Hot Water Conservation Program was promoted through:

- Mass market initiatives such as direct mails and email blasts
- Tradeshows/events – e.g. Property Management Expo
- Key associations
- National Accounts approach
- Union's business website

Figure 6.2, Showerheads & Aerators Promotional Material

Condensing Gas Water Heater 1,000 gal/day/tank Program

Condensing gas water heaters are high-efficient gas water heaters that operate at 95% thermal efficiency. This thermal efficiency is higher than the conventional tank type water heaters that operate at 80% efficiency – which results in faster hot water cycle times and, therefore, reduced building operating/energy costs. This program was targeted at multifamily, foodservice, education, recreation/ entertainment and healthcare customers whose hot water usage exceeds 1,000 gallons per day. Marketing efforts included promotion through a direct sales approach, mass market initiatives (direct mails and email blasts), tradeshows/events, and key association publications.

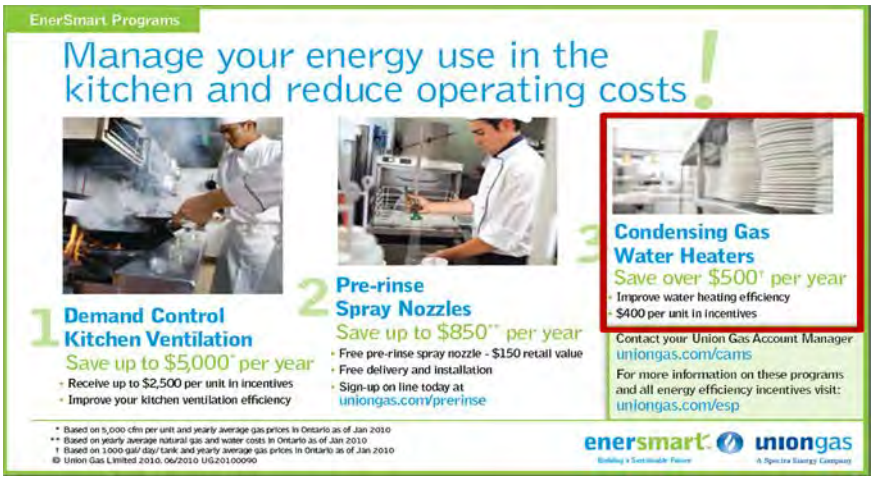


Figure 6.3, Condensing Gas Water Heater Promotional Literature

Front-Loading Clothes Washer- CEE Tier 2 Program

Front load washers extract more moisture from the clothes, thereby reducing the time, energy and cost of drying. This program was targeted at the multifamily segment. Marketing efforts included promotion through a direct sales approach, mass market initiatives (direct mails and email blasts), tradeshows/events, relationships with key manufacturers and suppliers, and promotion in key association publications.

Space Heating Technologies – Prescriptive

Measures that fall within this category include:

- Programmable Thermostats
- Demand Control Kitchen Ventilation

Programmable Thermostats (P-Stats)

This program promoted the replacement of mercury thermostats with a P-stat. A P-stat adjusts the temperature of a building space according to a series of programmed settings that take effect at different times of the day, and different days of the week. The benefit of this is a reduction in annual heating/cooling costs by up to 10%. This program was available to all customers.

In 2011, Union continued its relationship with Eco-Fitt Corporation (Eco-Fitt) as the delivery agent for the P-Stat Program. Eco-Fitt was responsible for tracking and managing all orders generated by Union's mass market campaigns through Eco-Fitt's online system or by fax.

This program was promoted through:

- Mass market initiatives such as direct mails and email blasts
- Direct sales, where Union worked with contractors who promoted this program directly to end-users
- Tradeshows/events - e.g. Property Management Expo (PM Expo)
- Key association ads, newsletters, publications
- Union's website – self serve order fulfillment

In 2011, Union distributed only 3,551 p-stats. During Union's 2010 Audit, new information related to p-stat savings became available and as such Union exited this program as the offering no longer remained cost effective despite a positive TRC.

Figure 6.4, Programmable Thermostat Promotional Material

Demand Control Kitchen Ventilation (DCKV)

Traditional ventilation systems operate at only one speed, whereas the speed of demand control kitchen ventilation systems automatically respond to changes in cooking volume and heat, resulting in much greater efficiency. The prescriptive savings for DCKV were based on three ranges of total range hood exhaust: 0 – 4999 CFM, 5000– 9999 CFM, and 10,000–14,999 CFM. The midpoint of each exhaust range was used to calculate energy savings for both gas and electricity.

Union works closely with manufacturers and end use customers to promote Demand Control Kitchen Ventilation (DCKV) systems. Union's efforts resulted in 15 installations, a slight decrease from the 18 installations in 2010 as a result of the longer than normal sales cycles. In the National Accounts segment, Union marketed the benefits of DCKV through the following communication vehicles:

- Industry trade magazine advertisements
- Newsletter communication through association (ORHMA)
- Mass marketing through direct mail and email blast
- Trade show participation (e.g. CFRA)
- National Accounts Approach with foodservice chains

Figure 6.5, Demand Control Kitchen Ventilation Promotional Material

Space Heating Technologies – Quasi-Prescriptive

As described previously, the energy savings for some measures are dependent on the application and segment in which they are installed and employ an automated savings calculator. These quasi-prescriptive measures include:

- Energy Recovery Ventilators (ERVs) & Heat Recovery Ventilators (HRVs)
- Condensing Boilers
- Infrared Heaters
- Destratification Fans
- Condensing Make-up Air Units

ERVs & HRVs

The most efficient way to provide indoor to outdoor air exchange to improve air quality is with an ERV or HRV. ERVs capture heat/moisture and HRVs capture only heat. Recovered heat/energy is used to heat air entering the building, which reduces energy use and energy related costs, and makes the whole system operate more efficiently. All commercial customers are eligible for this program; however Union mainly targets healthcare and education customers.

In 2011, Union offered end-use customers $100-$1,000 per unit. Union did not make any major changes to the marketing of this program in 2011 and continued with promotion through:

- Direct and national account sales approach
- Key healthcare/education association ads, newsletters, publications, customer direct mails and email blasts
- Key healthcare/education tradeshows/events speaking opportunities highlighting ERVs/HRVs and customer testimonial success stories, e.g. OASBO
- Building/maintaining relationships with key service providers and manufacturers to ensure education/awareness of Union's programs, as well as promotion of the programs to their customers

Condensing Boilers

In 2011, Union continued its condensing boiler program. A condensing boiler recovers energy that would normally be discharged into the atmosphere through a flue. This improves heating efficiency by approximately 15-20% compared to a conventional boiler, resulting in reduced gas bills. It also requires less space, offering more flexibility in small space environments. All customers are eligible for this program; however Union Gas mainly targets healthcare and education customers.

In 2011, Union offered end-use customers $250-$2,500 per unit. Union did not make any major changes to the marketing of this program in 2011 and continued with promotion through:

- Direct and national account sales approach
- Key healthcare/education association ads, press releases, newsletters, publications – and through direct mails and email blasts to their membership (Union's customers)
- Key healthcare/education tradeshows/events speaking opportunities highlighting condensing boilers and customer testimonial success stories, e.g. OASBO
- Building and maintaining relationships with key service providers and manufacturers to ensure education/awareness of Union's programs, as well as promotion of the programs to their customers
- Press releases to generate awareness and interest in this technology

Figure 6.6 Cheque Presentation Ceremony

Infrared Heaters

Infrared heaters help customers conserve energy and money, as they deliver heat directly to where it's needed instead of heating the air within a space, like traditional forced air heating systems.

Efficiency for this technology is especially evident in large volume buildings that do not require a steady state of heat or where there is a large amount of air exchange such as near a loading dock. Union mainly targeted warehouses for program participation. In 2011, Union offered end-use customers $50 - $100 per unit and continued with promotion through:

- Direct sales approach
- Mass marketing initiatives such as direct mails and email blasts
- Building/maintaining relationships with key service providers, distributors, contractors and manufacturers to ensure they are educated about Union's programs and to ensure they are promoting it to their customers
- Union Gas website

Figure 6.7, Infrared Heater Promotional Material

Figure 6.8, Infrared Heater Promotional Material

Destratification Fans

In 2011, Union continued the destratification fan program that was introduced in 2009 as part of the prescriptive portfolio. Destratification fans are large downdraught fans ranging from 8 to 24 feet in diameter. They offer an inexpensive and efficient way to bring heat down from the ceiling to mix with cooler floor temperature air, ensuring a consistent and comfortable temperature where it is most needed. Facilities with large stratified temperature differences have the greatest potential for energy savings; typically, the greater the ceiling height, the greater the potential for savings in the heating load.

In 2011, Union targeted warehouses and offered end-use customers $500 per unit. This initiative resulted in the installation of 36 units in 2011, an increase from the 30 units delivered in 2010.

Marketing efforts included working with manufacturers and targeting potential customers, such as warehousing and industrial segments, via mass marketing direct mail and targeted communication. Relationships with service providers and manufacturers continued to be established and actively managed in 2011 to generate awareness of Union's program, and to ensure the program was being consistently promoted to their customers.

Figure 6.9, Destratification Fan Promotional Material

Custom Projects

Custom projects cover opportunities where energy savings are linked to unique building specifications or design concepts, processes or new technologies that are outside the scope of prescriptive and/or quasi-prescriptive programs. Trade allies in the design and engineering communities, and key commercial customers are the targeted audience for this program, which includes both incentives and educational support.

Commercial custom project incentives were harmonized with Distribution Contract incentive offerings, and set at 15% of the incremental cost; up to a maximum of $40,000 per project (incremental cost is defined as the difference in cost between the high efficient option and the base case option). All custom projects must pass a TRC test for cost-effectiveness before being approved.

In 2011, Union continued to implement an improved quality control process for custom projects. Professional engineers review every project as they are submitted to validate the savings calculations and ensure the appropriate supporting documentation is provided. In addition, three online checklists were developed during 2010 in response to recommendations made during the 2009 Audit. Each checklist included a list of items Account Managers and /or Project Managers were requested to check for prior to submitting projects for review by Quality Control Engineers. They were intended to act as visual reminders regarding the required documentation for each project type. The following checklists were developed and incorporated within the Automated Information Management System (AIMS) in September 2010:

- Equipment Checklist – for use on all equipment projects
- Study Checklist – for use on all study applications with the exception of DAPs
- Education Checklist – for use on all education/training applications

Design Assistance Program (DAP)

Union continued to offer incentives under the Design Assistance program to channel partners in the design and engineering communities as well as key commercial customers that are responsible for the design and management of multiple facilities. A $4,000 incentive per project was provided to eligible participants to assist with breaking down the financial barriers associated with modeling high efficient buildings. This program demonstrated that energy efficient options beyond the building code are cost effective to developers of new buildings and operators of existing buildings undergoing a significant renovation. The DAP program was available to new buildings and existing building participants.

Feasibility Studies

Through the provision of financial support to end use customers, energy efficiency audits are conducted to analyze the efficiency of natural gas equipment, including a review of gas, electric and water use, if applicable. An incentive equal to 30% of the audit cost (up to a maximum of $4,000) was offered for feasibility studies. Given the nature of audit programs, no savings are attributed, but participation rates are tracked and linked to future prescriptive and custom project applications.

Feasibility studies have proven to help identify future project opportunities that help maintain the focus on energy efficiency in the commercial sector.

6.2 Programs Results

The commercial sector delivered natural gas savings of 15 million m^3 with a net program TRC of $32.586 million through the New Buildings and Existing Buildings markets in 2011. As shown in Table 6.2 below, the largest commercial results came from the building retrofit market which represented 76% of TRC results.

Table 6.2 - 2011 Commercial Results by Program

Commercial Programs	Natural Gas Savings (m3s)	% of Total	Program TRC	% of Total
New Building Construction	4,457,662	30%	$ 7,866,472	24%
Building Retrofit	10,452,252	70%	$24,719,710	76%
Total	**14,909,914**	**100%**	**$32,586,182**	**100%**

Overall, 2011 TRC results in the commercial sector were 5% lower than in 2010 mainly due to the exiting of Unions programmable thermostat offering. The two initiatives that delivered the largest savings in 2011 were condensing boilers and Commercial Custom projects, as presented in Table 6.3. Commercial Custom projects accounted for over 19% of the overall TRC, while condensing boilers represented the largest portion of commercial savings with over $9.799 million in TRC, or more than 29% of the segment savings, in 2011.

Table 6.3 - Commercial Savings Drivers in 2011

Program	2011 Gross TRC	2011 Units	2010 Units	2009 Units	2008 Units	2007 Units
CEE Tier 2 Front-Loading Clothes Washer	$ 935,711	1,426	103	-	-	-
Condensing Boilers	$ 9,799,434	683	598	508	318	352
Condensing Gas Water Heaters	$ 145,036	116	41	-	-	-
Custom Projects	$ 6,288,562	163	263	144	165	255
DCKVs	$ 478,675	15	18	42	20	28
Destratification Fans	$ 1,054,497	36	30	13	-	-
Dishwasher	$ 1,171,341	224	-	-	-	-
Energy Star Front Load Clothes Washer	$ 124,200	566	-	-	-	-
Food Service	$ 183,905	159	-	-	-	-
ERVs	$ 2,251,538	380	262	466	191	437
HE Furnaces	$ -	-	-	356	140	562
HRVs	$ 1,460,593	320	183	213	50	96
Infrared Heaters	$ 3,045,030	992	656	926	931	558
Hot Water Conservation	$ 3,743,617	65,702	78,263	134,478	75,700	115,781
Make Up Air	$ 129,962	14	-	-	-	-
Ozone Laundry	$ 661,482	63	-	-	-	-
Pre-Rinse Spray Nozzles	$ 1,168,069	992	333	1,987	3,349	906
Programmable Thermostats	$ 464,330	3,551	3,911	9,320	3,307	830
Rooftop Units	$ -	-	209	1,224	830	242
Total	**$ 33,105,983**	**75,402**	**84,870**	**149,677**	**85,001**	**120,047**

Commercial Custom projects continue to play an important role in driving DSM Savings for Union, generating over $6.289 million in TRC in 2011. Figure 6.8 displays the adjusted TRC benefits, excluding

cost, by resource type as a percentage of total TRC benefits from commercial custom projects in 2011.

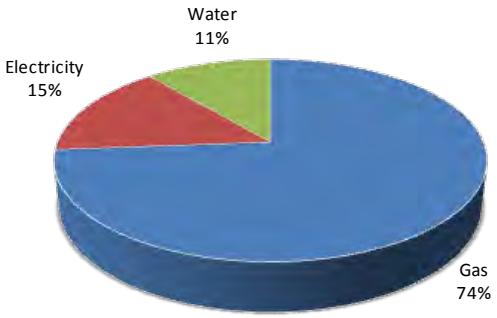


Figure 6.10, Commercial Custom Projects Benefits by Resource Type

Due to the diverse nature of custom projects, verifying claimed savings of a representative sample of projects is essential to ensuring accurate results. To this end, a sampling methodology was developed by Navigant (formerly Summit Blue Consulting) in 2008 to generate optimal custom project representation for verification. Since 2008, this new stratified approach captures projects representing not only a meaningful sample of claimed gas savings, but also water and electricity savings. In 2011, Michaels Engineering was contracted to complete commercial custom project paper reviews for the bulk of the sample, as well as conduct 5 on-site verifications. Study details and results are provided in Section 9, Verification and Evaluation.

Table 6.4 - Feasibility Studies and Audits

Facility Feasibility and Audit Participation			
Measure	**2011 Studies Completed**	**2010 Studies Completed**	**2009 Studies Completed**
Feasibility Studies and	128	559	121
Boiler Audits	0	0	46
Total	**128**	**559**	**167**

6.3 Program Costs

Direct commercial program expenditures in 2011 were approximately $4.143 million, an increase of 5% from 2010. Table 6.5 summarizes the direct expenditures for the commercial sector in 2011.

Table 6.5 - 2011 Commercial Program Direct Expenditures

Commercial Program	Incentives	Program Costs	Total Costs
New Building Construction	$ 652,288	$ 106,328	$ 758,616
Building Retrofit	$ 2,971,029	$ 413,473	$ 3,384,502
Total	**$ 3,623,317**	**$ 519,801**	**$ 4,143,118**

Overall the commercial sector achieved a TRC of $7.85 for every direct dollar spent in 2011, a decrease from the TRC per dollar spent of $8.75 in 2010.

6.4 Lessons Learned

1. Incorporated Quality Control Recommendations into Program Procedures

In 2011, Union continued the enhanced quality control practices that were introduced in 2010, for Commercial Custom projects. As an adjunct to these efforts, Union developed third party engineering approved calculators to assess energy savings for specific commercial custom project types.

2. Identifying appropriate incentive level for new measures

It became increasingly apparent in 2011 that, in order to continue current prescriptive program traction, the programs will need to gain deeper penetration in the commercial market. Information garnered through informal research in 2011, demonstrated that capital costs for certain technologies in the prescriptive measure mix remains a barrier to program traction. In light of this barrier, Union will consider revisions to the incentive funding levels to ensure prescriptive incentive amounts are sufficient to compel customer adoption of higher efficient technologies.

7. Distribution Contract Market

Union's Distribution Contract (DC) and Commercial programs are aligned under one brand platform, the EnerSmart Program. This ensures a seamless, recognizable brand throughout Union's franchise. Unlike other DSM market segments, the DC market falls solely within the scope of custom projects.

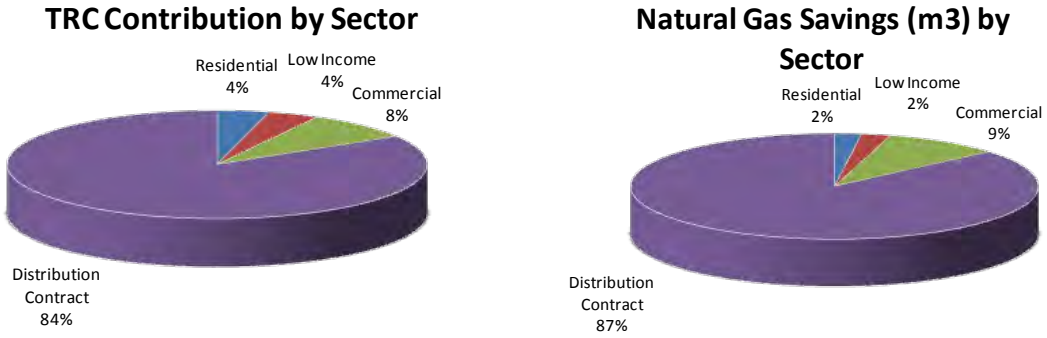


Figure 7.0, Results by Sector (Percentage)

The EnerSmart program for the DC market accounted for 84% of total TRC results in 2011, with a net program TRC of $323.655 million. Programs in this sector achieved 141.753 million m³ in natural gas savings. Direct program expenditures were $8.737 million.

TRC results in the DC sector were 39% higher than in 2010, and the overall number of participants in custom projects including boiler audits and feasibility studies increased from 308 participants in 2010 to 496 in 2011. Table7.0 presents the DC market program results for 2011 and the preceding two years.

Table 7.0 - 2010 DC Results

Distribution Contact	Net TRC	Natural Gas Savings (m3)	Projects	Expenditures	TRC per Dollar Spent
2011 Results	**$ 323,654,850**	**141,753,196**	**496**	**$ 8,736,579**	**$ 37.05**
2010 Results	$ 232,077,531	105,169,866	308	**$ 5,055,246**	**$ 45.91**
2009 Results	$ 201,056,110	64,272,873	211	**$ 5,022,108**	**$ 40.03**

**Expenditures include program costs*

7.1 Program Framework

Given the low level of new build activity in this sector, the DC market is not differentiated into new build and existing buildings. The DC market is highly heterogeneous, with most projects tied directly to unique processes or technology requirements. Each project is validated on a stand-alone basis by a comprehensive professional engineering review and is required to pass a TRC screening process.

The EnerSmart program was designed to achieve savings in process-specific energy applications, as well as space heating, water heating and the building envelope. Account Managers market the program directly to customers and indirectly through trade allies, channel partners, Energy Service

Companies (ESCO's), engineering firms, and equipment manufacturers. Account Managers work to cost-effectively promote energy efficiency within Union's DC customer base.

The majority of projects were jointly delivered through Union's Account Managers and Technical Project Managers. Success was achieved by combining strong engineering expertise with the customer knowledge derived from established account-managed relationships. This approach is critical to influencing the market and achieving successful implementation of the program.

7.1.1 DC Program 2011 Incentives

Table 7.1 shows the incentive guidelines for the 2011 DC initiatives.

Table 7.1 - Program Incentives

Program Element	Incentive Guideline
Equipment Incentive	15% of cost (up to $40,000)
Industrial Process Studies	66% of cost (up to $20,000)
Energy Efficiency Feasibility Studies	50% of cost (up to $10,000)
Steam Trap Surveys	50% of cost (up to $6,000)
Education and Promotion	Available upon request
Demonstration of New Technologies	10% of cost (up to $50,000)
DAP	$4,000 per project

Equipment incentives

Union's role in promoting and implementing energy efficient options continued to help companies control energy costs and remain competitive in today's global economy. The instability of the current economic climate is a threat to the industrial customer base in Union's franchise area. With the continual focus on cost reduction, many industries lack the expertise to analyze potential energy saving opportunities. Union helps fill this gap with its reliable, knowledgeable and reputable Technical Project Managers in conjunction with incentives designed to influence equipment choices.

Industrial Process Studies

Union provided customer incentives up to $20,000 for conducting detailed engineering analysis and designing specific process equipment or operational improvements identified with or without a general plant audit. The program worked to support performance testing and analyses of industrial boilers, total steam plants, thermal fluid heaters, vaporizers, furnaces and special process equipment. Analysis of the testing identified and quantified energy saving opportunities, cost saving opportunities, implementation costs and payback periods as well as NOx and CO_2 impacts.

Energy Efficiency Feasibility Studies

Energy efficiency feasibility studies that included an analysis of natural gas equipment as well as electricity, compressed air, water and wastewater were provided an incentive of up to $10,000. These feasibility studies were used by Union to help customers formulate a priority list of energy efficiency projects geared to site-specific energy plans and budgets. Union also assisted the customer's technical staff in generating business cases to enable the customer to secure corporate capital funding for energy efficient equipment and/or process changes.

Steam Trap Surveys

Steam trap surveys conducted by qualified service companies were designed to reduce losses from steam distribution systems and were eligible for up to $6,000 incentive. Each survey identified leaking, over-sized or under-sized, blocked and/or flooded traps, as well as the need for improvements in condensate return systems.

7.1.2. Education and Promotion

Customers have repeatedly told Union they find significant value in the training and educational material provided by the utility.

Union continued to expand investment in the following educational and promotional tools:

- GasWorks newsletter
- EnerSmart brochures
- EnerCase reports
- Workshops to promote the efficient use of natural gas and increase the awareness of energy saving opportunities
- Sponsorship of specific educational forums
- Promotion and attendance at independent professional development groups, trade organizations, and government workshops

GasWorks is a technology and energy conservation newsletter, designed to assist large users of natural gas to better manage their business. The newsletter not only provided links to Union's website but also various tools, calculators, an online library, and the "Ask an Expert" service provided by Union's technical resources.

Below is a summary of the most accessed articles of 2011.

- Winter Fuel Price Outlook for 2012
- Steam System Maintenance Optimization Series: Minimize Vented Steam
- Lowering Steam Pressure Reduces Energy Losses
- Direct Contact Water Heaters Rake in the Energy Dollars
- The Basics: How to Calculate Energy Savings

In 2011 Union developed one additional *EnerCase* brochure designed to assist in the education of DC customers. Union Gas also produced a steam performance brochure that communicates benefits, average savings and the information required from a custom necessary to qualify for Union Gas financial incentives.

Union's webpage, dedicated to the EnerSmart program, contains an application form, technology information, conversion calculations, technical presentations from customer meetings, and a series of links for additional references. Included in the links are the newly developed brochures and inserts, which were added to a growing library of ***EnerSmart*** and ***EnerCase*** brochures. These brochures include customer testimonials regarding challenges encountered and solutions Union helped provide (see Figure 7.1).

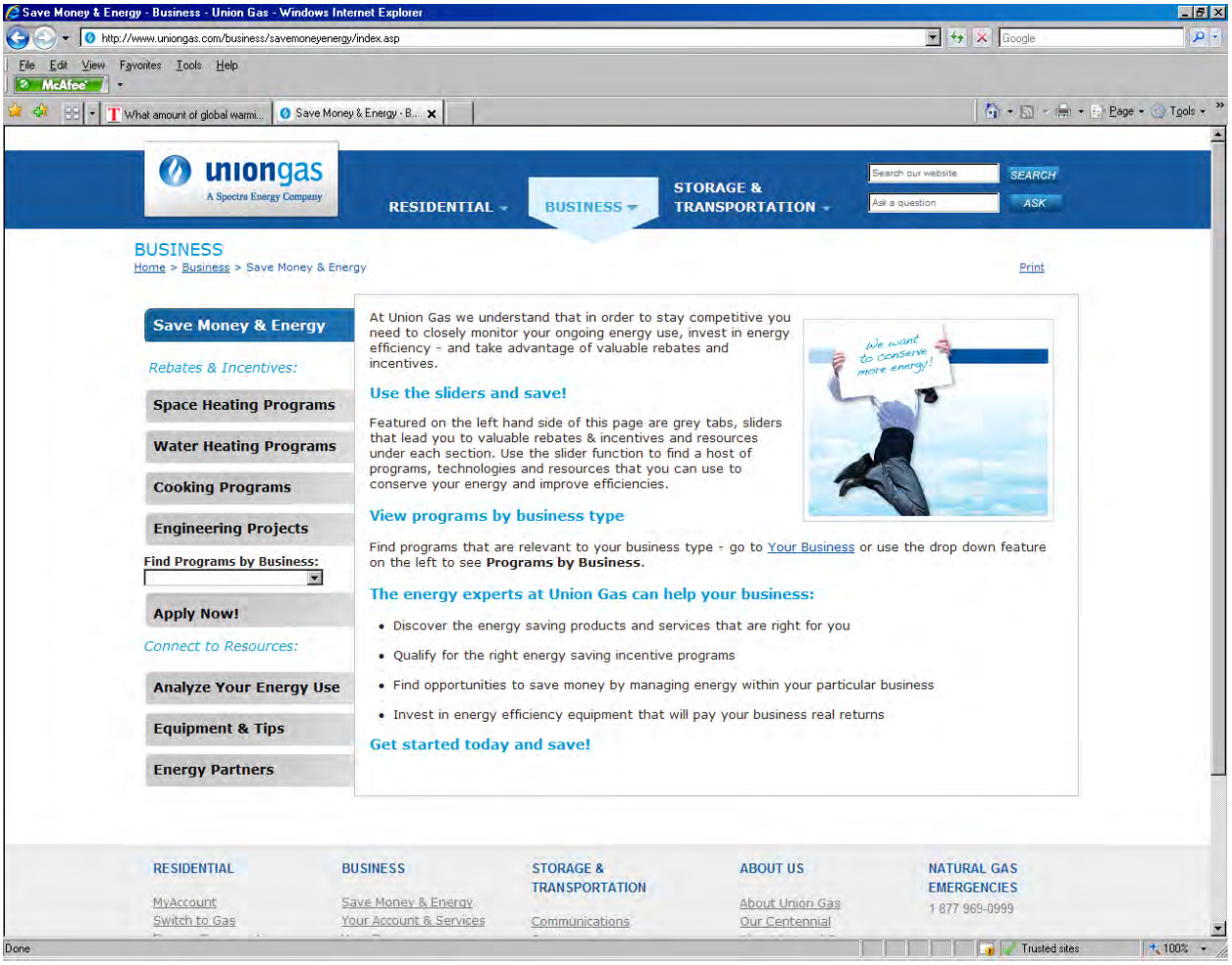


Figure 7.2, Website screenshot: uniongas.com/business/savemoneyenergy

Union hosted several workshops throughout 2011 to promote energy conservation to DC customers. These workshops were attended by 133 delegates in total. Table 7.2 provides a summary of seminars and number of participants.

Table 7.2 - 2011 Seminar's Hosted by Union

Name of Seminar	# of Participants
Calculating and Predicting Savings A Hands-On Energy Management Workshop	97
Monitoring, Targeting and Reporting workshop at Ontario Hospital Association (OHA)	7
EnerSmart for Business - Energy Auditing 101	10
Sustainable Energy Plan Workshop	19

In addition to hosting seminars, Union also showcased its program offerings and industry knowledge by attending industry meetings and tradeshows. Table 7.3 lists the meetings and tradeshows specific to large industrial customers that Union attended in 2011.

Table 7.3 - 2011 Customer Meetings and Tradeshows

Customer Meetings and Tradeshows	Date
Large Commercial / Industrial Customer Meeting and Tradeshow (London & Burlington)	Apr 2011
Forest City Customer Meeting	June 2011
Kingston Customer Meeting	June 2011
Canadian Healthcare Engineering Society Conference	May 2011
Canadian Boiler Society Education & Training Forum	June 2011
Greenhouse Growers Trade Show and Open House Featuring Energy Efficiency Suppliers	Sept 2011
CME/NRCan Energy 2011	Nov 2011
Hot Mix Association Conference	Dec 2011

Education does not stop with customer training and seminars. Union prides itself on providing highly valued energy expertise, technical support, and resources for industrial customers. As a leader in energy efficiency committed to working closely with government efficiency, environmental, and professional organizations, Union fully understands the latest trends and technologies. This is not limited to potential solutions for individual customers, but also includes the co-benefit of shared learning. Some examples of industry partnerships include:

Canadian Manufacturers and Exporters (CME)

- Union actively participated as a member of the CME Energy Committee sessions
- Sponsored/exhibited/presented at the 2010 "THINK" Sustainability Summit
- Sponsored/exhibited at the CME/London Economic Development Corporations Manufacturers Only Event

- Participated in the CME Regional Energy Forums (3) in 2010
- Submitted one editorial feature for the CME publication "Industry Matters"

Ontario Ministry of Small Business and Consumer Services

- The Ontario Ministry of Small Business and Customer Services developed a one day session to introduce small businesses in the Windsor, ON area to programs and funding sources, including Union's energy efficiency programs.

Consortium for Energy Efficiency (CEE)

Through this partnership, Union networked with efficiency program administrators from across the United States and Canada with a focus on developing common approaches to advancing energy efficiency.

Energy Solutions Centre (ESC)

- Through the ESC, Union collaborated with energy utilities, municipal energy authorities, equipment manufacturers, and vendors to accelerate the acceptance and deployment of new energy-efficient, gas-fuelled technologies.

Natural Resources Canada (NRCan)

Union's involvement with NRCan includes participation in research activities, funding of industry-specific benchmark studies, and offering Union customers assistance in obtaining government funding for energy efficiency projects. Specific NRCan programs include:

- Office of Energy Efficiency (OEE)
- Canadian Industry Program for Energy Conservation (CIPEC)
- CANMET Energy Technology Centre

Other

- Union also worked within Municipal Economic Development Coordinators to share information and build awareness on Union programs offerings that may benefit their constituents.

7.2 Program Results

Under the uniformed DC EnerSmart program branding, DC Custom projects continued to generate the largest contribution to Union's DSM portfolio, with a net program TRC of $323.655 million, approximately 141.753 million m^3 in natural gas savings, and direct program spending of $8.737 million. With 496 TRC generating projects in 2011, Union's EnerSmart program saw a marked increase in uptake by DC customers.

The continued success of the DC custom program was a result of ongoing efforts over the last several years to identify and implement multi-year projects. Accomplishing an increase in DC project results despite slow economic recovery in 2011 can be attributed to increased communications, strong account relationships, and provision of technical initiatives to help customers implement shorter term projects while identifying multi-year project opportunities.

Custom Project Analysis

The DC Custom program completed 496 TRC generating projects in 2011, representing a total of 1,125 installed measures as shown in Table 7.4. While there were more DC custom projects, they were by and large of lower cost compared with 2010.

Table 7.4 - DC Custom Project Analysis

Year	# of Measures	Customer Invested Capital	Customer Capital $/ Measure
2011	1,125	$78,574,665	$69,844
2010	357	$156,265,927	$437,720
2009	386	$94,266,048	$244,213

DC represents more than 80% of the DSM savings achieved across the overall portfolio; given the customized nature through which these results are generated, Union conducts a third party on-site engineering study to verify the results of a representative project sampling. Diamond Engineering provided the DC on-site custom project verification services in 2011, the sample for which was pulled by Navigant using the stratified sampling method established in 2008. The verification results are presented in Section 9 of this report.

Unlike previous years when the DC portfolio was weighted heavily by one large project, the 2011 DC projects were more evenly distributed with the largest project representing 7% of the overall DC Net TRC.

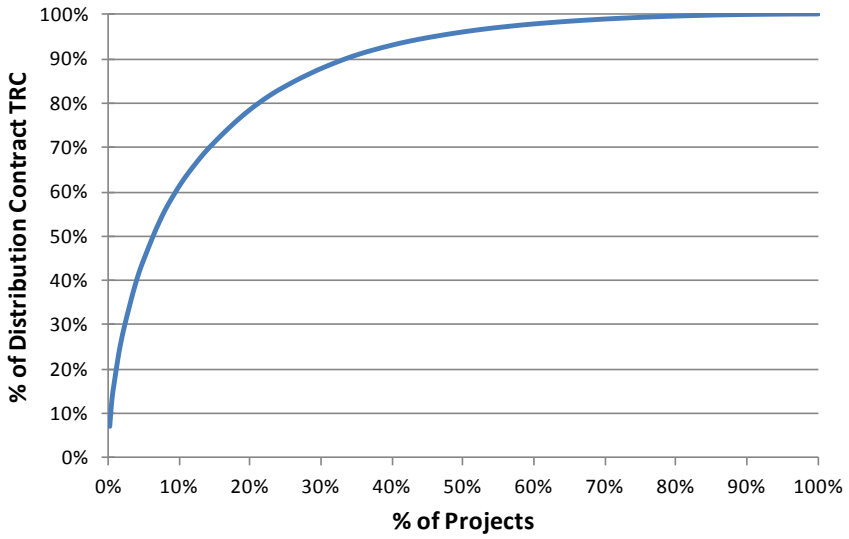


Figure 7.3, Distribution Analysis of Custom

As depicted in Figure 7.3, 20% of Distribution Custom projects accounted for approximately 78% of the TRC savings generated by this group of customers. Given the resource demands and capital

demands of DSM projects, it is understandable that customers require sizeable energy savings and reasonable payback periods in order to meet their own internal return on capital requirements to support the initial investment.

A number of these projects also had multiple resource savings, including electricity and water, however the bulk of the savings (90%) were specific to natural gas. Figure 7.4 displays the adjusted TRC benefits, excluding cost, by resource type as a percentage of total TRC benefits from DC custom projects in 2011.

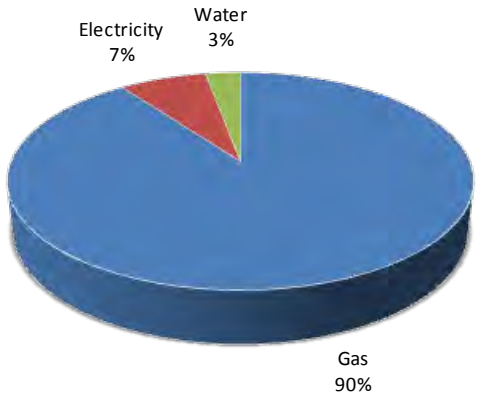


Figure 7.4, Distribution Custom Projects Benefits by Resource Type

Facility Audit Results

Facility audits continued as an important part of the EnerSmart program in 2011. Securing the necessary funding to complete facility efficiency upgrades is often difficult for customers, and many are unclear where or how to start evaluating their facility's potential for energy conservation. Feasibility studies work to effectively demonstrate the potential energy and cost savings associated with improving energy efficiency within a facility. These studies are often the basis used by the customer to build a business case that will allocate the necessary corporate funding for project implementation. There were 68 feasibility studies completed in 2011, as shown in Table 7.5.

Table 7.5 – Facility Audit Participation

Type	2011	2010	2009
Feasibility Studies & DAP	68	67	121
Audits	48	56	46
Seminars	2	12	5
Total	**118**	**135**	**172**

7.4 Program Costs

As noted in Table 7.6 below, direct budget expenditures in 2011 totalled approximately $8.737 million, over $3.681 million more than 2010 levels.

Table 7.6 - DC Program Expenditures

Distribution Contract Expenditures	Incentives	Program Costs	Total Costs
2011	$ 8,014,800	$ 721,779	$ 8,736,579
2010	$ 4,688,368	$ 366,878	$ 5,055,246
2009	$ 4,231,669	$ 790,439	$ 5,022,108

Table 7.6 shows that the majority of the budget in 2011 went to incentives, which was required to support the increased number of projects.

7.5 Lessons Learned

1. Monthly communications with customers help keep energy efficiency in the forefront

Union has been able to maintain high retention and interest in monthly energy efficiency topics since launching the GasWorks monthly newsletter with over 3700 visits in 2011. Also, the Enersmart website was updated to facilitate ease of use and customer access to the Enersmart program offerings, incentives, system improvement brochures and customer success stories.

2. Partnerships

Union has partnered with a series of entities in 2011 to offer feasibility studies and coaching opportunities to customers, including:

Universities/EnerSmart for Business with University of Windsor and McMaster University

Establishing a partnership with universities has numerous mutually beneficial outcomes, not only does it build energy management expertise for participating students, it also provides Union's commercial industrial clients with free energy audits. Union Gas initially partnered with the Department of Civil and Environmental Engineering at the University of Windsor. This unique business-academia partnership has received accolades and recognition from students, the academic world, and media across Canada. Due to the great success of the University of Windsor partnership, Union Gas initiated a new partnership with McMaster University.

Through the partnerships with both the Universities of Windsor and McMaster, Union's Energy Audit Program targets local schools as well as businesses with free energy audits to enable the reduction of energy use and greenhouse gas emissions. Union Gas provided $500,000 in funding for the program and donated the specialized equipment needed to conduct the audits.

As with the University of Windsor partnership, McMaster is responsible for managing the program and reporting on program results. The Energy Audit Program is part of Union Gas' broader EnerSmart

program, which offers incentives to its larger commercial and industrial customers to implement projects that will use natural gas more efficiently and lower operating costs.

Additionally, Union Gas also provided equipment training, educational presentations as well as government training sessions to both universities to share industry specific knowledge and tools that address energy savings in industrial applications with students. Performing the energy audits is a practical lesson for the students, entrenching what they have learned and improving their overall engineering approach to conserve energy.

The partnership has significantly contributed to capacity building for Ontario, and real life experience for participating engineering students. It functions as a way to immerse each student involved into a post-graduation mindset.

3. Automating Project Processing, DSM Tracking and Reporting Upgrade

The enhanced quality control and electronic database and filing system allowed for project information to be input and instantly reviewed. 707 projects (this includes TRC and non-TRC generating projects) were put through the enhanced DSM Tracking system in 2011, 330 more than 2010, and 381 more than 2009. This reduced the administrative process burden despite the increase in project files.

8.0 Market Transformation

As determined through the OEB Decision with Reasons August 25, 2006, EB-2006-0021, $1 million was allocated for Market Transformation in 2007, with a 10% escalating factor for each subsequent year of the three year plan, which was further extended annually for two consecutive years (2010 and 2011). Fourteen percent of Union's Market Transformation budget has been allocated to the Low-Income segment. Unlike Resource Acquisition programs, Market Transformation is not required to pass the TRC test; however, it is expected to meet clear criteria as outlined in the approved Market Transformation Scorecard for 2011 (Table 8.0 below). The utility is "entitled to an incentive payment of up to $0.5 million in each year of the multi-year plan based on the measured success of market transformation programs."

Union's Market Transformation activities have been focused exclusively on the Drain Water Heat Recovery (DWHR) technology since 2007. Union's DWHR program has driven increased market penetration and supported the development of a competitive market for the technology in Ontario. However, based on best available information, Union has assessed the resource savings for a DWHR unit are materially lower than when the program was developed. For this reason, Union will exit this program in 2012.

8.1 Drain Water Heat Recovery Program Framework

In 2011, Union's DWHR Program engaged manufacturers of the technology in addition to builders, customers, and installers. The program continued to facilitate the sales process between manufacturers and home builders, work collectively to identify opportunities to reduce per unit costs, and foster a competitive marketplace for DWHR in Ontario.

To drive installation of DWHR units, incentives were offered to builders that participated in the program. Union also worked collaboratively with channel partners, such as HVAC contractors and the DWHR manufacturers to provide effective education and program participation incentives. In addition, the program provided technology specific training to residential builders and contractors to increase awareness of both the program and its benefits.

In 2011, Union continued to focus on direct marketing and one-to-one builder outreach. Through this direct marketing approach, Union was able to target builders on a personal level which resulted in increased uptake and participation within the builder community. Direct marketing approaches included:

- Co-branded marketing communication material with individual builders
- Working closely with builders to install units and signage in their model homes
- Outreach through partnerships with the Ontario Home Builder's Association (OHBA) and EnerQuality, as well as Manufacturers (RenewABILITY and EcoInnovations)
- Outreach at local builder events (i.e. golf tournaments, local home builder association events, etc)

Union also provided builder incentives of $400 per participating home to encourage the purchase and installation of DWHR units. The incentive is provided to the DWHR manufacturer who passes it on to the builder as an on-bill rebate. This incentive structure was established in 2010 to encourage the development of relationships between market participants and thereby furthering the evolution toward a non-utility supported market for DWHR systems. The sell sheet, which was developed in 2010 to outline the process for builders, was improved upon in 2011 and included in the new 'Home Builder Portfolio'.

8.1.1 Program Improvements in 2011

Growing market share of a Second DHWR Manufacturer

In January 2010, Union made the strategic decision to encourage the development of a competitive marketplace by working closely with Quebec based manufacturer EcoInnovations. The goal was to have EcoInnovations move into the Ontario DWHR market. In order to facilitate their growth into the province, Union began working with their Ontario Manufacturer's Sales Representative, Air Solutions. EcoInnovations officially began to participate in Union's DWHR program in November 2010. With Union's support, they have grown their participation in the DWHR program throughout 2011. At the end of 2011, EcoInnovations/Air Solutions represented 20% of Union's total units, while RenewABILITY comprised 80%. This has created more choice and competitiveness within the DWHR market for builders.

Innovative Marketing Additions

Union created a push-pull strategy by encouraging both builders to install DWHR and homeowners to request DWHR from their builder. This strategy resulted in further enhancements to builder specific material in 2011, including co-branded sell sheets, builder brochures, and order forms. For the homeowner target audience, new customer brochures were created and for the first time this material was placed in the model homes' bathrooms.

Additional marketing material was improved upon in 2011, including lawn signs and model home signage.

Figure 8.2, 2011 DWHR Homeowner Brochure

8.1.2 Market Transformation Scorecard for 2011

Consistent with 2010, the 2011 MT scorecard tracked results against a two metrics to effectively measure program performance. Escalating on 2010 results, these metrics included:

- Number of participating builders as tracked by the program;
- Overall number of units installed as a percentage of residential new attachments (formerly referred to as "housing starts") as tracked by the program and available residential new attachments for Union's franchise;

Awareness of the product is quite high for builders, and growing for homeowners. In previous years, marketing approached larger builders first, followed by smaller builders. However, by the fifth year of the program, more targeted marketing activities were needed to obtain participation. As the target

audience for this program is fairly small (only those homeowners moving into new build homes each year are applicable), Union decided to focus on model home signage and targeted promotional activities in 2011.

8.2 Program Results

Table 8.0 outlines the results achieved in 2011 for the DWHR Market Transformation program.

Table 8.0 - 2011 Market Transformation Scorecard Results

Market Transformation DWHR Scorecard							
Metrics Weighting	**Metric Value Levels**			**Weight**	**Actual Results**	**Payout %**	**Score**
	50%	**100%**	**150%**				
Participating Builders	122	128	133	20%	137	150	30/20
Units Installed (new build) as a percentage of 2011 residential new attachments *	15.72% or 2011 units	17.72% or 2267 units	19.72% or 2522 units	80%	2691	150	120/80
Overall Results					$ 500,000.00	150%	150/100

**Formerly referred to as "Housing Starts"*

Having surpassed 100% on the performance metrics, Union achieved a $500,000 MT incentive payout for 2011. As outlined below, Union undertook several initiatives to promote DWHR to builders that resulted in 137 participating builders and a total of 2,691 installations. It is worth noting that market transformation programs are typically designed to influence consumer behaviour and attitudes through education. Based on DSM program delivery experience, Union has found that education, awareness, and outreach are critical components to program success, be they market transformation or resource acquisition.

Union Gas promoted DWHR throughout the year to builders and homeowners. Some examples of events are listed below:

- OHBA Industry Leaders Event - Jan 18, 2011 (Toronto)
- Low Income DWHR Kick-off meeting, Jan 27, 2011 – Air Solutions, City of Windsor, Plumbers
- OHBA Builder Forum; trade show and sponsorship, Feb 2-4, 2011
- OHBA Annual conference and Awards event, Sept 22, 2011
- London Lifestyles Home Show, Jan 28-30, 2011
- OBC 2012 Training (London, Hamilton, Sudbury, Kitchener, Chatham, Thunder Bay)

Union Gas supported home builders across the franchise and the program delivery group participated in activities to cultivate relationship building with builders as applicable. The largest growth areas include: Hamilton/Halton, London and Waterloo.

Figure 8.3, Hamilton Halton Home Builder's Association (HHHBA)
From left to right: Frank Mercury (outgoing HHHBA President), Carla Agostino (incoming HHHBA President), Tracy Lynch (Manager Program Delivery, Union Gas)

Advertising for the program continued through the Ontario Home Builder magazine to create awareness and interest about DWHR. The magazine has a circulation of 3,500 builders in Ontario:

- Spring, Summer , Fall and Winter of 2011
- OHBA Awards 2011
- Annual Directory 2011

8.3 Program Costs

Union spent $1.572 for its 2011 MT activity as shown in Table 8.1. Spend incremental to the $1.464 million budget will be reflected in the DSMVA per EB-2006-021, Issue 6.1.

Table 8.1, 2011 Market Transformation Expenditures

Market Transformation Expenditures	Incentives	Program Costs	Total Costs
2011	$1,385,764	$ 185,756	$1,571,520
2010	$1,023,174	$ 305,276	$1,328,450
2009	$ 825,330	$ 349,966	$1,175,296

8.4 Lessons Learned

1. Importance of the development of a non-utility supported competitive marketplace

The addition of a second manufacturer, EcoInnovations and their Ontario Representative Air Solutions in November 2010 enhanced the DWHR program by highlighting the importance of the development of a non-utility supported competitive marketplace. This relationship has driven market share from 0% to 20% within Union's franchise area for these two organizations.

With the introduction of a competitive DWHR market in Ontario, the program has experienced a continued increase in productive competition, lower administrative costs, and the ability for Union to focus on additional innovative marketing and educational efforts.

2. Consumer Awareness and Acceptance

Union recognizes that it is equally important to promote new energy efficiency technologies to the end user, the consumer. These early adopters look for advanced technologies that will improve their homes efficiency as well as contribute to long term gas energy savings. The increased marketing efforts to the end user showcasing the products benefits, the economies of scale and the availability has been instrumental to the success of Union's DWHR program.

3. Transforming the Market

In 2007, Union selected DWHR for the purpose of MT specific to the residential new construction market. In the five years of promoting DWHR Union has been able to induce lasting structural and behavioural changes in the marketplace, resulting in increased adoption of DWHR. Union has been key in addressing awareness, availability, accessibility, affordability and acceptance of DWHR in the marketplace and for these reasons Union will exit this program in 2012.

9. Verification and Evaluation – 2011 Results

In order to ascertain the accuracy of claimed savings, Union undertakes several verification studies each year. These evaluation projects are designed to ensure that the claimed participation and installation rates for technologies delivered through Union's programs are accurate. An assessment of claimed savings obtained through custom projects was also completed. In addition, Union carries out related research to better understand the overall impacts and benefits that specific programs provide its customers. For 2011, Union commissioned verification studies for its Residential ESK, Low Income HHC, Commercial HWC, Commercial Custom and Distribution Custom programs as detailed in this section of the report.

9.1 Residential and Low Income Verification Studies

Union conducted five verification studies for the Residential Energy Saving Kit (ESK) program and one for the Low Income Helping Homes Conserve (HHC) program to ensure the savings claimed were accurate, as listed in Table 9.0. These verifications determined the number of ESK/HHC elements that were installed and remained installed for 2011. Additionally, since the savings associated with the ESK/HHC showerheads relate to showering for an entire home, the verification also established the portion of showering that was attributable to the ESK/HHC showerhead. The purpose of these studies was to provide an adjustment factor to be applied to the claimed savings. Union also uses the collected information to assess areas of program success and areas for potential improvement.

Table 9.0 - Summary of Program Verifications for Residential Programs

Program	Title	Source	Objective
ESKs: Union Direct and HVAC Partnership and ESK Replacements: Union Direct and HVAC Partnership	Final Report Following an Audit in 2011 of the Union Gas ESK Residential "Push" Initiative (2011) and Final Report Following an Audit in 2011 of the Union Gas ESK Residential "Push" Replacement Initiative (2011)	Beslin Communications Group Inc.	- Validate consumers' awareness of products received; - Verify product installation; - Verify continuing usage of measures; - Verify percentage showering; - Verify water heater type; - Gauge customer satisfaction with equipment; - Determine influence of channel partners in end-users' decisions to install products; and, - Gauge performance of channel partners in delivery of products and ESK information.
ESKs: Home Depot and ESK Replacements: Home Depot	Final Report Following an Audit in 2011 of the Union Gas ESK Home Depot "Pull" Initiative (2011) and Final Report Following an Audit in 2011 of the Union Gas ESK Home	Beslin Communications Group Inc.	- Validate accuracy of information tracking sent by partners claiming incentives; - Verify measure installation; - Verify continuing usage of measures; - Verify percentage showering; - Verify water heater type; - Understand end-users' knowledge of energy efficiency, purchase motivations, and general satisfaction; - Determine factors affecting end-users' decisions to install; and,

	Depot "Pull" Replacement Initiative (2011)		- Opinions on other incentives Union Gas could offer
ESKs: Install	Final Report Following an Audit in 2011 of the Union Gas ESK "Install" Initiative (2011)	Beslin Communications Group Inc.	- Validate the accuracy of information; recorded by Channel Partners; - Verify measure installation; - Verify continuing usage of measures; - Verify percentage showering; - Verify water heater type; - Gauge customer satisfaction with equipment; - Gauge end-user understanding of the efficiency level of measures installed
HHC: Low Income	Final Report Following an Audit in 2011 of the Union Gas HHC Low Income Initiative (2011)	Beslin Communications Group Inc.	- Validate consumers' awareness of products received; - Verify measure installation; -Verify continuing usage of measure; - Verify percentage showering; - Verify water heater type; - Gauge customer satisfaction with equipment; - Determine influence of channel partners in end-users' decisions to install products; and, - Gauge performance of channel partners in delivery of products and ESK information.

The results of these evaluations are summarized in section 9.1.1 below.

9.1.1 ESK and HHC Program Verification Results

In order to fully assess the savings generated through the ESK and HHC program offerings, Union completed a verification study to determine the rate at which measures were installed and remained installed with participants. During the 2010 audit, a recommendation was made to ensure the verification study presented results to reflect the percentage of homes that heat their water with natural gas. This value had been captured in the verification study previously; however, it had not been presented in the tabulated results, but rather in text in the body of the report. The final verified results for the ESK & HHC programs include this recommendation and are presented in Tables 9.1, 9.2, 9.3, and 9.4 below and are reflective of gross savings, not participant count. As demonstrated in Tables 9.3 and 9.4, providing customer installation of measures clearly result in more favourable adjustments.

Table 9.1 - Adjustment Factors: ESK Union Gas Direct and HVAC (Push)

Measure	Measure Verified Installed	Measure Remained Installed	% Showering under low-flow Showerhead	% with Natural Gas Hot water heaters	Adjustment Factor
Bath Aerator	46.99%	74.36%		82.53%	28.84%
Kitchen Aerator	59.64%	86.87%		82.53%	42.76%
Pipe Wrap	64.46%	94.39%		82.53%	50.21%
Showerhead	65.06%	85.19%	86.68%	82.53%	39.65%
Showerhead - Replacement	88.24%	97.33%	81.85%	100.00%	70.29%

Table 9.2 - Adjustment Factors: ESK Home Depot (Pull)

Measure	Measure Verified Installed	Measure Remained Installed	% Showering under low-flow Showerhead	% with Natural Gas Hot water heaters	Adjustment Factor
Bath Aerator	52.94%	91.11%		89.41%	43.13%
Kitchen Aerator	65.88%	94.64%		89.41%	55.75%
Pipe Wrap	70.00%	95.80%		89.41%	59.96%
Showerhead	71.76%	86.89%	80.19%	89.41%	44.71%
Showerhead - Replacement	76.25%	93.44%	79.39%	100.00%	56.56%

Table 9.3 - Adjustment Factors: ESK Install

Measure	Measure Verified Installed	Measure Remained Installed	% Showering under low-flow Showerhead	% with Natural Gas Hot water heaters	Adjustment Factor
Bath Aerator	79.00%	100.00%		100.00%	79.00%
Kitchen Aerator	71.00%	94.37%		100.00%	67.00%
Pipe Wrap	83.00%	100.00%		100.00%	83.00%
Showerheard	97.00%	98.97%	76.30%	100.00%	73.25%

Table 9.4 - Adjustment Factors: HHC Low Income

Measure	Measure Verified Installed	Measure Remained Installed	% Showering under low-flow Showerhead	% with Natural Gas Hot water heaters	Adjustment Factor
Bath Aerator	84.85%	100.00%		96.36%	81.76%
Kitchen Aerator	84.85%	95.71%		96.36%	78.26%
Pipe Wrap	93.94%	100.00%		96.36%	90.52%
Showerheard	95.15%	99.36%	86.22%	96.36%	78.55%

Through the audit process, the auditor made four adjustment factor recommendations relating to various ESK Residential Push/Pull/Install measures.

The first item addressed Union's approach to handling "don't know" responses for the percentage of participants that have natural gas fuelled domestic hot water heaters. Union applied current market research industry practices to deal with the "don't know" responses, which entails removing the responses from the overall population and then recalculating the new results. The Auditor, while agreeing that this approach was in line with current industry practice, recommended that Union take a more conservative approach to count all "don't know" responses as "no" responses. Similar to the treatment of "don't know" responses for the domestic hot water heaters, the Auditor recommended that all "don't know" responses to the question on what percentage of showering is done under the

low-flow showerhead should be counted as zero instead of removing them from the population. The two remaining audit adjustments relate to corrections of clerical errors that were discovered in the replacement calculation adjustment factors. Tables 9.1 to 9.4 have been updated to reflect the Auditor's recommendations noted above.

9.2 Commercial Prescriptive Program Verification Studies

Union conducted verification studies for the multi-family and non multi-family commercial Hot Water Conservation (HWC) Programs to ensure the savings claimed were accurate. Union contracted the SeeLine Group Ltd. to perform the verification study for the multi-family program stream and Energuy Canada Ltd. for the non multi-family program stream. The non multi-family program includes the following segments: Hotel/Motel, Long Term Care/Retirement Facilities, University Residences/Dorms, and "Other" (such as food services, entertainment, etc).

9.2.1 Commercial Prescriptive Program Verification Results

These verification studies determined the number of HWC elements that were installed through on-site inspections. The purpose of these studies was to provide an adjustment factor to be applied to the claimed savings. Union also uses the collected information to assess areas of program success and areas for potential improvement. The final verified results for the multi-family and non multi-family segments are presented in Tables 9.5 and 9.6 below.

Table 9.5 - Adjustment Factors: HWC Multi-Family

Measure	Adjustment Factor
Showerhead	53.06%
Bathroom Aerator	38.67%
Kitchen Aerator	60.61%

During the audit process, a data transfer error was found from the verification study report to the Audit Tool for both the bathroom and kitchen aerator measures. Accordingly, the above adjustment factors have been updated from the Draft Annual Report and reflect the findings in the final verification study.

Table 9.6 - Adjustment Factors: HWC Non Multi-Family

Measure	Adjustment Factor
Showerhead	90.21%
Bathroom Aerator	52.33%
Kitchen Aerator	73.81%

The adjustment factors applied to the non multi-family sector were verified at an aggregate level to reflect the sampling methodology. Detailed findings for segment specific results in the non multi-family sector are presented in table 9.7 below.

The audit uncovered a clerical data transfer error from the verification study to the Audit Tool for the kitchen aerator measure. The above adjustment factor has been updated from the Draft Annual Report and reflects the findings of the final verification study.

Table 9.7 - Verification Results: HWC non Multi-Family Segments

Measure	Hotel/Motel - Measure Verified Installed	University Residences and Dormitories - Measure Verified Installed	Long Term Care and Retirement Facilities - Measure Verified Installed	Other - Measure Verified Installed
Showerhead	97.80%	94.70%	85.00%	75.80%
Bathroom Aerator	31.10%	45.00%	100.00%	51.40%
Kitchen Aerator	NA	74.50%	N/A	72.70%

9.3 Commercial/Industrial and Distribution Contract Custom Project Verification

Each year Union conducts a verification study for both the Commercial/Industrial Custom program and the Distribution Contract Custom program. In completing this work, Union looks to validate that the claimed savings reported through the custom projects are accurate and recommend any adjustment factors to the savings if required.

Summit Blue Canada provided a revised sampling methodology for the annual engineering review of custom DSM projects in 2008. This sampling methodology far exceeded the OEB's TRC Guide requirements for sampling for custom projects:

- Develop an approach that considers the significance of water and electricity savings;
- Adjust strata sizes to meet practical challenges in field applications, specifically census samples for the largest projects; and,
- Accommodate two sample assessment periods per year.

9.3.1 Commercial/Industrial Custom Project Verification Study

Navigant was contracted to extract a statistically representative sample for the purpose of Commercial Custom Project verification using the methodology established in 2008. To this end, the program projects were stratified by resource benefits as summarized in Table 9.8 below.

Table 9.8 - Sample of Commercial/Industrial Custom Projects for Verification

Description Commercial/Industrial (COM)	n (Stratum)	NATURAL GAS (m3)	WATER (1000's L)	ELECTRICITY (kWh)	NATURAL GAS TRC (Unadjusted Benefits)	WATER TRC (Unadjusted Benefits)	ELECTRICITY TRC (Unadjusted Benefits)	TRC (Unadjusted Benefits)
Sample Gas - High	10	2,344,322	-	361,573	$6,700,055	$0	$355,148	$7,035,203
Sample Gas - Medium	9	1,018,928	9,155	778,605	$2,741,241	$175,313	$668,506	$3,585,059
Sample Gas - Low	6	234,811	85,977	206,746	$544,838	$1,668,816	$178,042	$2,391,696
Total Projects Sampled	**25**	**3,598,061**	**95,132**	**1,346,924**	**$9,986,134**	**$1,844,129**	**$1,201,696**	**$13,011,958**
Commercial Custom Total Project Population	163	7,984,421	135,761	5,435,292	$21,267,679	$2,478,496	$3,511,532	$27,257,706
% of population sampled		**45.1%**	**70.1%**	**24.8%**	**47.0%**	**74.4%**	**34.2%**	**47.7%**

*Pre-audited savings claims

Navigant pulled a sample of 25 projects for the 2011 Commercial Custom Projects program, all of which were verified by Michaels Energy. Of these projects, 5 were verified on-site following Union's 2010 Audit recommendation. While Union has conducted on-site verification for unusually large Commercial Custom Projects in the past, 2011 was the first year that projects were selected from the sample to be verified on-site.

The sample projects represent 47.7% of the total unadjusted TRC savings of all Commercial Custom projects based on the original claimed savings. Given the geographic distribution of Commercial Custom Projects compared to benefits that the projects achieve, verification for this program primary includes a paper review of the projects files coupled with telephone interviews with customers and service providers for the verification of savings results for 20 of the sampled commercial projects. A subset of five projects was selected for on-site verification based on their complexity, and savings magnitude.

The deliverables of the verification studies included:

- A description of approach used to measure savings (including gas, water, and electricity savings, incremental cost and measure life, as appropriate);
- The results of telephone interviews to confirm installation and operating conditions;
- A detailed review of the methodology used by the evaluator to project the savings that would result from project implementation;
- A discussion of reasons (if applicable) for any variance between the projected and the evaluated savings;
- The evaluator's recommended adjustment factors based on the variance between the projected and evaluated savings claims; and,
- A report on calculation methodologies employed and recommendations for refinements for future savings calculations.

Commercial/Industrial Custom Project Verification Results

Adjustment factors determined through the Commercial Custom Project Verification Study are presented in Table 9.9 below. These adjustments have been applied to the Commercial Custom program savings claims for the purpose of this report.

Table 9.9 - 2011 Commercial Custom Program Verification Study Results

Commercial Custom Program Verification Results			
Resource	**Claimed Savings**	**Verification Savings**	**Realization Rate**
Natural Gas Savings	3,598,061	2,392,292	66.5% m3/year
Water Savings	95,131,545	82,042,370	86.2% litres/year
Electricity Savings	1,346,925	1,099,857	81.7% kWh/year
Incremental Cost	$ 2,583,411	$ 2,366,332	91.6%
EUL	18.08	17.27	95.5%

Through the Audit process, new adjustment factors were recommended and applied for six of the Commercial Custom projects. The Final Audited realization rates presented in Table 9.10 below have been applied to the 2011 Commercial Custom Program portfolio as recommended by the Auditor.

Table 9.10 – 2011 Commercial Custom Project Audit Adjustments

Resource	2011 Draft Annual Report	2011 Audit Value
Natural Gas Savings	66.5%	65.9%
Water Savings	86.2%	86.3%
Electricity Savings	81.7%	79.7%
Incremental Cost	91.6%	91.6%
EUL	95.5%	95.5%

9.3.2 Distribution Contact Custom Project Verification Study

As described in Section 9.3 above, a sample of 13 custom projects from the Distribution Contact sector was selected for the verification study by Navigant.

The sample for the industrial sector is stratified based on size of projects for gas, water, and electricity savings. Projects were randomly selected from among the largest projects based on TRC benefits from gas savings and the largest based on electricity savings. Table 9.10 summarizes the Distribution Contract sample.

Table 9.11 - Sample of Distribution Contract Custom Projects for Verification

Description Distribution Contract (IND)	n (Stratum)	NATURAL GAS (m3)	WATER (1000's L)	ELECTRICITY (kWh)	NATURAL GAS TRC (Unadjusted Benefits)	WATER TRC (Unadjusted Benefits)	ELECTRICITY TRC (Unadjusted Benefits)	TRC (Unadjusted Benefits)
Sample Gas - High	4	22,745,788	156,470	28,359,484	$64,898,754	$3,044,835	$26,286,801	$94,230,390
Sample Gas - Medium	5	9,596,224	36,412	586,998	$21,464,843	$614,560	$484,858	$22,564,261
Sample Gas - Low	4	2,095,677	64,259	869,136	$4,709,398	$1,152,765	$775,483	$6,637,647
Total Projects Sampled	**13**	**34,437,689**	**257,142**	**29,815,618**	**$91,072,995**	**$4,812,160**	**$27,547,142**	**$123,432,298**
Distribution Contract Custom Total Project Population	496	281,115,783	1,250,612	56,938,448	$601,163,100	$19,741,409	$48,997,467	$669,901,976
% of population sampled		**12.3%**	**20.6%**	**52.4%**	**15.1%**	**24.4%**	**56.2%**	**18.4%**

*Pre-audited savings claims

The 13 sampled projects represent 18.4% of the total unadjusted TRC savings of all Distribution Contract custom projects based on the original Distribution Contract claimed savings.

On-site verification studies were conducted by Diamond Engineering. In completing this work, the focus was to validate whether or not the claimed savings reported through the custom projects were accurate and recommend any adjustment factors to the savings if required. The objectives of the on-site verification studies included:

- Determination of whether savings calculations in the application were reasonable based on information available at the time made;
- Review of the assumptions used in calculations;
- Discussion of variations between project and savings ;
- Recommend adjustment factors based on the variance between the projected and evaluated savings;
- Verify that the equipment installation was completed at the site; and,
- Review of the confidence interval levels achieved in the results and statement of errors for calculations.

Distribution Contact Custom Project Verification Results

The results of the Distribution Contract custom project verification are presented in Table 9.11 below.

Table 9.12 - 2011 Distribution Contract Custom Project Verification Study Results

DC Custom Program Verification Results				
Resource	**Claimed Savings**	**Verification Savings**	**Realization Rate**	
Natural Gas Savings	33,807,360	37,059,854	109.62%	m3/year
Water Savings	255,119,480	274,563,463	107.62%	litres/year
Electricity Savings	29,815,618	32,127,316	107.75%	kWh/year
Incremental Cost	$ 8,134,367	$ 8,134,367	100.00%	
EUL	18.09	18.94	104.70%	

The results presented in Table 9.11 do not include one project (2011-IND-0335), which has been treated as an outlier. Based on previous related audit experience, the realisation rates for this project were not applied to the portfolio due to the large variance from the mean. For perspective, including the outlier in the realization rates would increased Union's TRC claim by $67,724,554.

10. 2011 Measures Evaluation Research

During the course of the three-year DSM framework, Union's measure evaluation strategy has been to undertake evaluations of a third of each program measure included in the 2007-2009 DSM Plan annually in accordance to EB-2006-0021. 2009 presented an unusual challenge because many of the evaluation projects that might have been undertaken in 2009 were precluded by the OEB commissioning and approving of Navigant Consulting Inc.'s, *Measures and Assumptions for Demand Side Management (DSM) Planning*, dated April 16, 2009. In 2011, as Union entered the fifth year under the framework what was intended to be a three year framework, this challenge remained unchanged. In addition, with focus on discussions on new measures and activities surrounding the 2012-2014 DSM Plan, no evaluation priorities were established in 2011.

11. Lost Revenue Adjustment Mechanism (LRAM)

The LRAM was approved by the Ontario Energy Board to allow Union to recover the lost distribution revenues associated with DSM activity. These lost revenues are calculated for each rate class impacted by DSM energy efficiency programs using the following formula:

Σ(Rate Class Volume Reduction x 2011 Delivery Rate) = LRAM Claimed

For 2011, the year one LRAM amount is $0.821 million based on 2011 delivery rates and natural gas savings of 163.703 million m³. The 2011 LRAM statement is detailed in Table 11.0 below.

Table 11.0 - 2011 LRAM Statement

UNION GAS LIMITED
Lost Revenue Adjustment Mechanism
2011 Unaudited Results

Line No.	Particulars	Audited Volumes (10^3 m^3)	2011 Delivery Rates ($/$10^3$ m^3)	Revenue Impact ($)
		(a)	(b)	(a) x (b) x 50%
	South			
1	M1 Residential	5,387	$ 40.757	$ 109,783
2	M1 Commercial	4,447	$ 40.757	$ 90,620
3	M1 Industrial	1,246	$ 40.757	$ 25,385
4	M2 Commercial	6,064	$ 40.763	$ 123,586
5	M2 Industrial	3,129	$ 40.763	$ 63,771
6	M4 Industrial	7,981	$ 8.764	$ 34,973
7	M5 Industrial	14,414	$ 14.574	$ 105,037
8	M7 Industrial	12,780	$ 2.418	$ 15,450
9	T1 Industrial	86,670	$ 0.913	$ 39,565
10		142,117		$ 608,170
	North			
11	01 Residential	1,653	$ 91.828	$ 75,892
12	01 Commercial	1,256	$ 85.583	$ 53,733
13	10 Commercial	1,549	$ 62.162	$ 48,153
14	10 Industrial	484	$ 57.001	$ 13,788
15	20 Industrial	4,577	$ 3.683	$ 8,429
16	100 Industrial	12,067	$ 2.065	$ 12,459
17		21,586		$ 212,455
18	Total	163,703		$ 820,625

The 2011 LRAM statement has been prepared using the 2011 input assumptions approved by the OEB. These assumptions are detailed in Appendix A. LRAM results by measure are shown in Appendix C. In EB-2006-0021 Decision with Reasons the Board ruled that the year one impact of DSM activities is equivalent to 50% of the savings in the first year in which the DSM measure is undertaken.

12. Shared Savings Mechanism (SSM)

For 2011, Union is eligible to earn an SSM incentive based on DSM program results. The SSM incentive payment has been calculated using the methodology approved by the OEB in the DSM Generic Hearings. The SSM incentive is calculated using the following structure:

- For TRC savings between 0 percent and 25 percent of the TRC target, an SSM payout shall equal $900 for each 1/10 of 1 percent of target reached;
- For TRC savings between 25 percent and 50 percent of the TRC target, an SSM payout shall equal $225,000 plus $1,800 for each 1/10 of 1 percent of target reached;
- For TRC savings between 50 percent and 75 percent of the TRC target, an SSM payout shall equal $675,000 plus $6,300 for each 1/10 of 1 percent of target reached; and,
- For TRC savings greater than 75 percent of the TRC target, an SSM payout shall equal $2,250,000 plus $10,000 for each 1/10 of 1 percent of target reached up to the maximum SSM annual cap of $8,500,000.

For 2011, the 2010 SSM incentive cap of $8,939,426 million will increase annually by the Ontario CPI as determined in October of the preceding year. For 2011, the annual SSM incentive cap increased to **$9,243,367**. This was reflective of the 3.4% annual increase of the Ontario CPI as determined in October 2011. Union's net TRC calculation for 2011 is shown in Table 12.0.

Table 12.0 - 2011 Net TRC Calculation

New Home Construction	$ 33,066		
Home Retrofit	$ 16,029,545		
Residential Program Costs	$ (957,530)		
Net Residential TRC		**$ 15,105,081**	
Low Income	$ 15,339,864		
Low Income Program Costs	$ (271,410)		
Net Low Income TRC		**$ 15,068,454**	
New Building Construction	$ 7,972,800		
Building Retrofit	$ 25,133,183		
Commercial Program Costs	$ (519,801)		
Net Commercial TRC		**$ 32,586,182**	
Distribution Contract	$ 324,376,629		
Distribution Contract Program Costs	$ (721,779)		
Net Distribution Contract TRC		**$ 323,654,850**	
Salaries	$ (5,716,463)		
Research & Evaluation	$ (1,269,738)		
Administration	$ (48,946)		
Total Other Program Costs		**$ (7,035,147)**	
Net TRC			**$ 379,379,419**

Union's TRC target for 2011 is $252,652,675 million, which results in the following SSM calculation:

SSM = {[(Net TRC – (Range End Percentage x Target TRC)) / (Payout Increment Percentage x Target TRC)] x Incremental Payout} + Base Payout

= {[(Net TRC – (75% x $252,652,675)) / (0.1 % x $252,652,675)] x $10,000} + $2,250,000

= {[($379,379,419 - $189,489,506)/$252,653] x $10,000} + $2,250,000

= $751.58 x $10,000 + $2,250,000

= $9,765,848[8]

The TRC breakdown by measure is included in Appendix D. The SSM breakdown by rate class is shown in Table 12.1 below.

[8] SSM Incentive without Cap. 2011 SSM Cap is $ 9,243,367

Table 12.1 – 2011 SSM by Rate

UNION GAS LIMITED
Shared Savings Mechanism
2011 Audited Results

Line No.	Particulars		Amount[1] ($)
	South		
1	M1 Residential	$	566,187
2	M1 Commercial	$	244,222
3	M1 Industrial	$	73,472
4	M2 Commercial	$	290,677
5	M2 Industrial	$	207,076
6	M4 Industrial	$	512,983
7	M5 Industrial	$	980,927
8	M7 Industrial	$	610,676
9	T1 Industrial	$	4,404,012
10		$	7,890,233
	North		
11	01 Residential	$	180,215
12	01 Commercial	$	71,589
13	10 Commercial	$	79,260
14	10 Industrial	$	24,972
15	20 Industrial	$	291,511
16	100 Industrial	$	705,587
17		$	1,353,134
18	Total	$	9,243,367

[1] The allocation is based on 2011 TRC achieved by rate class

13. DSM in 2011

The primary purpose of this Annual Report is to review program outcomes from the preceding year. In previous annual reports the secondary purpose was to also establish targets for the upcoming year, this is no longer the case as in 2012 Union enters a new DSM framework in which targets have already been established (EB-2011-0327).

13.1 2011 Avoided Costs

The Avoided Costs for 2011 are attached in Appendix E.

Appendix A: Input Assumptions (SSM) and (LRAM)

Measure			SSM Input Assumptions								LRAM Input Assumptions		
			Equipment Life	Energy Load	Free Rider Rate	Adjustment Factor	Natural Gas Savings (m3)	Water Savings (L)	Electricity Savings (kWh)	Incremental Cost	Free Rider Rate	Adjustment Factor	Natural Gas Savings (m3)
NHC	Faucet Aerator - Bath - 1.5gpm		10	baseload	33.0%	100.0%	6	2,004	-	$0.49	33.0%	100.0%	6
NHC	Faucet Aerator - Kitchen - 1.5gpm		10	baseload	33.0%	100.0%	19	6,201	-	$1.29	33.0%	100.0%	19
NHC	Showerhead - 1.25gpm		10	baseload	10.0%	100.0%	44	13,885	-	$3.79	10.0%	100.0%	44
HR	ESK	Install - Faucet Aerator - Bath - 1.5gpm	10	Baseload	33.0%	79.0%	6	2,004	-	$0.49	33.0%	79.0%	6
HR	ESK	Install - Faucet Aerator - Kitchen - 1.5gpm	10	Baseload	33.0%	67.0%	23	7,797	-	$1.29	33.0%	67.0%	23
HR	ESK	Install - Pipe Insulation - 2m	10	Baseload	4.0%	83.0%	18	-	-	$0.98	4.0%	83.0%	18
HR	ESK	Install - Showerhead - 1.25gpm	10	Baseload	10.0%	73.3%	44	13,885	-	$3.79	10.0%	73.3%	44
HR	ESK	Install - Showerhead - 1.25gpm exist 2.6+	10	Baseload	10.0%	73.3%	88	22,580	-	$3.79	10.0%	73.3%	88
HR	ESK	Install - Showerhead - 1.25gpm - Replacement	10	Baseload	10.0%	56.6%	33	11,584	-	$3.79	10.0%	56.6%	33
HR	ESK	Pull - Faucet Aerator - Bath - 1.5gpm	10	Baseload	33.0%	43.1%	6	2,004	-	$0.49	33.0%	43.1%	6
HR	ESK	Pull - Faucet Aerator - Kitchen - 1.5gpm	10	Baseload	33.0%	55.8%	23	7,797	-	$1.29	33.0%	55.8%	23
HR	ESK	Pull - Pipe Insulation - 2m	10	Baseload	4.0%	60.0%	18	-	-	$0.98	4.0%	60.0%	18
HR	ESK	Pull - Showerhead - 1.25gpm	10	Baseload	10.0%	44.7%	44	13,885	-	$3.79	10.0%	44.7%	44
HR	ESK	Pull - Showerhead - 1.25gpm - Replacement	10	Baseload	10.0%	56.6%	33	11,584	-	$3.79	10.0%	56.6%	33
HR	ESK	Push - Faucet Aerator - Bath - 1.5gpm	10	Baseload	33.0%	28.8%	6	2,004	-	$0.49	33.0%	28.8%	6
HR	ESK	Push - Faucet Aerator - Kitchen - 1.5gpm	10	Baseload	33.0%	42.8%	23	7,797	-	$1.29	33.0%	42.8%	23
HR	ESK	Push - Pipe Insulation - 2m	10	Baseload	4.0%	50.2%	18	-	-	$0.98	4.0%	50.2%	18
HR	ESK	Push - Showerhead - 1.25gpm	10	Baseload	10.0%	39.6%	44	13,885	-	$3.79	10.0%	39.6%	44
HR	ESK	Push - Showerhead - 1.25gpm - Replacement	10	Baseload	10.0%	70.3%	33	11,584	-	$3.79	10.0%	70.3%	33
HR	Thermostat - Programmable		15	weather	43.0%	100.0%	53	-	54	$25.00	43.0%	100.0%	53
LI	ESK	HHC - Faucet Aerator - Bath - 1.0gpm	10	baseload	1.0%	81.8%	10	3,435	-	$0.55	1.0%	81.8%	10
LI	ESK	HHC - Faucet Aerator - Kitchen - 1.5gpm	10	baseload	1.0%	78.3%	23	7,797	-	$1.39	1.0%	78.3%	23
LI	ESK	HHC - Pipe Insulation - 2m	10	baseload	1.0%	90.5%	18	-	-	$2.00	1.0%	90.5%	18
LI	ESK	HHC - Showerhead - 1.25gpm exist 2.0-2.5	10	baseload	1.0%	78.6%	46	14,294	-	$3.69	1.0%	78.6%	46
LI	ESK	HHC - Showerhead - 1.25gpm exist 2.6+	10	baseload	1.0%	78.6%	88	22,580	-	$3.69	1.0%	78.6%	88
LI	Thermostat - Programmable - HHC		15	weather	1.0%	100.0%	53	-	54	$26.95	1.0%	100.0%	53
NBC	CEE Tier 2 Front-Loading Clothes Washer (MF)		11	baseload	10.0%	100.0%	117	58,121	396	$600	10.0%	100.0%	117
NBC	Condensing Boiler - up to 299 MBtu/h		25	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	Condensing Boiler - 300 to 999 MBtu/h		25	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	Condensing Boiler - over 1,000 Mbtu/h		25	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	Condensing Gas Water Heater (1,000gal/day)		13	baseload	5.0%	100.0%	1,551	-	-	$2,230	5.0%	100.0%	1,551
NBC	Custom Agriculture		Actual	Actual	54.0%	100.0%	Actual	Actual	Actual	Actual	54.0%	100.0%	Actual
NBC	Custom New Construction		Actual	Actual	54.0%	100.0%	Actual	Actual	Actual	Actual	54.0%	100.0%	Actual
NBC	DCKV Fast Casual (< 5000 cfm)		15	weather	5.0%	100.0%	4,801	-	13,521	$10,000	5.0%	100.0%	4,801
NBC	DCKV Full Menu (5000 - 9999 cfm)		15	weather	5.0%	100.0%	11,486	-	30,901	$15,000	5.0%	100.0%	11,486
NBC	Dishwasher - Rack Conveyor - Single High Temperature		20	Baseload	27.0%	100.0%	2,203	310,271	9,811	$2,375.00	27.0%	100.0%	2,203
NBC	Dishwasher - Stationary Rack - High Temperature		15	Baseload	20.0%	100.0%	619	87,119	3,553	-$350.00	20.0%	100.0%	619
NBC	Dishwasher - Stationary Rack - Low Temperature		15	Baseload	20.0%	100.0%	841	118,369	855	-$350.00	20.0%	100.0%	841
NBC	Dishwasher - Undercounter - High Temperature		10	Baseload	40.0%	100.0%	801	112,795	3,754	-$13.00	40.0%	100.0%	801
NBC	Energy Star Front Load Clothes Washer		11	Baseload	48.0%	100.0%	76	19,814	201	$150.00	48.0%	100.0%	76
NBC	Energy Star Fryer		12	Baseload	20.0%	100.0%	1,083	-	17	$1,028.00	20.0%	100.0%	1,083
NBC	Energy Star Steam Cooker		10	Baseload	20.0%	100.0%	3,224	42,812	162	$2,000.00	20.0%	100.0%	3,224
NBC	ERV - up to 1000CFM - Multi Family, Health Care, Nursing		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	ERV - over 1000CFM - Multi Family, Health Care, Nursing		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	ERV - up to 2000CFM - Hotel, Restaurant, Retail		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	ERV - over 2000CFM - Hotel, Restaurant, Retail		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	ERV - up to 2000CFM - Office, Warehouse, School		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	ERV - over 2000CFM - Office, Warehouse, School		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	HRV - Health Care, Multi Family		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	HRV - 500 to 1999CFM - Hotel, Restaurant, Retail		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	HRV - over 1999CFM - Hotel, Restaurant, Retail		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
NBC	Infrared Heating - 20 to 99 MBtu/hr		20	weather	33.0%	100.0%	Quasi	Quasi	Quasi	Quasi	33.0%	100.0%	Quasi
NBC	Infrared Heating - 100 to 300 MBtu/hr		20	weather	33.0%	100.0%	Quasi	Quasi	Quasi	Quasi	33.0%	100.0%	Quasi
NBC	MUA - Improved Efficiency 1700 to 2999CFM - Multi Family , Long Term Care		15	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	CEE Tier 2 Front-Loading Clothes Washer (MF)		11	baseload	10.0%	100.0%	117	58,121	396	$600	10.0%	100.0%	117
BR	CEE Tier 2 Front-Loading Clothes Washer (Laundromat)		11	baseload	10.0%	100.0%	117	58,121	396	$601	10.0%	100.0%	117
BR	Condensing Boiler - up to 299 MBtu/h		25	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	Condensing Boiler - 300 to 999 MBtu/h		25	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	Condensing Boiler - over 1,000 Mbtu/h		25	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	Condensing Gas Water Heater (1,000gal/day)		13	baseload	5.0%	100.0%	1,551	-	-	$2,230	5.0%	100.0%	1,551
BR	Custom Agriculture		Actual	Actual	54.0%	100.0%	Actual	Actual	Actual	Actual	54.0%	100.0%	Actual
BR	Custom Retrofit		Actual	Actual	54.0%	100.0%	Actual	Actual	Actual	Actual	54.0%	100.0%	Actual
BR	DCKV Fast Casual (< 5000 cfm)		15	weather	5.0%	100.0%	4,801	-	13,521	$10,000	5.0%	100.0%	4,801
BR	DCKV Full Menu (5000 - 9999 cfm)		15	weather	5.0%	100.0%	11,486	-	30,901	$15,000	5.0%	100.0%	11,486
BR	Destratification Fan		15	weather	10.0%	100.0%	Quasi	Quasi	Quasi	Quasi	10.0%	100.0%	Quasi
BR	Dishwasher - Rack Conveyor - Single High Temperature		20	Baseload	27.0%	100.0%	2,203	310,271	9,811	$2,375.00	27.0%	100.0%	2203
BR	Dishwasher - Stationary Rack - High Temperature		15	Baseload	20.0%	100.0%	619	87,119	3,553	-$350.00	20.0%	100.0%	619
BR	Dishwasher - Stationary Rack - Low Temperature		15	Baseload	20.0%	100.0%	841	118,369	855	-$350.00	20.0%	100.0%	841
BR	Dishwasher - Undercounter - High Temperature		10	Baseload	40.0%	100.0%	801	112,795	3,754	-$13.00	40.0%	100.0%	801
BR	Energy Star Convection Oven		12	Baseload	20.0%	100.0%	847	-	1	$875.00	20.0%	100.0%	847
BR	Energy Star Front Load Clothes Washer		11	Baseload	48.0%	100.0%	76	19,814	201	$150.00	48.0%	100.0%	76
BR	Energy Star Fryer		12	Baseload	20.0%	100.0%	1,083	-	17	$1,028.00	20.0%	100.0%	1083
BR	Energy Star Steam Cooker		10	Baseload	20.0%	100.0%	3,224	42,812	162	$2,000.00	20.0%	100.0%	3224
BR	ERV - up to 1000CFM - Multi Family, Health Care, Nursing		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	ERV - over 1000CFM - Multi Family, Health Care, Nursing		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	ERV - up to 2000CFM - Hotel, Restaurant, Retail		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	ERV - over 2000CFM - Hotel, Restaurant, Retail		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	ERV - up to 2000CFM - Office, Warehouse, School		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	ERV - over 2000CFM - Office, Warehouse, School		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	High Efficiency Under-Fired Broiler		12	Baseload	20.0%	100.0%	1,677	-	-	$1,270.00	20.0%	100.0%	1677
BR	HRV - Health Care, Multi Family		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
BR	HRV - 500 to 1999CFM - Hotel, Restaurant, Retail		14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi

BR	HRV - over 1999CFM - Hotel, Restaurant, Retail	14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
	HRV - over 1999CFM - Office,Warehouse,School	14	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
	HWC - Bathroom Aerator - University College Dorms - 1.0 gpm	10	Baseload	10.0%	52.3%	8	1,719	-	$0.59	10.0%	52.3%	8
	HWC - Bathroom Aerator - University College Dorms - 1.0 gpm - Rebate	10	Baseload	10.0%	52.3%	8	1,719	-	$3.59	10.0%	52.3%	8
	HWC - Bathroom Aerator - Hotel Motel - 1.0 gpm	10	Baseload	10.0%	52.3%	6	2,221	-	$0.59	10.0%	52.3%	6
	HWC - Bathroom Aerator - Hotel Motel - 1.0 gpm - Rebate	10	Baseload	10.0%	52.3%	6	2,221	-	$3.59	10.0%	52.3%	6
	HWC - Bathroom Aerator - Long Term Care and Retirement - 1.0 gpm	10	Baseload	10.0%	52.3%	10	2,254	-	$0.59	10.0%	52.3%	10
	HWC - Bathroom Aerator - Long Term Care and Retirement - 1.0 gpm - Rebate	10	Baseload	10.0%	52.3%	10	2,254	-	$3.59	10.0%	52.3%	10
	HWC - Bathroom Aerator - Other Commercial Institutional - 1.0 gpm	10	Baseload	10.0%	52.3%	8	2,065	-	$0.59	10.0%	52.3%	8
	HWC - Bathroom Aerator - Other Commercial Institutional - 1.0 gpm - Rebate	10	Baseload	10.0%	52.3%	8	2,065	-	$3.59	10.0%	52.3%	8
	HWC - Bathroom Aerator - Multi Family - 1.0 gpm	10	Baseload	10.0%	38.7%	7	2,371	-	$0.59	10.0%	38.7%	7
	HWC - Bathroom Aerator - Multi Family - 1.0 gpm - Rebate	10	Baseload	10.0%	38.7%	7	2,371	-	$3.59	10.0%	38.7%	7
	HWC - Kitchen Aerator - University College Dorms - 1.5 gpm	10	Baseload	10.0%	73.8%	16	5,377	-	$1.29	10.0%	73.8%	16
	HWC - Kitchen Aerator - University College Dorms - 1.5 gpm - Rebate	10	Baseload	10.0%	73.8%	16	5,377	-	$4.29	10.0%	73.8%	16
	HWC - Kitchen Aerator - Other Commercial Institutional - 1.5 gpm	10	Baseload	10.0%	73.8%	16	5,377	-	$1.29	10.0%	73.8%	16
	HWC - Kitchen Aerator - Other Commercial Institutional - 1.5 gpm - Rebate	10	Baseload	10.0%	73.8%	16	5,377	-	$4.29	10.0%	73.8%	16
	HWC - Kitchen Aerator - Multi Family - 1.5 gpm	10	Baseload	10.0%	60.6%	16	5,377	-	$1.29	10.0%	60.6%	16
	HWC - Kitchen Aerator - Multi Family - 1.5 gpm - Rebate	10	Baseload	10.0%	60.6%	16	5,377	-	$4.29	10.0%	60.6%	16
	HWC - Showerhead - University College Dorms - 1.25 gpm	10	Baseload	10.0%	90.2%	32	8,326	-	$3.79	10.0%	90.2%	32
	HWC - Showerhead - University College Dorms - 1.25 gpm - Rebate	10	Baseload	10.0%	90.2%	32	8,326	-	$6.79	10.0%	90.2%	32
	HWC - Showerhead - Hotel Motel - 1.25 gpm	10	Baseload	10.0%	90.2%	18	5,250	-	$3.79	10.0%	90.2%	18
	HWC - Showerhead - Hotel Motel - 1.25 gpm - Rebate	10	Baseload	10.0%	90.2%	18	5,250	-	$6.79	10.0%	90.2%	18
	HWC - Showerhead - Long Term Care and Retirement - 1.25 gpm & 1.5 gpm	10	Baseload	10.0%	90.2%	24	6,526	-	$3.79	10.0%	90.2%	24
	HWC - Showerhead - Long Term Care and Retirement - 1.25 gpm & 1.5 gpm - Rebate	10	Baseload	10.0%	90.2%	24	6,526	-	$6.79	10.0%	90.2%	24
	HWC - Showerhead - Other Commercial Institutional- 1.25 gpm	10	Baseload	10.0%	90.2%	24	6,700	-	$3.79	10.0%	90.2%	24
	HWC - Showerhead - Other Commercial Institutional - 1.25 gpm - Rebate	10	Baseload	10.0%	90.2%	24	6,700	-	$6.79	10.0%	90.2%	24
	HWC - Showerhead - Multi Family - 1.25 gpm	10	Baseload	10.0%	53.1%	32	9,585	-	$3.79	10.0%	53.1%	32
	HWC - Showerhead - Multi Family - 1.25 gpm - Rebate	10	Baseload	10.0%	53.1%	32	9,585	-	$6.79	10.0%	53.1%	32
	HWC - Showerhead - Multi Family - 1.25 gpm - Replacement	10	Baseload	10.0%	53.1%	24	7,933	-	$3.79	10.0%	53.1%	24
	HWC - Showerhead - Multi Family - 1.25 gpm - Replacement Rebate	10	Baseload	10.0%	53.1%	24	7,933	-	$6.79	10.0%	53.1%	24
	Infrared Heating - 20 to 99 MBtu/hr	20	weather	33.0%	100.0%	Quasi	Quasi	Quasi	Quasi	33.0%	100.0%	Quasi
	Infrared Heating - 100 to 300 MBtu/hr	20	weather	33.0%	100.0%	Quasi	Quasi	Quasi	Quasi	33.0%	100.0%	Quasi
	MUA - Improved Efficiency 3000 to 5999CFM - Multi Family, Long Term Care	15	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
	MUA - Improved Efficiency over 3999CFM - Other Commercial	15	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
	MUA - VFD 1700 to 5999CFM - Other Commercial	15	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
	MUA - VFD over 5999CFM - Other Commercial	15	weather	5.0%	100.0%	Quasi	Quasi	Quasi	Quasi	5.0%	100.0%	Quasi
	Laundry Washing Equipment with Ozone - <=120 lbs & 100,000 -199,999 lbs/yr	15	baseload	8.0%	100.0%	Quasi	Quasi	Quasi	Quasi	8.0%	100.0%	Quasi
	Laundry Washing Equipment with Ozone - <= 120 lbs & >= 200,000 lbs/yr	15	baseload	8.0%	100.0%	Quasi	Quasi	Quasi	Quasi	8.0%	100.0%	Quasi
	Laundry Washing Equipment with Ozone - > 120 lbs & 260,000 - 999,999 lbs/yr	15	baseload	8.0%	100.0%	Quasi	Quasi	Quasi	Quasi	8.0%	100.0%	Quasi
	Pre-Rinse Spray Nozzle - Full - 0.64gpm	5	baseload	0.0%	100.0%	1,286	252,000	-	$150	0.0%	100.0%	1,286
	Pre-Rinse Spray Nozzle - Full - 0.64gpm replacing existing 1.6gpm	5	baseload	0.0%	100.0%	457	97,292	-	$150	0.0%	100.0%	457
	Pre-Rinse Spray Nozzle - Limited - 0.64gpm	5	baseload	0.0%	100.0%	339	66,400	-	$150	0.0%	100.0%	339
	Pre-Rinse Spray Nozzle - Limited - 0.64gpm replacing existing 1.6gpm	5	baseload	0.0%	100.0%	90	19,197	-	$150	0.0%	100.0%	90
	Pre-Rinse Spray Nozzle - Other - 0.64gpm	5	baseload	0.0%	100.0%	318	62,200	-	$150	0.0%	100.0%	318
	Pre-Rinse Spray Nozzle - Other - 0.64gpm replacing existing 1.6gpm	5	baseload	0.0%	100.0%	109	23,166	-	$150	0.0%	100.0%	109
	Thermostat - Programmable - Ware, Ind, Rec, Agr	15	weather	20.0%	100.0%	108	-	29	$110	20.0%	100.0%	108
	Thermostat - Programmable - Food Service	15	weather	20.0%	100.0%	69	-	77	$110	20.0%	100.0%	69
	Thermostat - Programmable - Office, Institution, Education	15	weather	20.0%	100.0%	50	-	38	$110	20.0%	100.0%	50
DCM	Custom Agriculture Ind Baseload	Actual	Actual	54.0%	100.0%	Actual	Actual	Actual	Actual	54.0%	100.0%	Actual
	Custom Application	Actual	Actual	54.0%	100.0%	Actual	Actual	Actual	Actual	54.0%	100.0%	Actual

Appendix B: 2011 DSM Spending by Program

2011 DSM Spending

Sector	Program	Program Costs	Incentive Costs	Total
	*New Home Construction	$ 1,934.21	$ 546.87	$ 2,481.08
	*Home Retrofit	$ 955,595.79	$ 1,741,244.13	$ 2,696,840
Residential	**Total Residential**	**$ 957,530.00**	**$ 1,741,791.00**	**$ 2,699,321**
	Low Income	$ 271,410.00	$ 1,457,768.00	$ 1,729,178.00
Low Income	**Total Low Income**	**$ 271,410.00**	**$ 1,457,768.00**	**$ 1,729,178.00**
	*New Building Construction	$ 106,328.02	$ 652,288.00	$ 758,616
	*Building Retrofit	$ 413,472.98	$ 2,971,029.00	$ 3,384,502
Commercial	**Total Commercial**	**$ 519,801.00**	**$ 3,623,317.00**	**$ 4,143,118**
Distribution Contract	Distribution Contract	$ 721,779.00	$ 8,014,800.00	$ 8,736,579
	Total Distribution Contract	**$ 721,779.00**	**$ 8,014,800.00**	**$ 8,736,579**
Market Transformation	DWHR	$ 185,756.00	$ 1,385,764.00	$ 1,571,520
	Total Market Transformation	**$ 185,756.00**	**$ 1,385,764.00**	**$ 1,571,520**
Total Program Sector Costs				**$ 18,879,716**
Other Direct Program Costs	Salaries & Expenses			$ 5,716,463
	Research & Evaluation			$ 1,269,738
	Administration			$ 48,946
Total 2011 DSM Spending				**$ 25,914,863**

* Program costs allocation betw een new and retrofit markets based on TRC generated by each program

* New build incentive allocation based on DSMT tracking of incentives

Appendix C: 2011 LRAM Results by Measure

Program	Measure		Net Natural Gas Savings (m^3) per Unit	Units	Net Natural Gas Savings (m^3)
			(a)	(b)	(c) = (a) * (b)
Residential New Homes	ESK	Faucet Aerator - Bath - 1.5gpm	4	234	941
		Faucet Aerator - Kitchen - 1.5gpm	13	53	675
		Showerhead - 1.25gpm	40	96	3,802
Residential Existing Homes	ESK	Install - Faucet Aerator - Bath - 1.5gpm	3	503	1,597
		Install - Faucet Aerator - Kitchen - 1.5gpm	10	503	5,193
		Install - Pipe Insulation - 2m	14	503	7,214
		Install - Showerhead - 1.25gpm	29	398	11,545
		Install - Showerhead - 1.25gpm exist 2.6+	58	105	6,091
		Install - Showerhead - 1.25gpm - Replacement	17	80	1,344
	ESK	Pull - Faucet Aerator - Bath - 1.5gpm	2	60,394	104,708
		Pull - Faucet Aerator - Kitchen - 1.5gpm	9	56,174	482,603
		Pull - Pipe Insulation - 2m	10	56,174	582,009
		Pull - Showerhead - 1.25gpm	18	61,276	1,084,802
		Pull - Showerhead - 1.25gpm - Replacement	17	3,207	53,875
	ESK	Push - Faucet Aerator - Bath - 1.5gpm	1	20,284	23,513
		Push - Faucet Aerator - Kitchen - 1.5gpm	7	19,584	129,035
		Push - Pipe Insulation - 2m	9	19,584	169,930
		Push - Showerhead - 1.25gpm	16	20,564	322,877
		Push - Showerhead - 1.25gpm - Replacement	21	1,488	31,065
	Thermostat - Programmable		30	10,717	323,761
	Total Residential			**331,921**	**3,346,580**
Low Income	ESK	HHC - Faucet Aerator - Bath	8	28,866	233,657
		HHC - Faucet Aerator - Kitchen	18	28,866	514,380
		HHC - Pipe Insulation - 2m	16	28,910	466,355
		HHC - Showerhead - 1.25gpm exist 2.0-2.5	36	12,341	441,464
		HHC - Showerhead - 1.25gpm exist 2.6+	68	16,351	1,118,958
	Thermostat - Programmable - HHC		52	7,704	404,229
	Weatherization			450	514,499
	Total Low Income			**123,488**	**3,693,541**
Commercial New Buildings	CEE Tier 2 Front-Loading Clothes Washer (MF)		105	27	2,843
	Condensing Boiler			225	1,827,189
	Condensing Gas Water Heater (1,000gal/day)		1,473	44	64,832
	Custom Agriculture			8	392,675
	Custom New Construction			18	5,393
	DCKV Fast Casual (< 5000 cfm)		4,561	2	9,122
	DCKV Full Menu (5000 - 9999 cfm)		10,912	4	43,647
	Dishwasher - Rack Conveyor - Single High Temperature		1,608	7	11,257
	Dishwasher - Stationary Rack - High Temperature		495	5	2,476
	Dishwasher - Stationary Rack - Low Temperature		673	2	1,346
	Dishwasher - Undercounter - High Temperature		481	10	4,806
	Energy Star Front Load Clothes Washer		40	1	40
	Energy Star Fryer		866	15	12,996
	Energy Star Steam Cooker		2,579	1	2,579
	ERV			179	754,239
	HRV			180	939,077
	Infrared Heating			275	383,146
	MUA			1	1,596
	Total Commercial New Buildings			**1,004**	**4,459,258**

	CEE Tier 2 Front-Loading Clothes Washer (MF)	105.3	1,382	145,945
	CEE Tier 2 Front-Loading Clothes Washer (Laundromat)	105.3	32	3,370
	Condensing Boiler	[redacted]	458	3,188,510
	Condensing Gas Water Heater (1,000gal/day)	1,473.5	72	106,088
	Custom Agriculture	[redacted]	3	79,006
	Custom Retrofit	[redacted]	262	1,944,792
	DCKV Fast Casual (< 5000 cfm)	4,561.0	1	4,561
	DCKV Full Menu (5000 - 9999 cfm)	10,911.7	8	87,294
	Destratification Fan	[redacted]	36	512,460
	Dishwasher - Rack Conveyor - Single High Temperature	1,608.2	18	28,947
	Dishwasher - Stationary Rack - High Temperature	495.2	26	12,875
	Dishwasher - Stationary Rack - Low Temperature	672.8	142	95,538
	Dishwasher - Undercounter - High Temperature	480.6	14	6,728
	Energy Star Convection Oven	677.6	7	4,743
	Energy Star Front Load Clothes Washer	39.5	565	22,329
	Energy Star Fryer	866.4	131	113,498
	Energy Star Steam Cooker	2,579.2	4	10,317
	ERV	[redacted]	201	915,960
	High Efficiency Under-Fired Broiler	1,341.6	1	1,342
	HRV	[redacted]	140	397,724
	HWC - Bathroom Aerator - University College Dorms - 1.0 gpm	3.8	2,393	9,016
	HWC - Bathroom Aerator - Hotel Motel - 1.0 gpm	2.8	4,358	12,315
Commercial Existing Buildings	HWC - Bathroom Aerator - Long Term Care and Retirement - 1.0 gpm	4.7	2,654	12,500
	HWC - Bathroom Aerator - Other Commercial Institutional - 1.0 gpm	3.8	1,445	5,444
	HWC - Bathroom Aerator - Multi Family - 1.0 gpm	2.4	11,892	28,971
	HWC - Kitchen Aerator - University College Dorms - 1.5 gpm	10.6	1,593	16,931
	HWC - Kitchen Aerator - Other Commercial Institutional - 1.5 gpm	10.6	1,004	10,671
	HWC - Kitchen Aerator - Multi Family - 1.5 gpm	8.7	11,702	102,133
	HWC - Showerhead - University College Dorms - 1.25 gpm	26.0	2,651	68,882
	HWC - Showerhead - Hotel Motel - 1.25 gpm	14.6	4,616	67,466
	HWC - Showerhead - Long Term Care and Retirement - 1.25 gpm & 1.5 gpm	19.5	1,969	38,371
	HWC - Showerhead - Other Commercial Institutional- 1.25 gpm	19.5	1,448	28,218
	HWC - Showerhead - Multi Family - 1.25 gpm	15.3	12,931	197,602
	HWC - Showerhead - Multi Family - 1.25 gpm - Replacement	11.5	5,046	57,832
	Infrared Heating	[redacted]	717	918,022
	MUA	[redacted]	13	68,837
	Laundry Washing Equipment with Ozone	[redacted]	63	368,194
	Pre-Rinse Spray Nozzle - Full - 0.64gpm	1,286.0	165	212,190
	Pre-Rinse Spray Nozzle - Full - 0.64gpm replacing existing 1.6gpm	457.0	452	206,564
	Pre-Rinse Spray Nozzle - Limited - 0.64gpm	339.0	44	14,916
	Pre-Rinse Spray Nozzle - Limited - 0.64gpm replacing existing 1.6gpm	90.0	176	15,840
	Pre-Rinse Spray Nozzle - Other - 0.64gpm	318.0	57	18,126
	Pre-Rinse Spray Nozzle - Other - 0.64gpm replacing existing 1.6gpm	109.0	98	10,682
	Thermostat - Programmable - Ware, Ind, Rec, Agr	86.4	2,959	255,658
	Thermostat - Programmable - Food Service	55.2	103	5,686
	Thermostat - Programmable - Office, Institution, Education	40	489	19,560
	Total Commercial Existing Buildings		**74,526**	**10,450,656**
Distribution Contract Markets	Custom - Agriculture	[redacted]	107	10,646,350
	Custom - DC	[redacted]	1,018	131,106,846
	Total Distribution Contract Markets		**1,125**	**141,753,196**
	Total Program Results		**532,064**	**163,703,231**

Appendix D: 2011 TRC Results by Measure

Program	Measure		TRC Per Unit	Units	Gross TRC	Program Costs	Net Program TRC
			(a)	(b)	(c) = (a) * (b)	(d)	(e) = (c) - (d)
Residential New Homes	ESK	Faucet Aerator - Bath - 1.5gpm	$ 25.29	234	$ 5,916.88		
		Faucet Aerator - Kitchen - 1.5gpm	$ 78.96	53	$ 4,184.72		
		Showerhead - 1.25gpm	$ 239.21	96	$ 22,964.61		
Residential Existing Homes	ESK	Install - Faucet Aerator - Bath - 1.5gpm	$ 19.91	503	$ 10,013.15		
		Install - Faucet Aerator - Kitchen - 1.5gpm	$ 65.61	503	$ 33,000.25		
		Install - Pipe Insulation - 2m	$ 26.83	503	$ 13,496.05		
		Install - Showerhead - 1.25gpm	$ 174.31	398	$ 69,376.30		
		Install - Showerhead - 1.25gpm exist 2.6+	$ 306.60	105	$ 32,193.00		
		Install - Showerhead - 1.25gpm - Replacement	$ 107.43	80	$ 8,594.11		
	ESK	Pull - Faucet Aerator - Bath - 1.5gpm	$ 10.72	60,394	$ 647,337.78		
		Pull - Faucet Aerator - Kitchen - 1.5gpm	$ 54.45	56,174	$ 3,058,483.32		
		Pull - Pipe Insulation - 2m	$ 19.12	56,174	$ 1,074,125.10		
		Pull - Showerhead - 1.25gpm	$ 105.06	61,276	$ 6,437,469.65		
		Pull - Showerhead - 1.25gpm - Replacement	$ 107.43	3,207	$ 344,516.24		
	ESK	Push - Faucet Aerator - Bath - 1.5gpm	$ 7.06	20,284	$ 143,159.27		
		Push - Faucet Aerator - Kitchen - 1.5gpm	$ 41.55	19,584	$ 813,808.64		
		Push - Pipe Insulation - 2m	$ 15.86	19,584	$ 310,619.95		
		Push - Showerhead - 1.25gpm	$ 92.79	20,564	$ 1,908,097.73		
		Push - Showerhead - 1.25gpm - Replacement	$ 134.33	1,488	$ 199,889.14		
	Thermostat - Programmable		$ 86.35	10,717	$ 925,364.94		
	Total Residential			**331,921**	**16,062,611**	**$ 957,530**	**$ 15,105,081**
Low Income	ESK	HHC - Faucet Aerator - Bath	$ 52.01	28,866	$ 1,501,404		
		HHC - Faucet Aerator - Kitchen	$ 113.45	28,866	$ 3,274,748		
		HHC - Pipe Insulation - 2m	$ 30.27	28,910	$ 874,978		
		HHC - Showerhead - 1.25gpm exist 2.0-2.5	$ 213.13	12,341	$ 2,630,194		
		HHC - Showerhead - 1.25gpm exist 2.6+	$ 361.94	16,351	$ 5,918,055		
	Thermostat - Programmable - HHC		$ 148.04	7,704	$ 1,140,485		
	Weatherization		[redacted]	450	N/A		
	Total Low Income			**123,488**	**$ 15,339,863.91**	**$ 271,410**	**$ 15,068,454**
Commercial New Buildings	CEE Tier 2 Front-Loading Clothes Washer (MF)		$ 656.18	27	$ 17,717		
	Condensing Boiler		[redacted]	225	$ 3,569,812		
	Condensing Gas Water Heater (1,000gal/day)		$ 1,250.31	44	$ 55,014		
	Custom Agriculture		[redacted]	8	$ 982,491		
	Custom New Construction		[redacted]	18	$ 13,372		
	DCKV Fast Casual (< 5000 cfm)		$ 12,307.51	2	$ 24,615		
	DCKV Full Menu (5000 - 9999 cfm)		$ 36,812.69	4	$ 147,251		
	Dishwasher - Rack Conveyor - Single High Temperature		$ 13,893.94	7	$ 97,258		
	Dishwasher - Stationary Rack - High Temperature		$ 4,984.41	5	$ 24,922		
	Dishwasher - Stationary Rack - Low Temperature		$ 4,105.50	2	$ 8,211		
	Dishwasher - Undercounter - High Temperature		$ 3,261.85	10	$ 32,619		
	Energy Star Front Load Clothes Washer		$ 219.43	1	$ 219		
	Energy Star Fryer		$ 1,074.70	15	$ 16,120		
	Energy Star Steam Cooker		$ 3,931.03	1	$ 3,931		
	ERV		[redacted]	179	$ 1,122,438		
	HRV		[redacted]	180	$ 957,709		
	Infrared Heating		[redacted]	275	$ 897,181		
	MUA		[redacted]	1	$ 1,921		
	Total Commercial New Buildings			**1,004**	**$ 7,972,799.59**	**$ 106,328**	**$ 7,866,472**

	CEE Tier 2 Front-Loading Clothes Washer (MF)	$ 656.18	1,367	$ 896,997		
	CEE Tier 2 Front-Loading Clothes Washer (Laundromat)	$ 656.18	32	$ 20,998		
	Condensing Boiler		458	$ 6,229,622		
	Condensing Gas Water Heater (1,000gal/day)	$ 1,250.31	72	$ 90,022		
	Custom Agriculture		3	$ 159,505		
	Custom Retrofit		262	$ 5,133,194		
	DCKV Fast Casual (< 5000 cfm)	$ 12,307.51	1	$ 12,308		
	DCKV Full Menu (5000 - 9999 cfm)	$ 36,812.69	8	$ 294,502		
	Destratification Fan		36	$ 1,054,497		
	Dishwasher - Rack Conveyor - Single High Temperature	$ 13,893.94	18	$ 250,091		
	Dishwasher - Stationary Rack - High Temperature	$ 4,984.41	26	$ 129,595		
	Dishwasher - Stationary Rack - Low Temperature	$ 4,105.50	142	$ 582,981		
	Dishwasher - Undercounter - High Temperature	$ 3,261.85	14	$ 45,666		
	Energy Star Convection Oven	$ 776.71	7	$ 5,437		
	Energy Star Front Load Clothes Washer	$ 219.43	565	$ 123,981		
	Energy Star Fryer	$ 1,074.70	131	$ 140,786		
	Energy Star Steam Cooker	$ 3,931.03	4	$ 15,724		
	ERV		201	$ 1,129,100		
	High Efficiency Under-Fired Broiler	$ 1,906.65	1	$ 1,907		
	HRV		140	$ 502,885		
	HWC - Bathroom Aerator - University College Dorms - 1.0 gpm	$ 17.52	971	$ 17,008		
	HWC - Bathroom Aerator - University College Dorms - 1.0 gpm - Rebate	$ 14.82	1,422	$ 21,068		
	HWC - Bathroom Aerator - Hotel Motel - 1.0 gpm	$ 18.83	3,187	$ 60,016		
	HWC - Bathroom Aerator - Hotel Motel - 1.0 gpm - Rebate	$ 16.13	1,171	$ 18,890		
	HWC - Bathroom Aerator - Long Term Care and Retirement - 1.0 gpm	$ 22.69	2,003	$ 45,439		
	HWC - Bathroom Aerator - Long Term Care and Retirement - 1.0 gpm - Rebate	$ 19.99	651	$ 13,011		
	HWC - Bathroom Aerator - Other Commercial Institutional - 1.0 gpm	$ 19.68	1,373	$ 27,020		
	HWC - Bathroom Aerator - Other Commercial Institutional - 1.0 gpm - Rebate	$ 16.98	72	$ 1,223		
	HWC - Bathroom Aerator - Multi Family - 1.0 gpm	$ 15.14	10,880	$ 164,769		
Commercial	HWC - Bathroom Aerator - Multi Family - 1.0 gpm - Rebate	$ 12.44	1,012	$ 12,594		
Existing	HWC - Kitchen Aerator - University College Dorms - 1.5 gpm	$ 66.85	582	$ 38,908		
Buildings	HWC - Kitchen Aerator - University College Dorms - 1.5 gpm - Rebate	$ 64.15	1,011	$ 64,858		
	HWC - Kitchen Aerator - Other Commercial Institutional - 1.5 gpm	$ 66.85	976	$ 65,248		
	HWC - Kitchen Aerator - Other Commercial Institutional - 1.5 gpm - Rebate	$ 64.15	28	$ 1,796		
	HWC - Kitchen Aerator - Multi Family - 1.5 gpm	$ 54.69	10,556	$ 577,297		
	HWC - Kitchen Aerator - Multi Family - 1.5 gpm - Rebate	$ 51.99	1,146	$ 59,579		
	HWC - Showerhead - University College Dorms - 1.25 gpm	$ 136.68	1,256	$ 171,668		
	HWC - Showerhead - University College Dorms - 1.25 gpm - Rebate	$ 133.98	1,395	$ 186,899		
	HWC - Showerhead - Hotel Motel - 1.25 gpm	$ 81.50	3,759	$ 306,354		
	HWC - Showerhead - Hotel Motel - 1.25 gpm - Rebate	$ 78.80	857	$ 67,531		
	HWC - Showerhead - Long Term Care and Retirement - 1.25 gpm & 1.5 gpm	$ 104.69	1,483	$ 155,257		
	HWC - Showerhead - Long Term Care and Retirement - 1.25 gpm & 1.5 gpm - Rebate	$ 101.99	486	$ 49,568		
	HWC - Showerhead - Other Commercial Institutional- 1.25 gpm	$ 106.57	1,288	$ 137,259		
	HWC - Showerhead - Other Commercial Institutional - 1.25 gpm - Rebate	$ 103.87	160	$ 16,619		
	HWC - Showerhead - Multi Family - 1.25 gpm	$ 86.96	11,368	$ 988,581		
	HWC - Showerhead - Multi Family - 1.25 gpm - Rebate	$ 84.26	1,563	$ 131,701		
	HWC - Showerhead - Multi Family - 1.25 gpm - Replacement	$ 69.09	3,135	$ 216,591		
	HWC - Showerhead - Multi Family - 1.25 gpm - Replacement Rebate	$ 66.39	1,911	$ 126,868		
	Infrared Heating		717	$ 2,147,849		
	MUA		13	$ 128,041		
	Laundry Washing Equipment with Ozone		63	$ 661,482		
	Pre-Rinse Spray Nozzle - Full - 0.64gpm	$ 3,306.84	165	$ 545,629		
	Pre-Rinse Spray Nozzle - Full - 0.64gpm replacing existing 1.6gpm	$ 1,139.54	452	$ 515,073		
	Pre-Rinse Spray Nozzle - Limited - 0.64gpm	$ 761.02	44	$ 33,485		
	Pre-Rinse Spray Nozzle - Limited - 0.64gpm replacing existing 1.6gpm	$ 104.25	176	$ 18,348		
	Pre-Rinse Spray Nozzle - Other - 0.64gpm	$ 703.90	57	$ 40,122		
	Pre-Rinse Spray Nozzle - Other - 0.64gpm replacing existing 1.6gpm	$ 157.26	98	$ 15,412		
	Thermostat - Programmable - Ware, Ind, Rec, Agr	$ 147.35	2,959	$ 436,005		
	Thermostat - Programmable - Food Service	$ 100.14	103	$ 10,314		
	Thermostat - Programmable - Office, Institution, Education	$ 36.83	489	$ 18,011		
	Total Commercial Existing Buildings		**74,526**	**$ 25,133,183**	**$ 413,473**	**$ 24,719,710**
Distribution	Custom - Agriculture		107	$ 11,608,701		
Contract	Custom - DC		1,018	$ 312,767,928		
Markets	**Total Distribution Contract Markets**		**1,125**	**$ 324,376,629**	**$ 721,779**	**$ 323,654,850**
	Total Program Results		**532,064**	**$ 388,885,086**	**$ 2,470,520**	**$ 386,414,566**
	Other Direct Program Costs				**$ 7,035,147**	
	2011 Total Net TRC					**$ 379,379,419**

Appendix E: 2012 Avoided Costs

Inflation Factor	1.9%
Discount Rate	7.9%

	Gas Avoided Costs					
	Residential/Commercial				Industrial	
	Baseload (m3)		Weather-Sensitive (m3)		Baseload (m3)	
	Rate	NPV	Rate	NPV	Rate	NPV
1	0.19511	0.19511	0.18904	0.18904	0.19018	0.19018
2	0.19966	0.38015	0.19835	0.37287	0.20123	0.37668
3	0.21221	0.56242	0.21224	0.55517	0.21000	0.55705
4	0.21684	0.73504	0.21830	0.72894	0.21590	0.72892
5	0.22096	0.89805	0.22245	0.89306	0.22000	0.89123
6	0.22516	1.05200	0.22667	1.04804	0.22418	1.04451
7	0.22944	1.19739	0.23098	1.19441	0.22844	1.18927
8	0.23380	1.33470	0.23537	1.33264	0.23278	1.32598
9	0.23824	1.46437	0.23984	1.46318	0.23720	1.45509
10	0.24276	1.58683	0.24440	1.58647	0.24171	1.57701
11	0.24738	1.70248	0.24904	1.70289	0.24630	1.69216
12	0.25208	1.81170	0.25377	1.81285	0.25098	1.80091
13	0.25687	1.91484	0.25860	1.91669	0.25575	1.90361
14	0.26175	2.01225	0.26351	2.01475	0.26061	2.00059
15	0.26672	2.10424	0.26852	2.10737	0.26556	2.09219
16	0.27179	2.19112	0.27362	2.19483	0.27061	2.17869
17	0.27695	2.27317	0.27882	2.27743	0.27575	2.26038
18	0.28221	2.35065	0.28411	2.35543	0.28099	2.33753
19	0.28758	2.42383	0.28951	2.42910	0.28633	2.41039
20	0.29304	2.49293	0.29501	2.49867	0.29177	2.47919
21	0.29861	2.55820	0.30062	2.56438	0.29731	2.54417
22	0.30428	2.61983	0.30633	2.62643	0.30296	2.60554
23	0.31006	2.67804	0.31215	2.68503	0.30872	2.66350
24	0.31595	2.73301	0.31808	2.74037	0.31458	2.71823
25	0.32196	2.78492	0.32412	2.79263	0.32056	2.76992
26	0.32807	2.83395	0.33028	2.84199	0.32665	2.81873
27	0.33431	2.88025	0.33656	2.88860	0.33286	2.86483
28	0.34066	2.92398	0.34295	2.93262	0.33918	2.90837
29	0.34713	2.96527	0.34947	2.97419	0.34563	2.94948
30	0.35373	3.00427	0.35611	3.01345	0.35219	2.98831

	Water and Electricity Avoided Costs			
	Residential/Commercial/Industrial			
	Water (m3)		Electricity (kWh)	
	Rate	NPV	Rate	NPV
1	2.05092	2.05092	0.09517	0.09517
2	2.08989	3.98779	0.09698	0.18506
3	2.12959	5.81696	0.09883	0.26994
4	2.17006	7.54441	0.10070	0.35010
5	2.21129	9.17581	0.10262	0.42581
6	2.25330	10.71649	0.10457	0.49731
7	2.29611	12.17149	0.10655	0.56483
8	2.33974	13.54559	0.10858	0.62859
9	2.38419	14.84328	0.11064	0.68881
10	2.42949	16.06880	0.11274	0.74569
11	2.47565	17.22618	0.11488	0.79940
12	2.52269	18.31920	0.11707	0.85012
13	2.57062	19.35145	0.11929	0.89802
14	2.61947	20.32629	0.12156	0.94326
15	2.66924	21.24692	0.12387	0.98598
16	2.71995	22.11636	0.12622	1.02633
17	2.77163	22.93745	0.12862	1.06443
18	2.82429	23.71289	0.13106	1.10042
19	2.87795	24.44520	0.13355	1.13440
20	2.93263	25.13679	0.13609	1.16649
21	2.98835	25.78993	0.13868	1.19680
22	3.04513	26.40674	0.14131	1.22543
23	3.10299	26.98926	0.14400	1.25246
24	3.16195	27.53939	0.14673	1.27799
25	3.22202	28.05892	0.14952	1.30210
26	3.28324	28.54956	0.15236	1.32487
27	3.34562	29.01293	0.15526	1.34637
28	3.40919	29.45052	0.15821	1.36668
29	3.47396	29.86378	0.16121	1.38585
30	3.53997	30.25406	0.16428	1.40397

Audit Report on Union Gas Draft DSM 2011 Annual Report

Final Report

June 15, 2012

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Staff at Cascade Energy, Inc. supported the audit by providing technical expertise in reviewing the engineering reports accompanying Union Gas' Draft DSM 2011 Annual Report. We appreciate the guidance and support of staff at Union Gas and the DSM Evaluation and Audit Committee.

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TABLE OF CONTENTS

ABBREVIATIONS

Draft DSM 2011 Annual Report – Union Gas Draft DSM 2011 Annual Report

DSM – Demand Side Management

DSMVA – Demand Side Management Variance Account

EAC – Evaluation and Audit Committee

ECONW – ECONorthwest

Enbridge – Enbridge Gas Distribution

ESK – Energy Saving Kits

EUL – Effective Useful Life

HWC – Hot Water Conservation

IR - Infrared

LRAM – Lost Revenue Adjustment Mechanism

OEB – Ontario Energy Board

SSM – Shared Savings Mechanism

TEC – Technical Evaluation Committee

TRC – Total Resource Cost

Union – Union Gas Limited

EXECUTIVE SUMMARY

As per Union's request for audit, in regulation with OEB guidelines, ECONW was engaged in conducting an independent, third-party audit of Union's Draft DSM 2011 Annual Report.[1] To conduct the audit, the Audit Team (comprised of staff at ECONW and Cascade Energy, Inc.) reviewed Union's 2011 savings estimates and the calculations, assumptions, background materials, and other documentation supporting the results presented in the Draft DSM 2011 Annual Report.

This audit identifies instances in which the calculations and results presented in the Draft DSM 2011 Annual Report could be improved. All of the Audit Team's recommendations are discussed, in detail, in this report. To summarize, the Audit Team recommends the following changes to the Draft DSM 2011 Annual Report:

- Change the adjustment factors for the Commercial Multi-Family HWC Program to match those identified in the SeeLine verification study.
- Change the adjustment factors for the Commercial Non Multi-Family HWC Program to match those identified in the Energuy verification study.
- Regarding the current use of natural gas hot water heaters, change all "Don't Know" responses collected through surveys supporting the Beslin verification study to "No" responses, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.
- Assume that all "Don't Know" responses collected in the Beslin verification study related to the use of low-flow showerheads indicate no use of low-flow showerheads, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.
- Correct the equations used to calculate the adjustment factors for the ESK Residential Push/Pull/Install Replacement measures.
- Change the adjustment factors for the ESK Residential Push Showerhead Replacement measures to accurately reflect those reported in Beslin's verification study.
- For the 2012 program year, begin tracking the number of two-stage IR (infrared) heater units installed, and use the gas savings assumptions for each type of heater rather than the blended gas savings across heater types.
- Investigate methods to disaggregate the blended incremental cost factor for IR heaters.
- Work with the Technical Evaluation Committee (TEC) to finalize free-ridership rates for new measures initiated in 2011, and develop a process for estimating free-ridership rates for new measures in the future.
- Decrease the EUL assumption for Condensing Boilers under 300 MBTU/h from 25 years to 22 years until the EUL of 25 years for this class of boilers is justified.
- Change the annual electricity savings rate for Condensing Make-up Air Units to accurately reflect industry practice.
- Use the audited realization rates to reflect the changes in savings for six of the Commercial Custom projects.

[1] Union Gas. 2012. *Draft Demand Side Management 2011 Annual Report.* April 2.

- For the 2012 program year, calculate realization rates using stratification weights from the sample drawn for verification. This approach is in line with industry best practices, and will improve the statistical accuracy of the realization rates.
- Given limited resources for DSM evaluation and verification, the Audit Team recommends improving coordination among Union staff and consultants to reduce duplicative and potentially unnecessary efforts regarding the estimation of realization rates.
- To improve the information available for Commercial Custom projects, the Audit Team makes the following recommendations:
  - Collect pre-project documentation of whether the project involves an expansion of production capacity.
  - Collect pre-project utility history for the facility or meter where the project will be affected.
  - Record baseline conditions (operating hours, operating usage, baseline equipment configuration, etc.).
  - Collect post-project documentation of what equipment and operating changes were made.
  - Record upgraded condition (operating hours, operating parameters, upgraded equipment configuration, etc.).

Table ES-1 summarizes how adjustments and recommendations identified in this audit impact the results presented in Union's Draft DSM 2011 Annual Report. In some instances, the recommendations listed above do not represent specific action items for the Draft DSM 2011 Annual Report, but rather represent recommendations for future actions relevant to next year's evaluation. Those recommendations are not reflected in Table ES-1.

Table ES-1. Summary of Adjustments

Measure	Description of Change	TRC Impact	SSM Impact (no cap)	LRAM Impact	Natural Gas Savings (m^3)
Prescriptive Measures					
HWC Commercial Multi-Family	Adj. Factor	+$130,816	+$5,178	+$497	+20,533
HWC Commercial Non Multi-Family	Adj. Factor	+$13,018	+$515	+$47	+2,034
ESK Residential Push/Pull/Install	Adj. Factor	–$271,746	–$10,756	–$1,720	–65,447
Quasi-Prescriptive Measures					
Condensing Make-up Air Units	Electricity Savings	+$10,482	+$415	N/A	N/A
Custom Projects					
All Custom Adjustments	N/A	-$84,114	-$3,329	-$450	-20,201
Total (All Adjustments)	N/A	-$201,544	-$7,977	-$1,626	-63,079

I. INTRODUCTION

ECONW and Cascade Energy (Audit Team) were retained to perform an independent audit of the Draft DSM 2011 Annual Report.[2] To conduct the audit, the Audit Team reviewed Union's 2011 savings estimates and the calculations, assumptions, background materials, and other documentation (including relevant files for Custom projects) supporting the results presented in the Draft DSM 2011 Annual Report.

A. Audit Approach

The Audit Team's approach to the audit followed four general principles:

- **Review savings calculations for accuracy.** The preliminary review ensures that all *simple* errors applied in the basic savings calculations (e.g., incorrect cell references and/or application of free ridership adjustments) have been identified and recommendations for changes have been stated.
- **Review calculations for consistency with stated objectives.** The next level of review ensures that all factors that have been determined through earlier agreements with the OEB have been applied correctly.
- **Review savings claims and related savings components for appropriate documentation.** This level of review ensures that all supporting materials used for the Draft DSM 2011 Annual Report have been properly documented and applied.
- **Review overall processes used to determine annual savings.** This level of review ensures that the over-arching decisions made by Union Gas in producing the Draft DSM 2011 Annual Report were consistent with its objectives and with past efforts.

This audit focused on the 2011 program areas as defined in the Draft DSM 2011 Annual Report (see Table 1).

Table 1. Sector Programs in the Draft DSM 2011 Annual Report

Sector	Program
Residential	• New Home Construction • Home Retrofit • Market Transformation
Low Income	• Helping Homes Conserve (HHC) • Weatherization
Commercial	• New Building Construction • Building Retrofit
Distribution Contract	• Custom Projects

Source: Union Gas. 2012. *Draft DSM 2011 Annual Report*. April. Pg. 7.

[2] Union Gas. 2012. *Draft Demand Side Management 2011 Annual Report.* April 2.

Table 2 contains all of the tasks the Audit Team completed while conducting the audit of the Draft DSM 2011 Annual Report.

Table 2. Checklist of Audit Process and Objectives

Audit the Draft 2011 DSM Annual Report to identify if there are claims made by Union that have not been substantiated.	✔
Review Union's procedures for tracking program participants and determine whether they lead to accurate counts.	✔
Verify that Union's claimed input assumptions for SSM are accurate and consistent with the OEB filed and approved SSM input assumptions.	✔
Verify that Union's claimed savings for LRAM are accurate and based on best available information at the time of the audit.	✔
Verify that the calculation methodology used to determine the SSM incentive and the LRAM amount adheres to the OEB approved method.	✔
Review third party verification of Commercial and Distribution Contract Custom projects for reasonableness. This review will not duplicate the detailed third party analysis of savings estimates and evaluation findings. Instead, the audit review will provide an opinion on the methods and parameters used in consideration of the OEB framework under which the programs operate.	✔
Review and verify the appropriateness of the Market Transformation program claim and related shareholder incentive.	✔
Review and provide an opinion on the DSMVA account.	✔
Review evaluation studies conducted in support of the DSM portfolio and provide recommendations on priority evaluations for 2012.	✔

B. Summary of Findings

After reviewing the data contained in the Audit Tool, the verification reports, and other documentation, it is the opinion of the Audit Team that the data and information provided by Union conforms to the Audit Team's understanding of the guidelines established in the Decisions and Reasons Document (EB-2006-0021). Table 3 summarizes the overall impacts on net TRC, SSM (no cap), SSM (with cap), LRAM, and natural gas savings from all of the recommendations identified and discussed in this report.

Table 3. Audit Adjustments to Net TRC, SSM, LRAM, and Natural Gas Savings

Account	Draft DSM 2011 Annual Report	2011 Audit Value	% Change
Net TRC	$379,580,963	$379,379,419	-0.05%
SSM (no cap)	$9,773,825	$9,765,848	-0.08%
SSM (with cap)	$9,243,367	$9,243,367	No Change
LRAM	$822,251	$820,625	-0.20%
Natural Gas Savings (m^3)	163,766,311	163,703,231	-0.04%

II. REVIEW OF SSM AND LRAM CALCULATIONS

The Audit Team reviewed the results of SSM and LRAM calculations as presented in the Draft DSM 2011 Annual Report. Union developed a Microsoft Excel-based tool (Audit Tool) to compile and organize relevant data from a database, and then to calculate TRC, net TRC, SSM, and LRAM. The Audit Team reviewed the Audit Tool in four ways:

- Reviewed the results presented in the Audit Tool to ensure that they match the values reported in the Draft DSM 2011 Annual Report.
- Reviewed the data and calculations in the Audit Tool to ensure there are no mechanical errors in how different values are computed.
- Reviewed the data and calculations in the Audit Tool to ensure they are consistent with OEB-approved methods.
- Reviewed the input data referenced in the Audit Tool to ensure that they are consistent with values presented in the Draft DSM 2011 Annual Report and evaluated other data-related concerns raised by the EAC.

LRAM values are calculated by multiplying total natural gas savings (m^3), at the rate class-level, by the relevant rate ($/$m^3$). The LRAM values are then halved to account for variability in installation timing (i.e., not all units were installed on January 1, 2011).

SSM values rely on a more complex set of variables and calculations. Table 4 summarizes the variables and functions used in the Audit Tool to calculate SSM. After reviewing the Audit Tool, we conclude that:

- All results from the Audit Tool match the values reported in the Draft DSM 2011 Annual Report.
- There are no mechanical errors in the Audit Tool.
- The Audit Tool's calculations are consistent with OEB-approved methods.
- Issues related to specific inputs used to calculate SSM and LRAM are discussed later in this report.

Table 4. Review of SSM Calculations

Prescriptive Results	Function of . . .
Gas, Electricity, and Water Benefits ($/Unit)	free-ridership; adjustment factor; energy load; equipment life; gas, electricity, and water savings; NPV of avoided costs
Participant Costs ($/Unit)	free-ridership and incremental cost
Total Adjusted Gross TRC ($)	gas, electricity, and water benefits, participant costs, and units
Net TRC ($)	gross TRC and total program costs
SSM	net TRC and OEB-approved calculation
Custom Results	**Function of . . .**
Gas, Electricity, and Water Benefits ($/Unit)	free-ridership; adjustment factor; energy load; equipment life; gas, electricity, and water savings; NPV of avoided costs; realization rate
Participant Costs ($/Unit)	free-ridership, incremental cost, and realization rate
Total Adjusted Gross TRC ($)	gas, electricity, and water benefits, participant costs, and units
Net TRC ($)	gross TRC and total program costs
SSM	net TRC and OEB-approved calculation

III. REVIEW OF DSMVA CALCULATION

The DSMVA is calculated by subtracting DSM spending from the allocated DSM budget. Union may recover excess spending, up to 15 percent of the OEB-approved budget. Table 5 summarizes Union's DSM-related budget and spending for 2011. As shown in the final row, the DSMVA for 2011 is $616,646.

Table 5. 2011 DSMVA Calculation

	2011 Budget	2011 Spending
Program Allocation		
Residential	$3,139,000	$2,699,321
Low-Income	$1,903,000	$1,729,178
Incremental Low-Income	$2,465,000	$2,055,783
Commercial	$5,666,000	$4,143,118
Distribution Contract	$4,990,000	$8,736,579
Market Transformation	$1,464,000	$1,571,520
Program Sub-total	$19,627,000	$20,935,498
Other Allocations	$7,727,000	$7,035,147
2011 Totals	$27,354,000	$27,970,646
2011 DSMVA		**$616,646**

Sources: Union Gas. 2012. *Draft DSM 2011 Annual Report*. April. Pg. 8; Union Gas. 2010. *2011 Demand Side Management Plan*. May. Pg. 5.

IV. MEASURE-SPECIFIC AUDIT

This section describes the results of the measure-specific audit. In general, this component of the audit consisted of four tasks:

- Reviewed all verification studies completed in 2011.
- Compared results from verification studies with assumptions applied in the Draft DSM 2011 Annual Report.
- Reviewed all available documents describing input assumptions for Custom projects.
- Addressed specific issues raised by the EAC and Union.

The rest of this section is organized by measure type. First, it presents all recommendations and findings relating to prescriptive measures, followed by quasi-prescriptive measures, and finally custom projects. Each recommendation is described in isolation, with brief text describing the basis for the recommendation, and a table showing how that recommendation impacts TRC, SSM, LRAM, and natural gas savings. In some instances, the audit uncovered multiple recommendations for the same set of measures. In these instances, the impacts of each recommendation on TRC, SSM, LRAM, and natural gas savings are not additive.

A. Prescriptive Measures

For prescriptive measures, the Audit Team reviewed the savings calculations and results, including major assumptions and evaluation research used to estimate savings. The adjustment factors are applied to modify savings estimates to reflect actual penetration, which is then used to calculate actual savings. The following changes pertain to the prescriptive measures' adjustment factors as taken from independent market research then applied to savings claim. The Audit Team also reviewed specific issues raised by the EAC in their review of the Draft DSM 2011 Annual Report.

1. Hot Water Conservation – Multi-Family (Data-Transfer Error)

The audit uncovered errors in transferring adjustment factors from the SeeLine verification study of the 2011 Commercial Multi-Family HWC Program[3] to the Audit Tool and the Draft DSM 2011 Annual Report. Table 6 summarizes the adjustment factors reported in Table 9.5 of the Draft DSM 2011 Annual Report, the Audit Team's recommended changes based on the adjustment factors reported in the SeeLine verification study, and the impact on TRC, SSM, LRAM, and natural gas savings. The Audit Team recommends changing the adjustment factors to align with the results of the SeeLine verification study.

[3] SeeLine Group Ltd. 2012. *Verification Results: 2011 Commercial Multi-Family Hot Water conservation (HWC) Program Final Report*. March.

Table 6. Hot Water Conservation – Multi-Family

Program/Measure		Draft DSM 2011 Annual Report Adjustment Factor	Audited Adjustment Factor
Bathroom Aerator – 1.0gmp		60.61%	38.67%
Bathroom Aerator – 1.0gpm - Rebate		60.61%	38.67%
Kitchen Aerator – 1.5gmp		38.67%	60.61%
Kitchen Aerator – 1.5gpm - Rebate		38.67%	60.61%
TRC Impact	**SSM Impact (no cap)**	**LRAM Impact**	**Natural Gas Savings Impact (m^3)**
+ $130,816	+ $5,178	+ $497	+ 20,534

2. Hot Water Conservation – Non Multi-Family (Data-Transfer Error)

The audit uncovered an error in transferring data used to calculate adjustment factors from Energuy's verification study of the 2011 Commercial Non Multi-Family HWC Program[4] to the Audit Tool and the Draft DSM 2011 Annual Report. Table 7 summarizes the adjustment factors used in the 2011 Draft Annual Report, the Audit Team's recommended changes to those adjustment factors, and the impact on TRC, SSM, LRAM, and natural gas savings. Table 9.7 in the Draft DSM 2011 Annual Report presents verification results for the Kitchen Aerator measure in Long Term Care and Retirement Facilities. Union has dropped this program from its portfolio, and will not claim any related savings. Therefore, excluding the verification results of the Kitchen Aerator measure in Long Term Care and Retirement Facilities increases the adjustment factor for the HWC Non Multi-Family Kitchen Aerator measure from 68.37 percent to 73.81 percent.

Table 7. Hot Water Conservation – Non Multi-Family (Kitchen Aerator)

Program/Measure		Draft DSM 2011 Annual Report Adjustment Factor	Audited Adjustment Factor
University College Dorms – 1.5gpm		68.37%	73.81%
University College Dorms – 1.5gpm Rebate		68.37%	73.81%
Other Commercial Institutional – 1.5gpm		68.37%	73.81%
Other Commercial Institutional – 1.5gpm – Rebate		68.37%	73.81%
TRC Impact	**SSM Impact (no cap)**	**LRAM Impact**	**Natural Gas Savings Impact (m^3)**
+ $13,018	+ $515	+ $47	+ 2,034

[4] Energuy Canada Ltd. 2012. *Verification Report for Hot Water Conservation Commercial Non Multi-Family.* February.

3. ESK Residential Push/Pull/Install

The Audit Team identified four recommendations related to various Energy Savings Kit (ESK) Residential Push/Pull/Install measures. ESKs are pre-packaged measures designed to help residential customers reduce energy use and water consumption. In all cases, these recommendations change the adjustment factors applied to the relevant measures. In some cases, multiple recommendations apply to the same adjustment factors. This section describes each of the Audit Team's four recommendations applicable to these measures. In describing each of the four recommendations, the net impact of each recommendation (considered in isolation of other recommendations) is described in terms of TRC, SSM (no cap), LRAM, and natural gas savings. The net impact of all four recommendations, considered simultaneously is discussed at the end of the section.

ESK Residential Push/Pull (Survey Responses Regarding Homes with Natural Gas Hot Water Heaters)

As part of its verification of Union's ESK Residential Push/Pull measures in 2011,[5] Beslin administered surveys to develop the adjustment factors used in the Audit Tool and the Draft DSM 2011 Annual Report. In its surveys, Beslin asked respondents whether or not they had natural gas hot water heaters. While most respondents knew if they did or did not have a natural gas hot water heater, some did not know. In applying the survey results, Union adopted the industry's standard approach and dropped these "Don't Know" responses from the sample and used the remaining results to estimate the percentage of the population with natural gas hot water heaters. By dropping the "Don't Know" responses, Union implicitly distributed those responses to "Yes" and "No" responses in proportion to the known respondents.

It is not possible to precisely determine, however, how many of these "Don't Know" respondents have or do not have natural gas hot water heaters. While dropping these responses from the sample may be the standard approach when conducting market research, it has the potential to inflate the savings associated with the program without evidence of actual savings. In instances like these, the Audit Team recommends making consistent assumptions that do not inflate savings without verified evidence of actual savings. Removing these "Don't Know" respondents suggests that 92.68 percent and 85.63 percent of Pull and Push respondents (respectively) have natural gas hot water heaters. Assigning these "Don't Know" responses to the "No" category decreases these percentages to 89.41 percent (Pull) and 82.53 percent (Push).

Considered in isolation of the Audit Team's other recommendations to these measures, this recommendation reduces the adjustment factors applied to the relevant measures. Again, in isolation of other recommendations to these measures, this recommendation decreases TRC by $546,966, SSM (no cap) by $21,649, LRAM by $2,806, and natural gas savings by 107 (10^3 m^3) as reported in the Draft DSM 2011 Annual Report.

[5] Beslin Communication Group, Inc. 2011. *Final Report Following An Audit in 2012 of the Union Gas ESK-Residential Pull Initiative*; Beslin Communication Group, Inc. 2011. *Final Report Following An Audit in 2012 of the Union Gas ESK-Residential Pull Initiative*.

ESK Residential Push/Pull (Survey Responses Regarding Use of Low-Flow Showerheads)

As part of its verification of Union's ESK Residential Push/Pull Showerhead measures in 2011, Beslin administered surveys to develop the adjustment factors used in the Audit Tool and the Draft DSM 2011 Annual Report. In its surveys, Beslin asked respondents how often they use their low-flow showerheads. While most respondents identified how often they used their showerheads, some were unsure. In applying the survey results, Union put these "Don't Know" responses in the lowest shower-use category (25 percent of the time).

It is not possible to precisely determine, however, how often these "Don't Know" respondents use their showerhead. In instances like these, the Audit Team recommends making consistent assumptions that do not inflate savings without verified evidence of actual savings. Union weighted the responses by the percentage of showerhead use. Placing "Don't Know" respondents into the lowest positive use-class suggests use rates of 86.96 percent (Push), 82.53 percent (Push Replacement), and 80.42 percent (Pull). Assigning these "Don't Know" responses to the "Never Use" category decreases these percentages to 86.68 percent (Push), 81.85 percent (Push Replacement), and 80.19 percent (Pull).

Considered in isolation of the Audit Team's other recommendations to these measures, this recommendation reduces the adjustment factors applied to the relevant measures. Again, in isolation of other recommendations to these measures, this recommendation decreases TRC by $27,718, SSM (no cap) by $1,097, LRAM by $119, and natural gas savings by 5 ($10^3\,m^3$) as reported in the Draft DSM 2011 Annual Report.

ESK Residential Push/Pull/Install (Calculation Error)

During the audit, Union uncovered an internal error in the equations it uses to calculate the number of verified installations. The equations reference an incorrect population, resulting in very low adjustment factors (which are used in the Audit Tool and the Draft DSM 2011 Annual Report). The Audit Team recommends correcting this error. Considered in isolation of the Audit Team's other recommendations to these measures, this recommendation increases the adjustment factors applied to the relevant measures. Again, in isolation of other recommendations to these measures, this recommendation increases TRC by $293,340, SSM (no cap) by $11,610, LRAM by $1,165, and natural gas savings by 44 ($10^3\,m^3$) as reported in the Draft DSM 2011 Annual Report.

ESK Residential Push (Calculation Error, ESK Push – Showerhead – 1.25pgm - Replacement)

The Audit Team uncovered an error in transferring data used to calculate adjustment factors from Beslin's verification study of the 2011 ESK Residential Push Initiative to the Audit Tool and the Draft DSM 2011 Annual Report. Beslin's verification study found that 97.33 percent of the ESK Push Showerhead – 1.25gpm – Replacements were still installed, yielding an adjustment factor of 34.84 percent. The Draft DSM 2011 Annual Report, on the other hand, shows that only 93.06 percent were still installed, yielding an adjustment factor of 33.31 percent. In isolation of other recommendations, this recommendation increases TRC by $4,452, SSM (no cap) by $176, LRAM by $19, and natural gas savings by 1 ($10^3\,m^3$), as reported in the Draft DSM 2011 Annual Report.

Summary of ESK Residential Push/Pull/Install Impacts

Table 8 summarizes the adjustment factors used in the Draft DSM 2011 Annual Report, the Audit Team's recommended changes, and the impact on TRC, SSM, LRAM, and natural gas savings. The results in Table 8 represent all four of the relevant recommendations considered simultaneously.

Table 8. Adjustment Factors for the Residential ESK Program

Program/Measure	Draft DSM 2011 Annual Report	Audited Adjustment Factor
ESK - Install - Showerhead - 1.25gpm - Replacement	26.62%	56.56%
ESK - Pull - Faucet Aerator - Bath - 1.5pgm	44.71%	43.13%
ESK - Pull - Faucet Aerator - Kitchen - 1.5gpm	57.79%	55.75%
ESK - Pull - Pipe Insulation - 2m	62.15%	59.96%
ESK - Pull - Showerhead - 1.25gpm	46.48%	44.71%
ESK - Pull - Showerhead - 1.25gpm - Replacement	26.62%	56.56%
ESK - Push - Faucet Aerator - Bath - 1.5gpm	29.92%	28.84%
ESK - Push - Faucet Aerator - Kitchen - 1.5gpm	44.36%	42.76%
ESK - Push - Pipe Insulation - 2m	52.10%	50.21%
ESK - Push - Showerhead - 1.25gpm	41.27%	39.65%
ESK - Push - Showerhead - 1.25gpm - Replacement	33.31%	70.29%

TRC Impact	SSM Impact (no cap)	LRAM Impact	Natural Gas Savings Impact (m^3)
– $271,746	– $10,756	– $1,720	– 65,447

B. Quasi-Prescriptive Measures

For the Quasi-Prescriptive measures, the Audit Team reviewed the savings calculations and results, including major assumptions and evaluation research used to estimate savings. The Audit Team also reviewed specific issues raised by the EAC in their review of the Draft DSM 2011 Annual Report.

1. Infrared Heaters

During conversations with Union and the EAC, the Audit Team was directed to consider three issues concerning measures associated with infrared (IR) heaters: (1) base-case technology of IR heater savings assessment, (2) sizing of IR heater units, and (3) market share of program participation. This section will address the base-case technology first, and then the sizing and market share issues jointly.

Base Case Technology of Heater Savings Assessment

After reviewing Agviro's assessment of IR heater savings,[6] the Audit Team concludes that the newest (and most appropriate) base-case technology, according to Natural Resources Canada,[7] is used to estimate the savings reported in the Draft DSM 2011

[6] Agviro. 2004. *Assessment of Average Infrared Heater Savings.*

[7] Natural Resources Canada. 2008. *Gas-fired Unit Heaters Energy Efficiency Regulations*. Retrieved from http://oee.nrcan.gc.ca/regulations/products/8110.

Annual Report. Union's measure sheets also appropriately use the < 80% thermal efficiency standard to calculate savings.

Sizing of Heaters and Market Share

The natural gas savings factor Union uses in determining energy savings from IR heater units is based on an average measurement of savings, weighted by the market share of three types of IR heater units (single-stage, two-stage, and high intensity). This factor also implicitly accounts for the size (thermal output in BTU/h) of the unit installed. The Audit Team was specifically asked to investigate:

- If market share percentages should be monitored so as to update the weighting components used to compute the average gas savings; and
- Whether or not unit oversizing matters in calculating the savings.

After conducting research to address these two matters, the Audit Team concludes that the *type* of IR heater unit installed has a significantly larger impact on gas savings than optimal *sizing*. Furthermore, two-stage IR heater units behave more similarly to an optimally-sized unit than do single-stage or high intensity heater units. Therefore, if more two-stage heater units are installed as replacement units, the issue of optimally-sized IR heater units becomes moot.

Currently, Union uses weighted averages based on the market share of each of the three types of IR heater units. The Audit Team contacted Nexant, author of the 2010 market share study, to gather a sense of any shifts in market share trends in IR heater units. Nexant collected data that described consumption of IR heater units by type of heater unit (single-stage, two-stage, and high intensity) and by consumer category (manufacturer, distributor, and contractor). Nexant found that, for two-stage heater units, there was more variation between the consumer categories as compared to the single-stage and high intensity heater units. In Nexant's opinion, the volatility and quality of existing survey data suggest that a similar study, conducted today, would reveal approximately the same results. At this time, the Audit Team has not found justification for adjusting the market share percentages of the three types of IR heater units as applied in the Draft DSM 2011 Annual Report.

Rather than periodically updating these market share percentages, the Audit Team recommends that Union track, as separate line items in the Audit Tool, the number of two-stage heaters installed each year. By tracking this information, Union would no longer rely on static market shares in its savings calculations. Instead, Union could use the appropriate savings factor for two-stage heaters (0.0242 m^3/BTU/h) and the appropriate factor for single-stage and high intensity units (0.0144 m^3/BTU/h).[8] This approach ensures that future changes in preferences or programming are reflected in the savings associated with the three different types of IR heater units.

The Audit Team recognizes that tracking IR heater units by heater type for calculating savings also requires that incremental costs be disaggregated as well. While the measure sheet provides clear methods as to how the aggregated savings number was calculated, there is no supporting tabulation or description that shows how the aggregated

[8] Savings factors come from the Navigant Measure Sheet.

incremental cost figure was calculated. The Audit Team recommends that Union investigate: 1) If it is possible to disaggregate the incremental cost factor, 2) The best methods as to how this disaggregation can take place.

2. New Quasi Prescriptive Programs

In 2011, Union implemented one new measure: Condensing Make-up Air Units (MUAs), and adopted Enbridge's substantiation values for one measure: Boilers under 300 MBTU/h. In previous filings, Union had grouped the savings inputs for the less than 300 MBTU/h boilers into a general class of boilers, which was approved by the EAC. The Audit Team identified three potential areas for recommendations regarding these two measures:

- Free-ridership rates applied to the two measures.
- EUL applied to Boilers under 300 MBTU/h.
- Electricity savings per unit applied to Condensing Make-up Air Units.

Free-Ridership Rates

To date, Union has not filed these two measures for negotiation with the OEB. When implementing new measures prior to OEB approval, Union applies free-ridership rates which have been negotiated with the OEB. In this instance, Union applied a free-ridership rate of five percent to the two new measures based on rates used by Enbridge. Per the EAC's request, the Audit Team looked for further justification for the free-ridership rate from other sources:

- Union's free-ridership rate is based on a negotiated agreement between Enbridge Gas Distribution and its interveners for the measure.
- While NYSERDA does not use a default free-ridership rate for new measures, it does use a default net-to-gross ratio of 90 percent for all new measures. The net-to-gross ratio is a function of the free-ridership rate and the spill-over ratio.
- Energy Trust of Oregon uses a free-ridership rate of zero percent for all new residential measures. For commercial and industrial applications, it uses a free-ridership rate equal to the three-year average (weighted by savings) of free-ridership rates at the program level. In 2011, Energy Trust of Oregon used free-ridership rates of 24 percent for new buildings, 36 percent for existing buildings, and 24 percent for production efficiency.
- California Public Utilities Commission's Database for Energy Efficient Resources (DEER) provides two examples of default net-to-gross ratios for new measures that lack sufficient data to estimate a free-ridership rate ranging from 60 to 70 percent.[9]

Without additional data (such as a measure-specific free-ridership study) the Audit Team cannot verify the free-ridership rates used for these two new measures. Furthermore, since free-ridership rates are so closely tied to the individual characteristics of each measure and the manner in which they are implemented, the Audit Team cannot propose a potentially more accurate rate. Given the relatively small savings associated with these two measures, as stated in the Draft DSM 2011 Annual

[9] California Public Utilities Commission. 2008. *Database for Energy Efficient Resources*. Retrieved from http://www.deeresources.com/.

Report, changing the free-ridership rate would not change TRC enough to push the reported SSM beyond the cap. Since data are insufficient to recommend different free-ridership rates, and since applying different rates would have no impact on SSM, the Audit Team recommends accepting the five percent rate as reported in the Draft DSM 2011 Annual Report. Moving forward, however, the Audit Team recommends raising the issue of free-ridership rates for these two measures (as well as all new measures in the future) with the TEC.

Effective Useful Life (Boilers under 300 MBTU/h)

In its 2011 filing to the OEB, Enbridge prescribed an EUL of 25 years for Boilers under 300 MBTU/h. Historically, large boilers have typically exceeded their assumed EUL of 25 years. The boilers associated with this new measure, however, are much smaller, and do not yet have the proven history of large, conventional boilers. Furthermore, these smaller boilers are made of different, much thinner, materials than larger conventional boilers, suggesting that they may have a shorter EUL. Several sources suggest using an EUL for small boilers of 18–20 years.[10] Without a verified EUL assumption for boilers of this size, the Audit Team recommends that Union apply an EUL of 22 years (the midpoint of what other utilities use, 18–25 years) for boilers under 300 MBTU/h. The Audit Team also recommends that Union monitor the relevant literature for verifiable EUL assumptions for boilers of this size. However, since Union had already filed a 25 year EUL for all boilers (which was accepted by the EAC), these recommendations for a 22 year EUL should be implemented for the 2012 program year.

Electricity Savings per Unit (Condensing Make-up Air Units)

In its 2011 proposal to OEB, Enbridge correctly states that the electrical demand of the motor is a function of the motor's horsepower, percent motor loading, motor efficiency, and control factor. Enbridge does not, however, show the values it used for these parameters. The relationship between fan speed and power is well documented (often referred to as the "fan law").[11] The fan law states that when an electric motor is powering a fan under ideal conditions, the fractional power use is equal to the fractional fan speed, raised to the third power. However, due to inefficiencies, savings are more accurately modeled by raising the fractional fan speed to the 2.7 power.

$$\frac{Power_{New}}{Power_{Baseline}} = \left(\frac{Fan\ Speed_{New}}{Fan\ Speed_{Baseline}}\right)^{2.7}$$

Applying this principle, typical values of motor efficiencies for small motors, and a motor load of 65 percent, results in electricity savings that are much greater than originally estimated by Enbridge. The Audit Team recommends changing the annual per unit electricity savings assumption used in the Audit Tool and reported in Union's

[10] See, for example, GDS Associates. 2009. *Natural Gas Energy Efficiency Potential in Massachusetts*. GasNetworks. April. California Public Utilities Commission. 2008. *Database for Energy Efficient Resources*. Retrieved from http://www.deeresources.com/.

[11] See, for example, Prachyl, S. 2010. *Variable Frequency Drives and Energy Savings*. Siemens; Energy Star. 2012. *Variable Speed Fan Drives*. Retrieved on May 14, 2012 from http://www.energystar.gov/index.cfm?c=power_mgt.datacenter_efficiency_vsds.

Draft DSM 2011 Annual Report from 0.48 kWh/cfm to 1.09 kWh/cfm (see Table 9) for select Condensing Make-Up Air Units.

Table 9. Condensing Make-up Air Units (Electricity Savings Rate)

Program/Measure		Draft DSM 2011 Annual Report Annual Electricity Savings Rate	Audited Annual Electricity Savings Rate
Condensing Make-up Air Units Other Commercial Efficiency 1,700–5,999 cfm and greater than or equal to 6,000 cfm		0.48 kWh/cfm	1.09 kWh/cfm
TRC Impact	**SSM Impact (no cap)**	**LRAM Impact**	**Natural Gas Savings Impact (m^3)**
+ $10,482	+ $415	N/A	N/A

C. Custom Projects

For the Commercial and Distribution Contract Custom projects, the Audit Team reviewed the realization rates and engineering reports (including input assumptions and values) that Union used to estimate the savings presented in the Draft DSM 2011 Annual Report. The Audit Team coordinated with the statistical and engineering consultants responsible for conducting the third-party verifications of the savings and realization rates used in preparing the Draft DSM 2011 Annual Report. The Audit Team also reviewed specific issues raised by the EAC in their review of the Draft DSM 2011 Annual Report.

1. Engineering Review

Commercial Custom Projects

For Commercial Custom projects, the Audit Team reviewed the Michaels verification study on Union's Commercial and Industrial Custom projects.[12] The stated purpose of the Michaels study was to verify the reported savings, project costs, and EULs on a representative sample of Union's Commercial Custom projects. Michaels also performed a desk review of each project's documentation and savings calculations, and completed on-site project verifications. The purpose of this component of the audit is to:

- Review the engineering approach.
- Ensure compliance with engineering best practices.
- Verify calculated savings.
- Compare claimed savings from natural gas, water, and electricity to the savings Michaels found as a result of its review of these projects.

Of the 25 projects included in its verification study, Michaels reviewed 20 of them using phone interviews; Michaels reviewed the other five projects using on-site visits to verify

[12] Michaels Energy. 2012. *Union Gas 2011 Commercial and Industrial Markets Project Verification Final Report*. March.

installed equipment and operating parameters. The on-site reviews used the current operating information to calculate the corresponding natural gas, water, and electrical savings. To review the results of the Michaels verification study, the Audit Team followed these steps:

- The Audit Team reviewed the documentation and calculations reported in the Michaels verification study.
- Where engineering approaches or methodologies were unclear, the Audit Team communicated with Michaels for clarification.
- Where data from Michaels were insufficient to justify its approach, or other errors were uncovered, the Audit Team made recommendations for changes in the Draft DSM 2011 Annual Report.

After completing the steps described above, the Audit Team has five recommendations for changes to the inputs used in calculating savings from Commercial Custom projects:

- **Project 203 (Natural Gas Savings).** In calculating the savings associated with this project, the Michaels study inaccurately interpreted the assumptions used in the baseline data, and subsequently generated an overly conservative model. After clarifying and adjusting the assumptions and baseline data, the natural gas savings increase by 24 percent from 45,217 m^3 to 56,074 m^3.

- **Project 207 (Electrical Savings).** Projected electrical motor savings are based on the time a motor is used, and the average load placed on that motor during that time. The Michaels study uses a 90 percent load factor to calculate electrical savings. The Audit Team's experience has shown that a load factor of 70 percent is more realistic. Changing the load factor from 90 percent to 70 percent reduces calculated savings by 23 percent, from 118,715 kWh/year to 91,711 kWh/year.

- **Project 210 (Natural Gas Savings).** Insulating the thermal oil heater tank and the distribution piping can conserve natural gas. For this project, the Michaels study overestimated the size of the heater tank. Using a more accurate size reduced natural gas savings by 55 percent, from 156,237 m^3 to 70,140 m^3.

- **Project 238 (Natural Gas Savings).** The Michaels study used static air density (which is a function of temperature) to calculate savings. In this instance, applying dynamic air density values alongside variable heat recovery effectiveness (which is a function of actual temperature difference) is more appropriate. Applying these new assumptions increases the natural gas savings from 6,684 m^3 to 48,772 m^3.

- **Project 240 (Natural Gas Savings).** When steam traps leak, there are repercussions throughout the boiler system. Most notably, feed water flow must increase by more than just the amount lost from the leaks – it must also increase to account for the increased volume of boiler blowdown. Conversely, reducing steam leaks reduces the amount of feed water that must be heated (and natural gas that is required to heat the feed water) by more than just the volume of water lost to the leaks. Assuming a typical blowdown rate of 10 percent results in an increased savings of natural gas by 13 percent, from 105,132 m^3/year to 118,569 m^3/year.

- **Project 240 (Water Savings).** As explained above, reducing steam leaks reduces the amount of feed water by more than just the volume of water lost to the leaks because it also reduces the amount of water lost through boiler blowdown. Assuming a typical blowdown rate of 10 percent results in an increased water savings 12 percent, from 318,876 L/year to 356,471 L/year.

Table 10 summarizes the changes described above. The table shows the estimated savings for each of the projects described above, Michaels' verified savings and the audited savings

Table 10. Audit Results for Commercial Custom Projects

Project	Technology	Ex Ante Savings Volume	Verified Savings Volume	Project Savings Rate	Audited Savings Volume	Audited Project Savings Rate
203 Gas (m^3)	HVAC	66,623	45,217	67.9%	56,074	84.0%
207 Electrical (kWh)	Process	69,031	118,715	172.0%	91,711	132.9%
210 Gas (m^3)	Process	240,179	156,237	65.1%	70,140	29.2%
238 Gas (m^3)	HVAC	229,185	6,684	2.9%	48,772	21.0%
240 Gas (m^3)	Process	100,428	105,132	104.7%	118,569	118.1%
240 Water (L)	Process	308,942	318,876	103.2%	356,471	115.4%

Note: The Project Savings Rate value is the ratio of the Verified Savings to Ex-Ante Savings. The Audited Project Savings Rate value is the ratio of the Audited Savings to Ex-Ante Savings.

Distribution Contract Custom Projects

For Distribution Contract (DC) Custom projects, the Audit Team reviewed the Diamond verification report of Union's DC Custom projects.[13] Diamond completed on-site verification visits to each of the 13 Custom projects included in the sample. The facilities included in the Diamond verification study ranged from an oil refinery to a university campus to a large greenhouse facility. The purpose of this component of the audit is to:

- Review the data and assumptions (including incremental costs and EUL) used to describe baseline and upgraded equipment.
- Review the energy savings calculations for natural gas, water, and electrical savings.

To review the results of the Diamond verification study, the Audit Team followed these steps:

- The Audit Team reviewed the documentation and calculations in the Diamond verification study.
- Where engineering approaches or methodologies were unclear, the Audit Team communicated with Diamond for clarification.
- If data from Diamond were insufficient to justify its approach, or other errors were uncovered, the Audit Team made recommendations for changes in the Draft DSM 2011 Annual Report.

[13] Diamonds Engineering. 2012. *2011 Evaluation of Distribution Contract Custom Projects*. March.

After this review, Diamond and the Audit Team resolved all questions. The Audit Team agrees with the energy savings calculated by Diamond, and has no recommendations for adjustments to the realizations rates from the Diamond verification study.

General Recommendations for Custom Projects

The realization rates reported in the Michaels and Diamond verification studies suggest that the information available for the small Commercial Custom projects is less thorough and less reliable than the information available for large Custom projects. Nine of the Commercial Custom projects have realization rates of 25 percent or less. To improve the information available for Commercial Custom projects, the Audit Team makes the following recommendations:

- Collect pre-project documentation of whether the project involves an expansion of production capacity.
- Collect pre-project utility history for the facility or meter where the project will be affected.
- Record baseline conditions (operating hours, operating usage, baseline equipment configuration, etc.).
- Collect post-project documentation of what equipment and operating changes were made.
- Record upgraded condition (operating hours, operating parameters, upgraded equipment configuration, etc.).

2. Realization Rates

Audited Realization Rates

Realization rates are estimated parameters used to extrapolate audited savings from a *sample* of Custom projects to *all* Custom projects. These rates affect claimed program outcomes such as energy savings, incremental costs, and EULs. As such, realization rates affect the calculation of TRC, SSM, and LRAM. The Audit Team recalculated the realization rates based on the audited values of savings for the Commercial Custom projects listed above. These audited realization rates are listed in Table 11. Since the Audit Team found no reason to change verified savings in the sample of DC Custom projects, the realization rates for DC Custom savings remain unchanged from those reported in the Draft DSM 2011 Annual Report.

Table 11. Audited Realization Rates

Program/Measure		Draft DSM 2011 Annual Report Realization Rate	Audited Realization Rate
Natural Gas Savings – Commercial Custom		0.665	0.659
Natural Gas Savings – DC Custom		1.096	1.096
Water Savings – Commercial Custom		0.862	0.863
Water Savings – DC Custom		1.076	1.076
Electricity Savings – Commercial Custom		0.817	0.797
Electricity Savings – DC Custom		1.078	1.078
TRC Impact	**SSM Impact (no cap)**	**LRAM Impact**	**Natural Gas Savings**

			Impact ($m)
-$84,114	-$3,329	-$450	-20,201

Precision Level Audit

Navigant Consulting measured precision levels for realization rates associated with Union's Commercial Custom and DC Custom projects and reported them in its April 18, 2012 memorandum (herein referred to as "Navigant Precision Memo"). The Audit Team's initial efforts focused on determining if the realization rates Union reports in its Draft DSM 2011 Annual Report do, in fact, fall within the precision levels reported in the Navigant Precision Memo. The Audit Team notes that the precision levels Navigant reports (reproduced in Table 12 below) are *realized precision levels*, which are the relative precision levels attained after the sample is drawn and verified. This distinction is made from the ex-ante precision levels assumed in the sampling methodology for determining the sample size. Navigant sets that ex-ante level at 15 percent.

The Audit Team verified that the reported realization rates for natural gas and water savings for Custom projects fall within the calculated precision levels put forth in the Navigant Precision Memo. However, realization rates for electricity savings fall below the precision interval for those rates. Table 12 compares realization rates reported in the Draft DSM 2011 Annual Report with those reported in the Navigant Precision Memo.

Table 12. Comparison of Reported Realization Rates to Navigant's Achieved Precision Levels

Savings Type	Reported Realization Rate	Navigant Realization Rate	Navigant Achieved Precision Level	Precision Interval
Natural Gas Savings				
Commercial Custom	0.6649	0.73	14%	0.628–0.832
DC Custom	1.0962	1.06	15%	0.901–1.219
Water Savings				
Commercial Custom	0.8624	0.86	1%	0.851–0.869
DC Custom	1.0762	1.07	36%	0.685–1.455
Electricity Savings				
Commercial Custom	0.8166	0.92	8%	0.846–0.994
DC Custom	1.0775	1.48	4%	1.421–1.539

Source: Union Gas. 2012. *Draft DSM 2011 Annual Report*. April. Pg. 78-79; Navigant Consulting. 2012. *Navigant Precision Memo*. April 18, 2012.

Notes: ECONW calculated the upper and lower bound values using Navigant's realization rates and precision levels.

Navigant produced new Achieved Precision Levels with the audited savings number. The new calculations did not change from previous calculations in any manner of significant digits already reported. Thus, Navigant's previously reported rates and precision numbers do not vary with audited values.

Given that the realization rates reported in the Draft DSM 2011 Annual Report for electricity savings were outside—i.e., below—the precision levels reported in the

Navigant Precision Memo, the Audit Team reviewed the methodologies used to calculate each set of realization rates. The Audit Team noted the differences in the realization rates used in the Audit Tool (the values in the first column in Table 12) and those in the Navigant Precision Memo (the values in the second column in Table 12), for both gas and electricity savings; especially since the reported realization rates for electricity fell below the precision bound. To better understand the source of the difference between these two sets of rates, the Audit Team reviewed the process by which Custom projects are selected and verified, as well as the methodology used to estimate the reported realization rates.

The process Union employed for verifying Custom projects for the Draft DSM 2011 Annual Report was consistent with the process it has employed in the past. Specifically, for the Draft DSM 2011 Annual Report, the verification process consisted of the following steps:

- Navigant drew a stratified random sample of projects to verify. This sampling method has been approved by Union and the EAC.[14]
- Data for the sample projects were provided to two consultants (Diamond Engineering Company and Michaels Energy) who verified the utility savings for the Draft DSM 2011 Annual Report. These consultants reported the verified savings to Union, as well as their calculated realization rates.
- Union delivered the verification data to Navigant. Navigant then computed its estimate of the precision levels, and the realization rates that generate those precision levels
- Union reported the realization rates from the engineering consultants and the precision levels from Navigant in the Draft DSM 2011 Annual Report.

Diamond and Michaels estimated the realization rates reported in the Draft DSM 2011 Annual Report. To calculate these realization rates, they divided the audited utility savings from the sample of projects by the claimed savings for those projects. In estimating these realization rates, the two firms treated the drawn sample of verified projects as a simple random sample from the population of all Custom projects. Navigant estimated realization rates, as well as relative precision levels, by ratio estimation methods (these realization rates are not reported in the Draft DSM 2011 Annual Report). This method incorporates weighting factors, constructed from the stratification process, to account for the heterogeneous population of Custom projects. The Audit Team has reviewed Navigant's methods and has found them to be accurate and correct.

From a statistical standpoint, the Audit Team finds that the differences between the realization rates reported in the Draft DSM 2011 Annual Report and those reported in the Navigant Precision Memo are due to the methodologies used to estimate them. Given the accepted stratified sampling procedure used to generate the verified project sample, Navigant's method of estimation is a sound practice, and produces the best,

[14] Navigant Consulting. 2008. *Sampling Methodology for Engineering Reviews of Custom Projects.* April.

unbiased estimate of the realization rates for the population.[15] Moreover, Navigant has used this methodology in similar verification studies for utility DSM programs elsewhere.[16] The Audit Team understands that the methodologies used for calculating realization rates are being investigated for the first time. Therefore, the Audit Team understands that the current process of using realization rates derived from one statistical method, and precision values from another, is a product of inherited practice. However, the current procedures can easily be streamlined to consolidate responsibilities.

The Audit Team recommends that Union make the following changes to the process of calculating realization rates for the 2012 program year:

- Draw the sample of Custom projects to be verified.
- Verify the savings of those projects.
- Calculate the realization rates from the verified data using the appropriate sample stratification weights and use the rates in the Draft DSM Annual Report.
- Audit verified savings.
- Re-calculate the realization rate from the audited data using appropriate sample stratification weights and use these rates in the Final DSM Annual Report.
- Conduct confidence precision levels after audited savings are calculated.

The Audit Team believes that these steps will improve the statistical accuracy of the realization rates, and would be in line with industry best practices. Given limited resources for DSM evaluation and verification, the Audit Team recommends improving coordination among Union staff and consultants to reduce duplicative and potentially unnecessary efforts regarding the estimation of realization rates.

The Audit Team recognizes that the audited realization rates presented in Table 12 are calculated from the methodology used by the engineering consultants. The Audit Team also notes that the TRC, SSM, LRAM, and gas savings number reported herein do no reflect the adoption of the stratified realization rates. Since applying the stratified realization rates does not affect capped SSM, the recommendation to adopt these rates should be bundled with the recommendations to improve the process starting in the 2012 program year.

V. SCORECARD AUDIT

Up to this point, this report has focused on TRC-related programs. In addition to these programs, Union implements other programs (with separate funding). This section contains the Audit Team's review of the Market Transformation Scorecard and the Low-Income Weatherization Scorecard.

[15] Expert panels from other utilities have reviewed and approved this method. See, for example, TecMarket Works. 2004. *The California Evaluation Framework*. Project No. K2033910. Pg. 356. For discussion on the unbiased properties of the procedure, see, for example, Lohr, S. 1999. "Sampling: Design and Analysis."

[16] Navigant Consulting. 2011. *Energy Efficiency/Demand Response Plan Year 2*. AEP Ohio. March. Retrieved on May 15, 2012 from http//dis.puc.state.oh.us/TiffToPDf/ A1001001A11C16B02413C41830.pdf.

A. Market Transformation Scorecard

The Audit Team reviewed the work Union has completed to show progress on its Market Transformation Program. Since 2007, Union's Market Transformation Program has targeted Drain Water Heat Recovery (DWHR) technology, and as stated in the Draft DSM 2011 Annual Report, Union will exit the program this year. Union's methods for measuring program performance, as presented in the Draft DSM 2011 Annual Report, are consistent with its approach in 2010.

Union relied on two metrics to measure performance: (1) the number of participating builders as tracked by the program, and (2) the overall number of units installed as a percentage of residential new attachments as tracked by the program and available residential new attachments for Union's franchise. Table 13 summarizes the results from the Market Transformation Scorecard, as reported in the Draft DSM 2011 Annual Report (with a revision to the overall score from 150/150, as reported in the Draft DSM 2011 Annual Report, to 150/100).

The Audit Team assumes that the actual results reported in the Scorecard (137 participating builders and 2,691 units installed) are tracked by internal program databases, and that they are accurate. The Audit Team did not attempt to verify the builder enrollment or units installed as part of this audit. The metric value levels (reported in the second, third, and fourth columns of the table) show the required results needed to meet 50, 100, and 150 percent of the performance metric. In both cases, the actual results exceeded the 150 percent metric value level.

Table 13. 2011 Market Transformation Scorecard Results (Revised)

Metric Weighting	Metric Value Levels			Weight	Actual Results	Payout %	Score
	50%	100%	150%				
Participating Builders	122	128	133	20%	137	150	30/20
Units Installed (new build) as a percentage of 2011 residential new attachments	15.72% or 2011 units	17.72% or 2267 units	19.72% or 2522 units	80%	2691	150	120/80
Overall Results					$500,000	150%	150/100
Source: Union Gas. 2012. Draft DSM 2011 Annual Report. April. Pg. 70.							

The Audit Team also reviewed the actions taken on recommendations from past audits. In 2010, Union removed two metrics from its analysis of program performance. The two metrics described customer and builder awareness of the technology as determined through a market survey. The 2010 Audit recommended that Union re-institute the annual awareness surveys, as awareness is a leading indicator of market transformation. If, in the future, Union initiates a new Market Transformation Program, the Audit Team recommends that Union re-instate efforts to measure changes in awareness. The Audit Team does not recommend that Union use awareness metrics to claim savings, but rather, emphasizes the usefulness of tracking changes in awareness over time.

B. Low-Income Weatherization Scorecard

As stated in the Draft DSM 2011 Annual Report, Union received additional funding for a new incremental Low-Income Weatherization Program. Savings from this program are not factored into the SSM and LRAM calculations and do not influence TRC. To evaluate this program, Union creates a Scorecard (like the one for the Market Transformation Program). Table 14 summarizes the results from the Low-Income Weatherization Scorecard, as reported in the Draft DSM 2011 Annual Report. The Audit Team assumes that the actual results reported in the Scorecard (450 participants and 514,499 m^3 in natural gas savings) are tracked by internal program databases, and that they are accurate. The Audit Team did not attempt to verify enrollment or savings as part of this audit. The metric value levels (reported in the second, third, and fourth columns of the table) show the required results needed to meet 50, 100, and 150 percent of the performance metric. After weighting the results of the two metrics, Union scored 135.9/100, for a total incentive payout of $543,600.

Table 14. 2011 Low-Income Weatherization Scorecard Results

Metric Weighting	Metric Value Levels			Weight	Actual Results	Payout %	Score
	50%	100%	150%				
Weatherization Participants	300	400	450	50%	450	150	75/50
Total Natural Gas Savings (m^3)	366,000	488,000	549,000	50%	514,499	121.7	60.9/50
Overall Results					$543,600	136%	135.9/100
Source: Union Gas. 2012. Draft DSM 2011 Annual Report. April. Pg. 28.							

VI. SUMMARY

As per Union's request for audit, in regulation with OEB guidelines, ECONW was engaged in conducting an independent, third-party audit of Union's Draft DSM 2011 Annual Report. To conduct the audit, the Audit Team reviewed Union's 2011 savings estimates and the calculations, assumptions, background materials, and other documentation (including relevant files supporting Custom projects) supporting the results presented in the Draft DSM 2011 Annual Report.

This report presents the Audit Team's recommendations for changes to the Draft DSM 2011 Annual Report as well as procedural changes for future verification and reporting. To summarize, the Audit Team recommends the following:

- Change the adjustment factors for the Commercial Multi-Family HWC Program to match those identified in the SeeLine verification study.
- Change the adjustment factors for the Commercial Non Multi-Family HWC Program to match those identified in the Energuy verification study.
- Regarding the current use of natural gas hot water heaters, change all "Don't Know" responses collected through surveys supporting the Beslin verification study to "No" responses, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.
- Assume that all "Don't Know" responses collected in the Beslin verification study related to the use of low-flow showerheads indicate no use of low-flow

showerheads, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.

- Correct the equations used to calculate the adjustment factors for the ESK Residential Push/Pull/Install Replacement measures.
- Change the adjustment factors for the ESK Residential Push Showerhead Replacement measures to accurately reflect those reported in Beslin's verification study.
- For the 2012 program year, begin tracking the number of two-stage IR (infrared) heater units installed, and use the gas savings assumptions for each type of heater rather than the blended gas savings across heater types.
- Investigate methods to disaggregate the blended incremental cost factor for IR heaters.
- Work with the TEC to finalize a free-ridership rate for new measures initiated in 2011 and develop a process for estimating free-ridership rates for new measures in the future.
- Decrease the EUL assumption for Condensing Boilers under 300 MBTU/h from 25 years to 22 years until the EUL of 25 years for this class of boilers is justified. Change the annual electricity savings rate for Condensing Make-up Air Units to accurately reflect industry practice.
- Use the audited realization rates to reflect the changes in savings for six of the Commercial Custom projects.
- For the 2012 program year, calculate realization rates using stratification weights from the sample drawn for verification. This approach is in line with industry best practices, and will improve the statistical accuracy of the realization rates.
- Given limited resources for DSM evaluation and verification, the Audit Team recommends improving coordination among Union staff and consultants to reduce duplicative and potentially unnecessary efforts regarding the estimation of realization rates.
- To improve the information available for Commercial Custom projects, the Audit Team makes the following recommendations:
  - Collect pre-project documentation of whether the project involves an expansion of production capacity.
  - Collect pre-project utility history for the facility or meter where the project will be affected.
  - Record baseline conditions (operating hours, operating usage, baseline equipment configuration, etc.).
  - Collect post-project documentation of what equipment and operating changes were made.
  - Record upgraded condition (operating hours, operating parameters, upgraded equipment configuration, etc.).

Table 15 summarizes how adjustments and recommendations identified in this report impact the results presented in the Draft DSM 2011 Annual Report. In some instances, the recommendations listed above do not represent specific action items for the Draft DSM 2011 Annual Report. Those recommendations are not reflected in Table 15, but rather represent recommendations for future actions relevant to next year's evaluation.

Table 15. Summary of Adjustments

Measure	Description of Change	TRC Impact	SSM Impact (no cap)	LRAM Impact	Natural Gas Savings (m^3)
Prescriptive Measures					
HWC Commercial Multi-Family	Adj. Factor	+$130,816	+$5,178	+$497	+20,533
HWC Commercial Non Multi-Family	Adj. Factor	+$13,018	+$515	+$47	+2,034
ESK Residential Push/Pull/Install	Adj. Factor	–$271,746	–$10,756	–$1,720	–65,447
Quasi-Prescriptive Measures					
Condensing Make-up Air Units	Electricity Savings	+$10,482	+$415	N/A	N/A
Custom Projects					
All Custom Adjustments	N/A	-$84,114	-$3,329	-$450	-20,201
Total (All Adjustments)	N/A	-$201,544	-$7,977	-$1,626	-63,079

Table 16 summarizes the overall impacts on TRC, SSM (no cap), SSM (with cap), LRAM, and natural gas savings from all of the recommendations identified and discussed in this report.

Table 16. Audit Adjustments to TRC, SSM, LRAM, and Natural Gas Savings

Account	Draft DSM 2011 Annual Report	2011 Audit Value	% Change
Net TRC	$379,580,963	$379,379,419	-0.05%
SSM (no cap)	$9,773,825	$9,765,848	-0.08%
SSM (with cap)	$9,243,367	$9,243,367	No Change
LRAM	$822,251	$820,625	-0.20%
Natural Gas Savings (m^3)	163,766,311	163,703,231	-0.04%

APPENDIX A. KEY MEETINGS

Meetings and Participants

Kick-off Meeting - March 21, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter Randy Pozdena	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Josh Bachman	Jeff Hare	Craig Phillips	
Audit Discussion - April 11, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Jeff Hare	Craig Phillips		
Audit Discussion - April 18, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Julie Girvan	Kai Millyard		
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Jeff Hare	Craig Phillips		
Audit Discussion - May 2, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Julie Girvan	Kai Millyard		
	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Jeff Hare			
Audit Discussion - May 9, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Craig Phillips			
Review Draft Audit - May 23, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Craig Phillips			
Review Draft Audit - May 30, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	Tom Souhlas
Cascade	Jeff Hare	Craig Phillips		
Review Draft Audit – June 11, 2012				
Union Gas	Leslie Kulperger	Tina Nicholson		
EAC	Vincent DeRose	Julie Girvan	Kai Millyard	
ECONW	Steven Carter	Alec Josephson	Tessa Krebs	
Cascade	Jeff Hare	Craig Phillips		

APPENDIX B. DOCUMENTS REVIEWED

Ontario Energy Board

Phase 1 - Decisions With Reasons (2006)

Demand Side Management Guidelines For Natural Gas Utilities (2008)

Union Gas Limited

2011 DSM Draft Annual Report

2010 DSM Annual Report and Audit

2010 Audit Summary Results And Responses

EB-2010-0055 - 2011 Demand Side Management Plan – Update

EB-2010-0055 - Amendment to the 2011 Demand Side Management Plan – Incremental Low-Income Demand Side Management Plan

C/I Marketing - Program Concept: Condensing Make-up Air (MUA)

C/I Marketing - Program Concept: Condensing Boiler <300 MBTU/Hr

Verification Reports

Diamond Engineering Company

2011 Evaluation Of Distribution Contract Custom Projects

Beslin

Final Report ESK—Residential—Program Install Initiative (2011)

Final Report ESK—Residential—Push Initiative (2011)

Final Report ESK—Residential—Pull Initiative (2011)

Final Report ESK—Residential— Replacement Program (2011)

Final Report ESK-Helping Homes Conserve-HHC-Program Low-Income Initiative (2011)

Survey Instruments

Seeline

2011 Commercial Multi-Family Hot Water Conservation (HWC) Program

Energuy

Verification Report For Hot Water Conservation Commercial Non Multi-Family

Michaels Energy

Michaels No.: UB511AAN Union Gas 2011 Commercial And Industrial Markets Project Verification Final Report.

Navigant

Measures and Assumptions Demand Side Management (DSM) Planning. Appendix C: Substantiation Sheets

Estimated Realization Rates with related Confidence and Precision for Gas, Electricity and Water - 2012 Custom Projects

Infrared Heater Substantiation Document

Other Documents

Enbridge Gas

EB-2011-0254: Enbridge Gas 2012 Substantiation Documents For New And Revised Measures

Agviro

Assessment Of Average Infrared Heater Savings. RFP#: 04-P7

Nexant

Market Study Of Natural Gas Fired Infrared Heaters

ASHRAE

Service Life Data Query: Boiler

Evaluation & Audit Committee
Summary Results and Responses to the Audit of Union's 2011 DSM Annual Report

June 29, 2012

The purpose of this document is to outline the process followed for the Audit of the 2011 DSM Annual Report; provide a summary of Union's responses to the Auditor's recommendations and discussion with the Evaluation and Audit Committee (EAC), recalculate the corresponding impacts to the 2011 DSM savings claims, and present audit process issues or other recommendations brought forward by the EAC.

Audit Process

Selection of EAC members

The EAC was comprised of three Consultative representatives and two Union Gas representatives (Leslie Kulperger and Tina Nicholson).

The Consultative elected three EAC members via an e-mail casting for votes on January 18 2011, to represent the group through the Audit process. These representatives were:

- Kai Millyard – Green Energy Coalition
- Julie Girvan – Consumers Council of Canada
- Vince DeRose – Canadian Manufacturers and Exporters

Selection of Auditor and Terms of Reference

The "Auditor Request for Proposal" and the proponent's proposals were reviewed by the EAC. The intervenor representatives of the EAC recommended ECONorthwest as the Auditor of the 2011 Annual Report. ECONorthwest was commissioned to undertake the Audit with full consensus of the EAC. The Request for Proposal is attached in Appendix A.

Information Exchange

The Consultative, including the members of the EAC, and ECONorthwest reviewed the Draft 2011 DSM Annual Report circulated by Union Gas on April 2, 2012.

Other than comments from members of the EAC, no additional comments were received from members of the Consultative.

ECONorthwest presented the EAC with the 2011 Draft Audit report on June 6, 2012 for review. Eight joint meetings with the EAC, ECONorthwest, and Union were held between March 21, 2012 and June 11, 2012 to initiate the audit process, review the Draft 2011 Annual DSM Report, the Draft Audit Report, and the Draft Final Audit Report.

Following these discussions, the 2011Audit of Union's DSM Annual Report was completed by ECONorthwest on June 15, 2012.

Auditor's Recommendations

The recommendations outlined in the Audit Report along with the resolution of those issues are documented below.

The Audit recommendations were focused in several areas that affected financial results for 2011 including:

- Proposed changes to TRC and LRAM

In addition to recommendations that affect TRC and LRAM, the Auditor also made recommendations in the following areas:

- Commercial & Industrial Custom verification realization rates
- Free ridership for new measures
- Adjust infrared program tracking
- Documentation improvement for Commercial Custom program

Auditor's Recommended Changes to TRC & Recalculation of SSM

Subject to the recommendations set out below, the Auditor's opinion is that Union's 2011 SSM claims `conform to the rules and principles set down by the Ontario Energy Board as ECONorthwest understands them.. While the recommendations noted below impact TRC, the corresponding affect on SSM is above the $9.243 million cap and, as such, does alter the SSM earned in 2011.

Residential Recommendations

Recommendation #1

Regarding the current use of natural gas hot water heaters, change all "Don't Know" responses collected through surveys supporting the ESK verification study to "No" responses, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.

Resolution:

Union accepts the Auditor's recommendation for adjusting the TRC and LRAM. This results in a $546,709 decrease in TRC and a decrease of $2,805 in LRAM; however, as noted above, it will not alter the SSM claim. In addition, Union will treat the Auditor's recommendation on how to deal with "Don't Know" responses as 'best available information' until the Technical Evaluation Committee (TEC) has the opportunity to review and provide an opinion on the appropriate way to treat 'Don't Know' responses.

Recommendation #2

Assume that all "Don't Know" responses collected in the ESK verification study related to the use of low-flow showerheads indicate "No" use of low-flow showerheads, and change the adjustment factors for the ESK Residential Push/Pull measures accordingly.

Resolution:

Union accepts the Auditor's recommendation for adjusting the TRC and LRAM. This results in $26,552 decrease in TRC and a decrease of $114 in LRAM; however, as noted above, this will not alter the SSM claim. In addition, Union will treat the Auditor's recommendation on how to deal with "Don't Know" responses as 'best available' until the Technical Evaluation Committee (TEC) has the opportunity to review and provide an opinion on the appropriate way to treat 'Don't Know' responses.

Recommendation #3

Correct the equations used to calculate the adjustment factors for ESK Residential Push/Pull/Install Replacement measures resulting from a clerical error.

Resolution:

Union accepts the Auditor's recommendation. This results in a $292,507 increase in TRC; however, as noted above, this will not alter the SSM claim. This also results in a $1,161increase in the LRAM claim.

Recommendation #4

Change the adjustment factors for the ESK Residential Push Showerhead Replacement measures to accurately reflect those reported in ESK verification study resulting from a clerical data-transfer error.

Resolution:

Union accepts the Auditor's recommendation. This results in a $9,008 increase in TRC; however, as noted above, this will not alter the SSM claim. This also results in a $37increase in the LRAM claim.

Commercial Prescriptive Recommendations

Recommendation #5

Change the adjustment factors for the Commercial Multi-Family Hot Water Conservation (HWC) Program to match those identified in the verification study resulting from a clerical data-transfer error.

Resolution:

Union accepts the Auditor's recommendation. This results in a $130,816 increase in TRC; however, as noted above, this will not alter the SSM claim. This also results in a $497 increase in the LRAM claim.

Recommendation #6

Change the adjustment factors for the Commercial Non Multi-Family HWC Program to match those identified in the verification study resulting from a clerical data-transfer error.
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Resolution:

Union accepts the Auditor's recommendation. This results in a $13,018 increase in TRC; however, as noted above, this will not alter the SSM claim. This also results in a $47 increase in the LRAM claim.

Commercial Quasi - Prescriptive Recommendations

Recommendation #7

Change the annual electricity savings rate for Condensing Make-up Air Units to accurately reflect industry practice.

Resolution:

Union accepts the Auditor's recommendation. This results in a $10,482 increase in TRC net benefits. Union will update and file a new substantiation document reflecting this recommendation and treat the revised savings values as 'best available information' until the (TEC) has the opportunity to review and provide an opinion the appropriate input assumptions to be used in the Technical Reference Manual.

Commercial Custom Program

Recommendation #8

Use the audited savings for six of the Commercial Custom projects and adjust all Commercial Custom projects accordingly with the appropriate realization rates.

Resolution:

Union accepts the Auditor's recommendation. This results in a decrease of $84,114 in TRC; however, as noted above, this will not alter the SSM claim. This also results in a $450 decrease in the LRAM claim.

TRC Calculation

The eight recommended adjustments to TRC decreased Union's 2011 pre-Audit TRC claim of $379,580,963 by $201,544 to $379,379,419.

The Table below outlines the TRC net benefits 2011 pre and post Audit results:

Program Segment	Pre-Audited Claimed Savings	Audited Savings
New Home Construction	$ 33,066	$ 33,066
Home Retrofit	$ 16,301,290	$ 16,029,545
Residential Program Costs	$ (957,530)	$ (957,530)
Net Residential TRC	**$ 15,376,827**	**$ 15,105,081**
Low Income	$ 15,339,864	$ 15,339,864
Low Income Program Costs	$ (271,410)	$ (271,410)
Net Low Income TRC	**$ 15,068,454**	**$ 15,068,454**
New Building Construction	$ 7,982,194	$ 7,972,800
Building Retrofit	$ 25,053,586	$ 25,133,183
Commercial Program Costs	$ (519,801)	$ (519,801)
Net Commercial TRC	**$ 32,515,979**	**$ 32,586,182**
Distribution Contract	$ 324,376,629	$ 324,376,629
Distribution Contract Program Costs	$ (721,779)	$ (721,779)
Net Distribution Contract TRC	**$ 323,654,850**	**$ 323,654,850**
Salaries	$ (5,716,463)	$ (5,716,463)
Research & Evaluation	$ (1,269,738)	$ (1,269,738)
Administration	$ (48,946)	$ (48,946)
Total Other Program Costs	**$ (7,035,147)**	**$ (7,035,147)**
Net TRC	**$ 379,580,963**	**$ 379,379,419**

SSM Calculation

The eight recommended adjustments to TRC net benefits did not affect Union's 2011 pre-Audit SSM claim of $9,243,367 as it had surpassed the cap.

SSM = {[(Net TRC – (Range End Percentage x Target TRC)) / (Payout Increment Percentage x Target TRC)] x Incremental Payout} + Base Payout

= {[(Net TRC – (75% x $252,652,675)) / (0.1 % x $252,652,675)] x $10,000} + $2,250,000

= {[($379,379,419 - $189,489,506)/$252,653] x $10,000} + $2,250,000

= $751.58 x $10,000 + $2,250,000

= $9,765,848

UNION GAS LIMITED
Shared Savings Mechanism
2011 Audited Results

Line No.	Particulars		Amount[(1)] ($)
	South		
1	M1 Residential	$	566,187
2	M1 Commercial	$	244,222
3	M1 Industrial	$	73,472
4	M2 Commercial	$	290,677
5	M2 Industrial	$	207,076
6	M4 Industrial	$	512,983
7	M5 Industrial	$	980,927
8	M7 Industrial	$	610,676
9	T1 Industrial	$	4,404,012
10		$	7,890,233
	North		
11	01 Residential	$	180,215
12	01 Commercial	$	71,589
13	10 Commercial	$	79,260
14	10 Industrial	$	24,972
15	20 Industrial	$	291,511
16	100 Industrial	$	705,587
17		$	1,353,134
18	Total	$	9,243,367

(1) The allocation is based on 2011 TRC achieved by rate class

UNION GAS LIMITED
Lost Revenue Adjustment Mechanism
2011 Unaudited Results

Line No.	Particulars	Audited Volumes (10^3 m^3)	2011 Delivery Rates ($/$10^3$ m^3)	Revenue Impact ($)
		(a)	(b)	(a) x (b) x 50%
	South			
1	M1 Residential	5,387	$ 40.757	$ 109,783
2	M1 Commercial	4,447	$ 40.757	$ 90,620
3	M1 Industrial	1,246	$ 40.757	$ 25,385
4	M2 Commercial	6,064	$ 40.763	$ 123,586
5	M2 Industrial	3,129	$ 40.763	$ 63,771
6	M4 Industrial	7,981	$ 8.764	$ 34,973
7	M5 Industrial	14,414	$ 14.574	$ 105,037
8	M7 Industrial	12,780	$ 2.418	$ 15,450
9	T1 Industrial	86,670	$ 0.913	$ 39,565
10		142,117		$ 608,170
	North			
11	01 Residential	1,653	$ 91.828	$ 75,892
12	01 Commercial	1,256	$ 85.583	$ 53,733
13	10 Commercial	1,549	$ 62.162	$ 48,153
14	10 Industrial	484	$ 57.001	$ 13,788
15	20 Industrial	4,577	$ 3.683	$ 8,429
16	100 Industrial	12,067	$ 2.065	$ 12,459
17		21,586		$ 212,455
18	Total	163,703		$ 820,625

Program and Evaluation Recommendations Arising from the Audit Report and EAC Discussions

Recommendations presented below were either put forward by the Auditor or were made by the intervenor members of the EAC. Given the nature of the recommendations in this section of the report are more process and programmatic in nature, related resolutions were determined in consultation and agreement with the EAC.

Recommendation #9

For the 2012 program year, Union should begin tracking the number of two-stage infrared heater units installed, and use the gas savings assumptions for each type of heater rather than the blended gas savings across heater types.

Resolution:

Union will update the savings values in the substantiation document to separate the two-stage infrared heaters from single-stage and high intensity infrared heaters and provide the new information to the TEC.

Recommendation #10

Investigate the methods to disaggregate the blended incremental cost factor for infrared heaters.

Resolution:

Union will disaggregate the incremental cost for the two-stage infrared heaters from single-stage and high intensity infrared heaters. Union will also update the substantiation document to reflect this change and provide the new information to the TEC.

Recommendation #11

Decrease the Effective Useful Life (EUL) assumption for Condensing Boilers under 300 MBtu/h from 25 years to 22 years until an EUL of 25 years for this class of boilers is justified.

Resolution:

Union will treat this new information as 'best available information' until the TEC has the opportunity to review and provide an opinion the appropriate input assumptions to be used in the Technical Reference Manual.

Recommendation #12

Work with the TEC to develop a process for estimating free-ridership rates for new measures in the future. This recommendation followed the finding that Union adopted free

rider rates for new measures that were unsupported by evaluation because no better information was available at the time.

Resolution:

Union will work with the TEC to establish a process for estimating free-ridership rates for new measures in the future, which could include a provision to use default values until evaluated results are available. This review may include taking steps to revise specific free rider rates that have not been reviewed in some time.

Recommendation #13

Starting with the 2012 program year, calculate realization rates using stratification weights from the sample drawn for verification. This approach is in line with industry best practices, and will improve the statistical accuracy of the realization rates.

Resolution:

Union will provide the Auditor's recommendation to the TEC to ensure a harmonized process for both gas utilities.

Recommendation #14

Given limited resources for DSM evaluation and verification, the Audit Team recommends improving coordination among Union staff and consultants to reduce duplicative and potentially unnecessary efforts regarding the estimation of realization rates. The change means developing realization rates using the sampling stratification, and preparing final realization rate adjustments and the confidence and precision analysis after audited results are available.

Resolution:

In order to have a harmonized process across Ontario, Union will bring forward the Auditor's recommendation to the TEC.

Recommendation #15

To improve the information available for Commercial Custom projects, the Audit Team makes the following recommendations:

- Collect pre-project documentation of whether the project involves an expansion of production capacity.
- Collect pre-project utility history for the facility or meter where the project will be affected.
- Record baseline conditions (operating hours, operating usage, baseline equipment configuration, etc.).

- Collect post-project documentation of what equipment and operating changes were made.
- Record upgraded condition (operating hours, operating parameters, upgraded equipment configuration, etc.).

Resolution:

Union accepts the Auditor's recommendation and notes that many of the above documentation improvements have already been implemented. Union will continue to refine the Commercial Custom project data collection process.

Recommendation #16

The EAC requests that Union include a section in the DSM Annual Report that provide a status update on previous Audit recommendations.

Resolution:

Union will take this recommendation under advisement with the intent of including Audit recommendations in the DSM Annual Reports going forward.

Appendix A: 2011 Audit of DSM Annual Report RFP

REQUEST FOR PROPOSAL

Independent Audit of 2011 DSM Annual Report

January 17, 2012

Background

Union Gas Limited (Union) has delivered Demand Side Management (DSM) initiatives since 1997 to its broad customer base. DSM activities include planning, developing, implementing and evaluating energy efficiency initiatives for residential, commercial and distribution contract markets. 2011 serves as the fifth year under the constructs of the extended 2007 – 2009 DSM framework originally put forth and approved by the Ontario Energy Board (OEB) during a DSM Generic Proceeding in 2006. Annual program results are presented in a detailed annual report which is then subject to a third party audit. The 2011 DSM Annual Report contains a review of DSM program results and will be completed by April 1, 2012.

As a result of the 2002 Customer Review Process, and reconfirmed in the DSM Generic Proceeding, Union has established a **DSM Evaluation and Audit Committee (EAC)** made up of representatives from Union and the DSM Consultative (please refer to Appendix A for the list of DSM Evaluation and Audit Committee members). All Interveners in Union's most recent rate case are able to participate as members of the consultative. Although Union is technically a member of the EAC, **for the purpose of this RFP, the "EAC" will be considered intervenor consultative representatives only, and will not include Union Gas.**

Both Union and the EAC will be accessible to the Auditor to ensure a comprehensive review of the 2011 DSM Annual Report.

Union's DSM plan aims to achieve quantifiable savings, measured by Total Resource Cost (TRC) analysis. Union receives a Shared Savings Mechanism (SSM) based on the DSM portfolio program results, as well as a Lost Revenue Adjustment Mechanism (LRAM). In addition, DSM spending is tracked in a DSM Variance Account (DSMVA).

In 2011, Union operated seven energy efficiency programs:

Residential Markets

- New Home Construction
- Existing Customers
- Low Income Existing Customers

Market Transformation

- Drain Water Heat Recovery

Commercial and Industrial Markets

- New Build Construction
- Existing Buildings

Distribution Contract Market

- Industrial Process Improvements

A variety of delivery channels are used to promote the uptake of cost-effective energy efficient technologies through information and incentives. Programs are designed around measures for which input assumptions have been filed and approved by the OEB in accordance to the current DSM Framework.[1] All programs within the DSM portfolio are subject to evaluation based on the priorities identified in the year. SSM savings claimed through prescriptive and quasi-prescriptive measures are based on pre-approved input assumptions. The unique nature of Commercial/Industrial and Distribution Contract custom project input assumptions does not enable a prescriptive approach to the savings estimates, and consequently, there are no custom inputs filed with the OEB. Select programs, including Commercial/Industrial and Distribution Contract Custom programs are subject to verification by a third party, reports for which will be provided to the Auditor for review. LRAM savings are based on best available information at the time of the audit; Union will provide evaluation studies for review for LRAM purposes.

Union's DSM Plans and Annual Reports are reported and filed with the OEB as part of the Reporting and Record-keeping Requirement process.

Objective

The primary objective of the audit is to provide an independent opinion to DSM stakeholders (i.e. the OEB, Intervenor consultative members, and the Utility), that serves to determine if the SSM incentive calculation, Market Transformation incentive calculation, and LRAM calculation are appropriate.

As an initial requirement upon selection, the Auditor will meet with Union and the EAC to determine the priorities for the audit, and to set the audit approach to be followed to achieve the objective stated above. The deliverable will be a written report outlining the principles of the audit, the methodology followed, and the findings and recommendations of the audit.

The Auditor will provide an opinion on the SSM, LRAM, and DSMVA amounts presented in the Annual Report. A final Auditor opinion will indicate whether the data that has been gathered and recorded applies reasonable methods, is accurate in all material respects, and is consistent with the OEB rules and principles applicable to Union's 2011 DSM programs, SSM, LRAM, and DSMVA as outlined in EB2006-021 Decision with Reasons.[2]

[1] EB2006-021 Decision with Reasons: Generic Proceeding for DSM.
[2] ibid

Scope of Work

The following list outlines activities that are expected to be carried out for the purpose of this audit. The Auditor is encouraged to propose other tasks that they believe would be helpful in reaching the study objective.

1. Provide a detailed work plan and present to Union at the Launch Meeting. The Launch Meeting will allow the Auditor, Union, and the EAC to finalize the communication protocols that will be established and strictly adhered to for the duration of the 2011 Audit.
2. Attend, via teleconferencing, weekly audit status meetings to discuss Auditor processes, requirements, findings, and concerns with the EAC and Union.
    a. The Auditor will work closely with Union to satisfy all questions and concerns prior to releasing the Draft Audit Report.
3. Audit the draft 2011 DSM Annual Report to identify if there are claims made by Union that have not been substantiated.
4. Review Union's procedures for tracking program participants and determine whether they lead to accurate counts.
5. Verify that Union's claimed input assumptions for SSM are accurate and consistent with the OEB filed and approved SSM input assumptions.
6. Verify that Union's claimed savings for LRAM are accurate and based on best available information at the time of the audit.
    a. Changes to measure inputs must be based on 'best available information' established through relevant research presented during the audit. If alternative values are presented, the Auditor will discuss any derivation with Union and the EAC before rendering any opinions in regard to the alternatives. Proposed alternative values will be presented with a plausible range of values with full documentation from publicly available research made available for the EAC and Union to review at the time of the audit.[3]
7. Verify that the calculation methodology used to determine the SSM incentive and the LRAM amount adheres to the OEB approved method.
8. Review third party verification of commercial and distribution contract custom projects for reasonableness. This review will not duplicate the detailed third party analysis of savings estimates and evaluation findings. Instead, the audit review will provide an opinion on the methods and parameters used in consideration of the OEB framework under which the programs operate.
    a. In addition to reviewing the verification reports, the Auditor may speak with the third party verification consultants and seek clarification as needed with either the verification consultant and/or Union Gas to ensure the Auditor has all the relevant information before forming any opinions.
    b. As above, any recommendations to changing custom project inputs will be supported by relevant research.

[3] In accordance with the OEB 2006-021 Decision with Reasons, changes to prescriptive measure inputs may impact LRAM but will not be retroactively applied to TRC or SSM.

9. Review and verify the appropriateness of the Market Transformation program claim and related shareholder incentive.
10. Review and provide an opinion on the DSMVA account.
11. Review evaluation studies conducted in support of the DSM portfolio and provide recommendations on priority evaluations for 2012.
12. Prepare a Draft Audit Report on the findings of these activities, including recommendations for future evaluation work. The Auditor will be expected to communicate the essence of recommendations put forward in the Draft Audit Report during weekly status update calls to ensure the EAC and Union are aware of, and have an opportunity to respond to, recommendations that it proposes.
13. Prepare and submit a Draft Final Audit Report. The purpose of the Draft Final Audit report is to allow all parties to review the report and ensure it accurately reflects the findings and discussions after the Draft Audit Report.
14. Prepare and submit a Final Audit Report.

To assist the Auditor in conducting the audit, the following will be made available to the Auditor:

- Access to the company's tracking system and documentation of program participants;
- Access to the company's cost-effectiveness screening model;
- Access to all previous DSM Annual Reports, (previously called Evaluation Reports) which outline terms of evaluation and objectives;
- Access to all evaluation research conducted during 2011;
- Access to 2011 verification studies of custom projects
- Comments from members of the DSM Intervenor consultative members will be forwarded; and,
- Support from Union staff, as required.

While Union is the "client" for the purpose of the audit, the EAC will be included in all communiqués with respect to the audit report.[4] The Auditor will be provided with copies of comments submitted by all customer intervenor stakeholders. Relevant comments should be addressed in the audit report.

Any discussion of key findings and drafts of the audit report will be delivered directly to Union and the EAC for review and comment (email addresses are included in Appendix A).

[4] In the event that customer sensitive data must be discussed, an alternate arrangement may be necessary to gain the information required.

Schedule

Following an OEB Directive, the independent audit of DSM results is to be completed and a recommendation filed with the OEB by the last day of the sixth month after the financial year end.

Due to the importance in meeting the OEB imposed deadlines, the Auditor will be contractually bound to meet the deadlines outlined in this RFP. Refer to the schedule presented in the table below. Failure to meet the deadlines will result in a payment penalty of $700 per diem, with a maximum penalty not to exceed the value of the work. This penalty is contingent on receiving feedback on the Draft Audit Report from Union and the EAC by May 30, 2012; each business day feedback from Union and the EAC is delayed, a day will be applied to the Final Report deadline (i.e. if feedback on the Draft Report from Union and the EAC is received on May 30, the Final Report deadline will be June 11, 2012).

AUDIT SCHEDULE	
Activity	**Due**
RFP Dissemination	January 17, 2012
Intent to bid and questions of clarification	January 27, 2012 – 5:00p.m.
Proposals due	February 16, 2012 - 3:00 p.m.
Contract awarded	on or before March 2, 2012
Auditor work plan	Week of March 12, 2012
Launch Meeting	Week of March 12, 2012
DSM Annual Report sent to Auditor	**on or before – April 2, 2012**
EAC & Consultative written comments	on or before – April 9, 2012
Draft Audit Report	on or before May 16, 2012
Response from Union and EAC	on or before May 30, 2012
Final Draft Audit Report	on or before June 6, 2012
Final Audit Report	June 12, 2012

Qualifications and Experience Requirements

Union is seeking Auditors with demonstrated knowledge of, or experience in, the following areas:

- Current regulatory framework as established by the Ontario Energy Board in its Decision with Reasons EB-2006-021;
- Energy efficiency/DSM, marketing program evaluation and market transformation evaluation;
- A range of research capabilities;
- A range of methodological approaches including qualitative and quantitative assessments; and,

- Providing evaluations in a performance-based regulatory environment.

The criteria listed below will be considered in the evaluation of all proposals received:

- Clarity and comprehensiveness of the proposed approach to the audit;
- Experience in energy efficiency/DSM program evaluation and other relevant areas (as outlined above) and in all market sectors (residential, commercial, and industrial);
- Experience with gas utility DSM is essential, experience in Ontario and/or other parts of Canada will be considered an asset;
- Relevant engineering and/or technical experience;
- Knowledge of the Ontario regulatory framework;
- Demonstrated ability to work with (and be viewed as credible and objective by) a variety of different types of stakeholders, including utilities, environmental groups, consumer groups and industry; and,
- Reasonableness of the cost proposal.

Reporting Structure

The independent Auditor will be selected by Union and the EAC. The launch meeting with the Auditor will be held with all members of the EAC and representatives from Union to ensure a consistent understanding among all parties of the scope and expectations of the independent audit.

Throughout the period of the audit, the Auditor may contact the EAC and Union via email and as needed, however all correspondence must be sent to each person identified in "Appendix A". Weekly conference calls between the EAC, Union, and the Auditor will be arranged for group discussion and progress reporting.

The independent Auditor will be required to discuss all material concerns with the EAC and Union prior to presenting the Draft Audit Report and Draft Final Audit Report. Union and the EAC will review the Draft Audit Report and request any necessary revisions. The final Audit Report will be circulated with the entire DSM Intervener Consultative Group. Since portions of the Audit Report may be used to update Union's Annual Report and tables contained therein, please submit the Draft and Final Audit Report in editable MS Word and MS Excel files in addition to a non-editable 'pdf.'

Evaluation of Proposals

The following components are required in all proposals in order to be reviewed and considered:

1. Description of the planned approach to the audit, including an outline of the audit principles that will guide the work (LIMIT 4 PAGES);

2. Description of the project team assembled to execute the project, including an outline of each individual's qualifications;
3. An outline of the firm's background in the areas listed above;
4. Cost proposal.

Contact

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Deadline for Proposals

Proposals should be received no later than 3:00pm on February 16, 2012. All proposals should be forwarded via email to ensure prompt distribution to each of the three EAC members and two representatives from Union. Email addresses are listed in Appendix A.

Appendix A – Audit Contacts

Union Gas

Leslie Kulperger
Union Gas
lkulperger@uniongas.com

Tina Nicholson
Union Gas
tnicholson@uniongas.com

Evaluation and Audit Committee

Julie Girvan
Consumers Council of Canada
jgirvan@ca.inter.net

Kai Millyard
Green Energy Coalition
kai@web.ca

Vince DeRose
Industrial Gas Users Association
vderose@blgcanada.com

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Memorandum

To: **Leslie Kulperger, Imran Noorani, Tina Nicholson – Union Gas Ltd**

From: **Brad Rogers, Dan Violette – Navigant Consulting**

Date: **February 24, 2012**

Re: **Sample Design for the Evaluation of Union Gas 2011 Custom Projects**

This memorandum presents the sample design for the evaluation of custom projects completed during 2011. It describes the population of custom projects and presents the expected sample sizes required to meet the precision requirements. The custom programs are direct towards two different rate classes; Distribution Contract (large industrial) customers; and Commercial and Industrial (non-contract) customers.

Program Description

Union encourages the adoption of energy efficient technology and equipment targeting facilities in the commercial, institutional, and industrial markets, using a segment focus. Union influences end-use customers, and the many stakeholders and trade allies in this market, to use best practices when operating or replacing equipment and when implementing energy efficiency projects. Offerings target end-use customers and are marketed both directly through account managers and indirectly through trade allies.

The custom offering focuses on advancing customer energy efficiency and productivity through providing a mix of custom incentive offerings to customers in the commercial, institutional and industrial markets. These offerings are applicable to both Distribution Contract and Commercial and Industrial customers.

The sample design described in this memo focuses only on evaluation of custom programs and excludes prescriptive programs.

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Program Population

Table 1 below shows that 659 custom projects[1] were implemented during 2011. All custom projects in the population reported gas benefits, 190 projects reported water benefits, and 188 projects reported electricity benefits.

Table 1. Unadjusted TRC Benefits[2] for Union 2011 Custom Projects by Resource

Resource	Projects (N)	Unit Savings	TRC Benefits ($)	% TRC by Resource
Natural Gas (m^3)	659	289,100,204.17	$ 622,430,778.78	89.28%
Water (1000s L)	190	1,386,373.25	$ 22,219,906.62	3.19%
Electricity (kWh)	188	62,373,740.13	$ 52,508,998.17	7.53%
Total	**659**		**$ 697,159,682.57**	**100.00%**

Table 2 below shows the 2011 projects for each custom program and the contribution of each program resource to total unadjusted TRC benefits for all custom projects:

- *Distribution Contract (DC)* accounts for about 96% of total unadjusted TRC benefits including 97% of total natural gas benefits, 89% of total water benefits, and 93% of total electricity benefits.
- *Commercial/Industrial (CI)* accounts for about 4% of total unadjusted TRC benefits including 3% of total natural gas benefits, 11% of total water benefits, and 7% of total electricity benefits.

[1] Projects are only counted once in the total number of projects even if a project produced benefits across multiple resources. Total Unadjusted TRC benefits are summed across all resources.
[2] The sample design is based on *Total Unadjusted TRC Benefits*. These are the unadjusted TRC benefits per unit multiplied by the number of units. These values are not adjusted for net-to-gross factors.

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Table 2. Unadjusted TRC Benefits for 2011 Custom Projects by Program & by Resource

Program	Resource	Projects (N)	Unit Savings	TRC Benefits ($)	% TRC by Resource
Commercial/Industrial	Natural Gas (m^3)	163	7,984,421.44	$ 21,267,678.58	3.05%
	Water (1000s L)	31	135,760.87	$ 2,478,496.13	0.36%
	Elec. (kWh)	63	5,435,292.24	$ 3,511,531.63	0.50%
	Total	**163**		**$ 27,257,706.34**	**3.91%**
Distribution Contract	Natural Gas (m^3)	496	281,115,782.73	$ 601,163,100.21	86.23%
	Water (1000s L)	159	1,250,612.38	$ 19,741,409.49	2.83%
	Elec. (kWh)	125	56,938,447.82	$ 48,997,466.54	7.03%
	Total	**496**		**$ 669,901,976.23**	**96.09%**

Approach to Addressing Non-Gas Resource Benefits

The sample was designed primarily for gas benefits with quotas set for the minimum number of projects containing water and electricity benefits. Projects were initially randomly selected from a pool with only projects reporting benefits for multiple resources in order to satisfy the quotas for water and/or electricity benefits. The remainder of the requisite number of projects was chosen randomly from the total population.

Basis for Stratification

Separate samples were designed for the Commercial/Industrial program and the Distribution Contract program. Within each program segment, strata were defined based on the amount of reported gas benefits. Very small projects were combined into a single stratum with the small projects for determining sample sizes. The very small sites, however, were excluded from the sample selection in order to ensure cost-effective use of evaluation budget.[3] Table 3 below indicates the unadjusted gas TRC benefit thresholds for each stratum.

[3] It has become common industry practice in sample design to drop the very smallest customers in each category. This is done for two reasons: 1) First, performing post-participation verification audits on DC and CI customers is expensive and requires on-site visits for data collection. As a result, the information gained from verifying very small amounts of benefits is typically not worth the cost of gathering the data since the realization rates for those projects make very small contributions to the overall program realization rate. 2) Second, including customers that contribute only small fractions of a percent to program benefits in the sample frame might result in a random selection of customers that includes a disproportionate number of these small customers which could reduce the accuracy with which the overall realization rate is estimated and reduce the overall representativeness of the sample.

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Table 3. Program Segmentation Thresholds (Based on Unadjusted Gas TRC Benefits)

Resource	Distribution Contract	Commercial/Industrial
Gas – Large	> $7M	> $500k
Gas – Medium	> $2M	> $150k
Gas – Small	> $500k	> $50k
Gas – Very Small[4]	< $500k	<$50k

Table 4 below indicates the number of projects in each gas segment as well as the unadjusted gas TRC benefits for each segment and the % contribution to total program unadjusted gas TRC benefits.

Table 4. Program Segment Characteristics

Program	Strata	Population	Gas TRC Benefits	% of Program Gas Benefits
Commercial/Industrial	Gas - Large	12	8,561,931.35	40.26%
	Gas - Medium	32	7,919,296.51	37.24%
	Gas - Small	119	4,786,450.72	22.51%
	Total	**163**	**21,267,679.00**	**100.00%**
Distribution Contract	Gas - Large	16	191,504,494.04	31.86%
	Gas - Medium	66	235,277,174.42	39.14%
	Gas - Small	414	174,381,431.74	29.01%
	Total	**496**	**622,430,778.78**	**100.00%**

Proportional sampling based on project benefits is a common industry practice for ratio estimation and impact evaluation. Stratifying based on amount of benefits allows the sample to take advantage of concentrations of benefits in the largest projects to most cost-effectively evaluate these programs and to improve the representativeness of the sample. This produces unbiased estimates of the realization rate as long as the sample is randomly selected within each stratum.[5]

Basis for Sample Size Determination

The sample is designed to target 90% confidence coverage for plus or minus 15% relative precision for each program (i.e., 90/15 two-sided each for DC and CI). Coefficients of variation (CV) of 0.5 and 0.3 were conservatively assumed for the Commercial/Industrial program and the Distribution Contract

[4] *Very small* projects account for about 8% of total reported TRC benefits for both the DC and CI populations. DC contains 310 *very small* projects, and CI contains 101 *very small* projects. The *very small* projects were combined with the *small* projects to form a single *small* stratum each for DC and CI.

[5] The 2010 Custom Program sample design focused on the top few sites for each program. A large/ medium/small split was deemed more appropriate for the 2011 sample based on analysis of the population data and the extent of concentrations of reported savings appearing across the projects.

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program respectively based on the observed sample from the 2010 programs.[6] The finite population correction factor[7] was applied in order to take advantage of the concentrations of benefits in the large project strata. Strata were weighted based on their contribution to total program gas benefits. T-values[8] were applied to standard errors in order to estimate the relative precision for 90% two-sided confidence coverage.

These assumptions were applied to estimate the minimum sample sizes required to hit the 90/15 target by appropriately allocating sample projects to each stratum based on reported unadjusted gas TRC benefits. Additionally, a level of precision is desired for benefits estimates from water and electricity resources separate from the program-level precision. Water and electricity resource benefits from projects in the gas sample segments are expected to yield sufficient additional precision for these non-gas resources. If the assumptions made in the sample design turn out to be conservative with respect to the observed sample data, then there is a good possibility that each resource for each program could surpass the 90/15 target, as was the case for the 2010 sample.

Approach to Sample Selection

The sample was designed primarily based on unadjusted gas TRC benefits since those benefits represent over 90% of the total unadjusted TRC benefits of custom projects. Quotas were set for the minimum number of projects containing water and electricity benefits to ensure that sufficient data would be collected for the non-gas resources. Projects reported to produce benefits for more than one resource were allowed to count separately toward estimating benefits for each resource. Projects were initially randomly[9] selected from a pool with only projects reporting benefits for multiple resources in order to satisfy the quotas for water and electricity benefits. The remainder of the sample was chosen randomly from the total population within each stratum. Each strata sample was inspected for representativeness across market segments (e.g., manufacturing, education, healthcare, etc.). A preliminary sample was selected following Q3 of 2011 in order to begin evaluating projects early enough to ultimately meet the reporting deadline. The preliminary sample is referred to as Wave 1. The sample design was updated at the end of 2011 to account for the final population, and a final sample was selected for Wave 2.

Overview of Sample Draw

Table 5 below indicates the target sample sizes for each stratum that are expected to achieve the desired precision targets. A sample size of 13 is estimated for the Distribution Contract program, and a sample size of 25 is estimated for the Commercial/Industrial program.

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[6] The observed sample of gas benefits for custom projects in 2010 produced a CV of 0.44 for the CI program and 0.20 for the DC program.

[7] Only the large and medium strata for the CI program required the finite population correction factor to account for sampling 10 of the 14 projects in the large project stratum and 9 of 31 projects in the medium project stratum. The correction factors applied were 0.4 and 0.85 respectively. All other strata used correction factors of 0.9 or greater.

[8] It is sometimes industry practice to apply Z-values rather than T-values. However, this can result in overstating confidence in the final results if sample sizes are small (i.e., less than 25). T-values more conservatively account for additional uncertainty in smaller sample sizes and lead to a more accurate depiction of confidence.

[9] Random selection employed Microsoft Excel's random number function—RAND.

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Table 5. Target Sample Sizes by Gas Program Segment

Gas Segment	Distribution Contract	Commercial/Industrial
Gas - Large	4	10
Gas - Medium	5	9
Gas - Small	4	6
Total	**13**	**25**

From these 13 and 25 sampled projects, some will also produce data for non-gas resources. Table 6 below indicates the total sample size expected for each resource.

Table 6. Sample Sizes Expected for Each Resource

Resource Type	Distribution Contract	Commercial/Industrial
Gas	13	25
Water	6	12
Electricity	11	12
Note: Water and electricity sampled projects are a subset of the gas sample projects.		

Table 7 and Table 8 on the following page provide a summary of the selected sample for the DC program and the CI program respectively.

Table 9 and

Table 10 on the subsequent pages show the sample project selections for the DC program and the CI program respectively.

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Table 7. Summary of the Selected Sample for the Distribution Contract Program

Description Distribution Contract (IND)	n (stratum)	NATURAL GAS (m3)	WATER (1000's L)	ELECTRICITY (kWh)	NATURAL GAS TRC (Unadjusted Benefits)	WATER TRC (Unadjusted Benefits)	ELECTRICITY TRC (Unadjusted Benefits)	TOTAL TRC (Unadjusted Benefits)
Sample Gas - High	4	22,745,788.00	156,470.46	28,359,484.00	$ 64,898,754.39	$ 3,044,835.32	$ 26,286,800.53	$ 94,230,390.24
Sample Gas - Medium	5	9,596,224.00	36,412.16	586,998.00	$ 21,464,842.74	$ 614,560.30	$ 484,857.63	$ 22,564,260.67
Sample Gas - Low	4	2,095,677.00	64,259.26	869,136.00	$ 4,709,398.31	$ 1,152,765.42	$ 775,483.15	$ 6,637,646.88
Sample Total	13	34,437,689.00	257,141.88	29,815,618.00	$ 91,072,995.44	$ 4,812,161.04	$ 27,547,141.31	$ 123,432,297.79
Population		281,115,783.00	1,250,612.38	56,938,448.00	$ 601,163,100.21	$ 19,741,409.49	$ 48,997,466.54	$ 669,901,976.24
Sample % of Population		12.3%	20.56%	52.36%	15.1%	24.4%	56.2%	18.4%

Table 8. Summary of the Selected Sample for the Commercial/Industrial Program

Description Commercial/Industrial (COM)	n (stratum)	NATURAL GAS (m3)	WATER (1000's L)	ELECTRICITY (kWh)	NATURAL GAS TRC (Unadjusted Benefits)	WATER TRC (Unadjusted Benefits)	ELECTRICITY TRC (Unadjusted Benefits)	TOTAL TRC (Unadjusted Benefits)
Sample Gas - High	10	2,344,322.00	0.00	361,573.00	$ 6,700,055.19	$ -	$ 355,148.56	$ 7,055,203.75
Sample Gas - Medium	9	1,018,928.00	9,154.57	778,605.00	$ 2,741,240.95	$ 175,312.80	$ 668,505.52	$ 3,585,059.27
Sample Gas - Low	6	234,811.00	85,976.98	206,746.00	$ 544,838.39	$ 1,668,816.03	$ 178,041.85	$ 2,391,696.27
Sample Total	25	3,598,061.00	95,131.54	1,346,924.00	$ 9,986,134.53	$ 1,844,128.83	$ 1,201,695.93	$ 13,031,959.29
Population		7,984,421.00	135,760.87	5,435,292.00	$ 21,267,678.58	$ 2,478,496.13	$ 3,511,531.63	$ 27,257,706.34
Sample % of Population		45.1%	70.1%	24.8%	47.0%	74.4%	34.2%	47.8%

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Table 9. Distribution Contract Program Sample Selection

	Project	Market Segment	Gas Benefits	Gas	Water	Electricity
	Gas Large					
Wave 2	2011-IND-0203	Manufacturing	Large	✓	✓	✓
	2011-IND-0216	Education	Large	✓		✓
Wave 1	2011-IND-0026	Education	Large	✓		✓
	2011-IND-0186	Manufacturing	Large	✓	✓	✓
	Gas Med					
Wave 2	2011-IND-0282	Manufacturing	Med	✓	✓	✓
	2011-IND-0665	Healthcare	Med	✓		✓
	2011-IND-0379	Manufacturing	Med	✓	✓	
Wave 1	2011-IND-0165	Manufacturing	Med	✓	✓	✓
	2011-IND-0367	Agriculture	Med	✓		
	Gas Small					
Wave 2	2011-IND-0441	Manufacturing	Small	✓	✓	✓
	2011-IND-0518	Education	Small	✓		✓
Wave 1	2011-IND-0276	Utility	Small	✓		✓
	2011-IND-0335	Manufacturing	Small	✓		✓

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Table 10. Commercial / Industrial Program Sample Selection

	Project	Market Segment	Gas Benefits	Gas	Water	Electricity
	Gas Large					
Wave 2	2011-COM-0133	Manufacturing	Large	✓		✓
	2011-COM-0177	Agriculture	Large	✓		
	2011-COM-0207	Manufacturing	Large	✓		✓
	2011-COM-0210	Manufacturing	Large	✓		
	2011-COM-0224	Manufacturing	Large	✓		✓
	2011-COM-0238	Transport	Large	✓		
	2011-COM-0302	Manufacturing	Large	✓		
Wave 1	2011-COM-0150	Entertainment	Large	✓		✓
	2011-COM-0163	Agriculture	Large	✓		
	2011-COM-0178	Agriculture	Large	✓		
	Gas Med					
Wave 2	2011-COM-0240	Manufacturing	Med	✓	✓	✓
	2011-COM-0242	Healthcare	Med	✓	✓	
	2011-COM-0203	Manufacturing	Med	✓		✓
	2011-COM-0197	Manufacturing	Med	✓		
Wave 1	2011-COM-0011	Education	Med	✓		✓
	2011-COM-0035	Education	Med	✓		
	2011-COM-0055	Retail	Med	✓		✓
	2011-COM-0135	Manufacturing	Med	✓	✓	
	2011-COM-0156	Agriculture	Med	✓		

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	Gas Small					
Wave 2	2011-COM-0189	Manufacturing	Small	✓	✓	✓
	2011-COM-0183	Multi-Family	Small	✓		
Wave 1	2011-COM-0062	Manufacturing	Small	✓	✓	
	2011-COM-0139	Manufacturing	Small	✓	✓	✓
	2011-COM-0182	Multi-Family	Small	✓		✓

	Gas Very Small					
Wave 1	2011-COM-0013	Education	Very Small	✓		✓

Verification Report for Hot Water Conservation Commercial Non Multi-Family

Date of Submission:
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Sept– November 2011

Submitted to:
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Union Gas Limited

Contents

Appendices

1. Executive Summary

Union Gas Ltd. (Union) commissioned Energuy Canada Ltd (Energuy) to provide an independent third party on-site verification of their Hot Water Conservation program (HWC). The program consists of the following measures: showerheads, bathroom aerators and kitchen aerators, designed to reduce natural gas consumption associated with hot water consumption. They were distributed to commercial non multi-family participants in the 'Hotel/Motel', 'University and College Dormitories', 'Long Term Care and Retirement Facilities' and 'Other' segments in 2011. Energuy successfully completed on-site verification for 202 units across these segments.

Results from the study are presented in Table 1 below:

Table 1: Summary of Results

	# Installed	# Not Installed	% Installed	% Not Installed
Aggregate				
Showerheads	175	19	90.21%	9.8%
Bathroom Aerators	90	82	52.33%	47.7%
Kitchen Aerators	62	22	73.81%	26.2%
Hotel/Motel				
Showerheads	44	1	97.8%	2.2%
Bathroom Aerators	14	31	31.1%	68.9%
Kitchen Aerators	NA	NA	NA	NA
Long Term Care and Retirement Facilities				
Showerheads	34	6	85.0%	15.0%
Bathroom Aerators	30	0	100.0%	0.0%
Kitchen Aerators	NA	NA	NA	NA
University and College Dormitories				
Showerheads	72	4	94.7%	5.3%
Bathroom Aerators	27	33	45.0%	55.0%
Kitchen Aerators	38	13	74.5%	25.5%
Other				
Showerheads	25	8	75.8%	24.2%
Bathroom Aerators	19	18	51.4%	48.6%
Kitchen Aerators	24	9	72.7%	27.3%

2. Program Description

The Hot Water Conservation (HWC) program is designed to reduce hot water consumption, and more specifically, the corresponding natural gas required to heat the water, through the installation of energy efficient showerheads and faucet aerators. Union supplies the measures at no charge to program participants that qualify. The program targets non multi-family segments with choices of free offerings including a 1.25gpm Showerhead, a 1.5gpm Kitchen Aerator and a 1.0gpm Bathroom Aerator for applicable units. Non multi-family segments targeted include:

- Hotel/Motel
- Long Term Care and Retirement Facilities
- University and College Dormitories
- Other (such as retail, entertainment, food services, etc.)

3. Objective

Union commissioned Energuy to provide on-site verification for non multi-family HWC program participants for a representative sample of program participants. The main goal of this study was to verify the installation rates of Union showerheads and aerators distributed in 2011.

4. Sampling

A random sampling methodology was developed by an independent third party contracted by Union. The sampling protocol was based on on-site inspections of 200 units, not to exceed10 units for each large location, and 5 units for small. Large locations are defined as properties with more than 50 units and small locations as properties with less than 50 units. In cases where the total units at a property were 5 or less, every unit at the property was verified.

To achieve the desired number of verifications, Energuy ensured that it achieved a minimum of 200 completes. At project conclusion, 202 units were verified across 31 properties.

5. Methodology

Union supplied Energuy with a sample list of recipients of HWC measures in the Hotel/Motel, Long Term Care and Retirement Facilities, University and College Dormitories and “Other” segments. Energuy followed the sampling protocol which required 5 units for small locations and 10 units for large.

<u>Appointment Scheduling and Communication</u>

Prior to any on-site visits being conducted a letter was sent from Union to the sample informing them that their site could be visited for the purpose of the on-site verification study (Appendix B). On-site visits were conducted through scheduled appointments with program participants to verify the installation of showerheads and aerators. For selected sites, the on-site verification took place at a time that did not cause inconvenience to guests, residents, members, or customers of the locations.

A sample list was provided to Energuy, and each proponent was contacted in sequential order. Sample sites spread across Union's franchise territory. Site specific units to be verified were determined using a random number generator (Appendix A) while on location. Units selected for verification were not communicated to the program participants prior to the visit.

On-site verification

Product samples and detailed photographs of the measures were provided to Energuy by Union prior to the inspections for field comparison. Energuy certified energy advisors arrived at the property at the scheduled time. ID letters identifying the advisors as agents of Union (Appendix C) along with a letter indicating the nature of the business were available for review by program participants.

During the on-site visits program participants accompanied Energuy certified energy advisors to the randomly selected units. Digital pictures were taken of the program measures including showerheads, kitchen aerators and bathroom aerators with a label identifying the property and unit number. Information was documented on a data collection form (Appendix D). The energy advisor marked down "yes" if the measure was in place, "no" if the measure was not in place. Union requested to be informed where an installation did not meet the program criteria, such as if the measure was not offered to the segment (e.g. no kitchen aerators allowed in a hotel room). Once all the units in a property were verified the certified energy advisor received a signature from the program participant on the "verification tracking sheet" (Appendix E).

Analysis of Results

At verification conclusion, Energuy organized the results in an excel spreadsheet for analysis (Appendix F). Installation rates are presented in next section.

6. Results

As an aggregate, the following results were calculated:

- Showerheads were installed in 90.2% of the units,
- Bathroom aerators were installed in 52.3% of the units, and
- Kitchen aerators were installed in 73.8% of the units.

Figure 1 below provides numeric results by measure for all of the non multi-family segments.

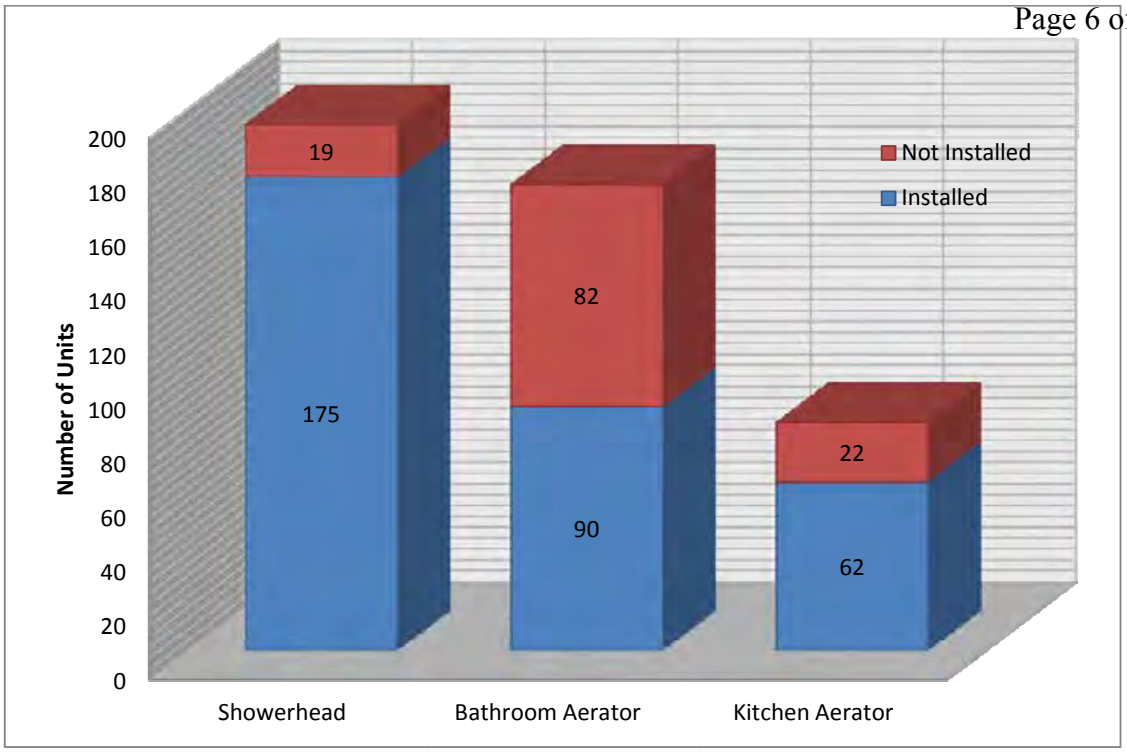


Figure 1: Aggregate Results

Through the verification process, it was noted that three locations had an installation that did not meet the program requirements. Specifically, three kitchen aerators were found installed in the Hotel/Motel segment. These installations were not included in calculation of aggregate numbers.

6.1 Hotel/Motel Results

A total of 45 verifications were performed across 8 properties in the Hotel/Motel segment. Results are presented in the table below:

Table 2: Results – Hotel/Motel

Hotel/Motel	Showerhead		Bathroom Aerator	
	Y	N	Y	N
[redacted]	5	0	0	5
[redacted]	4	1	4	1
[redacted]	10	0	0	10
[redacted]	5	0	0	5
[redacted]	5	0	0	5
[redacted]	5	0	5	0
[redacted]	5	0	5	0
[redacted]	5	0	0	5
Hotel Motel Totals	**44**	**1**	**14**	**31**
	97.78%	**2.22%**	**31.11%**	**68.89%**

As illustrated in the table above, results show that showerheads were utilized 97.8% of the time. Of the 45 units verified, 44 had an installed showerhead while only 1 unit did not. The bathroom sink aerator was found to be installed 31.1% of the time. 14 had an installed bathroom aerator while 31 units did not.

6.2 University and College Dormitories Results

A total of 76 verifications were performed across 9 properties in the University and College Dormitories segment. Results are presented in the table below:

Table 3: Results – University and College Dormitories

University and College Dormitories	Showerhead		Bathroom Aerator		Kitchen Aerator	
	Y	N	Y	N	Y	N
[redacted]	10	0	9	1	10	0
	10	0	0	0	0	0
	10	0	0	10	0	4
	10	0	9	1	10	0
	10	0	9	1	8	2
	7	3	0	10	9	1
	10	0	0	0	0	0
	0	1	0	5	1	2
	5	0	0	5	0	4
University Residences and Dormitories Totals	**72**	**4**	**27**	**33**	**38**	**13**
	94.74%	**5.26%**	**45.00%**	**55.00%**	**74.51%**	**25.49%**

As illustrated in table above, results show that showerheads were installed 94.7% of the time. Of the 76 units verified, 72 had an installed showerhead while 4 units did not. The bathroom sink aerator was found to be installed 45.0% of the time when applicable. 27 units for which the measure was ordered had an installed aerator, while 33 units did not. The kitchen aerator was found be to be installed 74.5% of the time when applicable. 38 units had an installed measure while 13 units did not.

6.3 Long Term Care and Retirement Facilities Results

A total of 40 verifications were performed across 5 properties in the Long Term Care and Retirement Facilities segment. Results are presented in the table below:

Table 4: Results – Long Term Care and Retirement Facilities

Long Term Care and Retirement Facilities	Showerhead		Bathroom Aerator	
	Y	N	Y	N
[redacted]	10	0	10	0
[redacted]	4	6	0	0
[redacted]	10	0	10	0
[redacted]	5	0	5	0
[redacted]	5	0	5	0
Long Term Care and Retirement Facilities Totals	**34**	**6**	**30**	**0**
	85.00%	**15.00%**	**100.00%**	**0.00%**

As illustrated in table above, results show that showerheads were installed 85.0% of the time. Of the 40 units verified, 34 had an installed showerhead while 6 units did not. The bathroom sink aerator was found to be installed 100.0% of the time when applicable. All 30 units for which the measure was ordered had an installed aerator.

6.4 Other Results

A total of 33 verifications were performed across 9 properties in the Other segment. Results are presented in the table below:

Table 5: Results – Other

Other	Showerhead		Bathroom Aerator		Kitchen Aerator	
	Y	N	Y	N	Y	N
[redacted]	5	0	5	0	5	0
	0	3	0	3	3	0
	5	0	5	0	0	5
	2	1	1	4	1	0
	0	1	2	0	1	1
	5	0	1	4	4	1
	5	0	5	0	5	0
	0	2	0	2	2	0
	3	1	0	5	3	2
Other Totals	**25**	**8**	**19**	**18**	**24**	**9**
	75.76%	**24.24%**	**51.35%**	**48.65%**	**72.73%**	**27.27%**

As illustrated in table above, results show that showerheads were installed 75.8% of the time. Of the 33 units verified, 25 had an installed showerhead while 8 units did

not. The bathroom sink aerator was found to be installed 51.3% of the time when applicable. 19 units for which the measure was ordered had an installed aerator, while 18 did not. The kitchen aerator was found be to be installed 72.8% of the time when applicable. 24 units had an installed measure while 9 units did not.

7. Conclusions and Recommendations

Energuy conducted on-site verification for 202 units across 31 locations for the non multi-family commercial HWC program. Segments verified include Hotel/Motel, Long Term Care and Retirement Facilities, University and College Dormitories and Other.

Aggregate results are as follows:

- Showerheads were installed in 90.2% of the units,
- Bathroom aerators were installed in 52.3% of the units, and
- Kitchen aerators were installed in 73.8% of the units.

Energuy noted the following findings through the on-site verification process that may be of interested to Union:

- Supporting materials for measures such as threading options for older faucets and more instructions
- More distinct packaging for smaller measures (i.e. bathroom aerator)
- For future verification considerations, where the location has gender based segregation, both female and male verification consultants may be required. In this study there was one instance at a university residence where only male locker and shower rooms were verified because the consultant was male.

Appendix A

Random Number Chart

Energuy Canada Ltd. evaluators were given a list of available rooms from the manager and used this table to select verifiable units. The evaluator would select a starting point on the table and asked to go in a vertical, horizontal or diagonal line until they reached a number which corresponded with numbers on the list of available rooms.

105	070	176	079	210	116	178	212	190	257	055	140	184	193	247	084	054	224	235	122
159	270	017	256	138	111	114	104	133	047	086	128	223	078	073	166	108	124	076	220
087	265	253	148	082	201	145	092	172	231	132	130	056	057	214	263	036	198	011	192
031	134	204	135	120	085	191	174	005	211	273	007	285	052	150	156	279	288	042	179
069	239	029	217	254	065	112	051	233	206	209	199	228	142	101	143	018	088	181	202
219	170	015	182	060	268	243	177	295	240	186	267	026	227	225	151	072	229	058	131
213	106	207	126	149	299	230	215	180	286	269	100	226	068	102	080	147	165	251	074
083	137	194	164	034	049	160	127	066	249	001	004	294	023	237	196	238	113	188	183
276	297	013	110	197	154	063	258	272	090	255	281	062	121	242	020	246	167	024	153
146	008	002	221	244	094	245	010	275	081	195	021	163	117	095	162	260	045	169	098
152	289	259	129	027	144	175	222	161	043	096	099	089	118	252	291	033	208	283	278
071	292	158	053	067	185	050	136	037	115	261	262	119	168	241	103	097	236	039	040
248	064	264	016	019	009	038	203	125	287	077	035	109	025	290	061	274	155	059	006
048	298	293	028	044	296	173	012	277	232	041	205	200	250	032	271	093	123	139	091
280	216	107	187	046	189	022	300	171	003	157	218	234	030	075	282	141	014	284	266

Specs: This table of 300 random numbers was produced according to the following specifications: Numbers were randomly selected from within the range of 1 to 300. Duplicate numbers were not allowed.

<<Customer>>
<<Building Street #>> <<Building Street>>
«City», ON
«Postal Code»

RE: Notification of Low-Flow Showerheads and Aerators Program Review

Dear <<Contact name>>,

Thank you for your participation in Union Gas's Hot Water Conservation program in 2011, through which you received free energy efficient showerheads and/or aerators for the suites in your building. It is your commitment to helping conserve energy that has enabled Union Gas to achieve success in this energy savings initiative.

As a utility regulated by the Ontario Energy Board, Union Gas engages in program reviews like this to ensure our programs are being delivered effectively. To do this, a condition of program participation is to allow a site visit to determine that the units have been installed. As such, Union Gas has hired Energuy Canada (an independent contractor) to check on the showerheads and/or aerators in the suites in your building. We are sending this letter to you to let you know that you may be contacted for the purpose of a review.

What does an on-site visit involve?

- An authorized Energuy Canada representative may contact you to schedule an appointment
- When scheduled for a visit, an Energuy Canada representative will visit your site and look at the low-flow showerheads and/or aerators delivered through the program and take a digital photo of the installed units
- The on-site visit will take roughly 10-15 minutes per suite, up to a maximum of 10 suites in the building

In the event that you receive a request for an appointment from Energuy Canada, you will be required to notify your tenants that their suite may be entered. Energuy will work with you to find a mutually agreeable time to visit your location between now and March.

Additional information about the program can be found at www.uniongas.com/showerheads. [redacted] is also available to answer your questions [redacted] Your cooperation is greatly appreciated.

[redacted]

[redacted]

enersmart
Conserve • Save • Comfort

[redacted]

Name [redacted]

Certified **Energuy** representative, contracted by **Union Gas Ltd.**

January 30, 2012

RE: Hot Water Conservation Program Review

Dear Sir/Madam:

Union Gas has hired [redacted] Energuy Canada (an independent contractor) to check on the installation of showerheads and/or aerators for program participants. As a utility regulated by the Ontario Energy Board, Union Gas engages in program reviews like this to ensure our programs are being delivered effectively.

What does the on-site visit involve?

- [redacted] will look at the low-flow showerheads and/or aerators delivered through the program and take a digital photo of the installed units
- The on-site visit will take roughly 10-15 minutes per unit, up to a maximum of 10 units in the building

Additional information about the program can be found at www.uniongas.com/showerheads. [redacted], is also available to answer your questions at [redacted] Your cooperation is greatly appreciated.

[redacted]

[redacted]

[redacted]

HWC Audit

Audit Code	

Order Details:

SH: __ | ___

BA: __ | ___

KA: __ | ___

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	
Total # of units in building:	
Contact:	
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			
Aerator			
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			

Signature received		

General Notes:

Proof of installation (insert picture below):

If unable to verify, why?

REASON	CHECK
Access denied by property manager	
Access denied by suite guest	
Address unidentifiable	
Pipe installed at another location (see below)	
Other:	

Verification Tracking Sheet

Please sign to indicate that an authorized advisor of Union Gas has completed the on-site visit.

Audit code	Address	Phone #	Unit Numbers	Name (First and Last)	Signature

Verification Tracking Sheet

Please sign to indicate that an authorized advisor of Union Gas has completed the on-site visit.

Audit code	Address	Phone #	Unit Numbers	Name (First and Last)	Signature

Appendix F

Total Results

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	175	90	62
No	19	82	22
Total	194	172	84

Results By Customer

Hotel / Motel

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	0	NA
No	0	5	NA
Total	5	5	NA

SMALL - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	0	NA
No	0	5	NA
Total	5	5	NA

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	4	4	NA
No	1	1	NA
Total	5	5	NA

SMALL - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	5	NA
No	0	0	NA
Total	5	5	NA

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	0	NA
No	0	10	NA
Total	10	10	NA

SMALL - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	5	NA
No	0	0	NA
Total	5	5	NA

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	0	NA
No	0	5	NA
Total	5	5	NA

SMALL - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	0	NA
No	0	5	NA
Total	5	5	NA

HOTEL/MOTEL TOTALS

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	44	14	NA
No	1	31	NA
Total	45	45	NA

University Residences and Dormitories

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	9	10
No	0	1	0
Total	10	10	10

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	9	10
No	0	1	0
Total	10	10	10

LARGE - UWO - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	0	0
No	0	0	0
Total	10	0	0

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	9	8
No	0	1	2
Total	10	10	10

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	0	0
No	0	0	0
Total	10	0	0

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	7	0	9
No	3	10	1
Total	10	10	10

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	0	0
No	0	10	4
Total	10	10	4

SMALL - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	0	0
No	0	5	4
Total	5	5	4

SMALL - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	0	0	1
No	1	5	2
Total	1	5	3

EDUCATION TOTALS

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	72	27	38
No	4	33	13
Total	76	60	51

Long Term Care and Retirement Facilities

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	10	NA
No	0	0	NA
Total	10	10	NA

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	4	0	NA
No	6	0	NA
Total	10	0	NA

LARGE - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	10	10	NA
No	0	0	NA
Total	10	10	NA

SMALL - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	5	NA
No	0	0	NA
Total	5	5	NA

Small - [redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	5	NA
No	0	0	NA
Total	5	5	NA

LTC TOTALS

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	**34**	**30**	**NA**
No	**6**	**0**	**NA**
Total	**40**	**30**	**NA**

Other

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	5	5
No	0	0	0
Total	5	5	5

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	0	0	3
No	3	3	0
Total	3	3	3

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	5	0
No	0	0	0
Total	5	5	0

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	2	1	1
No	1	4	0
Total	3	5	1

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	0	2	1
No	1	0	1
Total	1	2	2

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	1	4
No	0	4	1
Total	5	5	5

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	5	5	5
No	0	0	0
Total	5	5	5

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	0	0	2
No	2	2	0
Total	2	2	2

[redacted]

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	3	0	3
No	1	5	2
Total	4	5	5

OTHER TOTALS

	Shower Head	Bathroom Aerator	Kitchen Aerator
Yes	**25**	**19**	**24**
No	**8**	**18**	**9**
Total	**33**	**37**	**33**

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	13
Contact:	[redacted]
Address:	[redacted]
City:	[redacted]

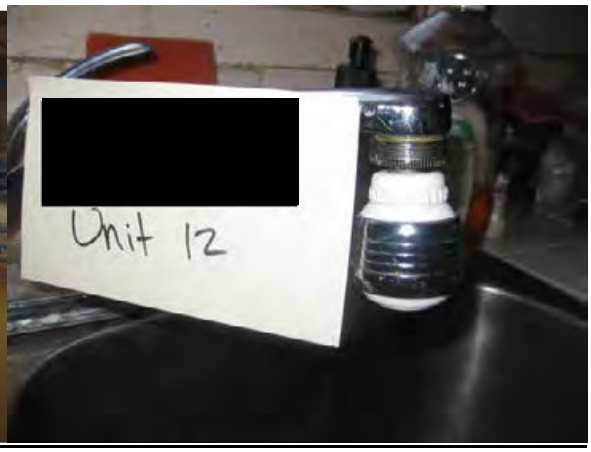
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator	**x**		

Signature received	**X**	

General Notes:

Not a Hotel/Motel, permanent residents. Property Manager Indicated units installed Aug 2010, he claimed no bathroom aerator was supplied to them; however this unit did have one. Only 6 of the 13 units were available for viewing. Selection of units was done by myself out of available units.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	13
Contact:	[redacted]
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Property Manager Indicated units installed Aug 2010, he claimed no bathroom aerator was supplied to them. Only 6 of the 13 units were available for viewing. Selection of units was done by myself out of available units.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	13
Contact:	[redacted]
Address:	
City:	

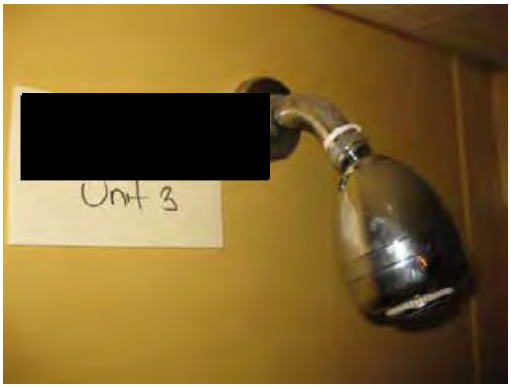
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator	**X**		

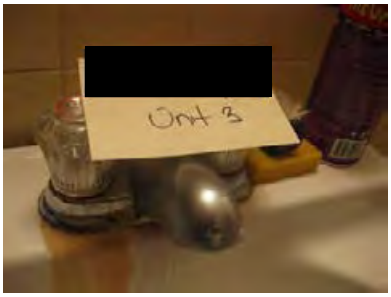
Signature received	**X**	

General Notes:

Not a Hotel/Motel, permanent residents. Property Manager Indicated units installed Aug 2010, he claimed no bathroom aerator was supplied to them. Only 6 of the 13 units were available for viewing. Selection of units was done by myself out of available units.

Proof of installation (insert picture below):





HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	13
Contact:	[redacted]
Address:	
City:	

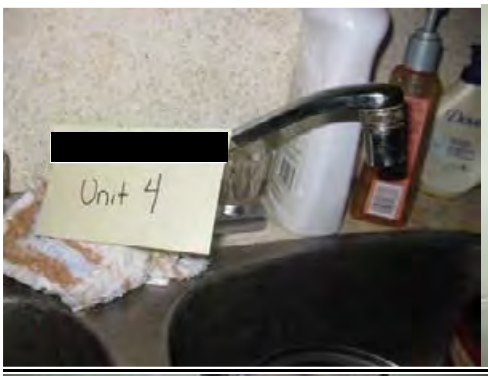
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator		**x**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator		**x**	

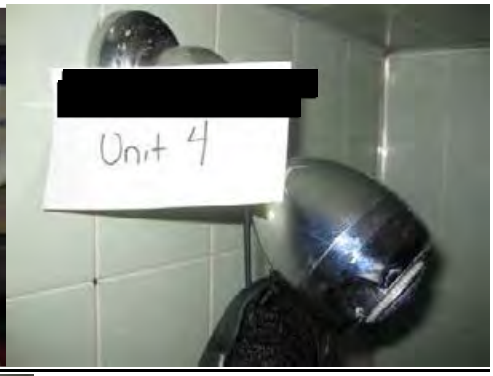
Signature received	**X**	

General Notes:

Not a Hotel/Motel, permanent residents. Property Manager Indicated units installed Aug 2010, he claimed no bathroom aerator was supplied to them. Only 6 of the 13 units were available for viewing. Selection of units was done by myself out of available units. Kitchen faucet appeared to have some kind of aerator however no marks were indicated on it.

Proof of installation (insert picture below):





HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	13
Contact:	[redacted]
Address:	
City:	

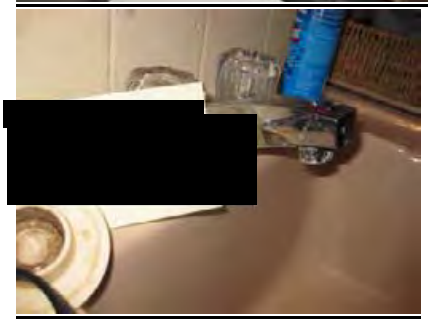
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator		**x**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator	**x**		

Signature received	**X**	

General Notes:

Not a Hotel/Motel, permanent residents. Property Manager Indicated units installed Aug 2010, he claimed no bathroom aerator was supplied to them. Only 6 of the 13 units were available for viewing. Selection of units was done by myself out of available units.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	12
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 4

BA: 12

KA: 3

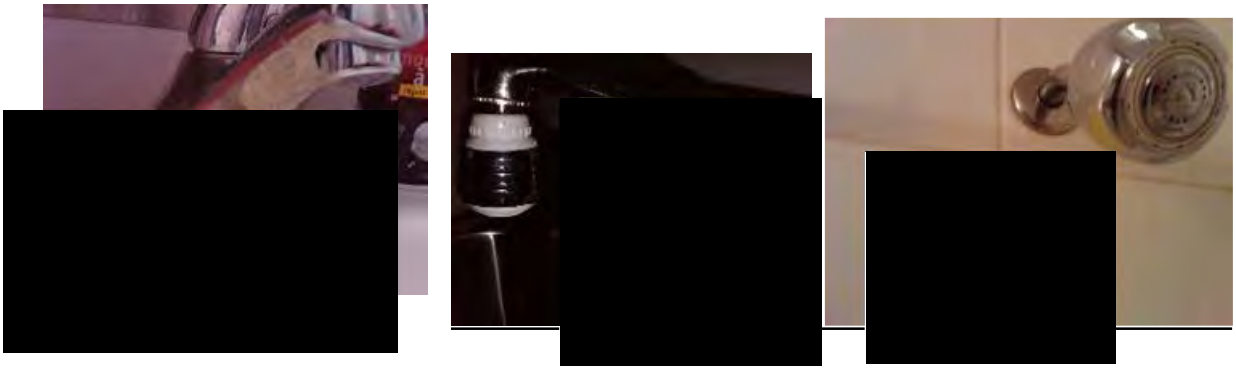
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Rooms Selected at random from vacant rooms

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	12
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 4

BA: 12

KA: 3

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

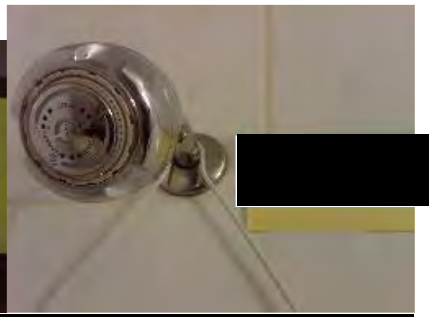
General Notes:

Rooms Selected at random from vacant rooms

Proof of installation (insert picture below):


[redacted]


[redacted]


[redacted]

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	12
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 4

BA: 12

KA: 3

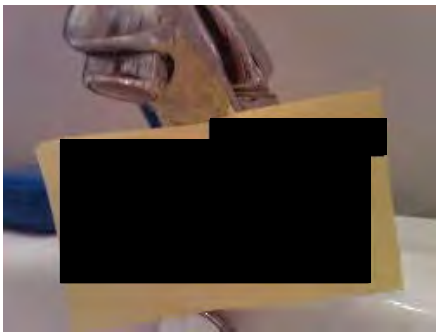
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

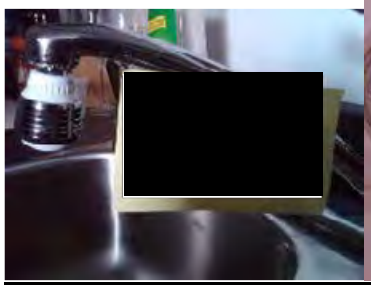
Signature received	x	

General Notes:

Rooms Selected at random from vacant rooms

Proof of installation (insert picture below):





HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	12
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 4

BA: 12

KA: 3

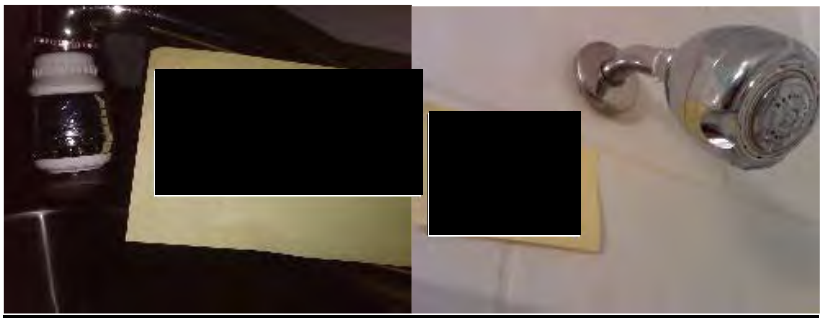
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Rooms Selected at random from vacant rooms

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	12
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 4

BA: 12

KA: 3

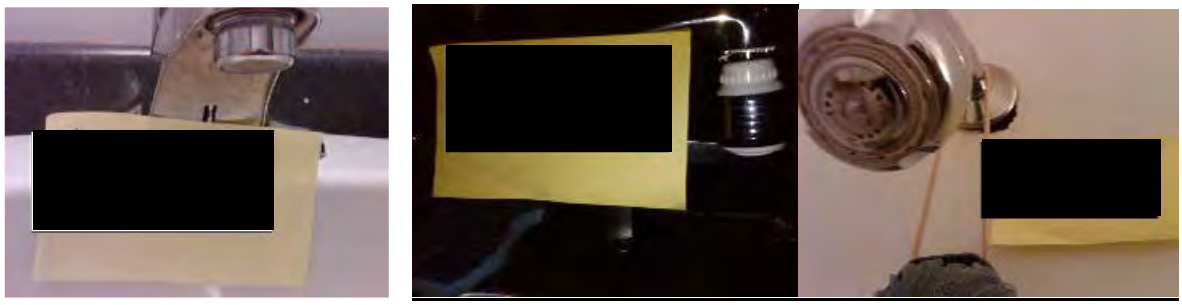
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Rooms Selected at random from vacant rooms

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Other
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 2

BA: 2

KA: 2

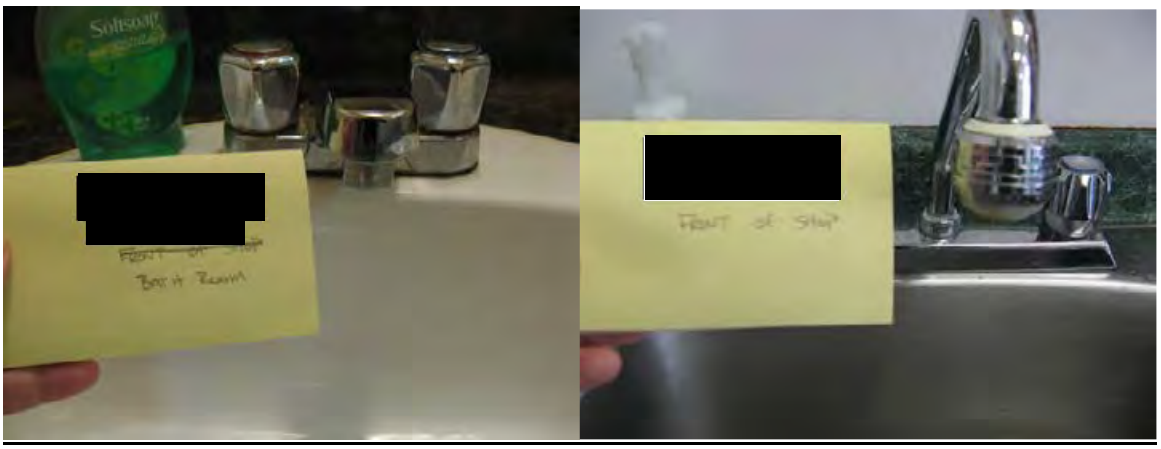
Unit/ID #bathroom	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead			xxxxxxxxxxxx
Aerator		xxxxxxxxxxxx	
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator	xxxxxxxxxxxxx		

Signature received	xxxxxxxxxxxxx	

General Notes:

There was one kitchen, front of shop and on bathroom.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**Other**
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 2

BA: 2

KA: 2

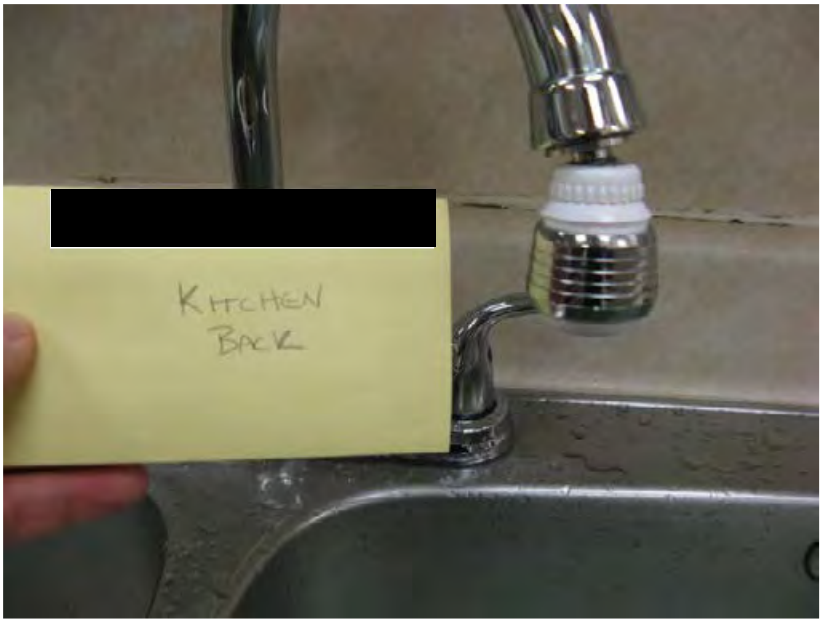
Unit/ID #backofshop	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			**xxxxxxxxxxx**
Aerator		**xxxxxxxxxxx**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**xxxxxxxxxxxxxx**		

Signature received	**xxxxxxxxxxxxx**	

General Notes:

There was one kitchen, front of shop and on bathroom.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

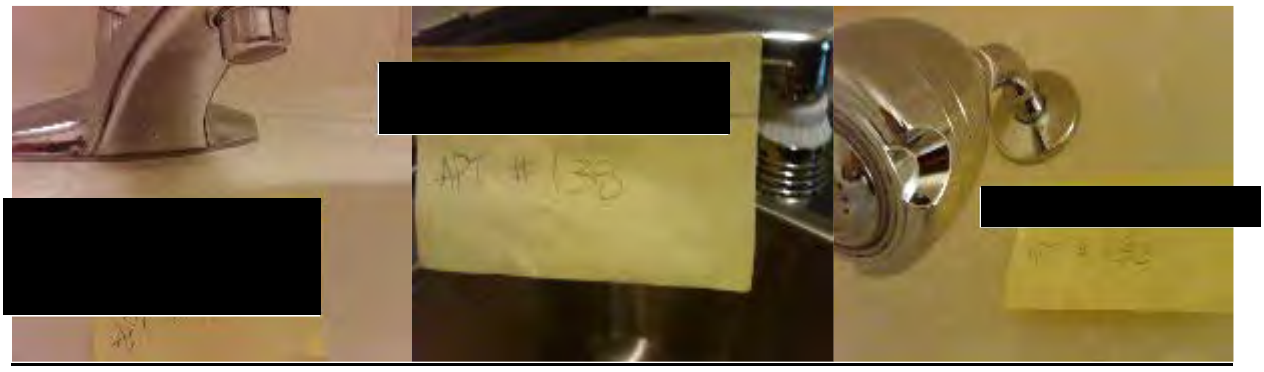
Unit/ID #138	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Completely random room selection
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

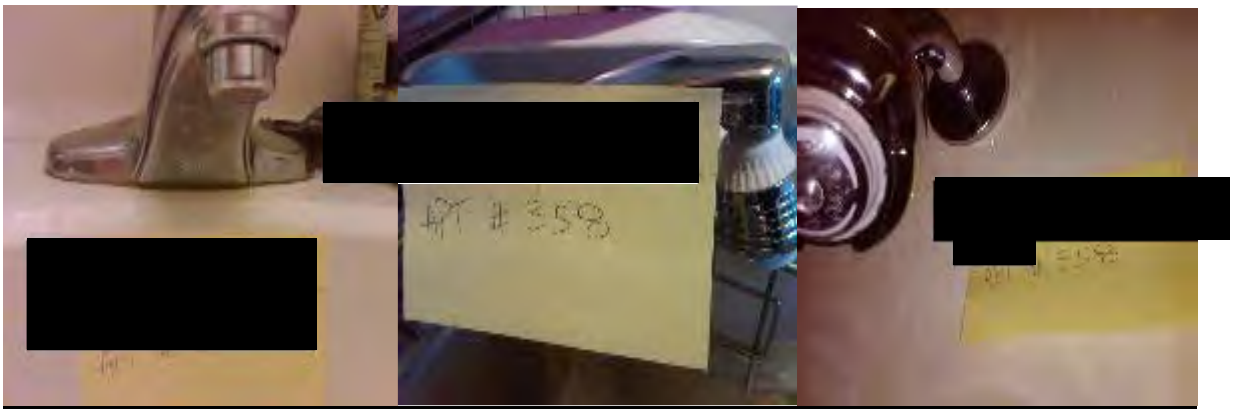
Unit/ID #358	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Completely random room selection
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

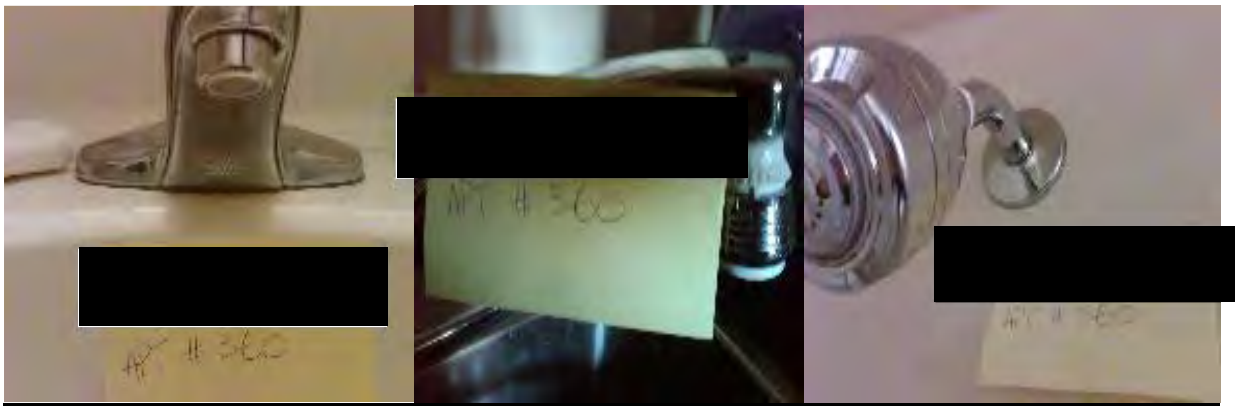
Unit/ID #360	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Completely random room selection
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

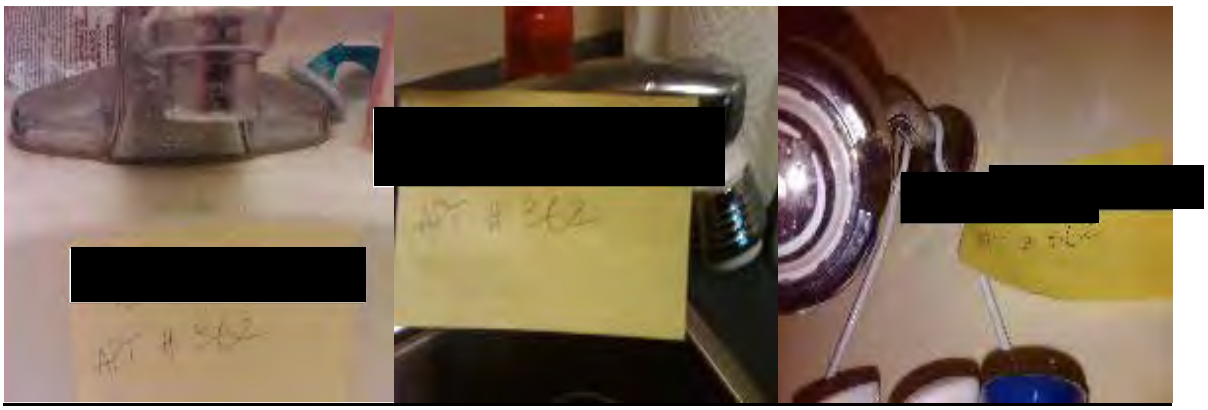
Unit/ID #362	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Completely random room selection
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

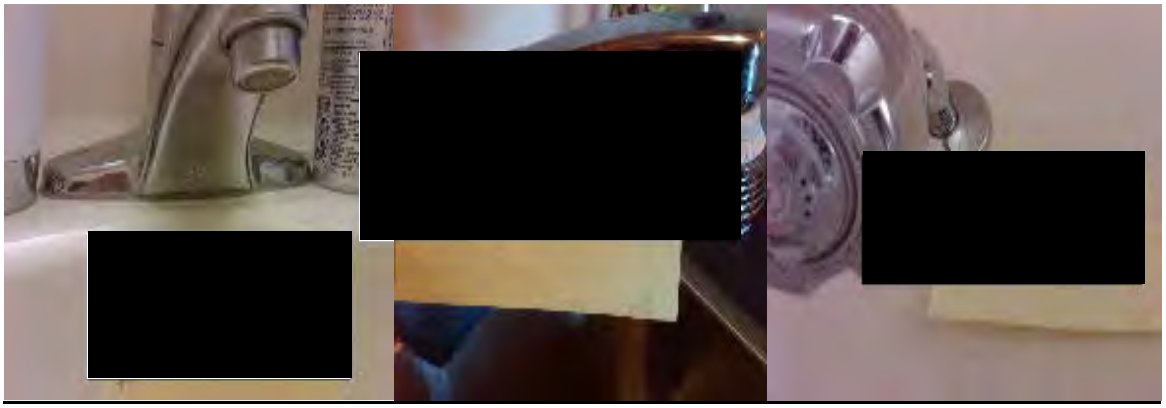
Unit/ID #364	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Completely random room selection
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

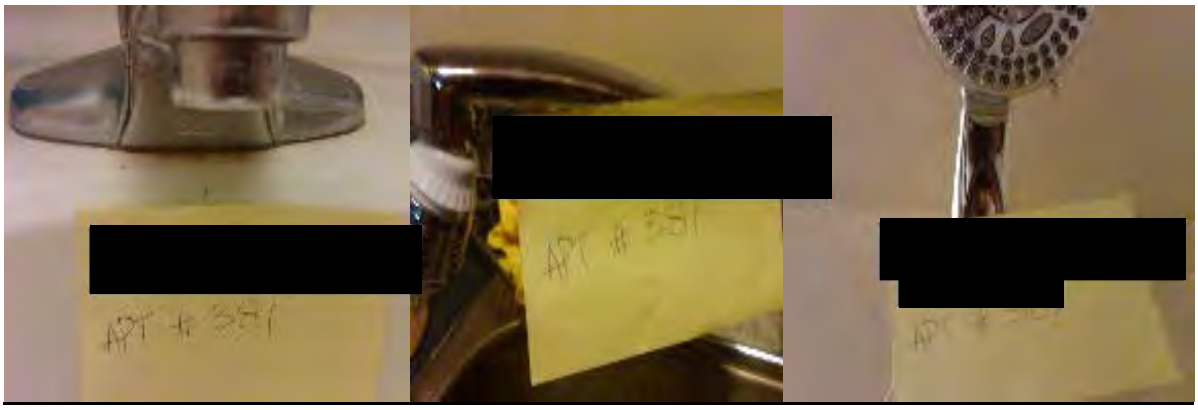
Unit/ID #381	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**x**	
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Completely random room selection
Tenant had installed their own shower head
Kitchen and bathroom aerators were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

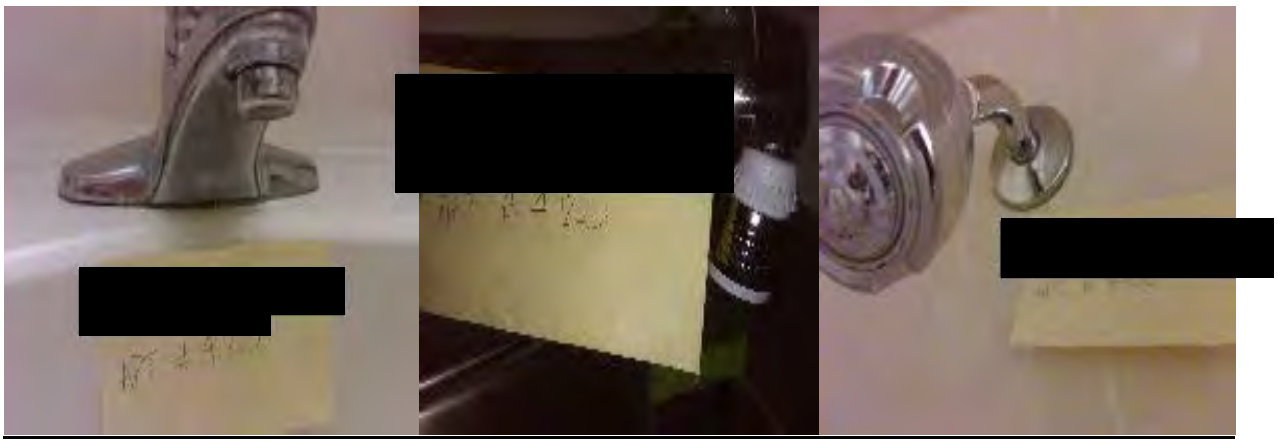
Unit/ID #420	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Completely random room selection
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

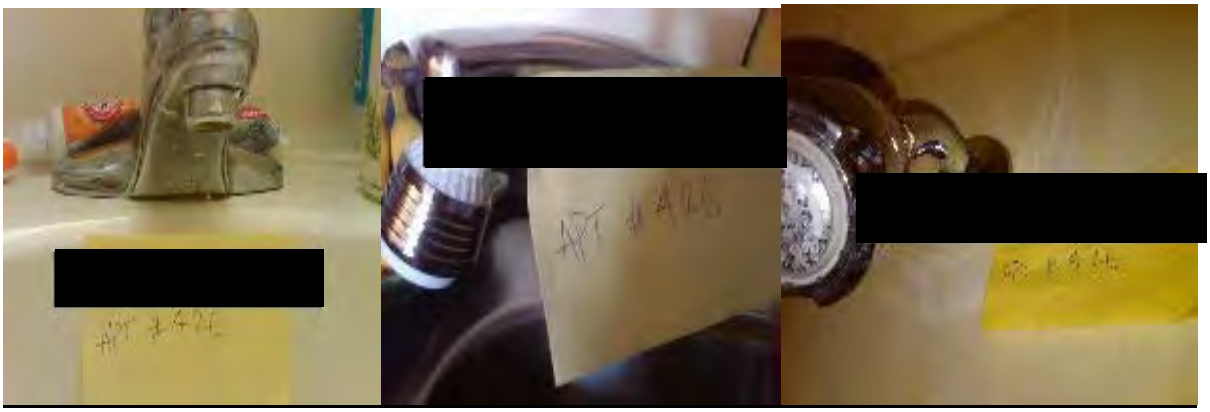
Unit/ID #426	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Completely random room selection
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

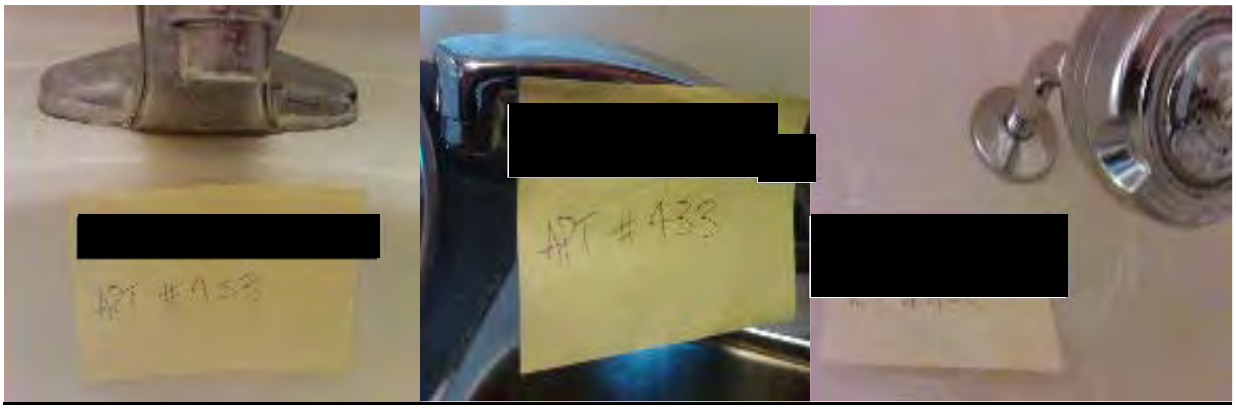
Unit/ID #433	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		x	

Signature received	x	

General Notes:

Completely random room selection
Appeared to be the original kitchen faucet aerator
Aerator was marked as Masco 2.2 GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	300
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 300

BA: 300

KA: 300

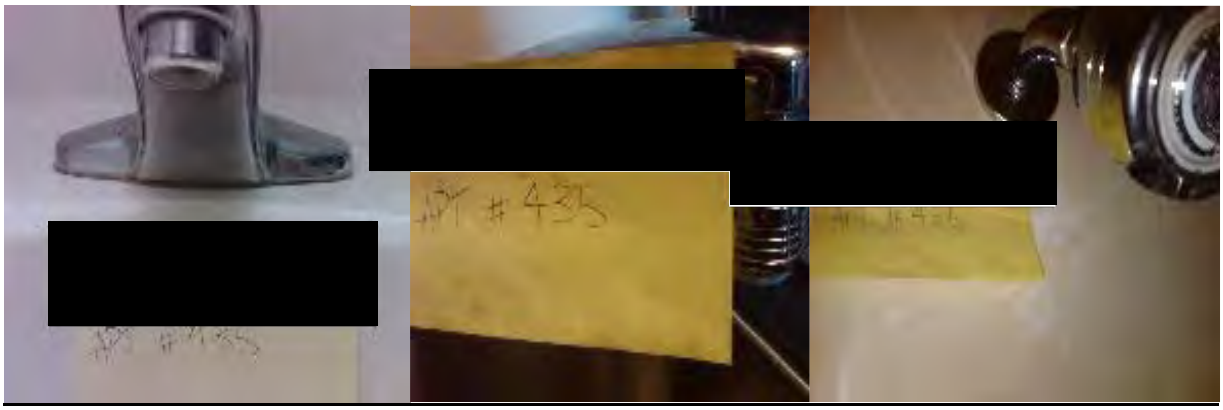
Unit/ID #435	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Completely random room selection
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

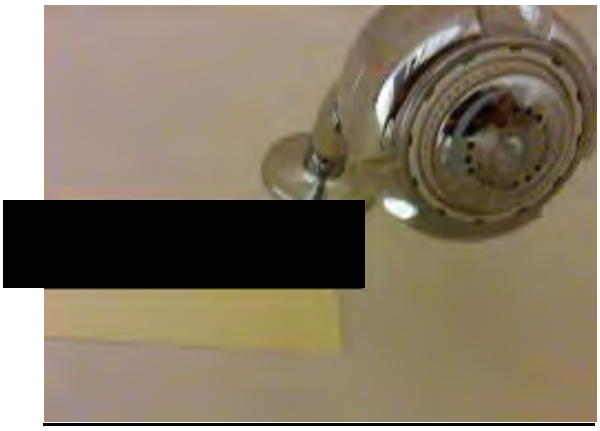
Customer (hotel/motel):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	[redacted]
City:	[redacted]

Unit/ID # 124	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	x		
Aerator	x		
Unit/ID # 124	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			x

Signature received	x	

Proof of installation (insert picture below):


[redacted]


[redacted]

HWC Audit

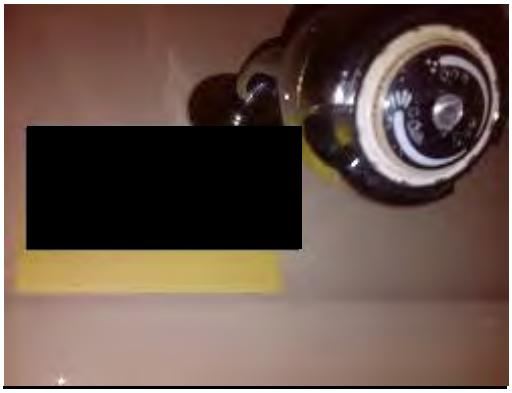
Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Unit/ID # 132	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	x		
Aerator	x		
Unit/ID # 132	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			x

Signature received	x	

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

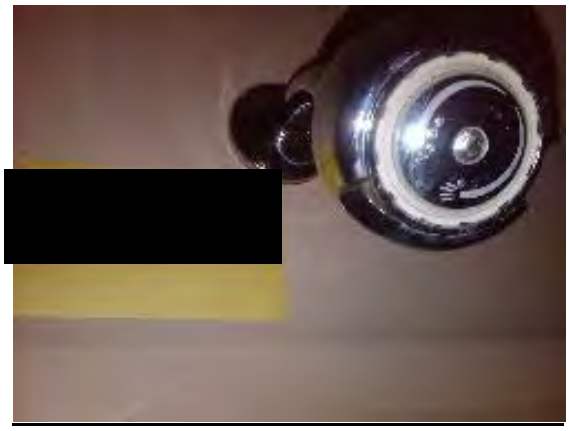
Customer (hotel/motel):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Unit/ID # 139	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	x		
Aerator	x		
Unit/ID # 139	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			x

Signature received	x	

Proof of installation (insert picture below):


[redacted]


[redacted]

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Unit/ID # 208	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	x		
Aerator	x		
Unit/ID # 208	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			x

Signature received	x	

Proof of installation (insert picture below):


[redacted]


[redacted]

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Unit/ID # 230	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead		**x**	
Aerator		**x**	
Unit/ID # 230	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**x**

Signature received	**x**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Other Details:

SH: 55

BA: 55

KA: N/A

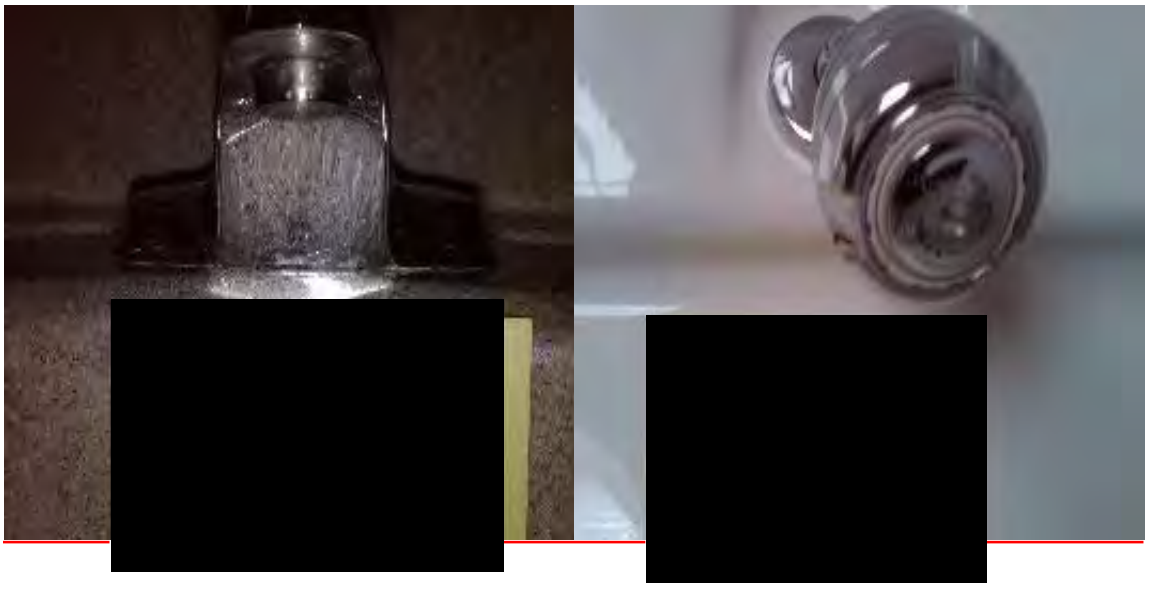
Unit/ID #101	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 55

BA: 55

KA: N/A

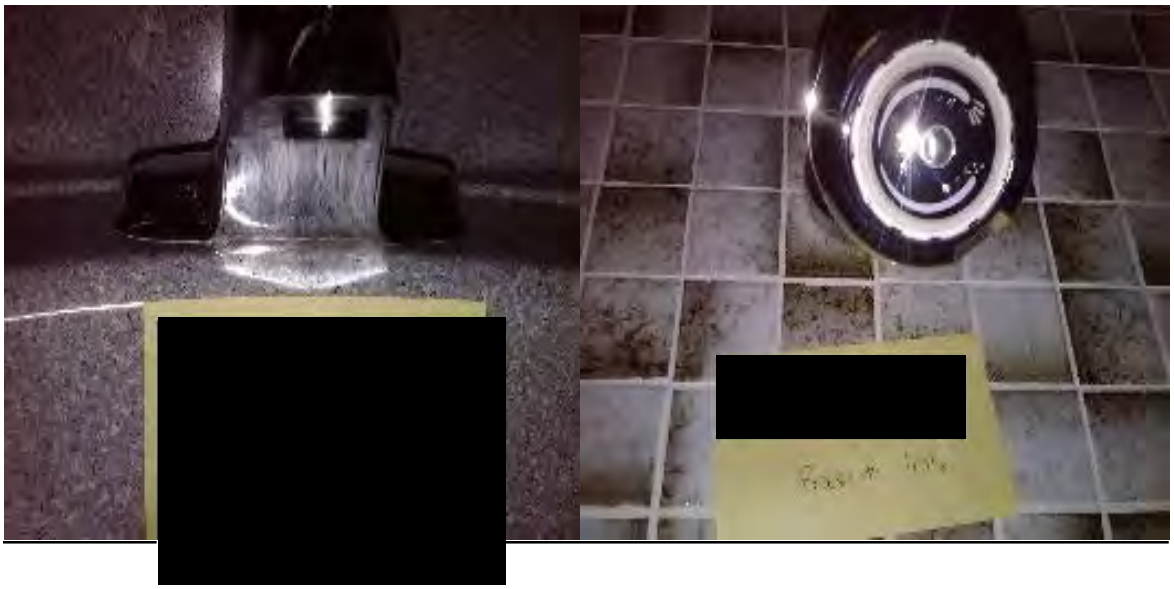
Unit/ID #105	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 55

BA: 55

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

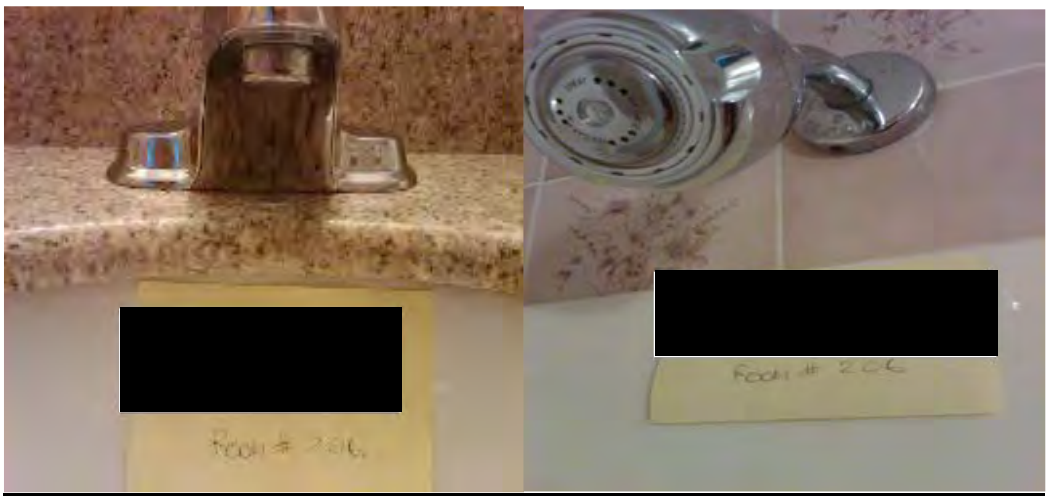
Unit/ID #206	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Other Details:

SH: 55

BA: 55

KA: N/A

Unit/ID #212	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 55

BA: 55

KA: N/A

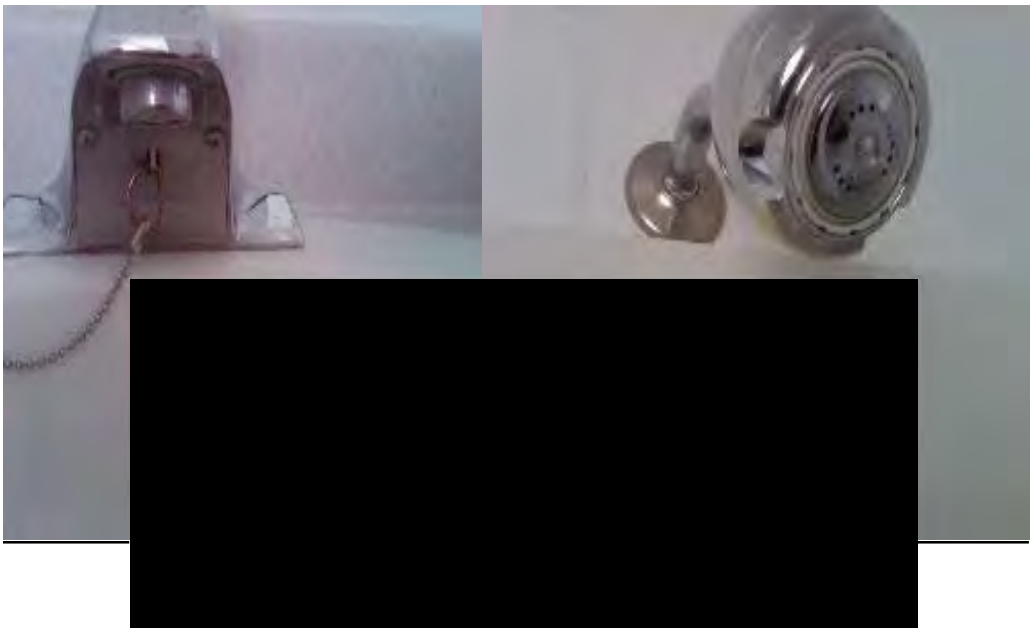
Unit/ID #300	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Other Details:

SH: 55

BA: 55

KA: N/A

Unit/ID #303	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 55

BA: 55

KA: N/A

Unit/ID #306	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 55

BA: 55

KA: N/A

Unit/ID #406	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 55

BA: 55

KA: N/A

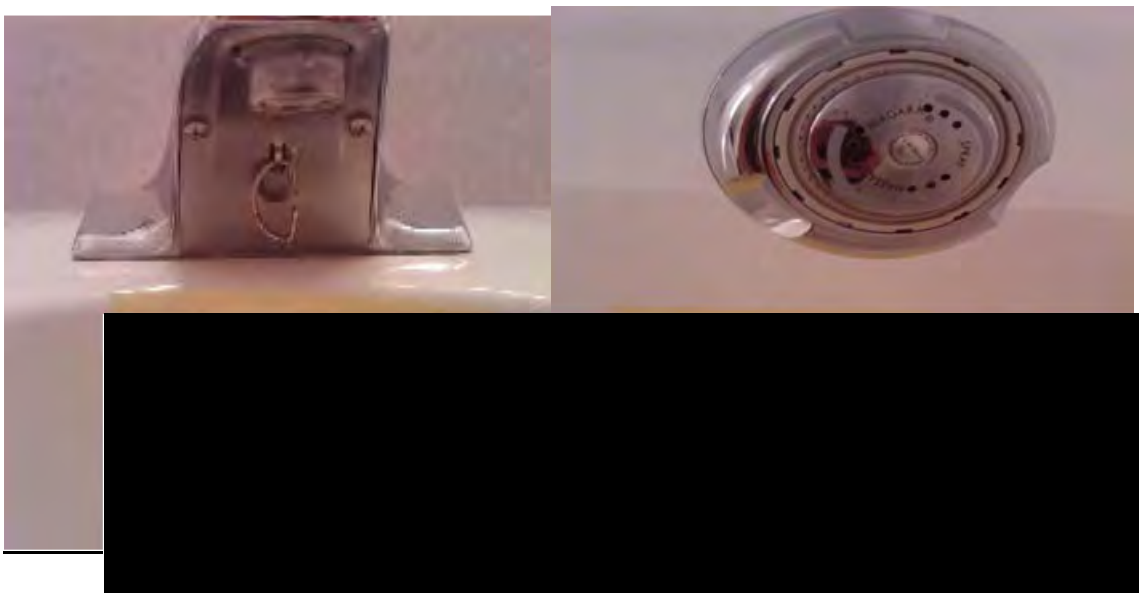
Unit/ID #408	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Motel
Total # of units in building:	50
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 55

BA: 55

KA: N/A

Unit/ID #411	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			x

Signature received	x	

General Notes:

Room selection was completely random with vacancy considered
Faucet aerator was original with the fixture, marked as Moen with 2+ GPM

Proof of installation (insert picture below):

[redacted]

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

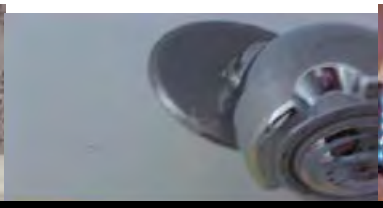
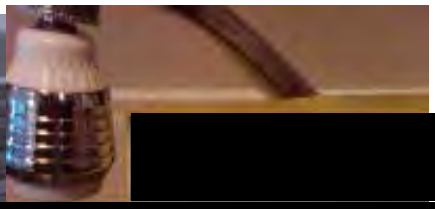
Unit/ID # 118	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator	x		

Signature received	x	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):




[redacted]

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 272

BA: 272

KA: 172

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

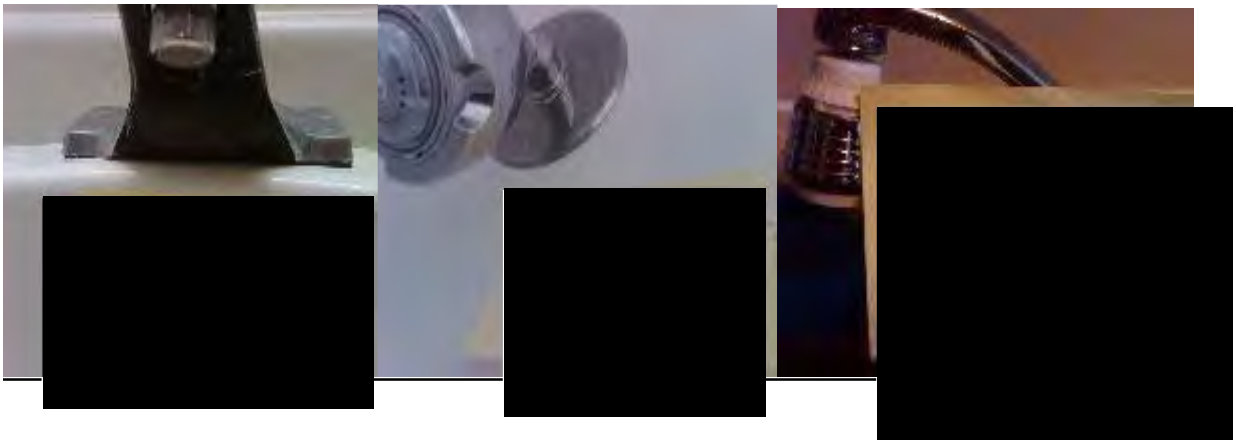
Unit/ID # 124	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

Unit/ID # 125	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator	x		

Signature received	x	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

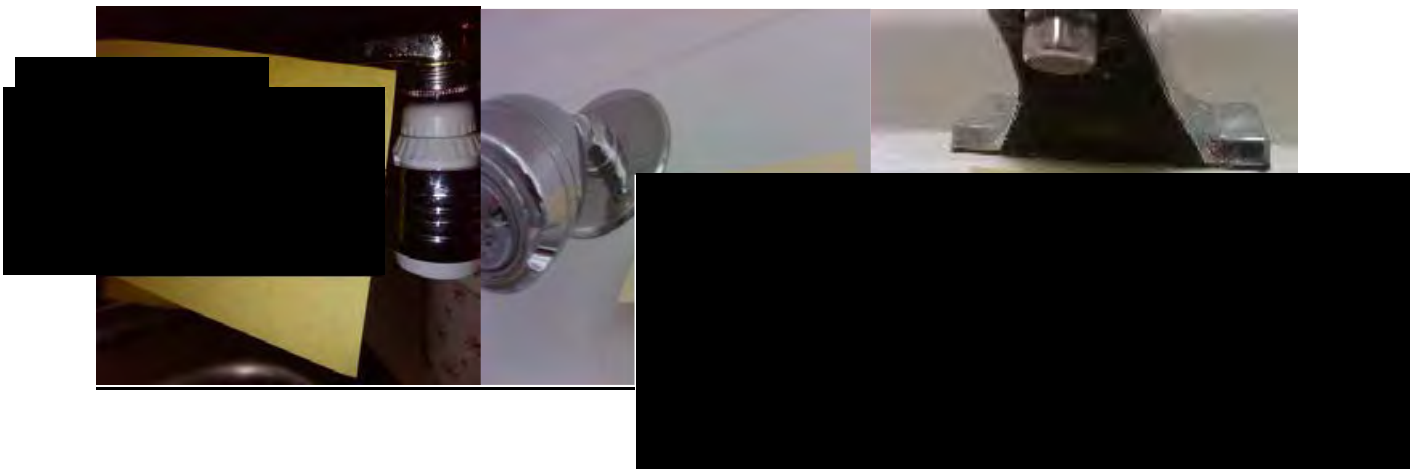
Unit/ID # 144	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

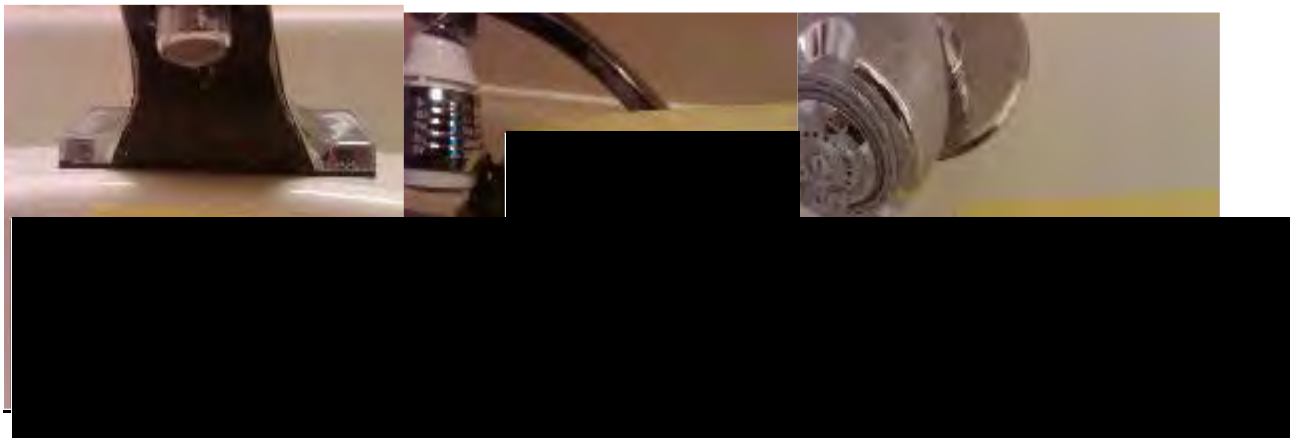
Unit/ID # 148	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

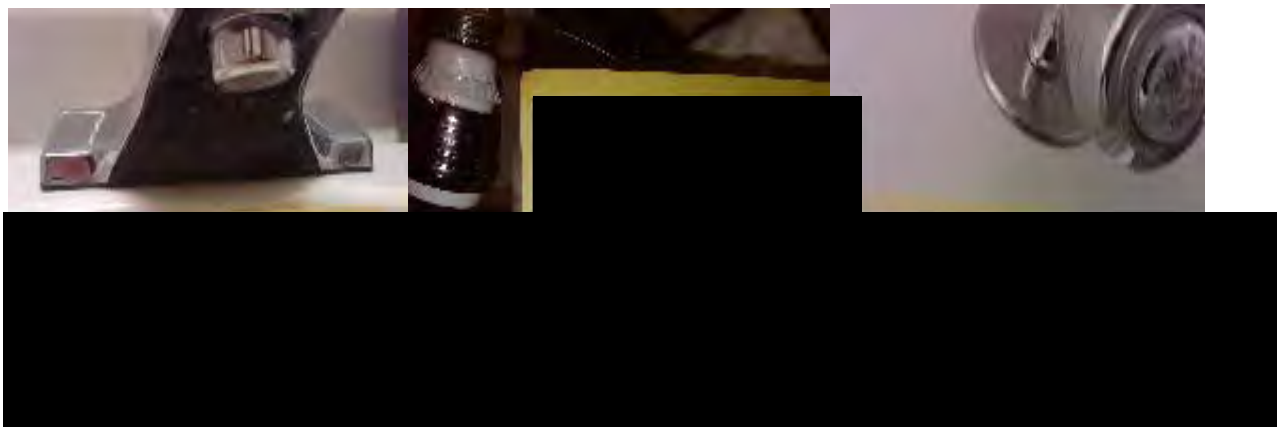
Unit/ID # 150	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

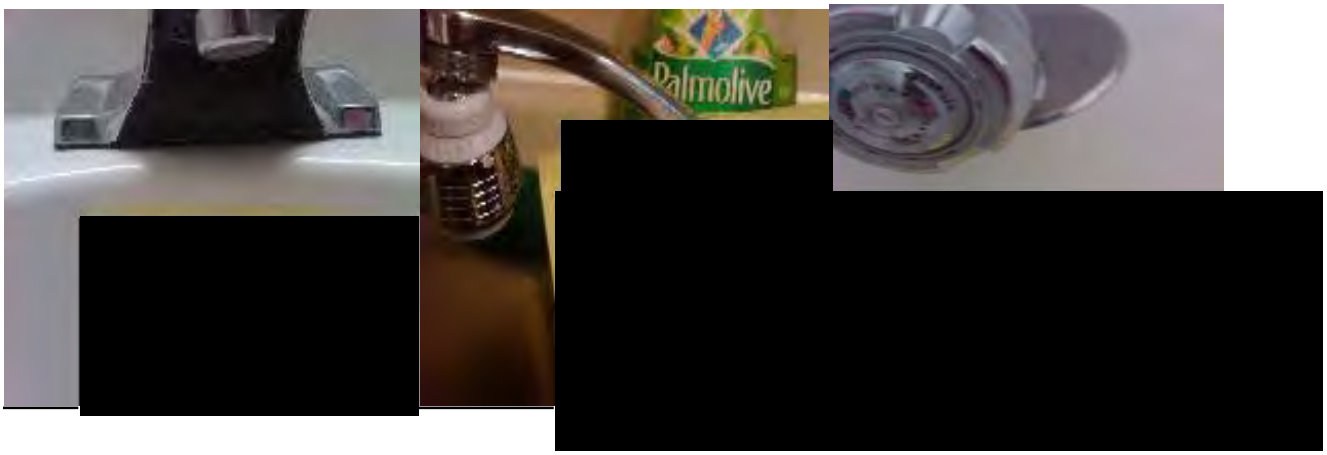
Unit/ID # 151	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

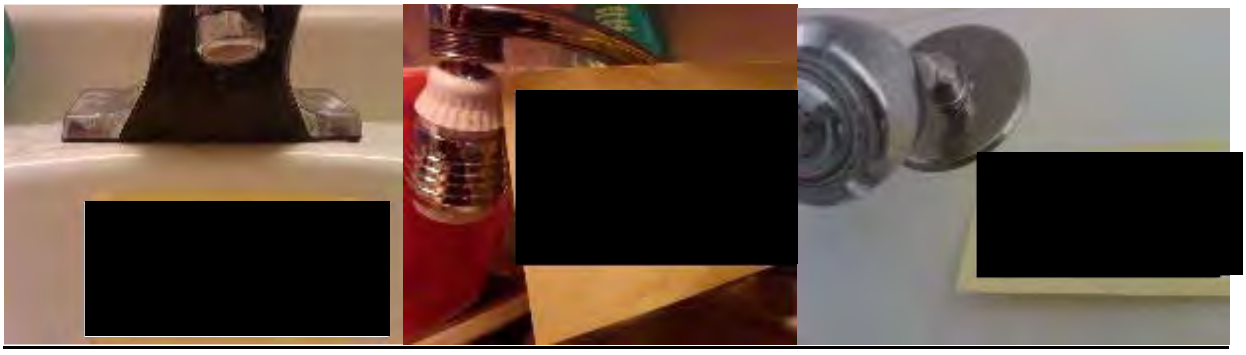
Unit/ID # 158	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator	x		

Signature received	x	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

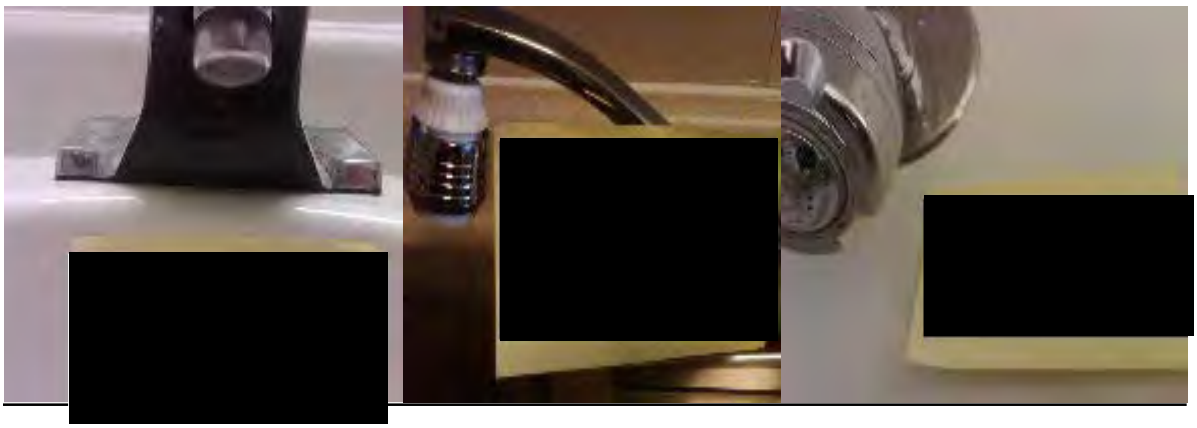
Unit/ID # 159	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator	x		

Signature received	x	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Dorm
Total # of units in building:	172
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 272

BA: 272

KA: 172

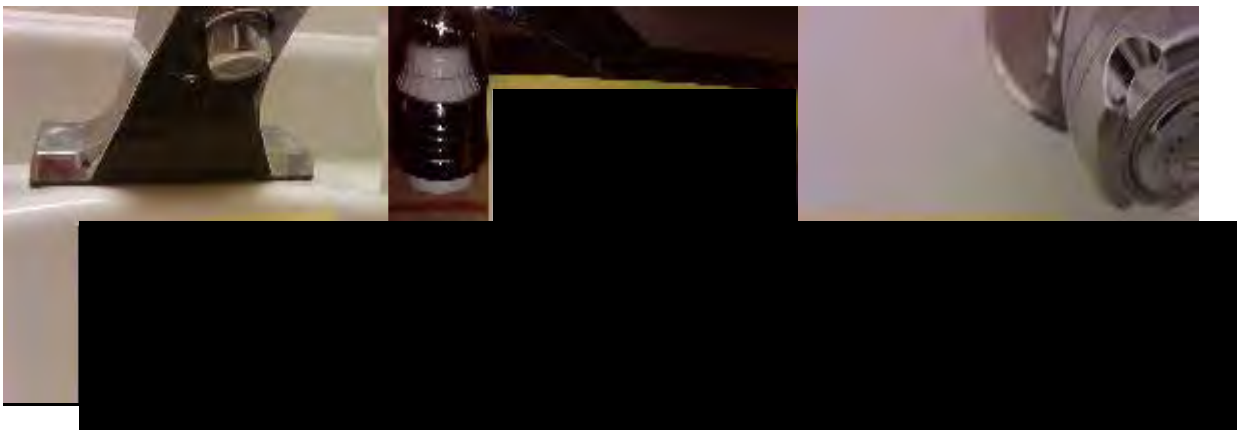
Unit/ID # 160	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was not random and provided for me
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Other Details:

SH: 1

BA: 12

KA: 3

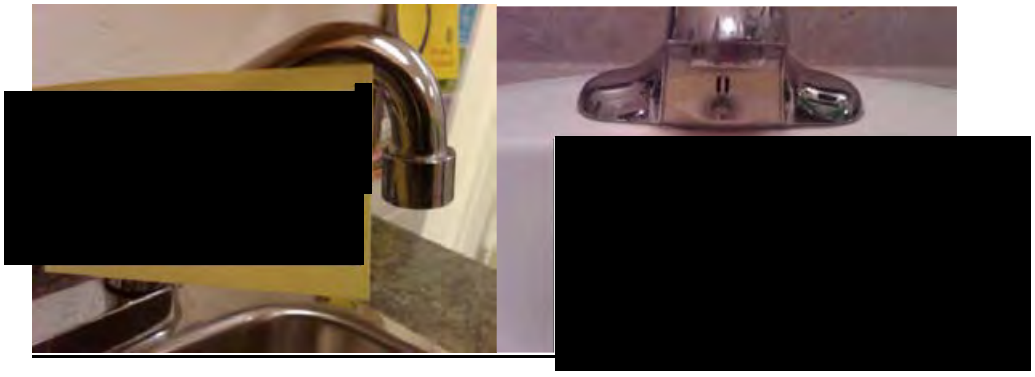
Unit/ID # boysbathroom1	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead			x
Aerator		X	
Unit/ID # kitchen1	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		X	

Signature received	x	

General Notes:

No aerators installed
Only faucets available for audit

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 1

BA: 12

KA: 3

Unit/ID # boys bathroom2	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead			x
Aerator		X	
Unit/ID # kitchen2	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			X

Signature received	x	

General Notes:

No aerators installed
Only available faucets for audit

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 1

BA: 12

KA: 3

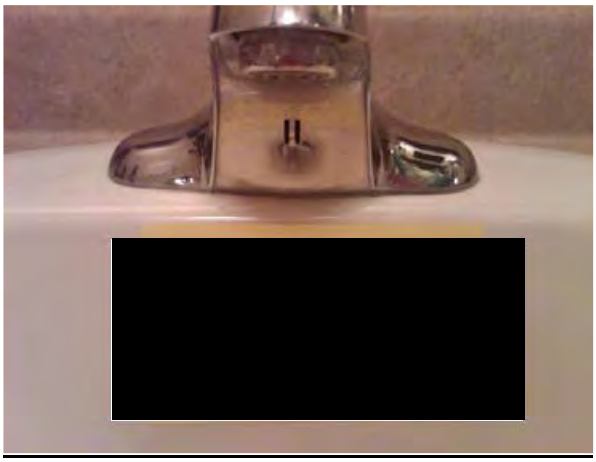
Unit/ID # boys bathroom3	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead			x
Aerator		X	
Unit/ID # kitchen3	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			X

Signature received	x	

General Notes:

No aerators installed
Only faucets available for audit

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 1

BA: 12

KA: 3

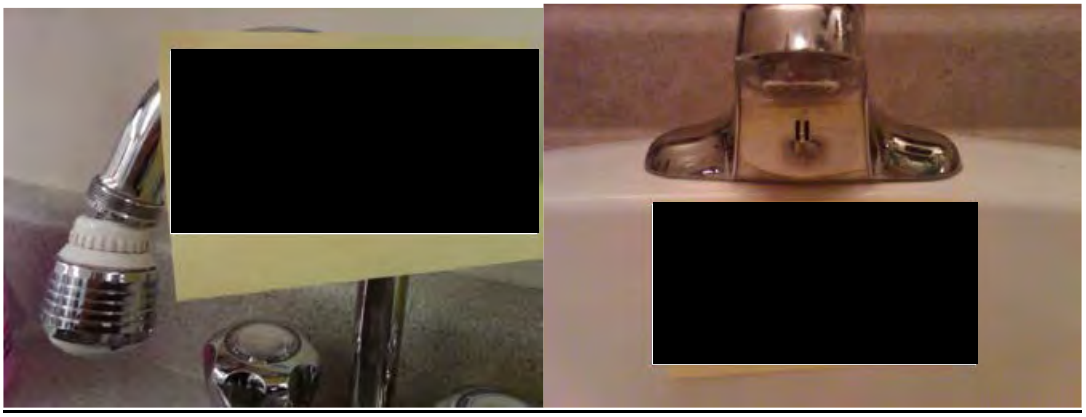
Unit/ID # boys bathroom4	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead			x
Aerator		X	
Unit/ID # room110	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	X		

Signature received	x	

General Notes:

Kitchen faucet aerator installed that was Union Gas issued
No bathroom aerator installed
Only faucets available for audit

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 1

BA: 12

KA: 3

Unit/ID # boys bathroom5	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead			x
Aerator		X	
Unit/ID # room124	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		X	

Signature received	x	

General Notes:

Kitchen faucet aerator installed but does not to appear to issued by Union Gas, brand name is Siroflex
No bathroom aerator installed
Only faucets available for audit

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

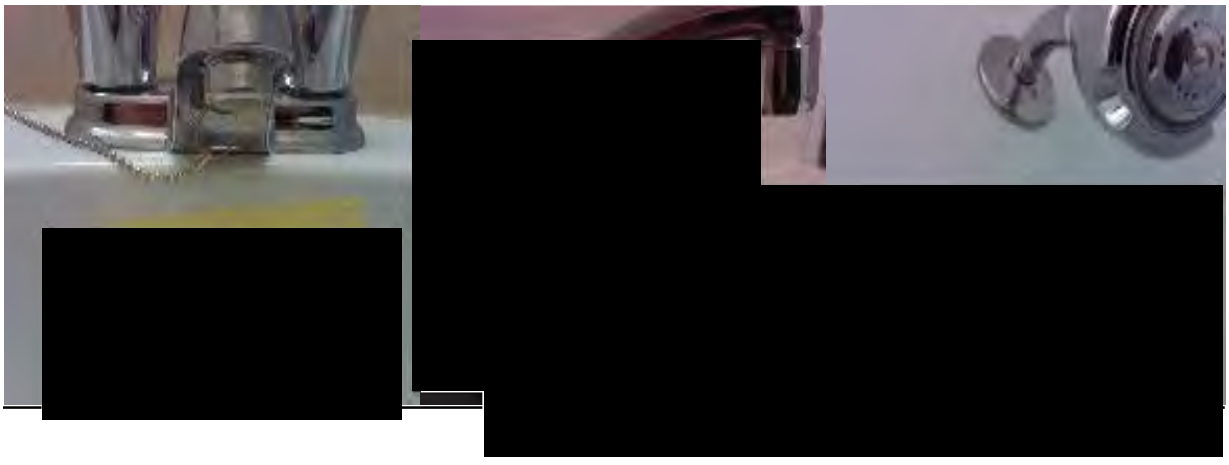
Unit/ID #457-14	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		x	

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
Shower head and bathroom aerator were installed and Union Gas issued
Kitchen faucet aerator appeared to be original, marked Moen 2.2 GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

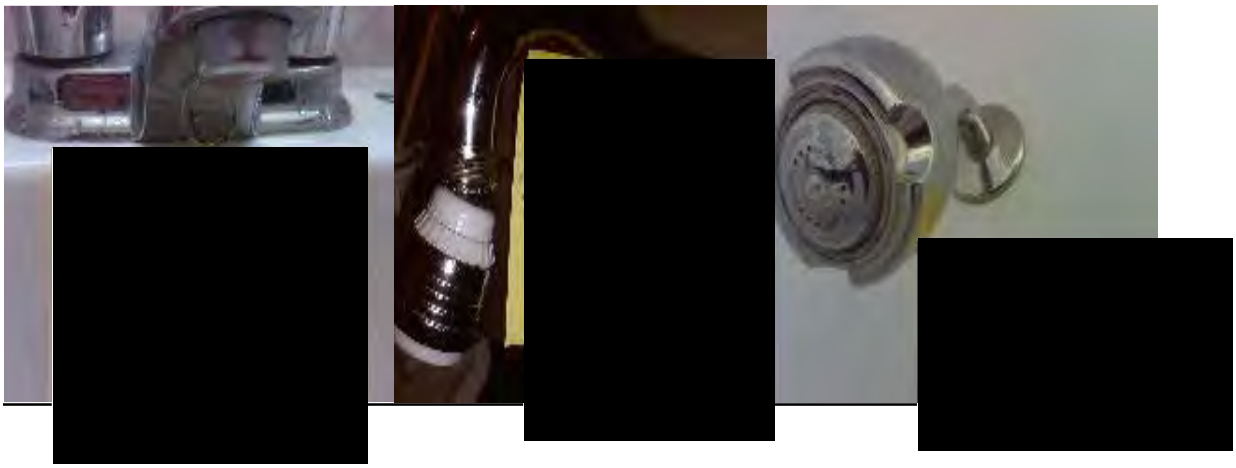
Unit/ID #459-21	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

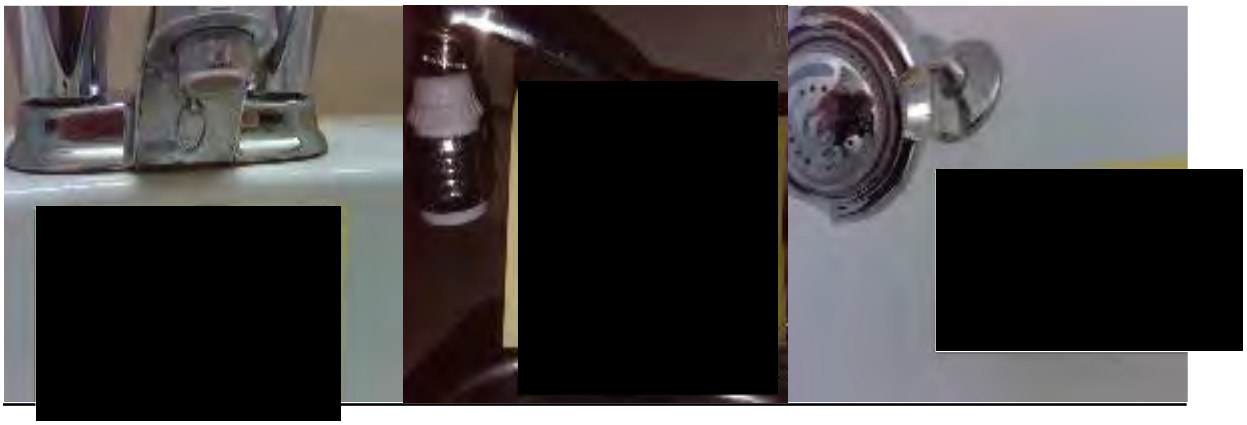
Unit/ID #463-11	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

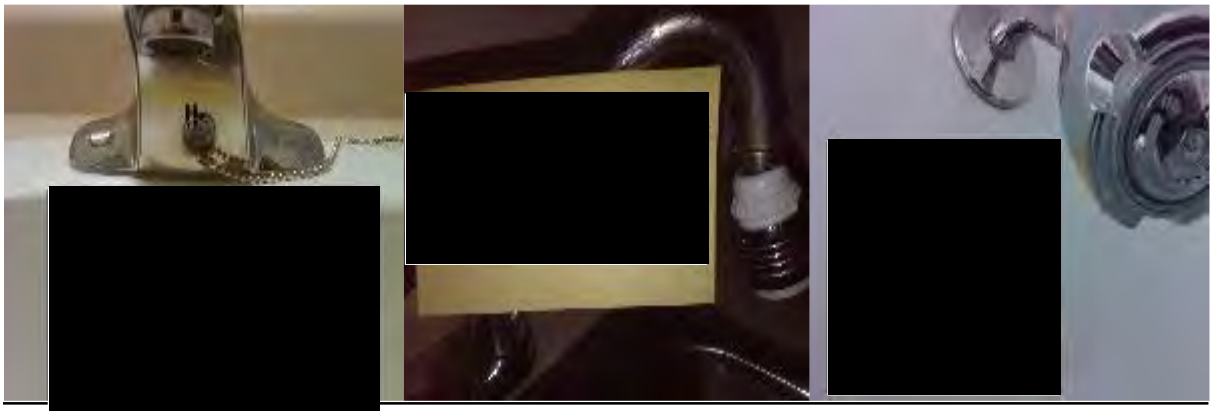
Unit/ID #463-24	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator		x	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
Shower head and kitchen faucet aerator was installed and Union Gas issued
Bathroom aerator appeared to be original, marked Moen 1.5 GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]-

Other Details:
SH: 60
BA: 60
KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

Unit/ID #532-34	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		x	

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
Shower head and bathroom aerator were correct and Union Gas issued
Kitchen aerator appeared to be original, marked Moen 2.2 GPM

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

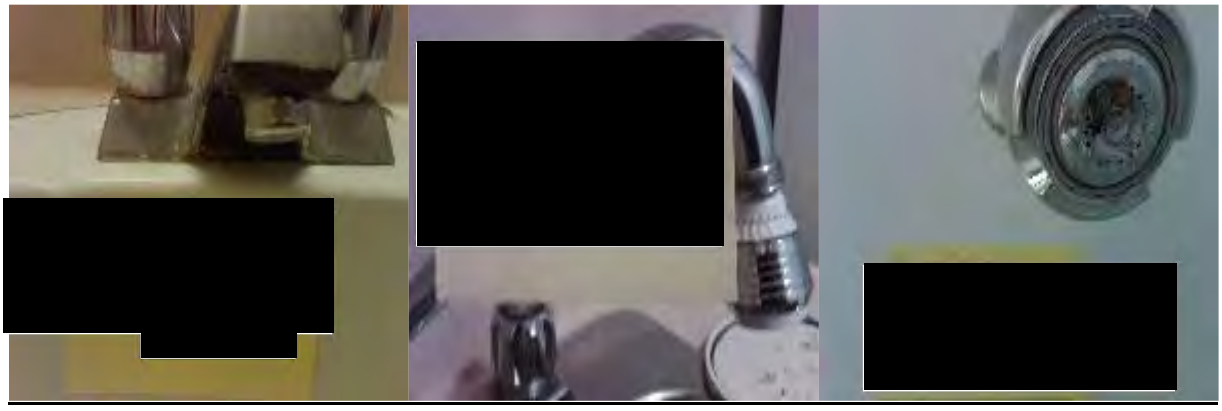
Unit/ID #534-24	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
[redacted]	[redacted]

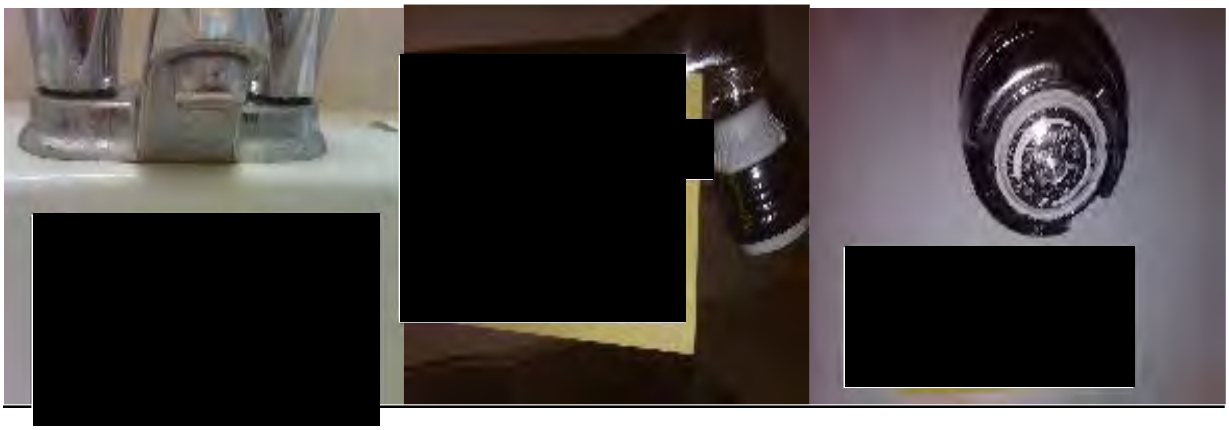
Unit/ID #534-34	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Room selection was random from a list of vacant rooms
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

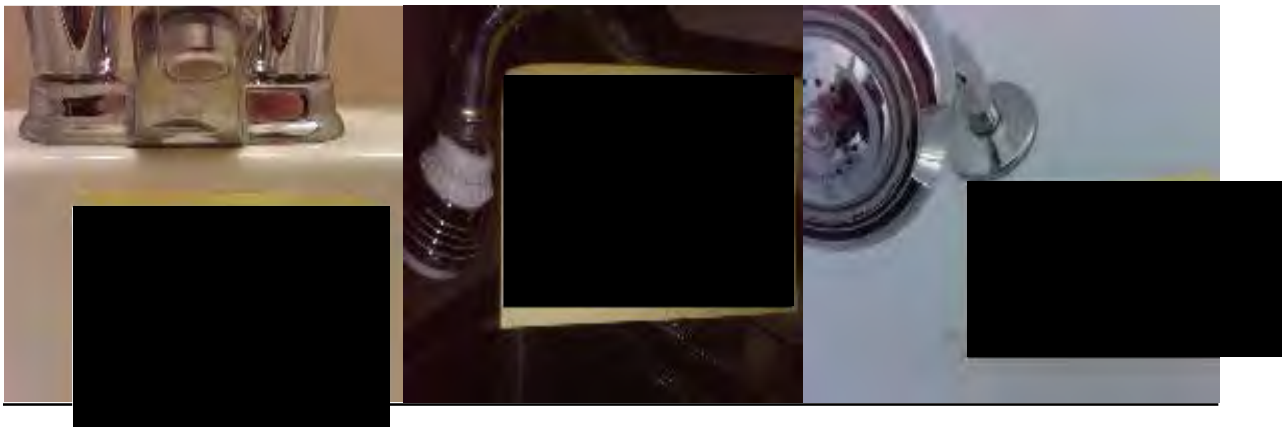
Unit/ID #542-11	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

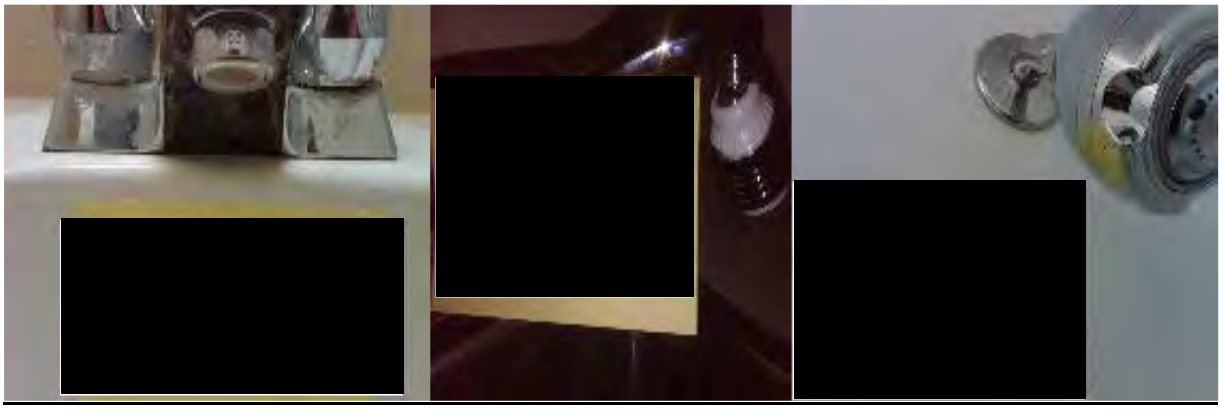
Unit/ID #546-34	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 60

BA: 60

KA: 60

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Apartment / Dorm
Total # of units in building:	400
Contact:	[redacted]
Address:	
City:	

Unit/ID #548-13	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	x		

Signature received	x	

General Notes:

Room selection was random from a list of vacant rooms
All 3 were installed and Union Gas issued

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	High School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 10

BA: 10

KA: 4

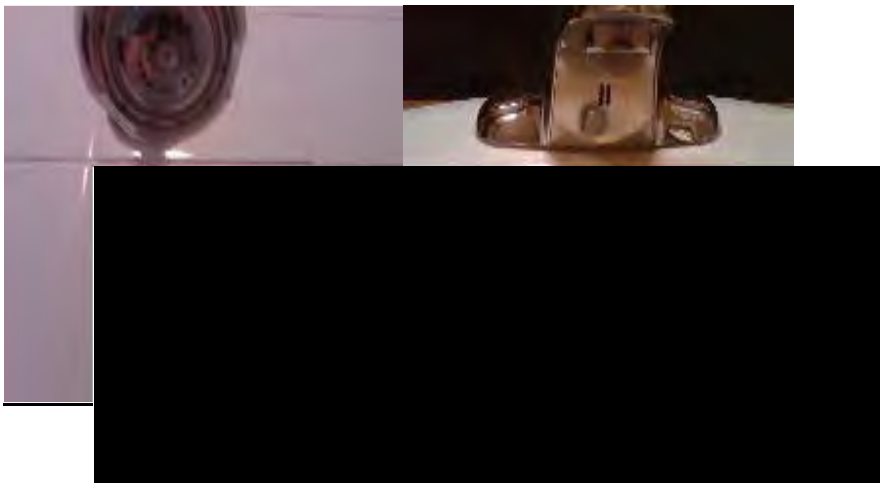
Unit/ID #204 B/ Boys Bathroom1	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	X		
Aerator		X	
Unit/ID # Cafeteria	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			X

Signature received	x	

General Notes:

Shower head was installed and Union Gas issued
Bathroom faucet aerator not installed

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	High School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 10

BA: 10

KA: 4

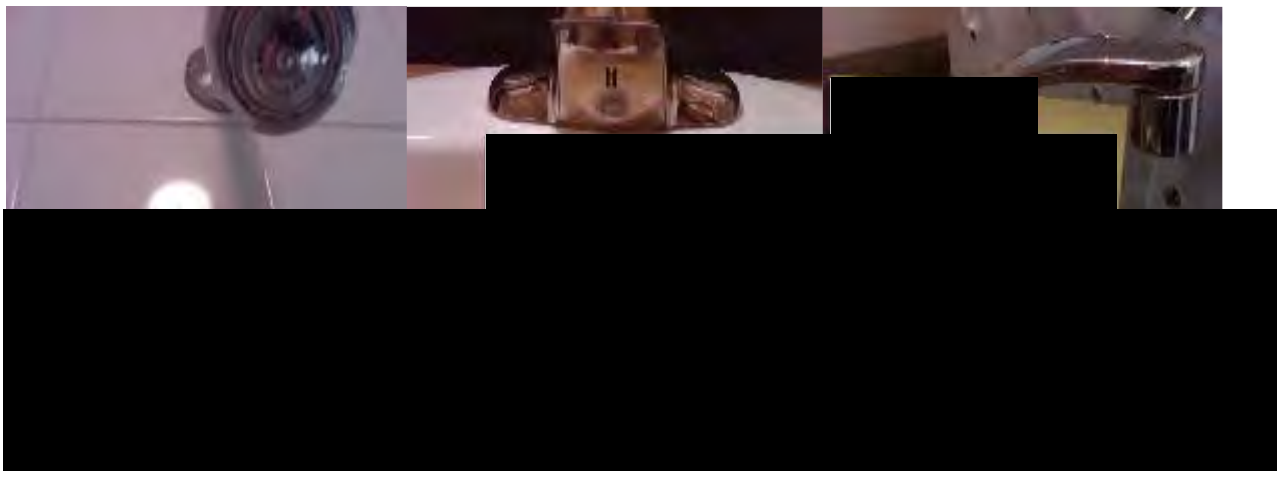
Unit/ID # boys changeroom1/ bathroom2	Installed		N/A No bathroom in unit or measure not ordered for unit
BATHROOM	**YES**	**NO**	
Showerhead	X		
Aerator		X	
Unit/ID # staff room	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		X	

Signature received	x	

General Notes:

Shower head was installed and Union Gas issued
Bathroom faucet aerator not installed
Kitchen faucet aerator appeared to be original, marked Masco 1.5 GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	High School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 10

BA: 10

KA: 4

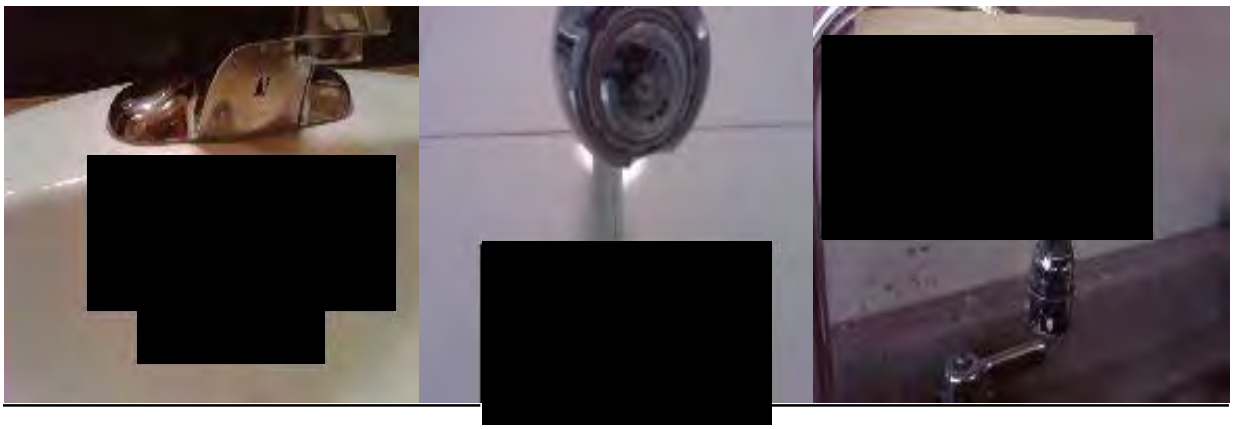
Unit/ID # boys changeroom2 /bathroom3	**Installed**		**N/A No bathroom in unit or measure not ordered for unit**
BATHROOM	**YES**	**NO**	
Showerhead	**X**		
Aerator		**X**	
Unit/ID # visual art 1	**Installed**		**N/A No kitchen in unit or measure not ordered for unit**
KITCHEN/ KITCHENETTE	**YES**	**NO**	
Aerator		**X**	

Signature received	**x**	

General Notes:

Shower head was installed and Union Gas issued
Bathroom faucet aerator not installed
Kitchen faucet aerator appeared to be original, marked Masco 1.5 GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	High School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Other Details:

SH: 10

BA: 10

KA: 4

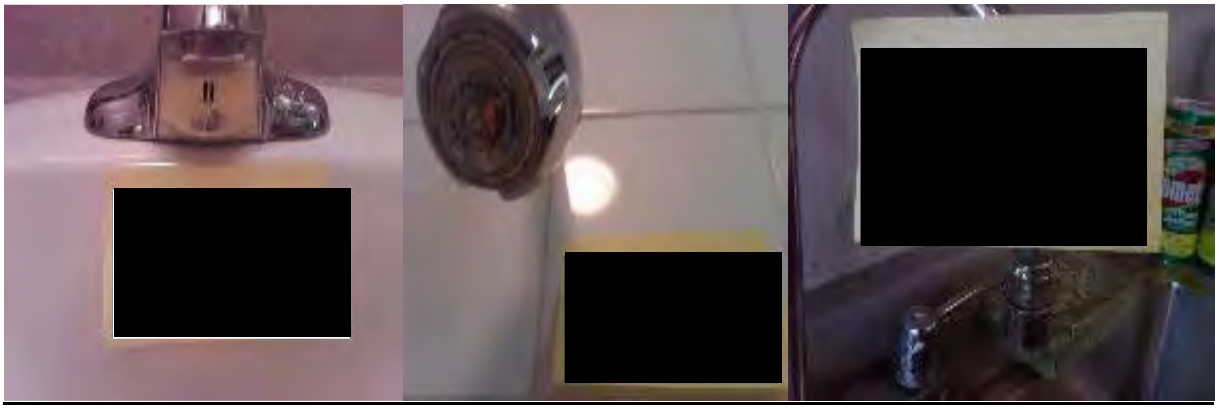
Unit/ID # boys changeroom3/bathroom4	**Installed**		**N/A No bathroom in unit or measure not ordered for unit**
BATHROOM	**YES**	**NO**	
Showerhead	**X**		
Aerator		**X**	
Unit/ID # visual art 2	**Installed**		**N/A No kitchen in unit or measure not ordered for unit**
KITCHEN/ KITCHENETTE	**YES**	**NO**	
Aerator		**X**	

Signature received	**x**	

General Notes:

Shower head was installed and Union Gas issued
Bathroom faucet aerator not installed
Kitchen faucet aerator appeared to be original, marked Masco 1.5 GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	High School
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 10

BA: 10

KA: 4

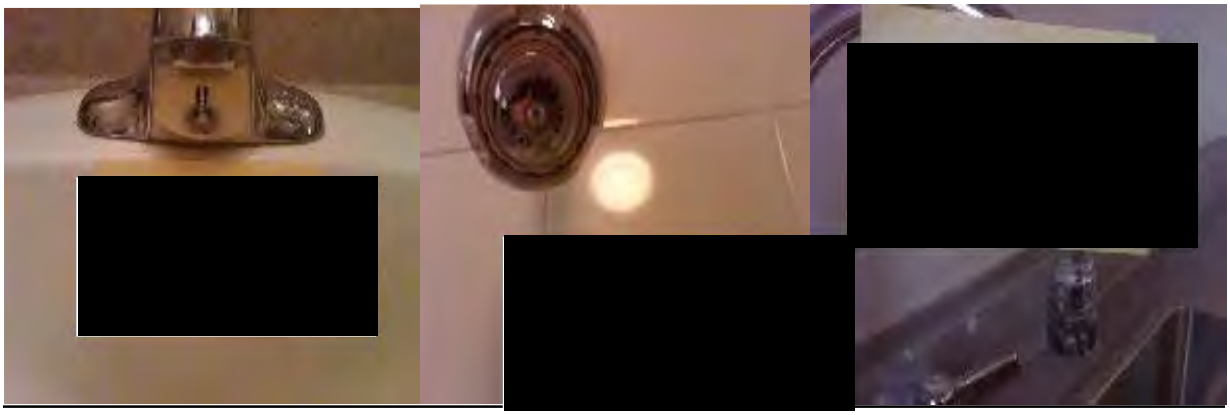
Unit/ID # boys changeroom4/ bathroom5	**Installed**		**N/A No bathroom in unit or measure not ordered for unit**
BATHROOM	**YES**	**NO**	
Showerhead	**X**		
Aerator		**X boys**	
Unit/ID # visual art3	**Installed**		**N/A No kitchen in unit or measure not ordered for unit**
KITCHEN/ KITCHENETTE	**YES**	**NO**	
Aerator		**X**	

Signature received	**x**	

General Notes:

Shower head was installed and Union Gas issued
Bathroom faucet aerator not installed
Kitchen faucet aerator appeared to be original, marked Masco 1.5 GPM

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 4

BA: 14

KA: 4

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Other
Total # of units in building:	20
Contact:	[redacted]
Address:	
City:	

Unit/ID #1	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			**x**
Aerator		**x**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Bathroom aerator marked Moen,
Kitchen aerator was installed and appeared to be Union Gas issued

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 4

BA: 14

KA: 4

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Other
Total # of units in building:	20
Contact:	[redacted]
Address:	
City:	

Unit/ID #10	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator		**x**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Kitchen aerator installed but appears to be an older model
Bathroom aerator not installed. Appears to be old and calcified
Showerhead was installed and Union Gas issued

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 4

BA: 14

KA: 4

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Other
Total # of units in building:	20
Contact:	[redacted]
Address:	
City:	

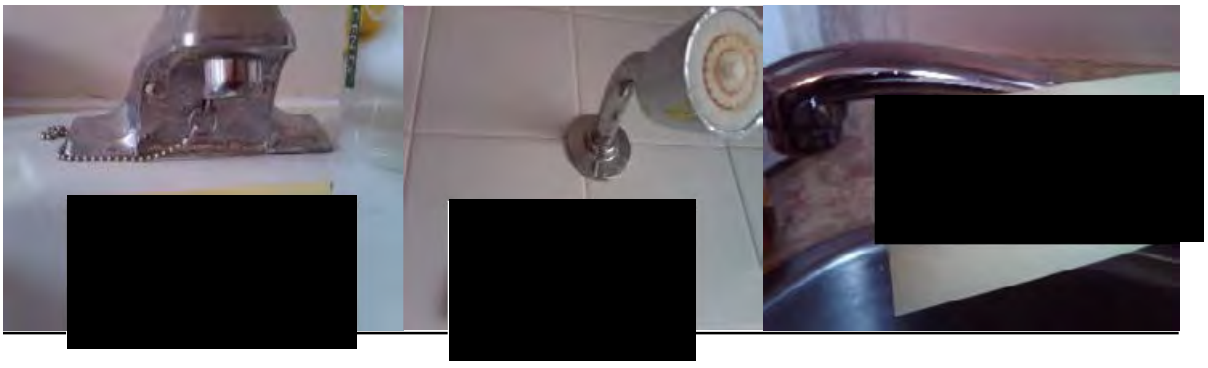
Unit/ID #12	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**x**	
Aerator		**x**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		**x**	

Signature received	**x**	

General Notes:

Kitchen aerator not installed, marked 2.2 GPM, brand name Moen
No markings on the bathroom aerator

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 4

BA: 14

KA: 4

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Other
Total # of units in building:	20
Contact:	[redacted]
Address:	
City:	

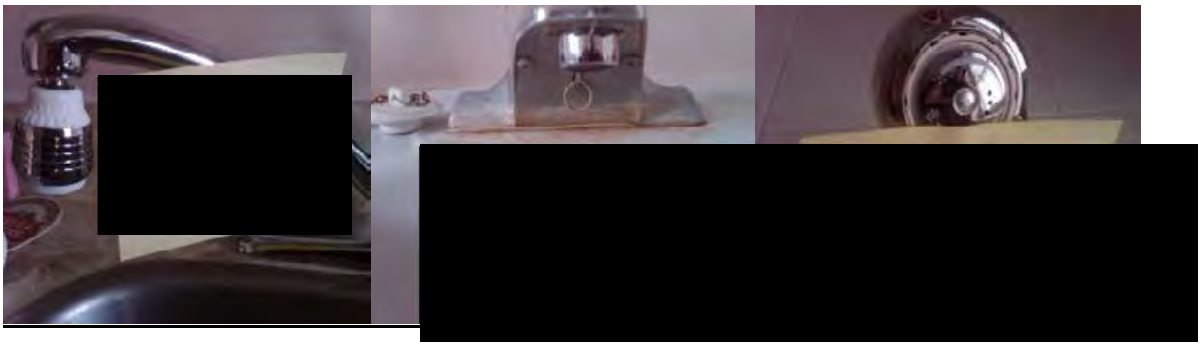
Unit/ID #14	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator		**x**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Showerhead and kitchen aerator were installed and Union Gas issued
No markings on bathroom aerator

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 4

BA: 14

KA: 4

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	Other
Total # of units in building:	20
Contact:	[redacted]
Address:	
City:	

Unit/ID #8	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator		**x**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Kitchen aerator not installed. Was marked as 2.2 GPM, brand name Neqperl
Bathroom aerator not installed. Appeared to be old and calcified
Showerhead was installed and Union Gas issued

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 3

BA: 2

KA: 138

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	108
Contact:	[redacted]
Address:	
City:	

Unit/ID # 120B	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**Yes**		
Aerator	**Yes**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**Yes**		

Signature received	**Yes**	

General Notes:

Rooms were selected by my contact Rita, so that resident's daily routines were not disrupted.

Proof of installation (insert picture below)

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 3

BA: 2

KA: 138

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	108
Contact:	[redacted]
Address:	
City:	

Unit/ID # 114	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**YES**		
Aerator	**YES**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**YES**		

Signature received	**YES**	

General Notes:

Rooms were selected by my contact Rita, so that resident's daily routines were not disrupted.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	108
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 3

BA: 2

KA: 138

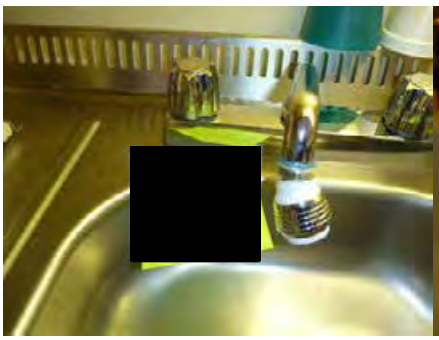
Unit/ID # 112	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	Yes		
Aerator	Yes		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator	Yes		

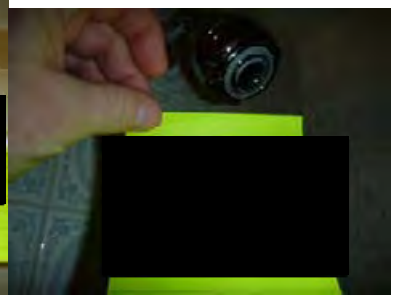
Signature received	Yes	

General Notes:

Rooms were selected by my contact Rita, so that resident's daily routines were not disrupted.

Proof of installation (insert picture below):





HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	108

Order Details:

SH: 3

BA: 2

KA: 138

Contact:	[redacted]
Address:	
City:	

Unit/ID # 104	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**Yes**		
Aerator	**Yes**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**Yes**		

Signature received	**Yes**	

General Notes:

Rooms were selected by my contact Rita, so that resident's daily routines were not disrupted.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	108

Order Details:

SH: 3

BA: 2

KA: 138

Contact:	[redacted]
Address:	
City:	

Unit/ID # 128	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**Yes**		
Aerator	**Yes**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**Yes**		

Signature received	**Yes**	

General Notes:

Rooms were selected by my contact Rita, so that resident's daily routines were not disrupted.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Other Details:

SH: 3 | ___

BA: 5 | ___

KA: 1 | ___

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

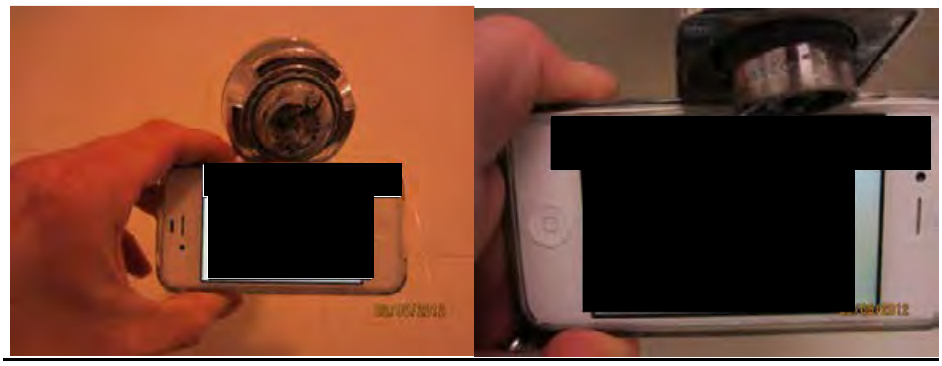
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Shower room sink aerator was not Niagara brand but rated 1.0 gpm
Only 3 showers in entire facility
Selection was limited so I obtained as many verifications as possible

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 3| ___

BA: 5 | ___

KA: 1 | ___

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

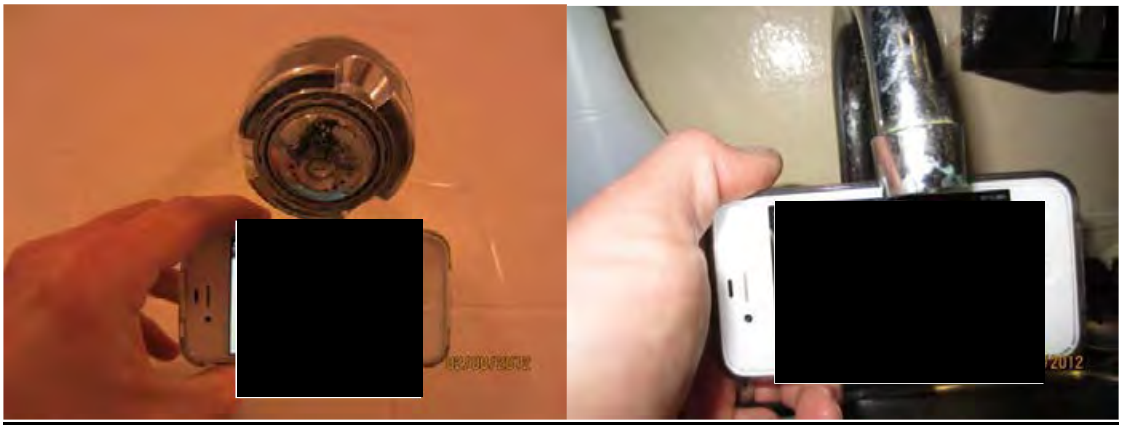
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

No visible markings on kitchen aerator
Only 3 showers in entire facility
Selection was limited so I obtained as many verifications as possible

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 3| ___

BA: 5 | ___

KA: 1 | ___

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

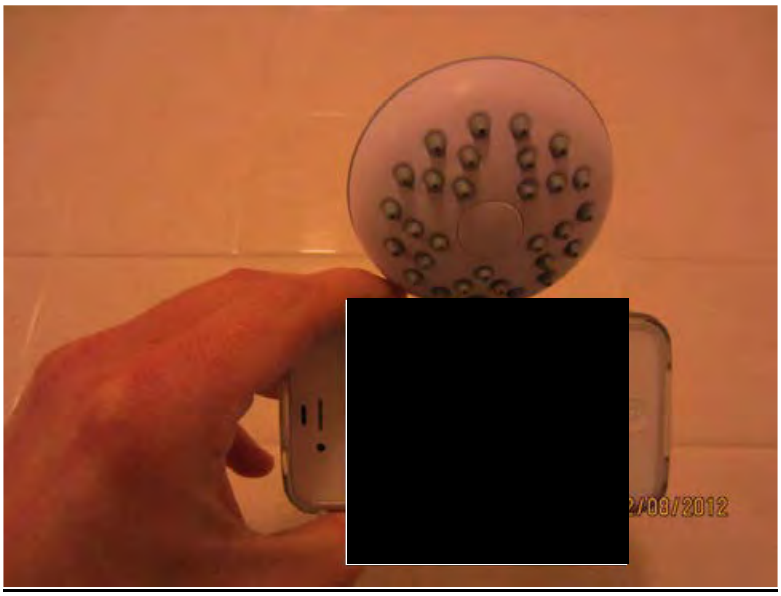
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**X**	
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Only 3 showers in entire facility
Selection was limited so I obtained as many verifications as possible

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 3| ___

BA: 5 | ___

KA: 1 | ___

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

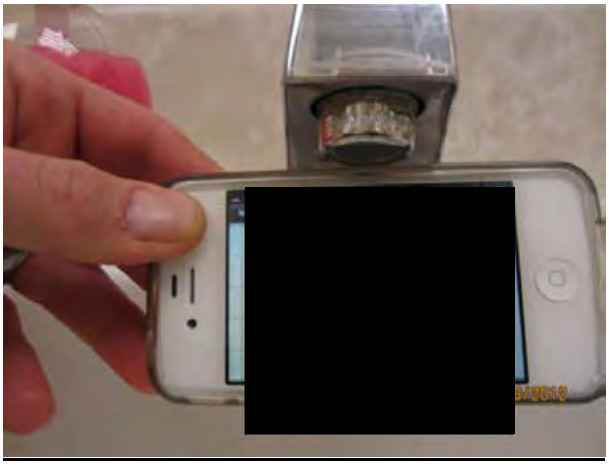
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			**X**
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Only 3 showers in entire facility
Niagara brand not visible on either aerator but both marked at 1.0 gpm
Selection was limited so I obtained as many verifications as possible

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 3| ___

BA: 5 | ___

KA: 1 | ___

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	N/A
Contact:	[redacted]
Address:	
City:	

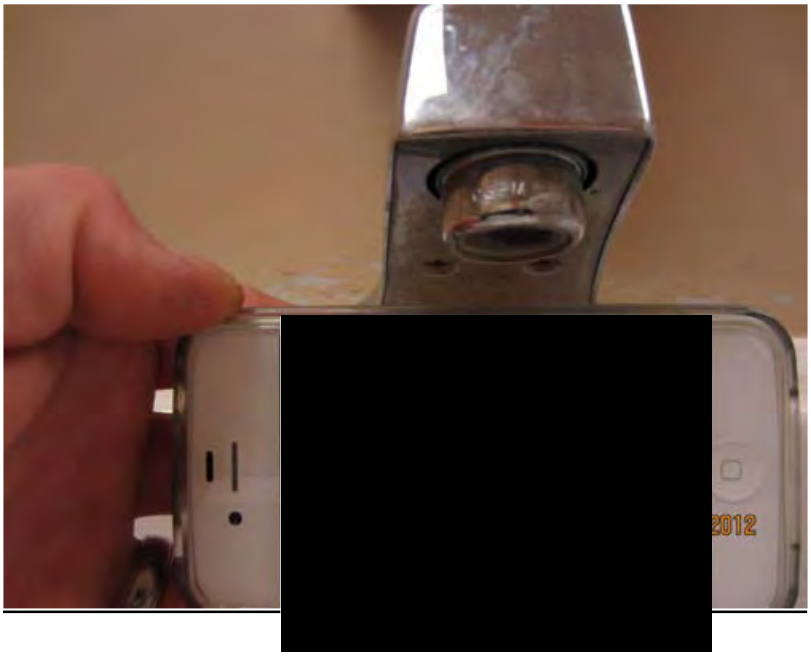
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			**X**
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Only 3 showers in entire facility
Niagara brand not visible on aerator but marked at 1.0 gpm
Selection was limited so I obtained as many verifications as possible

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	60
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 47

BA: 47

KA: 3

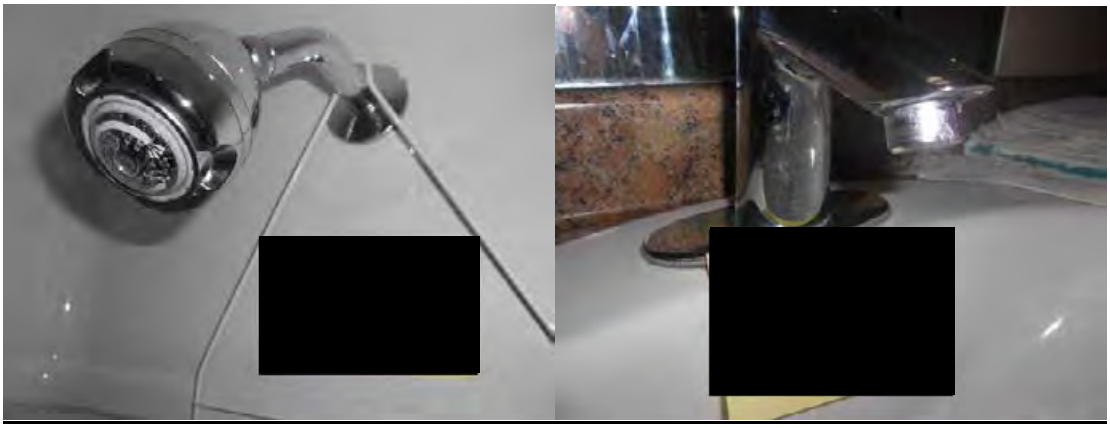
Unit/ID #68	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Many of the Units contain special Handicapped fixtures, to which the Aerators and Showerheads do not fit.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	60
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 47

BA: 47

KA: 3

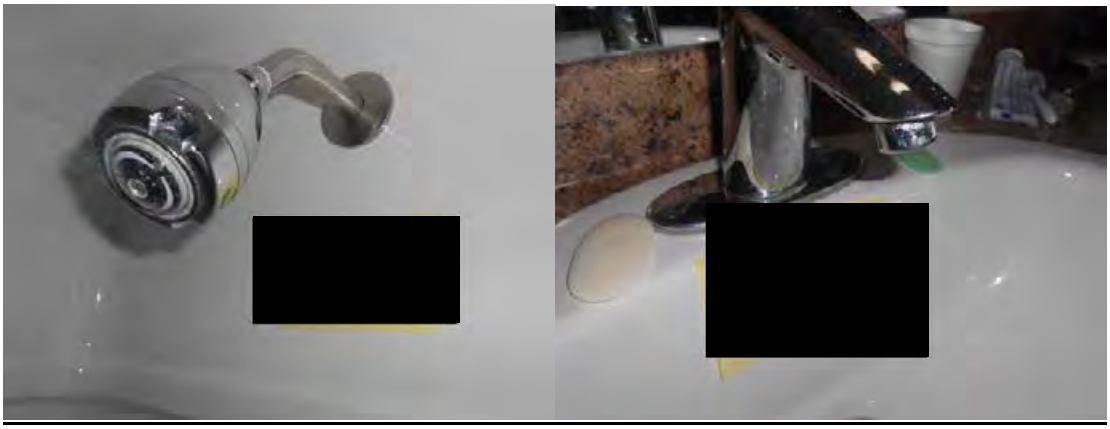
Unit/ID #60	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Many of the Units contain special Handicapped fixtures, to which the Aerators and Showerheads do not fit.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	60
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 47

BA: 47

KA: 3

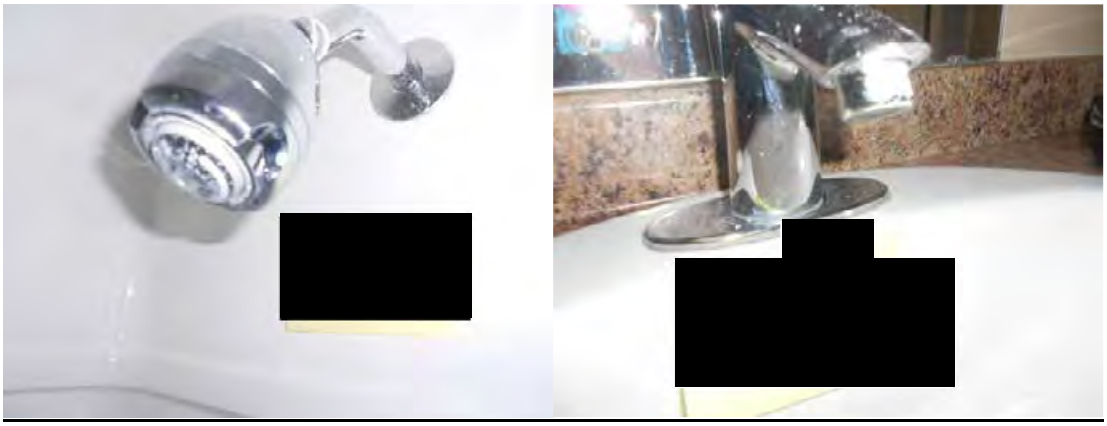
Unit/ID #61	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Many of the Units contain special Handicapped fixtures, to which the Aerators and Showerheads do not fit.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	60
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 47

BA: 47

KA: 3

Unit/ID #womens washroom 1	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Many of the Units contain special Handicapped fixtures, to which the Aerators and Showerheads do not fit.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	60
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 47

BA: 47

KA: 3

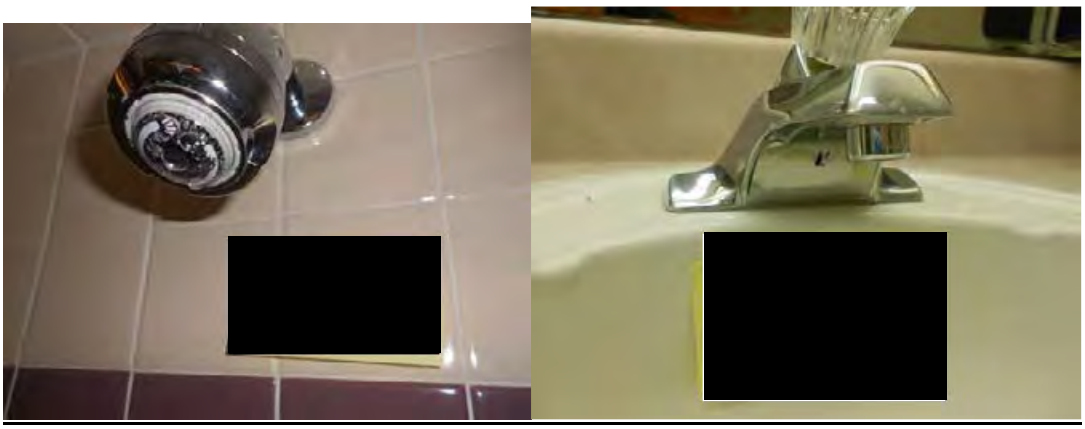
Unit/ID #womens Washroom2	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Many of the Units contain special Handicapped fixtures, to which the Aerators and Showerheads do not fit.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 61

BA: 61

KA: 1

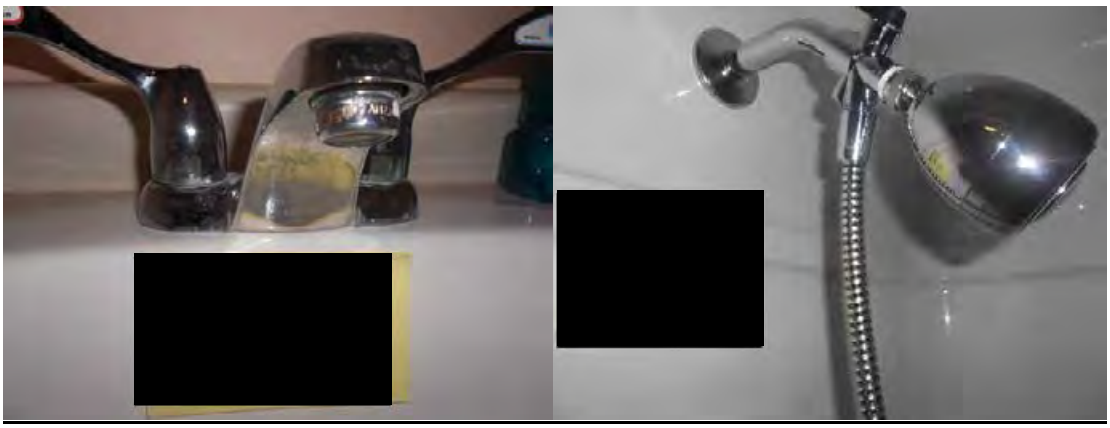
Unit/ID # 124	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 61

BA: 61

KA: 1

Unit/ID # 134	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Order Details:

SH: 61

BA: 61

KA: 1

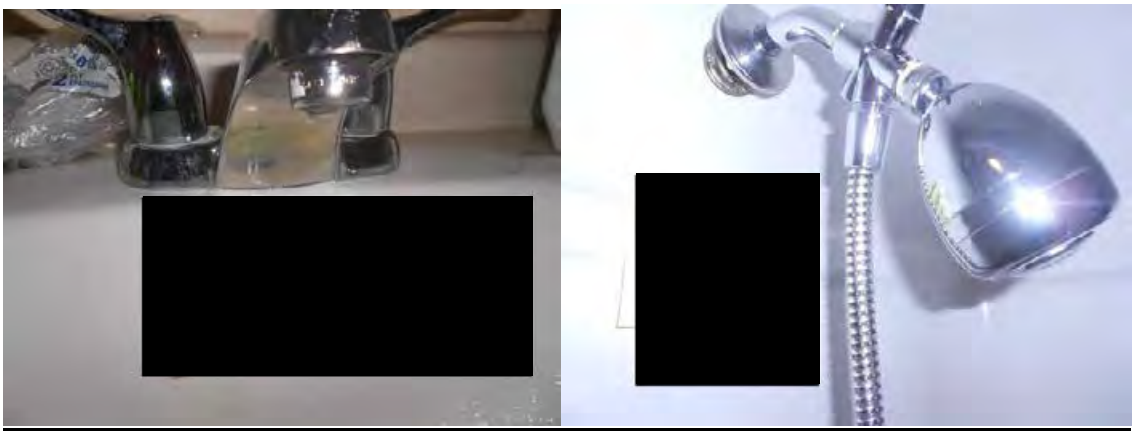
Unit/ID # 223	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 61

BA: 61

KA: 1

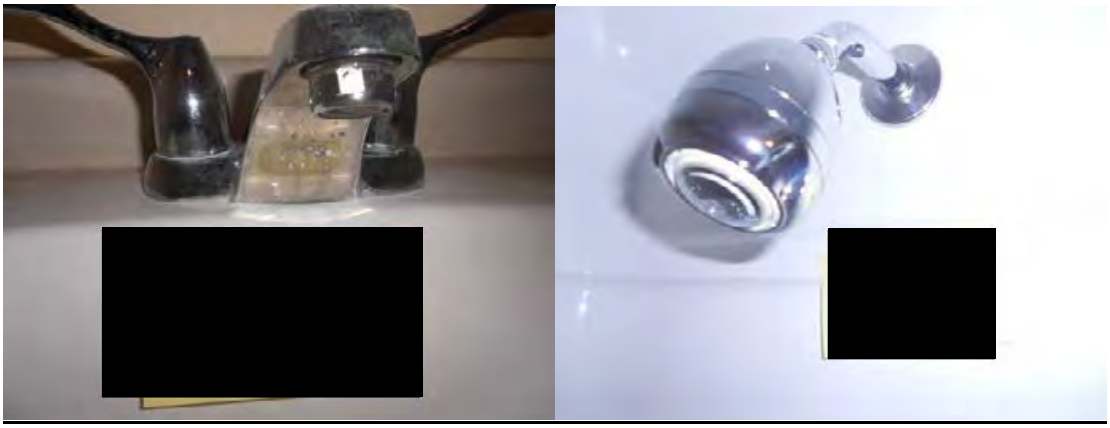
Unit/ID # 230	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 61

BA: 61

KA: 1

Unit/ID # 233	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

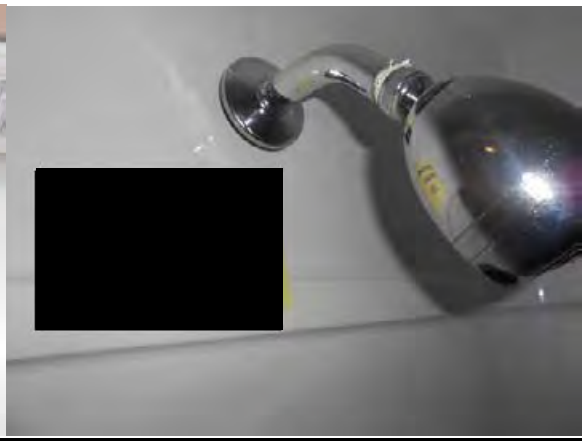
Signature received	x	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):


[redacted]


[redacted]

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 61

BA: 61

KA: 1

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

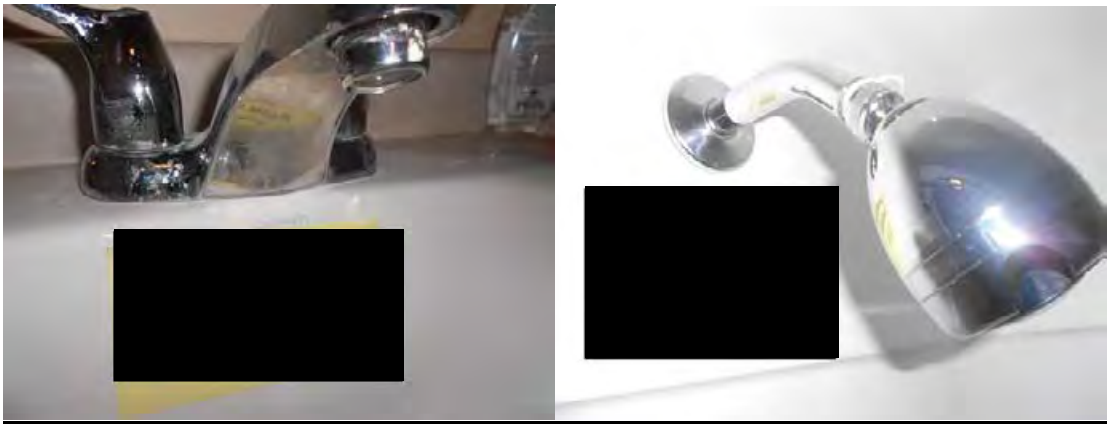
Unit/ID # 323	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 61

BA: 61

KA: 1

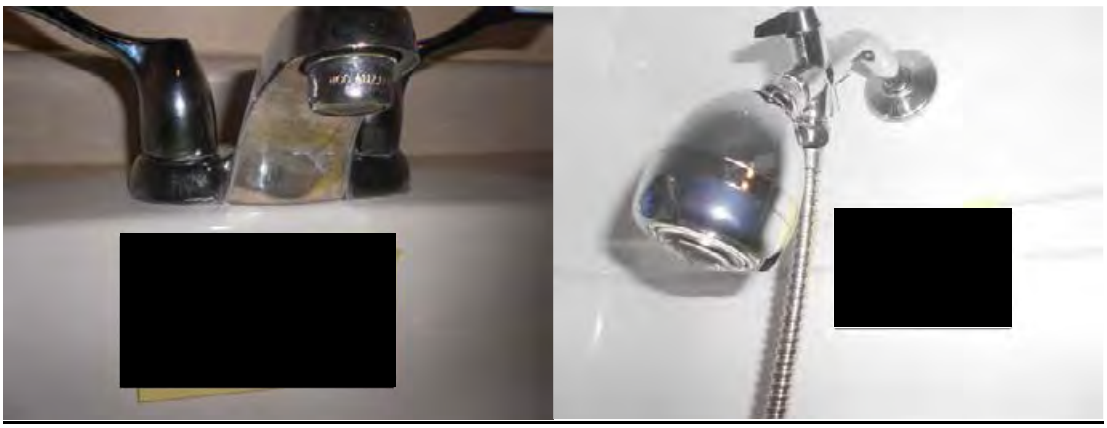
Unit/ID # 326	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 61

BA: 61

KA: 1

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

Unit/ID # 329	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 61

BA: 61

KA: 1

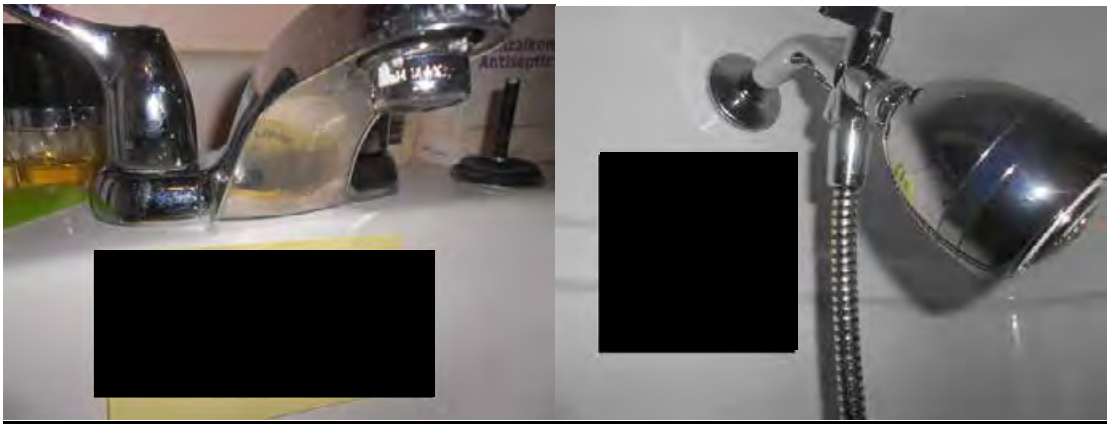
Unit/ID # 333	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	68
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 61

BA: 61

KA: 1

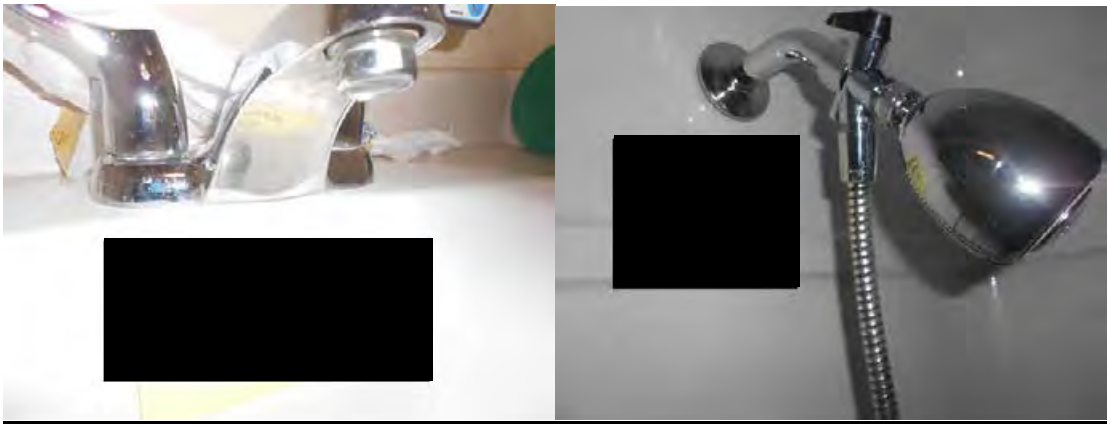
Unit/ID # 337	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Most rooms Fitted, but some residents need hand held showerheads, as they cannot stand to wash.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	6
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 4

BA: 9

KA: 7

Unit/ID #Bar	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			**x**
Aerator			**x**
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Kitchens and Bar area checked- Units are privately rented and unaccessible.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	6
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 4

BA: 9

KA: 7

Unit/ID # Kitchen	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			**x**
Aerator			**x**
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Kitchens and Bar area checked- Units are privately rented and unaccessible.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	6
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 4

BA: 9

KA: 7

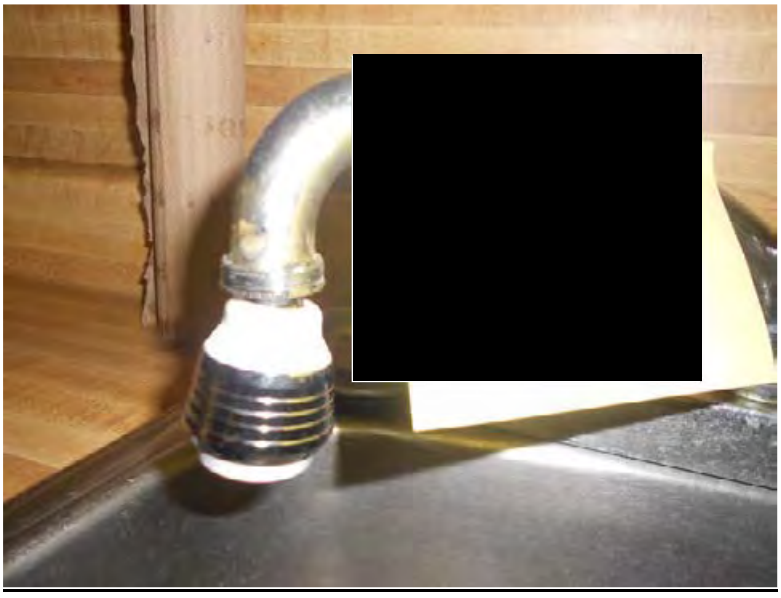
Unit/ID #Small Kitchen	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			**x**
Aerator			**x**
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Kitchens and Bar area checked- Units are privately rented and unaccessible.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 22

BA: 26

KA: 26

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	APARTMENTS
Total # of units in building:	[redacted]
Contact:	
Address:	
City:	

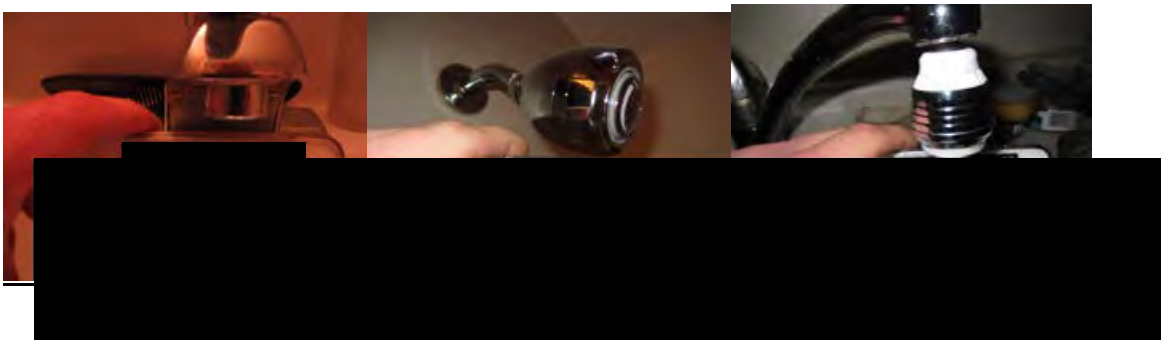
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random selection of apartments was selected from the two floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 22

BA: 26

KA: 26

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	APARTMENTS
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

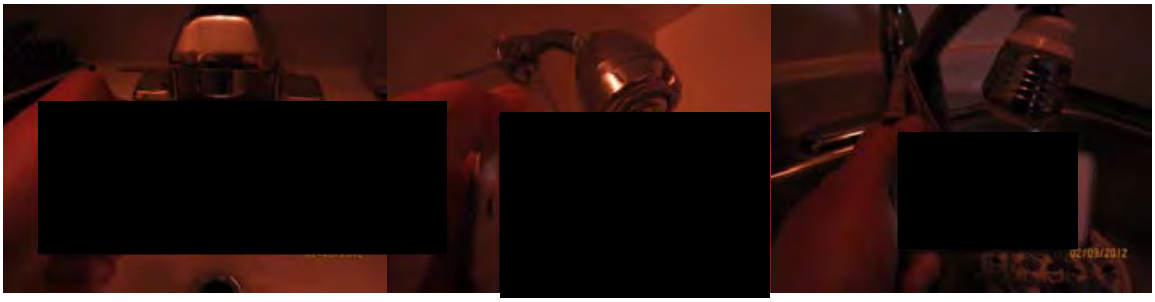
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random selection of apartments was selected from the two floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 22

BA: 26

KA: 26

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	APARTMENTS
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

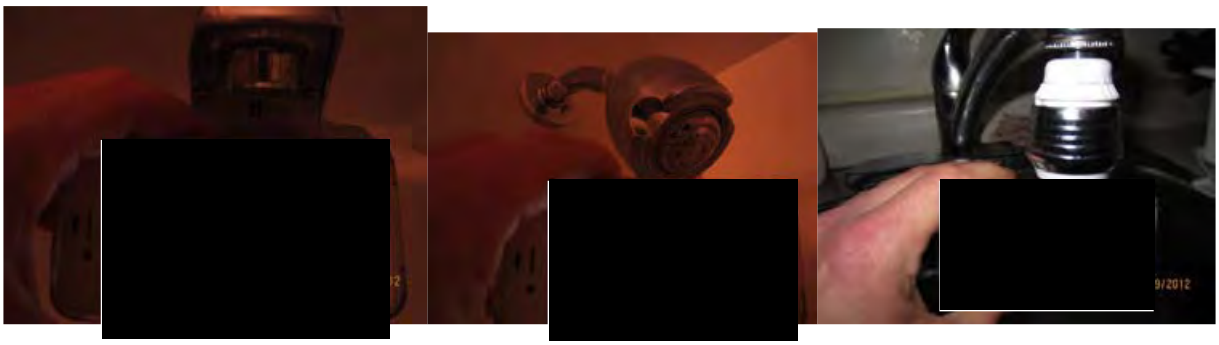
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random selection of apartments was selected from the two floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 22

BA: 26

KA: 26

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	APARTMENTS
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

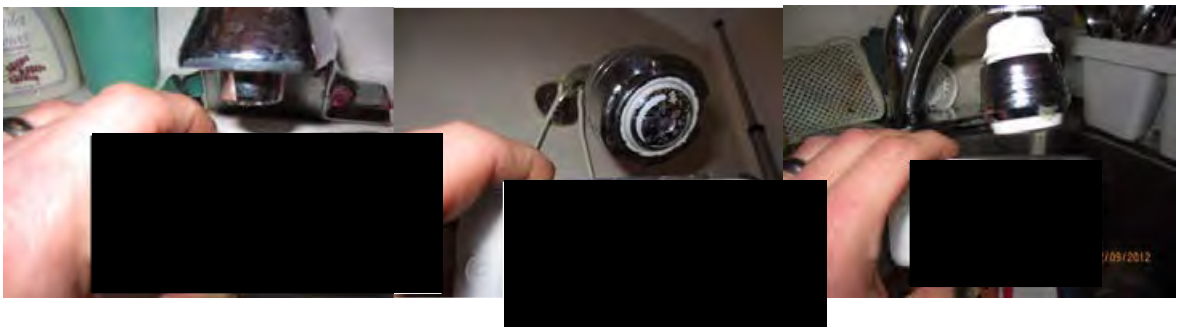
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random selection of apartments was selected from the two floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 22

BA: 26

KA: 26

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	APARTMENTS
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

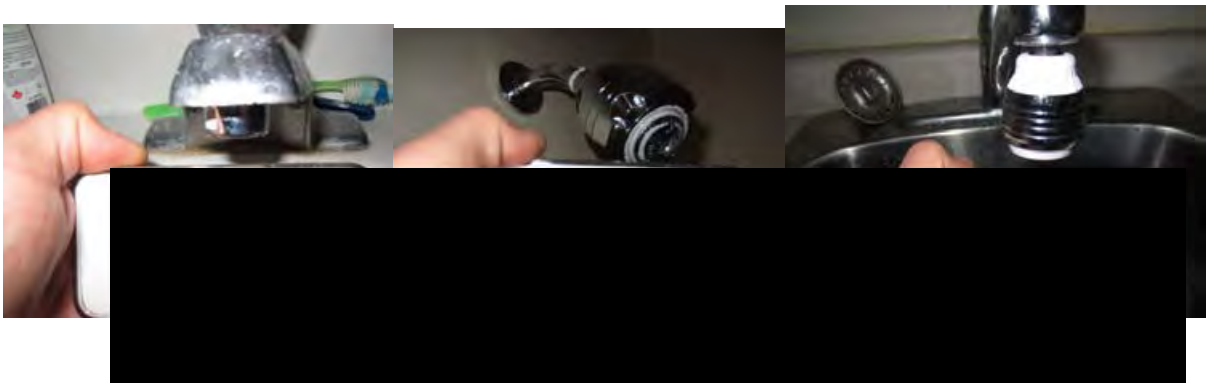
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random selection of apartments was selected from the two floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	8
Contact:	[redacted]
Address:	
City:	

Unit/ID #	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	X		
Aerator	X		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator			X

Signature received	X	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	8
Contact:	[redacted]
Address:	
City:	

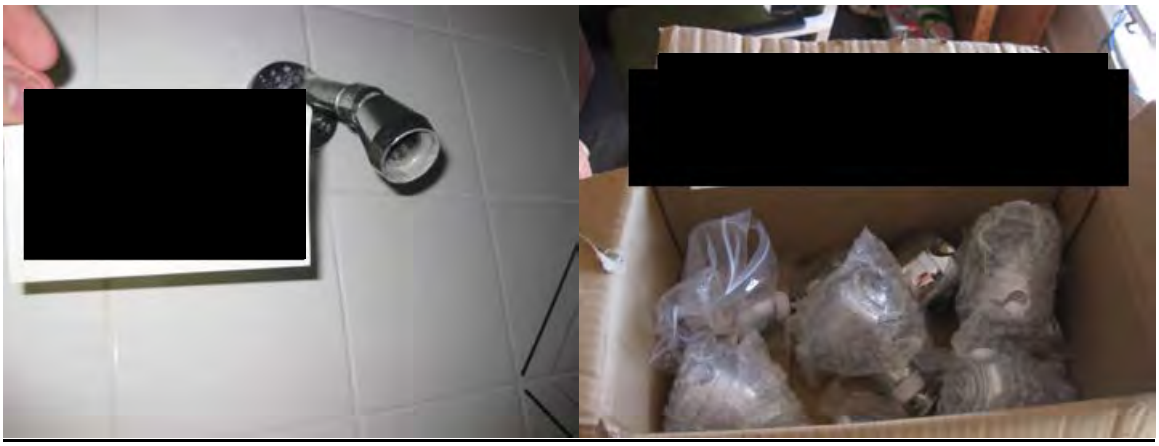
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Unit currently under renovations – Manager has bathroom aerator and showerhead to be installed when done renovations
Manager was very co-operative.

Proof of installation (insert picture below):



HWC Audit

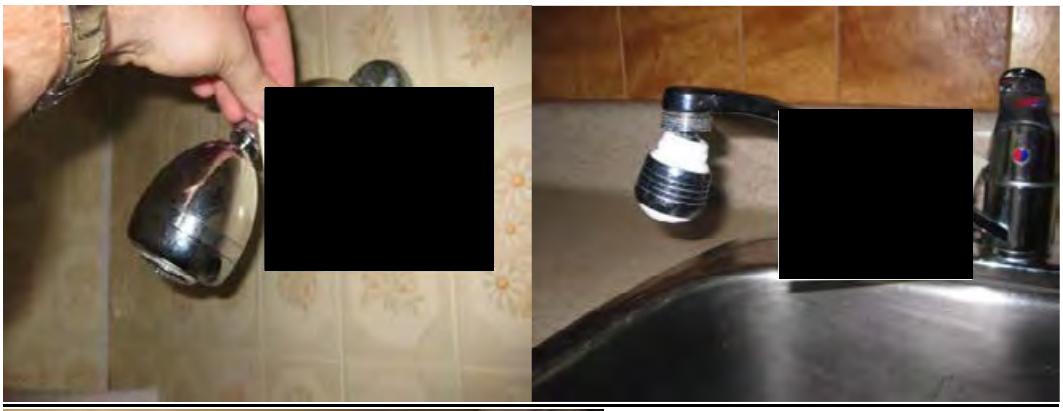
Audit Code	[redacted]

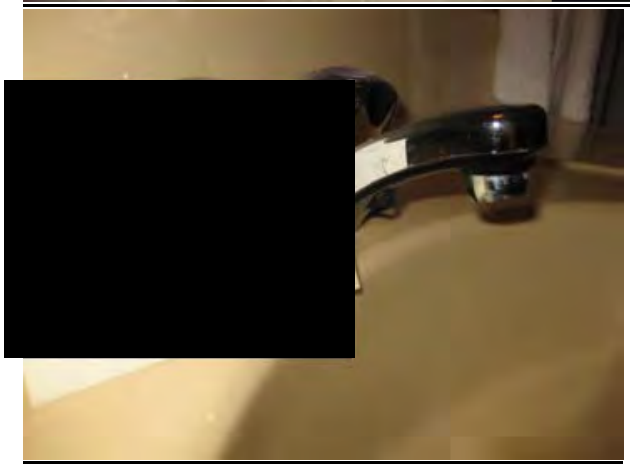
Customer (hotel/motel):	[redacted]
Total # of units in building:	8
Contact:	[redacted]
Address:	
City:	

Unit/ID #	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	X		
Aerator		X	
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator	X		

Signature received	X	

Proof of installation (insert picture below):





HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	8
Contact:	[redacted]
Address:	
City:	

Unit/ID #	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	X		
Aerator		X	
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator		X	

Signature received	X	

Proof of installation (insert picture below):

HWC Audit

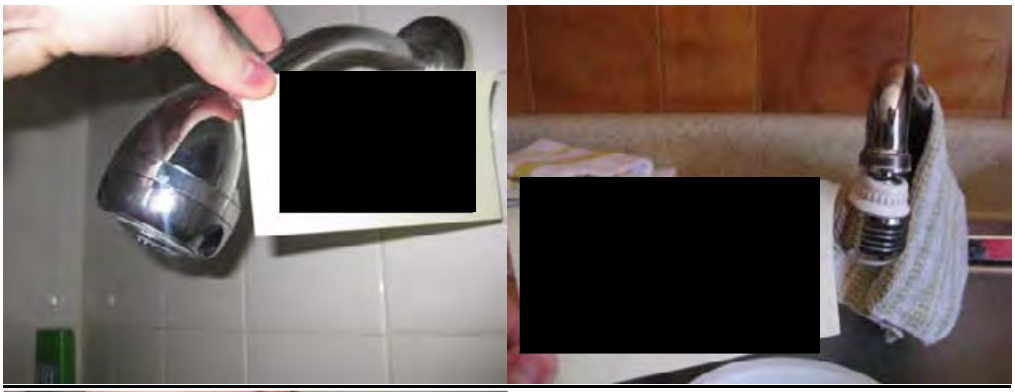
Audit Code	[redacted]

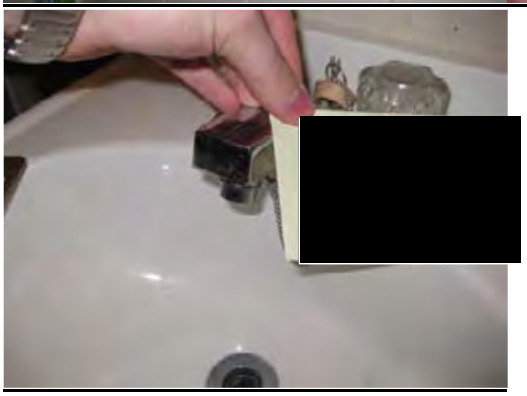
Customer (hotel/motel):	[redacted]
Total # of units in building:	8
Contact:	[redacted]
Address:	
City:	

Unit/ID #	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	X		
Aerator		X	
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator	X		

Signature received	X	

Proof of installation (insert picture below):





HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 20

BA: 22

KA: 11

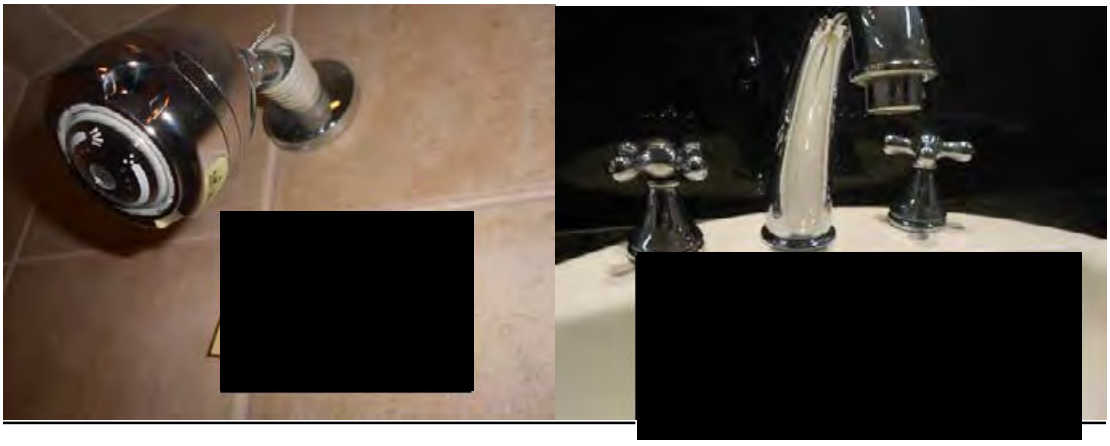
Unit/ID # Mens Lockers 1	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Mens Facilities only checked – Womens in use.
All fixtures fitted with Aerators and Showerheads

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 20

BA: 22

KA: 11

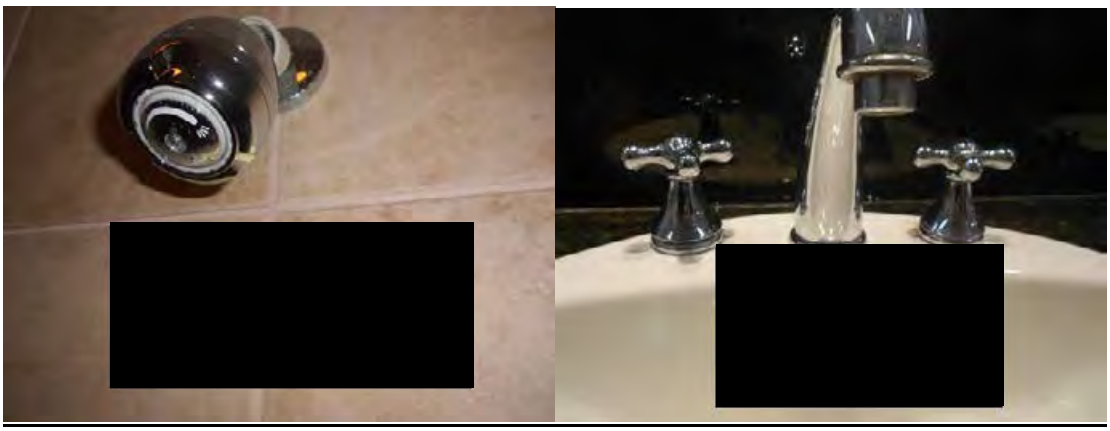
Unit/ID # Mens Lockers 2	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Mens Facilities only checked – Womens in use.
All fixtures fitted with Aerators and Showerheads

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 20

BA: 22

KA: 11

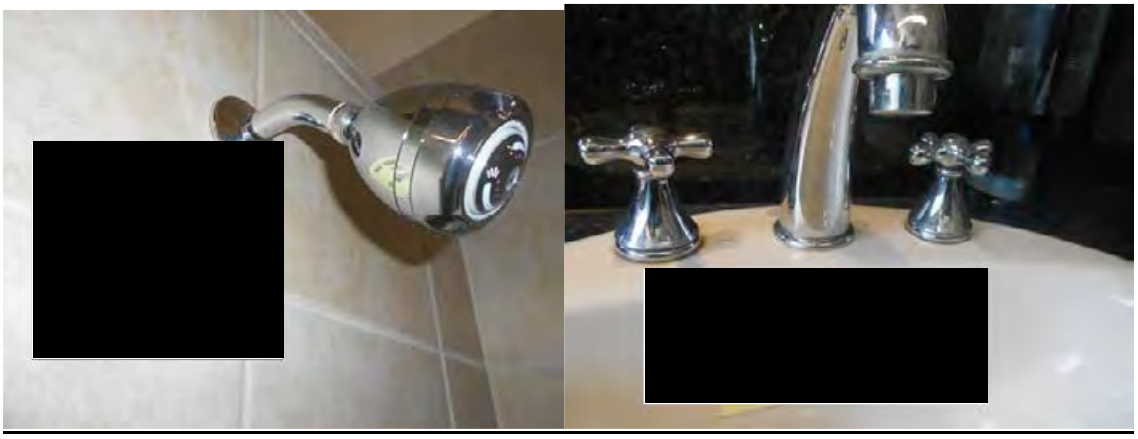
Unit/ID #Upstairs Lockers 1	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Mens Facilities only checked – Womens in use.
All fixtures fitted with Aerators and Showerheads

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 20

BA: 22

KA: 11

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] Golf Club
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

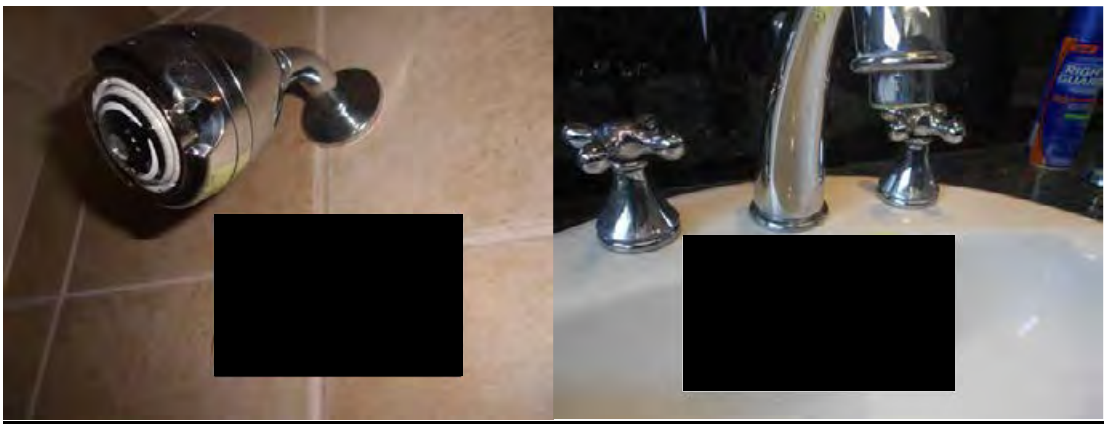
Unit/ID #Upstairs Lockers 2	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Mens Facilities only checked – Womens in use.
All fixtures fitted with Aerators and Showerheads

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 20

BA: 22

KA: 11

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] Golf Club
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

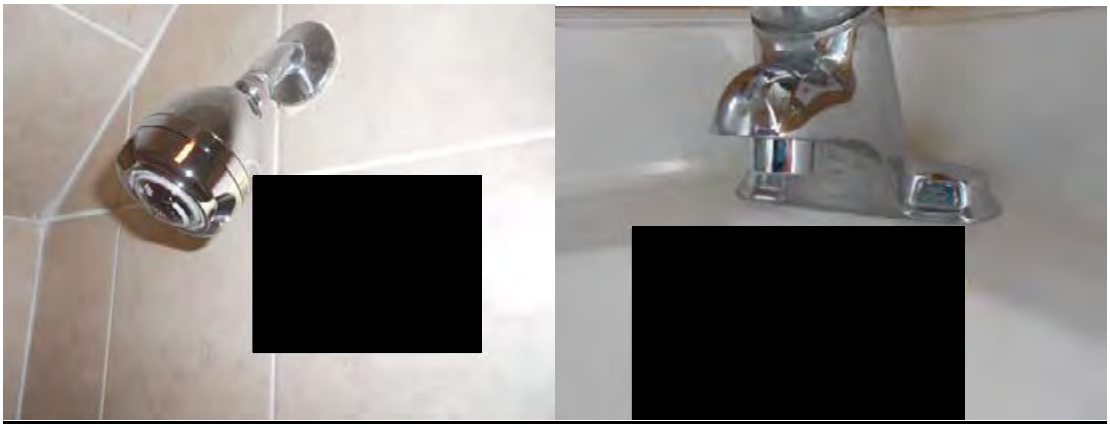
Unit/ID #Upstairs washroom	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Mens Facilities only checked – Womens in use.
All fixtures fitted with Aerators and Showerheads

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 1

BA:2

KA: 2

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**School/Dorm**
Total # of units in building:	3 room
Contact:	[redacted]
Address:	
City:	

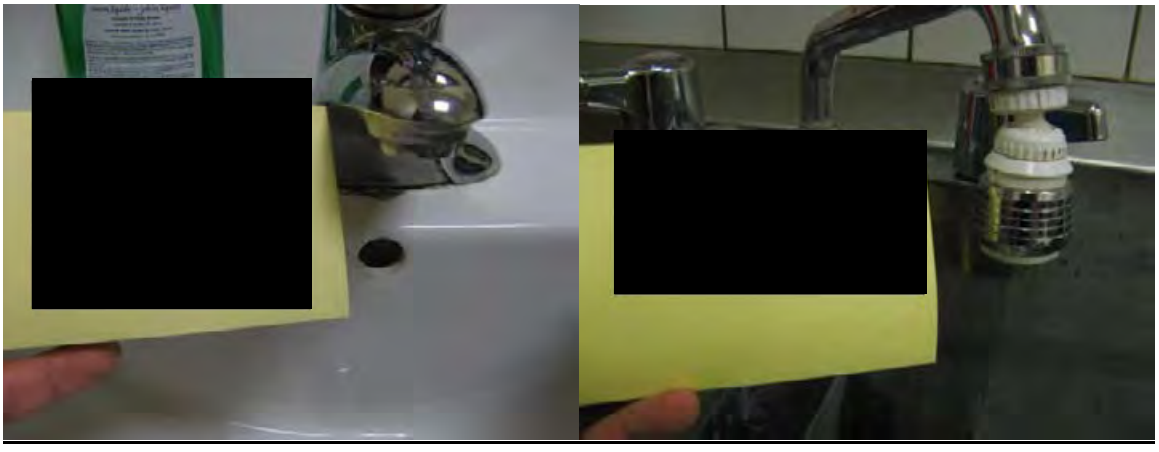
Unit/ID #Ladies	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**xxxxxxxxxxxxx**	
Aerator	**xxxxxxxxxxxx**		
Unit/ID # kitchen	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**XXXXXX**		

Signature received	**X**	

General Notes:

There was one kitchen one men's room, and one ladies room.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 1

BA: 2

KA: 2

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**School/Dorm**
Total # of units in building:	3 room
Contact:	[redacted]
Address:	
City:	

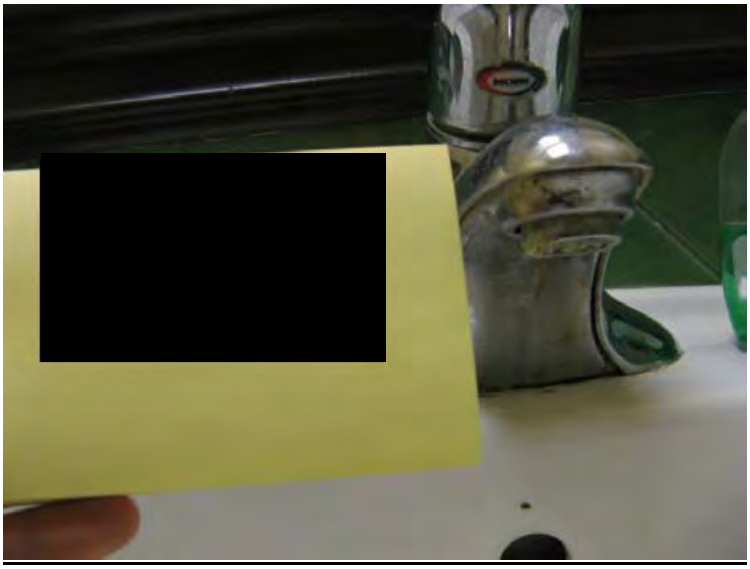
Unit/ID #Men	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead			**xxxxxxxxxxxx**
Aerator	**xxxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		**xxxxxxxxxxxx**	

Signature received	**X**	

General Notes:

There was one kitchen one men's room, and one ladies room.

Proof of installation (insert picture below



HWC Audit

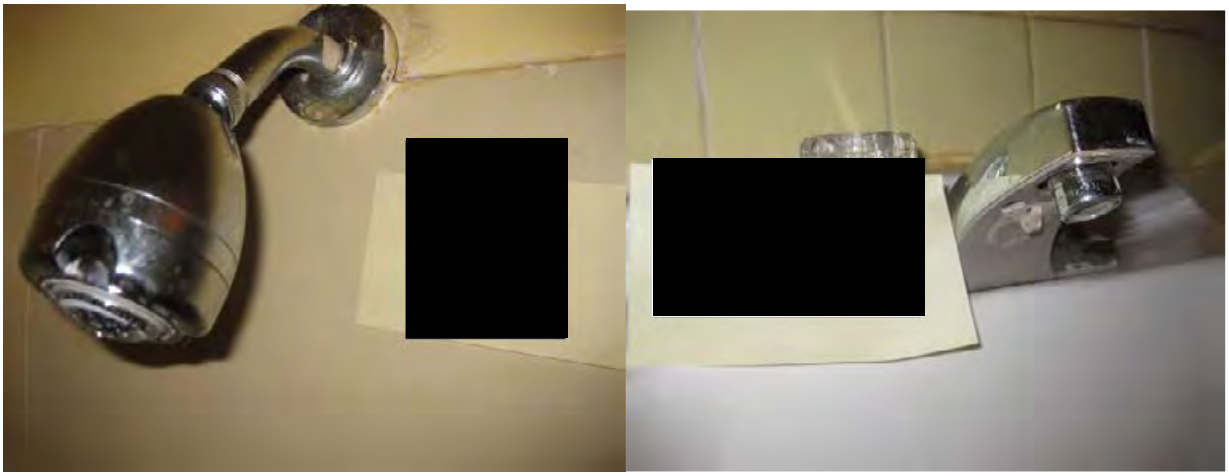
Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**X**

Signature received	**X**	

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

Unit/ID #	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	X		
Aerator	X		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator			X

Signature received	X	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**X**

Signature received	**X**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**X**

Signature received	**X**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	16
Contact:	[redacted]
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**X**

Signature received	**X**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	48
Contact:	
Address:	[redacted]
City:	

Unit/ID #113	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	xxxxxxxxxxx		
Aerator		xxxxxxxxxxxxx	
Unit/ID #	Installed		N/a
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator			xxxxxxxxxxxxxxxxxxxxx

Signature received	Yes	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Airport
Total # of units in building:	48
Contact:	
Address:	[redacted]
City:	

Unit/ID #202	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**xxxxxxxxxxx**		
Aerator		**xxxxxxxxxxxxx**	
Unit/ID #	**Installed**		**N/a**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxx**

Signature received	**Yes**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Airport
Total # of units in building:	48
Contact:	
Address:	[redacted]
City:	

Unit/ID #207	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	xxxxxxxxxxx		
Aerator		xxxxxxxxxxxxx	
Unit/ID #	**Installed**		**N/a**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			xxxxxxxxxxxxxxxxxxxxx

Signature received	Yes	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Airport
Total # of units in building:	48
Contact:	
Address:	[redacted]
City:	

Unit/ID #211	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**xxxxxxxxxxx**		
Aerator		**xxxxxxxxxxxxx**	
Unit/ID #	**Installed**		**N/a**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxx**

Signature received	**Yes**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Airport
Total # of units in building:	48
Contact:	[redacted]
Address:	[redacted]
City:	[redacted]

Unit/ID #105	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**xxxxxxxxxxx**		
Aerator		**xxxxxxxxxxxxx**	
Unit/ID #	**Installed**		**N/a**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxx**

Signature received	**Yes**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 50

BA: 60

KA: 5

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**LTC Facility**
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

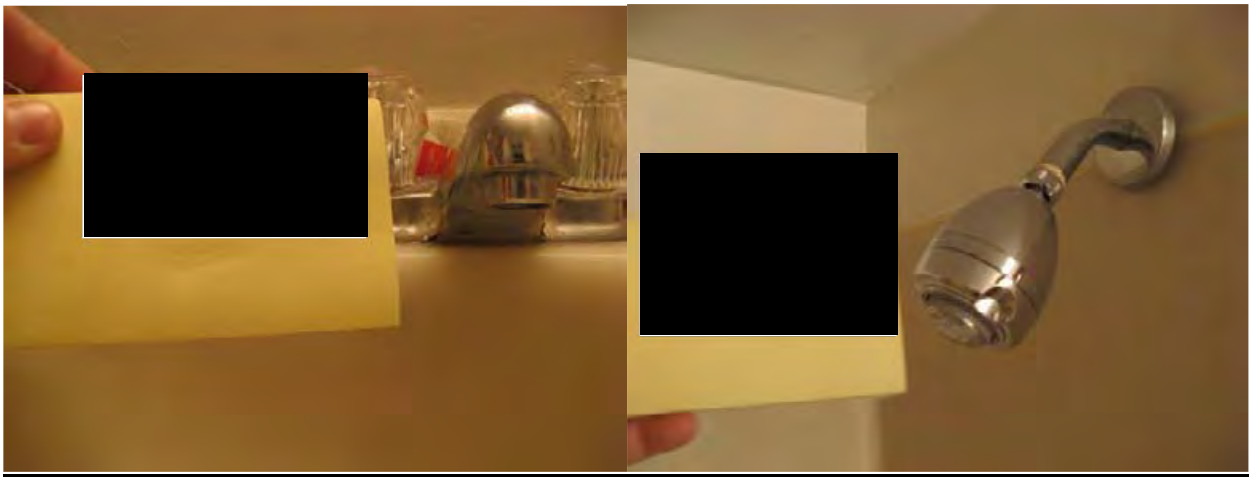
Unit/ID #102	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof of installation (insert picture below



HWC Audit

Audit Code	4[redacted]

Order Details:

SH:50

BA:60

KA: 5

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**LTC Facility**
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

Unit/ID #110	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof of installation (insert picture below

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 50

BA: 60

KA: 5

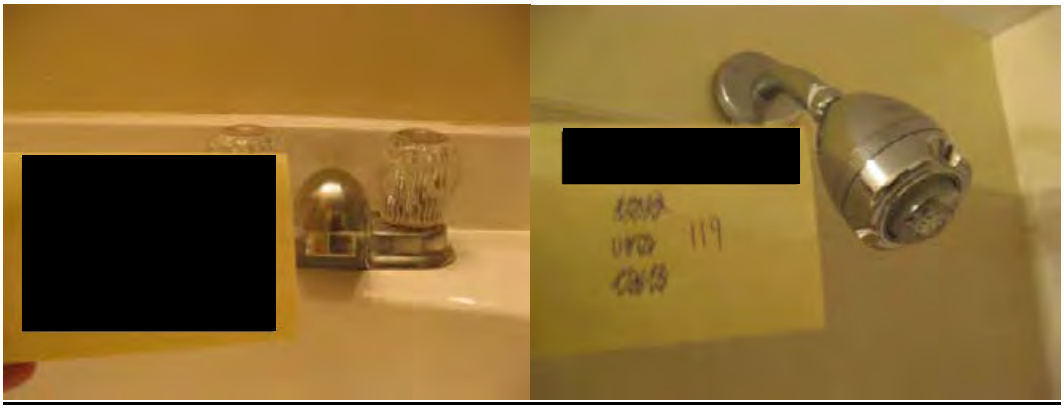
Unit/ID #119	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

Order Details:

SH:50

BA: 60

KA:5

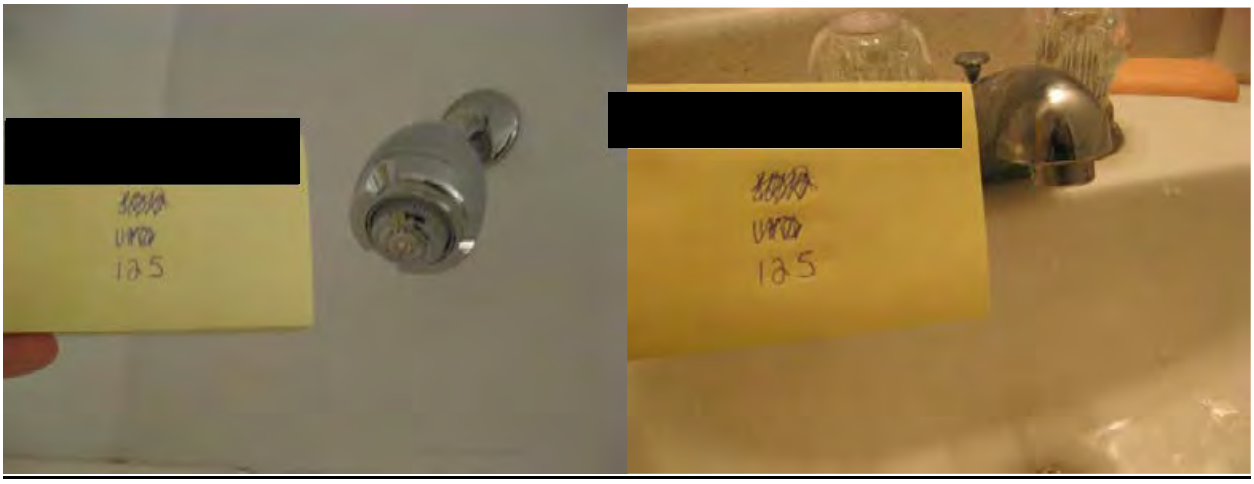
Unit/ID #125	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**LTC Facility**
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 50

BA: 60

KA: 5

Unit/ID #202	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof of installation (insert picture below

:

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 50

BA: 60

KA: 5

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

Unit/ID #207	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof of installation (insert picture below

HWC Audit

Audit Code	[redacted]

Order Details:

SH:50

BA: 60

KA: 5

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	LTC Facility
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

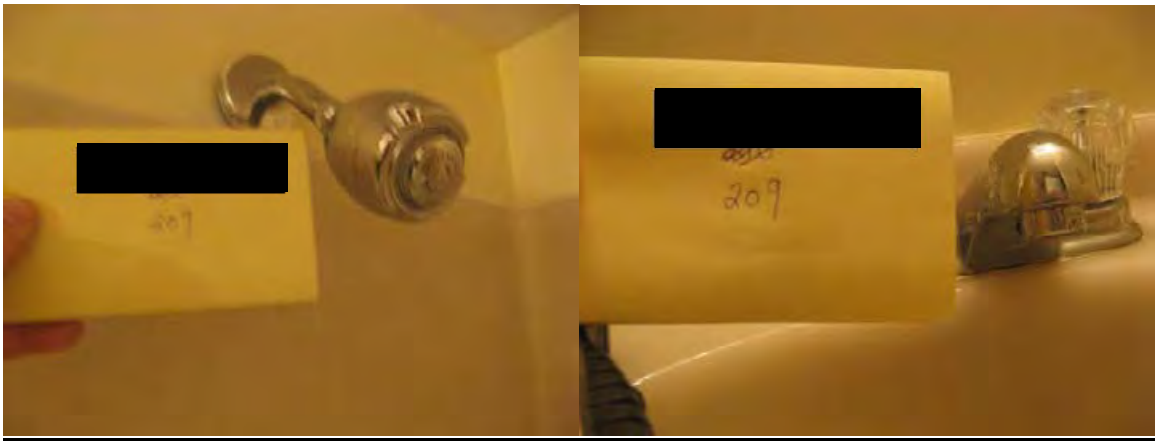
Unit/ID #209	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Order Details:

SH:50

BA:60

KA:5

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**LTC Facility**
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

Unit/ID #219	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof oinstallation (insert picture below

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**LTC Facility**
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 50

BA: 60

KA: 5

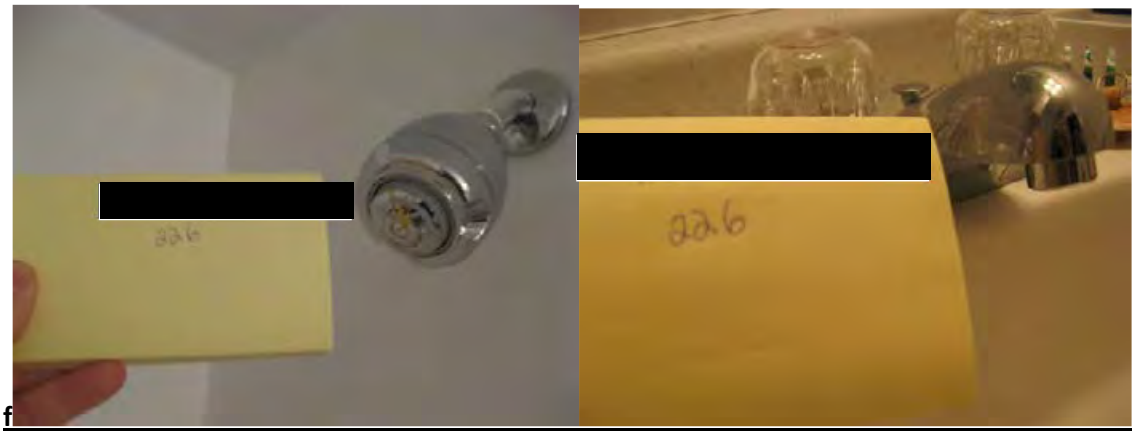
Unit/ID #209	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof oinstallation (insert picture below



f

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**LTC Facility**
Total # of units in building:	49
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 50

BA: 60

KA: 5

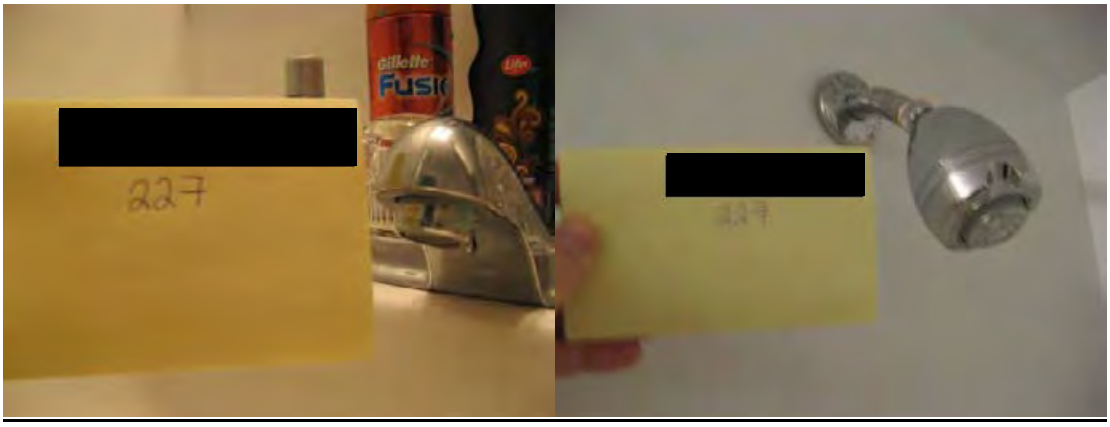
Unit/ID #227	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

Where was two floors of units and I picked the rooms at random.

Proof oinstallation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Hotel
Total # of units in building:	119
Contact:	[redacted]
Address:	
City:	

Unit/ID # 224	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**X**

Signature received	**Yes**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Hotel
Total # of units in building:	119
Contact:	[redacted]
Address:	
City:	

Unit/ID # 231	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**X**

Signature received	**Yes**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Hotel
Total # of units in building:	119
Contact:	[redacted]
Address:	
City:	

Unit/ID # 316	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**Yes**		
Aerator		**No**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**No**

Signature received	**Yes**	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Hotel
Total # of units in building:	119
Contact:	[redacted]
Address:	
City:	

Unit/ID # 430	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**Yes**		
Aerator		**No**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**No**

Signature received	**Yes**	

Proof of installation (insert picture below):

HWC Audit

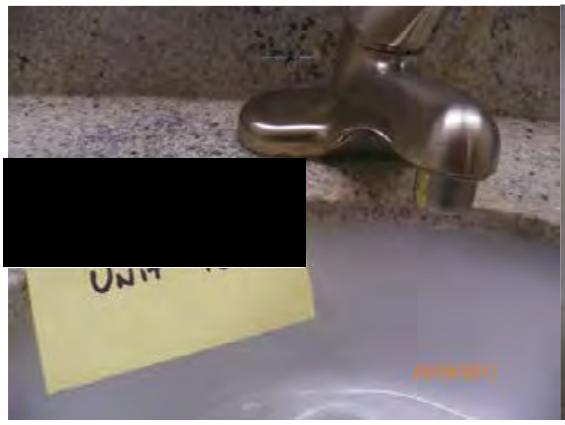
Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Hotel
Total # of units in building:	119
Contact:	[redacted]
Address:	
City:	

Unit/ID # 435	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**Yes**		
Aerator		**No**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator	**Yes**		

Signature received	**Yes**	

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 62

BA:N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Unit/ID #100	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**x**	
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**x**		

Signature received	**x**	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 62

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

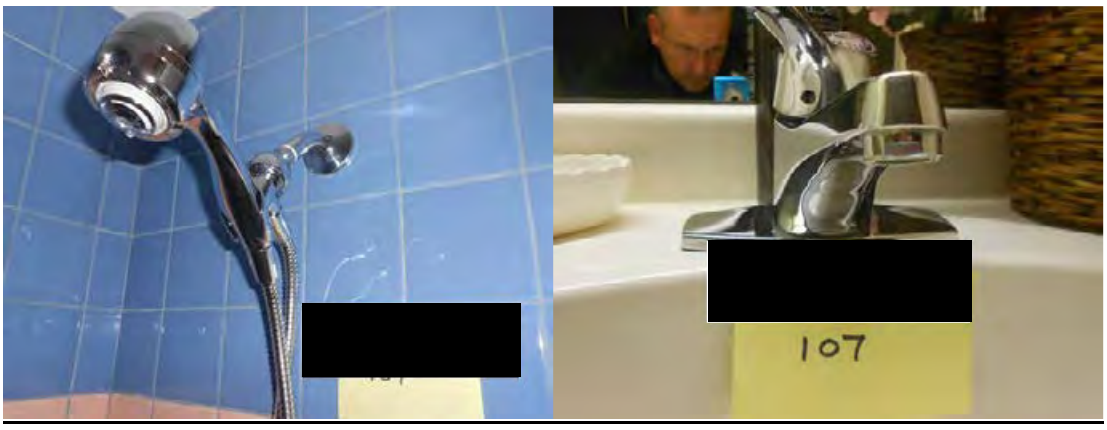
Unit/ID #107	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 62

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

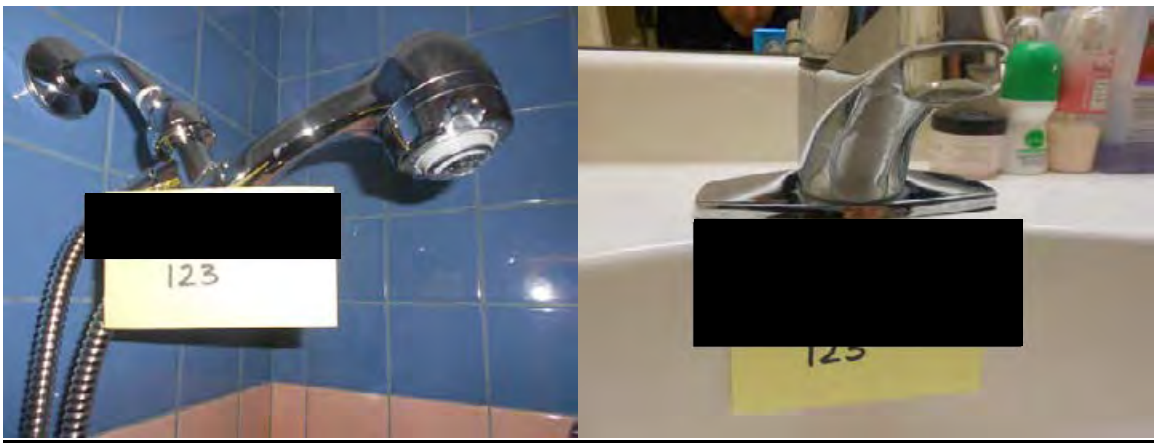
Unit/ID #123	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**x**		
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 62

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

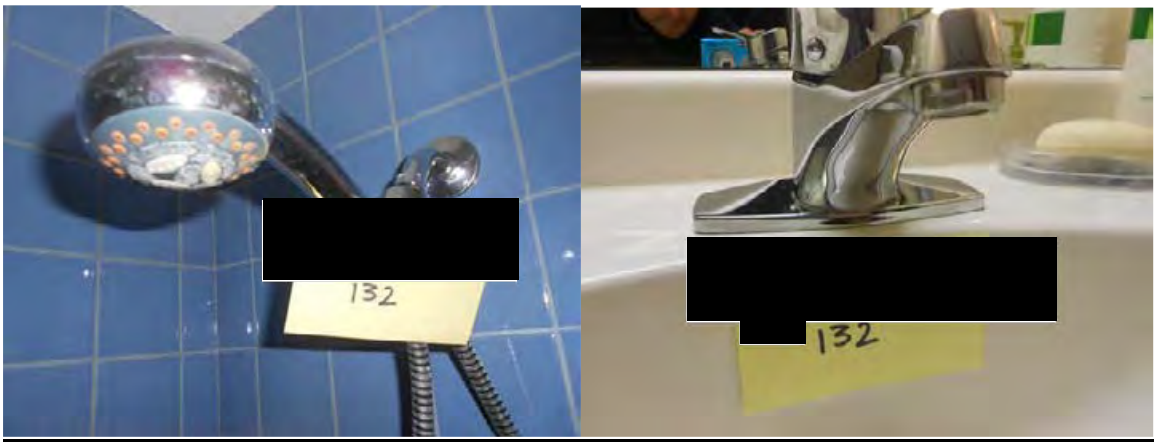
Unit/ID #132	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**x**	
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 62

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Unit/ID #205	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**x**	
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 62

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Unit/ID #214	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 62

BA: N/A

KA: N/A

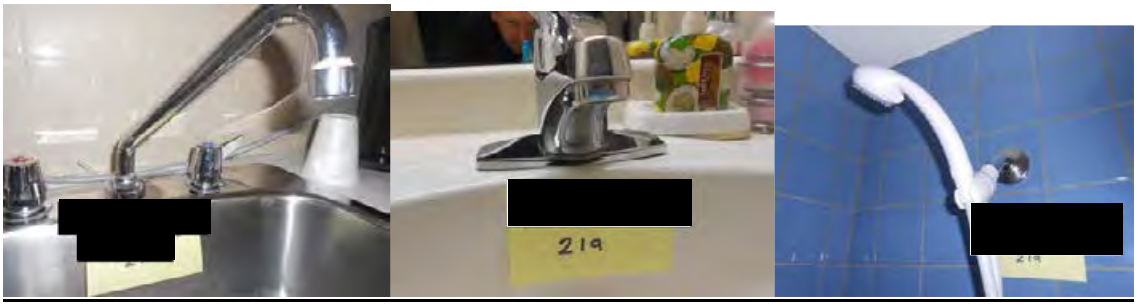
Unit/ID #219	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		x	
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		x	

Signature received	x	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 62

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

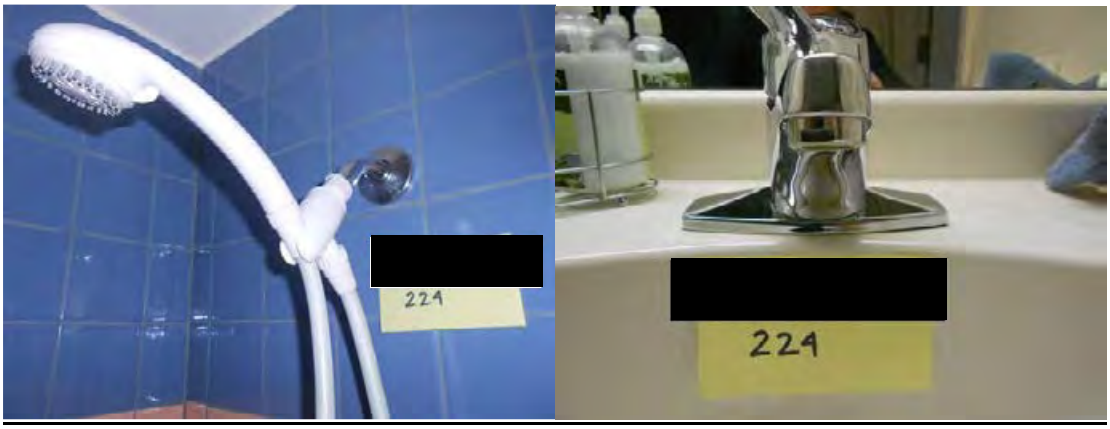
Unit/ID #224	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**x**	
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 62

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Unit/ID #230	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	x		
Aerator	x		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			x

Signature received	x	

General Notes:

Retirement residence [redacted]
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	72
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 62

BA: N/A

KA: N/A

Unit/ID #241	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**x**	
Aerator	**x**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**x**

Signature received	**x**	

General Notes:

Retirement residence with 72 rooms on 2 floors.
Rooms selected at random
Contact has stock of new Showerheads and Aerators, and is replacing them as existing ones wear out.

Proof of installation (insert picture below):

HWC Audit

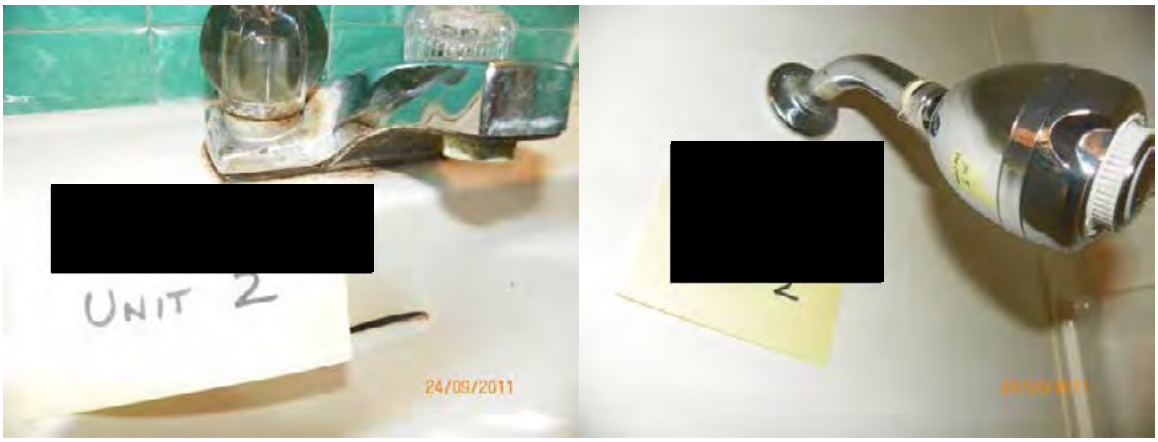
Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Motel
Total # of units in building:	10
Contact:	[redacted]
Address:	
City:	

Unit/ID # 2	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**Yes**		
Aerator		**No**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**No**

Signature received	**Yes**	

Proof of installation (insert picture below):



HWC Audit

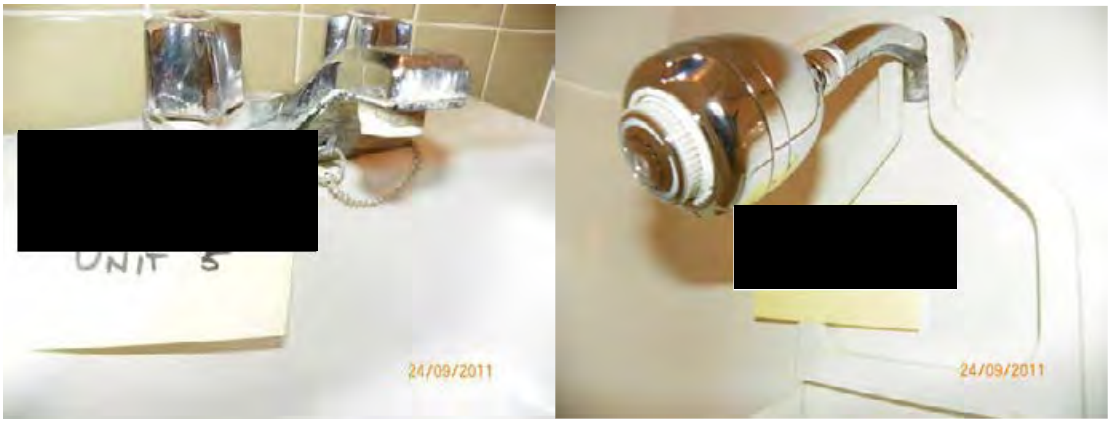
Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Motel
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

Unit/ID # 5	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**Yes**		
Aerator		**No**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**No**

Signature received	**Yes**	

Proof of installation (insert picture below):



HWC Audit

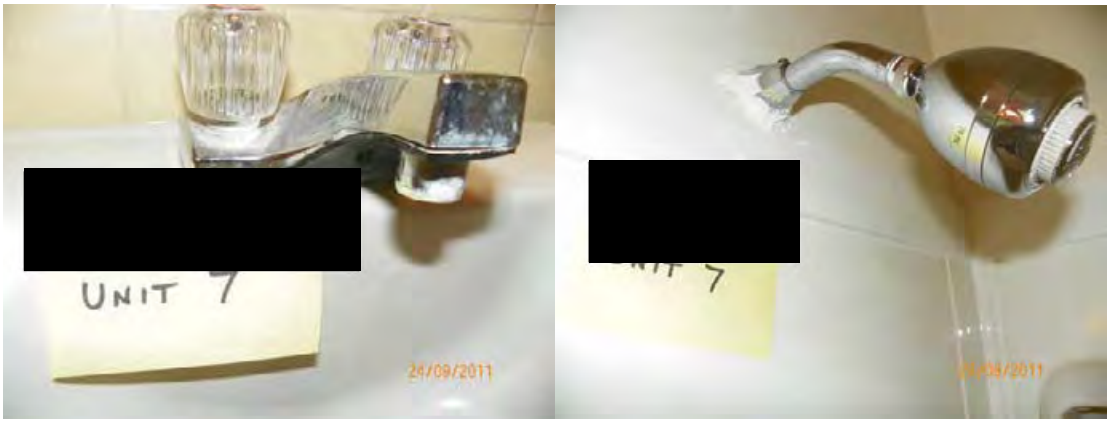
Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Motel
Total # of units in building:	10
Contact:	[redacted]
Address:	
City:	

Unit/ID # 7	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**Yes**		
Aerator		**No**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**No**

Signature received	**Yes**	

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	10
Contact:	[redacted]
Address:	
City:	

Unit/ID # 8	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**Yes**		
Aerator		**No**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**No**

Signature received	**Yes**	

Proof of installation (insert picture below):

HWC Audit

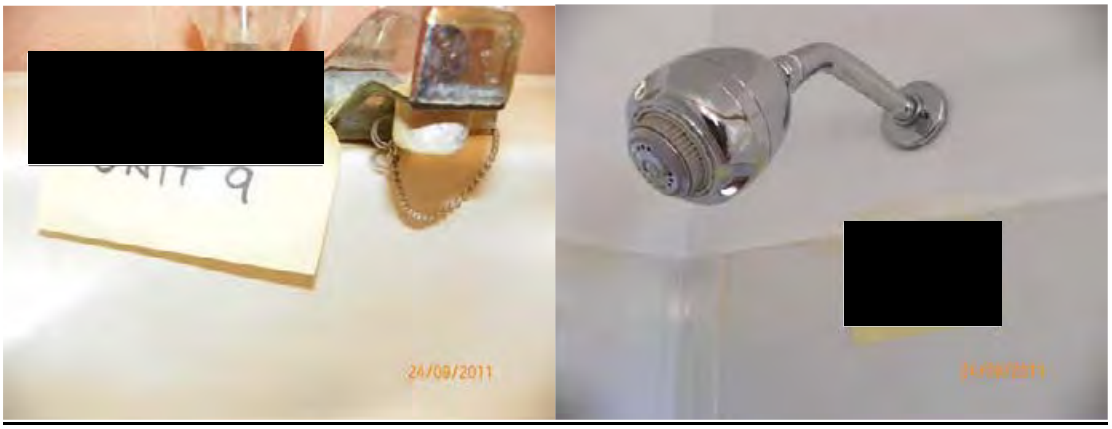
Audit Code	[redacted]

Customer (hotel/motel):	[redacted] Motel
Total # of units in building:	[redacted]
Contact:	
Address:	
City:	

Unit/ID # 9	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	**Yes**		
Aerator		**No**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			**No**

Signature received	**Yes**	

Proof of installation (insert picture below):



HWC Audit

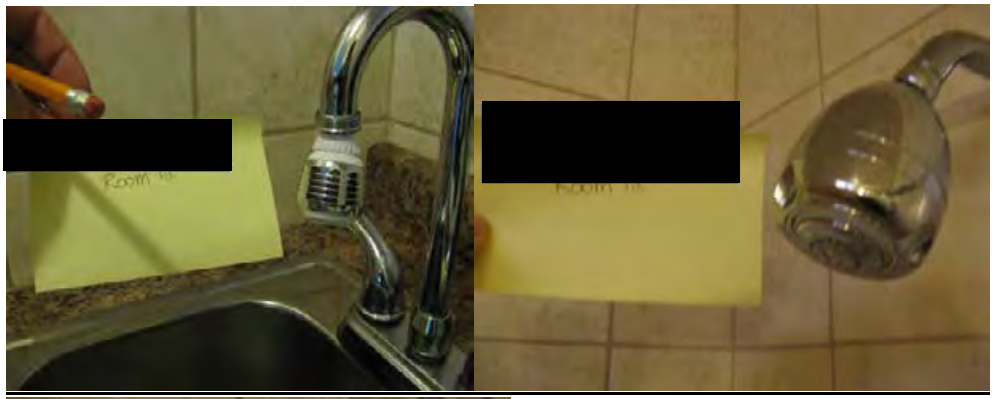
Audit Code	[redacted]

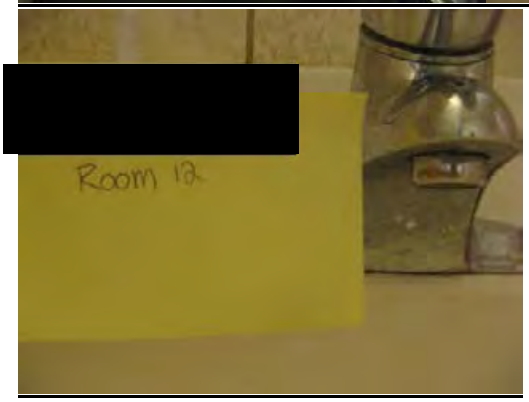
Customer (hotel/motel):	[redacted]
Total # of units in building:	28
Contact:	
Address:	[redacted]
City:	

Unit/ID #12	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	xxxxxxxxxxx		
Aerator	xxxxxxxxxxxx		
Unit/ID #	Installed		N/a
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator	xxxxxxxxxxxx		

Signature received	Yes	

Proof of installation (insert picture below):





HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	28
Contact:	
Address:	[redacted]
City:	

Unit/ID #15	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	xxxxxxxxxxx		
Aerator	xxxxxxxxxxxx		
Unit/ID #	Installed		N/a
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator			xxxxxxxxxxxxxxxxxxxxx

Signature received	Yes	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	28
Contact:	
Address:	[redacted]
City:	

Unit/ID #17	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	xxxxxxxxxxx		
Aerator	xxxxxxxxxxxx		
Unit/ID #	**Installed**		**N/a**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			xxxxxxxxxxxxxxxxxxx

Signature received	yes	

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	28
Contact:	
Address:	[redacted]
City:	[redacted]

Unit/ID #18	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit**
Showerhead	xxxxxxxxxxx		
Aerator	xxxxxxxxxxxx		
Unit/ID #	**Installed**		**N/a**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit**
Aerator			xxxxxxxxxxxxxxxxxxxx

Signature received	Yes	

Proof of installation (insert picture below):

HWC Audit

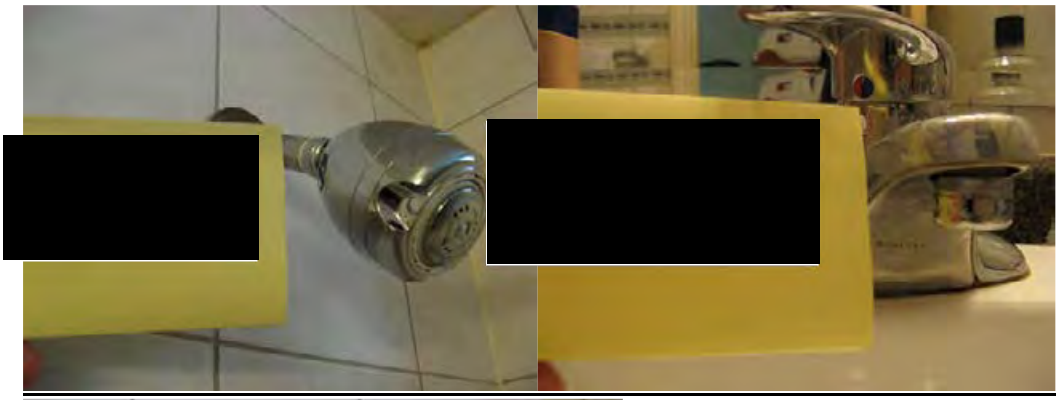
Audit Code	[redacted]

Customer (hotel/motel):	[redacted]
Total # of units in building:	28
Contact:	
Address:	[redacted]
City:	

Unit/ID #28	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit
Showerhead	xxxxxxxxxxx		
Aerator	xxxxxxxxxxxx		
Unit/ID #	Installed		N/a
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit
Aerator	xxxxxxxxxxxxx		

Signature received	Yes	

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 100

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School/Dorm
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

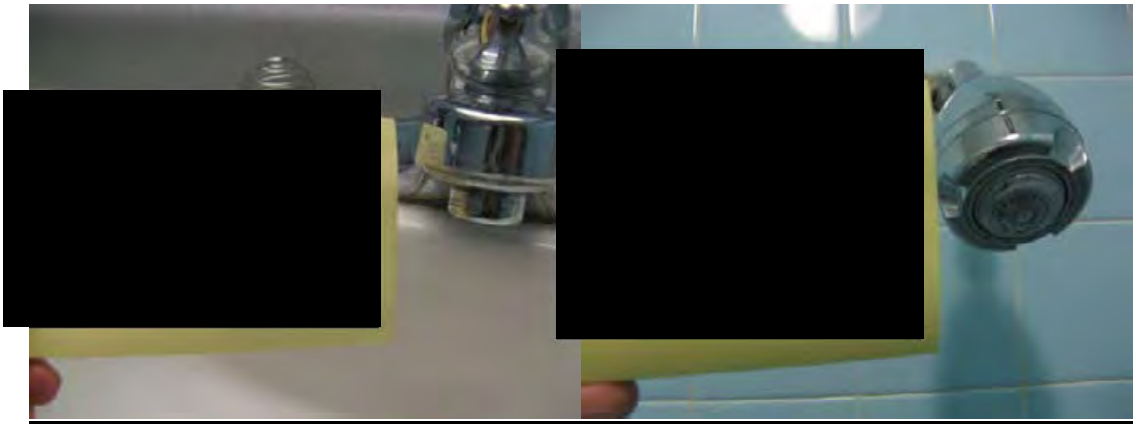
Unit/ID #106e	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School/Dorm
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 100

BA: N/A

KA: N/A

Unit/ID #109w	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof of installation (insert picture below

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 100

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**School/Dorm**
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

Unit/ID #127w	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof of installation (insert picture below

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School/Dorm
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 100

BA: N/A

KA: N/A

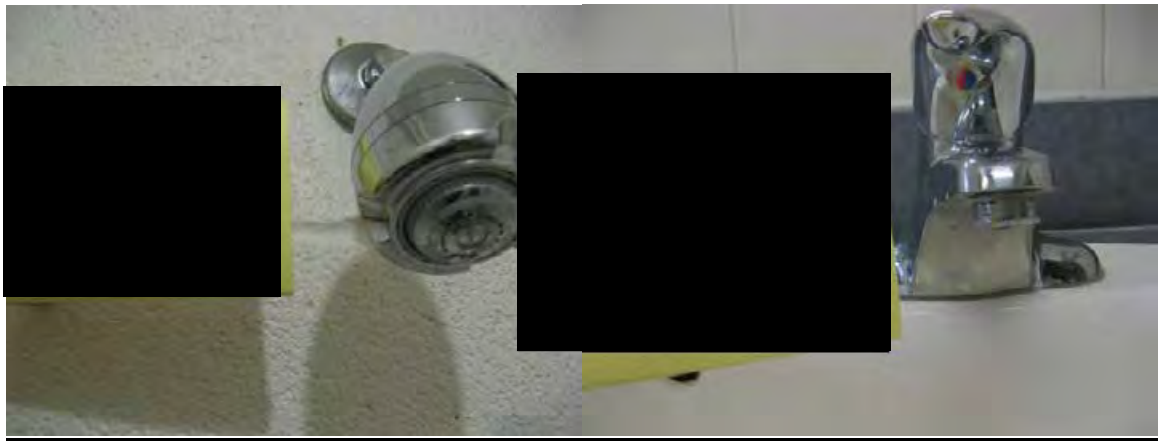
Unit/ID #209w	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School/Dorm
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 100

BA: N/A

KA: N/A

Unit/ID #210e	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof of installation (insert picture below

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School/Dorm
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 100

BA: N/A

KA: N/A

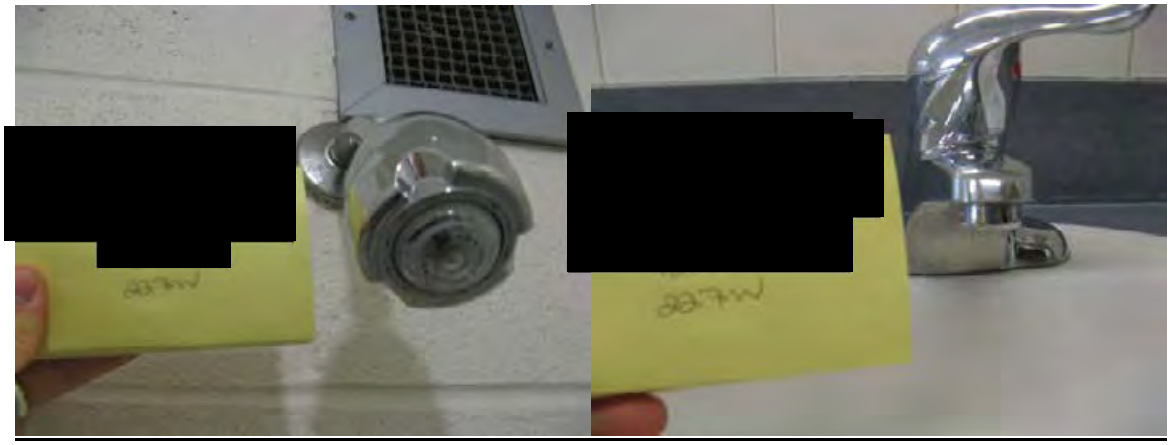
Unit/ID #227w	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School/Dorm
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 100

BA: N/A

KA: N/A

Unit/ID #308e	Installed		N/A
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	xxxxxxxxx		
Aerator	xxxxxxxxxx		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof oinstallation (insert picture below

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**School/Dorm**
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 100

BA: N/A

KA: N/A

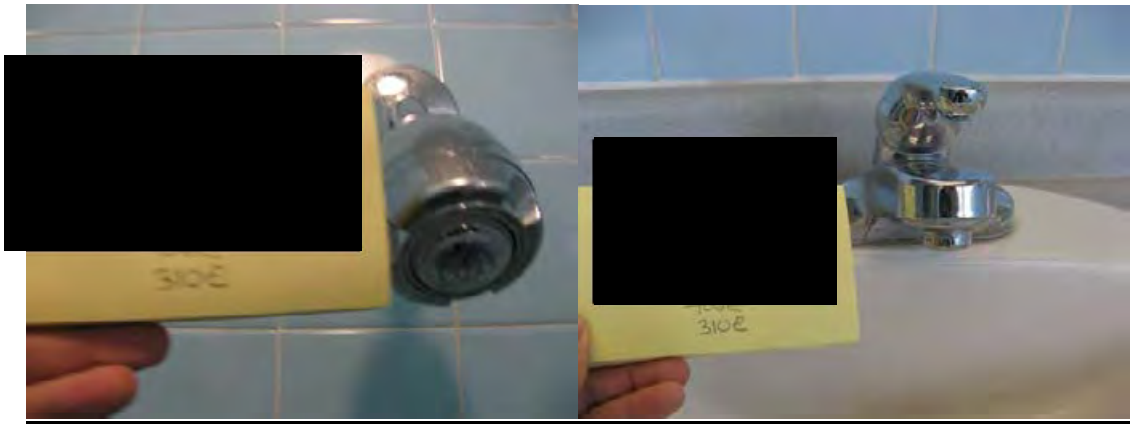
Unit/ID #310e	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof of installation (insert picture below



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 100

BA: N/A

KA: N/A

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	**School/Dorm**
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

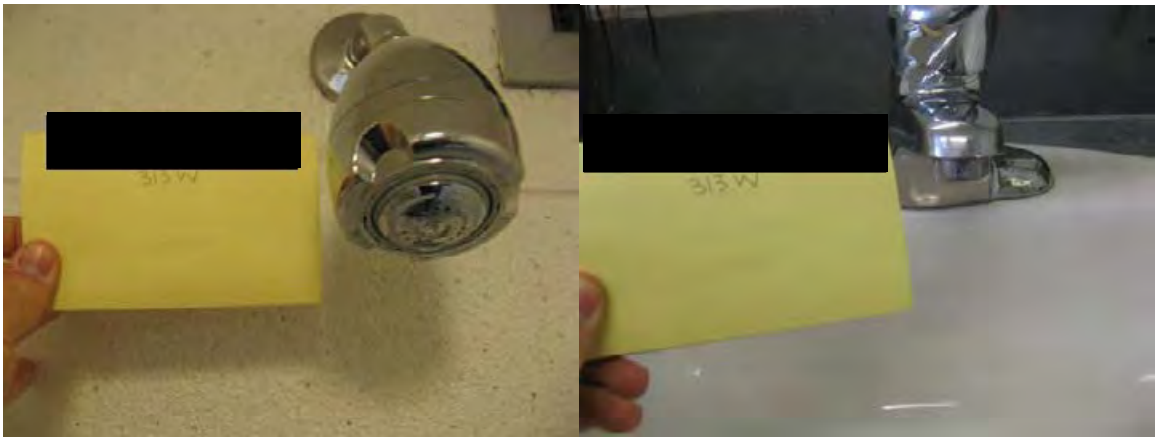
Unit/ID #313w	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**xxxxxxxxx**		
Aerator	**xxxxxxxxxx**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx**

Signature received	**X**	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof oinstallation (insert picture below



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	School/Dorm
Total # of units in building:	40
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 100

BA: N/A

KA: N/A

Unit/ID #604b	Installed		N/A
BATHROOM	YES	NO	No bathroom in unit or measure not ordered for unit
Showerhead	xxxxxxxxx		
Aerator		xxxxxxxxxxxxx	
Unit/ID #	Installed		N/A
KITCHEN/ KITCHENETTE	YES	NO	No kitchen in unit or measure not ordered for unit
Aerator			xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Signature received	X	

General Notes:

The rooms where selected because they are common bathrooms throughout the Dorm.

Proof of installation (insert picture below

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Order Details:

SH: 200

BA: 200

KA: 100

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 200

BA: 200

KA: 100

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

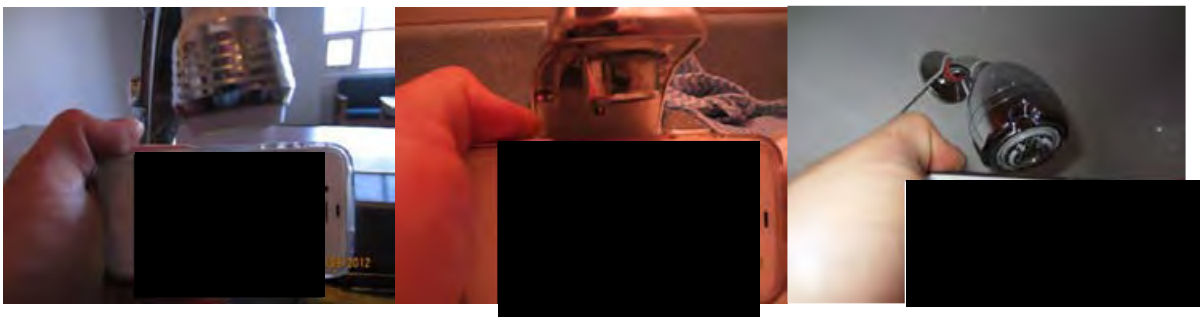
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 200

BA: 200

KA: 100

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

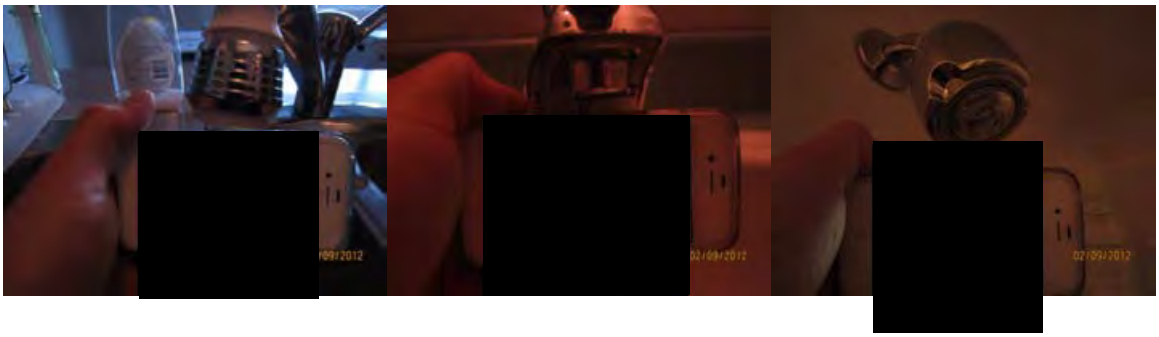
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Order Details:

SH: 200

BA: 200

KA: 100

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Order Details:

SH: 200

BA: 200

KA: 100

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Order Details:

SH: 200

BA: 200

KA: 100

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 200

BA: 200

KA: 100

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

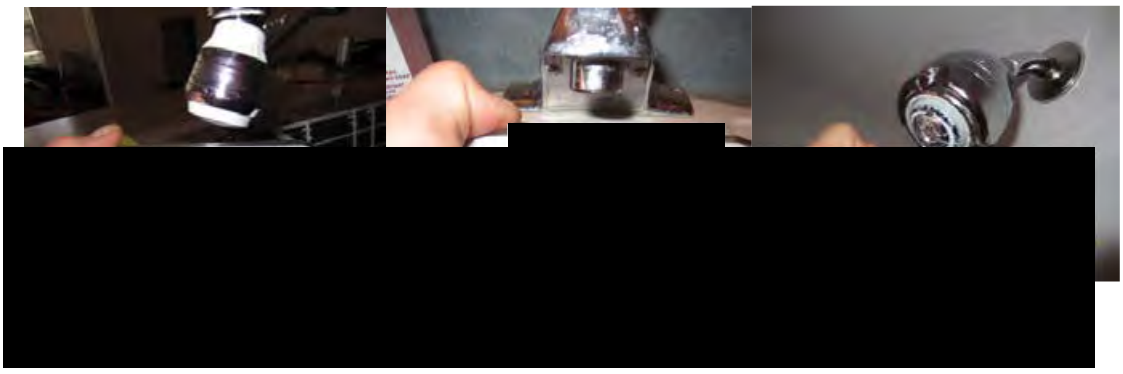
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 200

BA: 200

KA: 100

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 200

BA: 200

KA: 100

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator	**X**		
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Order Details:

SH: 200

BA: 200

KA: 100

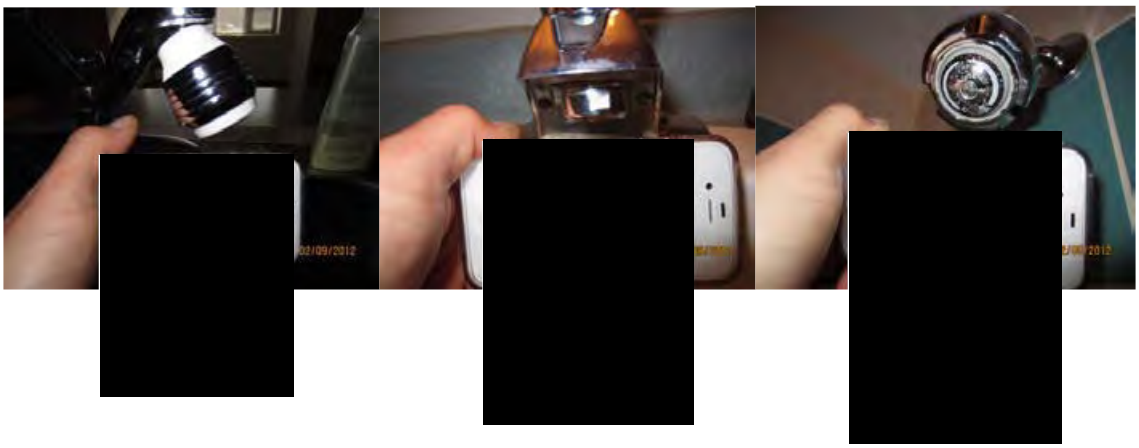
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

A random wing of ten units was selected
Not Niagara bathroom aerator, rated at 1.05 gpm

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

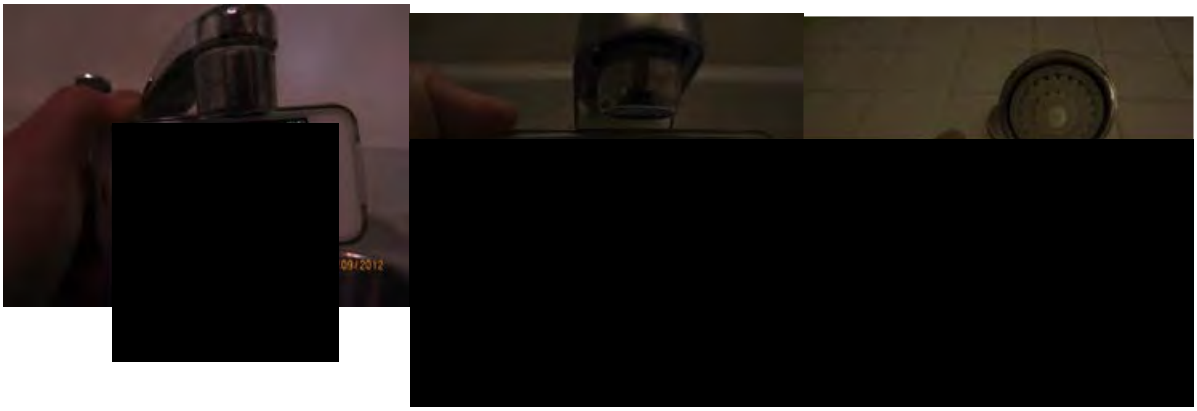
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**X**	
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator		**X**	

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 2.75 gpm
Bathroom aerator not Niagara brand and rated 2.5 gpm
Units selected randomly from different floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

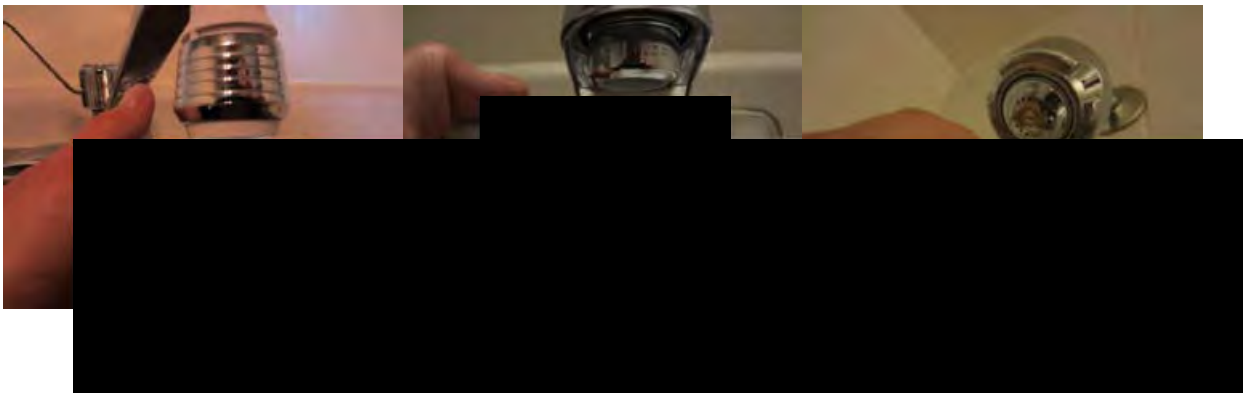
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Bathroom aerator not Niagara brand and rated 1.0 gpm
Units selected randomly from different floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	[redacted]
Contact:	[redacted]
Address:	[redacted]
City:	[redacted]

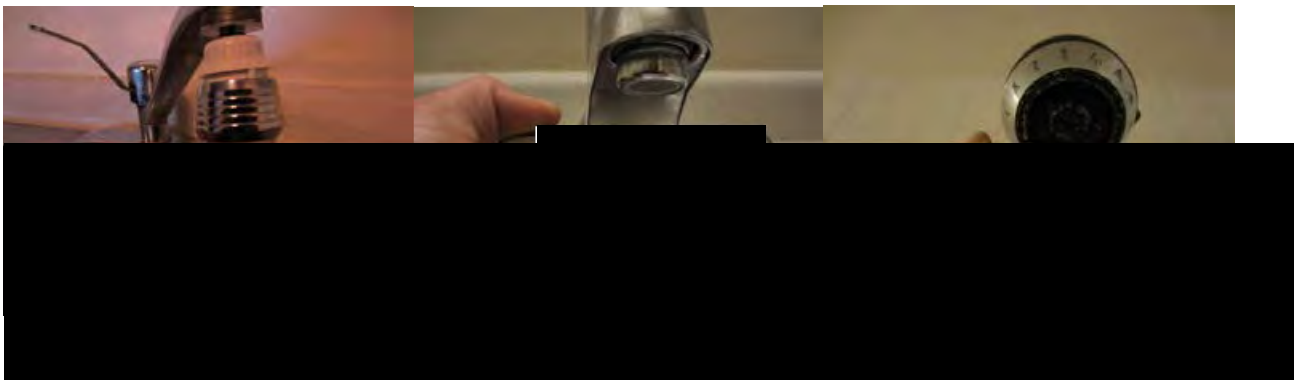
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**X**	
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Shower head not Niagara. No visible markings
Units selected randomly from different floors
Bathroom aerator not Niagara brand and rated 1.0 gpm

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

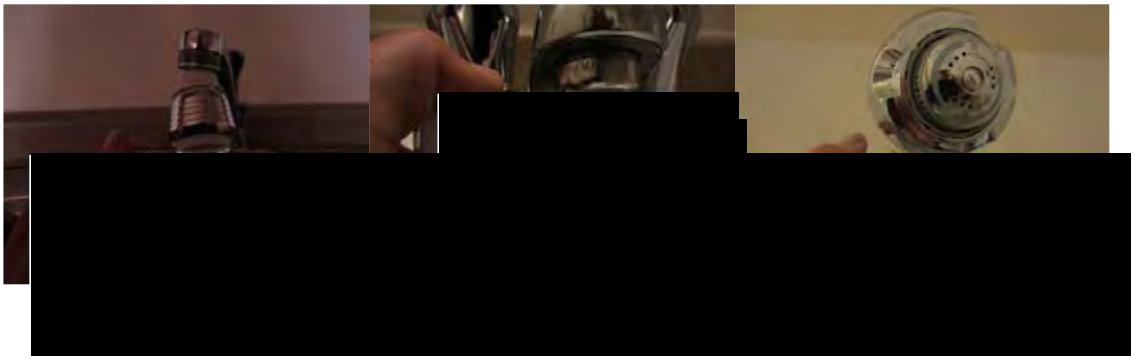
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Bathroom aerator not Niagara brand and rated 1.0 gpm
Units selected randomly from different floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	[redacted]
Contact:	
Address:	
City:	

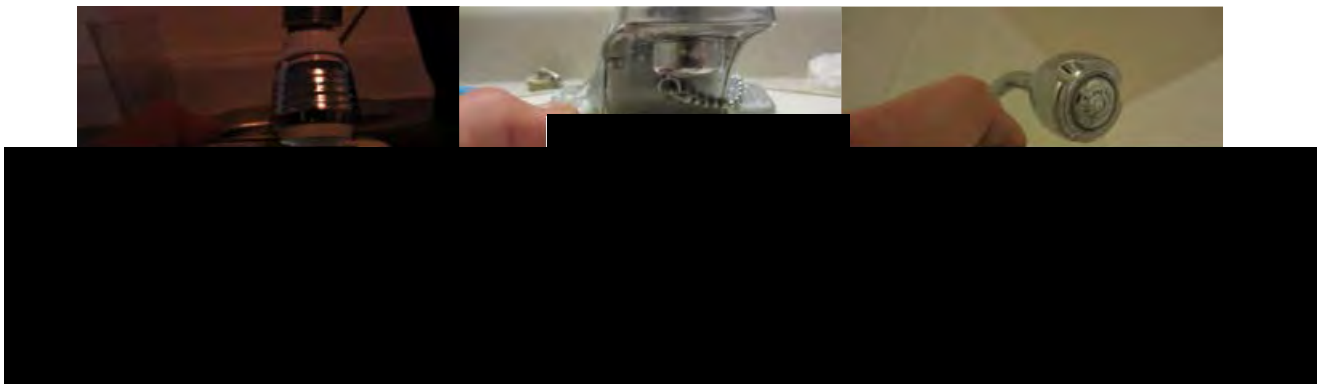
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Bathroom aerator not Niagara brand and rated 1.0 gpm
Units selected randomly from different floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Order Details:

SH: 143

BA: 143

KA: 143

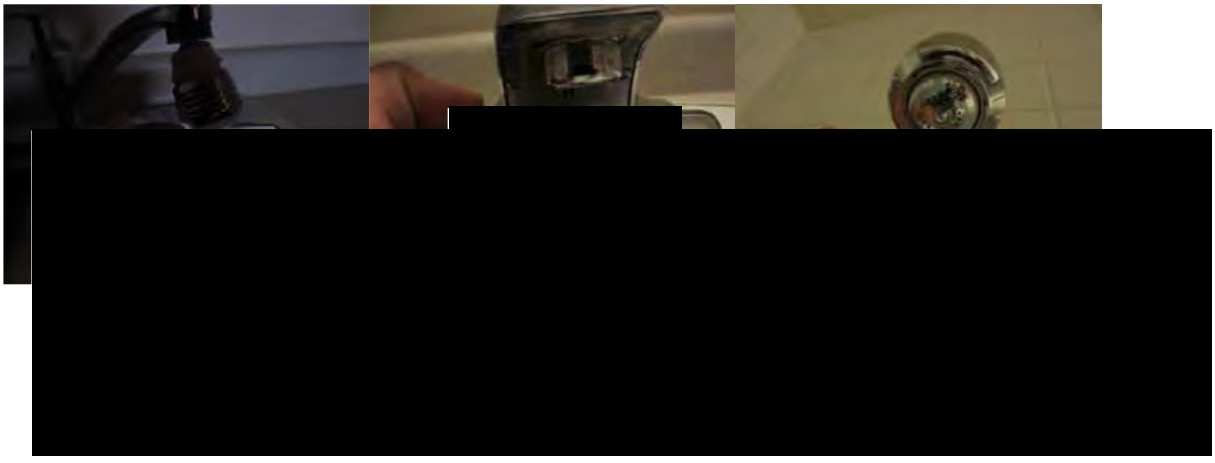
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Bathroom aerator not Niagara brand and rated 1.0 gpm
Units selected randomly from different floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

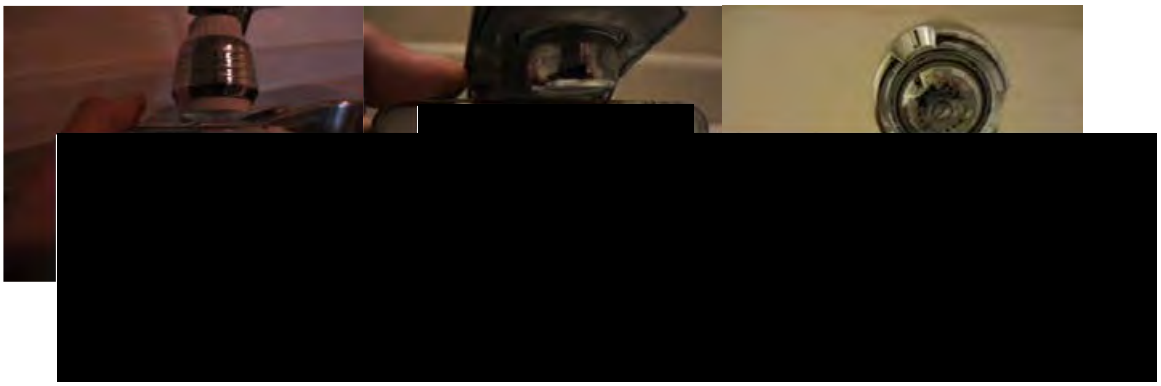
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Bathroom aerator not Niagara brand and rated 1.0 gpm
Units selected randomly from different floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

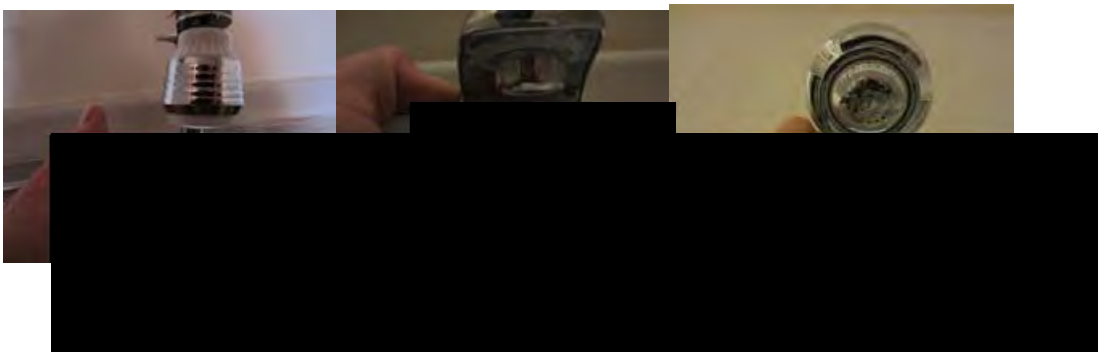
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Bathroom aerator not Niagara brand and rated 1.0 gpm
Units selected randomly from different floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other)	[redacted] UNIVERSITY [redacted] RESIDENCE
Total # of units in building:	
Contact:	
Address:	
City:	

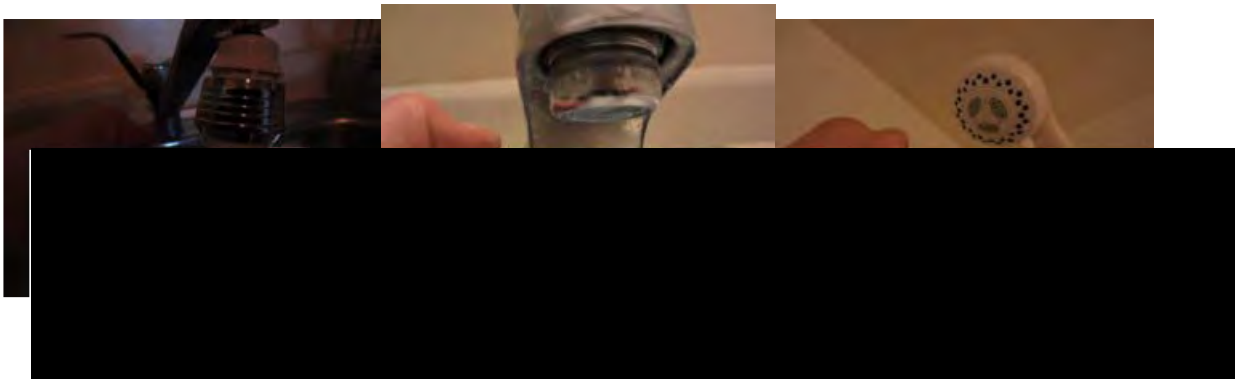
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead		**X**	
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Shower head not Niagara brand. No visible markings
Units selected randomly from different floors
Bathroom aerator not Niagara brand and rated 1.0 gpm

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 143

BA: 143

KA: 143

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

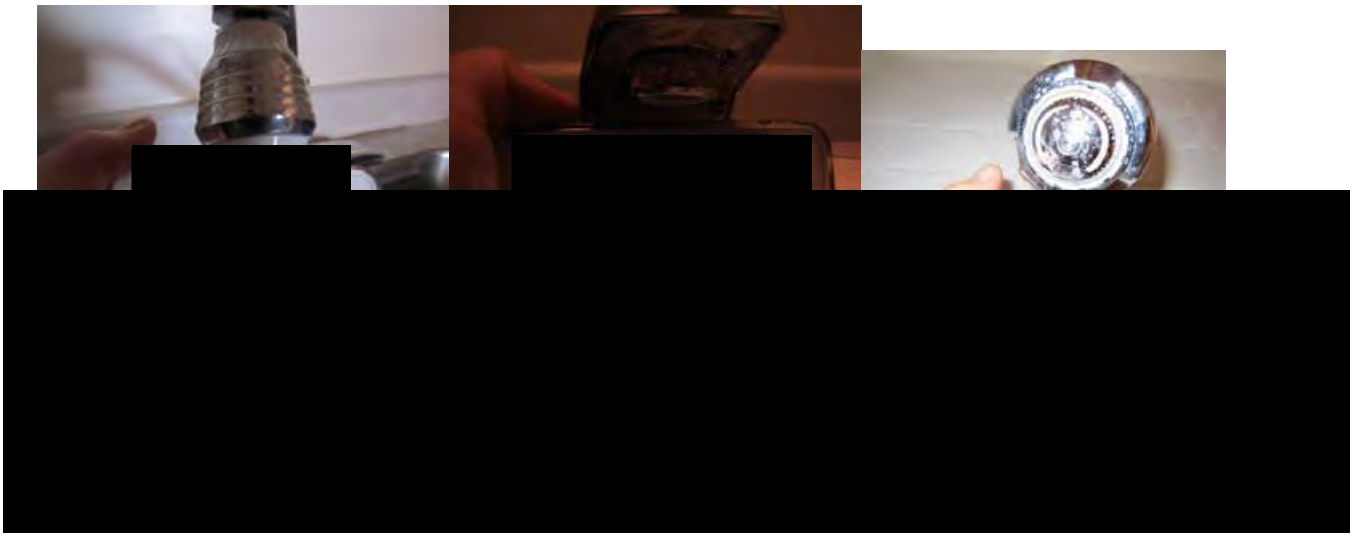
Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator	**X**		

Signature received	**X**	

General Notes:

Kitchen sink aerator was not Niagara brand and rated 1.5 gpm
Bathroom aerator not Niagara brand and rated 1.0 gpm
Units selected randomly from different floors

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Order Details:

SH: 47

BA: 34

KA: 4

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted] (x10)
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Shower room sink aerator was not Niagara brand but rated 0.5 gpm
All showers using Niagara low flow units!
Selection was limited to Men's rooms only

Proof of installation (insert picture below):

[redacted]

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 47

BA: 34

KA: 4

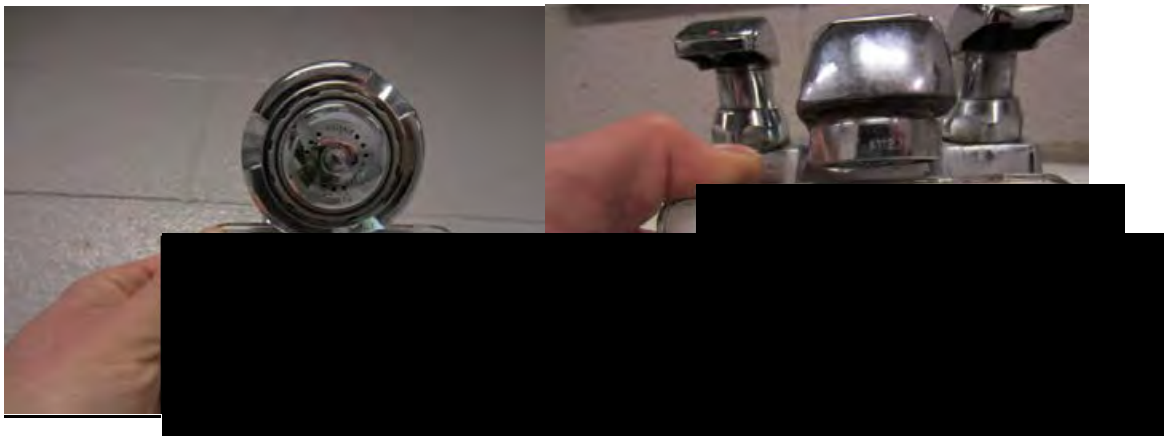
Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

[redacted]

Proof of installation (insert picture below):



HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	[redacted]
Contact:	
Address:	
City:	

Order Details:

SH: 47

BA: 34

KA: 4

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
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Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
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Signature received	**X**	

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Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	[redacted]
Contact:	
Address:	
City:	

Order Details:

SH: 47

BA: 34

KA: 4

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Shower room sink aerator was not Niagara brand but rated 0.5 gpm
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Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	
Contact:	[redacted]
Address:	
City:	

Order Details:

SH: 47

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KA: 4

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BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
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Signature received	**X**	

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Shower room sink aerator was not Niagara brand but rated 0.5 gpm
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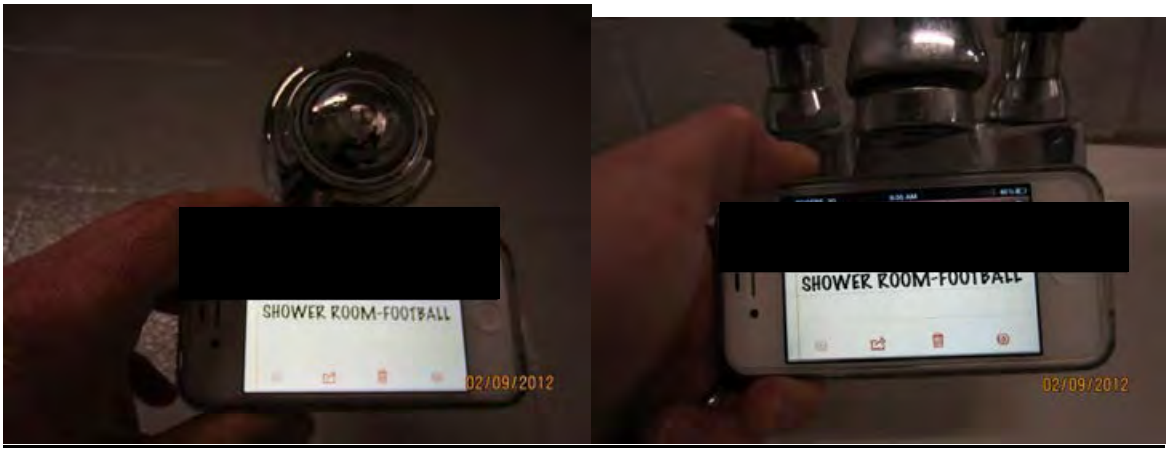

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	[redacted]
Contact:	[redacted]
Address:	[redacted]
City:	[redacted]

Order Details:

SH: 47

BA: 34

KA: 4

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Shower room sink aerator was not Niagara brand but rated 0.5 gpm
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Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	[redacted]
Contact:	
Address:	
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Order Details:

SH: 47

BA: 34

KA: 4

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Shower room sink aerator was not Niagara brand but rated 0.5 gpm
All showers using Niagara low flow units!
Selection was limited to Men's rooms only

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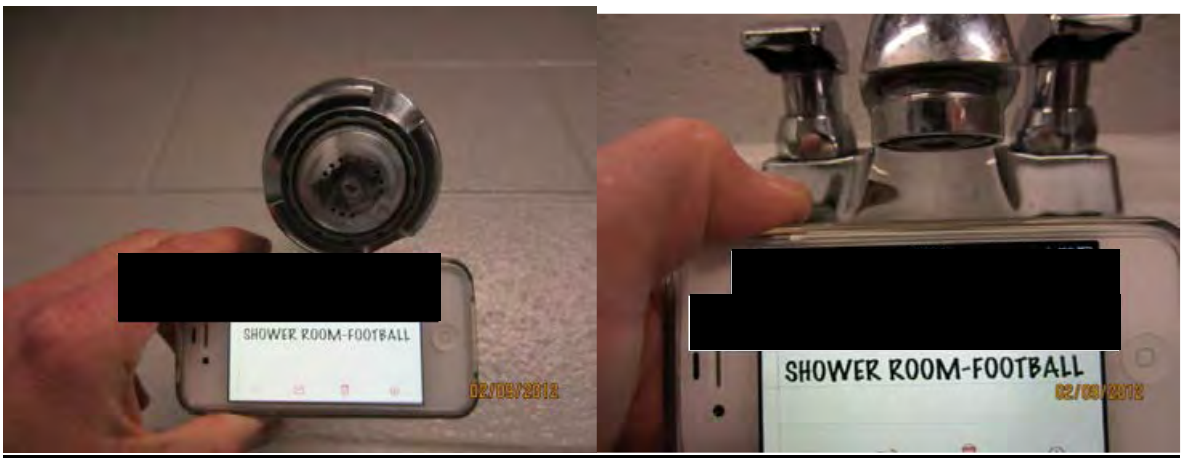

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 47

BA: 34

KA: 4

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	[redacted]
Contact:	[redacted]
Address:	[redacted]
City:	[redacted]

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Shower room sink aerator was not Niagara brand but rated 0.5 gpm
All showers using Niagara low flow units!
Selection was limited to Men's rooms only

Proof of installation (insert picture below):

HWC Audit

Audit Code	[redacted]

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	
Contact:	
Address:	
City:	

Order Details:

SH: 47

BA: 34

KA: 4

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

Shower room sink aerator was not Niagara brand but rated 0.5 gpm
All showers using Niagara low flow units!
Selection was limited to Men's rooms only

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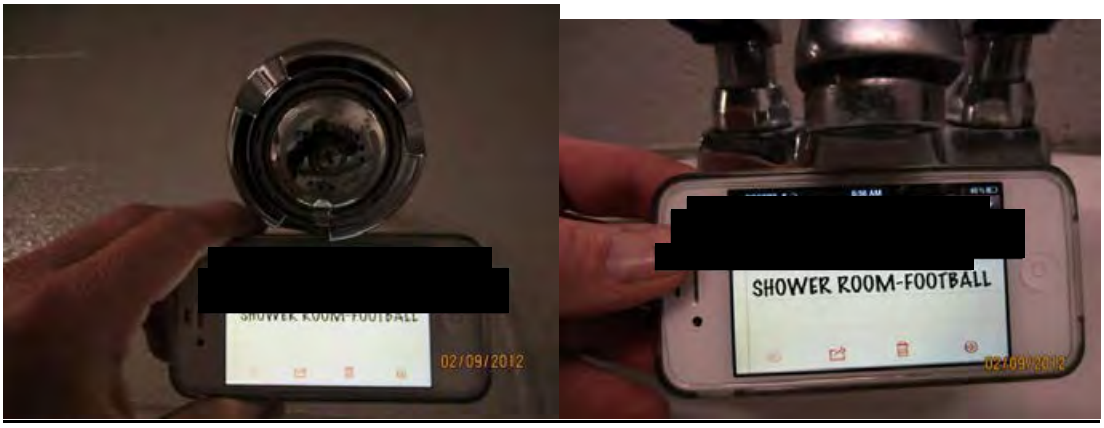

HWC Audit

Audit Code	[redacted]

Order Details:

SH: 47

BA: 34

KA: 4

Customer (hotel/motel, School/Dorm, LTC Facility, Other):	[redacted] UNIVERSITY [redacted]
Total # of units in building:	[redacted]
Contact:	[redacted]
Address:	[redacted]
City:	[redacted]

Unit/ID #	**Installed**		**N/A**
BATHROOM	**YES**	**NO**	**No bathroom in unit or measure not ordered for unit**
Showerhead	**X**		
Aerator		**X**	
Unit/ID #	**Installed**		**N/A**
KITCHEN/ KITCHENETTE	**YES**	**NO**	**No kitchen in unit or measure not ordered for unit**
Aerator			**X**

Signature received	**X**	

General Notes:

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All showers using Niagara low flow units!
Selection was limited to Men's rooms only

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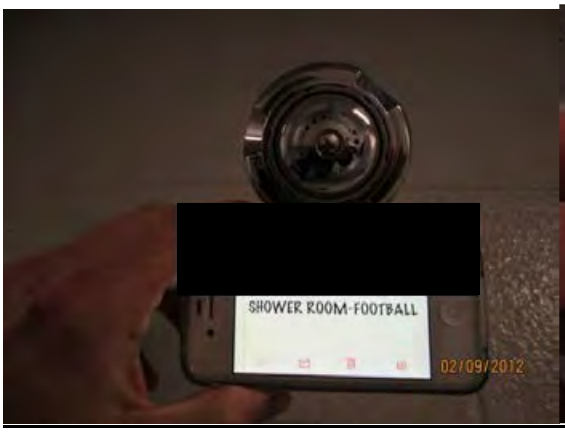

Verification Tracking Sheet

Please sign to indicate that an authorized advisor of Union Gas has completed the on-site visit.

Audit code	Address	Phone #	Unit Numbers	Name (First and Last)	Signature
[redacted]					

Verification Tracking Sheet

Please sign to indicate that an authorized advisor of Union Gas has completed the on-site visit.

Audit code	Address	Phone #	Unit Numbers	Name (First and Last)	Signature
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Verification Tracking Sheet

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Audit [redacted]	Address	Phone #	Unit Numbers	Name (First and Last)	Signature
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Audit code	Address	Phone #	Unit Numbers	Name (First and Last)	Signature
[redacted]					

Verification Tracking Sheet

Please sign to indicate that an authorized advisor of Union Gas has completed the on-site visit.

Audit code	Address	Phone #	Unit Numbers	Name (First and Last)	Signature
[redacted]					

Verification Tracking Sheet

Nick

Please sign to indicate that an authorized advisor of Union Gas has completed the on-site visit.

Audit code	Address	Phone #	Date	Unit Numbers	Name (First and Last)	Signature
[redacted]						

[redacted]

Verification Tracking Sheet

Please sign to indicate that an authorized advisor of Union Gas has completed the on-site visit.

Audit code	Address	Phone #	Date	Unit Numbers	Name (First and Last)	Signature
[redacted]						

[redacted]

Verification Tracking Sheet

Please [redacted]ate that an authorized advisor of Union Gas has completed the on-site visit.

Audit code	Address	Phone #	Date	Unit Numbers	Name (First and [redacted]	Signature
[redacted]						

[redacted]

Verification Tracking Sheet

Please sign to indicate that an authorized advisor of Union Gas has completed the on-site visit.

Audit [redacted]	Address	Phone #	Date	Unit Numbers	Name (First and [redacted]	Signature
[redacted]						

VERIFICATION RESULTS:

2011 COMMERCIAL MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM

FINAL REPORT

SUBMITTED TO:

IMRAN NOORANI,

Program Evaluator, DSM Research & Evaluation

Union Gas Ltd., 777 Bay Street, Suite 2801, PO Box 153, Toronto, Ontario, M5G 2C8

By

SeeLine Group Ltd.

416-703-8695

March 2012

Table of Contents

1.0 Executive Summary – Multi-Residential HWC Verification

In November 2011, Union Gas Ltd. (UGL) contracted with SeeLine Group Ltd. (SLG) to provide on-site verification and documentation of results for the multi-family "Hot Water Conservation" (HWC) program. The verification effort took place in two phases. A total of 45 buildings (facilities) were visited and 360 units were verified onsite for installed showerheads, bathroom faucet aerators, and kitchen faucet aerators. 15 'small' buildings comprising 67 units were verified in Phase 1, while 30 'large' buildings comprising 293 units were verified in Phase 2.

Key results included:

- There were 201 (56%) showerheads observed installed and 159 (44%) were not.
- There were 116 (39%) bathroom aerators observed installed and 184 (61%) were not.
- There were 200 (61%) kitchen faucet aerators observed installed and 130 (39%) were not.

The table below summarizes the overall findings:

Observed Measure	Installed	Not Installed	Total
Showerhead Aerators	201 (56%)	159 (44%)	360
Bathroom Sink Aerators	116 (39%)	184 (61%)	300
Kitchen Faucet Aerators	200 (61%)	130 (39%)	330

Wave 2 installation rates were higher than Wave 1 results. Two factors were identified that could have contributed to this result: program enhancements implemented by UGL half way through the year; and Wave 1 had a greater proportion of large buildings, which tended to have higher install rates than smaller buildings – possibly due to the presence of professional building management or operations staff. It is also worth noting that bathroom aerator installations were significantly lower than the other measures, possibly due to performance or installation challenges.

Report data can be found in the attached appendices according to the table of contents above.

2.0 Background & Objective

As indicated, UGL contracted with SLG to provide on-site verification and documentation of results for the (HWC) program. UGL wished to confirm on-site installation of showerheads and faucet aerators that were distributed to multi-family residential buildings as part of the HWC program. The HWC program is designed to reduce natural gas usage associated with hot water consumption. The HWC program provides a choice of a suite of measures at no cost to participants including: 1.25 gpm showerhead,1.5gpm kitchen aerator, and a 1.0 gpm bathroom aerator for applicable multi-family units. The multi-family segment is defined as dwellings with more than 3 floors and more than 5 units. The verification work occurred in 2 phases. Phase 1 included verification for HWC participants from Q1 to Q3 in 2011. Phase 2 included verification of HWC participants from Q1 to Q4 2011.

This report presents findings for Phase 1 and Phase 2 verifications.

2.1 Objective

Through on-site verification, the main goal of this study was to confirm the installation of showerheads and aerators distributed to HWC multifamily participants who received measures in 2011. A total of 350 on-site apartment units needed to be verified (90 small, 260 large). Through this effort, 360 units were verified.

UGL also wished to understand more about the number of second bathrooms on-site. SLG captured on-site data relating to the number of second bathrooms, whether a second showerhead was installed, and whether a bathroom aerator was installed.

3.0 Methodology – HWC Verification

Phase 1

A sampling methodology was developed by an independent third party and a random sample of participants was provided to SLG. S LG was required to verify 65 units, across at least 13 facilities. SLG contacted these candidates in sequential order by telephone to arrange an on-site inspection date.

Phase 2

A random sample of participants from Phase 2 was provided to SLG. SLG was required to verify 285 units across at least 29 facilities. . SLG contacted these candidates in sequential order by telephone to arrange an on-site inspection date.

Approach to Both Phases

For both Phases, a meeting request to verify the installed measures was placed with the program participant. A meeting time and date were arranged. Meeting times and dates were assigned to an SLG agent. The SLG agent arrived on-site and randomly selected up to 5 or 10

units for verification. 5 units were selected in Phase 1, which focused on smaller buildings, and 10 units were selected in Phase 2, which focused on larger buildings. The sampling protocol was based on on-site inspections not to exceed 10 units for each large location, and 5 units for small. Small facilities are defined as properties with less than 50 units and large facilities are defined as properties with more than 50 units. In cases where the total units at a property were 5 or less, every unit at the property was verified. Key features of the approach included:

- A random number generator was used to make the random unit selections while on location. Units selected for verification were not communicated to the program participants prior to the visit. The on-site contact person (usually the superintendent) brought the agent to each randomly selected unit. The SLG agent gained access to the unit and inspected the aerators and showerheads to determine whether they were UGL issued. Specifically, these measures included:
    - 1.25 gpm showerhead aerator;
    - 1.5 gpm kitchen faucet aerator; and,
    - 1.0 gpm bathroom faucet aerator.

Physical samples of the models were provided to SLG agents by UGL staff prior to the inspections. These models were brought to the field to make direct comparisons. In addition, detailed photographs of the measures were provided by UGL, so that SLG agents could positively identify the measures in the field. The models provided through the HWC program are unique to the Ontario market, which facilitated a positively identified measure. SLG agents also took detailed photographs of the installed measures in the field, so that a visual record would be available after the verification had occurred. A unique identity tag was affixed to each installed measure for the recording purposes.

The verification details were recorded in a data-capture 'sign-off' sheet. This document recorded the results of the inspection, and required the superintendent/on-site contact person to sign off on the inspection along with the SLG agent. See the appendix documentation for examples of the template as well as copies of the original sign-off sheets.

Overall, 360 units at 45 facilities were included in this effort. Specifically, 67 units at 15 locations in Phase 1 and 293 units at 30 locations in Phase 2 were visited. Site visits were established following the sequence they were presented in the random sample provided.

For Phase 1, phone calls were placed in the first 2 weeks of November, 2011 to arrange meeting times. The verification visits occurred in the second 2 weeks of November. All the on-site verification meetings had been concluded by November 30th 2011. In Phase 2, phone calls were generally placed in the first 2 weeks of February, 2012, and meetings were arranged in the second half of the month.

While all facilities ordered showerheads, not all facilities in the sample necessarily ordered the other kitchen or bathroom faucet aerators. UGL provided participant data indicating the number of measures ordered for each building. SLG agents confirmed the order quantities with participants while in the field and with property owners on the phone. The data has been

adjusted to only include participants who actually ordered the measure(s). This avoids the situation of mistakenly attributing a non-install to a participant that did not order the measure in the first place.

3.1 Methodology – HWC Verification – Second Bathrooms

As part of the data collection efforts, UGL wished to gain some insight into the number of secondary bathrooms. While in the field, verifiers would record whether a unit had a second bathroom, whether the second bathroom had a showerhead, and whether the showerhead aerator or sink aerators had HWC measures installed in the second bathroom.

Overall, no second bathrooms were observed in Phase 1 verifications. Phase 2 observed 24 second bathrooms with a showerhead, of which 4 had a UGL issued low-flow showerhead. Interestingly, of the remaining 20 second bathrooms that did not have the showerhead measure installed, a UGL issued showerhead *was* found to be installed in the other (the first) bathroom shower. Out of these 20 locations with a second bathroom, 10 were found to have a UGL issued showerhead installed in the first bathroom, and 10 were found to have no UGL issued showerhead installed.

While the data collected for secondary bathrooms and usage of the secondary shower does yield some interesting insights, it is not statistically valid. Due to sampling methodology and the small sample size, the data for secondary bathrooms should not be considered representative of all program participants.

4.0 Results – Showerhead Aerators

Qualitative findings

Based on feedback and insights from property owners, superintendents, and tenants it is clear that the fate of showerhead aerators is not altogether uniform. Two main outcomes identified included: not installed or installed. SLG also noted where tenants had un-installed (removed) the program issued measure according to the property manager, but these were considered not installed for the purpose of this study.

Quantitative findings

The table below displays the combined results from Phase 1 and Phase 2 verifications of showerhead aerators.

Showerhead Aerator (Y/N)		
Result	**#**	**%**
Yes	201	55.8%
No	159	44.2%
Total	360	100%

A total of 360 bathroom showers were verified for Phase 1 and Phase 2. Overall, slightly over 56% (Yes) of the showerheads were positively identified and about 44% (No) were not.

The data can be displayed in terms of Phase 1 and Phase 2. Note that in Phase 1 data was collected from 'smaller' multi-residential buildings, while in Phase 2 data was collected from 'larger' multi-residential buildings. The following tables display data from Phase 1 and Phase 2 respectively.

Phase 1 Showerhead Aerator (Y/N)		
Result	**#**	**%**
Yes	23	34.3%
No	44	65.7%
Total	67	100%

Out of 67 units verified in Phase 1, 23 had the measure installed, and 44 did not. Note that no second bathrooms were observed in Phase 1.

Phase 2 Showerhead Aerator (Y/N)		
Result	**#**	**%**
Yes	178	60.8%
No	115	39.2%
Total	293	100%

In Phase 2, there were 293 units verified. It appears that the observed penetration of showerhead installations was greater in Phase 2 than Phase 1. A possible reason for higher installation rates in Phase 2 may be due to program design improvements that occurred during

2011. Another reason for this difference may be that phase two consisted mainly of larger multi-residential buildings, which could have more sophisticated professional management who are more diligent at completing the installations than smaller multi-residential buildings.

Second Bathrooms

Out of 293 suites in Phase 2, there were 46 second bathrooms observed. Of the 46 second bathrooms, only 24 second bathrooms were observed with a showerhead, of which 4 had a UGL installed showerhead. No second bathrooms were observed in Phase 1. The table below displays data for second bathrooms observed in Phase 2.

2nd Bathroom (Y/N)		
Result	**#**	**%**
Yes	46	15.7%
No	247	84.3%
NA	0	0.0%
Total	293	100%

Of the 293 units verified in Phase 2, only 46 (about 16%) had second bathrooms. This figure would be even lower if the 67 units from Phase 1 were included (about 13% - 46/360). Furthermore, not all of the secondary bathrooms included facilities for showering. (ie. not all secondary bathrooms were 3 piece bathrooms with a shower, many were simply 2 piece bathrooms without a shower). The table below displays data for the 46 secondary bathrooms.

Shower2 (Y/N)		
Result	**#**	**%**
Yes	4	8.7%
No	20	43.5%
NA	22	47.8%
Total	46	100%

Of the 46 secondary bathrooms, 22 were not applicable (NA) because the bathroom only had a sink and toilet (ie. there was no shower facility in the bathroom). Of the 24 bathrooms with showering facilities, only 4 (about 9%) had the HWC showerhead measure installed. 20 (about 44%) did not.

4.1 Results – Bathroom Aerators

Not all participants ordered bathroom aerators. The data for bathroom aerators has been adjusted to account this. As such, the totals used for the calculations of bathroom aerators differ from the totals used to calculate showerhead aerators.

Qualitative findings

The percentage of bathroom aerator installations was lower than that of the showerhead installations, and much lower than that of the kitchen aerators. A few potential reasons were identified in the field. One is that bathroom faucet fixtures were quite variable. Not all of the faucet fixtures were compatible with the HWC faucet aerator measure. Another reason was the reported increased 'splash-back' that could occur. This is a potential issue where relatively strong water pressure creates a strong flow into a relatively shallow basin. Compatibility with the fixtures and perceived performance issues may help to explain most of the low percentage of observed installations.

Quantitative findings

The table below displays data for Phase 1 and Phase 2 verification of bathroom aerators.

Bathroom Aerator (Y/N)		
Result	**#**	**%**
Yes	116	38.7%
No	184	61.3%
Total	300	100%

A total of 300 qualifying units were verified, representing 67 Phase 1 participants and 293 Phase 2 participants but not including 60 participants who did not order bathroom aerators. (67+293-60=300). The table shows that 116 (about 39%) of the bathroom aerators were verified, and 184 (about 61%) were not. It is informative to break the bathroom aerator data down into Phase 1 and Phase 2 as it shows that the same trend noted for showerhead aerators. It appears that the 'larger' locations in Phase 2 achieved higher levels of penetration of all the measures.

The table below displays data for bathroom aerators observed in Phase 1. Note that no secondary bathrooms were observed in Phase 1.

Phase 1 Bathroom Aerator (Y/N)		
Result	**#**	**%**
Yes	17	25.4%
No	50	74.6%
Total	67	100%

67 bathroom aerators were inspected in Phase 1. 17 (about 25%) of the aerators were verified as installed, and 50 (about 75%) were not.

Phase 2 Bathroom Aerator (Y/N)		
Result	**#**	**%**
Yes	99	42.5%
No	134	57.5%
Total	233	100%

233 qualifying aerators were verified in Phase 2. That figure is calculated by taking 293 participants in Phase 2 minus 60 participants who did not order the measure. (293-60=233). 99 (about 43%) of the bathroom aerators were observed in Phase 2, while 134 (about 58%) of them were not.

4.2 Results – Kitchen Aerators

The analysis of the kitchen aerators is similar to the analysis for the bathroom aerators. There were some participants who did not order the kitchen aerators along with their showerhead aerators. As a result, the totals are different from the totals found in the above analyses of showerheads and bathroom aerators.

Qualitative Findings

The percentage of observed installations of kitchen faucet aerators was notably higher than the other two measures. Feedback from the agents indicates that there appears to be fewer issues regarding installation and perceived performance although challenges affixing the measure to the faucet, and concerns about splash-back (especially with smaller kitchen sinks were noted).

Quantitative Findings

The table below displays data for kitchen aerators verified in Phase 1 and Phase 2.

Kitchen Aerator (Y/N)		
Result	**#**	**%**
Yes	200	60.6%
No	130	39.4%
Total	330	100%

330 qualifying kitchen aerators were observed in total. This figure is arrived at by taking 67 Phase 1 participants adding 293 Phase 2 participants and subtracting 30 participants who did not order the measure. (67+293-30=330). 200 kitchen aerators were observed (about 61%), while 130 (about 39%) were not.

The table below displays data for Phase 1 verifications of bathroom aerators.

Phase 1 Kitchen Aerator (Y/N)		
Result	**#**	**%**
Yes	28	41.8%
No	39	58.2%
Total	67	100%

67 qualifying kitchen aerators were observed in Phase 1. 28 (about 42%) of the measures were observed, while 39 (about 58%) were not.

The table below displays data for Phase 2 verifications of kitchen aerators.

Phase 2 Kitchen Aerator (Y/N)		
Result	**#**	**%**
Yes	172	65.4%
No	91	34.6%
Total	263	100%

263 qualifying kitchen aerators were verified in Phase 2. This figure is achieved by subtracting 30 participants who did not order kitchen aerators from the total group of 293 participants. (293-30=263). 172 (about 65%) of the kitchen aerators were observed, while 91 (bout 45%) were not.

The same trend is reinforced with kitchen aerators as with showerheads and bathroom aerators. 'larger' multi-residential buildings in Phase 2 achieved higher penetration rates of all 3 measures. This may be due to program design improvements, characteristics of Phase 2 participants (ie. 'larger' versus 'smaller' buildings), or other factors.

List of Appendices

Appendix A – List of Buildings

See document: "Appendix A – HWC Verification 2011.pdf"

Appendix B – Sample Sign-Off Sheet

See document: "Appendix B – HWC Verification 2011.pdf"

Appendix C – Sign-Off Sheets (Field Data)

See document: "Appendix C – HWC Verification 2011.pdf"

Appendix D – Field Data in Excel Format

See document: "Appendix D – HWC Verification 2011.pdf"

Appendix E – Photos of Installed Measures

See document: "Appendix E – HWC Verification 2011 – Phase 1.pdf"

See document: "Appendix E – HWC Verification 2011 – Phase 2.pdf"

Appendix A: List of Buildings - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1 and Phase 2

Appendix A – Phase 1

Application #	Order #	Building Street #	Building Street	City	Province	Postal Code	Northern/ Southern UGL Territory
HWC20110807	[redacted]						North
HWC20110804							North
HWC20110807							North
HWC20110807							South
HWC20111504							South
HWC20111504							South
HWC20110807							South
HWC20110605							South
HWC20110605							South
HWC20110804							South
HWC20111504							South
HWC20112503							South
HWC20110807							South
HWC20110807							South
HWC20111504							South

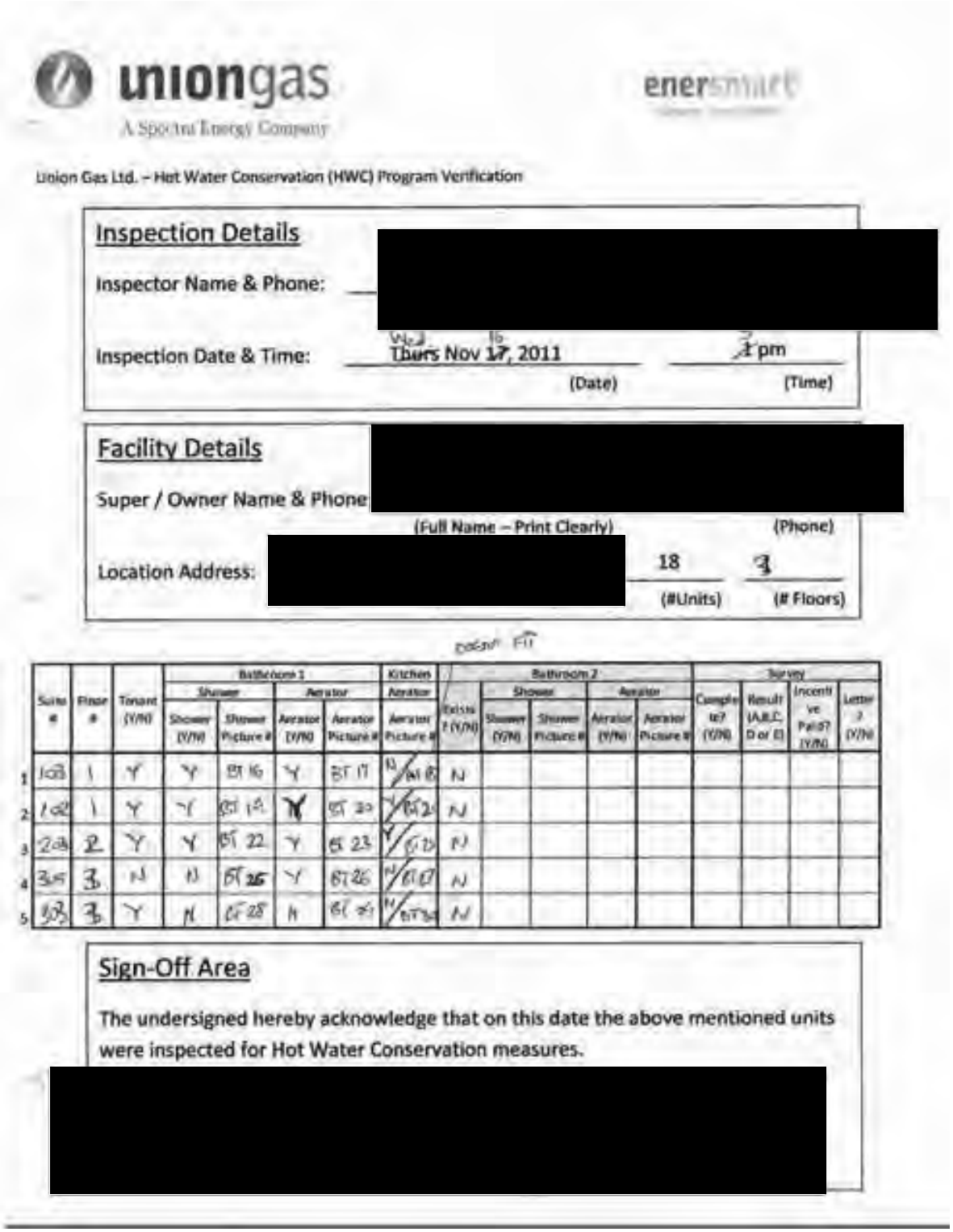
Appendix A: List of Buildings - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1 and Phase 2

Appendix A – Phase 2

Application #	Project	Customer	Address	City	Postal Code	Northern / Southern UGL Territory
HWC20111512						outh
HWC20110811						outh
HWC20110912						outh
HWC20110912						North
HWCREBATE0411						outh
HWC20110104						outh
HWC20110104						outh
HWC20110912						North
HWC20111512						outh
HWC20110811						outh
HWC20111512						outh
HWC20111512						outh
HWC20110104						outh
HWC20110811						outh
HWC20110811						outh
HWC20112511						outh
HWC20110912						outh
HWC20110912						outh
HWC20110811A						North
HWC20110811						outh
HWC20110912						outh
HWC20111504						outh
HWC20110512						North
HWCREBATE0411B						outh
HWC20110512						North
HWC20110912						North
HWC20111512						outh
HWC20110912						outh
HWC20110807						outh
HWC20111512						outh

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

Appendix C – Sign-Off Sheets (Field Data) – Phase 1



union gas
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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]

Inspection Date & Time: Wed Thurs Nov 17, 2011 (Date) — 2 pm (Time)

Facility Details

Super / Owner Name & Phone [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] 18 (#Units) 3 (# Floors)

Door: FD

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Exists ? (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Shower Picture #	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Aerator Picture #	Survey Complete? (Y/N)	Survey Result (A,B,C, D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	103	1	Y	Y	BT 16	Y	BT 17	N/BT 18	N								
2	102	1	Y	Y	BT 19	Y	BT 20	Y/BT 21	N								
3	203	2	Y	Y	BT 22	Y	BT 23	Y/BT 24	N								
4	305	3	N	N	BT 25	Y	BT 26	N/BT 27	N								
5	303	3	Y	N	BT 28	N	BT 29	N/BT 30	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]

Inspection Date & Time: Wed Nov 16, 2011 (Date) 11 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 36 (#Units) 3 (# Floors)

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Shower Picture #	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Aerator Picture #	Survey Complete? (Y/N)	Survey Result (A,B,C, D or E)	Survey Incentive Paid? (Y/N)	Survey Letter? (Y/N)
1	101	1	Y	NO	BT 1	N	BT 2	N/BT3	N								
2	B02	1	Y	NO	BT 6	N	BT 5	N/BT 4	N								
3	301	3	Y	NO	BT 8	N	BT 7	N/BT 9	N								
4	205	2	Y	[redacted]	BT 11	N	BT 10	N/BT 12	N								
5	203	2	Y	[redacted]	BT 13	N	BT 14	N/BT 15	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]

Inspection Date & Time: Thursday Nov 17, 2011 (Date) 11 am (Time)

Facility Details

Super / Owner Name & Phone [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 3 (#Units) 1 (# Floors)

				Bathroom 1				Kitchen	Bathroom 2					Survey			
				Shower		Aerator		Aerator		Shower		Aerator					
	Suite #	Floor #	Tenant (Y/N)	Shower (Y/N)	Shower Picture #	Aerator (Y/N)	Aerator Picture #	Aerator Picture #	Exists? (Y/N)	Shower (Y/N)	Shower Picture #	Aerator (Y/N)	Aerator Picture #	Complete? (Y/N)	Result (A,B,C, D or E)	Incentive Paid? (Y/N)	Letter? (Y/N)
1	~~1-2~~	~~1~~	~~Y~~	~~N~~	~~BT1~~	~~N~~	~~BT2~~	~~N/BT3~~									
2	1	1	Y	Y	BT31	N	BT32	Y/BT33	N								
3	3	2	Y	No shower	BT34	N	BT35	Y/BT36	N								
4																	
5																	

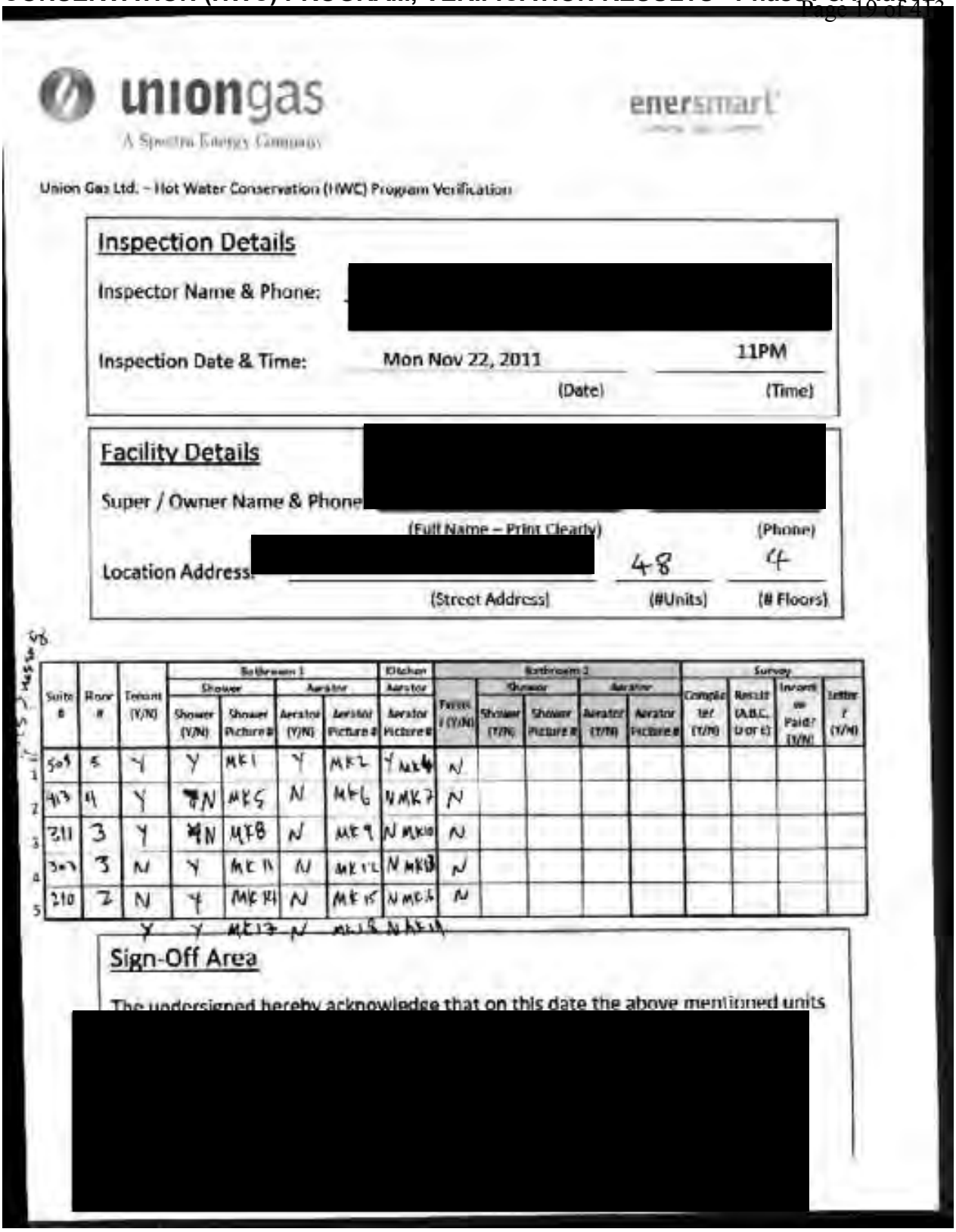
No shower only bathtub

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]

Inspection Date & Time: Mon Nov 22, 2011 (Date) 11PM (Time)

Facility Details

Super / Owner Name & Phone [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 48 (#Units) 4 (# Floors)

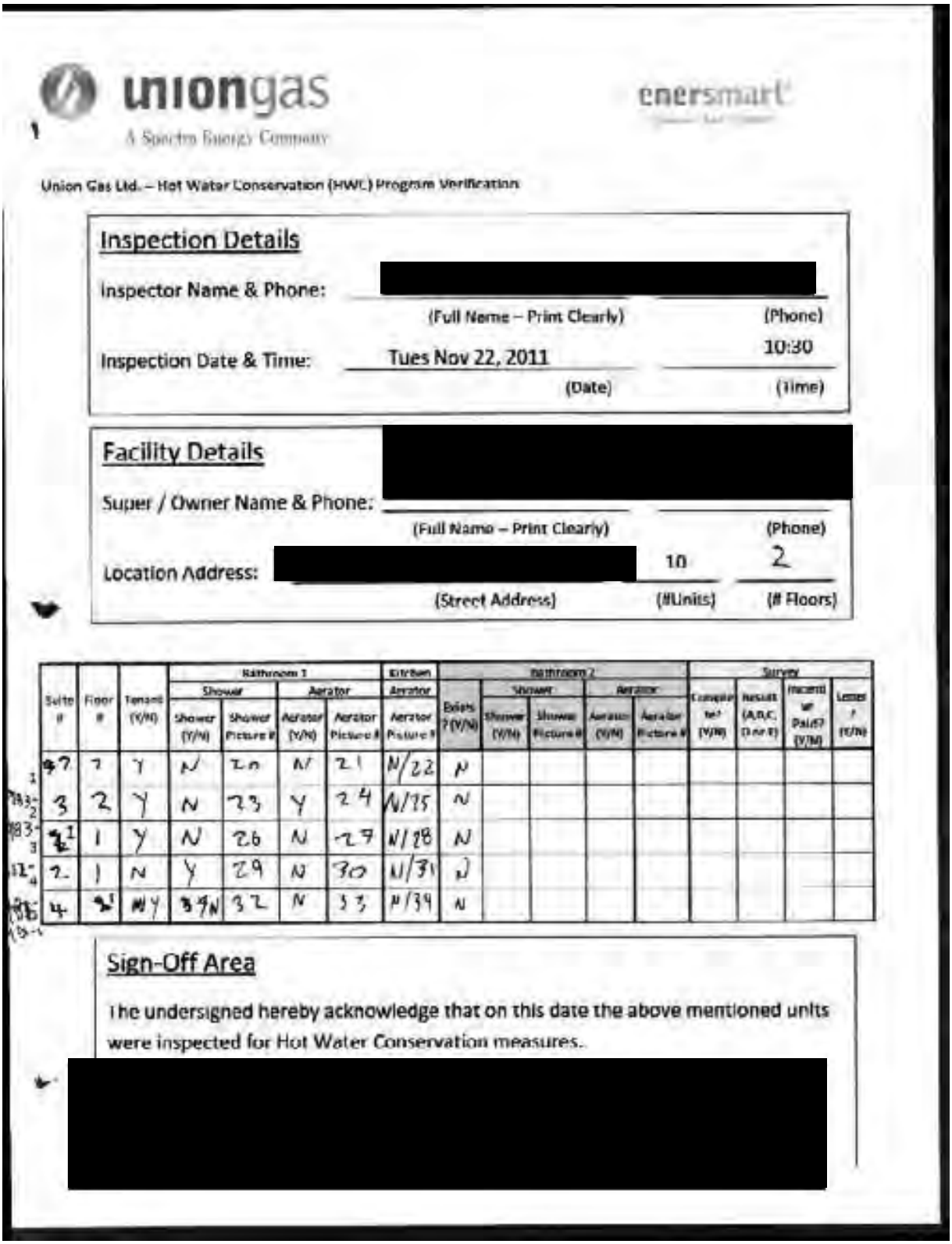
	Suite #	Room #	Tenant (Y/N)	Bathroom 1				Kitchen	Bathroom 2					Survey			
				Shower		Aerator		Aerator	Faucet (Y/N)	Shower		Aerator		Complete (Y/N)	Result (A,B,C, D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
				Shower (Y/N)	Shower Picture #	Aerator (Y/N)	Aerator Picture #	Aerator Picture #		Shower (Y/N)	Shower Picture #	Aerator (Y/N)	Aerator Picture #				
1	509	5	Y	Y	MK1	Y	MK2	Y MK4	N								
2	413	4	Y	N	MK5	N	MK6	N MK7	N								
3	311	3	Y	N	MK8	N	MK9	N MK10	N								
4	307	3	N	Y	MK11	N	MK12	N MK13	N								
5	210	2	N	Y	MK14	N	MK15	N MK16	N								

Y Y MK17 N MK18 N MK19

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Tues Nov 22, 2011 (Date) 10:30 (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 10 (#Units) 2 (# Floors)

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Bidets ? (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Shower Picture #	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Aerator Picture #	Survey Complete? (Y/N)	Survey Results (A,B,C, D or F)	Survey Incentive $ Paid? (Y/N)	Survey Letter ? (Y/N)
1	97	7	Y	N	20	N	21	N/22	N								
283-2	3	2	Y	N	23	Y	24	N/25	N								
283-3	3 1	1	Y	N	26	N	27	N/28	N								
12-4	2	1	N	Y	29	N	30	N/31	N								
283-1	4	2	N Y	Y N	32	N	33	N/34	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed Nov 23, 2011 (Date) 1 pm (Time)

Facility Details

Super / Owner Name & [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] 13 (#Units) 3 (# Floors)
(Street Address)

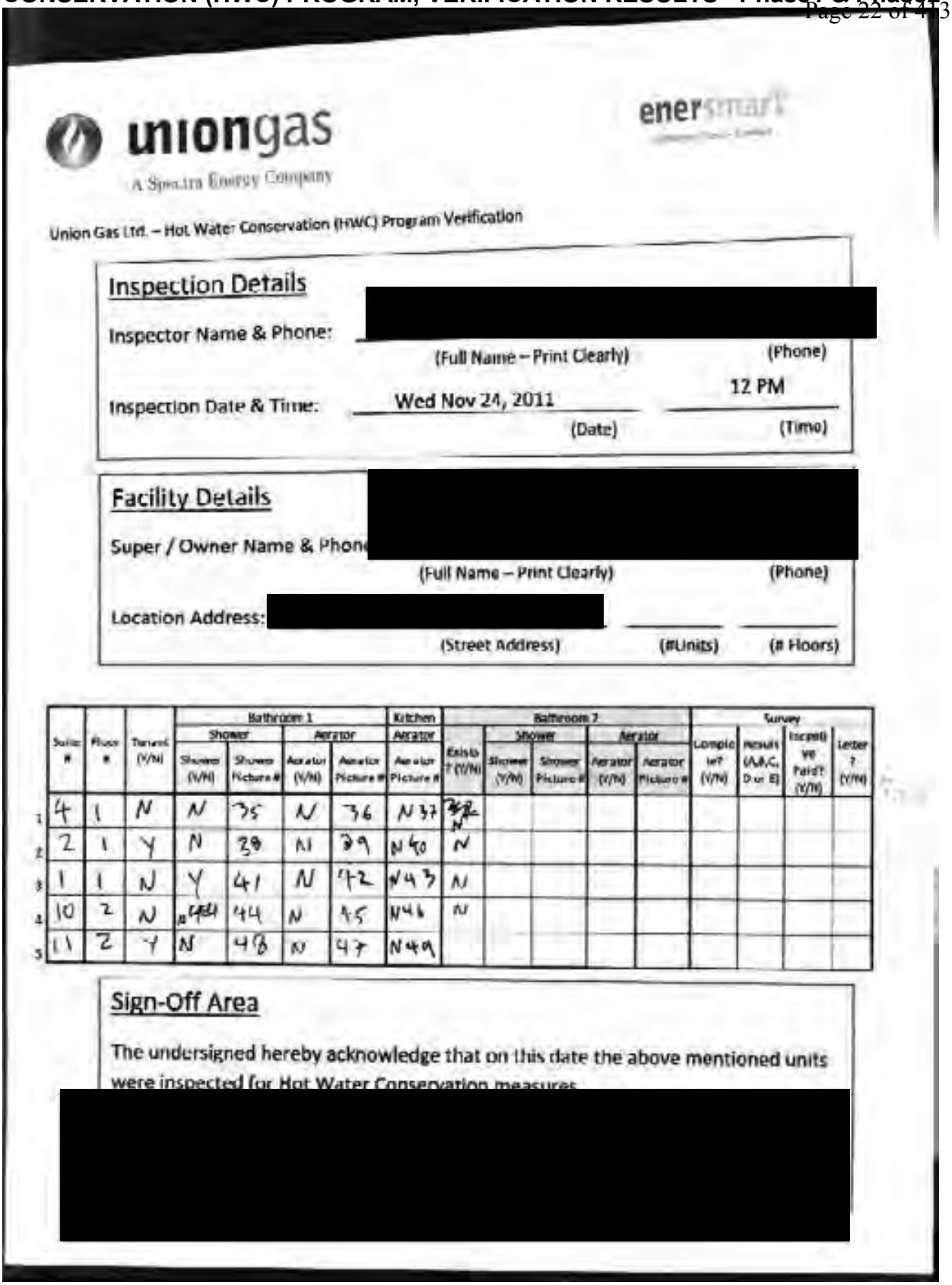
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Picture #	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture #	Survey Complete? (Y/N)	Result (A,B,C, D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
1	7	2	Y	N	BT 37	N	BT 38	Y/BT 39									
2	1	1	N	N	BT 40	N	BT 41	N/B 42									
3	9	3	Y	Y	BT 43	Y	BT 44	Y/B 45									
4	6	2	Y	N	BT 46	N	BT 47	Y/B 48									
5	2	1	N	N	BT 49	Y	BT 50	Y/BT 51									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed Nov 24, 2011 12 PM
(Date) (Time)

Facility Details

Super / Owner Name & Phone [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted]
(Street Address) (#Units) (# Floors)

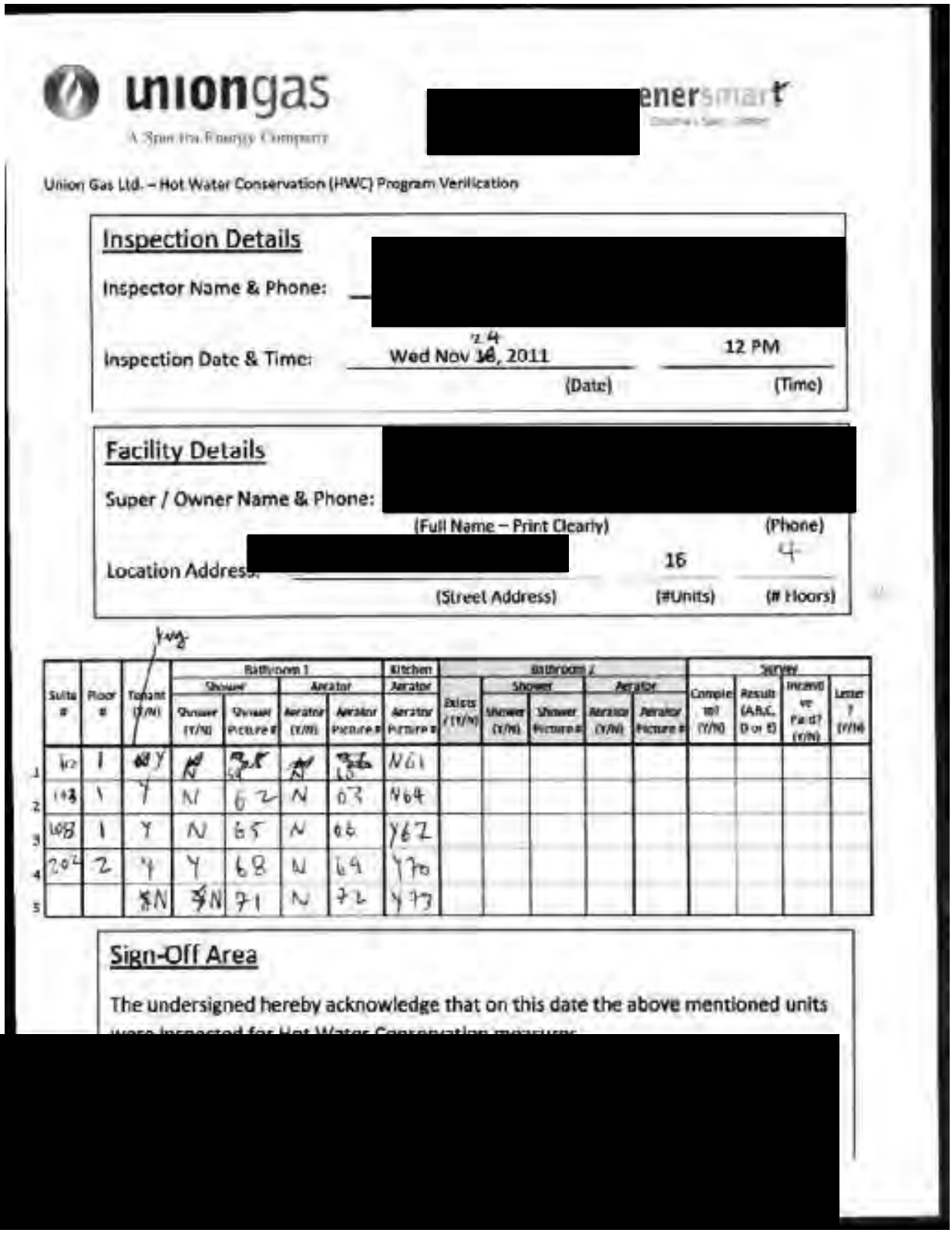
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Exists? (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Shower Picture #	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Aerator Picture #	Survey Complete? (Y/N)	Results (A,B,C, D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
1	4	1	N	N	35	N	36	N 37									
2	2	1	Y	N	38	N	39	N 40	N								
3	1	1	N	Y	41	N	42	N 43	N								
4	10	2	N	[illegible]	44	N	45	N 46	N								
5	11	2	Y	N	48	N	47	N 49									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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[redacted] enersmart

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]

Inspection Date & Time: Wed Nov 16, 2011 (Date) 12 PM (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 16 (#Units) 4 (# Floors)

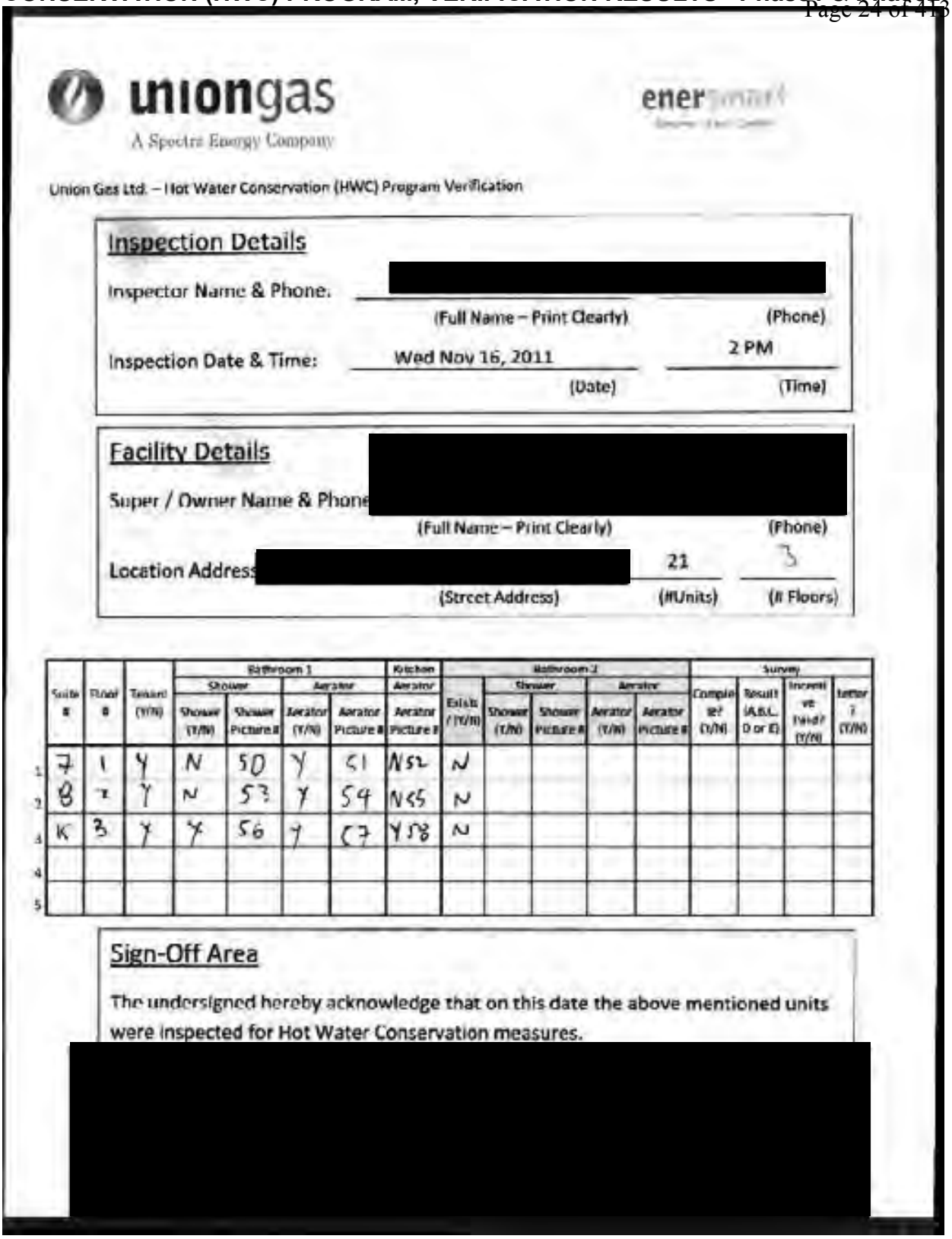
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Shower Picture #	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Aerator Picture #	Survey Complete? (Y/N)	Survey Result (A,B,C, D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	102	1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	N61									
2	103	1	Y	N	62	N	63	N64									
3	108	1	Y	N	65	N	66	Y67									
4	202	2	Y	Y	68	N	69	Y70									
5			[redacted]	[redacted]	71	N	72	Y73									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed Nov 16, 2011 (Date) 2 PM (Time)

Facility Details

Super / Owner Name & Phone [redacted]
(Full Name – Print Clearly) (Phone)

Location Address [redacted] (Street Address) 21 (#Units) 3 (# Floors)

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 Exists (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Picture #	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture #	Survey Complete? (Y/N)	Survey Result (A,B,C, D or E)	Incentive Paid? (Y/N)	Letter 1 (Y/N)
1	7	1	Y	N	50	Y	51	N52	N								
2	8	2	Y	N	53	Y	54	N55	N								
4	K	3	Y	Y	56	Y	57	Y58	N								
4																	
5																	

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]

(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Sat Nov 27, 2011 (Date) 9am 4:30 pm (Time)

Facility Details

Super / Owner Name & Phon [redacted]

(Full Name – Print Clearly) (Phone)

Location Address: [redacted] 45 (#Units) 12 (# Floors)

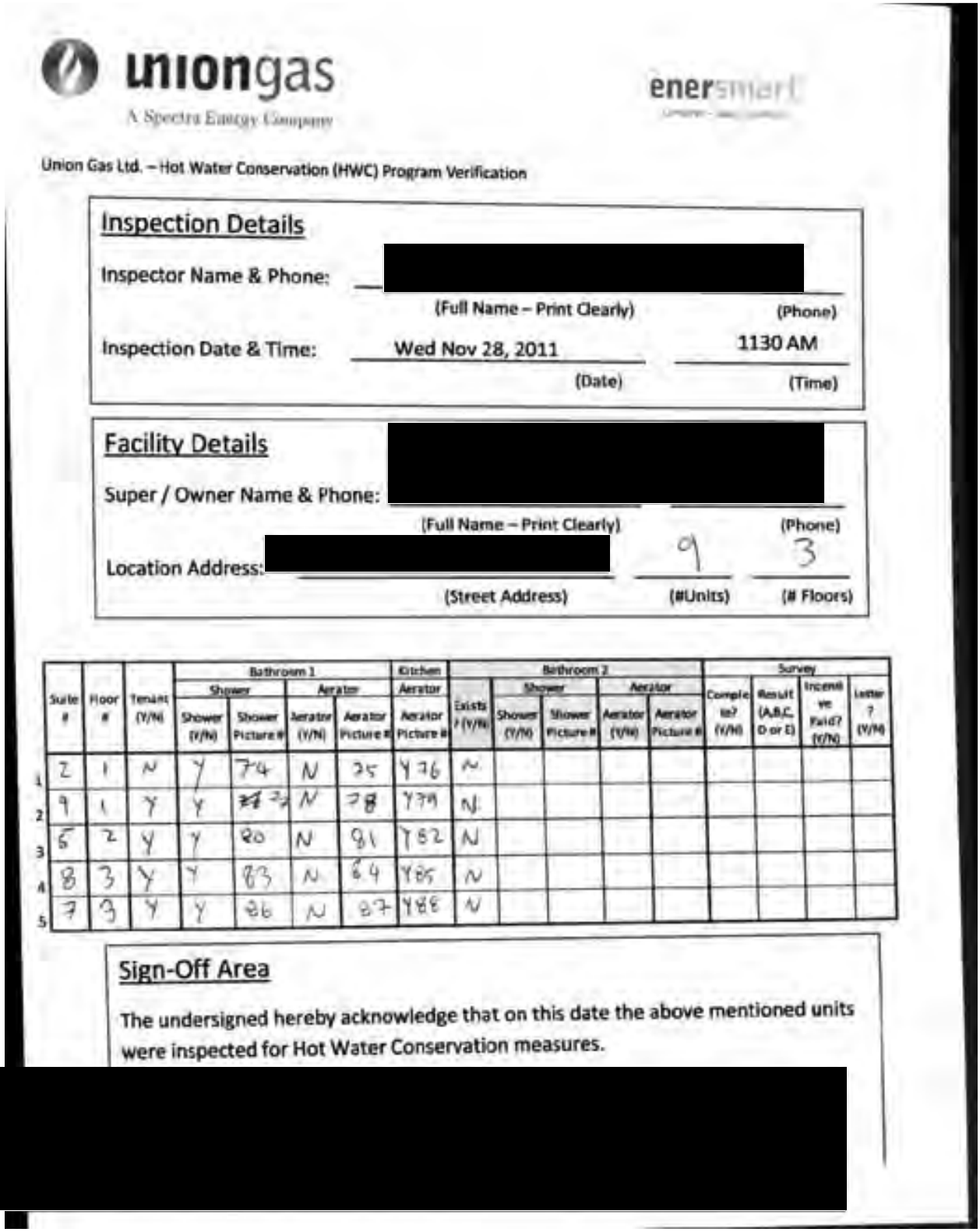
(Street Address)

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1				Kitchen	Bathroom 2					Survey			
				Shower		Aerator		Aerator	Exists? (Y/N)	Shower		Aerator		Complete? (Y/N)	Result (A,B,C, D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
				Shower (Y/N)	Shower Picture #	Aerator (Y/N)	Aerator Picture #	Aerator Picture #		Shower (Y/N)	Shower Picture #	Aerator (Y/N)	Aerator Picture #				
1	3	2	Y	Y	52	Y	53	Y/54									
2	4	2	Y	N	55	Y	56	Y/57									
3	2	1	Y	N	58	Y	59	Y/60									
4	1	1	N	N	61	Y	62	Y/63									
5	5	1	N	N	64	N	65	N/66									

Sign-Off Area

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed Nov 28, 2011 (Date) 1130 AM (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 9 (#Units) 3 (# Floors)

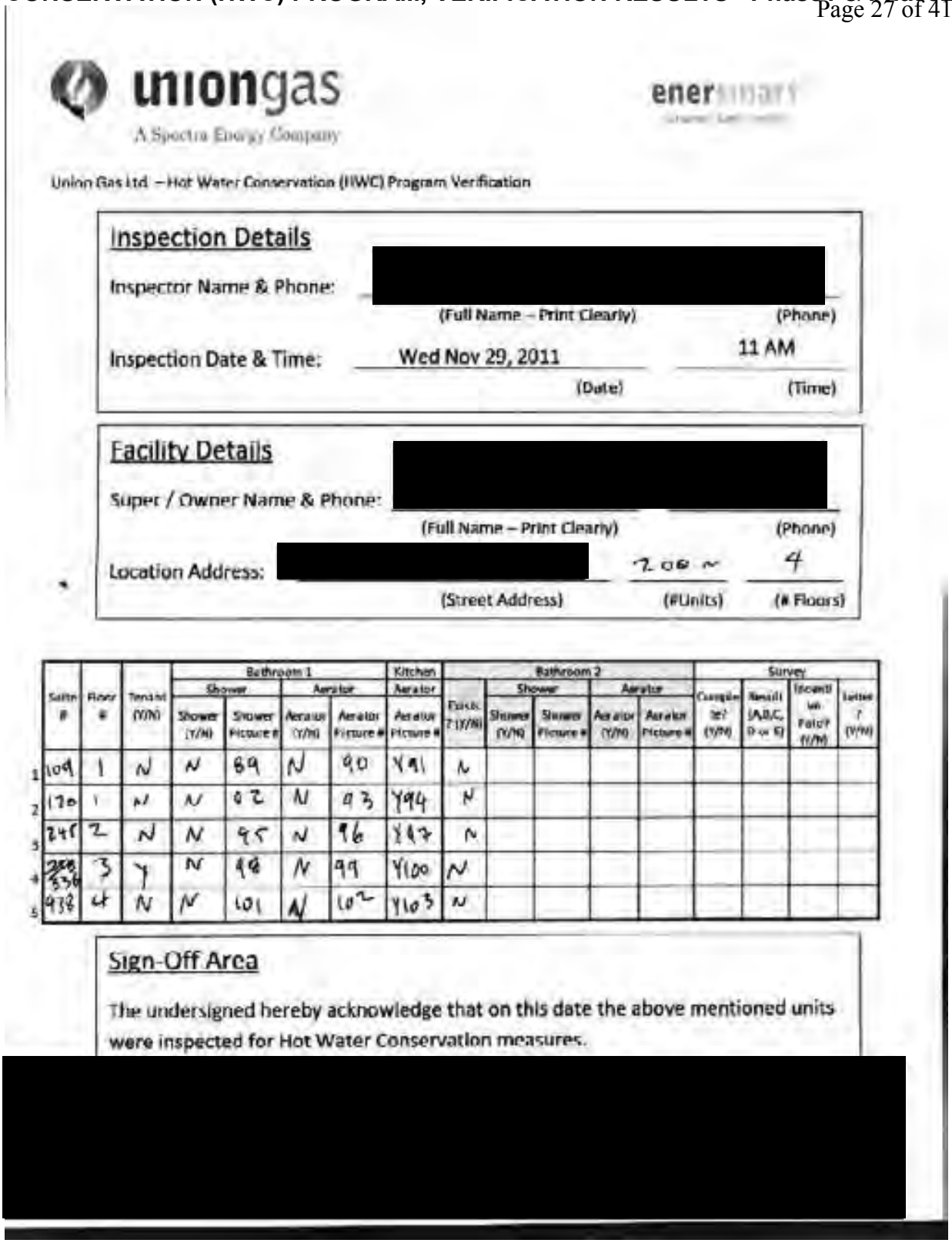
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Picture #	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture #	Survey Complete? (Y/N)	Survey Result (A,B,C, D or E)	Survey Incentive Paid? (Y/N)	Survey Letter? (Y/N)
1	2	1	N	Y	74	N	75	Y 76	N								
2	9	1	Y	Y	~~72~~	N	78	Y 79	N								
3	5	2	Y	Y	80	N	81	Y 82	N								
4	8	3	Y	Y	83	N	84	Y 85	N								
5	7	3	Y	Y	86	N	87	Y 88	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



uniongas
A Spectra Energy Company

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed Nov 29, 2011 11 AM
(Date) (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] 206 ~ 4
(Street Address) (#Units) (# Floors)

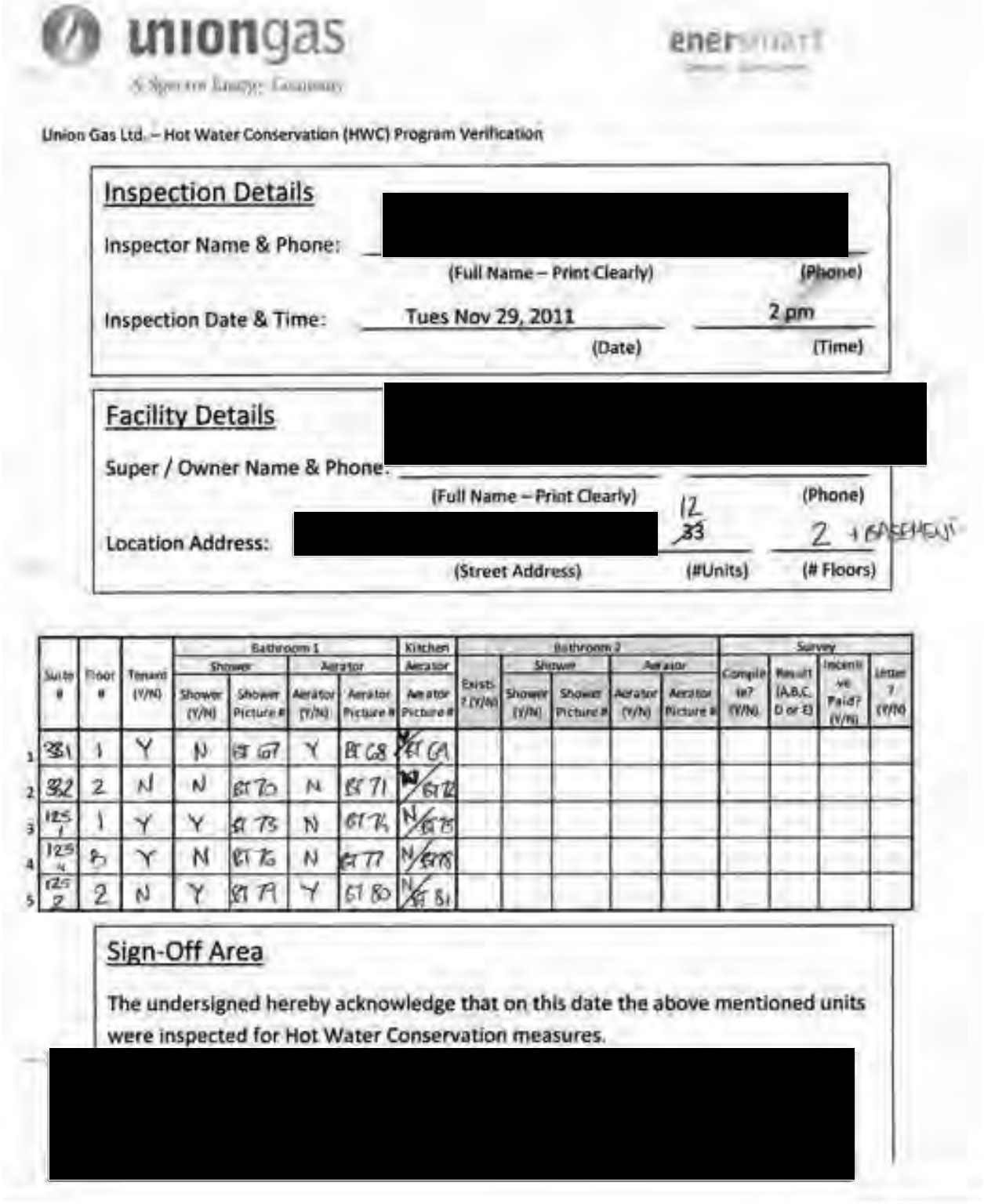
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Picture #	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture #	Survey Complete (Y/N)	Survey Result (A,B,C, D or E)	Survey Issued with Patch? (Y/N)	Survey Letter ? (Y/N)
1	109	1	N	N	89	N	90	Y91	N								
2	170	1	N	N	92	N	93	Y94	N								
3	245	2	N	N	95	N	96	Y97	N								
4	259 336	3	Y	N	98	N	99	Y100	N								
5	938	4	N	N	101	N	102	Y103	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Tues Nov 29, 2011 (Date) 2 pm (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 12 33 (#Units) 2 + BASEMENT (# Floors)

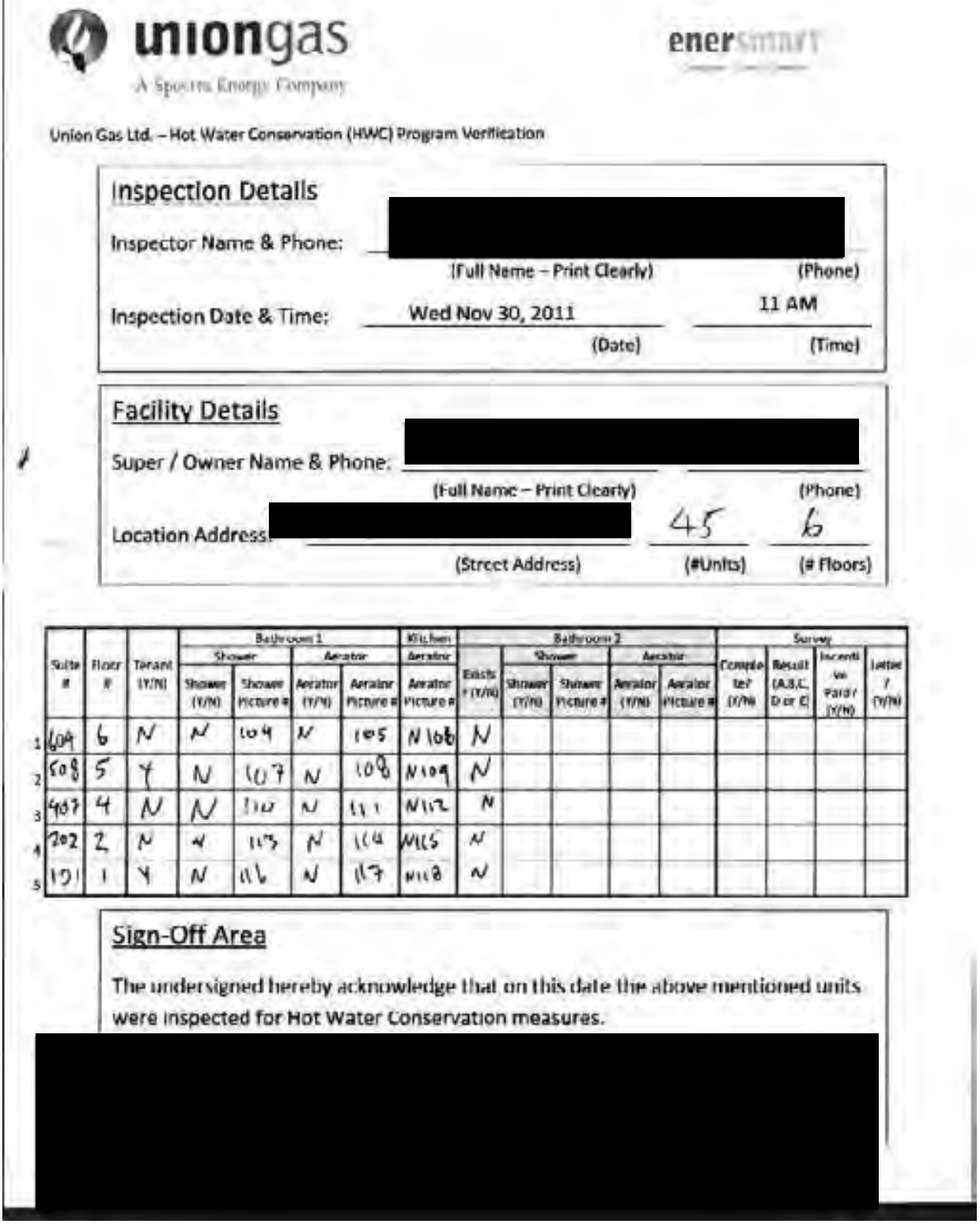
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists ? (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Shower Picture #	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Aerator Picture #	Survey Complete? (Y/N)	Survey Result (A,B,C, D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	331	1	Y	N	BT 67	Y	BT 68	BT 69									
2	332	2	N	N	BT 70	N	BT 71	N/BT 72									
3	125 1	1	Y	Y	BT 73	N	BT 74	N/BT 75									
4	125 4	3	Y	N	BT 76	N	BT 77	N/BT 78									
5	125 2	2	N	Y	BT 79	Y	BT 80	N/BT 81									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed Nov 30, 2011 (Date) 11 AM (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 45 (#Units) 6 (# Floors)

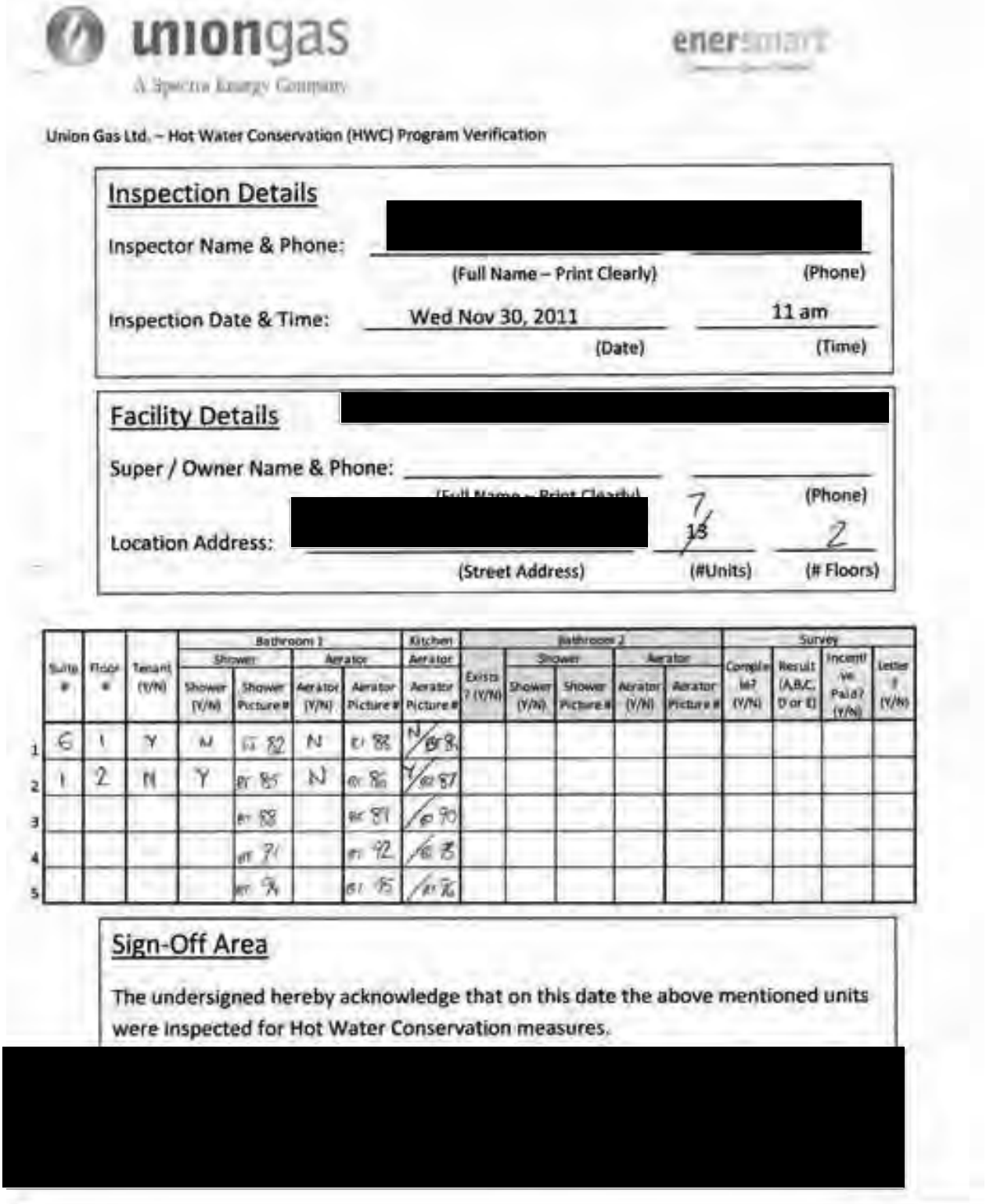
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Basic (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Shower Picture #	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Aerator Picture #	Survey Complete (Y/N)	Survey Result (A,B,C, D or E)	Survey Incentive Paid (Y/N)	Survey Letter (Y/N)
1	609	6	N	N	104	N	105	N 106	N								
2	508	5	Y	N	107	N	108	N 109	N								
3	407	4	N	N	110	N	111	N112	N								
4	202	2	N	N	113	N	114	N115	N								
5	101	1	Y	N	116	N	117	N118	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed Nov 30, 2011 (Date) 11 am (Time)

Facility Details

Super / Owner Name & Phone: _____ _____
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] 7 (#Units) 2 (# Floors)
(Street Address)

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Picture #	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture #	Survey Complete? (Y/N)	Survey Result (A,B,C, D or E)	Survey Incentive Paid? (Y/N)	Survey Letter # (Y/N)
1	6	1	Y	N	82	N	83	N/84									
2	1	2	N	Y	85	N	86	Y/87									
3					88		89	/90									
4					91		92	/93									
5					94		95	/96									

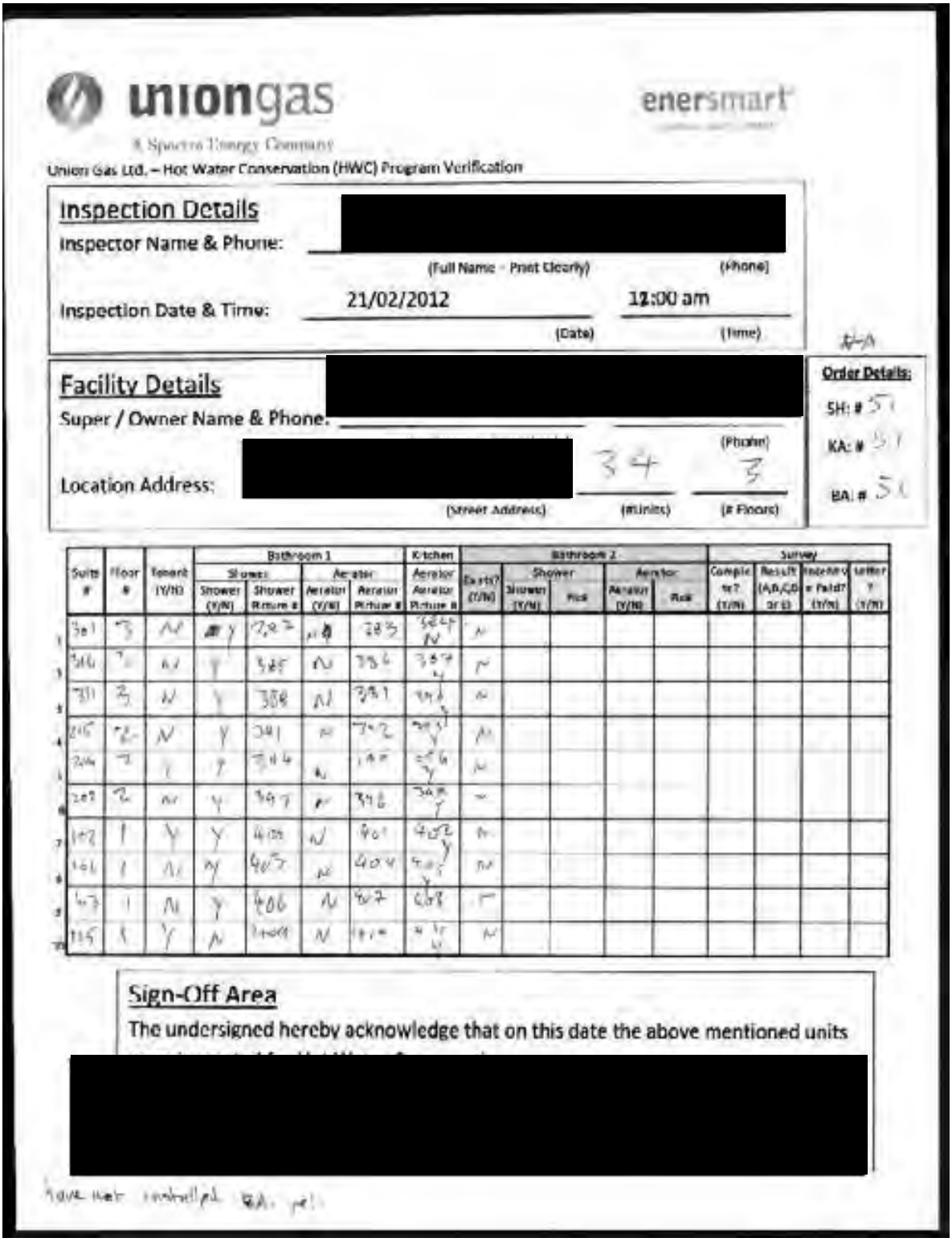
Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

Appendix C – Sign-Off Sheets (Field Data) – Phase 2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name - Print Clearly) (Phone)

Inspection Date & Time: 21/02/2012 12:00 am
(Date) (Time)

Facility Details

Super / Owner Name & Phone: [redacted]

Location Address: [redacted] 34 3
(Street Address) (#Units) (# Floors)

Order Details:
SH: # 51
KA: # 51
BA: # 51

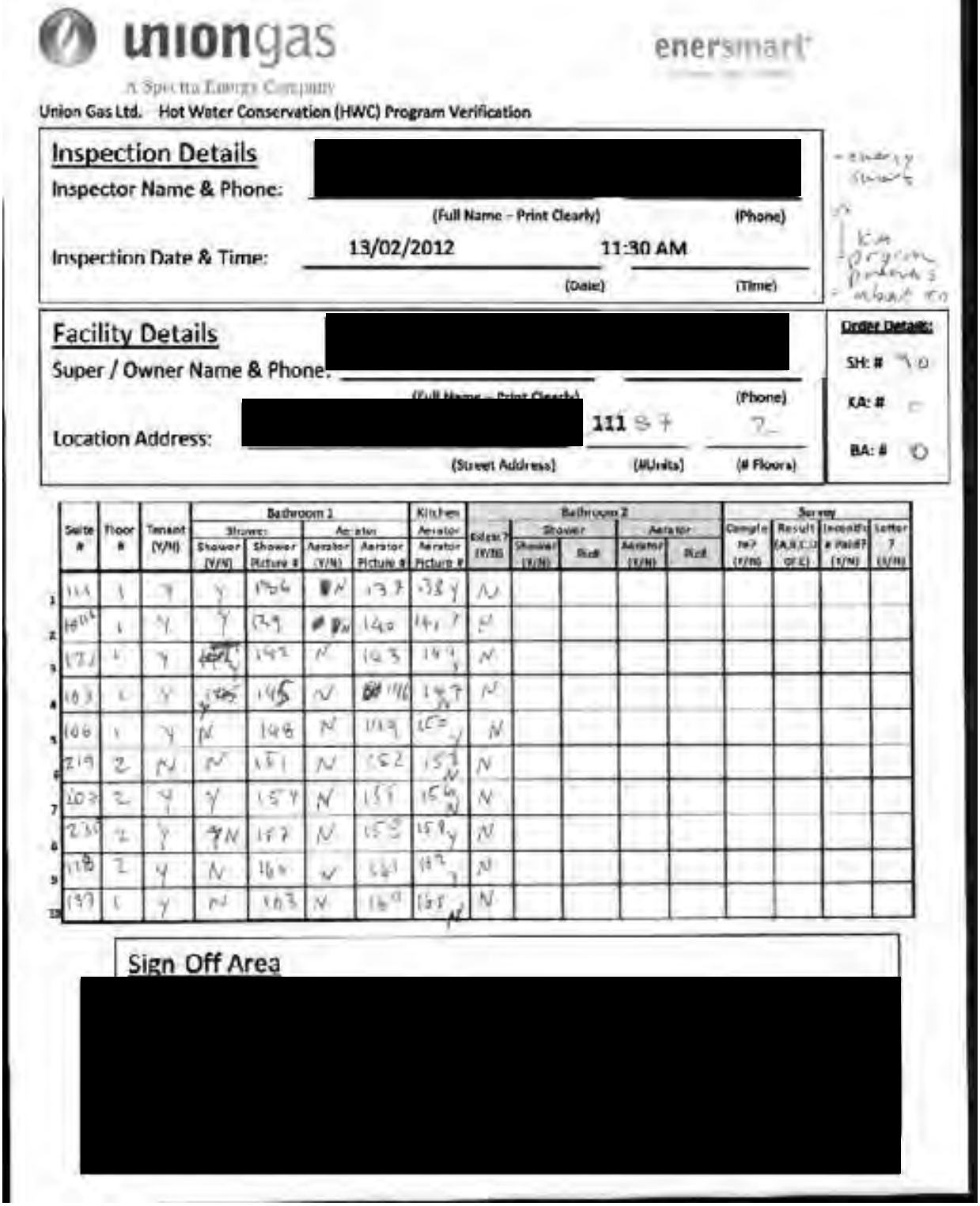
Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Risk	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Risk	Survey Complete? (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter Y (Y/N)
301	3	N	Y	297	N	283	284 N	N								
306	3	N	Y	285	N	286	287 Y	N								
311	3	N	Y	308	N	291	292 Y	N								
315	3	N	Y	301	N	302	303 Y	N								
204	2	Y	Y	314	N	315	316 Y	N								
203	2	N	Y	317	N	318	319 Y	N								
102	1	Y	Y	400	N	401	402 Y	N								
106	1	N	N	403	N	404	405 Y	N								
107	1	N	Y	406	N	407	408	N								
115	1	Y	N	409	N	410	411 Y	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 13/02/2012 (Date) 11:30 AM (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 111 (#Units) 7 (# Floors)

Order Details:

SH: # 10

KA: #

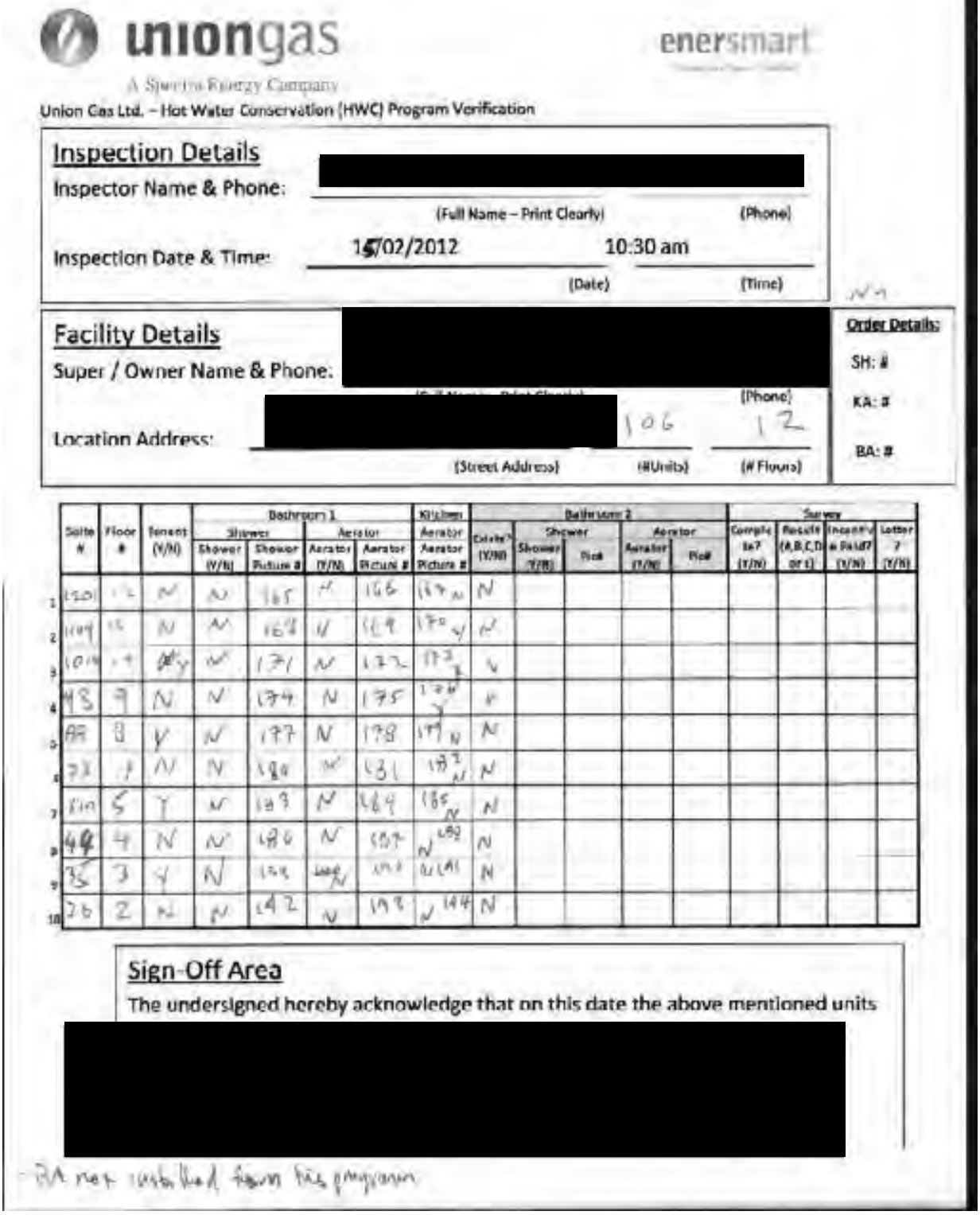
BA: #

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower: Shower (Y/N)	Bathroom 1 Shower: Shower Picture #	Bathroom 1 Aerator: Aerator (Y/N)	Bathroom 1 Aerator: Aerator Picture #	Kitchen Aerator: Aerator Picture #	Bidet? (Y/N)	Bathroom 2 Shower: Shower (Y/N)	Bathroom 2 Shower: Bidet	Bathroom 2 Aerator: Aerator (Y/N)	Bathroom 2 Aerator: Bidet	Survey: Complete? (Y/N)	Survey: Result (A,B,C,D or E)	Survey: Incentive Paid? (Y/N)	Survey: Letter 7 (Y/N)
1	111	1	Y	Y	136	N	137	138	N								
2	110	1	Y	Y	139	N	140	141	N								
3	107	1	Y	Y	142	N	143	144	N								
4	103	1	Y	Y	145	N	146	147	N								
5	106	1	Y	N	148	N	149	150	N								
6	219	2	N	N	151	N	152	153	N								
7	207	2	Y	Y	154	N	155	156	N								
8	211	2	Y	N	157	N	158	159	N								
9	110	2	Y	N	160	N	161	162	N								
10	197	1	Y	N	163	N	164	165	N								

Sign Off Area

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 15/02/2012 (Date) 10:30 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Phone)

Location Address: [redacted] (Street Address) 106 (#Units) 12 (# Floors)

Order Details:

SH: #

KA: #

BA: #

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Estrate? (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Pic#	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Pic#	Survey Complete? (Y/N)	Result (A,B,C,D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
1	120	12	N	N	165	N	166	167 N	N								
2	109	10	N	N	168	N	169	170 N	N								
3	101	9	N	N	171	N	172	173 Y	N								
4	48	9	N	N	174	N	175	176 Y	N								
5	88	8	Y	N	177	N	178	179 N	N								
6	73	7	N	N	180	N	181	182 N	N								
7	60	6	Y	N	183	N	184	185 N	N								
8	44	4	N	N	186	N	187	N 188	N								
9	35	3	Y	N	189	N	190	191 N	N								
10	26	2	N	N	192	N	193	N 194	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

BA not installed from this program

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]

Inspection Date & Time: 23/02/2012 (Date) 11:00 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Phone)

Location Address: [redacted] (Street Address) (#Units) 12 (# Floors)

Order Details:

SH: #

KA: #

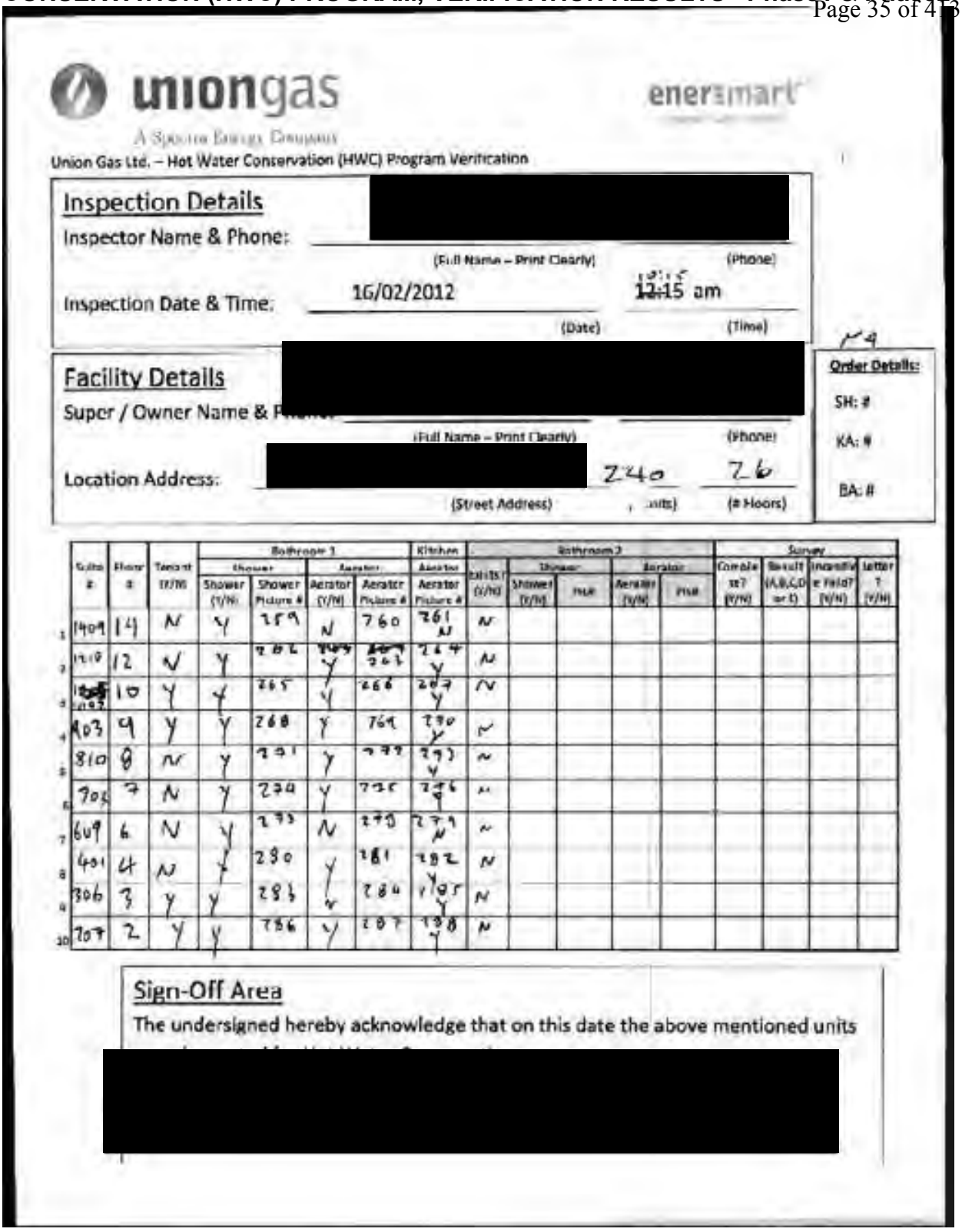
BA: #

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pics	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pics	Survey Complete? (Y/N)	Result? (A,B,C,D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 16/02/2012 (Date) 12:15 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 240 (# Units) 26 (# Floors)

Order Details:
SH: #
KA: #
BA: #

Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower PSUR	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator PSUR	Survey Complete (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1409	14	N	Y	259	N	760	261 N	N								
1210	12	N	Y	262	Y	263 Y	264 Y	N								
1005 1007	10	Y	Y	265	Y	266	267 Y	N								
903	9	Y	Y	268	Y	769	270 Y	N								
810	8	N	Y	271	Y	272	273 Y	N								
705	7	N	Y	274	Y	275	276 Y	N								
609	6	N	Y	277	N	278	279 N	N								
401	4	N	Y	280	Y	281	282 Y	N								
306	3	Y	Y	283	Y	284	285 Y	N								
207	2	Y	Y	286	Y	287	288 Y	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 15/02/2012 (Date) 11:30 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 143 (#Units) 12 (# Floors)

Order Details:

SH: # 137

KA: #

BA: # 137

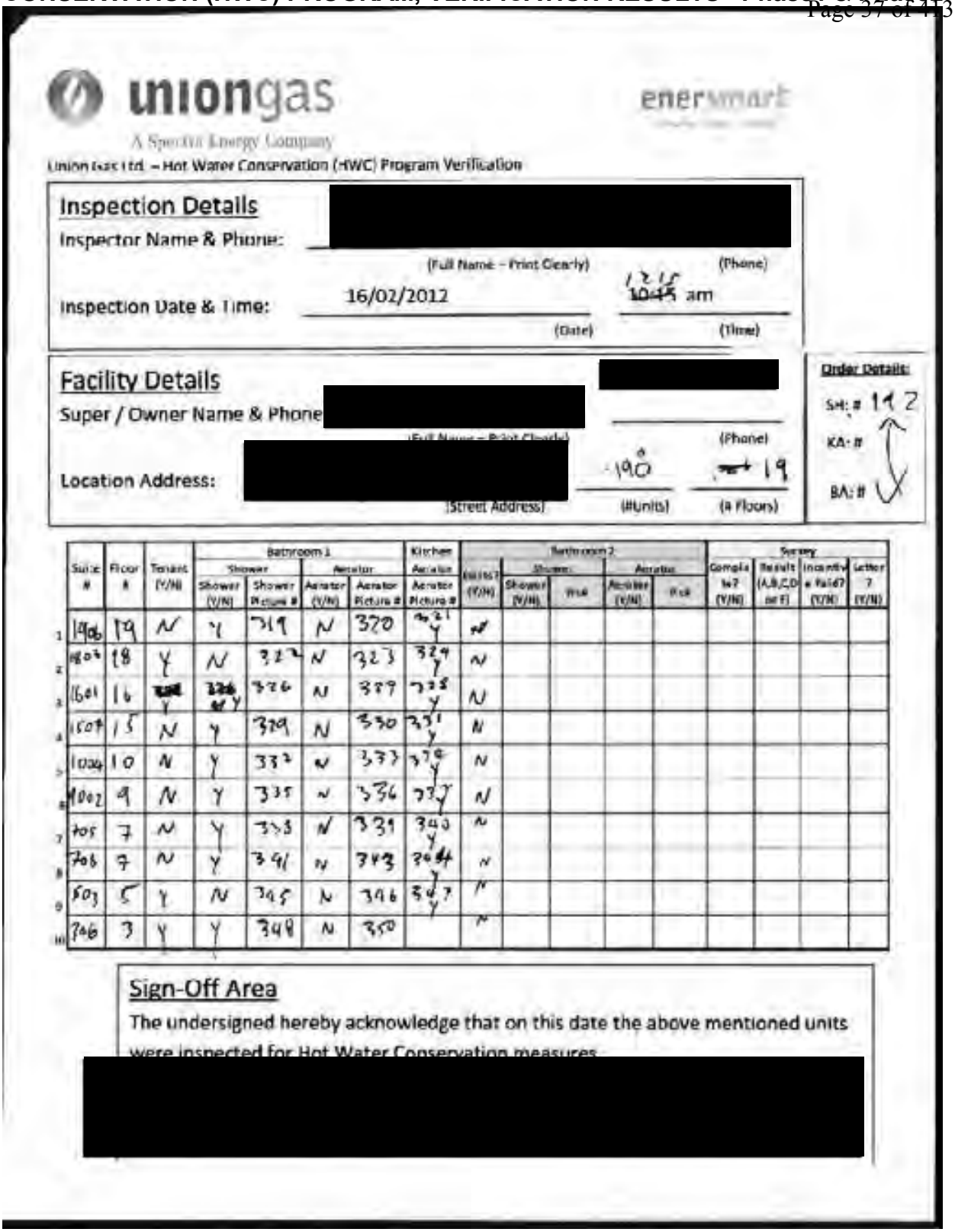
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Size	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Size	Safety Complete? (Y/N)	Safety Reason (A,B,C,D or E)	Safety Incentive Paid? (Y/N)	Safety Letter? (Y/N)
1	142	12	Y	N	195	N	196	197 N	N								
2	106	11	N	N	198	N	199	N 200	N								
3	102	10	N	N	201	N	202	N 203	N								
4	307	8	Y	N	204	N	205	206 N	N								
5	310	9	N	N	207	N	208	209 N	N								
6	311	9	N	N	210	N	211	212 N	N								
7	411	5	Y	N	213	N	214	215 N	N								
8	404	4	Y	N	216	N	217	218 N	N								
9	209	3	N	N	219	N	220	N 221	N								
10	202	2	N	N	222	N	223	224	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 16/02/2012 (Date) 1215 ~~1045~~ am (Time)

Facility Details

Super / Owner Name & Phone [redacted] (Full Name – Print Clearly) [redacted] (Phone)

Location Address: [redacted] (Street Address) 190 (#Units) 19 (# Floors)

Order Details: SH: # 112 KA: # BA: #

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pic#	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pic#	Survey Complete? (Y/N)	Survey Result (A,B,C,D or F)	Survey Incentive Paid? (Y/N)	Survey Letter 7 (Y/N)
1	1906	19	N	Y	319	N	320	321 Y	N								
2	1803	18	Y	N	322	N	323	324 Y	N								
3	1601	16	[redacted] Y	326 of Y	326	N	327	328 Y	N								
4	1504	15	N	Y	329	N	330	331 Y	N								
5	1004	10	N	Y	332	N	333	334 Y	N								
6	1002	9	N	Y	335	N	336	337 Y	N								
7	705	7	N	Y	338	N	339	340 Y	N								
8	706	7	N	Y	341	N	342	343 Y	N								
9	503	5	Y	N	345	N	346	347 Y	N								
10	306	3	Y	Y	348	N	350		N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 23/02/2012 (Date) 1:00 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Print Clearly) (Phone)

Location Address: [redacted] (Street Address) (# Units) (# Floors)

Order Details:
SIL #
KA: #
BA: #

Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	RESS? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pic#	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pic#	Survey Complete? (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

SeeLine

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]

(Full Name – Print Clearly) (Phone)

Inspection Date & Time: 15/02/2012 12:30 am

(Date) (Time)

Facility Details

Super / Owner Name & Phone: [redacted]

(Full Name – Print Clearly) (Phone)

Location Address: [redacted] 137 18

(Street Address) (#Units) (# Floors)

Order Details:

SH # 137

KA # 137

HA # 137

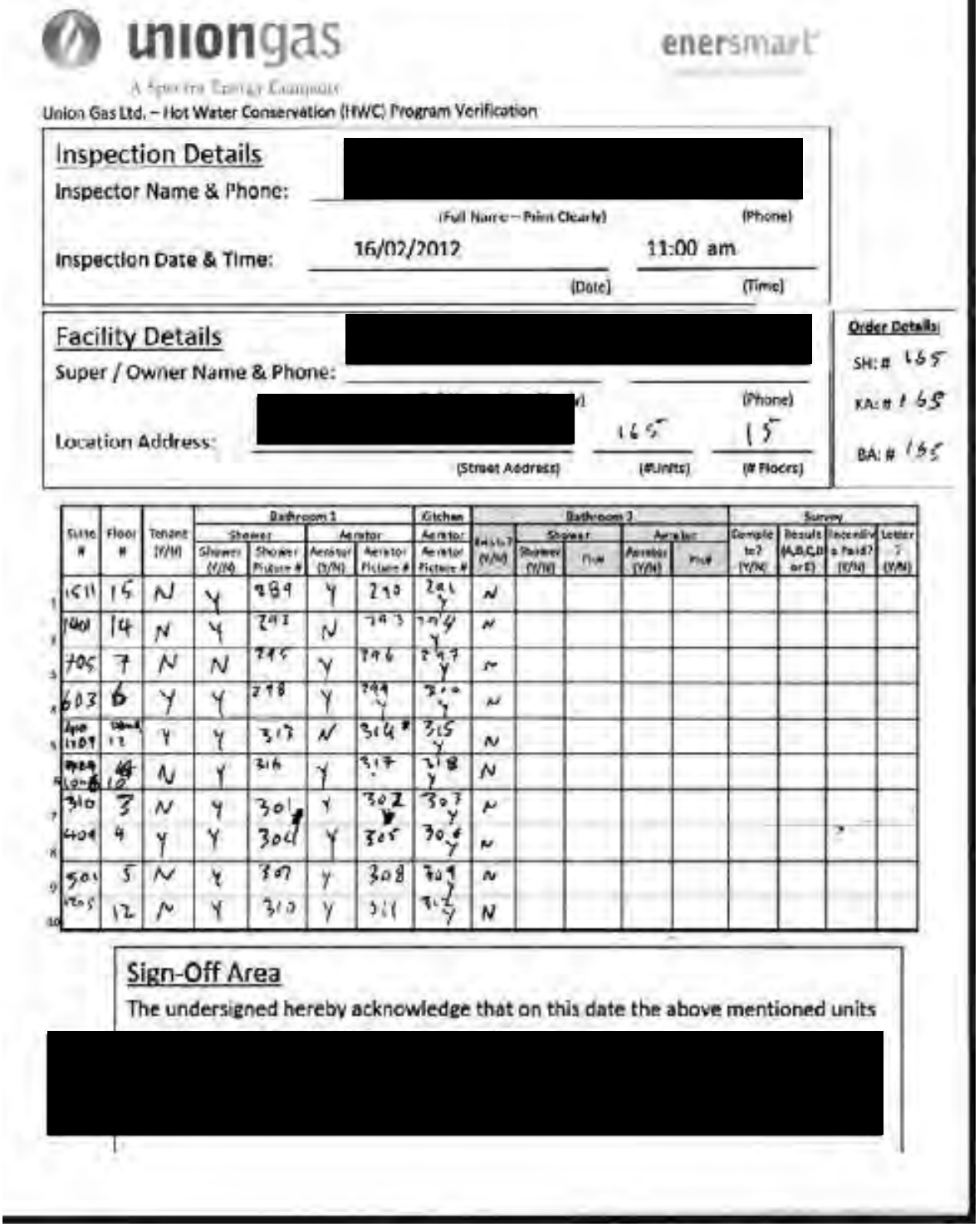
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower: Shower (Y/N)	Bathroom 1 Shower: Shower Picture #	Bathroom 1 Aerator: Aerator (Y/N)	Bathroom 1 Aerator: Aerator Picture #	Kitchen Aerator: Aerator Picture #	Bathroom 2: Bath2? (Y/N)	Bathroom 2 Shower: Shower (Y/N)	Bathroom 2 Shower: Pic#	Bathroom 2 Aerator: Aerator (Y/N)	Bathroom 2 Aerator: Pic#	Survey: Complete? (Y/N)	Survey: Result (A,B,C,D or E)	Survey: Incentive Paid? (Y/N)	Survey: Letter? (Y/N)
1	1902	19	N	N	225	N	226	227 Y	N								
2	[illegible]	17	N	N	228	N	229	Y 230	N								
3	1401	14	Y	N	231	N	232	233 Y	Y	used in closet #273				4 N			
4	1206	12	N	N	235	N	236	237	N								
5	1102	11	Y	N	238	N	239	240 Y	Y	N	N	N	241	N			
6	904	9	N	N	242	N	243	244 Y	N								
7	706	7	Y	Y	245	N	246	247 Y	Y	N	N	N	248	N			
8	503	5	Y	N	249	N	250	251 Y	Y	N	N	N	252	N			
9	308	3	Y	N	253	N	254	255 N									
10	204	2	Y	N	256	N	257	258 Y									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



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Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 16/02/2012 (Date) 11:00 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Phone)

Location Address: [redacted] (Street Address) 165 (#Units) 15 (# Floors)

Order Details:

SH: # 165

KA: # 165

BA: # 165

Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Flow	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Flow	Survey Complete (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter (Y/N)
1511	15	N	Y	289	Y	290	291 Y	N								
1401	14	N	Y	292	N	293	294 Y	N								
705	7	N	N	295	Y	296	297 Y	N								
603	6	Y	Y	298	Y	299 Y	300 Y	N								
1109	11	Y	Y	313	N	314	315 Y	N								
1004	10	N	Y	316	Y	317	318 Y	N								
310	3	N	Y	301	Y	302	303 Y	N								
404	4	Y	Y	304	Y	305	306 Y	N								
501	5	N	Y	307	Y	308	309 Y	N								
1205	12	N	Y	310	Y	311	312 Y	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 23/02/2012 (Date) 12:00 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Phone)

Location Address: [redacted] (Street Address) (#Units) 6 (# Floors)

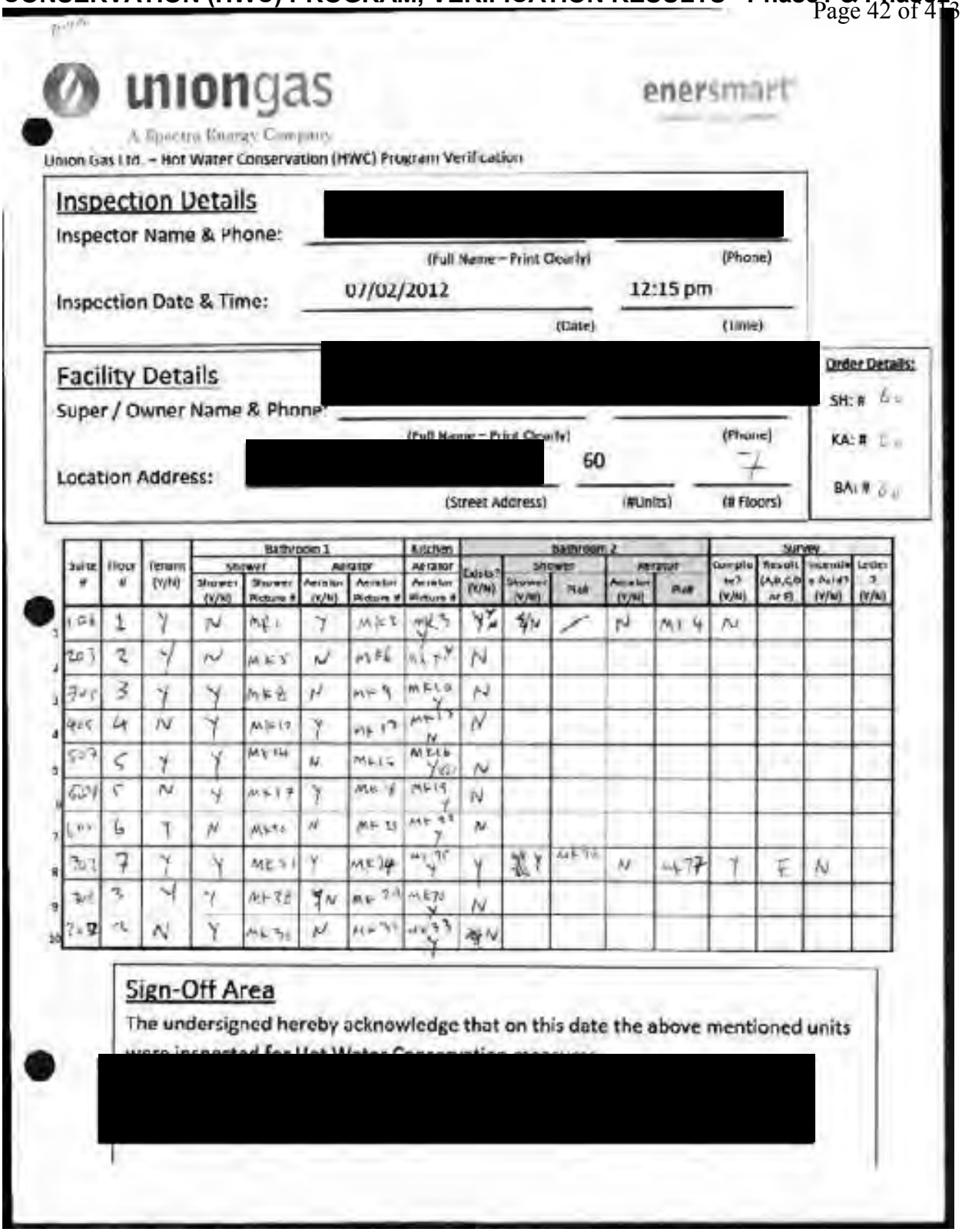
Order Details:
SH: #
KA: #
BA. #

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Flow	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Flow	Survey Complete? (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter? (Y/N)	
1	601	6	N	N	463	N	464	465 N	Y	Y N	466	N/A	467	N	—		Y	482
2	604	6	N	N	467	N	468	469 N	Y	N	472		471	N		—	Y	101
3	607	6	N Y	N	472	N	473	474 N	Y	N	474	N	475	Y	E	N	N	
4	504	5	N Y	N	477	N	478	479 N	Y	N	482	N	481	N Y	F	N	N	
5	504	5	N	N	482	N	431	484 N	Y	N	485	N	486	Y	E	N	N	
6	505	5	N	N	487	N	488	489 N	Y	N	490	N	491	N			Y	103
7	506	5	N Y	N	492	N	493	494 N	Y	N	495	N	496	Y	E	N	N	
8	508	5	N	N	497	N	498	499 N	Y	N	500	N	501	N			Y	NL 104
9	701	7	Y	Y	502	N	503	504 N	Y	N	505	N	506	Y	E	N	N	
10	101	1	Y	N	509	N	508	510	Y	N	511	N	512	Y	E	N	N	

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



union gas
A Spectra Energy Company

enersmart

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: 07/02/2012 (Date) 12:15 pm (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 60 (#Units) 7 (# Floors)

Order Details:
SH: #
KA: #
BA: #

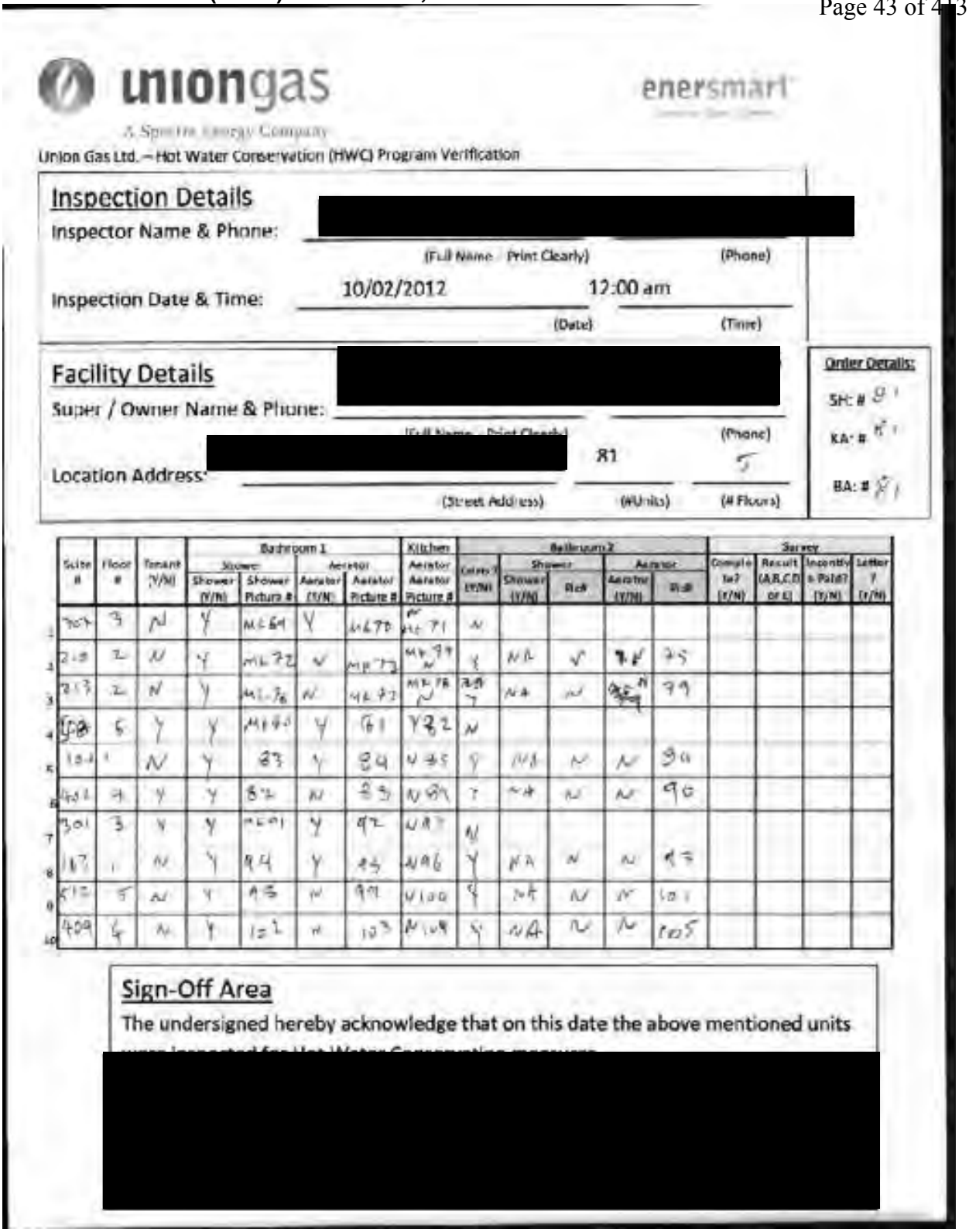
Suite #	Floor #	Return (Y/N)	Bathroom 1				Kitchen	Bathroom 2					Survey			
			Shower		Aerator		Aerator	Exists? (Y/N)	Shower		Aerator		Complete? (Y/N)	Result (A,B,C,D or F)	Interview Asked? (Y/N)	Letter 3 (Y/N)
			Shower (Y/N)	Shower Picture #	Aerator (Y/N)	Aerator Picture #	Aerator Picture #		Shower (Y/N)	Hab	Aerator (Y/N)	Hab				
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name - Print Clearly) (Phone)

Inspection Date & Time: 10/02/2012 (Date) 12:00 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name - Print Clearly) (Phone)

Location Address: [redacted] (Street Address) R1 (# Units) 5 (# Floors)

Order Details:
SH: # 9
KA: # 5
BA: # 9

Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower: Shower (Y/N)	Bathroom 1 Shower: Shower Picture #	Bathroom 1 Aerator: Aerator (Y/N)	Bathroom 1 Aerator: Aerator Picture #	Kitchen Aerator: Aerator Picture #	Bathroom 2: Caulked? (Y/N)	Bathroom 2 Shower: Shower (Y/N)	Bathroom 2 Shower: Rich	Bathroom 2 Aerator: Aerator (Y/N)	Bathroom 2 Aerator: Rich	Survey: Complete? (Y/N)	Survey: Result (A,B,C,D or E)	Survey: Incentive Paid? (Y/N)	Survey: Letter Y (Y/N)
304	3	N	Y	ML69	Y	ML70	ML71	N								
203	2	N	Y	ML72	N	ML73	ML74	Y	NA	N	N	75				
213	2	N	Y	ML76	N	ML77	ML78	Y	NA	N	N	79				
608	6	Y	Y	ML80	Y	81	Y82	N								
104	1	N	Y	83	Y	84	N85	Y	NA	N	N	86				
401	4	Y	Y	87	N	88	N89	Y	NA	N	N	90				
301	3	Y	Y	ML91	Y	92	N93	N								
107	1	N	Y	94	Y	95	N96	Y	NA	N	N	97				
512	5	N	Y	98	N	99	N100	Y	NA	N	N	101				
409	4	N	Y	102	N	103	N104	Y	NA	N	N	105				

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

uniongas
A Spectra Energy Company

enersmart

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: 10/02/2012 11:00 am
(Date) (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Phone)

Location Address: [redacted] 73 10
(Street Address) (#Units) (# Floors)

Order Details:
SH: #
KA: #
BA: #

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower: Shower (Y/N)	Bathroom 1 Shower: Shower Picture #	Bathroom 1 Aerator: Aerator (Y/N)	Bathroom 1 Aerator: Aerator Picture #	Kitchen Aerator: Aerator Picture #	Bathroom 2: Exists? (Y/N)	Bathroom 2 Shower: Shower (Y/N)	Bathroom 2 Shower: Pic#	Bathroom 2 Aerator: Aerator (Y/N)	Bathroom 2 Aerator: Pic#	Survey: Complete? (Y/N)	Survey: Result (A,B,C,D or E)	Survey: Incentive Paid? (Y/N)	Survey: Letter? (Y/N)
1	704	2	N	N	ME34	N	35	36 N	Y	N/A	N	N	37	N			
2	513	5	Y	N	ME39	N	ME39	40 Y	N								
3	504	5	Y	N	ME41	Y	ME42	43 Y	N								
4	506	5	Y	N	ME44	Y	ME45	ME46 Y	N								
5	401	4	Y	N	ME47	N	ME48	ME49 N	Y	NA	N	N	50				N
6	403	4	N	Y	ME51	N	ME52	ME53 Y	N								
7	404	4	N	N	ME55	N	ME54	ME56 N	N								
8	211	2	Y	N	ME57	N	ME58	59 N	Y	NA	N	N	60				
9	305	3	Y	N	61	Y	ME62	ME63 Y	Y	NA	N	Y	64				
10	352	3	Y	N	65	Y	ME66	ME67 N	Y	NA	N	N	68				

50
2
255

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

uniongas
A Spectra Energy Company

enersmart

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name Print Clearly) (Phone)

Inspection Date & Time: 12/07/2012 (Date) 10:30 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted]
(Street Address) 80 (#Units) 10 (# Floors)

Order Details:
SH: #
KA: #
BA: #

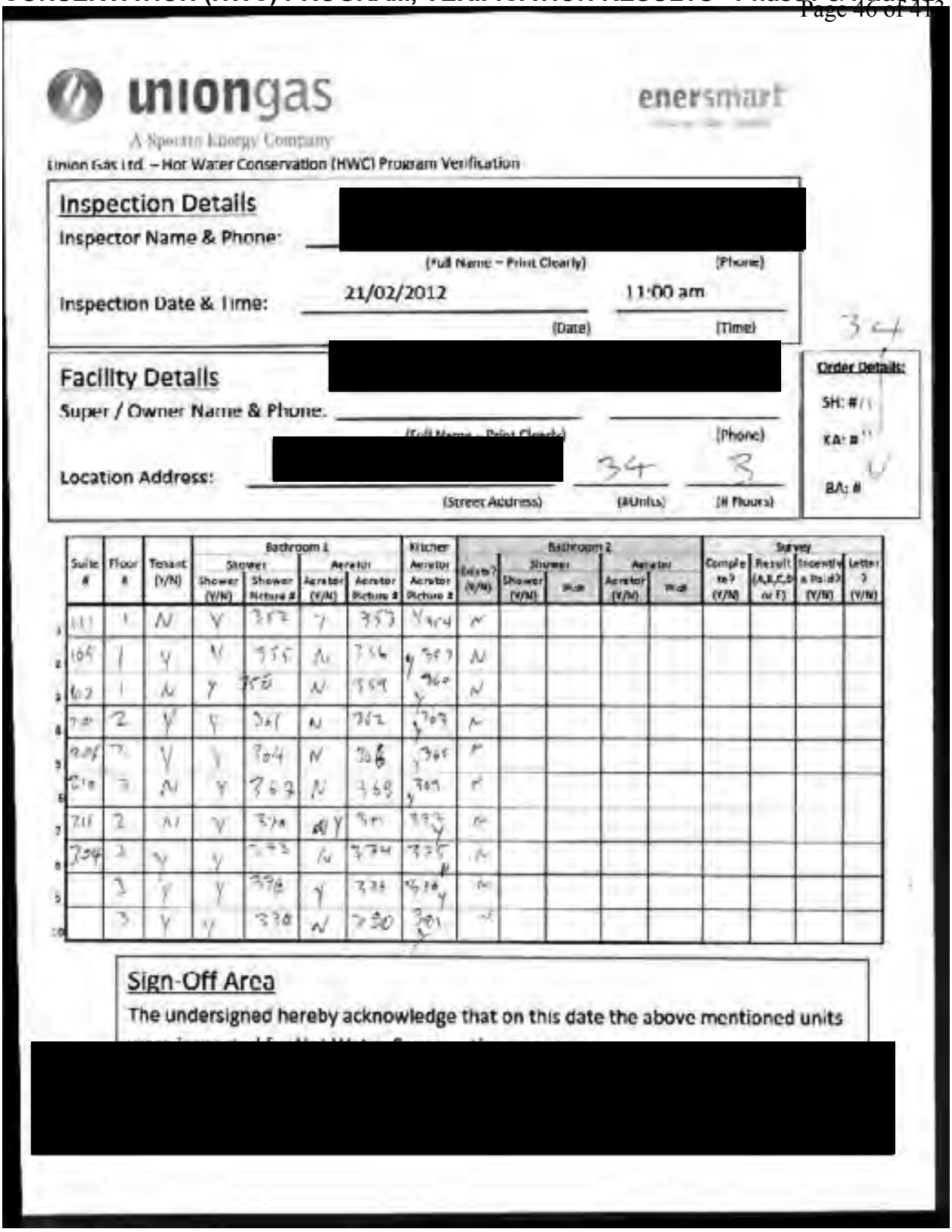
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Bath 2 (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Wall	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Wall	Survey Complete? (Y/N)	Result (A,B,C,D or F)	Incentive Paid? (Y/N)	Letter ? (Y/N)
1	1006	10	N	N	106	N	107	108 N	N								
2	1005	9	N	N	102	N	110	111 N	N								
3	1004	8	Y	N	111	Y	113	114 N	N								
4	1003	7	Y	N	115	N	116	117 Y	N								
5	1002	6	N	Y	118	Y	119	120 Y	N								
6	1001	5	N	Y	121	N	122	123 N	N								
7	1012	4	N	N	124	Y	125	126 N	N								
8	1011	3	Y	N	127	Y	128	129 N	N								
9	1010	2	N	N	130	Y	131	132 Y	N								
10	1009	1	Y	N	133	Y	134	135 N	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation purposes.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



uniongas
A Spectra Energy Company

enersmart

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: 21/02/2012 (Date) 11:00 am (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 34 (#Units) 3 (# Floors)

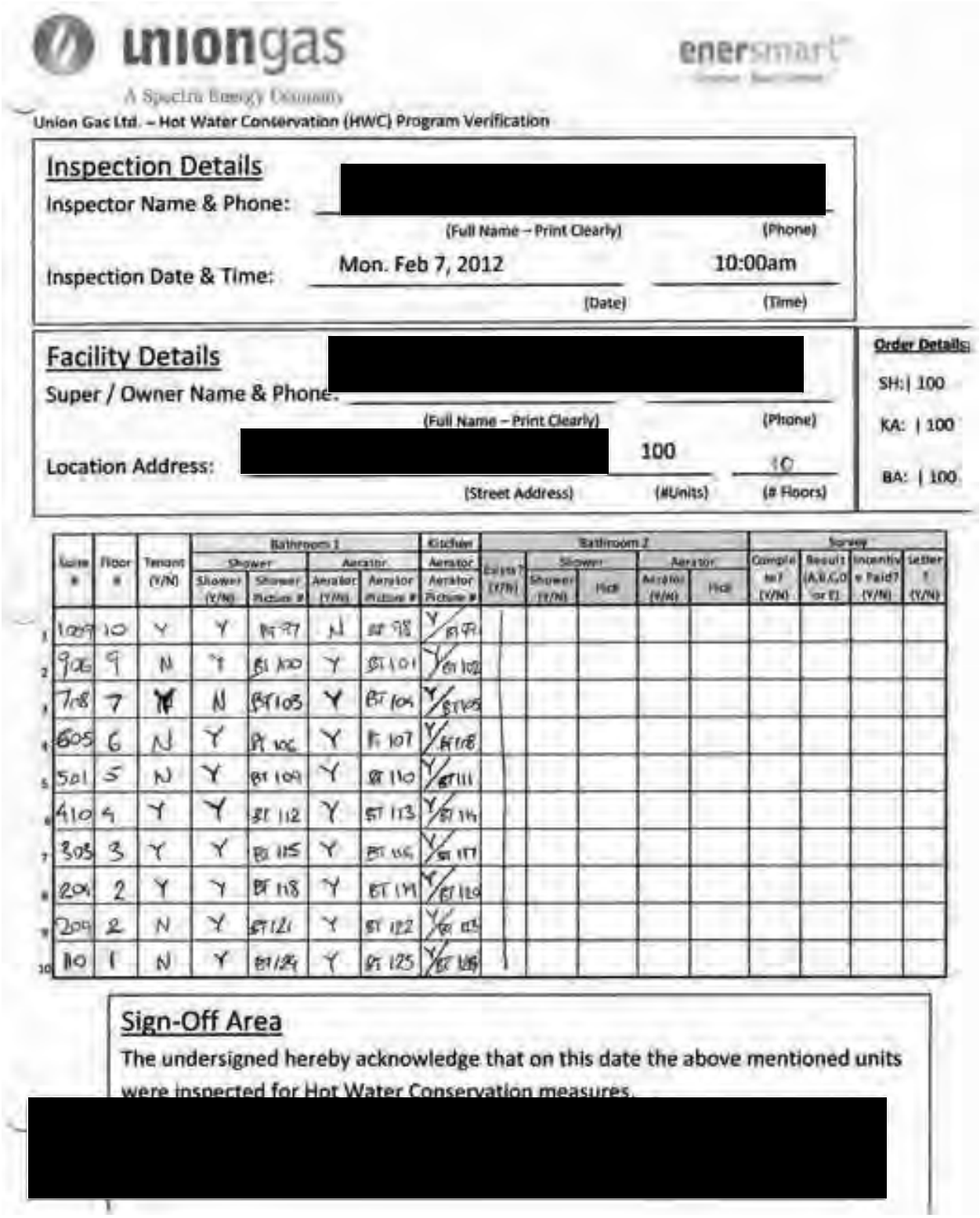
Order Details:
SH: # 34
KA: #
BA: # 0

Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator	Survey Complete? (Y/N)	Survey Result (A,B,C,D or F)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	1	N	Y	352	Y	353	Y 354	N								
2	1	Y	N	355	N	356	Y 359	N								
3	1	N	Y	358	N	359	Y 360	N								
4	2	Y	Y	361	N	362	Y 369	N								
5	2	Y	Y	364	N	366	Y 365	N								
6	2	N	Y	367	N	368	Y 369	N								
7	2	N	Y	370	N Y	371	Y 373	N								
8	2	N	Y	372	N	374	Y 375	N								
9	3	Y	Y	376	Y	378	Y 379	N								
10	3	Y	Y	378	N	380	Y 381	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Mon. Feb 7, 2012 (Date) 10:00am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 100 (#Units) 10 (# Floors)

Order Details:
SH: | 100
KA: | 100
BA: | 100

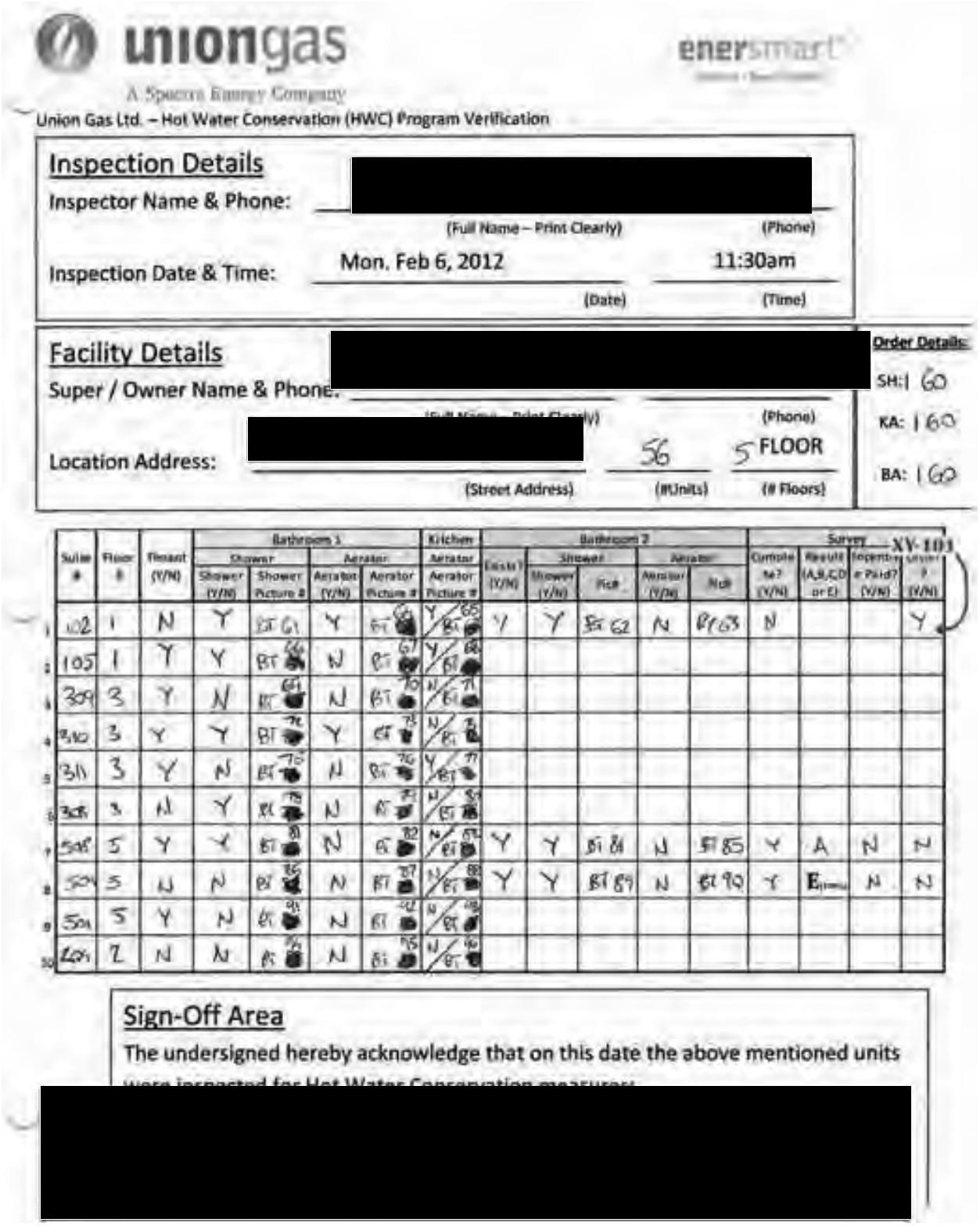
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Flow	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Flow	Survey Complete? (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	1009	10	Y	Y	BT 97	N	BT 98	Y/BT 96									
2	906	9	N	Y	BT 100	Y	BT 101	Y/BT 102									
3	708	7	N	N	BT 103	Y	BT 104	Y/BT 105									
4	605	6	N	Y	BT 106	Y	BT 107	Y/BT 108									
5	501	5	N	Y	BT 109	Y	BT 110	Y/BT 111									
6	410	4	Y	Y	BT 112	Y	BT 113	Y/BT 114									
7	305	3	Y	Y	BT 115	Y	BT 116	Y/BT 117									
8	204	2	Y	Y	BT 118	Y	BT 119	Y/BT 120									
9	209	2	N	Y	BT 121	Y	BT 122	Y/BT 123									
10	110	1	N	Y	BT 124	Y	BT 125	Y/BT 126									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Mon. Feb 6, 2012 (Date) 11:30am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Phone)

Location Address: [redacted] (Street Address) 56 (#Units) 5 FLOOR (# Floors)

Order Details: SH: 60 KA: 60 BA: 60

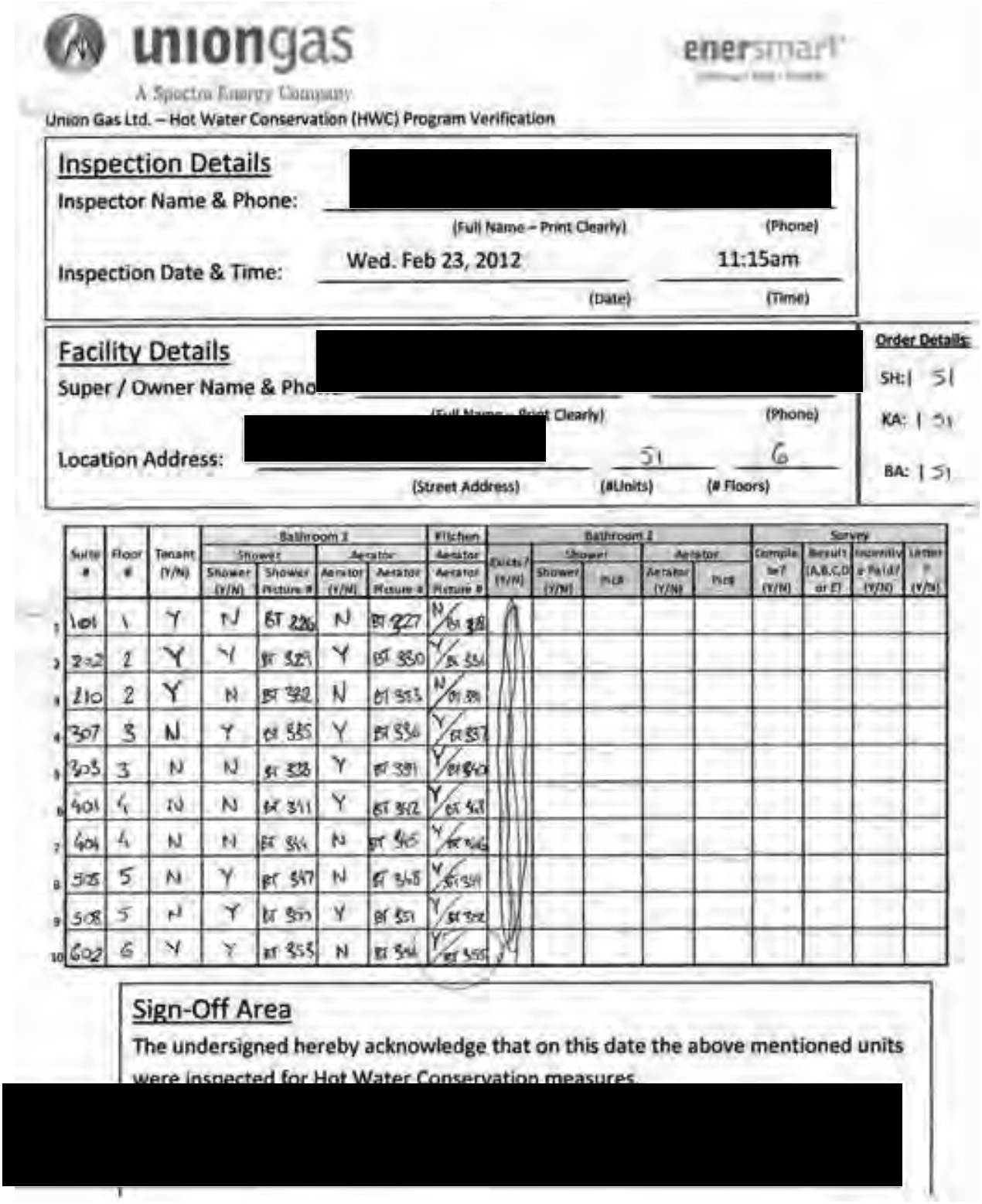
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Extra? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Pic#	Bathroom 2 Aerator (Y/N)	Bathroom 2 Pic#	Survey Complete? (Y/N)	Result (A,B,C,D or E)	Incentive Paid? (Y/N)	XV-101 (Y/N)
1	102	1	N	Y	BT 61	Y	BT 64	Y BT 65	Y	Y	BT 62	N	BT 63	N			Y
2	105	1	Y	Y	BT 66	N	BT 67	Y BT 68									
4	309	3	Y	N	BT 69	N	BT 70	N BT 71									
4	310	3	Y	Y	BT 72	Y	BT 73	N BT 74									
5	311	3	Y	N	BT 75	N	BT 76	Y BT 77									
6	308	3	N	Y	BT 78	N	BT 79	N BT 80									
7	508	5	Y	Y	BT 81	N	BT 82	N BT 83	Y	Y	BT 84	N	BT 85	Y	A	N	N
8	504	5	N	N	BT 86	N	BT 87	N BT 88	Y	Y	BT 89	N	BT 90	Y	E	N	N
9	501	5	Y	N	BT 91	N	BT 92	N BT 93									
10	201	2	N	N	BT 94	N	BT 95	N BT 96									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures:

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed. Feb 23, 2012 (Date) 11:15am (Time)

Facility Details

Super / Owner Name & Pho[redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 51 (#Units) 6 (# Floors)

Order Details: SH: | 51 KA: | 51 BA: | 51

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pict	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pict	Survey Complete (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive $ Paid? (Y/N)	Survey Letter (Y/N)
1	101	1	Y	N	BT 326	N	BT 327	N/BT 328									
2	202	2	Y	Y	BT 329	Y	BT 330	Y/BT 331									
3	210	2	Y	N	BT 332	N	BT 333	N/BT 334									
4	307	3	N	Y	BT 335	Y	BT 336	Y/BT 337									
5	308	3	N	N	BT 338	Y	BT 339	Y/BT 340									
6	401	4	N	N	BT 341	Y	BT 342	Y/BT 343									
7	404	4	N	N	BT 344	N	BT 345	Y/BT 346									
8	505	5	N	Y	BT 347	N	BT 348	Y/BT 349									
9	508	5	N	Y	BT 350	Y	BT 351	Y/BT 352									
10	602	6	Y	Y	BT 353	N	BT 354	Y/BT 355									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2

SeeLine Energy Ltd.

uniongas
A Spectra Energy Company

enersmart

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Mon. Feb 13, 2012 (Date) 2:00pm (Time)

Facility Details

Super / Owner Name & Phone [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 50 (#Units) 4 (# Floors)

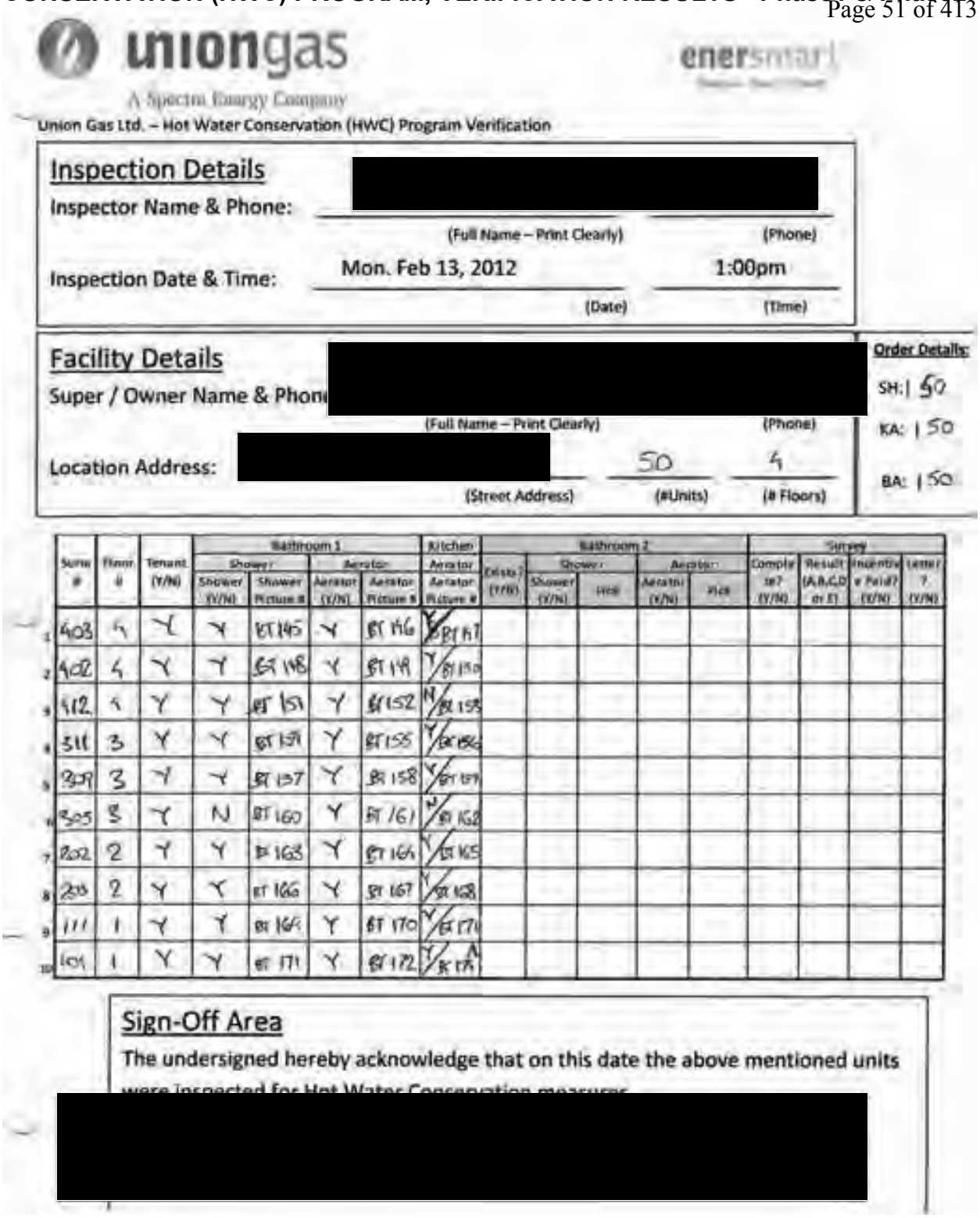
Order Details:
SH: 50
KA: 50
BA: 50

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pict	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pict	Survey Complete? (Y/N)	Result (A,B,C,D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
1	102	1	Y	N	BT 179 B	Y	BT 175	Y BT 176									
2	402	4	Y	Y	BT 177	Y	BT 178	Y BT 179									
3	403	4	Y	N	BT 180	Y	BT 181	Y BT 182									
4	410	4	Y	Y	BT 183	Y	BT 184	Y BT 185									
5	411	4	Y	Y	BT 186	Y	BT 187	Y BT 188									
6	312	3	N	Y	BT 189	Y	BT 190	Y BT 191									
7	306	3	Y	Y	BT 192	Y	BT 193	Y BT 194									
8	303	3	Y	Y	BT 195	Y	BT 196	Y BT 197									
9	207	2	N	Y	BT 198	Y	BT 199	Y BT 200									
10	214	2	Y	Y	BT 201	Y	BT 202	Y BT 203									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



union gas
A Spectra Energy Company

enersmart

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Mon. Feb 13, 2012 (Date) 1:00pm (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 50 (#Units) 4 (# Floors)

Order Details:
SH: 50
KA: 50
BA: 50

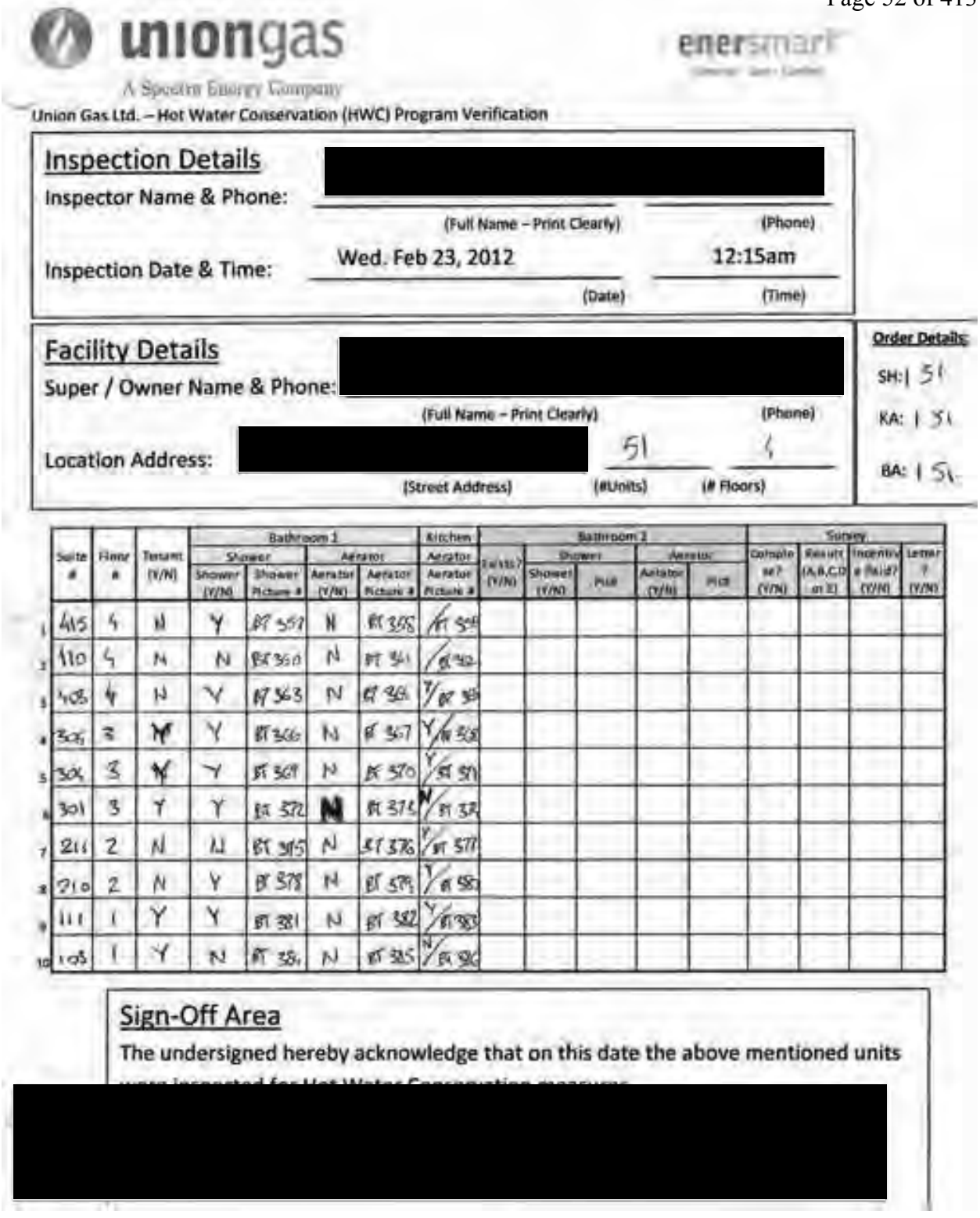
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Picture #	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture #	Survey Complete? (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	403	4	Y	Y	BT 145	Y	BT 146	Y BT 147									
2	402	4	Y	Y	BT 148	Y	BT 149	Y BT 150									
3	412	4	Y	Y	BT 151	Y	BT 152	N BT 153									
4	311	3	Y	Y	BT 154	Y	BT 155	Y BT 156									
5	309	3	Y	Y	BT 157	Y	BT 158	Y BT 159									
6	305	3	Y	N	BT 160	Y	BT 161	N BT 162									
7	202	2	Y	Y	BT 163	Y	BT 164	Y BT 165									
8	208	2	Y	Y	BT 166	Y	BT 167	Y BT 168									
9	111	1	Y	Y	BT 169	Y	BT 170	Y BT 171									
10	101	1	Y	Y	BT 171	Y	BT 172	Y BT 173 A									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed. Feb 23, 2012 (Date) 12:15am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 51 (#Units) 4 (# Floors)

Order Details: SH: 51 KA: 51 BA: 51

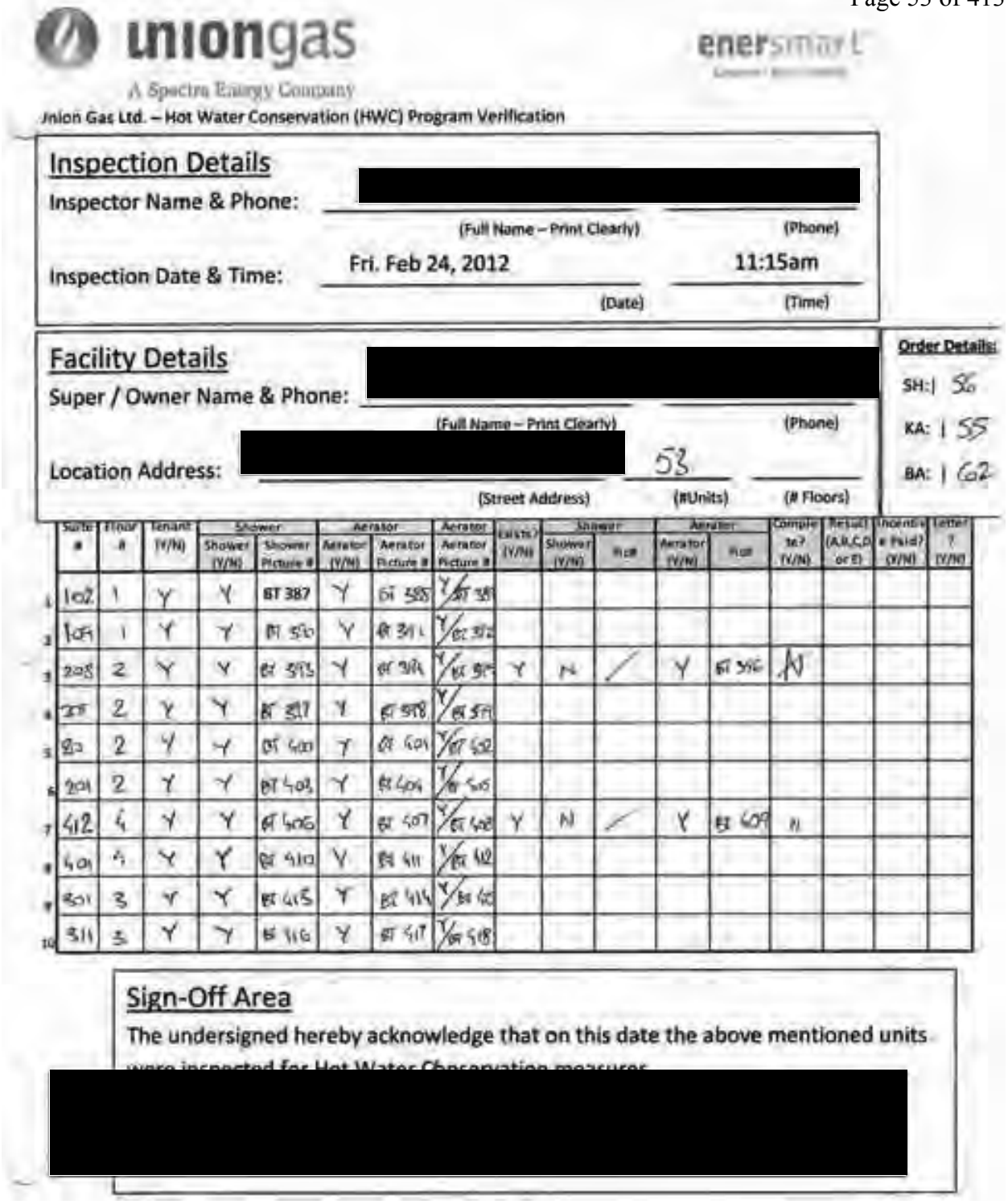
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pic#	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pic#	Survey Complete? (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive $ Paid? (Y/N)	Survey Letter ? (Y/N)
1	415	4	N	Y	BT 357	N	BT 358	BT 356									
2	410	4	N	N	BT 360	N	BT 361	BT 362									
3	405	4	N	Y	BT 363	N	BT 364	Y/BT 365									
4	305	3	N	Y	BT 366	N	BT 367	Y/BT 368									
5	304	3	N	Y	BT 369	N	BT 370	Y/BT 371									
6	301	3	Y	Y	BT 372	N	BT 373	N/BT 374									
7	211	2	N	N	BT 375	N	BT 376	Y/BT 377									
8	210	2	N	Y	BT 378	N	BT 379	Y/BT 380									
9	111	1	Y	Y	BT 381	N	BT 382	Y/BT 383									
10	105	1	Y	N	BT 384	N	BT 385	N/BT 386									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Fri. Feb 24, 2012 (Date) 11:15am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 53 (#Units) (# Floors)

Order Details:
SH: | 56
KA: | 55
BA: | 62

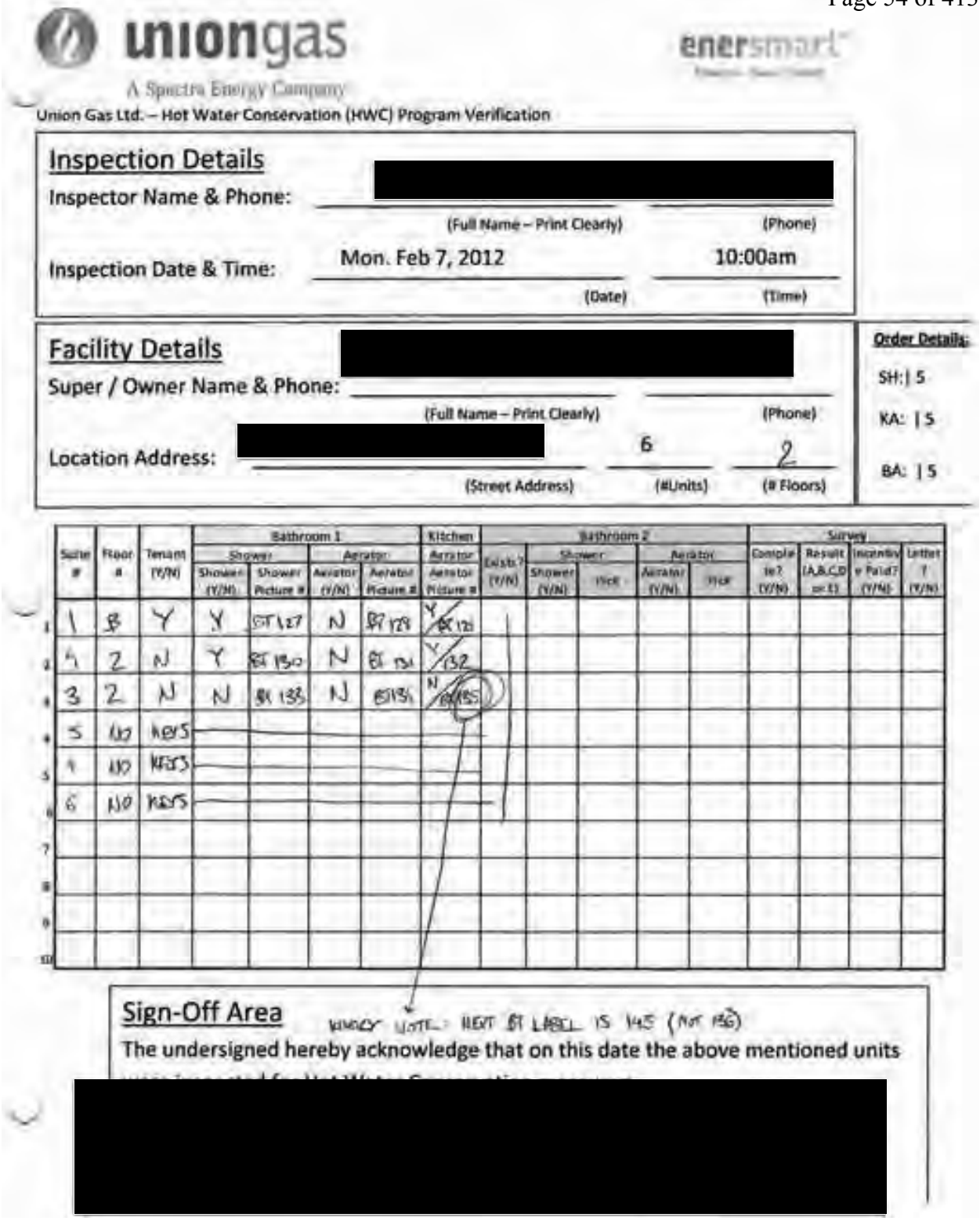
	Suite #	Floor #	Tenant (Y/N)	Shower		Aerator		Aerator	Exists? (Y/N)	Shower		Aerator		Complete? (Y/N)	Result (A,B,C,D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
				Shower (Y/N)	Shower Picture #	Aerator (Y/N)	Aerator Picture #	Aerator Picture #		Shower (Y/N)	Flow	Aerator (Y/N)	Flow				
1	102	1	Y	Y	BT 387	Y	BT 388	Y/BT 389									
2	104	1	Y	Y	BT 390	Y	BT 391	Y/BT 392									
3	208	2	Y	Y	BT 393	Y	BT 394	Y/BT 395	Y	N	✓	Y	BT 396	N			
4	210	2	Y	Y	BT 397	Y	BT 398	Y/BT 399									
5	213	2	Y	Y	BT 400	Y	BT 401	Y/BT 402									
6	201	2	Y	Y	BT 403	Y	BT 404	Y/BT 405									
7	412	4	Y	Y	BT 406	Y	BT 407	Y/BT 408	Y	N	✓	Y	BT 409	N			
8	401	4	Y	Y	BT 410	Y	BT 411	Y/BT 412									
9	501	5	Y	Y	BT 413	Y	BT 414	Y/BT 415									
10	311	3	Y	Y	BT 416	Y	BT 417	Y/BT 418									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



A Spectra Energy Company

enersmart

Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Mon. Feb 7, 2012 (Date) 10:00am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 6 (#Units) 2 (# Floors)

Order Details:
SH: | 5
KA: | 5
BA: | 5

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pict.	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pict.	Survey Complete? (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	1	B	Y	Y	BT 127	N	BT 128	Y BT 126									
2	4	2	N	Y	BT 130	N	BT 131	Y 132									
3	3	2	N	N	BT 133	N	BT 134	N BT 135									
4	5	UP	KEYS														
5	4	UP	KEYS														
6	6	UP	KEYS														
7																	
8																	
9																	
10																	

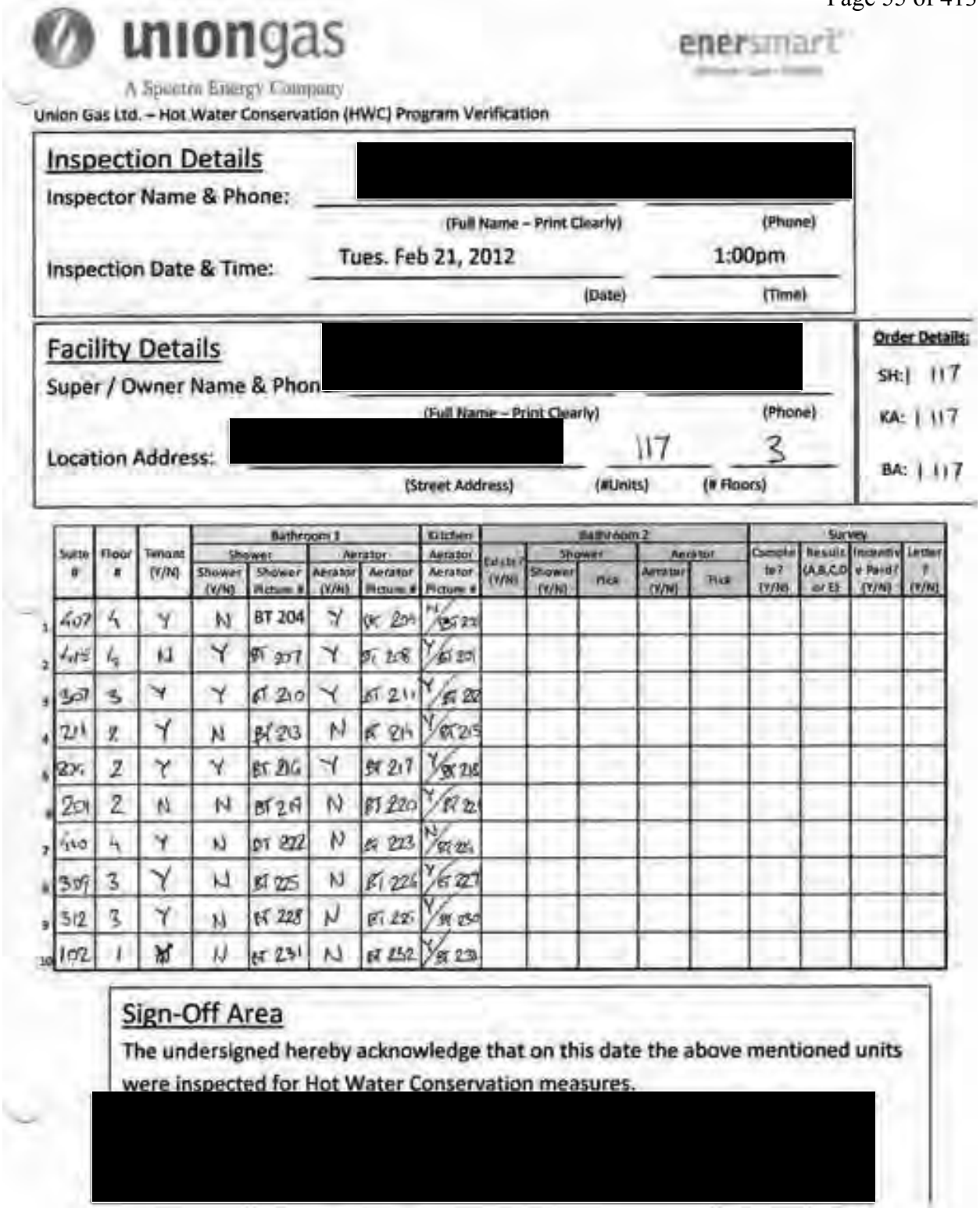
Sign-Off Area

KINDLY NOTE: NEXT BT LABEL IS 145 (NOT 136)

The undersigned hereby acknowledge that on this date the above mentioned units

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Tues. Feb 21, 2012 (Date) 1:00pm (Time)

Facility Details

Super / Owner Name & Phon [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 117 (#Units) 3 (# Floors)

Order Details:

SH: | 117

KA: | 117

BA: | 117

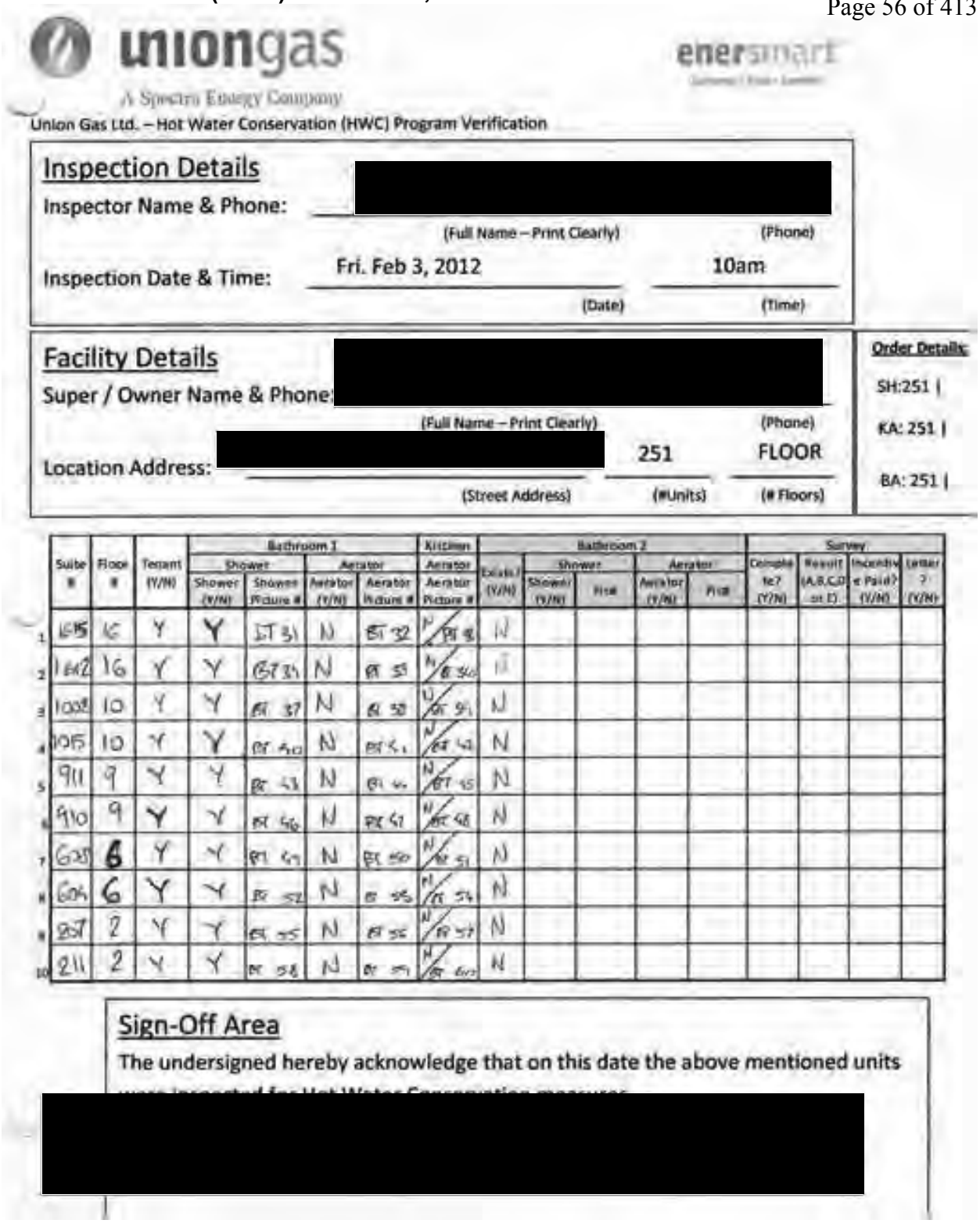
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Flick	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Flick	Survey Complete? (Y/N)	Survey Results (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	407	4	Y	N	BT 204	Y	BT 204	N/BT 221									
2	415	4	N	Y	BT 207	Y	BT 208	Y/BT 201									
3	307	3	Y	Y	BT 210	Y	BT 211	Y/BT 202									
4	211	2	Y	N	BT 213	N	BT 214	Y/BT 215									
5	206	2	Y	Y	BT 216	Y	BT 217	Y/BT 218									
6	201	2	N	N	BT 219	N	BT 220	Y/BT 221									
7	410	4	Y	N	BT 222	N	BT 223	N/BT 224									
8	309	3	Y	N	BT 225	N	BT 226	Y/BT 227									
9	312	3	Y	N	BT 228	N	BT 229	Y/BT 230									
10	102	1	N	N	BT 231	N	BT 232	Y/BT 233									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures.

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Inspection Date & Time: Fri. Feb 3, 2012 (Date) 10am (Time)

Facility Details

Super / Owner Name & Phone: [redacted]
(Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 251 (#Units) FLOOR (# Floors)

Order Details:
SH:251 |
KA: 251 |
BA: 251 |

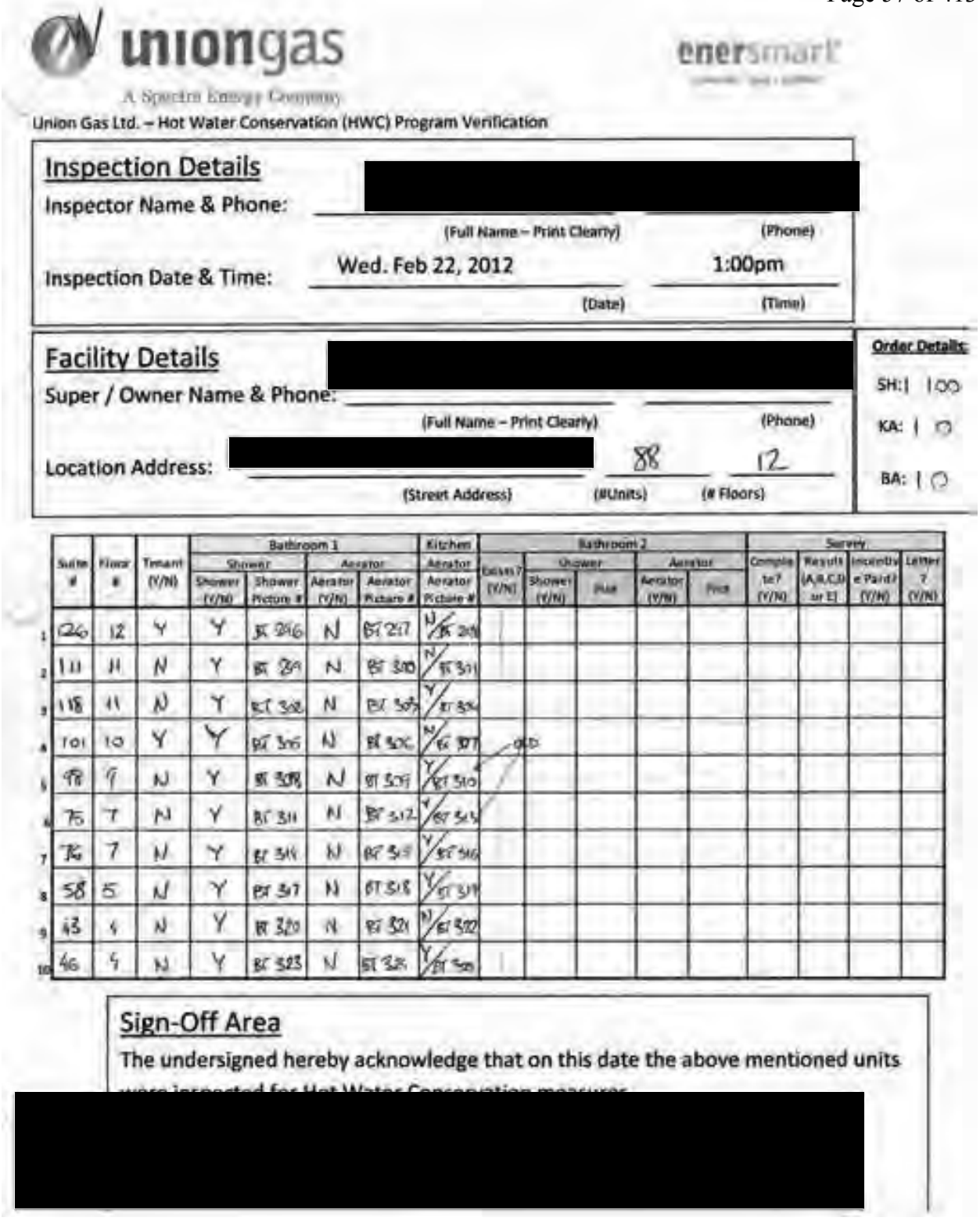
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Estab./ (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pic#	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pic#	Survey Complete? (Y/N)	Result (A,B,C,D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
1	615	16	Y	Y	BT 31	N	BT 32	N/BT 33	N								
2	1612	16	Y	Y	BT 34	N	BT 35	N/BT 36	N								
3	1008	10	Y	Y	BT 37	N	BT 38	N/BT 39	N								
4	1005	10	Y	Y	BT 40	N	BT 41	N/BT 42	N								
5	911	9	Y	Y	BT 43	N	BT 44	N/BT 45	N								
6	910	9	Y	Y	BT 46	N	BT 47	N/BT 48	N								
7	625	6	Y	Y	BT 49	N	BT 50	N/BT 51	N								
8	604	6	Y	Y	BT 52	N	BT 53	N/BT 54	N								
9	207	2	Y	Y	BT 55	N	BT 56	N/BT 57	N								
10	211	2	Y	Y	BT 58	N	BT 59	N/BT 60	N								

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed. Feb 22, 2012 (Date) 1:00pm (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 88 (#Units) 12 (# Floors)

Order Details:
SH: | 100
KA: | 0
BA: | 0

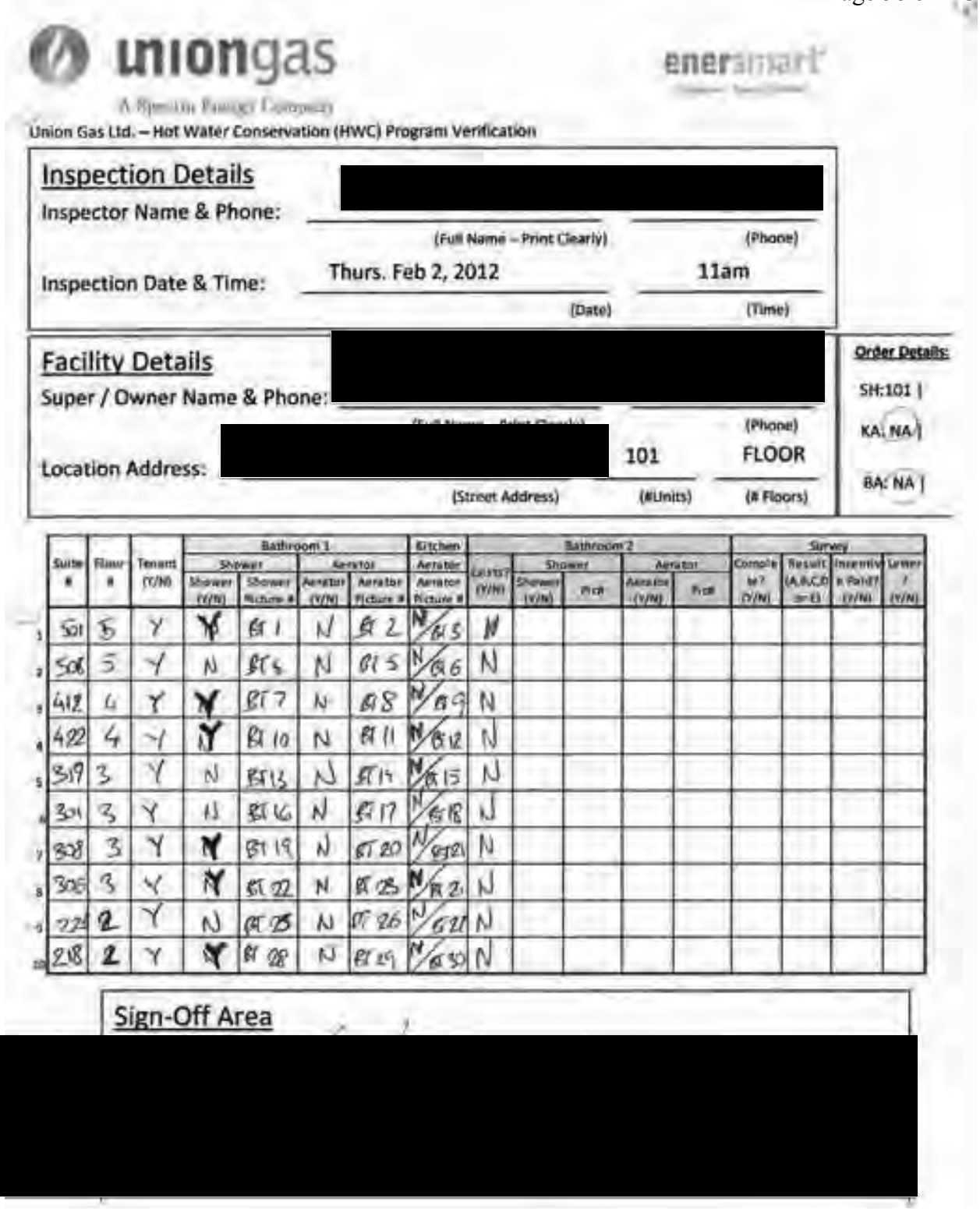
	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower Shower (Y/N)	Bathroom 1 Shower Shower Picture #	Bathroom 1 Aerator Aerator (Y/N)	Bathroom 1 Aerator Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower Shower (Y/N)	Bathroom 2 Shower Pics	Bathroom 2 Aerator Aerator (Y/N)	Bathroom 2 Aerator Pics	Survey Complete? (Y/N)	Survey Results (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	120	12	Y	Y	BT 316	N	BT 317	N/BT 318									
2	111	11	N	Y	BT 299	N	BT 300	N/BT 301									
3	118	11	N	Y	BT 302	N	BT 303	Y/BT 304									
4	101	10	Y	Y	BT 306	N	BT 307	N/BT 308									
5	98	9	N	Y	BT 308	N	BT 309	Y/BT 310									
6	75	7	N	Y	BT 311	N	BT 312	Y/BT 313									
7	76	7	N	Y	BT 314	N	BT 315	Y/BT 316									
8	58	5	N	Y	BT 317	N	BT 318	Y/BT 319									
9	43	4	N	Y	BT 320	N	BT 321	N/BT 322									
10	46	4	N	Y	BT 323	N	BT 324	Y/BT 325									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units were inspected for Hot Water Conservation measures

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Thurs. Feb 2, 2012 (Date) 11am (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Phone)

Location Address: [redacted] (Street Address) 101 (#Units) FLOOR (# Floors)

Order Details:

SH:101 |

KA: NA |

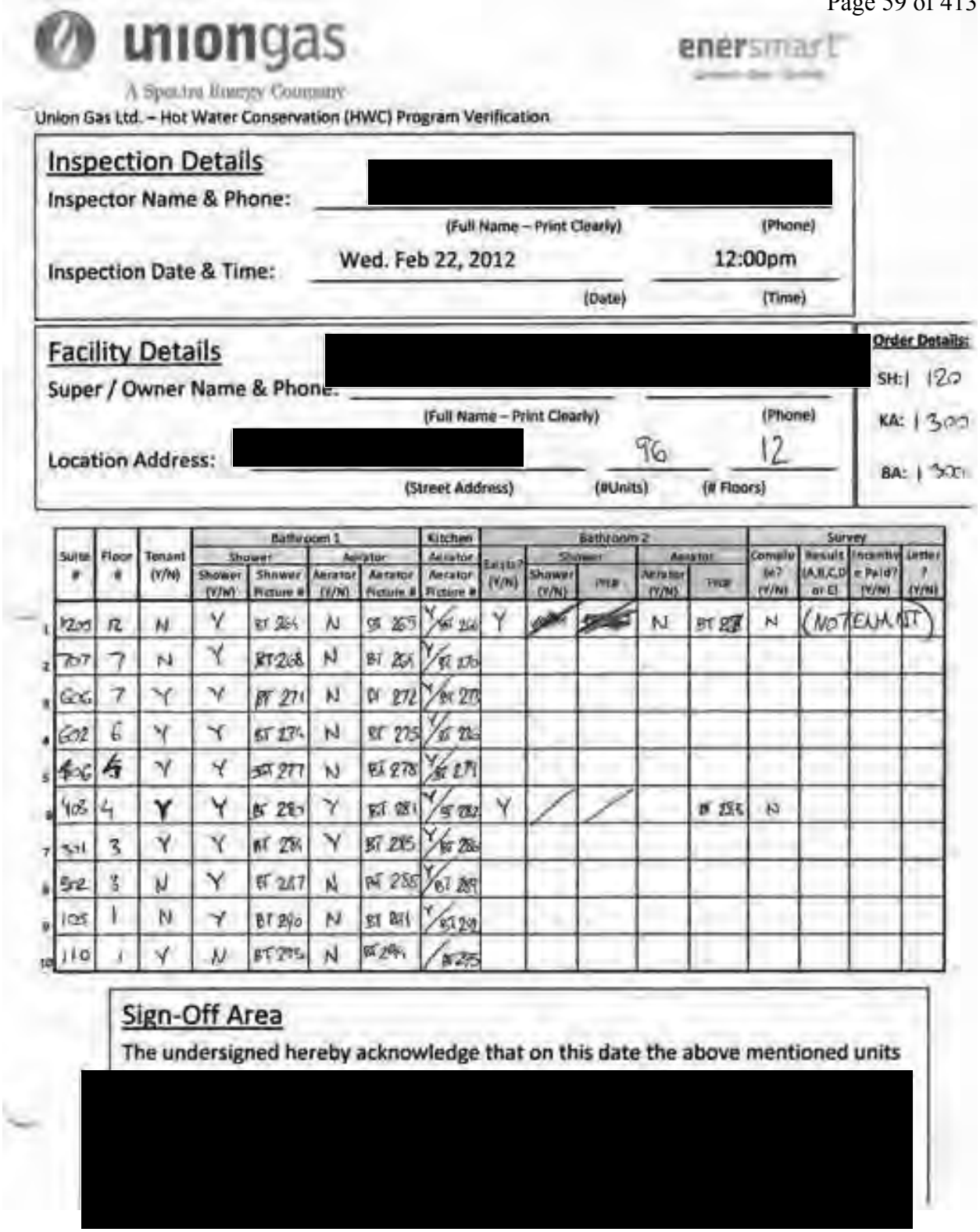
BA: NA |

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Leaks? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pic#	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pic#	Survey Complete? (Y/N)	Survey Result (A,B,C,D or E)	Survey Incentive Paid? (Y/N)	Survey ? (Y/N)
1	501	5	Y	Y	BT 1	N	BT 2	N/BT 5	N								
2	508	5	Y	N	BT 4	N	BT 5	N/BT 6	N								
3	412	4	Y	Y	BT 7	N	BT 8	N/BT 9	N								
4	422	4	Y	Y	BT 10	N	BT 11	N/BT 12	N								
5	319	3	Y	N	BT 13	N	BT 14	N/BT 15	N								
6	301	3	Y	N	BT 16	N	BT 17	N/BT 18	N								
7	308	3	Y	Y	BT 19	N	BT 20	N/BT 21	N								
8	305	3	Y	Y	BT 22	N	BT 23	N/BT 24	N								
9	224	2	Y	N	BT 25	N	BT 26	N/BT 27	N								
10	218	2	Y	Y	BT 28	N	BT 29	N/BT 30	N								

Sign-Off Area

[redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed. Feb 22, 2012 (Date) 12:00pm (Time)

Facility Details

Super / Owner Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 96 (#Units) 12 (# Floors)

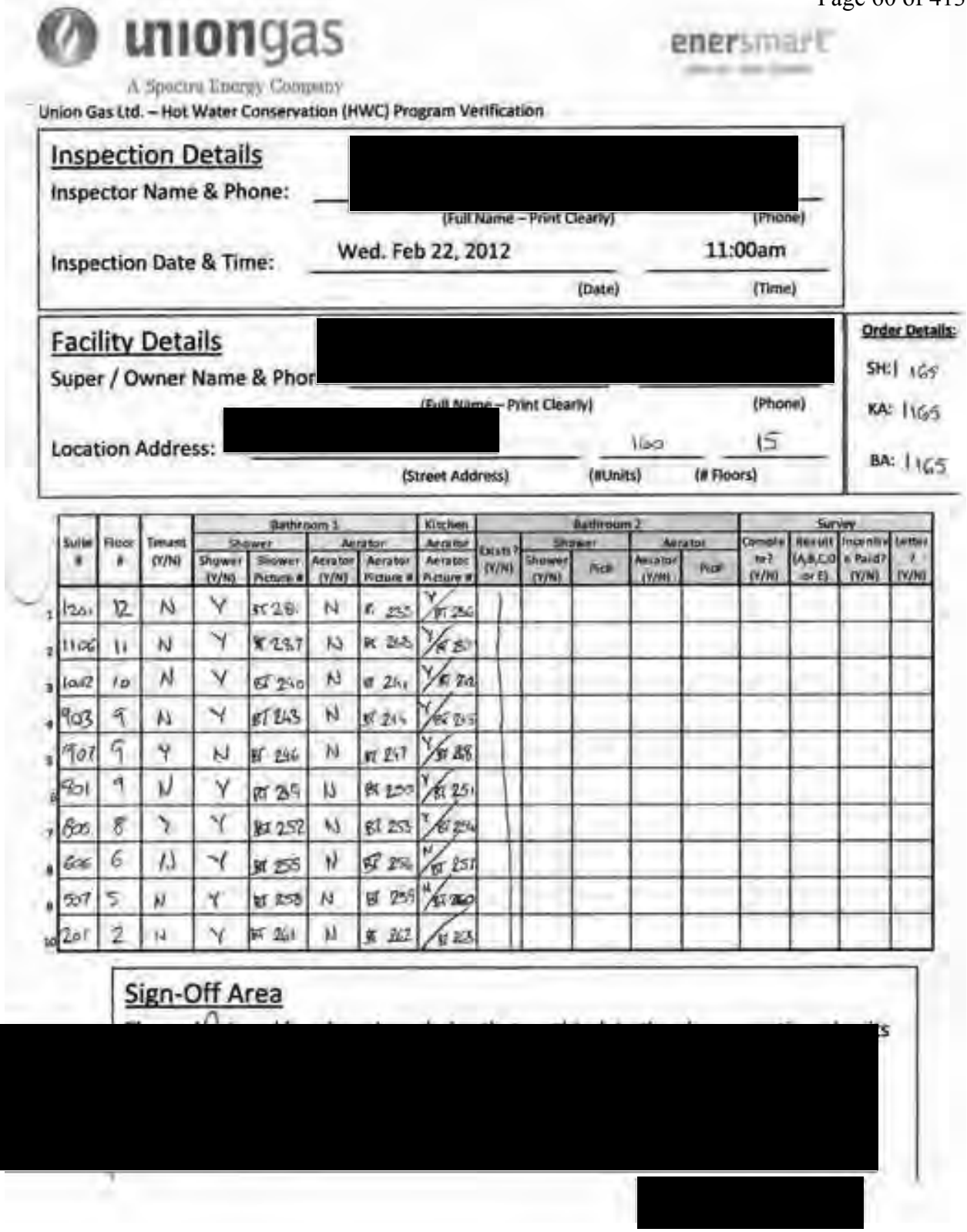
Order Details: SH: 120 KA: 300 BA: 300

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pict#	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pict#	Survey Comply (y)? (Y/N)	Survey Result (A,B,C,D or E)?	Survey Incentive Paid? (Y/N)	Survey Letter ? (Y/N)
1	1205	12	N	Y	BT 264	N	BT 265	Y/BT 266	Y	[illegible]	[illegible]	N	BT 267	N	(NOT EXAMINT)		
2	707	7	N	Y	BT 268	N	BT 269	Y/BT 270									
3	606	7	Y	Y	BT 271	N	BT 272	Y/BT 273									
4	602	6	Y	Y	BT 274	N	BT 275	Y/BT 276									
5	406	4	Y	Y	BT 277	N	BT 278	Y/BT 279									
6	408	4	Y	Y	BT 280	Y	BT 281	Y/BT 282	Y	/	/		BT 283	N			
7	301	3	Y	Y	BT 284	Y	BT 285	Y/BT 286									
8	302	3	N	Y	BT 287	N	BT 288	Y/BT 289									
9	105	1	N	Y	BT 290	N	BT 291	Y/BT 292									
10	110	1	Y	N	BT 293	N	BT 294	/ BT 295									

Sign-Off Area

The undersigned hereby acknowledge that on this date the above mentioned units [redacted]

Appendix C: Sign-Off Sheets - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS –Phase1 & Phase2



Union Gas Ltd. – Hot Water Conservation (HWC) Program Verification

Inspection Details

Inspector Name & Phone: [redacted] (Full Name – Print Clearly) (Phone)

Inspection Date & Time: Wed. Feb 22, 2012 (Date) 11:00am (Time)

Facility Details

Super / Owner Name & Phor[redacted] (Full Name – Print Clearly) (Phone)

Location Address: [redacted] (Street Address) 160 (#Units) 15 (# Floors)

Order Details:

SH: 165

KA: 165

BA: 165

	Suite #	Floor #	Tenant (Y/N)	Bathroom 1 Shower (Y/N)	Bathroom 1 Shower Picture #	Bathroom 1 Aerator (Y/N)	Bathroom 1 Aerator Picture #	Kitchen Aerator Picture #	Bathroom 2 Exists? (Y/N)	Bathroom 2 Shower (Y/N)	Bathroom 2 Shower Pic#	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Pic#	Survey Complete? (Y/N)	Result (A,B,C,D or E)	Incentive Paid? (Y/N)	Letter ? (Y/N)
1	1201	12	N	Y	[illegible]	N	[illegible]	Y [illegible]									
2	1106	11	N	Y	[illegible]	N	[illegible]	Y [illegible]									
3	1002	10	N	Y	[illegible]	N	[illegible]	Y [illegible]									
4	903	9	N	Y	[illegible]	N	[illegible]	Y [illegible]									
5	907	9	Y	N	[illegible]	N	[illegible]	Y [illegible]									
6	901	9	N	Y	[illegible]	N	[illegible]	Y [illegible]									
7	805	8	Y	Y	[illegible]	N	[illegible]	Y [illegible]									
8	606	6	N	Y	[illegible]	N	[illegible]	N [illegible]									
9	507	5	N	Y	[illegible]	N	[illegible]	N [illegible]									
10	201	2	N	Y	[illegible]	N	[illegible]	[illegible]									

Sign-Off Area

[redacted]

Appendix D: Field Data - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1 and Phase 2

Phase1 Field Data

# UNITS	Contact Name	VERIF DATE / TIME	Building Address	Unit	Tenant (Y/N)	Shower (Y/N)	Shower Picture	Bathroom Aerator (Y/N)	Bathroom Aerator Picture	Kitchen Aerator (Y/N)	Kitchen Aerator Picture	*NOTE* No Second Bathrooms Were Found
5	[redacted]	on-21-Nov -- 10:00 AM	[redacted]	509	Y	Y	MK17	Y	MK18	N	MK19	
				413	Y	N	MK5	N	MK6	N	MK7	
				311	Y	N	MK8	N	MK9	N	MK10	
				303	N	Y	MK11	N	MK12	N	MK13	
				210	N	Y	MK14	N	MK15	N	MK16	
5		Tue-22-Nov -- 9:00 AM		2	Y	N	MK20	N	MK21	N	MK22	
				3	Y	N	MK23	Y	MK24	N	MK25	
				1	Y	N	MK26	N	MK27	N	MK28	
				2	N	Y	MK29	N	MK30	N	MK31	
				4	Y	N	MK32	N	MK33	N	MK34	
5		hu-24-Nov -- 12:00 PM		4	N	N	MK35	N	MK36	N	MK37	
				2	Y	N	MK38	N	MK39	N	MK40	
				1	N	Y	MK41	N	MK42	N	MK43	
				10	N	N	MK44	N	MK45	N	MK46	
				11	Y	N	MK48	N	MK47	N	MK49	
5		hu-24-Nov -- 12:00 PM		101	Y	N	MK59	N	MK60	N	MK61	
				103	Y	N	MK62	N	MK63	N	MK64	
				108	Y	N	MK65	N	MK66	Y	MK67	
				202	Y	Y	MK68	N	MK69	Y	MK70	
				208	N	N	MK71	N	MK72	Y	MK73	
3		hu-24-Nov -- 12:00 PM		7	Y	N	MK50	Y	MK51	N	MK52	
				8	Y	N	MK53	Y	MK54	N	MK55	
				15	Y	Y	MK56	Y	MK57	Y	MK58	
5		Mon-28-Nov -- 1:00 PM		2	N	Y	MK74	N	MK75	Y	MK76	
				9	Y	Y	MK77	N	MK78	Y	MK79	
				5	Y	Y	MK80	N	MK81	Y	MK82	
				8	Y	Y	MK83	N	MK84	Y	MK85	
				7	Y	Y	MK86	N	MK87	Y	MK88	
5		ue-29-Nov -- 10:00 AM		109	N	N	MK89	N	MK90	Y	MK91	
				120	N	N	MK92	N	MK93	Y	MK94	
				245	N	N	MK95	N	MK96	Y	MK97	
				336	Y	N	MK98	N	MK99	Y	MK100	
				438	N	N	MK101	N	MK102	Y	MK103	
5		ed-30-Nov -- 10:00 AM		604	N	N	MK104	N	MK105	N	MK106	
				508	Y	N	MK107	N	MK108	N	MK109	
				407	N	N	MK110	N	MK111	N	MK112	
				202	N	N	MK113	N	MK114	N	MK115	
				101	Y	N	MK116	N	MK117	N	MK118	
5		Thu-17-Nov -- 1:00 PM		103	Y	Y	BT16	Y	BT17	N	BT18	
				102	Y	Y	BT19	Y	BT20	Y	BT21	
				203	Y	Y	BT22	Y	BT23	Y	BT24	
				305	N	N	BT25	Y	BT26	N	BT27	
				303	Y	N	BT28	N	BT29	N	BT30	
5		ed-16-Nov -- 10:00 AM		101	Y	N	BT1	N	BT2	N	BT3	
				102	Y	N	BT6	N	BT5	N	BT4	
				301	Y	N	BT8	N	BT7	N	BT9	
				205	Y	Y	BT11	N	BT10	N	BT12	
				203	Y	Y	BT13	N	BT18	N	BT15	
2		hu-17-Nov -- 11:00 AM		1	Y	Y	BT31	N	BT32	Y	BT33	
				3	Y	NA	BT34	N	BT35	Y	BT36	
5		Wed-23-Nov -- 1:00 PM		7	Y	N	BT37	N	BT38	Y	BT39	
				1	N	N	BT40	N	BT41	N	BT42	
				9	Y	Y	BT43	Y	BT44	Y	BT45	
				6	Y	N	BT46	N	BT47	Y	BT48	
				2	N	N	BT49	Y	BT50	Y	BT51	
5		Sat-26-Nov -- 9:00 AM		3	Y	Y	BT52	Y	BT53	Y	BT54	
				4	Y	N	BT55	Y	BT56	Y	BT57	
				2	Y	N	BT58	Y	BT59	Y	BT60	
				1	N	N	BT61	Y	BT62	Y	BT63	
				5	N	N	BT64	N	BT65	N	BT66	
2		ed-30-Nov -- 10:00 AM		6	Y	N	BT82	N	BT83	N	BT84	
				1	N	Y	BT85	N	BT86	Y	BT87	
5		Tue-29-Nov -- 2:00 PM		331	Y	N	BT67	Y	BT68	Y	BT69	
				332	N	N	BT70	N	BT71	N	BT72	
				125-1	Y	Y	BT73	N	BT74	N	BT75	
				125-4	Y	N	BT76	N	BT77	N	BT78	
				125-2	N	Y	BT79	Y	BT80	N	BT81	

Appendix D: Field Data - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1 and Phase 2

Appendix D – Phase2 Field Data

VERIF DATE / TIME	Building Address	Unit	Tenant (Y/N)	Shower (Y/N)	Shower Picture	Bathroom Aerator (Y/N)	Bathroom Aerator Picture	Kitchen Aerator (Y/N)	Kitchen Aerator Picture	2nd Bathroom	Shower2 (Y/N)	Shower2 Picture	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture	Survey Complete	Survey Result
Thu-23-Feb -- 12:00 PM	[redacted]	605	N	N	MK463	N	MK464	N	MK405	Y	N	MK466	N	MK467	N	
		604	N	Y	MK467	N	MK468	N	MK409	Y	N	MK470	N	MK471	N	
		602	Y	N	MK472	N	MK473	N	MK476	Y	N	MK474	N	MK475	Y	E
		506	Y	N	MK477	N	MK478	N	MK479	Y	N	MK480	N	MK481	Y	E
		504	Y	N	MK482	N	MK483	N	MK484	Y	N	MK485	N	MK486	Y	E
		405	N	N	MK487	N	MK488	N	MK489	Y	N	MK490	N	MK491	N	
		306	Y	N	MK492	N	MK493	N	MK494	Y	N	MK495	N	MK496	Y	E
		304	N	N	MK497	N	MK498	N	MK499	Y	N	MK501	N	MK500	N	
		201	Y	Y	MK502	N	MK503	N	MK504	Y	N	MK505	N	MK506	Y	E
		101	Y	N	MK508	N	MK509	N	MK510	Y	N	MK511	N	MK512	Y	E
Tue-07-Feb -- 12:15 PM		106	Y	N	MK1	Y	MK2	Y	MK3	Y	NA		N	MK4		
		203	Y	N	MK5	N	MK6	Y	MK7	N						
		305	Y	Y	MK8	N	MK9	Y	MK10	N						
		405	N	Y	MK11	Y	MK12	N	MK13	N						
		507	Y	Y	MK14	N	MK15	Y	MK16	N						
		504	N	Y	MK17	Y	MK18	Y	MK19	N						
		601	Y	N	MK20	N	MK21	Y	MK22	N						
		702	Y	Y	MK23	Y	MK24	Y	MK25	Y	Y	MK26	N	MK27	Y	E
		308	Y	Y	MK28	N	MK29	Y	MK30	N						
		202	N	Y	MK31	N	MK32	Y	MK33	N						
Fri-10-Feb -- 11:00 AM		206	N	N	MK34	N	MK35	N	MK36	Y	NA		N	MK37		
		513	Y	N	MK38	N	MK39	Y	MK40	N						
		507	Y	N	MK41	Y	MK42	Y	MK43	N						
		506	Y	N	MK44	Y	MK45	Y	MK46	N						
		401	Y	N	MK47	N	MK48	N	MK49	Y	NA		N	MK50		
		408	N	Y	MK51	N	MK52	Y	MK53	N						
		410	N	N	MK55	N	MK54	N	MK56	N						
		211	Y	N	MK57	N	MK58	N	MK59	Y	NA		N	MK60		
		108	Y	N	MK61	Y	MK62	Y	MK63	Y	NA		Y	MK64		
		302	Y	N	MK65	Y	MK66	N	MK67	Y	NA		N	MK68		
Fri-10-Feb -- 12:00 PM		307	N	Y	MK69	Y	MK70	N	MK71	N						
		210	N	Y	MK72	N	MK73	N	MK74	Y	NA		N	MK75		
		213	N	Y	MK76	N	MK77	N	MK78	Y	NA		N	MK79		
		508	Y	Y	MK80	Y	MK81	Y	MK82	N						
		107	N	Y	MK83	Y	MK84	N	MK85	Y	NA		N	MK86		
		402	Y	Y	MK87	N	MK88	N	MK89	Y	NA		N	MK90		
		301	Y	Y	MK91	Y	MK92	N	MK93	N						
		163	N	Y	MK94	Y	MK95	N	MK96	Y	NA		N	MK97		
		512	N	Y	MK98	N	MK99	N	MK100	Y	NA		N	MK101		
		409	N	Y	MK102	N	MK103	N	MK104	Y	NA		N	MK105		
Sun-12-Feb -- 10:30 AM		106	N	N	MK106	N	MK103	N	MK108	N						
		905	N	N	MK109	N	MK110	N	MK111	N						
		907	Y	N	MK112	Y	MK113	N	MK114	N						
		804	Y	N	MK115	N	MK116	Y	MK117	N						
		704	N	Y	MK118	Y	MK119	Y	MK120	N						
		606	N	Y	MK121	N	MK122	N	MK123	N						
		502	Y	N	MK124	Y	MK125	N	MK126	N						
		303	Y	N	MK127	Y	MK128	N	MK129	N						
		208	N	N	MK130	Y	MK131	Y	MK132	N						
		101	Y	N	MK133	Y	MK134	N	MK135	N						
Mon-13-Feb -- 11:30 AM		111	Y	Y	MK136	N	MK137	Y	MK138	N						
		116	Y	Y	MK139	N	MK140	Y	MK141	N						
		122	Y	Y	MK142	N	MK143	Y	MK144	N						
		103	Y	Y	MK145	N	MK146	N	MK147	N						
		106	Y	N	MK148	N	MK149	N	MK150	N						
		219	N	N	MK151	N	MK152	N	MK153	N						
		207	Y	Y	MK154	N	MK155	N	MK156	N						
		235	Y	N	MK157	N	MK158	Y	MK159	N						
		228	Y	N	MK160	N	MK161	Y	MK162	N						
		137	Y	N	MK163	N	MK164	N	MK165	N						
Wed-15-Feb -- 10:30 AM		1201	N	N	MK165	N	MK166	N	MK167	N						
		1109	N	N	MK168	N	MK169	Y	MK170	N						
		1010	Y	N	MK171	N	MK172	Y	MK173	N						
		93	N	N	MK174	N	MK175	Y	MK176	N						
		88	Y	N	MK177	N	MK178	N	MK179	N						
		73	N	N	MK180	N	MK181	N	MK182	N						
		510	Y	N	MK183	N	MK184	N	MK184	N						
		44	N	N	MK186	N	MK187	N	MK188	N						
		35	Y	N	MK189	N	MK190	N	MK191	N						
		26	N	N	MK192	N	MK193	N	MK194	N						
Wed-15-Feb -- 11:30 AM		PH1	Y	N	MK195	N	MK196	N	MK197	N						
		1106	N	N	MK198	N	MK199	N	MK200	N						
		1012	N	N	MK201	N	MK202	N	MK203	N						
		807	Y	N	MK204	N	MK205	N	MK206	N						
		810	N	N	MK207	N	MK208	N	MK209	N						
		603	N	N	MK210	N	MK211	N	MK212	N						
		511	Y	N	MK213	N	MK214	N	MK215	N						
		404	Y	N	MK216	N	MK217	N	MK218	N						
		309	N	N	MK219	N	MK220	N	MK221	N						
		202	N	N	MK222	N	MK223	N	MK224	N						

Appendix D: Field Data - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1 and Phase 2

Appendix D – Phase2 Field Data

VERIF DATE / TIME	Building Address	Unit	Tenant (Y/N)	Shower (Y/N)	Shower Picture	Bathroom Aerator (Y/N)	Bathroom Aerator Picture	Kitchen Aerator (Y/N)	Kitchen Aerator Picture	2nd Bathroom	Shower2 (Y/N)	Shower2 Picture	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture	Survey Complete	Survey Result
Wed-15-Feb -- 12:30 PM	[redacted]	1902	N	N	MK225	N	MK226	Y	MK227	N						
		1705	N	N	MK228	N	MK229	Y	MK230	N						
		1401	Y	N	MK231	N	MK232	Y	MK233	Y	NA		N	MK234		
		1208	N	N	MK235	N	MK236	N	MK237	N						
		1102	Y	N	MK238	N	MK239	Y	MK240	Y	NA		N	MK241		
		904	N	N	MK242	N	MK243	Y	MK244	N						
		706	Y	Y	MK245	N	MK246	Y	MK247	Y	NA		N	MK248		
		503	Y	N	MK249	N	MK250	Y	MK251	Y	NA		N	MK252		
		308	Y	N	MK253	N	MK254	N	MK255	N						
		204	Y	N	MK256	N	MK257	Y	MK258	N						
Thu-16-Feb -- 10:00 AM		1409	N	Y	MK259	N	MK260	N	MK261	N						
		1210	N	Y	MK262	Y	MK263	Y	MK264	N						
		1002	Y	Y	MK265	Y	MK266	Y	MK267	N						
		903	Y	Y	MK268	Y	MK269	Y	MK270	N						
		816	N	Y	MK271	Y	MK272	Y	MK273	N						
		703	N	Y	MK274	Y	MK275	Y	MK275	N						
		609	N	Y	MK273	N	MK278	N	MK279	N						
		401	N	Y	MK280	Y	MK281	Y	MK282	N						
		306	Y	Y	MK283	N	MK284	Y	MK285	N						
		207	Y	Y	MK286	Y	MK287	Y	MK288	N						
Thu-16-Feb -- 11:00 AM		1511	N	Y	MK289	Y	MK290	Y	MK291	N						
		1401	N	Y	MK292	N	MK293	Y	MK294	N						
		705	N	N	MK295	Y	MK296	Y	MK297	N						
		603	Y	Y	MK298	Y	MK299	Y	MK300	N						
		1209	Y	Y	MK313	N	MK314	Y	MK315	N						
		1006	N	Y	MK316	Y	MK317	Y	MK318	N						
		310	N	Y	MK301	Y	MK302	Y	MK303	N						
		409	Y	Y	MK304	Y	MK305	Y	MK306	N						
		501	N	Y	MK307	Y	MK308	Y	MK309	N						
		1205	N	Y	MK310	Y	MK311	Y	MK312	N						
Thu-16-Feb -- 12:30 PM		1906	N	Y	MK310	N	MK320	Y	MK321	N						
		1803	Y	N	MK322	N	MK323	Y	MK324	N						
		1601	Y	Y	MK326	N	MK327	Y	MK328	N						
		1507	N	Y	MK329	N	MK330	Y	MK331	N						
		1004	N	Y	MK332	N	MK333	Y	MK334	N						
		9002	N	Y	MK335	N	MK336	Y	MK337	N						
		705	N	Y	MK338	N	MK339	Y	MK340	N						
		706	N	Y	MK341	N	MK343	Y	MK344	N						
		503	Y	N	MK345	N	MK346	Y	MK347	N						
		306	Y	Y	MK348	N	MK350	Y	MK351	N						
Tue-21-Feb -- 11:00 AM		111	N	Y	MK352	Y	MK353	Y	MK354	N						
		104	Y	Y	MK355	N	MK356	Y	MK357	N						
		102	N	Y	MK358	N	MK359	Y	MK360	N						
		201	Y	Y	MK361	N	MK362	Y	MK363	N						
		205	Y	Y	MK364	N	MK366	Y	MK365	N						
		210	N	Y	MK367	N	MK368	Y	MK369	N						
		211	N	Y	MK370	Y	MK371	Y	MK372	N						
		304	Y	Y	MK373	N	MK374	N	MK375	N						
		?	Y	Y	MK376	Y	MK377	Y	MK378	N						
		?	Y	Y	MK379	N	MK380	Y	MK381	N						
Tue-21-Feb -- 12:00 PM		301	N	Y	MK382	N	MK383	N	MK384	N						
		316	N	Y	MK385	N	MK386	Y	MK387	N						
		311	N	Y	MK388	N	MK389	Y	MK390	N						
		215	N	Y	MK391	N	MK392	Y	MK393	N						
		704	Y	Y	MK394	N	MK395	Y	MK396	N						
		202	N	Y	MK397	N	MK398	Y	MK399	N						
		102	Y	Y	MK400	N	MK401	Y	MK402	N						
		106	N	Y	MK403	N	MK404	Y	MK405	N						
		103	N	Y	MK406	N	MK407	Y	MK408	N						
		115	Y	N	MK409	N	MK410	Y	MK411	N						
Thu-23-Feb -- 11:00 AM		1209	Y	N	MK432	N	MK433	N	MK434	N						
		1110	N	N	MK435	N	MK436	N	MK437	Y	NA		N	MK438		
		1005	Y	N	MK439	N	MK440	N	MK441	N						
		902	N	N	MK442	N	MK443	N	MK444	N						
		808	N	N	MK445	N	MK446	N	MK447	N						
		603	N	N	MK448	N	MK449	N	MK450	N						
		506	N	N	MK451	N	MK452	N	MK453	N						
		407	N	Y	MK454	N	MK455	N	MK456	N						
		301	N	N	MK457	N	MK458	N	MK459	N						
		204	N	N	MK460	N	MK461	N	MK462	N						
Thu-23-Feb -- 1:00 PM		1204	Y	N	MK513	Y	MK514	N	MK515	Y	N	MK516	Y	MK517	Y	E
		1102	Y	N	MK518	Y	MK519	N	MK520	Y	N	MK521	Y	MK522	Y	E
		1006	Y	N	MK523	Y	MK524	N	MK527	Y	N	MK525	Y	MK526	Y	E
		801	N	N	MK527	Y	MK528	Y	MK529	Y	N	MK530	Y	MK531	N	
		703	Y	N	MK532	Y	MK534	N	MK537	Y	N	MK535	Y	MK536	Y	E
		604	Y	N	MK537	Y	MK538	Y		Y	N	MK539	Y	MK540	Y	E
		405	Y	N	MK542	Y	MK543	N	MK544	Y	N	MK545	Y	MK546	Y	E
		402	Y	N	MK547	Y	MK548	N	MK549	Y	N	MK550	Y	MK551	Y	E
		304	Y	N	MK552	Y	MK553	N	MK554	Y	N	MK555	Y	MK556	Y	E
		206	Y	Y	MK557	Y	MK558	N	MK559	Y	N	MK560	Y	MK561	Y	E

Appendix D: Field Data - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1 and Phase 2

Appendix D – Phase2 Field Data

VERIF DATE / TIME	Building Address	Unit	Tenant (Y/N)	Shower (Y/N)	Shower Picture	Bathroom Aerator (Y/N)	Bathroom Aerator Picture	Kitchen Aerator (Y/N)	Kitchen Aerator Picture	2nd Bathroom	Shower2 (Y/N)	Shower2 Picture	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture	Survey Complete	Survey Result
Thu-02-Feb -- 11:00 AM	[redacted]	501	Y	Y	BT1	N	BT2	N	BT3	N						
		508	Y	N	BT4	N	BT5	N	BT6	N						
		412	Y	Y	BT7	N	BT8	N	BT9	N						
		422	Y	Y	BT10	N	BT11	N	BT12	N						
		319	Y	N	BT13	N	BT14	N	BT15	N						
		301	Y	N	BT16	N	BT17	N	BT18	N						
		308	Y	Y	BT19	N	BT20	N	BT21	N						
		306	Y	Y	BT22	N	BT23	N	BT24	N						
		223	Y	N	BT25	N	BT26	N	BT27	N						
		218	Y	Y	BT28	N	BT29	N	BT30	N						
Fri-03-Feb -- 10:00 AM		1615	Y	Y	BT31	N	BT32	N	BT33	N						
		1612	Y	Y	BT34	N	BT35	N	BT36	N						
		1002	Y	Y	BT37	N	BT38	N	BT39	N						
		1015	Y	Y	BT40	N	BT41	N	BT42	N						
		911	Y	Y	BT43	N	BT44	N	BT45	N						
		910	Y	Y	BT46	N	BT47	N	BT48	N						
		608	Y	Y	BT49	N	BT50	N	BT51	N						
		604	Y	Y	BT52	N	BT53	N	BT54	N						
		207	Y	Y	BT55	N	BT56	N	BT57	N						
		211	Y	Y	BT58	N	BT59	N	BT60	N						
Mon-06-Feb -- 11:30 AM		102	N	Y	BT61	Y	BT64	Y	BT65	Y	Y	BT62	N	BT63	N	
		105	Y	Y	BT66	N	BT67	Y	BT68	N						
		309	Y	N	BT69	N	BT70	N	BT71	N						
		310	Y	Y	BT72	Y	BT73	N	BT74	N						
		311	Y	N	BT75	N	BT76	Y	BT77	N						
		303	N	Y	BT78	N	BT79	N	BT80	N						
		508	Y	Y	BT81	N	BT82	N	BT83	Y	Y	BT84	N	BT85	Y	A
		504	N	N	BT86	N	BT87	N	BT88	Y	Y	BT89	N	BT90	Y	E
		501	Y	N	BT91	N	BT92	N	BT93	N						
		204	N	N	BT94	N	BT95	N	BT96	N						
Tue-07-Feb -- 10:00 AM		1009	Y	Y	BT97	N	BT98	Y	BT99	N						
		906	N	Y	BT100	Y	BT101	Y	BT102	N						
		708	Y	N	BT103	Y	BT104	Y	BT105	N						
		605	N	Y	BT106	Y	BT107	Y	BT108	N						
		501	N	Y	BT109	Y	BT110	Y	BT111	N						
		410	Y	Y	BT112	Y	BT113	Y	BT114	N						
		303	Y	Y	BT115	Y	BT116	Y	BT117	N						
		204	Y	Y	BT118	Y	BT119	Y	BT120	N						
		209	N	Y	BT121	Y	BT122	Y	BT123	N						
		110	N	Y	BT124	Y	BT125	Y	BT126	N						
Tue-07-Feb -- 10:00 AM		1	Y	Y	BT127	N	BT128	Y	BT129	N						
		9	N	Y	BT130	N	BT131	Y	BT132	N						
		3	N	N	BT133	N	BT134	N	BT135	N						
Mon-13-Feb -- 1:00 PM		403	Y	Y	BT145	Y	BT146	Y	BT147	N						
		402	Y	Y	BT148	Y	BT149	Y	BT150	N						
		412	Y	Y	BT151	Y	BT152	N	BT153	N						
		311	Y	Y	BT154	Y	BT155	Y	BT156	N						
		309	Y	Y	BT157	Y	BT158	Y	BT159	N						
		305	Y	N	BT160	Y	BT161	N	BT162	N						
		202	Y	Y	BT163	Y	BT164	Y	BT165	N						
		203	Y	Y	BT166	Y	BT167	Y	BT168	N						
		111	Y	Y	BT169	Y	BT170	Y	BT171	N						
		105	Y	Y	BT171	Y	BT172	Y	BT174(a)	N						
Mon-13-Feb -- 2:00 PM		102	Y	N	BT174(b)	Y	BT175	Y	BT176	N						
		402	Y	Y	BT177	Y	BT178	Y	BT179	N						
		403	Y	N	BT180	Y	BT181	Y	BT182	N						
		410	Y	Y	BT183	Y	BT184	Y	BT185	N						
		411	Y	Y	BT186	Y	BT187	Y	BT188	N						
		312	N	Y	BT189	Y	BT190	Y	BT191	N						
		306	Y	Y	BT192	Y	BT193	Y	BT194	N						
		303	Y	Y	BT192	Y	BT196	Y	BT197	N						
		207	N	Y	BT198	Y	BT199	Y	BT200	N						
		211	Y	Y	BT201	Y	BT202	Y	BT203	N						
Tue-21-Feb -- 1:00 PM		407	Y	N	BT204	Y	BT205	N	BT206	N						
		415	N	Y	BT207	Y	BT208	Y	BT209	N						
		307	Y	Y	BT210	Y	BT211	Y	BT212	N						
		211	Y	N	BT213	N	BT214	Y	BT215	N						
		209	Y	Y	BT216	Y	BT217	Y	BT218	N						
		201	N	N	BT219	N	BT220	Y	BT221	N						
		410	Y	N	BT222	N	BT223	N	BT224	N						
		309	Y	N	BT225	N	BT226	Y	BT227	N						
		312	Y	N	BT228	N	BT229	Y	BT230	N						
		102	Y	N	BT231	N	BT232	Y	BT233	N						

Appendix D: Field Data - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1 and Phase 2

Appendix D – Phase2 Field Data

VERIF DATE / TIME	Building Address	Unit	Tenant (Y/N)	Shower (Y/N)	Shower Picture	Bathroom Aerator (Y/N)	Bathroom Aerator Picture	Kitchen Aerator (Y/N)	Kitchen Aerator Picture	2nd Bathroom	Shower2 (Y/N)	Shower2 Picture	Bathroom 2 Aerator (Y/N)	Bathroom 2 Aerator Picture	Survey Complete	Survey Result
Wed-22-Feb -- 11:00 AM	[redacted]	1201	N	Y	BT234	N	BT235	Y	BT236	N						
		1106	N	Y	BT237	N	BT238	Y	BT239	N						
		1002	N	Y	BT240	N	BT241	Y	BT242	N						
		903	N	Y	BT243	N	BT244	Y	BT245	N						
		904	Y	N	BT246	N	BT247	Y	BT248	N						
		901	N	Y	BT249	N	BT250	Y	BT251	N						
		805	Y	Y	BT252	N	BT253	Y	BT254	N						
		606	N	Y	BT255	N	BT256	N	BT257	N						
		507	N	Y	BT258	N	BT259	N	BT260	N						
		201	N	Y	BT261	N	BT262	Y	BT263	N						
Wed-22-Feb -- 12:00 PM		1205	N	Y	BT264	N	BT265	Y	BT266	Y	NA		N	BT267		
		707	N	Y	BT268	N	BT269	Y	BT270	N						
		606	Y	Y	BT271	N	BT272	Y	BT273	N						
		602	Y	Y	BT274	N	BT275	Y	BT276	N						
		406	Y	Y	BT277	N	BT278	Y	BT279	N						
		403	Y	Y	BT280	Y	BT281	Y	BT282	Y	NA		N	BT283		
		301	Y	Y	BT284	Y	BT285	Y	BT286	N						
		302	N	Y	BT287	N	BT288	Y	BT289	N						
		105	N	Y	BT290	N	BT291	Y	BT292	N						
		110	Y	N	BT293	N	BT294	N	BT295	N						
Wed-22-Feb -- 1:00 PM		126	Y	Y	BT296	N	BT297	N	BT298	N						
		111	N	Y	BT299	N	BT300	N	BT301	N						
		118	N	Y	BT302	N	BT303	Y	BT304	N						
		101	Y	Y	BT305	N	BT306	N	BT307	N						
		98	N	Y	BT308	N	BT309	Y	BT310	N						
		75	N	Y	BT311	N	BT312	Y	BT313	N						
		76	N	Y	BT314	N	BT315	Y	BT316	N						
		58	N	Y	BT317	N	BT318	Y	BT319	N						
		43	N	Y	BT320	N	BT321	N	BT322	N						
		46	N	Y	BT323	N	BT234	Y	BT325	N						
Thu-23-Feb -- 11:00 AM		101	Y	N	BT326	N	BT327	N	BT328	N						
		202	Y	Y	BT329	Y	BT330	Y	BT331	N						
		210	Y	N	BT332	N	BT333	N	BT334	N						
		307	N	Y	BT335	Y	BT336	Y	BT337	N						
		303	N	N	BT338	Y	BT339	Y	BT340	N						
		401	N	N	BT341	Y	BT342	Y	BT343	N						
		404	N	N	BT344	N	BT345	Y	BT346	N						
		505	N	Y	BT347	N	BT348	Y	BT349	N						
		508	N	Y	BT350	Y	BT351	Y	BT352	N						
		602	Y	Y	BT353	N	BT354	Y	BT355	N						
Thu-23-Feb -- 12:00 PM		415	N	Y	BT357	N	BT358	Y	BT359	N						
		410	N	N	BT360	N	BT361	Y	BT362	N						
		403	N	Y	BT363	N	BT364	Y	BT365	N						
		305	Y	Y	BT366	N	BT367	Y	BT368	N						
		304	Y	Y	BT369	N	BT370	Y	BT371	N						
		301	Y	Y	BT372	N	BT373	N	BT374	N						
		215	N	N	BT375	N	BT376	Y	BT377	N						
		210	N	Y	BT378	N	BT379	Y	BT380	N						
		111	Y	Y	BT381	N	BT382	Y	BT383	N						
		103	Y	N	BT389	N	BT385	N	BT386	N						
Fri-24-Feb -- 11:00 AM		102	Y	Y	BT387	Y	BT388	Y	BT389	N						
		109	Y	Y	BT390	Y	BT391	Y	BT392	N						
		208	Y	Y	BT393	Y	BT394	Y	BT395	Y	NA		Y	BT396		
		205	Y	Y	BT397	Y	BT398	Y	BT399	N						
		202	Y	Y	BT400	Y	BT401	Y	BT402	N						
		201	Y	Y	BT403	Y	BT404	Y	BT405	N						
		412	Y	Y	BT406	Y	BT407	Y	BT408	Y	NA		Y	BT409		
		401	Y	Y	BT410	Y	BT411	Y	BT412	N						
		301	Y	Y	BT413	Y	BT414	Y	BT415	N						
		311	Y	Y	BT416	Y	BT417	Y	BT418	N						

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

Appendix E – Photos of Installed Measures: BT

BT1	
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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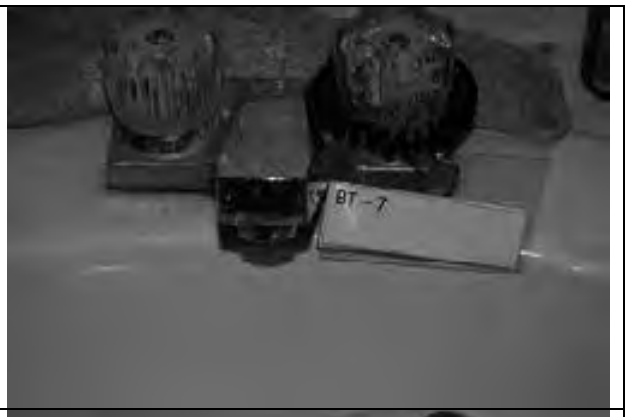
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

BT7	
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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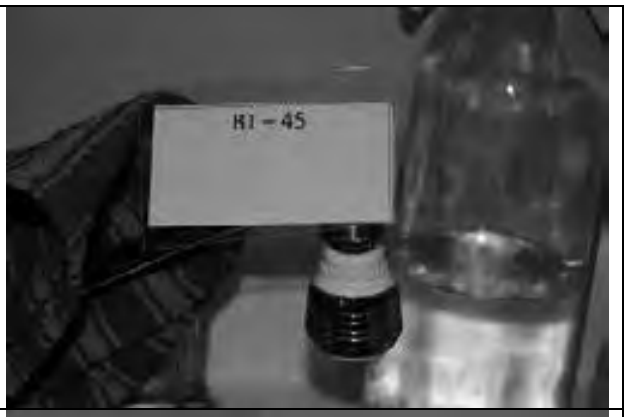
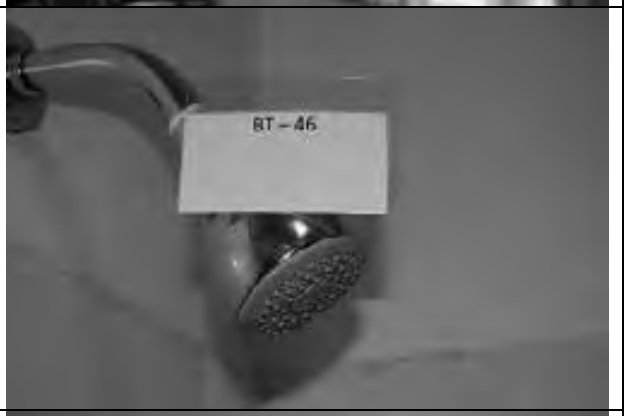
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

BT45	
BT46	
BT47	

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

	
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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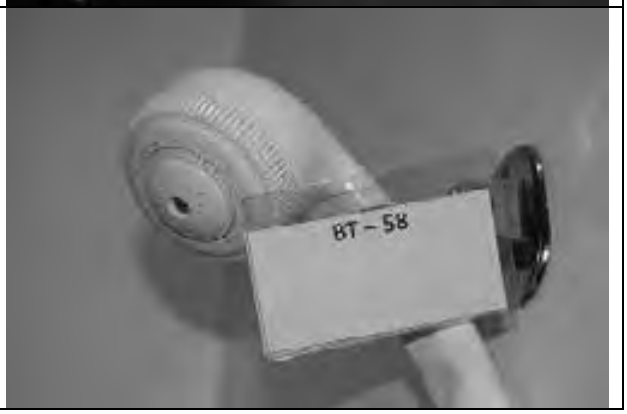
BT58	

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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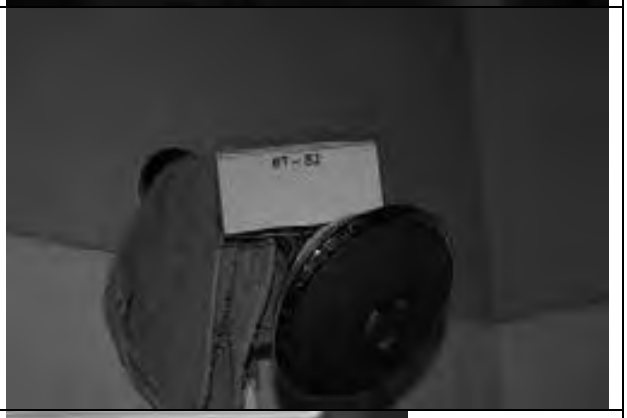
BT82	
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

	
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

UGL HWC Verification – Phase 1

Appendix E – Photos of Installed Measures: MK

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 1

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

UGL HWC Verification – Phase 2

Appendix E – Photos of Installed Measures: MK

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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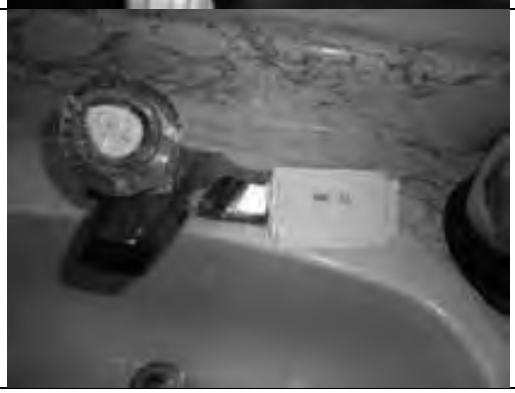
MK11		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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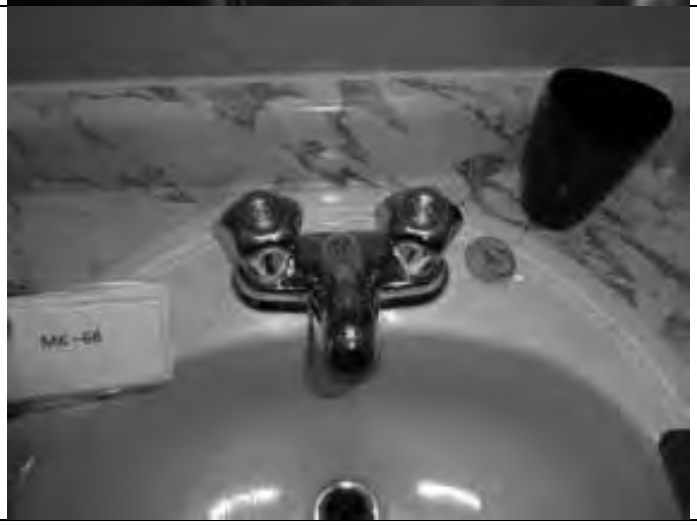
MK68		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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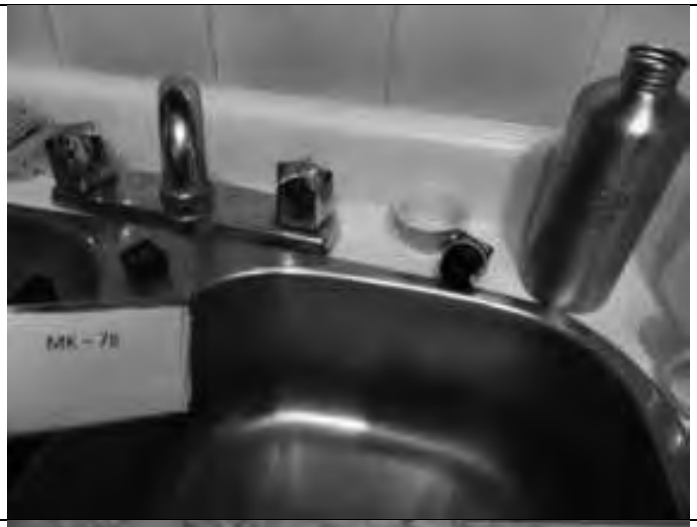
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

MK78		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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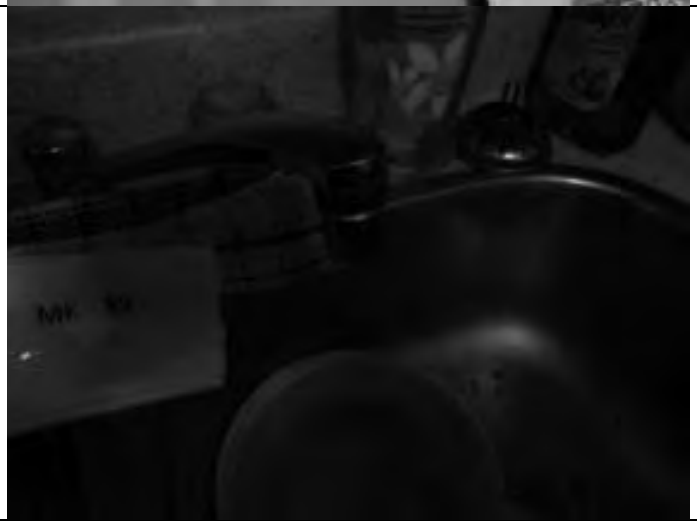
MK89		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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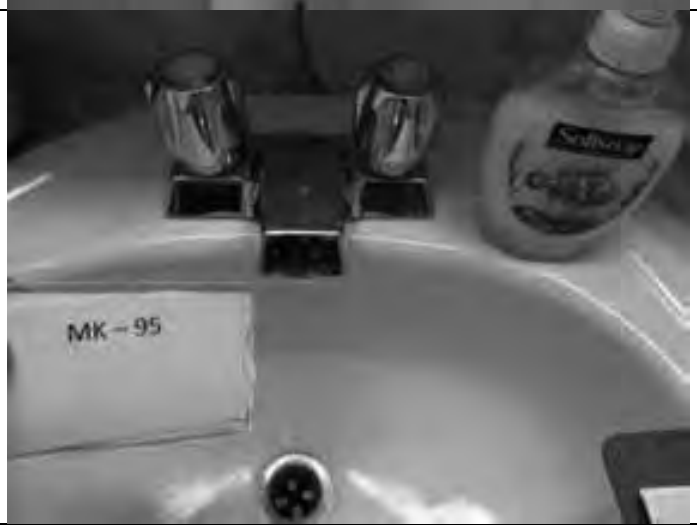
MK95		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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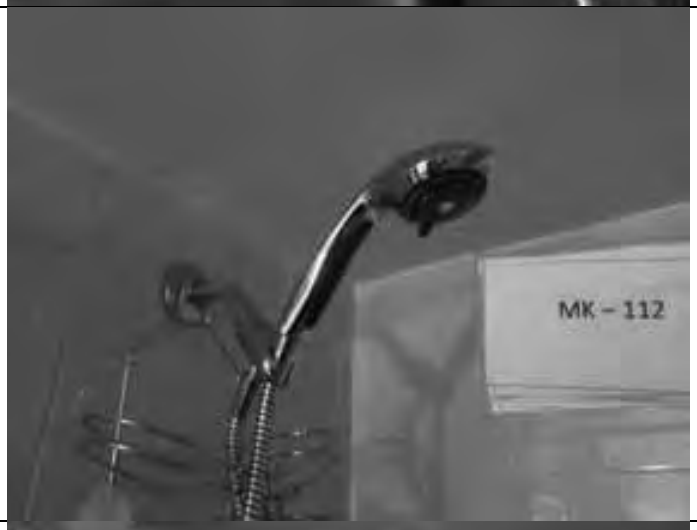
MK112		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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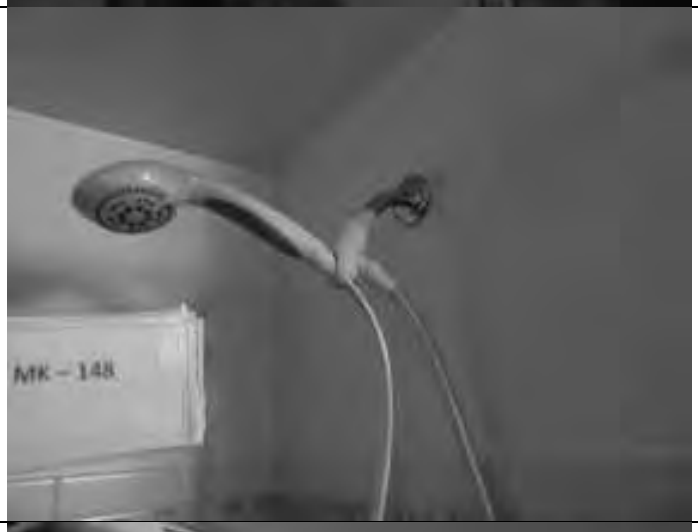
MK148		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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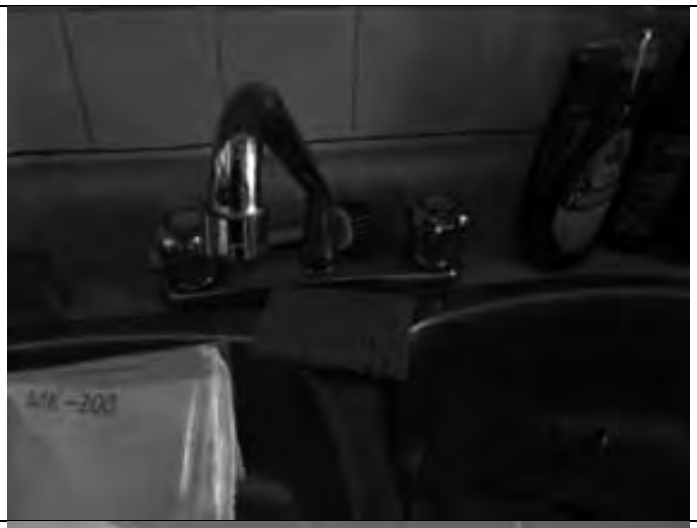
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

MK200		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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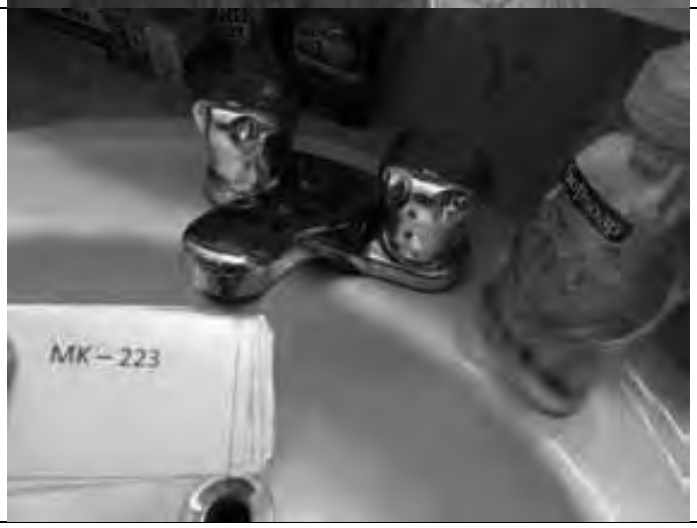
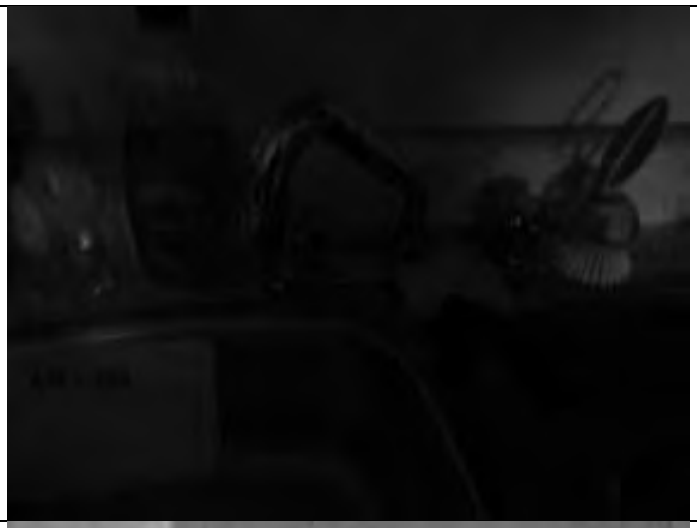
MK223		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

MK224		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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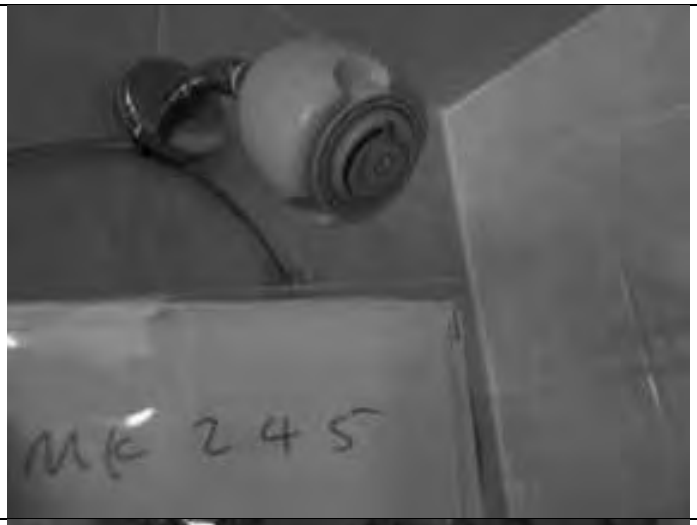
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

MK245		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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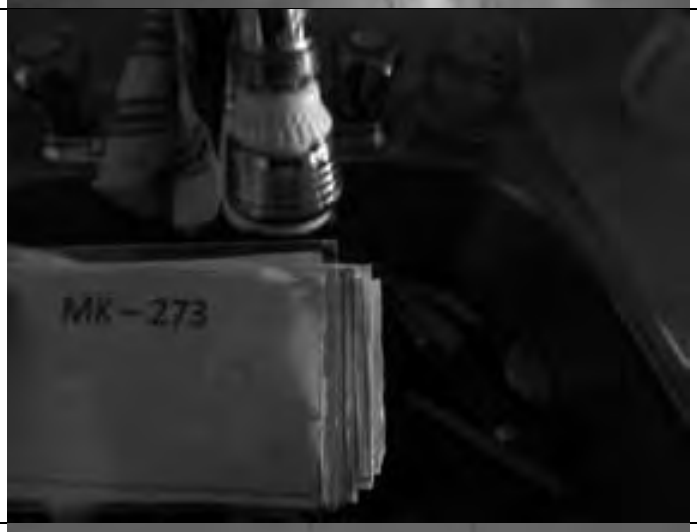
MK273		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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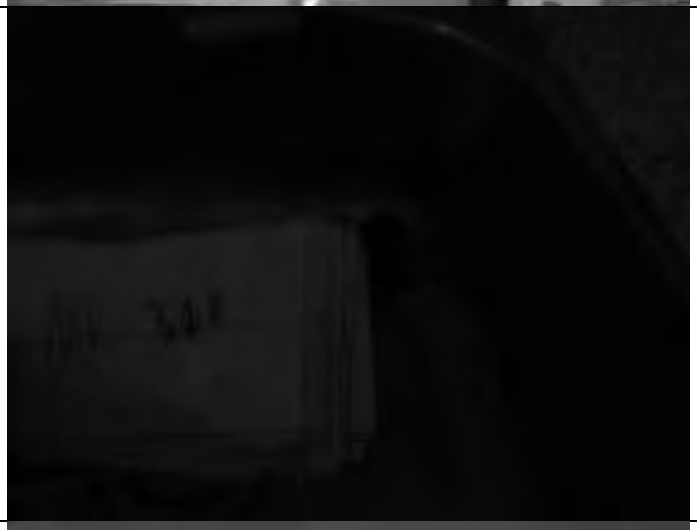
MK318		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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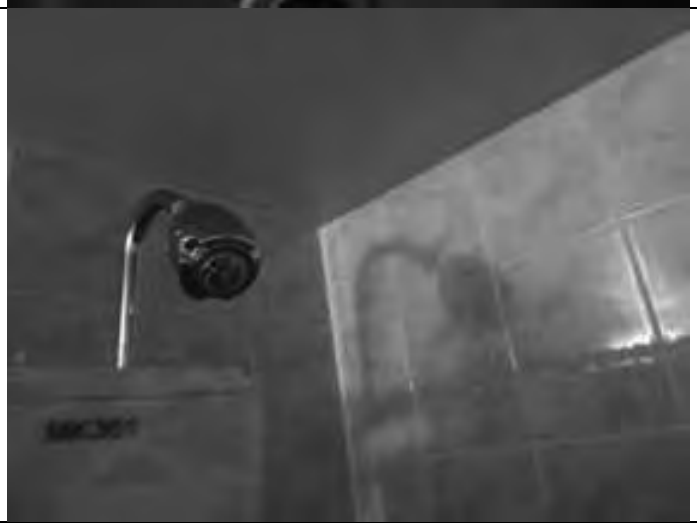
MK361		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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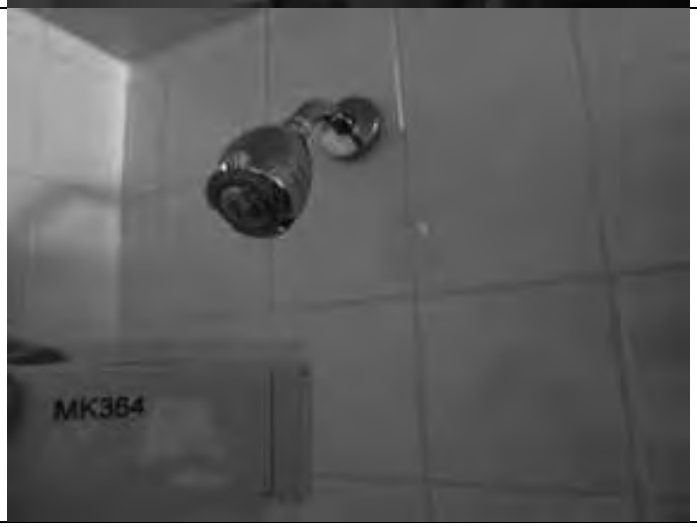
MK364		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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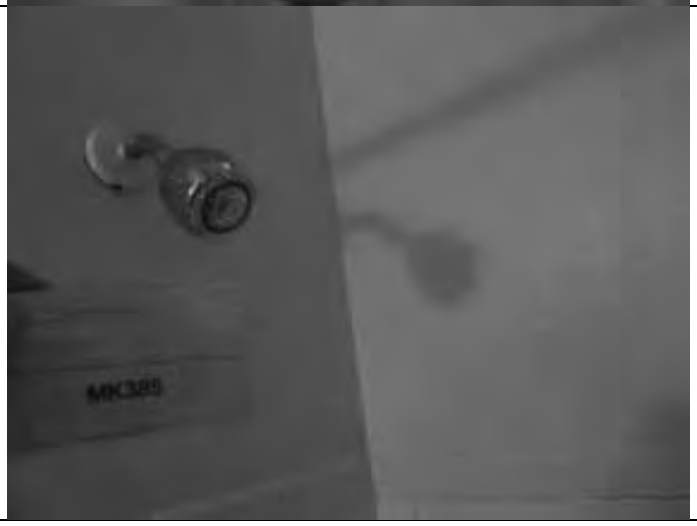
MK385		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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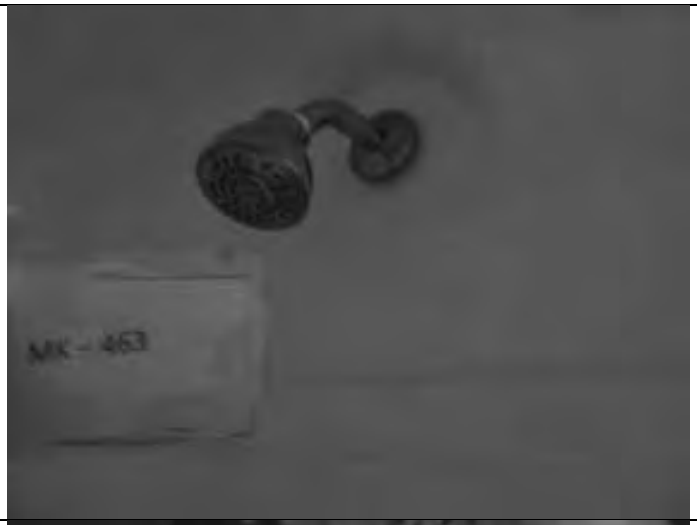
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

MK463		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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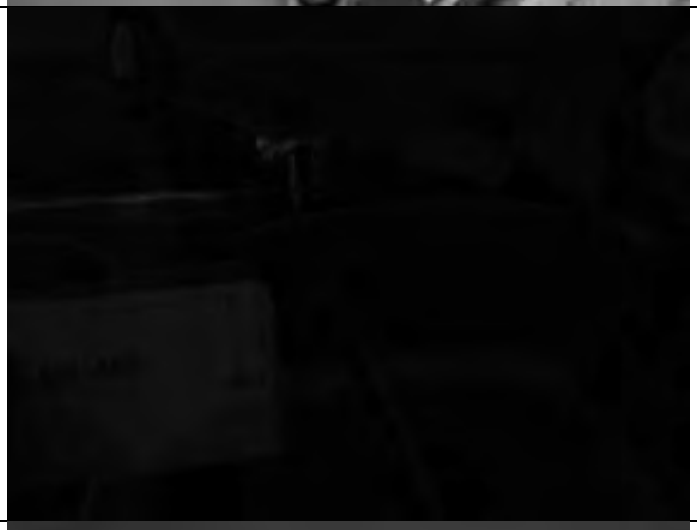
MK469		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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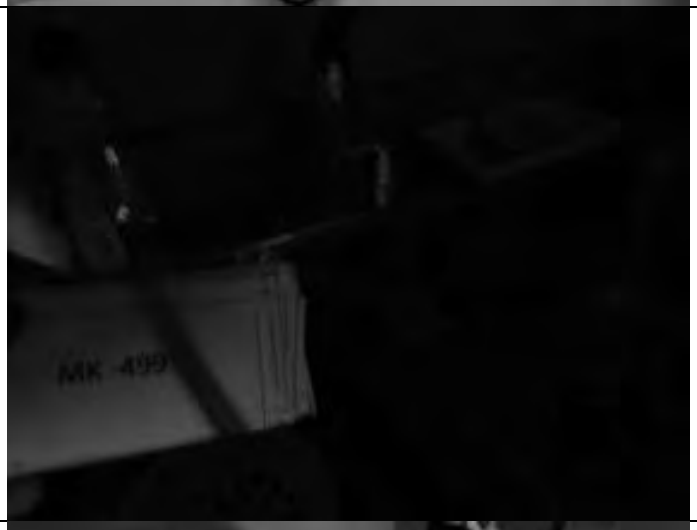
MK499		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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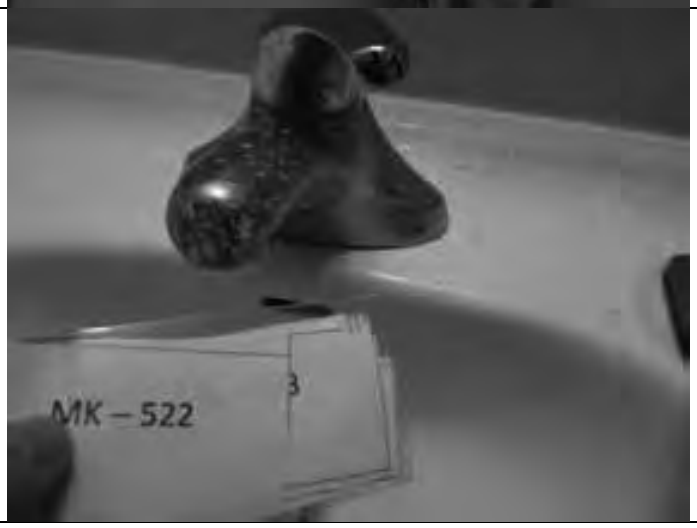
MK522		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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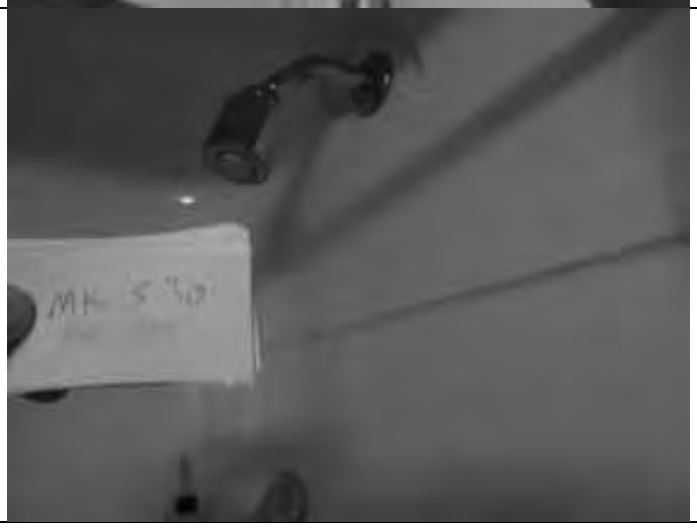
MK530		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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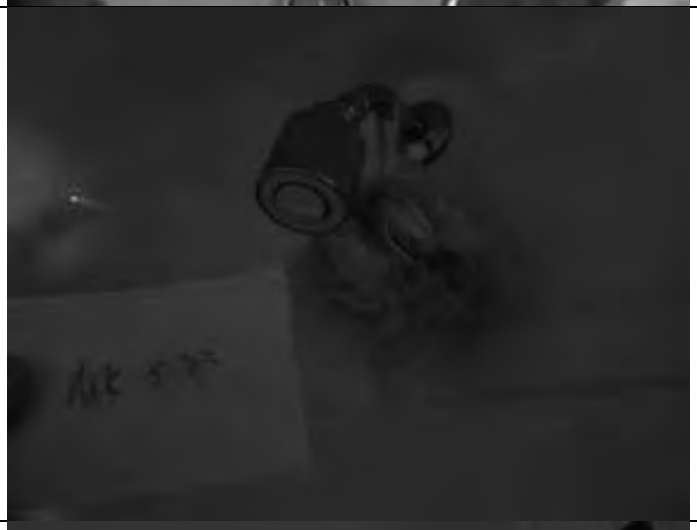
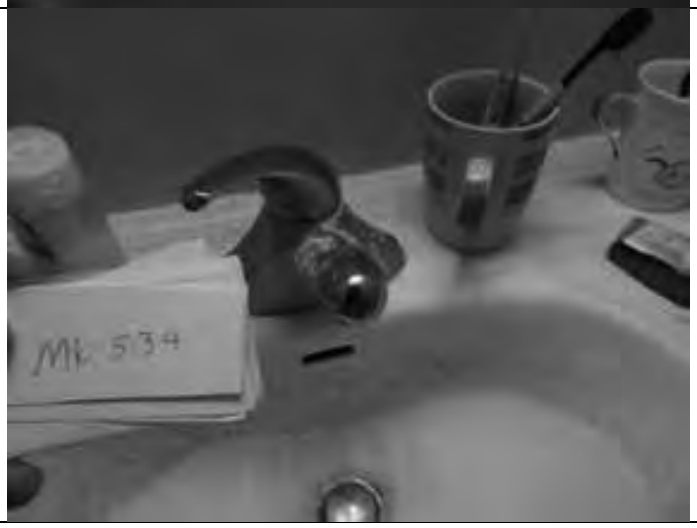
MK532		
MK534		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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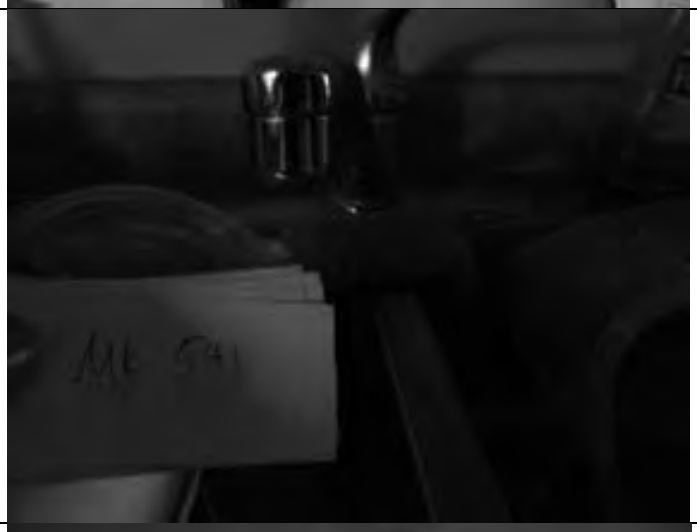
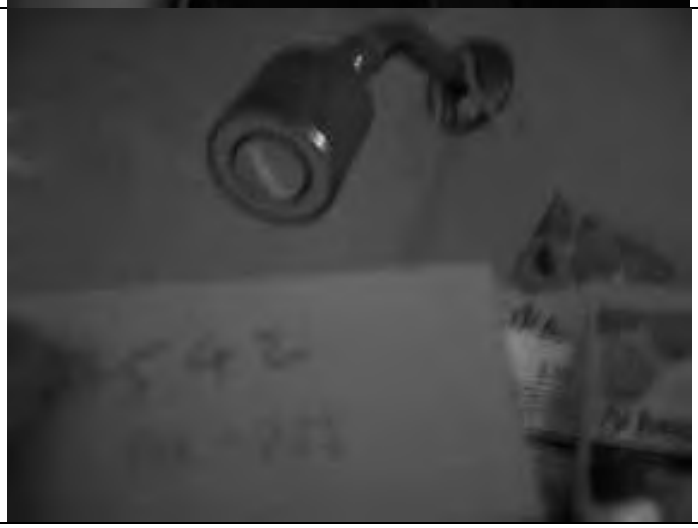
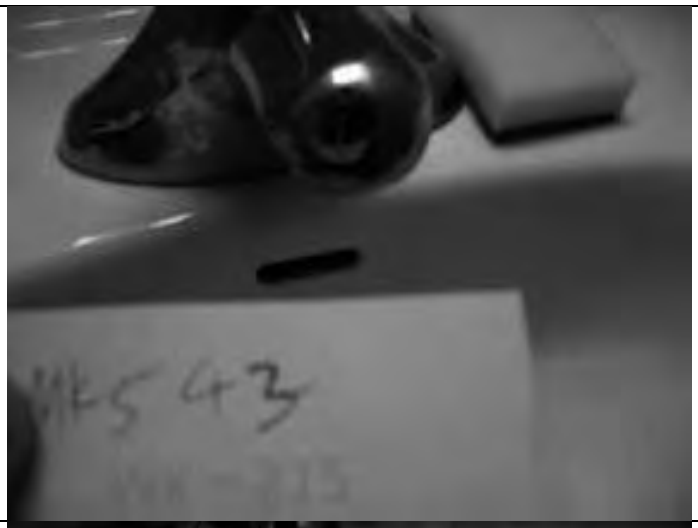
MK541		
MK542		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

MK543		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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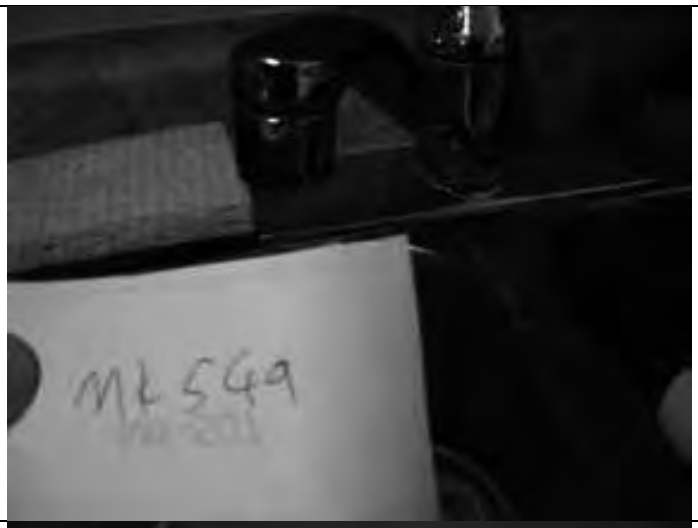
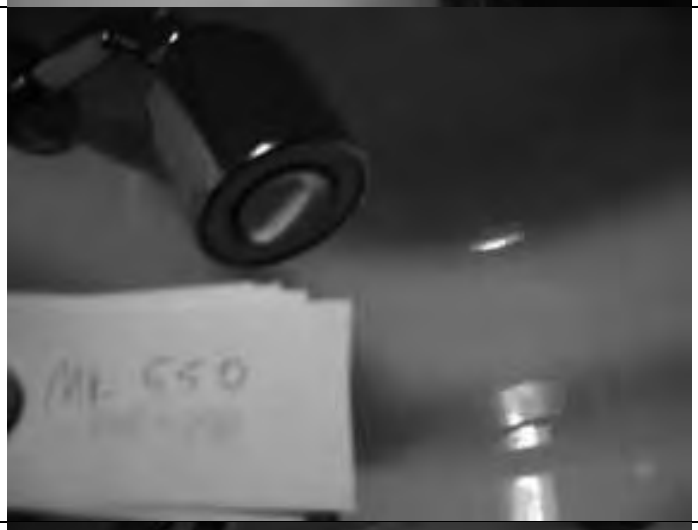
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

MK549		
MK550		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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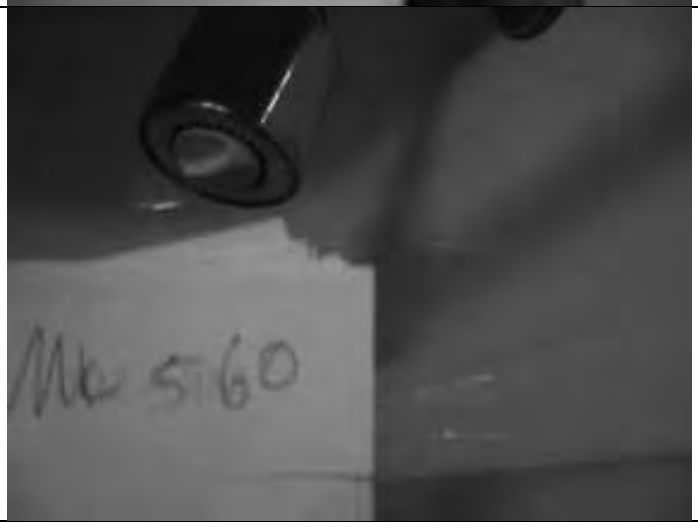
MK560		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

MK561		

UGL HWC Verification – Phase 2

Appendix E – Photos of Installed Measures: BT

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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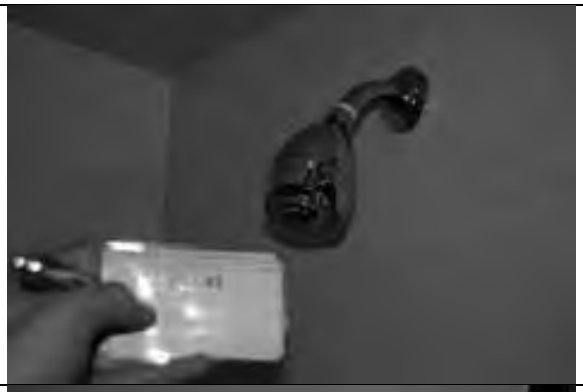
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT43		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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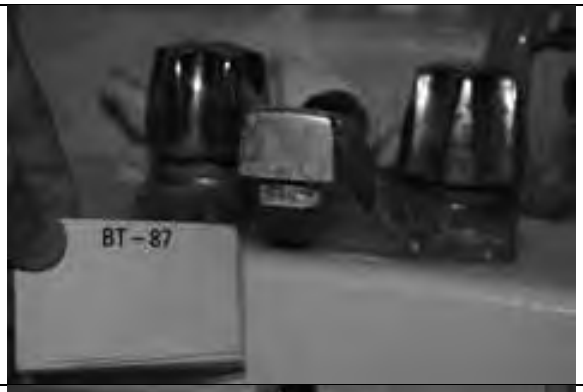
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT87		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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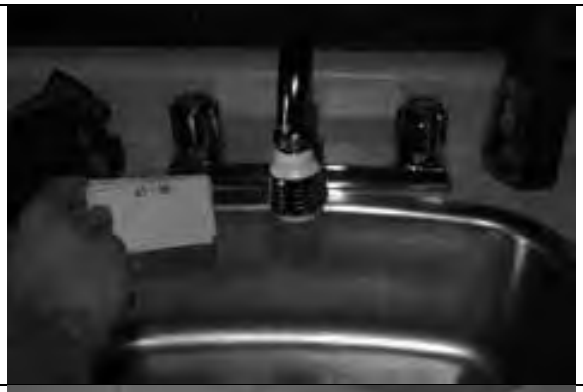
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT99		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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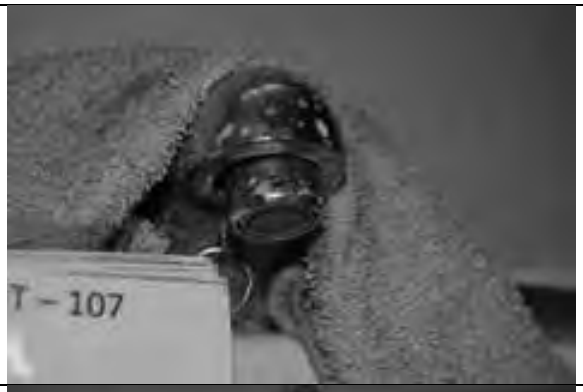
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT107		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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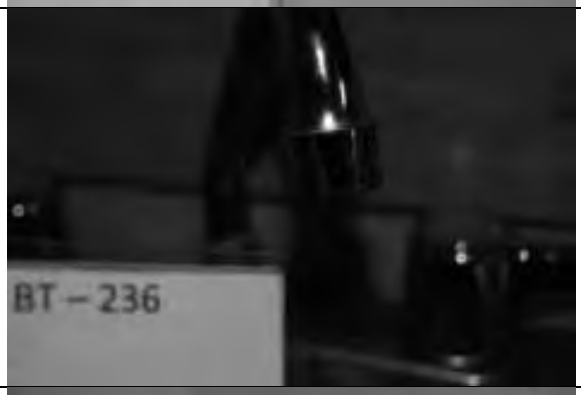
BT236		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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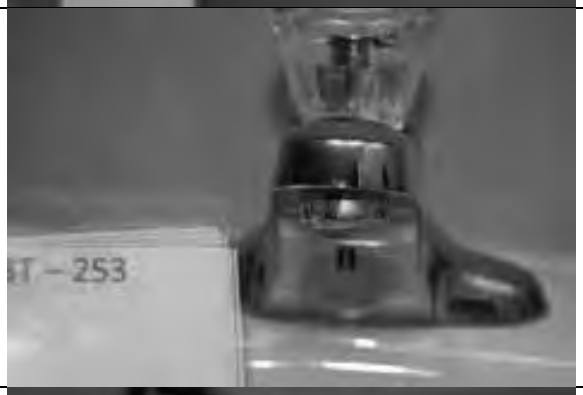
BT253		
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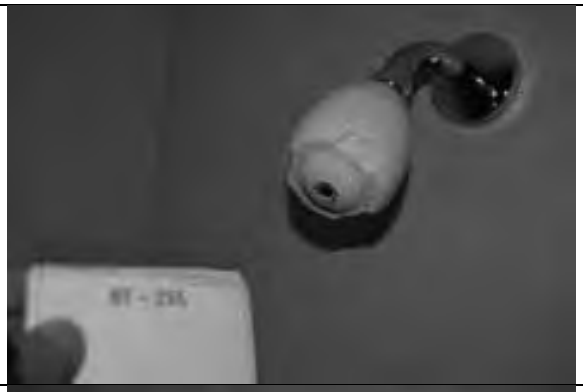
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT255		
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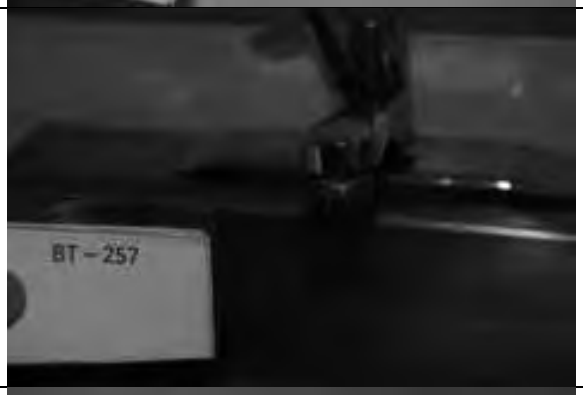
BT257		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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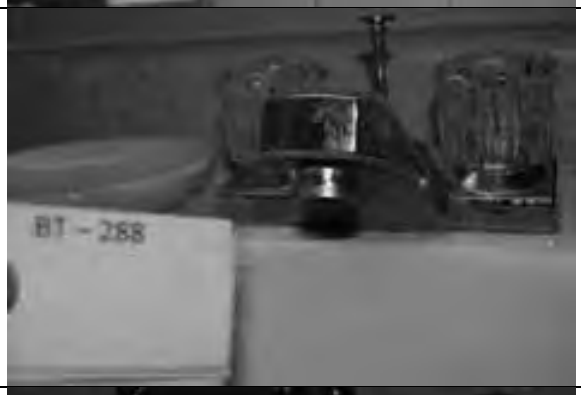
BT288		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT299		
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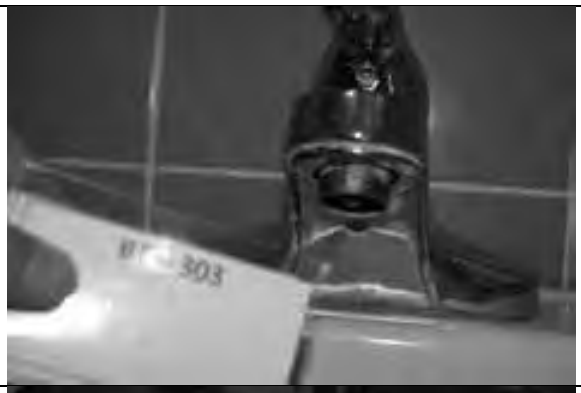
Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT303		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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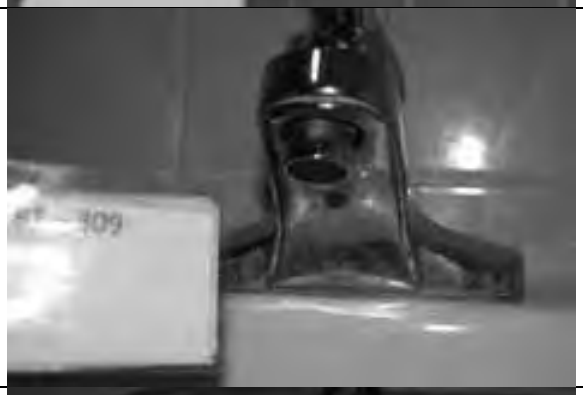
BT309		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT311		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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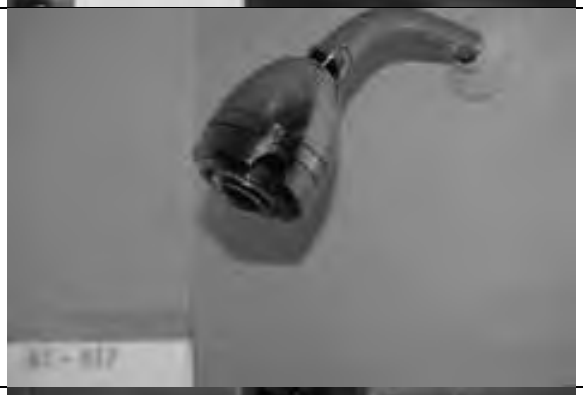
BT317		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT319		
BT320		
BT321		
BT322		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT323		
BT324		
BT325		
BT326		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT327		
BT328		
BT329		
BT330		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT331		
BT332		
BT333		
BT334		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT335		
BT336		
BT337		
BT338		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT339		
BT340		
BT341		
BT342		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT343		
BT344		
BT345		
BT346		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT347		
BT348		
BT349		
BT3450		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT351		
BT352		
BT353		
BT354		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT355		
BT356		
BT357		
BT359		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT360		
BT361		
BT3462		
BT363		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT364		
BT365		
BT366		
BT367		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT3468		
BT369		
BT370		
BT371		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT372		
BT373		
BT374		
BT375		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT376		
BT377		
BT378		
BT379		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT380		
BT381		
BT382		
BT383		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT384		
BT385		
BT386		
BT387		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT388		
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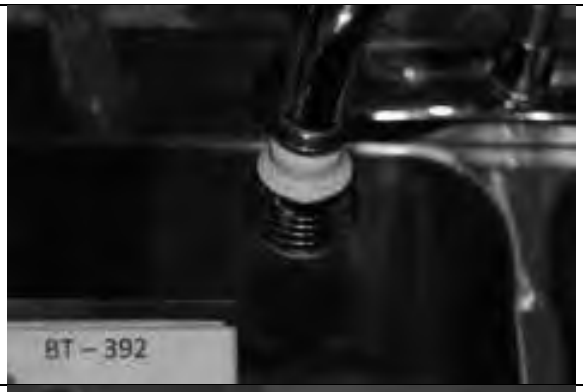
BT390		
BT391		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT392		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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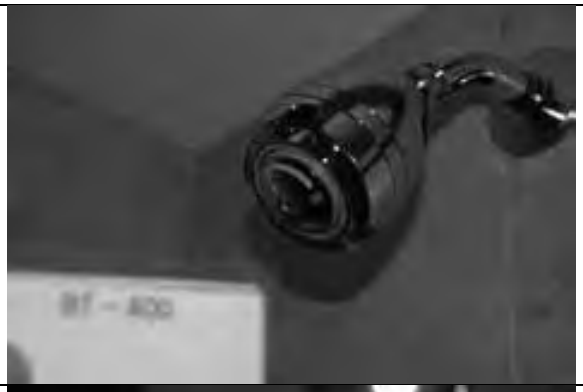
BT398		
BT399		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT400		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

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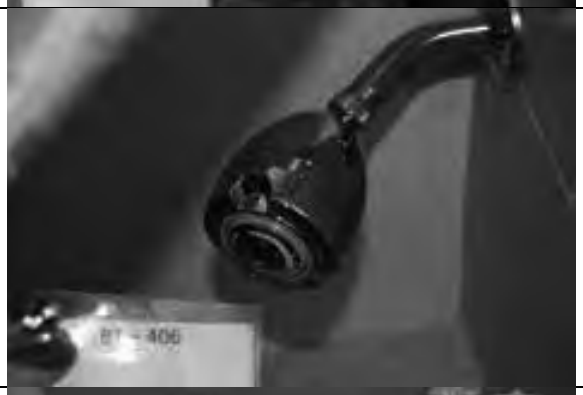
BT406		
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Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT408		
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BT411		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT412		
BT413		
BT414		
BT415		

Appendix E: Photos - 2011 MULTI-FAMILY HOT WATER CONSERVATION (HWC) PROGRAM, VERIFICATION RESULTS – Phase 2

BT416		
BT417		
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Union Gas 2011 Commercial and Industrial Markets Project Verification Final Report

Union Gas
Toronto, ON

Michaels No.: UB511AAN

March 2012

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Union Gas 2011 Commercial and Industrial Markets Project Verification

Final Report

Table of Contents

Executive Summary

Union Gas delivers Demand Side Management (DSM) services to their Ontario commercial and industrial customers through a Custom Rebate program where incentives are based on claimed savings.

Incentives are based on incremental cost relative to industry standard baselines for new construction and replacement, and on total project cost for retrofit projects. Energy savings are calculated by customers, Union Gas personnel, and business partners.

Union Gas has retained Michaels Energy to verify the reported savings, project costs, and effective useful lives on a representative sample of projects through the use of a customer or business partner interview, as well as a desk review of the project documentation and savings calculations, and on-site verification for five projects. This is the final report of verification results for the Union Gas Commercial and Industrial Markets program in Ontario for projects completed in 2011.

A summary of the reported savings for the projects selected for review is shown in Table 1.

Table 1: Reported Costs and Savings for Projects Reviewed

		Natural Gas	Electrical	Water	Incremental Cost	EUL
	Project	(m^3)	(kWh)	(L)	($)	(years)
Wave 1	11	139,203	235,524	-	$ 339.00	20
	13	12,176	160,064	-	$ 903.00	20
	35	57,908	-	-	$ 72,300.00	20
	55	93,175	442,000	-	$ 120,054.00	15
	62	49,178	-	85,145,984	$ 296,565.00	20
	135	105,842	-	7,979,309	$ 44,078.00	20
	139	35,068	502	142,962	$ 41,600.00	20
	150	186,609	41,516	-	$ 30,600.00	20
	156	113,279	-	-	$ 8,159.00	20
	163	179,300	-	-	$ 51,718.00	20
	178	371,379	-	-	$ 46,170.00	20
	182	43,132	40,525	-	$ 11,903.00	10
Wave 2	133	270,259	197,294	-	$ 182,085.00	20
	177	482,626	-	-	$ 74,702.00	20
	183	31,060	-	-	$ 43,345.00	10
	189	64,197	5,655	688,031	$ 2,748.00	10
	197	171,675	-	-	$ 5,214.00	20
	203	66,623	100,100	-	$ 11,206.00	20
	207	175,679	69,031	-	$ 475,650.00	20
	210	240,179	-	-	$ 31,650.00	20
	224	209,106	53,733	-	$ 475,650.00	20
	238	229,185	-	-	$ 419,100.00	20
	240	100,428	981	308,942	$ 3,272.00	7
	242	67,602	-	866,317	$ 90,800.00	20
	302	103,193	-	-	$ 43,600.00	20
	Total	**3,598,061**	**1,346,925**	**95,131,545**	**$ 2,583,411.00**	

The overall realization rate for these projects is 66.5% for gas savings, 81.7% for electrical savings, 86.2% for water savings, and 91.6% for incremental cost. The most frequent reasons for adjustments in gas savings include:

1) Inappropriate Assumptions.

2) Operated or Installed Differently.

3) Calculation or Engineering Error.

The *ex ante*, verified, and realization rate for each resource for all projects is shown in Table 2.

Table 2: Overall Sample Realization Rates

Sample Realization Rates			
Utility	**Ex-Ante**	**Verified**	**RR**
Gas (m3)	3,598,061	2,392,384	66.5%
Water (L)	95,131,545	82,042,371	86.2%
Electricity (kWh)	1,346,925	1,099,856	81.7%
Incremental Cost ($)	2,583,411	2,366,333	91.6%

Overall, effective useful lives (EUL) of the installed equipment were found to be reasonable and appropriate. Adjustments to the EUL were made to 4 of the 25 projects.

1. The EUL for HVAC controls projects (11 and 13) had claimed EULs of 20 years. A literature review indicates that the typical EUL for HVAC controls projects is 15 years.

2. The EUL for project 150 was claimed to be 20 years. However, this project involves multiple measures, and assuming the same EUL for all measures may not be appropriate. The appropriate EUL for multiple measure projects is the weighted average based on expected natural gas savings. Project 150 had one measure that accounted for 85% of the savings and a 15 year EUL, and the second measure accounted for 15% of the savings and a 20 year EUL. Weighting the savings appropriately yields a project EUL of 15.75 years.

Project 238 originally had the EUL claimed at 20 years. However, Union Gas supplied a document titled *UG Custom Offering EUL.pdf* (OEB filing EB-2011-0327) which indicated that the appropriate EUL for this project is 14 years. The 14 years is reasonable for this type of project, and consistent with the literature, therefore no additional changes were made from the 14 year claim

Summary of 2011 Recommendations: Based on the evaluated projects, it is recommended that continued ca*re be taken to ensure the* accuracy of the claimed savings. Establishing further guidelines for expected savings for measures, as well as a percentage of facility usage will help reduce variance among savings claims or calculations at the time of verification. Additionally, fully reviewing verifying calculations submitted by customers and vendors will help reduce the amount of calculation errors. Finally, continued attention should be placed on projects that have significant natural gas savings estimates. A few large projects can have significant impacts on the sample, and thus the program, realization rates.

Review of 2010 Recommendations: Based on the recommendations of the Independent Auditor of the 2010 DSM verification, site visits were included in the verification process. A total of five site visits were completed as part of the 2011 DSM verification, three from wave 1, and two from wave 2. The projects were selected for on-sites based on total natural gas savings, TRC benefits, project complexity, and uncertainty in the ex-ante analysis. The site visits for these five projects replaced the phone interview portion of the verification process. The information collected on-site was used to adjust the existing calculations or create new calculations to determine the verified savings.

Based on the 2010 evaluation, Union Gas was given several recommendations to improve their documentation levels and calculation processes. After conducting a review of the 2011 projects, there were several improvements that should be noted. The first is the consistent use of the *Energy Savings Calc* spreadsheet, and the *Equipment Installation Checklist*. These will continue to ensure all types of necessary documentation are obtained. The second recommendation involved ensuring that the secondary benefits were claimed. The results of the 2011 evaluation show that only one project had secondary benefits that were not accounted for in 2011, compared to four projects that were missed from 2010. However, the realization rate for secondary benefits decreased from 88.3% for electricity and 99.5% for water, to 81.7% and 86.2%, respectively.

1. Introduction

Union Gas delivers Demand Side Management (DSM) services to their Ontario commercial and industrial customers through a Custom Rebate program where incentives are based on claimed savings.

Incentives are based on incremental cost relative to industry standard baselines for new construction and replacement, and on total project cost for retrofit projects. Energy savings are calculated by customers, Union Gas personnel, and business partners.

Union Gas has retained Michaels Energy to verify the reported savings, project costs, and effective useful lives on a representative sample of projects through the use of a desk review of the project documentation and savings calculations, a customer or business partner phone interview, and on-site verification for five select projects. This is the final report of verification results for the Union Gas Commercial and Industrial Markets program in Ontario for projects completed in 2011.

2. Verification Methodology

2.1. Sample Overview

A summary of the reported savings for the projects selected for technical review are tabulated in Table 3.

Table 3: Reported Costs and Savings for Projects Reviewed

	Project	Natural Gas (m^3)	Electrical (kWh)	Water (L)	Incremental Cost ($)	EUL (years)
Wave 1	11	139,203	235,524	-	$ 339.00	20
	13	12,176	160,064	-	$ 903.00	20
	35	57,908	-	-	$ 72,300.00	20
	55	93,175	442,000	-	$ 120,054.00	15
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	242	67,602	-	866,317	$ 90,800.00	20
	302	103,193	-	-	$ 43,600.00	20
	Total	**3,598,061**	**1,346,925**	**95,131,545**	**$ 2,583,411.00**	

2.2. Verification Process

The verification process has up to three stages of review. The first stage is a phone interview of the project customer and/or business partner. The customer and/or business partner is interviewed to verify information submitted on the application, as well as determine the operating conditions of the equipment installed.

The second stage is the technical review. The calculations and documentation of all 25 projects are reviewed in depth. The calculations are compared against information provided in the application and equipment data, as well as information collected during the customer or business partner interview for consistency, accuracy, and reasonableness of assumptions. If no calculations are provided, the savings are recalculated using any and all information available to the evaluator.

Based on the recommendations of the Independent Auditor of the 2010 DSM verification, site visits were included in the verification process. A total of five site visits were completed as part of the 2011 DSM verification, three from Wave 1, and two from Wave 2. The projects were selected for on-sites based their total natural gas savings, TRC benefits, project complexity, and uncertainty in the *ex ante* analysis. The site visits for these five projects replaced the phone interview portion of the verification process. The information collected on-site was used to adjust the existing calculations or create new calculations to determine the verified savings.

For each project, a realization rate is calculated to show the impacts of any adjustments made to the savings during the technical reviews. The realization rate is calculated by dividing the adjusted savings by the original savings estimate. A project with no adjustments has a realization rate of 1.00.

2.3. Verification Guidelines

The following guidelines were used during the course of the verification process.

1. The original energy savings are determined based on the expected equipment operating conditions at the time of implementation. The verification, however, is based on the actual equipment operation at the time of the verification, after project completion. Adjustments are made if the system or equipment was not operating, at the time of verification, as described or portrayed in the original calculations. If the operation at the time of the verification is not considered to be "typical" operation by the customer, the verified savings are based instead on the customer described "typical" operation.

2. The verification includes assessment of savings claimed, as well as savings not claimed. Therefore, measures were examined in depth to verify the existence or non-existence of electrical or water savings that were not claimed.

3. The verification includes assessment of the calculations and procedures used to determine the verified savings after an onsite visit (when applicable) had been conducted. For these projects, the presented savings include any adjustments made by the onsite evaluator and/or Michaels Energy.

4. The verification includes assessment of costs associated with the projects. Cost will be reviewed for reasonableness. In addition, the baseline and efficient system costs will be reviewed to ensure they are consistent with the equipment used to determine the savings.

2.4. Savings Adjustment Categories

Each calculation adjustment has been categorized into one of the following types.

Inappropriate Assumptions:	These are adjustments made because the assumptions used in the savings calculations resulted in unrealistically high or overly conservative energy savings. Unrealistic assumptions result in an incorrect energy use estimate before or after project implementation. Calculations resulting in incorrect savings from using the wrong baseline are included in this group.

Tracking Error:	These are adjustments made because the savings in the calculations do not match the savings ultimately used to determine the rebate for the project.
Calculation or Engineering Error:	These are adjustments made because of errors in applying engineering principles or general calculation errors not attributable to operation or installation.
Operated or Installed Differently:	These are adjustments made because based on the description of operation from the interview of the customer and/or business partner, the equipment was installed differently or is operated differently than what was assumed in the savings calculations.
Unknown:	The cause of these adjustments could not be determined. Often this is due to incomplete calculations or project descriptions being provided in the project file.

3. Results of the Verification

Based on the evaluation, the gas, electric, and water realization rates for all projects reviewed are presented in Table 4 below.

Table 4: Overall Sample Realization Rate

Utility	Ex-Ante	Verified	RR
Gas (m3)	3,598,061	2,392,384	66.5%
Water (L)	95,131,545	82,042,371	86.2%
Electricity (kWh)	1,346,925	1,099,856	81.7%
Incremental Cost ($)	2,583,411	2,366,333	91.6%

The reviewed projects were split into two categories: Wave 1 and Wave 2. Both waves of projects contained a wide range of measures. There were substantially more industrial end uses in the sample compared to previous years, with 10 of the 25 projects used in process applications.

Table 5: Realization Rates for Wave 1 and Wave 2

Utility	Natural Gas (m^3)			Electrical (kWh)			Water (L)		
	Ex-Ante	Ex Post	RR	Ex-Ante	Ex Post	RR	Ex-Ante	Ex Post	RR
Wave 1	1,386,249	1,154,110	83.3%	920,131	745,838	81.1%	93,268,255	81,007,324	86.9%
Wave 2	2,211,812	1,238,274	56.0%	426,794	354,018	82.9%	1,863,290	1,035,047	55.5%
Total	3,598,061	2,392,384	66.5%	1,346,925	1,099,856	81.7%	95,131,545	82,042,371	86.2%

The results in Table 5 show that the realization rate for Wave 1 was higher than Wave 2 projects. It should be noted that Wave 2 has more than twice the natural gas savings of Wave 1. The projects were also reviewed using two different approaches; phone interviews with desk reviews, and on-site visits. The difference in the realization rates between the two review types can be seen in Table 6.

Table 6: Realization Rate by Review Type

Review Type	Qty	Natural Gas (m^3)			Electrical (kWh)			Water (L)		
		Ex-Ante	Ex Post	RR	Ex-Ante	Ex Post	RR	Ex-Ante	Ex Post	RR
Desk Review	20	2,548,961	1,370,094	53.8%	1,108,115	1,032,412	93.2%	9,985,561	5,799,116	58.1%
On-Site	5	1,049,100	1,022,289	97.4%	238,810	67,445	28.2%	85,145,984	76,243,254	89.5%

The projects which had on-site visits completed had higher realization rates for natural gas and water than those where a desk review was completed. However, due to the small number of on-site projects, it is nor possible to draw broad conclusions. As a result of the technical review of these projects, the natural gas savings were adjusted for 24 projects, of which 15 were adjusted by more than 15%. There are sometimes several reasons for adjusting the savings estimate for a project, but for clarity, only the primary reason was recorded. The primary reason is defined as the reason the reviewer determined had the greatest effect on the change in savings.

Table 7 includes the frequency of occurrence for each adjustment reason and the magnitude of adjustments.

Table 7: Reasons for Adjusting Gas Savings

Gas Savings				
Primary Reason for Adjustment	Frequency	Percentage of Occurance	Absolute Value of Adjustments	Percent of Total Adjustments
Inappropriate Assumptions	8	36%	298,355	20%
Tracking Error	0	0%	0	0%
Calculation or Engineering Error	5	23%	210,547	14%
Operated or Installed Differently	9	41%	790,466	52%
Unknown	2	9%	227,061	15%
Total Adjustments	22	100%	1,526,428	85%

Note that these tables are based on the absolute value of adjustments. The sum of these absolute values will be greater than the net adjustments reflected in the realization rate.

The most frequent reasons for gas savings adjustments were “Operated or Installed Differently” accounting for 9 adjustments, and “Inappropriate Assumptions”, which accounted for 8 adjustments.“Operated or Installed Differently” was responsible for the greatest adjustment in gas savings with 52% of the adjustments. “Inappropriate Assumptions” was responsible for the second largest adjustment in gas savings with 20% of the adjustments. There were also 2 projects were the adjustments were classified as “Unknown”. In these cases, the original savings estimates calculated using spreadsheets or models, and the actual savings realized based on the usage history were different. However, during the verification, the specific factor or error in the original analysis could not be identified.

3.1. Savings Impacts

The *ex ante* savings, *ex post* savings, and realization rate for each of the projects reviewed can be seen in Table 8. Those projects which did not claim any savings for a particular utility are given the realization rate “N/A” regardless of the *ex post* savings amount.

Table 8: Realization Rates by Project

	Project	Technology	Natural Gas (m3)			Electrical (kWh)			Water (L)		
			Ex Ante	Verified	RR	Ex Ante	Verified	RR	Ex Ante	Verified	RR
Wave 1	11	Controls	139,203	144,571	103.9%	235,524	68,905	29.3%	-	-	N/A
	13	Controls	12,176	5,873	48.2%	160,064	171,021	106.8%	-	-	N/A
	35	Shell	57,908	79,151	136.7%	-	-	N/A	-	-	N/A
	55	Controls	93,175	97,734	104.9%	442,000	442,000	100.0%	-	-	N/A
	62	Process	49,178	44,457	90.4%	-	-	N/A	85,145,984	76,243,254	89.5%
	135	Process	105,842	55,102	52.1%	-	-	N/A	7,979,309	4,764,070	59.7%
	139	Water Heating	35,068	8,106	23.1%	502	3	0.5%	142,962	-	0.0%
	150	HVAC Equipment	186,609	43,432	23.3%	41,516	20,393	49.1%	-	-	N/A
	156	Agricultural	113,279	113,279	100.0%	-	-	N/A	-	-	N/A
	163	Agricultural	179,300	157,739	88.0%	-	-	N/A	-	-	N/A
	178	Agricultural	371,379	367,965	99.1%	-	-	N/A	-	-	N/A
	182	Controls	43,132	36,701	85.1%	40,525	43,516	107.4%	-	-	N/A
Wave 2	133	HVAC Equipment	270,259	296,826	109.8%	197,294	47,052	23.8%	-	-	N/A
	177	Agricultural	482,626	45,373	9.4%	-	-	N/A	-	-	N/A
	183	Shell	31,060	2,045	6.6%	-	-	N/A	-	-	N/A
	189	Process	64,197	63,548	99.0%	5,655	1,177	20.8%	688,031	716,170	104.1%
	197	Process	171,675	269,609	157.0%	-	-	N/A	-	-	N/A
	203	HVAC Equipment	66,623	45,217	67.9%	100,100	24,807	24.8%	-	-	N/A
	207	Process	175,679	114,922	65.4%	69,031	118,715	172.0%	-	-	N/A
	210	Process	240,179	156,237	65.1%	-	-	N/A	-	-	N/A
	224	Process	209,106	94,821	45.3%	53,733	111,742	208.0%	-	-	N/A
	238	HVAC Equipment	229,185	6,684	2.9%	-	-	N/A	-	-	N/A
	240	Process	100,428	105,132	104.7%	981	1,013	103.3%	308,942	318,876	103.2%
	242	Process	67,602	23,486	34.7%	-	49,513	N/A	866,317	-	0.0%
	302	Process	103,193	14,373	13.9%	-	-	N/A	-	-	N/A
		Total	**3,598,061**	**2,392,384**	**66.5%**	**1,346,925**	**1,099,856**	**81.7%**	**95,131,545**	**82,042,371**	**86.2%**

Table 9 includes the reported savings and the realization rate for each technology group for all 25 projects reviewed. Controls projects accounted for the largest portion of the reviewed sample, and also had the largest adjustments.

Table 9: Savings by Technology Group

Technology Group	Technical Reviews Completed	Ex Ante Natural Gas Savings	Ex Post Natural Gas Savings	Realization Rate	Natural Gas Adjustments	Percent of Adjustments
Agricultural	4	1,146,584	684,356	60%	(462,228)	38%
Controls	4	287,686	284,879	99%	(2,807)	0%
HVAC Equipment	4	752,676	392,160	52%	(360,516)	30%
Process	10	1,287,079	941,686	73%	(345,393)	29%
Shell	2	88,968	81,196	91%	(7,772)	1%
Water Heating	1	35,068	8,106	23%	(26,962)	2%
Totals	25	**3,598,061**	**2,392,384**	**66%**	(1,205,677)	100%

Table 10 displays the energy savings and adjustments by wave. The gas saving adjustments (plus and minus) is a result of the technical review. The results of Table 10 show that the adjustments for the second wave were larger on a percentage basis than the first wave projects.

Table 10: Savings Adjustments after Technical Review

Utility	Natural Gas (m^3)			Electrical (kWh)			Water (L)		
	Ex-Ante	Ex Post	RR	Ex-Ante	Ex Post	RR	Ex-Ante	Ex Post	RR
Wave 1	1,386,249	1,154,110	83.3%	920,131	745,838	81.1%	93,268,255	81,007,324	86.9%
Wave 2	2,211,812	1,238,274	56.0%	426,794	354,018	82.9%	1,863,290	1,035,047	55.5%
Total	3,598,061	2,392,384	66.5%	1,346,925	1,099,856	81.7%	95,131,545	82,042,371	86.2%

3.2. Realization Rate Distribution

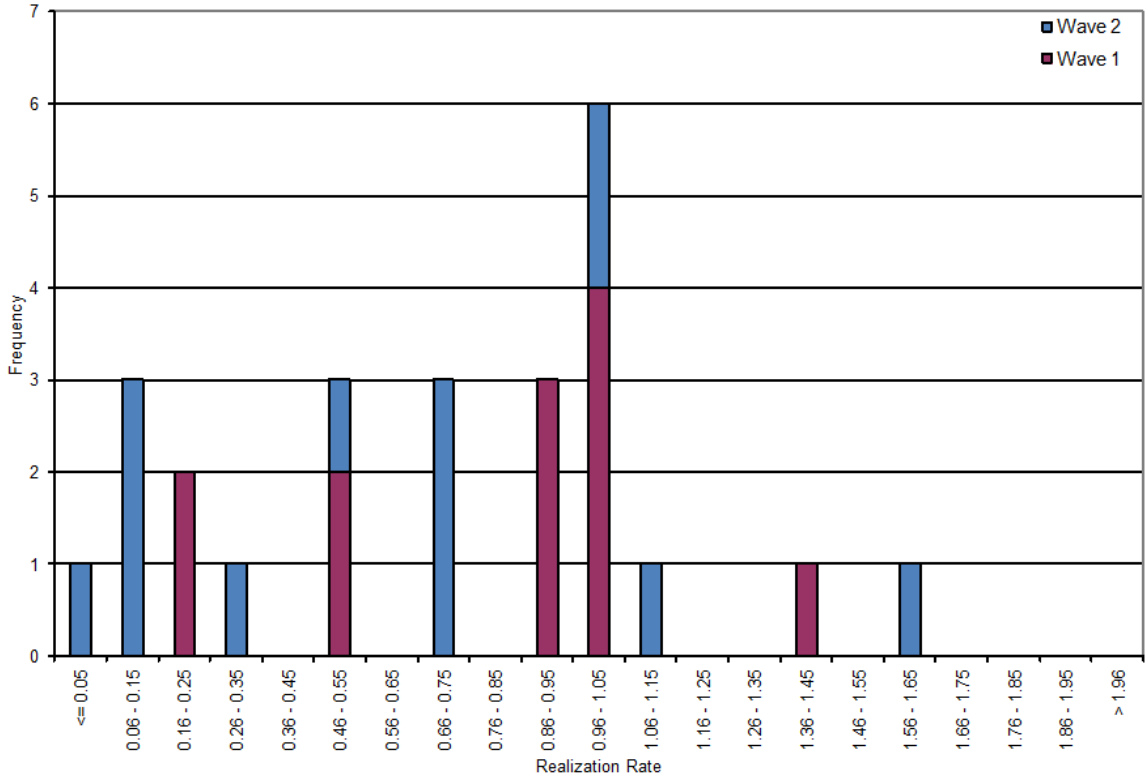
The overall realization rates do not fully indicate the extent of all adjustments. Table 11 shows the realization rate extremes.

Table 11: Realization Rate Range

	Minimum Realization Rate	Maximum Realization Rate
Natural Gas	3%	157%
Electric	1%	208%
Water	0%	104%

To illustrate the variation in individual projects, the frequency of individual project realization rates were plotted. The realization rates were broken into 10% bins and these bins were plotted against their frequency. These results are presented in Figure 1.

Figure 1: Realization Rate Frequency



The overall realization rate is based on the total net adjustment, so portions of the downward adjustments are cancelled by upward adjustments. This realization rate frequency plot offers another view of the accuracy of the original calculations.

Figure 1 shows that out of the 25 projects reviewed, 12 had realization rates that were less than 85% and 2 projects had a realization rate greater than 115%. Additionally, a total of 11 projects had their predicted savings adjusted by greater than 50% in either direction.

3.3. Observations on Specific Projects

There were 10 gas projects that had their predicted savings adjusted by 50% or more in either direction. These projects are shown in Table 12.

Table 12: Projects with Gas Realization Rates of <50% or >150%

Project	Technology Group	Project Realization Rate	Natural Gas Adjustment (m^3)	Specific Reason For Adjustments
238	HVAC Equipment	2.9%	(222,501)	The original calculation assumed the project would save approximately 50% of the facilities natural gas usage. Therefore, the savings for this project should be apparent in the gas bills. The billed regression analysis shows savings for the project, however, they are significantly smaller than what was originally claimed.
183	Shell	6.6%	(29,015)	The original savings calculation overestimated the savings for this technology when compared to the vendor supplied information. This was confirmed through the use of a billed regression analysis. The ex-post savings were calculated using the methodolgy laid out in the [redacted] vendor report.
177	Agricultural	9.4%	(437,253)	The main difference is the annual production. The original analysis assumed total annual production of [redacted] During the customer interview, the customer stated that going forward the anticipated production would be approximately [redacted]
302	Process	13.9%	(88,820)	Standard evaluation practice does not include anticipated production [redacted] unless sustained growth can be proven, contracts are already in place, or the current year was abnormal. Because the demand for [redacted] is customer driven, and not guaranteed by contracts already in place, the increase in production past next year cannot be considered in the energy savings calculation. This reduces the savings for this project.

Project	Technology Group	Project Realization Rate	Natural Gas Adjustment (m^3)	Specific Reason For Adjustments
139	Water Heating	23.1%	(26,962)	The hot water usage, and therefore the boiler usage is dependant on production and not constant as assumed in the original analysis. Using the anticipated production from the customer reduced the savings for this project.
150	HVAC Equipment	23.3%	(143,177)	The realization rate for this project was reduced due to the results of the billed regression analysis. Normalizing the energy usage for weather appears to have had the most significant impact on the analysis.
242	Process	34.7%	(44,116)	The ex post energy savings for this project are less than the ex ante savings estimates. No electronic copy of the savings calculations were provided for the ex ante savings, therefore, the causes for the discrepancies could not be fully identified.
224	Process	45.3%	(114,285)	The gas savings for this project were reduced due to using the actual usage for each individual building instead of using the [redacted] wide usage and averaging it out over all [redacted] buildings.
13	Controls	48.2%	(6,303)	The realization rate for this project was reduced because the average outdoor temperature during the heating season was assumed to be too high.
197	Process	157.0%	97,934	The natural gas savings for this project were increased because of the increase in production hours over what was assumed in the original analysis.

The complete review of each project, including a project description, calculation summary, and any recommended changes are presented in the appendices. The project overview can be found in Appendix A, detailed measure and calculation reviews can be found in Appendix B, and the completed customer interviews are located in Appendix C.

In addition to looking at projects that were adjusted by 50% or more, projects that had large savings adjustments were also examined. A total of 4 projects were found to have adjustments greater than 10% of the total value of the savings adjustments. These four projects contributed 76% of the total savings adjustments. In addition, these projects accounted for 60% of the absolute value of the adjustments. These projects are shown in Table 13 below.

Table 13: Projects With Large Savings Adjustments

Project	Technology Group	Project Realization Rate	Natural Gas Adjustment (m^3)	Specific Reason For Adjustments
224	Process	45.3%	(114,285)	The gas savings for this project were reduced due to using the actual usage for each individual building instead of using the [redacted] wide usage and averaging it out over all [redacted] buildings.
150	HVAC Equipment	23.3%	(143,177)	The realization rate for this project was reduced due to the results of the billed regression analysis. Normalizing the energy usage for weather appears to have had the most significant impact on the analysis.
238	HVAC Equipment	2.9%	(222,501)	The original calculation assumed the project would save approximately 50% of the facilities natural gas usage. Therefore, the savings for this project should be apparent in the gas bills. The billed regression analysis shows savings for the project, however, they are significantly smaller than what was originally claimed.
177	Agricultural	9.4%	(437,253)	The main difference is the annual production. The original analysis assumed total annual production of [redacted] During the customer interview, the customer stated that going forward the anticipated production would be approximately [redacted]
Total adjustment of this Group:			(917,215)	
Absolute value of adjustments:			917,215	

3.4. Project Cost Assessment

Incremental costs were adjusted on 9 of the 25 projects reviewed. The incremental costs for 4 projects were adjusted significantly. The 5 remaining costs were within 10% of the original values, with four projects being a simple rounding difference of less than $1.00. The assumptions used to develop the TRC values were not provided, therefore, updated TRC values could not be determined.

1. Project 139 had the incremental cost increased because the baseline equipment used in the original calculation of the incremental cost already contains the upgrades. The original incremental cost attributed $35,000 for the new boiler, and $22,850 for “Linkageless Controls & VFD”. However, examination of the manufacturer’s specifications for the baseline boiler indicates it comes equipped with these upgrades. The labor cost was estimated at $12,100 from RSMeans, bringing the total install cost for the baseline boiler to $47,100.

2. Project 156 had the incremental cost adjusted to reflect the inclusion of discounts offered in the proposed unit cost. The discounts of 3% and 6% were applied to the baseline cost just as they were to the proposed cost. The original calculation appears to have included this fact, but no calculation was provided to verify the numbers or determine where the discrepancy originated.

3. Project 163 had the incremental cost increased to reflect the actual cost of the installed unit. The original incremental cost was calculated based on the vendor quotes instead of the actual invoices for the equipment. The large incremental cost is due to the significantly higher installation of the proposed unit, as it is a different type (tower versus horizontal) of grain dryer than the quoted baseline unit.

4. Project 133 had the incremental cost reduced to represent the appropriate baseline. The data collected during the on-site visit demonstrated that the existing units were in disrepair and no longer functioning properly. This requires the use of “standard practice” equipment as the baseline, which for this particular project is indirect fired make-up air units. The customer provided quotes received from the vendor for the indirect and direct fired units considered for this project. The installed direct fired units were cheaper than the baseline indirect fired units, resulting in a decrease in the incremental cost.

A listing of the original and verified incremental costs is given in Table 14.

Table 14: Incremental Cost Realization Rate

		Incremental Cost		
		Original	Verified	RR
Wave 1	11	$ 339	$ 339	99.9%
	13	$ 903	$ 903	100.0%
	35	$ 72,300	$ 72,300	100.0%
	55	$ 120,054	$ 120,054	100.0%
	62	$ 296,565	$ 296,565	100.0%
	135	$ 44,078	$ 44,078	100.0%
	139	$ 41,600	$ 52,350	125.8%
	150	$ 30,600	$ 30,600	100.0%
	156	$ 8,159	$ 7,239	88.7%
	163	$ 51,718	$ 102,027	197.3%
	178	$ 46,170	$ 46,170	100.0%
	182	$ 11,903	$ 12,345	103.7%
Wave 2	133	$ 182,085	$ (95,573)	-52.5%
	177	$ 74,702	$ 74,702	100.0%
	183	$ 43,345	$ 43,345	100.0%
	189	$ 2,748	$ 2,748	100.0%
	197	$ 5,214	$ 5,214	100.0%
	203	$ 11,206	$ 11,206	100.0%
	207	$ 475,650	$ 475,650	100.0%
	210	$ 31,650	$ 31,650	100.0%
	224	$ 475,650	$ 475,650	100.0%
	238	$ 419,100	$ 419,100	100.0%
	240	$ 3,272	$ 3,272	100.0%
	242	$ 90,800	$ 90,800	100.0%
	302	$ 43,600	$ 43,600	100.0%
Total		**$2,583,411**	**$2,366,333**	**91.6%**

3.5. Effective Useful Life Assessment

Overall, effective useful lives (EUL) of the installed equipment were found to be reasonable and appropriate. Adjustments to the EUL were made to 4 of the 25projects. It is expected that these changes could impact the TRC, however, the extent of this effect was not determined.

3. The EUL for HVAC controls projects (11 and 13) had claimed EULs of 20 years. A literature review[1,2,3] indicates that the typical EUL for HVAC controls projects is 15 years.

4. The EUL for project 150 was claimed to be 20 years. However, this project involves multiple measures, and assuming the same EUL for all measures may not be appropriate. The appropriate EUL for multiple measure projects is the weighted average based on expected natural gas savings. Project 150 had one measure that accounted for 85% of the savings and a

[1] *Technical Reference User Manual*, Efficiency Vermont, 2004.

[2] *Database of Energy Efficiency Resources*, 2008.

[3] *Michigan Energy Measure Database*, Morgan Marketing, 2011.

15 year EUL, and the second measure accounted for 15% of the savings and a 20 year EUL. Weighting the savings appropriately yields a project EUL of 15.75 years.

5. Project 238 originally had the EUL claimed at 20 years. However, Union Gas supplied a document titled *UG Custom Offering EUL.pdf* (OEB filing EB-2011-0327) which indicated that the appropriate EUL for this project is 14 years. The 14 years is reasonable for this type of project, and consistent with the literature, therefore no additional changes were made from the 14 year claim.

4. Observations and Recommendations

4.1. Review of 2010 Recommendations

Based on the 2010 evaluation, Union Gas was given several recommendations to improve their documentation levels and calculation processes. After conducting a review of the 2011 projects, the progress made in several key areas should be identified.

4.1.1. Continue Improving the Documentation Levels

There were continued improvements in the types of documents included in each of the project files evaluated. Several key improvements were the use of the *Energy Savings Calc* spreadsheet. The spreadsheet contains a summary tab that contains most of the important project information such as cost, resource savings, and sources for assumed values. There is also an analysis tab which contains the calculation of the resource savings, a tab dedicated to breakdowns of project costs, and other miscellaneous tabs with project details. Another improvement is the use of the *Equipment Installation Checklist*. This document provides an outline detailing the types of documents that should be included in every file. These two tools are extremely useful tools for Union Gas staff to ensure all important documentation is maintained.

4.1.2. Continue Improving the Secondary Benefits Claims

There was only 1 project evaluated (242) where secondary electricity savings were not originally claimed. This is an improvement when compared to the 2010 evaluation which found 4 projects that did not include secondary resource benefits.

However, there were two projects (139 and 242) where water savings were claimed for projects that do not affect the water use. Additionally, 6 of the 12 projects that claimed electricity savings (11, 139, 150, 133, 189, and 203) had realization rates for electricity savings of less than 50%, and the realization rates for electricity and water savings were 81.7% and 86.2%, respectively. Therefore, while the number of projects where secondary benefits were included was improved, the accuracy of those claims was lower.

4.1.3. Develop Expected Savings for Common Project Types

There were two projects (238 and 242) that had savings claims that differed significantly from the savings that would have been expected, when compared to the annual usage of the facility. While the intent of this particular recommendation was not to develop savings estimates for all conceivable project types, having typical measure savings as well as typical custom project savings as a percent of annual building use may have been able to flag these particular projects as needing some additional follow-up.

Setting savings percentage flags which would require projects claiming more than 25% of total gas usage to go through additional review, or require a confirmation by examining the bills, may eliminate some projects that have unreasonable savings claims.

4.1.4. Review Complex projects in More Detail

The projects reviewed in the 2011 evaluation were generally less complex than those from the previous year. There also was no correlation between project "complexity" and resulting realization rate. Many of the adjustments were due to calculation errors or operational differences and not a misunderstanding of project oversimplification. Therefore, it is not possible to broadly state if any additional review steps have been implemented.

4.1.5. Additional Review of Large Projects

The evaluation team identified a possible process improvement regarding additional review of large projects. Similar to the 2010 sample, the largest few projects had the greatest impact on the overall sample results. The 2011 sample's six largest projects accounted for 50% of the natural gas savings, but had a combined realization rate of 54%. Additional post implementation review, such as a CUSUM analysis or additional metering, may have been able to uncover errors or inconsistencies prior to the evaluation.

4.2. Recommendations Going Forward – Impact

4.2.1. Continue Improving the Documentation Levels

There were several noticeable improvements in the documentation levels including the *Energy Savings Calc* spreadsheet, and the *Equipment Installation Checklist*. These will continue to ensure all types of necessary documentation are obtained. However, the level of detail contained in the documentation should continue to be improved. This applies both to complex and simple projects such as projects 150, and 240.

The savings for project 150 were due to the installation of new boilers, as well as a new energy management system controlling the entire heating and cooling system. However, the project description did not provide significant details regarding the new controls, the building type, its typical operation, the new equipment or the savings calculation. Complex projects such as controls should include very detailed descriptions about the existing equipment, operation schedules, setpoints, the new controls scheme, new equipment, new setpoints, and the assumptions and calculation methodology used to determine the resource savings.

Project documentation is also extremely important for simple projects such as project 240. The natural gas savings were attributed to the repair of steam traps. Based on the project documentation, there appeared to be a calculation error due to the steam loss presented in the steam audit being inconsistent with what was used in the analysis. However, the customer had indicated to Union Gas staff that there were some errors in the steam audit caused by the contractor using an incorrect steam pressure for several of the traps. The notes and updated estimates were not included in the original project documentation but were provided during verification. Small pieces of information such as this can have a significant impact on the savings. Including documentation such as this is not only useful for evaluation, but internal review as well.

4.2.2. Continue Improving the Secondary Benefits Claims

There were a total of 15 projects that included secondary resource benefits in the 2011 sample, and only one project (242) where secondary benefits were found but not claimed initially. However there were two projects where equipment was missed (207 and 224), two projects that inappropriately claimed secondary benefits (139 and 242), and five projects (11, 150, 133, 189, and 203) where the secondary benefits were calculated incorrectly (not including "Operated or Installed Differently" adjustments).

The evaluation team understands that claiming secondary resource benefits is not the primary purpose of the program. However, for some projects (such as 11, 55, 62, and 139) the secondary resource benefits are a major contributor to the overall resource benefits of the project. When secondary resources are significant, such as greater than 100,000 kWh or 1,000,000 L, the detail and level of rigor used to determine those benefits should be increased.

4.2.3. Fully Verify Customer or Vendor Provided Calculations

Several of the projects evaluated (11, 13, 182, 183, 203, 238, and 242) during the 2011 year had calculations that were supplied by the customer or the vendor. These seven projects had a combined realization rate of 44.9%, and all adjustments were due to calculation, assumption, or unknown errors. Customer and vendor supplied calculations should be fully reviewed and verified by Union Gas to ensure the savings claims are accurate and reasonable for the type of project. A follow-up interview, secondary calculation, comparison to billed history, or supplemental review should be completed for all vendor and customer supplied calculations.

4.2.4. Use Current Production Levels for Process Projects

There were a total of 11 projects examined during the 2011 evaluation which contained energy savings dependant on the facilities production levels. Two of those projects (178 and 302) had resource savings that were a function of anticipated production levels in the future. Standard evaluation practice does not award additional savings for future production increases unless; the current year in which the rebate was processed is significantly abnormal, the production increase can be proven based on previous year over year increases, or there are contracts in place guaranteeing the growth. However, in any of these cases, the increase in production can only be accounted for up to one year in the future.

For example, project 178 involved a [redacted] project where the production in 2012 was anticipated to be [redacted] the production in 2011. At the time of the site visit, the contracts for the anticipated production had been finalized, and the increase was planned for next year. Thus, the increase in production was included in the *ex post* analysis. The savings for project 302 were calculated based on assumptions about how the production would increase over the next seven years. Per the completed phone interview, the production is demand based, and dependant on their client's purchases of the material. There were no firm contracts in place, and the customer could only confidently estimate the production for next year. Thus, the increase in production for next year was included, but any estimated increase after that was not included.

4.3. Recommendations Going Forward – Process

The evaluation team identified an area of possible improvement concerning large projects. The evaluated sample included 6 projects that were above 200,000 m^3 of natural gas savings. Therefore, 24% of the projects account for 50% of the savings. Any adjustments made to projects of this magnitude will have an amplified affect on the entire sample, and subsequently the program. Thus, extra care should be taken with large projects to ensure they are accurate. The evaluation team has seen this performed in several ways, some of which include:

- Projects are inspected, onsite, by a utility representative, or third party consultant once the project is completed to ensure that the project is completed, and inputs and operating characteristics of the project are still consistent with the original analysis.

- Pre and/or post metering of the affected equipment is required in order to establish that the savings claimed are reasonable.

- Post installation analysis comparing to the billed history to verify projects that are saving large percentages (greater than 25%) of annual building gas usage.

- Large tier projects, or those with high levels of uncertainty, are technically reviewed by a third party before they are approved for payment.

- Projects are submitted for a peer review to a group that consists of several experienced and/or licensed engineers on staff. The peer group then reviews the projects for accuracy and reasonableness.

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0011	10/1/2010	$339.00	$284,682.00	20	Phone

Project Description:

This project involved the installation of upgraded HVAC controls on several air handling units. The controls improve the operation of the units in two ways. The first was they allowed the units to be scheduled to match occupied and unoccupied times. The second was they allowed for optimized outdoor air flows.

Realization Rate Comments:

The realization rate for this project was sightly increased because of two offsetting errors in the analysis. The savings were reduced because the average outdoor temperature during the heating season was assumed to be too high. The average temperature assumed in the original analysis was 80F, however, the actual time weighted average outdoor air temperature was 70F. This reduction was offset by the fact that the proposed controls reduce the outdoor air by a large enough amount that the units can operate in economizer mode at much lower temperatures. Operating in economizer mode reduces the amount of gas required.

Cost EUL Comments:

The incremental cost was adjusted very slightly due to a small $0.45 difference due to a rounding error. Additionally, the expected useful life was reduced from 20 years to 15 years to be consistent with the literature as well as what is claimed for other HVAC control measures.

Measure Type:

BAS

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	235,524	68,905	29.26%
Gas Savings (m3):	139,203	144,571	103.86%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$339.00	$338.55	100%
Expected Useful Life:	20.0	15.0	75%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0013	10/1/2010	$903.00	$83,963.00	20	Phone

Project Description:

This project involved the installation of upgraded HVAC controls on several air handling units. The controls improve the operation of the units in two ways. The first was they allowed the units to be scheduled to match occupied and unoccupied times. The second was they allowed for optimized outdoor air flows.

Realization Rate Comments:

The realization rate for this project was reduced because the average outdoor temperature during the heating season was assumed to be too high. The average temperature assumed in the original analysis was 80F, however, the actual time weighted average outdoor air temperature was 70F.

Cost EUL Comments:

The expected useful life was reduced from 20 years to 15 years to be consistent with the literature, and what is claimed for other HVAC control measures.

Measure Type:

BAS

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	160,064	171,021	106.85%
Gas Savings (m3):	12,176	5,873	48.23%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$903.00	$902.80	100%
Expected Useful Life:	20.0	15.0	75%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0035	9/1/2010	$72,300.00	$43,458.00	20	Phone

Project Description:

This project invovled the installation of the some additional roof insulation on a portion of the building. The total roof area that was affected was [redacted] sq. ft. The baseline roof insulation consisted of 0.5" of fiberboard and 2.0" of polyisocyanurate insulation. The proposed insulation is composed of 5.0" of expanded polystyrene.

Realization Rate Comments:

The realization rate for this project was increased due to a discrepancy between the assumed baseline insulation levels and the drawings provided in the project file. The building had three distinct sections. In the baseline analysis, all of the sections were assumed to have an insulatoin level of R-15. This was true for two of the sections, whose composit R-value was approximately 18, but not for the third whose baseline R-value was R-3.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Roof Insulation

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	57,908	79,151	136.68%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$72,300.00	$72,300.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0055	12/1/2010	$120,054.00	$216,419.00	15	Phone

Project Description:

The customer upgraded the existing building automation. The upgraded system provides additional controls for the facilities HVAC systems, as well as the interior and exterior lighting. The control system reduces the HVAC unit hours of operation, reduces the amount of interior lighting running during off-peak horus, adds photodells for daylight harvesting for the interior lights, and automatically controls the parking lot lights.

Realization Rate Comments:

The savings for this project increased slightly due to the results of the weather normalized billing regression analysis.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

BAS

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	442,000	442,000	100.00%
Gas Savings (m3):	93,175	97,734	104.89%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$120,054.00	$120,054.00	100%
Expected Useful Life:	15.0	15.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0062	7/1/2010	$296,565.00	$690,200.00	20	On-site

Project Description:

The customer installed a heat recovery system to capture waste heat from their product as it is cooled. The heat energy recovered is used to pre-heat [redacted] water, which saves on heating energy usage. The customer additionally adjusted their steam system to run on high pressure steam instead of low pressure steam to reduce [redacted] time.

Realization Rate Comments:

The realization rate for this project was decreased slightly due to the reslts of the ex-post billed regression analysis. The regression analysis was normalized to production, and used the average production over the last three years to project future production.

Cost EUL Comments:

The incremental cost, and expected useful life for this measure are consistent with the information received in the project file, and consistent with the information obtained during the on-site visit. No changes were made.

Measure Type:

Waste Water Heat Recovery

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	49,178	44,456	90.40%
Water Savings (L):	85,145,984	76,243,254	89.54%
Incremental Cost:	$296,565.00	$296,565.23	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0133	12/10/2010	$182,085.00	$358,399.00	20	On-site

Project Description:

The customer replaced their existing indirect fired make up air units with new direct fired make up air units. The new units have a higher efficiency, and are in better working condition, thus will save natural gas heating energy.

Realization Rate Comments:

The gas savings for this project were increased due to the increase in the plant operating hours as well as the adjustment of the baseline and normalization for weather conditions.

Cost EUL Comments:

The incremental cost of this project was originally assumed to be equal to the project cost. However, adjustment of the baseline changed the incremental cost significantly. According to RSMeans Mechanical Costbook, and information obtained from the customer, the indirect fired units would have cost $57,201 each, and the installed direct fired units actually cost $25,344 each. Since there were 3 units installed, the incremental cost for this project is -$95,573.

The expected useful life for this project was consistent with the literature, therefore no changes were made.

Measure Type:

Direct Fired MAU

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	197,294	47,052	23.85%
Gas Savings (m3):	270,259	296,826	109.83%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$182,085.00	($95,572.80)	-52%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0135	2/8/2011	$44,078.00	$189,855.00	20	Phone

Project Description:

The customer installed a steam condensate recovery system to recover the consensate from their process equipment. The recovered condensate is supplied to the boiler system to reduce the amount of heating energy required.

Realization Rate Comments:

The realization rate for this project was reduced because the amount of condensate recovered was not 100% of the steam produced, but 50% because of 10% is consumed in the process, and 40% was recovered in the baseline case.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Boiler Condensate Recovery

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	105,842	55,102	52.06%
Water Savings (L):	7,979,309	4,764,070	59.71%
Incremental Cost:	$44,078.00	$44,077.85	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0139	11/1/2010	$41,600.00	$28,314.00	20	Phone

Project Description:

The customer replaced their old boiler with a new direct contact water heater. The direct contact water heater improves the water heating efficiency, and therefore reduces the gas consumption of the facility.

Realization Rate Comments:

The realization rate for this project was reduced because, per the customer interview, the production of the facility was less than what was assumed in the original analysis.

Cost EUL Comments:

The expected useful life is consistent with the available literature, thus no changes are recommended.

The incremental cost of for this project was adjusted based on the baseline unit cost. The quoted unit price of $35,000 for Boilersmith boilers is reasonable, however the larger industrial sized boilers from this manufacturer already include high efficiency modulating burners. Therefore, there it is not necessary to include additional cost for improved boiler controls. Removing the estimated boiler controls cost and adding the exchange rate charges in results in an incremental cost of $60,406.68

Measure Type:

Direct-Contact Water Heater

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	502	3	0.60%
Gas Savings (m3):	35,068	8,106	23.12%
Water Savings (L):	142,962	0	0.00%
Incremental Cost:	$41,600.00	$52,349.81	126%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0150	10/1/2010	$30,600.00	$250,843.00	20	On-site

Project Description:

The customer installed new domestic hot water boilers, space heating boilers, and upgraded the controls in their building automation system.

Realization Rate Comments:

The realization rate for this project was reduced due to the results of the billed regression analysis. Normalizing the energy usage for weather appears to have had the most significant impact on the analysis. Additionally, the electricity savings were reduced because the savings associated with the installation of the high efficiency chiller were double counted.

Cost EUL Comments:

The expected useful life for this project was determined based on a weighted average of the measure expected useful lives. The new equipment has an EUL of 20 years, and is responsible for 15% of the ex-post gas savings. The new controls have an expected useful life of 15 years and account for 85% of the ex-post natural gas savings. Combinging the two measures results in a weighted expected useful life of 15.75 years.

The cost and incremental cost for this project were consistent with the supplied documentation and the information received from the customer during the on-site visit. Therefore, no changes were made.

Measure Type:

New Boiler and Water Heater

BAS

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	41,516	20,393	49.12%
Gas Savings (m3):	186,609	43,432	23.27%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$30,600.00	$30,600.00	100%
Expected Useful Life:	20.0	15.8	79%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0156	6/3/2011	$8,159.00	$144,698.00	20	Phone

Project Description:

The customer installed a new high efficiency [redacted]. The new dryer is equipped with a high efficiency burner, and exhaust heat recovery to preheat the product and the combustion air.

Realization Rate Comments:

The information obtained during the customer interview and the project file review confirmed the information used in the original analysis. No changes were made.

Cost EUL Comments:

The expected useful life is consistent with the available literature, thus no changes are recommended.

The incremental cost for this project was adjusted based on the supplied invoices. The high efficiency dryer had discounts applied, as well as a different installation cost than the baseline dryer. Applying the same discounts, and accouting for the different labor cost reduces the incremental cost from $8,159 to $7,238.95.

Measure Type:

[redacted] Dryer

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	113,279	113,279	100.00%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$8,159.00	$7,238.95	89%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0163	8/1/2011	$51,718.00	$211,181.00	20	Phone

Project Description:

The customer installed a new high efficiency [redacted] [redacted] The new dryer is equipped with a high efficiency burner, and exhaust heat recovery to preheat the product and the combustion air.

Realization Rate Comments:

The realization rate for this project was reduced slightly because of the differences in the operation characteristics obtained from the customer. The production amounts were slightly reduced, and the final water percentage was increased from 15.0% to 15.5%, and the starting moisture content was reduced from 25% to 23%, resulting in a slight decrease in the savings.

Cost EUL Comments:

The expected useful life is consistent with the available literature, thus no changes are recommended.

The incremental cost for this project was adjusted based on the supplied invoices. It appears that the high efficiency [redacted] cost used was based on a quote instead of the actual invoice. Totaling the invoices paid, and comparing that to the baseline dryer quote increases the incremental cost from $51,718 to $98,678.

Measure Type:

[redacted] Dryer

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	179,300	157,739	87.97%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$51,718.00	$102,026.70	197%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0177	10/3/2011	$74,702.00	$598,115.00	20	Phone

Project Description:

The customer installed a new high efficiency [redacted] dryer. The new dryer operates at an efficiency of [redacted] of water removed compared to the baseline efficiency of [redacted] of water removed. The new dryer is more efficient due to the more efficient burner, improved air flow, and waste heat recovery off of the exhaust.

Realization Rate Comments:

The gas savings were reduced for this project due to the production numbers obtained from the customer. The original analysis assumed [redacted] throughput. However, according to the customer, he anticipates only [redacted] throughput next year and in the near future.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

[redacted] Dryer

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	482,626	45,373	9.40%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$74,702.00	$74,702.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0178	7/1/2011	$46,170.00	$465,451.00	20	On-site

Project Description:

The customer installed a new high efficiency [redacted] dryer. The new dryer is equipped with a high efficiency burner, and exhaust heat recovery to preheat the product and the combustion air.

Realization Rate Comments:

The realization rate decreased slightly because the [redacted] processed is dried to 1[redacted] moisture instead of the assumed [redacted]% moisture.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

[redacted] Dryer

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	371,379	367,965	99.08%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$46,170.00	$46,170.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0182	7/25/2011	$11,903.00	$45,214.00	10	Phone

Project Description:

The customer is installing variable frequency drives on their two air handling units. The units ran at 100% flow capacity, 24 hours per day in the baseline case. The new controls set a maximum flow of 90% for 8 hours per day, and the rest will be reduced to 70% flow.

Realization Rate Comments:

The realization rate for this project was reduced slightly due to the assumed average outdoor air temperature being to low. If the temperature and the time of day are taken into account, the savings are slightly lower.

Cost EUL Comments:

The expected useful life is consistent with the available literature, thus no changes are recommended.

The incremental cost of for this project was adjusted due to the baseline system. Through the customer interview, the controls and equipment that were in place before the project was completed was a valid baseline. As such, there is no baseline cost. Removing the baseline cost increases the incremental cost for this project from $11,903 to $12,345.14.

Measure Type:

VFD/Controls

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	40,525	43,516	107.38%
Gas Savings (m3):	43,132	36,701	85.09%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$11,903.00	$12,345.14	104%
Expected Useful Life:	10.0	10.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0183	10/1/2009	$43,345.00	$8,073.00	10	Phone

Project Description:

This project involved the installation of radiator reflectors, as well as cleaning the radiators, and sealing any infiltration points behind the radiators. Additionally, the boiler controls were reset in order to accommodate the better performance of the radiators.

Realization Rate Comments:

The gas savings for this project were reduced because the results of the billed regression analysis do not show significant savings. The ex-post savings were calcualted using the methodology laid out in the Radflek report supplied in the project documentation.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Radiator Improvements

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	31,060	2,045	6.58%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$43,345.00	$43,345.00	100%
Expected Useful Life:	10.0	10.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0189	9/1/2011	$2,748.00	$61,766.00	10	Phone

Project Description:

The customer replaced a leaking boiler relief valve on one of their three boilers.

Realization Rate Comments:

The gas savings for this project were reduced due to the inclusion of the condensate enthalpy of 23.09 Btu/lb.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Relief Valve Repair

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	5,655	1,177	20.81%
Gas Savings (m3):	64,197	63,548	98.99%
Water Savings (L):	688,031	716,170	104.09%
Incremental Cost:	$2,748.00	$2,748.00	100%
Expected Useful Life:	10.0	10.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0197	7/1/2011	$5,214.00	$222,581.00	20	On-site

Project Description:

The customer installed a heat recovery system to capture some of the waste heat. The facility has [redacted] production lines. Production line [redacted] was the one affected. [redacted]

Realization Rate Comments:

The natural gas savings for this project were increased because of the increase in production hours over what was assumed in the original analysis. [redacted]

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Exhaust Heat Recovery

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	171,675	269,609	157.05%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$5,214.00	$5,214.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0203	7/1/2010	$11,206.00	$124,835.00	20	Phone

Project Description:

This project involved the installation of an efficient boiler with an economizer and linkageless controls to replace an existing less efficient boiler. The installation of the economizer and the linkageless controls increases the efficiency of the new unit to 85% at full load and 80% at low-fire operation. In addition, the new boiler is replacing an existing boiler that is greatly oversized. Ths will resulting in reduced shell losses as well.

Realization Rate Comments:

The ex post energy savings for this project are less than the ex ante savings estimates. No savings calculations were provided for the ex ante savings, therefore, the causes for the discrepancies could not be fully identified. However, it appears that the original analysis assumed that the new boilers would reduce the gas usage by 50%. This is significantly greater than the actual energy savings realized for this time period.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Boiler Controls

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	100,100	24,807	24.78%
Gas Savings (m3):	66,623	45,217	67.87%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$11,206.00	$11,206.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0207	6/1/2011	$475,650.00	$40,861.00	20	Phone

Project Description:

The customer replaced their exising water driven fire supression system with a dry chemical supression system. This allowed the customer to no longer heat the fire supression water or the facility as a whole.

Realization Rate Comments:

The gas savings for this project were reduced due to using the actual usage for each individual building instead of using the [redacted] wide usage and averaging it out over all [redacted] buildings.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Fire Supression System

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	69,031	118,715	171.97%
Gas Savings (m3):	175,679	114,922	65.42%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$475,650.00	$475,650.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0210	6/1/2011	$31,650.00	$300,194.00	20	Phone

Project Description:

The customer installed insulation on the hot oil piping at their facility. The hot oil piping runs outdoors, and installing the insulation reduces the heat loss considerably.

Realization Rate Comments:

The natural gas savings for this project were reduced because of a calculation error. The ex-ante calculation multiplied the heat loss by the pipe surface area instead of the linear feet of pipe, which overestimated the savings.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Pipe Insulation

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	240,179	156,237	65.05%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$31,650.00	$31,650.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0224	8/1/2011	$475,650.00	$78,144.00	20	Phone

Project Description:

The customer replaced their exising water driven fire supression system with a dry chemical supression system. This allowed the customer to no longer heat the fire supression water or the facility as a whole.

Realization Rate Comments:

The gas savings for this project were reduced due to using the actual usage for each individual building instead of using the [redacted] wide usage and averaging it out over all [redacted] buildings.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Fire Supression System

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	53,733	111,742	207.96%
Gas Savings (m3):	209,106	94,821	45.35%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$475,650.00	$475,650.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0238	10/1/2011	$419,100.00	$110,836.00	20	Phone

Project Description:

The customer installed a heat exchanger to recover heat from the exhaust for a [redacted] structure and to preheat the incoming ventilation air. In addition, scheduling was adjusted for many of the air handling units to reduce the hours of operation during the overnight and weekend hours.

Realization Rate Comments:

The ex post energy savings for this project are less than the ex ante savings estimates. The analysis methodology used to determine the savings appears reasonable, however, based on examination of the usage records, the savings are not being realized.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life was claimed to be 20 years. However, per the Union Gas Custom Offering EUL table, the EUL should have been 14 years. The EUL of 14 years is also consistent with the literature for this type of measure.

Measure Type:

Exhaust Heat Recovery

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	229,185	6,684	2.92%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$419,100.00	$419,100.00	100%
Expected Useful Life:	20.0	14.0	70%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0240	9/1/2011	$3,272.00	$69,294.00	7	Phone

Project Description:

The customer replaced five steam traps that had malfunctioned. Replacing the steam traps reduces the amount of steam lost in the system, which reduces the gas usage.

Realization Rate Comments:

The gas savings for this project were increased because the customer actually repaired five steam traps instead of the four that were assumed in the original analysis.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Steam Trap

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	981	1,013	103.26%
Gas Savings (m3):	100,428	105,132	104.68%
Water Savings (L):	308,942	318,876	103.22%
Incremental Cost:	$3,272.00	$3,272.00	100%
Expected Useful Life:	7.0	7.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0242	9/1/2011	$90,800.00	$54,579.00	20	Phone

Project Description:

Installation of pipe insulation on 147ft of bare steam and condensate piping and approximately 70 pipe fittings. The pipe and the fittings ranged in size from [redacted] in diameter and was used to transport steam or condensate with temperatures ranging from [redacted]

Realization Rate Comments:

The ex post energy savings for this project are less than the ex ante savings estimates. No electronic copy of the savings calculations were provided for the ex ante savings, therefore, the causes for the discrepancies could not be fully identified. However, the heat loss savings for the installation of the insulation appear excessive based on the heat loss values as determined from NAIMA 3E Plus software.

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

Pipe Insulation

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	49,513	0.00%
Gas Savings (m3):	67,602	23,486	34.74%
Water Savings (L):	866,317	0	0.00%
Incremental Cost:	$90,800.00	$90,800.00	100%
Expected Useful Life:	20.0	20.0	100%

Project Data

Project Number:	Date Completed:	Incremental Cost:	TRC:	EUL:	Review Type:
0302	5/1/2011	$43,600.00	$115,178.00	20	Phone

Project Description:

The customer installed the capability in their [redacted] to produce [redacted] as well as [redacted] which savings heating energy.

Realization Rate Comments:

The realization rate for this project was [redacted]

Cost EUL Comments:

The incremental cost is reasonable and consistent with the information in the project documentation. The expected useful life is consistent with the available literature. Therefore, no changes are recommended.

Measure Type:

[redacted]

Total Savings	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0.00%
Gas Savings (m3):	103,193	14,373	13.93%
Water Savings (L):	0	0	0.00%
Incremental Cost:	$43,600.00	$43,600.00	100%
Expected Useful Life:	20.0	20.0	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0011	BAS	Phone

Background

Measure Description:

This measure involved the installation and upgrade of the existing HVAC control system. The baseline controls did not allow for scheduling, and as such, the air handling units operated 24/7 throughout the year. Two of the three air handling units were also not able to modulate their outdoor air, and instead brought in nearly 100% outdoor air. The proposed control scheme adjusts the schedule of one of the air handling units to run [redacted] hours per week instead of the baseline 168 hours per week. The proposed controls also reduce the outdoor air flow of all three air handling units from [redacted] for the third unit.

SummaryEx-AnteCalc:

The ex-ante analysis follows the assumed average temperature method, where the average temperature during the entire heating or cooling season is used to estimate the energy usage over the entire season. The ex-ante analysis assumed a heating supply temperature of 55F and a cooling supply temperature of 60F. The ex-ante analysis also assumes an average outdoor temperature of 31.5F during the heating season, and 80F during the cooling season. One of the units had its operating hours reduced from 168 hours per week to [redacted] hours per week. The hours reduced was combined with the motor amperage measured to determine the energy savings associated with the reduced motor run time. Additionally, the reduction in operating hours were used to calculate the energy savings associated with reduced heating and cooling times. The last part of the ex-ante calculation details the reduction in outdoor air for all three air handling units. Measurements of the return air, mixed air, and outdoor air were taken both before and after the controls were implimented. These values were used to calculate the heating and cooling energy savings associated with the reduced outdoor air.

CommentsEx-AnteCalc:

The ex-ante calculation methodology is reasonable. The average temperature method is a reasonable approach when the appropriate average temperature is assumed. A more accurate approach is to use an ASHRAE simplified bin analysis, where the outdoor air temperature is varied, and the hours at each bin temperature are taken into consideration. The average outdoor air temperature for heating was assumed to be 31.5F, however, the time weighted average for the heating season was actually 34.5F. Similarly, the assumed average cooling outdoor temperature was 80F, while the actual weighted average temperature was 70.8F. Additionally, the ex-ante analysis did not take into account the fact that the units are equipped with economizers. According to the customer, all of the units are equipped with economizers, which will use the outdoor air to heat or cool when possible.

SummaryAdjEx-AnteCalc:

The ex-post calculation uses an ASHRAE simplified bin analysis to calculate the energy usage and savings for each temperature bin. The operating hours, supply air temperatures, and outdoor air percentages were taken from the data obtained during the customer interview. According to the customer, the baseline and efficient outdoor air percetages were assumed to be constant throughout the year, and were taken from the measurements performed by the customer. The return air temperature measured by the customer was also assumed to be constant throughout the year. For each temperature bin, the mixed air temperature was calculated, and then the energy required to heat or cool the air to the appropriate supply temperature was calculated. Temperature bins where the mixed air temperature was between the heating supply temperature of 55F, and the cooling supply temperature of 60F, were assumed to be operating in economizer mode. All of the units were equipped with economizers in both the baseline and proposed condition according to the customer. Additionally, the heating and cooling system efficiencies were verified from the customer during the

Measure Level Report

interview.

The bin analysis increased the savings slightly for natural gas. However, it significantly reduced the electricity savings for this project. The over estimation of the outdoor temperature during the cooling season had a significant impact on the elctricity savings for this project because a majority of the claimed savings were due to air conditioning savings, as opposed to the non temperature dependant savings due to the motor run hours being reduced.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☑ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	235,524	68,905	29%
Gas Savings (m3):	139,203	144,571	104%
Water Savings (L):	0	0	0%
Incremental Cost:	$339.00	$338.55	100%
Expected Useful Life:	20	15	75%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0013	BAS	Phone

Background

Measure Description:

This measure involved the installation and upgrade of the existing HVAC control system. The baseline controls did not allow for scheduling, and as such, the air handling units operated 24/7 throughout the year. One of the eight air handling units had its outdoor air controls updated to be consistent with the other air handling units. The proposed control scheme adjusts the schedule of one of the air handling units to [redacted] hours instead of the baseline 168 hours per week. The last unit continues to run 168 hours per week. The proposed controls also reduce the outdoor air flow of one unit from 32.74% to 31.12%.

SummaryEx-AnteCalc:

The ex-ante analysis follows the assumed average temperature method, where the average temperature during the entire heating or cooling season is used to estimate the energy usage over the entire season. The ex-ante analysis assumed a heating supply temperature of 55F and a cooling supply temperature of 60F. The ex-ante analysis also assumes an average outdoor temperature of 31.5F during the heating season, and 80F during the cooling season.The operating hours of the units were reduced in the proposed case to reflect the new control scheme. The hours reduced was combined with the motor amperage measured to determine the energy savings associated with the reduced motor run time. Additionally, the reduction in operating hours were used to calculate the energy savings associated with reduced heating and cooling times. The last part of the ex-ante calculation details the reduction in outdoor air for the air handling unit. Measurements of the return air, mixed air, and outdoor air were taken both before and after the controls were implimented. These values were used to calculate the heating and cooling energy savings associated with the reduced outdoor air.

CommentsEx-AnteCalc:

The ex-ante calculation methodology is reasonable. The average temperature method is a reasonable approach when the appropriate average temperature is assumed. A more accurate approach is to use an ASHRAE simplified bin analysis, where the outdoor air temperature is varied, and the hours at each bin temperature are taken into consideration. The average outdoor air temperature for heating was assumed to be 31.5F, however, the time weighted average for the heating season was actually 34.5F. Similarly, the assumed average cooling outdoor temperature was 80F, while the actual weighted average temperature was 70.8F. Additionally, the ex-ante analysis did not take into account the fact that the units are equipped with economizers. According to the customer, all of the units are equipped with economizers, which will use the outdoor air to heat or cool when possible.

SummaryAdjEx-AnteCalc:

The ex-post calculation uses an ASHRAE simplified bin analysis to calculate the energy usage and savings for each temperature bin. The operating hours, supply air temperatures, and outdoor air percentages were taken from the data obtained during the customer interview. According to the customer, the baseline and efficient outdoor air percetages were assumed to be constant throughout the year, and were taken from the measurements performed by the customer. The return air temperature measured by the customer was also assumed to be constant throughout the year. For each temperature bin, the mixed air temperature was calculated, and then the energy required to heat or cool the air to the appropriate supply temperature was calculated. Temperature bins where the mixed air temperature was between the heating supply temperature of 55F, and the cooling supply temperature of 60F, were assumed to be operating in economizer mode. All of the units were equipped with economizers in both the baseline and proposed condition according to the customer. Additionally, the heating and cooling system efficiencies were verified from the customer during the

Measure Level Report

interview.

The bin analysis reduced the gas savings significantly for this project, mostly due to the difference in heating energy at the temperature bins near 55F where the units would be economizing. The electricity savings were not impacted significantly by the over estimation of the outdoor air temperature during the cooling season because a majority of the savings for this project are derived form the reduced motor run hours instead of the air conditioning.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☑ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	160,064	171,021	107%
Gas Savings (m3):	12,176	5,873	48%
Water Savings (L):	0	0	0%
Incremental Cost:	$903.00	$902.80	100%
Expected Useful Life:	20	15	75%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0035	Roof Insulation	Phone

Background

Measure Description:

The customer replaced their existing leaky roof with a new, well sealed roof with more insulation. The original roof was not properly sealed, thus creating several leaks and increasing infiltration. The new roof increases the insulation level as well as applies new seals to the roof construction which will reduce the heat loss through the roof, as well as reduce the amount of infiltration through the roof.

SummaryEx-AnteCalc:

The ex-ante savings are calculted using an ASHRAE simplified bin analysis. The heat loss at each temperature bin is calculated assuming a baseline roof insulation level of R-15, a proposed insulation level of R-20, a balance point of 65F, and a boiler efficiency at full load of 80%. The heating load for each temperature bin was multiplied by the hours of operation for each temperature bin, resulting in the total energy consumed to replace the heat loss through the roof.

CommentsEx-AnteCalc:

The ex-ante calculation method is reasonable and appropriate for this type of measure. However, the assumed baseline and proposed insulation levels were not consistent with the building plans included in the project documentation. According to the building plans, the area affected by the insulation and roof repair totals [redacted] sq. ft instead of the assumed [redacted] ft found in the original analysis. Additionally, the area affected was comprised of three different areas. The baseline roof construction was detailed in the project drawings. Two of the sections, totaling [redacted] sqft, had nearly identical roof construction, with a composite R-value of 17.86. The third roof section, totaling [redacted] sqft, had very minimal insulation in the baseline case, with a composite R-value of 2.69.

SummaryAdjEx-AnteCalc:

The ex-post savings were calculated using an ASHRAE simplified bin analysis. The three roof areas were treated individually as they all had different baseline and proposed insulation levels. The heating efficiency was assumed to be 80% per the original project documentation. The baseline heat loss through the roof was calculated and summed for each of the three sections. The proposed heat loss through the roof was calculated identically, and then subtracted from the baseline usage to calcualte the energy savings. Additionally, the infiltration savings was calculated assuming a reduction in infiltration from 0.3 cfm/sqft to 0.1 cfm/sqft.

The adjustments to the baseline R-value for the one section of roof increased the savings significantly for this project.

Reasons for Adjustments:

Ex-Ante

- [x] Inappropriate Assumptions
- [ ] Calculation/Engineering Error
- [ ] Tracking Error
- [ ] Operated or Installed Diff
- [ ] Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	57,908	79,151	137%
Water Savings (L):	0	0	0%
Incremental Cost:	$72,300.00	$72,300.00	100%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0055	BAS	Phone

Background

Measure Description:

HVAC Controls: The HVAC system currently runs [redacted] hours per day throughout the entire year. The proposed control system will set the HVAC units to come on at [redacted] flow capacity daily. The reduced run time reduces the amount of heating and cooling energy required.

Lighting Controls: The lighting controls can be broken into two different categories; interior and exterior lighting. The exterior lighting affected by this project is the parking lot lights. The parking lot lights were operated manually before the new controls were installed. The new controls allow them to be automaitcally controlled via an atomic time clock which turns the lights on at dusk, and off at sunset throughout the year. The interior lighting was operating at [redacted]% on the rest of the night. The new interior lighting controls maintin the [redacted]

SummaryEx-AnteCalc:

The ex-ante savings were caluclated using the RETScreen calculation tool developed by National Resources Canada. This calculation tool takes weather, previous usage, and interactive affects into account and is seen as a reasonable approach to calculating energy savings.

CommentsEx-AnteCalc:

The information contained in the project file was confirmed by the customer during the customer interview. The customer also mentioned that there were setback controls incorporated into the controls system. The temperature setpoint during the occupied schedule is around 21-23C and is setback to 15C during the winter, and up to 28C during the summer. It is not clear if these assumptions were included in the ex-ante analysis.

SummaryAdjEx-AnteCalc:

The ex-post savings were calculated using a billed regression analysis. There are a total of 4 separate meters at the facility, and each meter was treated individually in the billed regression analysis. The regression analysis takes the monthly gas usage, and correlates it to the heating degree days of that month. The resulting equation for gas usage as a function of heating degree days is used in conjunction with monthly typical meteorological year data (TMY) to arrive at an estimation for the "typical" yearly gas consumption.

The results of the billing analysis show that there is slightly greater savings than what was originally calculated. The electricity savings for this project were not changed. The customer was not able to provide significant detail regarding the lighting system to determine the savings. However, the information received from the customer was consistent with what was used in the ex-ante calculations, and the near100% realization rate for gas provides additional support for the estimated electricity savings.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☑ Unknown

Measure Level Report

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	442,000	442,000	100%
Gas Savings (m3):	93,175	97,734	105%
Water Savings (L):	0	0	0%
Incremental Cost:	$120,054.00	$120,054.00	100%
Expected Useful Life:	15	15	100%

Measure Level Report

Project Number:	Measure ID:	Measure Type:	Onsite Complete:
0133	A	Direct Fired MAU	On-site

Background

Measure Description:

The customer installed new direct fired make-up air units (MUA) at their facility. A total of three new units were installed to replace the existing five units which were originally installed in 1975. The new units will have significantly smaller electronic motors, and are also more thermally efficient which will reduce the natural gas used. The burners run intermittently and the blowers run continuously [redacted] load factor. The new units also do not have inducer draft motors, which will provide a 10hp reduction in motor hp.

Summary Ex-Ante Calc:

The ex-ante savings were calculated based on the billed usage from 2009. The production usage was separated from the [redacted] units, and unit heaters were assumed to contribute [redacted] the heating load, respectively. The baseline was assumed to be the existing make up air units and unit heaters. The baseline make up air units were assumed to be 65% efficient. The proposed units were assumed to be direct fired and have an efficiency of 93%.

Additionally, there were electricity savings due to the baseline fan motors being larger than the fan motors of the new units.

Comments Ex-Ante Calc:

The calculation methodology is reasonable for this type of project. The heating energy was separated from the production energy usage, and attributed to each of the units providing the heating energy. However, the methodology did not normalize the billed data to account for weather variations from year to year. Normalizing the billed data to weather characteristics, such as heating degree days, and using typical meteorological year data would provide a more reasonable savings estimate.

During the on-site visit, the customer stated that the old units were no longer able to be maintained, were rusted out, and thus had to be replaced. The units were also installed in the 1970's, which puts them passed their expected useful life. These two factors require that the baseline units be code required units, or industry standard practice. For this project, the appropriate baseline should have been a new indirect fired furnace instead of the existing units. Therefore, the baseline unit efficiency should have been 78% instead of the assumed 65%. Additionally, the unit fans would have been appropriately sized in the new units, and the only electricity savings would be from the fact that indirect fired units contain inducing draft fans, and direct fired units do not. Additionally, during the on-site visit, the units in the [redacted] found to be indirect fired units, and the customer indicated they were indirect fired units in the baseline case. Therefore, there are no savings associated with the [redacted] room units.

MV Plan:

An on-site visit will be conducted for this project to obtain more detailed information regarding the systems operation. During the on-site visit, the equipment will be visually verified to be installed. The make, model number, and nameplate data of all installed and affected equipment will be recorded. The customer will be interviewed regarding the baseline equipment. If the baseline equipment is still on-site, the make, model number, and nameplate data will be recorded. If the customer has specifications for the baseline or proposed equipment, copies will be obtained if possible.
During the on-site visit, instantaneous readings of the air temperatures will be recorded. Additionally, the operating schedules for the heating equipment will be recorded. The customer will be interviewed regarding their system controls and set points. If the facility is equipped with a building automation system, the customer

Measure Level Report

will be interviewed regarding the data trending capabilities. If possible, trended data of exhaust temperatures, or burner firing rates will be obtained.

Ex Post Site Desc:

A site visit for this project was completed on February 22, 2012. During the site visit, the installed make up air units were visually verified to be installed and operating. Additionally, the customer provided a walkthrough of the areas served by the new units. Additionally, the other major gas consuming equipment, a compressed air dryer, and new oven, were examined as well. The customer was then interviewed regarding the baseline make up air units. The customer indicated that they required annual maintenance in order to function properly, including welding the combustion chamber and heat exchangers to prevent leaks. Because of welding in enclosed areas is prohibited, the units could no longer be maintained and needed to be replaced. The condition of the units was confirmed by inspecting a unit of similar type and vintage that was still in place at the facility. The unit was rusty, and had large holes in the side due to corrosion.

The customer was also interviewed regarding the facility operation. The customer indicated that the operaiton of the facitliy [redacted] Additionally, the customer mentioned that the new make up air units were working extremely well, and provided most of the heating needs of the facility. The unit heaters that used to run consistently in the baseline case, were barely running now that the new units were installed. The customer also stated that since the new units are direct fired, the added humidity from the combustion air helped to make the plant more comfortable during the dry winter months.

Summary Adj Ex-Ante Calc:

The ex-post calculation assumes that 81% of the variable heating load is provided by the new units per discussions with the customer regarding the reduced operation of the unit heaters. An ASHRAE simplified bin analysis was used to calculate the heating energy of the new system. The bin analysis was calibrated to the billed data for the year following the completion of the project. Using the calibrated bin analysis, the theoretical baseline energy usage of a standard 78% efficient indirect fired make up air system was calculated. The difference between the calibrated bin analysis, and the theoretical baseline analysis is the resulting ex-post nautral gas savings.

The ex-post electricity savings were calcualted as the energy usage of a compariable sized new indirect fired units inducing draft fan. The fans were assumed to run [redacted] the plant operating hours per the customer, and have an [redacted] load factor. The usage of these induced draft fans was the electricity savings for this project.

Reasons for Adjustments:

Ex-Ante

- ☑ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	197,294	47,052	24%
Gas Savings (m3):	270,259	296,826	110%
Water Savings (L):	0	0	0%
Incremental Cost:	$182,085.00	($95,572.80)	-52%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0135	Boiler Condensate Recovery	Phone

Background

Measure Description:

The customer installed a condensate recovery system to recover the condensate from their steam process. The customer moved the boiler plant to a different location at their facility to allow the condensate from the entire facility to be recovered. The baseline system involved dumping the used condensate down the drain, while the proposed system recovers that steam for use as boiler make-up water.

SummaryEx-AnteCalc:

The ex-ante calculation assumes 100% of the steam produced during the weekday and weekend production schedules was lost as condensate down the drain. The enthalpy difference between the condensate and the make-up water was multiplied by the total steam production, and divided by the boiler plant efficiency to obtain the natural gas savings.

CommentsEx-AnteCalc:

According to the customer, [redacted] to be consistent with the information obtained from the customer.

SummaryAdjEx-AnteCalc:

The ex-post energy savings are calculated using the same fundamental analysis as the original calculation. However, the condensate recovered was adjusted from 100% of the steam produced, to the 50% of the steam produced, and the hours of operation were increased to match the information obtained from the customer. This reduced the realized gas savings for this project. Additionally, because 40% of the steam was already recovered, the water savings for this project were also reduced proportionally.

The gas and water savings for this project were reduced due to the smaller than assumed percentage of steam being lost down the drain. The original analysis assumed 100% was lost, when according to the customer, only [redacted] was lost.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☑ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	105,842	55,102	52%
Water Savings (L):	7,979,309	4,764,070	60%
Incremental Cost:	$44,078.00	$44,077.85	100%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0139	Direct-Contact Water Heater	Phone

Background

Measure Description:

The customer installed a new direct contact water heater to replace their existing old inefficient boiler. The existing boiler was a 40 year old diesel fired boiler. The old boiler was connected to a [redacted] hot water tank to ensure there was sufficient hot water available. The hot water tank was kept at [redacted]. The new water heater can supply all of the hot water the facility requires without the need to continuously heat the hot water tank.

SummaryEx-AnteCalc:

The ex-ante savings are calculated assuming that the water heating system was operated at full rated capacity [redacted] per year. The unit rating was multiplied by the hours operated, and divided by the unit efficiency to determine the gas usage of the baseline and proposed units. The baseline boiler was assumed to be a natural gas fired boiler, with linkageless controls and an operating efficiency of [redacted] and the proposed water heater has an operating efficiency [redacted] Because the baseline boiler was used to heat the hot water tank even when hot water was not being used, an additional [redacted] added. Because of the added run time in the baseline case, there was electricity savings that were calculated as the blower motor kW multiplied by the additional run time hours, and water savings of the required hot water flow rate during production multiplied by the additional run time hours.

CommentsEx-AnteCalc:

According to the customer, the operation of the hot water system was different than what was assumed in the original analysis. The baseline boiler was used to keep the hot water tank preheated to [redacted] all times, however the remainder of the usage was not at [redacted] for all of the heating season. The hot water system was used on an as needed basis based on the production of the facility. According to the customer, the facility produces approximately [redacted] week, needs to heat the water for [redacted] weeks per year, and [redacted]. This results in significantly less gas usage than what was assumed in the original analysis. Additionally, the blower fan electricity savings will be reduced because of the reduced loading, and there will be no water savings for this project. The boiler hot water system was a [redacted], and thus no water is lost as a result of the increased run time.

Additionally, the original boiler was a diesel fired boiler that was approximately 40 years old. Because the boiler was old, and because it was using a different fuel, the appropriate baseline is a new boiler that meets the standard practice of the industry. The baseline boiler assumed in the analysis is a natural gas fired boiler meeting minimum efficiency standards, and equipped with linkagless controls. This is the appropriate baseline for this case.

SummaryAdjEx-AnteCalc:

The ex-post analysis uses the production information obtained from the customer to calculate the actual gas usage of the baseline and proposed hot water systems. The baseline boiler was assumed to be a new boiler with linkageless controls. The heat lost from the hot water tank to the outdoors was calculated using an ASHRAE simplified bin analysis assuming a constant water temperature of 180F, a tank diamter of 10ft, tank height of 15ft, and tank insulation of R-4. The tank heating energy was added to energy required to heat the production water to obtain the baseline energy usage. The proposed energy usage was only the production water heating energy calcualted using the direct contact water heater efficiency.

Measure Level Report

The gas savings for this project were reduced due the difference between the assumed loading, and the actual production obtained from the customer. The electricity savings were reduced because the run hours were over estimated in the ex-ante analysis. The ex-ante analysis assumed that the boiler would need to run 18% more to meet the same heating load. Based on the information obtained from the customer, the water heating system only runs 10% of the assumed hours, and the extra usage for the old boiler is only required to maintain the water tank temperature. This results in a reduced run time of the fan of 24 hours, compared to the ex-ante assumed [redacted] hours. There are also no water savings for this project. The assumed 18% increased run time was also applied to the water used, however the tank heating system is a closed loop, and the water is only used for production. The less efficient boiler would not consume more water simply because it is less thermally efficient.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☑ Operated or Installed Diff
- ☐ Unknown

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	502	3	1%
Gas Savings (m3):	35,068	8,106	23%
Water Savings (L):	142,962	0	0%
Incremental Cost:	$41,600.00	$52,349.81	126%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure ID:	Measure Type:	Onsite Complete:
0150	A	New Boiler and Water Heater	On-site

Background

Measure Description:

The customer replaced their existing space heating boiler and domestic hot water heaters. The customer replaced their three existing [redacted] boilers with two new [redacted] boilers. The boilers provide hot water for space heating to the different areas of the facility. The customer also replaced the domestic hot water heating boilers. The old [redacted] boilers also provided the domestic hot water for the facility. The new domestic hot water boilers are [redacted] boilers.

Summary Ex-Ante Calc:

The ex-ante savings were calculated in two steps. The first was to calculate the savings associated with the new DHW boilers. The monthly gas usage attributed to domestic hot water use was assumed to be equal to the average of the gas usage from July and August. This results in approximately 250,000 m3 associated to domestic hot water and the kitchen. DHW was assumed to contribute to [redacted] annually. The existing boilers were assumed to be 75% efficient. Because the boilers were older than their expected useful life, a new construction baseline boiler efficiency of 84% was used. The newly installed boilers were assumed to be 85% efficient.

The gas usage for the space heating boilers was calculated in a similar fashion. Subtracting the approximately [redacted] The boilers were assumed to contribute 70% of that usage, or [redacted]. The same efficiencies of 75%, 84%, and 85% were applied to the space heating boilers to calculate the natural gas savings.

Comments Ex-Ante Calc:

The calculation methodology is reasonable for this type of measure. The domestic hot water usage would not be expected to vary year over year with weather conditions. However, it is important to note that using as much billed information as possible, such as taking the average from July and August from the last 3 years, increases the accuracy and may account for years where facility usage is higher or lower. Similarly, the weather usage can vary substantially from one year to the next. Using the billed data from the last few years, or normalizing the billed data to typical weather conditions before calculating the energy savings may provide better "typical" year savings estimates.

MV Plan:

An on-site visit will be conducted for this project to obtain more detailed information regarding the systems operation. During the on-site visit, the equipment will be visually verified to be installed. The make, model number, and nameplate data of all installed and affected equipment will be recorded. The customer will be interviewed regarding the baseline equipment. If the equipment is still on-site, the make, model number, and nameplate data will be recorded. If the customer has specifications for the baseline or proposed equipment, copies will be obtained if possible.

During the on-site visit, instantaneous readings of the air temperatures, water temperatures, outdoor air percentages, fan power, boiler load, and space temperatures. Additionally, the operating schedules for the heating equipment will be recorded. Since a portion of this project involved the installation of an energy management system, many of these parameters may be available from a central control computer. If the energy management system is capable of trending data, the customer will be asked if it is possible to trend the desired parameters. If the energy management system cannot provide the desired data, the measurements will be taken using temperature sensors and the available gauges.

Measure Level Report

Ex Post Site Desc:

A site visit was completed on December 8, 2011. The customer, as well as the tehcnical and project supervisors from the contractor were present during the site visit. The customer representative provided a tour of the facility. The old boiler make and model, size, and efficiency were recorded, and the boilers were verified to be not in use. The new boilers were verified to be the [redacted]/hr output for space heating, and the domestic hot water heaters were the [redacted] Btu/hr input. The customer did not know the approximate hot water usage of the facility as the occupancy of the facility can vary significantly.

Summary Adj Ex-Ante Calc:

The ex-post savings were calculated using a regression analysis. The monthly natural gas consumption data was correlated as a function of heating degree days and days in the billing cycle. The baseline period was assumed to be January 1, 2009 through October 2010, which according to the customer was when the project was fully completed. The proposed period was then November 1, 2010 through November 2011, the most recent date of data. The data was also broken down depending on the season as well. Examination of the billed usage found that the fall months (September - December) had significantly lower usages per HDD than the remainder of the year. In order to account for this, separate curves for the fall months were developed in both the baseline and proposed cases. The resulting curves for gas consumption as a function of heating degree days were applied to the heating degree days developed from typical meteorological year (TMY) data. The difference between the annual gas consumption projected by the baseline curve fits and the usage projected by the proposed curve fits is the ex-post savings for this project.

The gas savings for this project were reduced as a result of the billed regression analysis. Normalizing the savings to weather appears to have had the most significant impact.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☑ Operated or Installed Diff
- ☐ Unknown

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	5,262	6,539	124%
Water Savings (L):	0	0	0%
Incremental Cost:	$0.00	$0.00	0%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure ID:	Measure Type:	Onsite Complete:
0150	B	BAS	On-site

Background

Measure Description:

The customer upgraded their building automation system to include more advanced controls. The facility has three air handling units, two of which are run on a schedule, and one of which is operated manually during events only. Both the baseline and new BAS system controls the occupied and unoccupied schedule, temperature settings, and outdoor air flows for each unit. The new control scheme saves natural gas and electricity due to the adjustments and improvements made to the outdoor air controls. The baseline controls set the outdoor air to 100% at all times in order to properly ventilate the facility because it previously allowed smoking. Now that smoking has been banned, the new control system is equipped with carbon dioxide monitors in the return air ducts. The carbon dioxide monitors are used to determine the optimum amount of outdoor air required for the system. Reducing the amount of outdoor air reduces the amount of heating energy required in the winter, and cooling energy required in the summer.

Summary Ex-Ante Calc:

The ex-ante savings were calcualted using a bin analysis. The outdoor air temperature and percentage along with the return air temperature were used to determine the mixed air temperature. The outdoor air percentage was assumed to be 100% in the baseline case, and 25% in the proposed case. Additionally, heating efficiency was assumed to be 85% to be consistent with the new boilers that were installed. The cooling efficiency was assumed to be 1.0 kW/ton in the baseline case, and 0.7 kW/ton in the proposed case. This calculation method was used for each of the three air handling units at the facility. The units were also assumed to be constant volume, and have a fixed percent outdoor air all year.

Comments Ex-Ante Calc:

The ex-ante calculation methodology is reasonable for this type of analysis as bin calculations take into account the varying weather conditions throughout the year. However, the fact that the outdoor air percentage is controlled via CO2 sensors can lead to significant variance in the percentage of outdoor air required throughout the year, or even during a single day. If possible, the occupancy of the building should be examined to determine the most appropriate outdoor air percentage to use.

There were also a couple errors in the ex-ante calculation. The first was that the new controls energy usage was not calculated with the units in economizing mode. There were several temperature bins where the mixed air temperature was higher than the outdoor air temperature and higher than the supply temperature, which would require cooling. In this case the system will bring in outdoor air and then cool it because the outdoor air is cooler, and will require less energy. The second error was that the chiller efficiency was changed between the baseline and proposed calculations. This is not accurate as the savings associated with the chiller replacement are calculated in a separate file. Including them in the air handling unit calculation double counts the savings.

MV Plan:

An on-site visit will be conducted for this project to obtain more detailed information regarding the systems operation. During the on-site visit, the equipment will be visually verified to be installed. The make, model number, and nameplate data of all installed and affected equipment will be recorded. The customer will be interviewed regarding the baseline equipment. If the equipment is still on-site, the make, model number, and nameplate data will be recorded. If the customer has specifications for the baseline or proposed equipment, copies will be obtained if possible.
During the on-site visit, instantaneous readings of the air temperatures, water temperatures, outdoor air

Measure Level Report

percentages, fan power, boiler load, and space temperatures. Additionally, the operating schedules for the heating equipment will be recorded. Since a portion of this project involved the installation of an energy management system, many of these parameters may be available from a central control computer. If the energy management system is capable of trending data, the customer will be asked if it is possible to trend the desired parameters. If the energy management system cannot provide the desired data, the measurements will be taken using temperature sensors and the available gauges.

Ex Post Site Desc:

A site visit was completed on December 8, 2011. The customer, as well as the tehcnical and project supervisors from the contractor were present during the site visit. During the site visit, the building automation system was verified to be installed and operational. The contractor was interviewed regarding the baseline and proposed systems, and stated that the outdoor air in the baseline case was purposefully set to 100% because the facility used to allow smoking. Now that smoking is banned, the newly installed CO2 sensors can be used to optimize the amount of outdoor air used. The customer did not trend any of the data from the system for longer than 24 hours, so no data was collected. However, the customer confirmed that the temperature setpoints, flow rates, and schedules were the same between the baseline and new control systems.

Summary Adj Ex-Ante Calc:

The ex-post savings were calculated using a regression analysis. The monthly natural gas consumption data was correlated as a function of heating degree days and days in the billing cycle. The baseline period was assumed to be January 1, 2009 through October 2010, which according to the customer was when the project was fully completed. The proposed period was then November 1, 2010 through November 2011, the most recent date of data. The data was also broken down depending on the season as well. Examination of the billed usage found that the fall months (September - December) had significantly lower usages per HDD than the remainder of the year. In order to account for this, separate curves for the fall months were developed in both the baseline and proposed cases. The resulting curves for gas consumption as a function of heating degree days were applied to the heating degree days developed from typical meteorological year (TMY) data. The difference between the annual gas consumption projected by the baseline curve fits and the usage projected by the proposed curve fits is the ex-post savings for this project.

The gas savings for this project were reduced as a result of the billed regression analysis. Normalizing the savings to weather appears to have had the most significant impact. The electricity savings for this measure were reduced because of two errors in the ex-ante calculation. The ex-ante calculation did not take into account the temperature bins in the proposed case where the air handling units will be in economizing mode. However, the ex-ante calculations also adjusted the cooling efficiency between the baseline and proposed cases even though the improved cooling efficiency is already considered in the savings calculation for the new chiller. Adjusting the baseline and proposed efficiencies to be identical to avoid double counting reduces the electricity savings for this measure.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☑ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	41,516	20,393	49%
Gas Savings (m3):	181,347	36,893	20%
Water Savings (L):	0	0	0%
Incremental Cost:	$30,600.00	$30,600.00	100%
Expected Useful Life:	20	15	75%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0156	[redacted] Dryer	Phone

Background

Measure Description:

The customer installed a new high efficiency [redacted] dryer. The new dryer operates at an efficiency of [redacted] water removed. The new dryer is more efficient due to the more efficient burner, improved air flow, and waste heat recovery off of the exhaust.

SummaryEx-AnteCalc:

The ex-ante savings were calculated assuming annual [redacted] s of water removed.

CommentsEx-AnteCalc:

The methodology used in ex-ante calculation is reasonable and consistent with the information obtained during the customer interview.

SummaryAdjEx-AnteCalc:

The information obtained during the customer interview were consistent with what was assumed in the orignal analysis. Thus no changes were made to the analysis.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	113,279	113,279	100%
Water Savings (L):	0	0	0%
Incremental Cost:	$8,159.00	$7,238.95	89%
Expected Useful Life:	20	20	100%

Measure Level Report

Measure Level Report

Project Number:	Measure Type:	Review Type:
0163	[redacted] Dryer	Phone

Background

Measure Description:

The customer installed a new high efficiency [redacted] dryer. The new dryer operates at an efficiency of [redacted] Btu/lb of water removed compared to the baseline efficiency [redacted] of water removed. The new dryer is more efficient due to the more efficient burner, improved air flow, and waste heat recovery off of the exhaust.

SummaryEx-AnteCalc:

The ex-ante savings were calculated assuming annual [redacted] energy factor is applied to account for the reduced temperature.

CommentsEx-AnteCalc:

The information obtained during the customer interview varied slightly from the information assumed in the orginal analysis. The production levels of [redacted] was consistent, as was the average [redacted] content and [redacted] conditions. The differences were in the [redacted]

SummaryAdjEx-AnteCalc:

The calculation method used in the ex-post analysis is identical to the ex-ante analysis, except that the updated [redacted] content numbers obtained from the customer are used. Reducing the [redacted] difference between the [redacted] reduces the savings for this project.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☑ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	179,300	157,739	88%
Water Savings (L):	0	0	0%
Incremental Cost:	$51,718.00	$102,026.70	197%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0177	[redacted] Dryer	Phone

Background

Measure Description:

The customer installed a new high efficiency [redacted] dryer. The new dryer operates at an efficiency of [redacted] Btu/lb of water removed compared to the baseline efficiency of [redacted] of water removed. The new dryer is more efficient due to the more efficient burner, improved air flow, and waste heat recovery off of the exhaust.

SummaryEx-AnteCalc:

The ex-ante savings were calculated assuming annual [redacted] drying of [redacted] with an average moisture content [redacted] The [redacted]. The baseline dryer efficiency was assumed to be [redacted] of water removed and the proposed efficiency was [redacted] of water removed. The dryer is also used to dry [redacted] s well. When [redacted], the temperature of the dryer does not need to be as high, [redacted]. Thus, a 70% energy factor is applied to account for the reduced temperature.

CommentsEx-AnteCalc:

During the customer interview, the customer indicated that the production through this [redacted] dryer was significantly less than what assumed in the original analysis. According to the customer, last year there were [redacted] processed in the dryer ([redacted]), and no [redacted]. The customer is anticipating that the amount of [redacted] run through the dryer will [redacted] to approximately [redacted] and for the near future. This results in a [redacted] assumed to be processed in the original analysis.

SummaryAdjEx-AnteCalc:

The calculation method used in the ex-post analysis is identical to the ex-ante analysis, except that the updated production numbers obtained from the customer are used.The [redacted] in [redacted] significantly reduced the savings for this project.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☑ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	482,626	45,373	9%
Water Savings (L):	0	0	0%
Incremental Cost:	$74,702.00	$74,702.00	100%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure ID:	Measure Type:	Onsite Complete:
0178	A	[redacted] Dryer	On-site

Background

Measure Description:

The customer installed a new high efficiency [redacted] dryer. The new dryer operates at an efficiency [redacted] of water removed. The new dryer is more efficient due to the more efficient burner, improved air flow, and waste heat recovery off of the exhaust.

Summary Ex-Ante Calc:

The ex-ante savings were calculated assuming annual [redacted] drying of [redacted] energy factor is applied to account for the reduced [redacted] The same process is applied to [redacted], except the [redacted] is around [redacted] so a 57% factor is applied.

Comments Ex-Ante Calc:

The information obtained from the customer during the on-site visit was consistent with the information contained in the original project file. The anticipated production levels were consistent with what the customer was expecting going forward. The one difference was that the [redacted]% instead of the assumed [redacted]%.

MV Plan:

An on-site visit will be conducted for this project to obtain more detailed information regarding the systems operation. During the onsite visit, the [redacted] dryer will be visually inspected to be installed. Additionally the make, model, and other nameplate data will be recorded. If available, specifications of the new [redacted] dryer will be obtained. Any specifications, or nameplate information of the baseline [redacted] dryer will also be obtained from the customer if possible.

The customer will be interviewed regarding the past and anticipated production of the [redacted] dryer. If possible, production records of the amount of [redacted] entering the [redacted] dryer and amount of dry [redacted] leaving the dryer will be obtained. The customer will be interviewed to determine the typical entering gain moisture content. If possible, past production records will be obtained in order to determine the typical [redacted] processed during a year. The customer will also be interviewed regarding any future plans for increasing production capacity.

Ex Post Site Desc:

A site visit was completed on December 9, 2011. The facility owner was interviewed during the site visit. The customer was interviewed regarding the facility production and was able to confirm the production numbers used in the ex-ante analysis as accurate, and a good estimate of production going forward. The customer indicated that the [redacted] dryer is operated starting in [redacted] around the [redacted]. He also indicated that the average moisture content of the [redacted] this year and last year have been exceptionally dry compared to what he has typically seen. The [redacted] content this season was around [redacted] was replaced because it was too small, too noisy, and too inefficient. The customer was able to provide the baseline dryer quotes, specs, and the new dryer specs to confirm the information found in the project file.

Measure Level Report

Summary Adj Ex-Ante Calc:

The calculation method used in the ex-post analysis is identical to the ex-ante analysis, except that the updated moisture content numbers obtained from the customer are used. Reducing the moisture content difference between the [redacted] reduces the savings for this project slightly.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☑ Operated or Installed Diff
- ☐ Unknown

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	371,379	367,965	99%
Water Savings (L):	0	0	0%
Incremental Cost:	$46,170.00	$46,170.00	100%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0182	VFD/Controls	Phone

Background

Measure Description:

The customer has two air handling units, one for each tower of their residential complex. The air handlers operated at 100% capacity, 24 hr. / day, 52 weeks per year in the baseline case. The air handling units cfm ratings are based on ASHRAE standards of 100 cfm/[redacted] air handler capacity. The new operating profile is: New maximum cfm volume is 90% of original or [redacted] temperature both existing and new is 65 degrees f. New peak volume times will be from [redacted]. All off peak volumes will be set at 70% of original.

SummaryEx-AnteCalc:

The ex-ante savings were calculated using a vendor supplied calculation tool. The calculator takes the motor size, flow rate, supply air temperature, baseline operating schedule and flow rates, and the proposed operating schedule and flow rates, and calculates the energy savings associated with the new control scheme. The efficiency of the boiler system is assumed to be 70.9%, which is low for boiler efficiency.

CommentsEx-AnteCalc:

Based on the PDF of the calculation tool the calculation algorithms behind the tool could not be examined. However the calculation was consistent with the scheduling information contained in the project file. However, from the information obtained, it is not clear if the outdoor air temperature is held constant or varied during the analysis. Additionally, the boiler efficiency is listed both as a thermal efficiency and an "annual efficiency". The annual efficiency most likely includes miscellaneous inefficiencies such as cycling and shell losses. While these do impact the overall performance of the boiler, they do not impact the efficiency of heating water, which is what should be considered in this analysis. Therefore, the efficiency should be the 80.2% thermal efficiency found in the documentation instead of the 70.9% annual efficiency.

SummaryAdjEx-AnteCalc:

The ex-post savings were calculated using an ASHRAE simplified bin analysis. The bin hours used were broken down into three different time groups, [redacted]. The flow rate was assumed to be 90% during the peak times obtained from the customer interview of [redacted], [redacted]. The remainder of the time, the flow was reduced to 70% of capcity. Additionally, the thermal efficiency of the boiler used was 80.2% instead of 70.9%, as the thermal efficiency is all that is relavent to this project.

The gas savings were reduced for this project due to the bin analysis as well as increasing the boiler efficiency. The electricity savings from the bin analysis were slightly higher than the ex-ante, thus the savings were increased.

Reasons for Adjustments:

Ex-Ante

- [x] Inappropriate Assumptions
- [ ] Calculation/Engineering Error
- [ ] Tracking Error
- [ ] Operated or Installed Diff
- [ ] Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	40,525	43,516	107%
Gas Savings (m3):	43,132	36,701	85%
Water Savings (L):	0	0	0%
Incremental Cost:	$11,903.00	$12,345.14	104%
Expected Useful Life:	10	10	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0183	Radiator Improvements	Phone

Background

Measure Description:

This project involved the installation of radiator reflectors, as well as cleaning the radiators, and sealing any infiltration points behind the radiators. Additionally, the boiler controls were reset in order to accommodate the better performance of the radiators.

SummaryEx-AnteCalc:

The ex-ante savings were calculated assuming a 10% reduction in natural gas usage for each of the two buildings where the radiator reflectors were installed. The 10% savings is based on a research paper presented by [redacted] the radiator reflector company.

The project documentation also included a weather normalized analysis based on the monthly usage and HDD. The analysis indicated an average savings of -18.0% (an increase in gas usage). This analysis was disregarded and replaced with an assumed 10% savings from the contractor.

CommentsEx-AnteCalc:

The ex-ante savings analysis does not appear reasonable for this type of measure. The amount of area affected by the installation of this measure is small compared to the overall wall and window area of the buildings. As such, heat loss through the unaffected wall area and windows will be larger than the heat loss through the wall behind the radiator. Additionally, the project file included an analysis of the gas bills that showed negative savings associated with this project.

SummaryAdjEx-AnteCalc:

The ex-post savings were calclated using a weather normalized billed regression analysis. The regression analysis correlates the baseline and proposed gas usage to the heating degree days, and then uses those correlation with TMY weather data to arrive at the savings for a "typical" year. The results of the regression analysis do not show any significant savings. This is consistent with the information supplied in the Radflek_FinalReport document, as well as the results of the original billed history analysis.

According to the methodology laid out in the [redacted] document, the affected wall area of [redacted] would have a heat loss reduction of 45.2 kwh/m2/year. Assuming a boiler efficiency of 78% results in the final ex-post savings value of 2,045 m3 of gas savings.

Reasons for Adjustments:

Ex-Ante

- ☑ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	31,060	2,045	7%
Water Savings (L):	0	0	0%
Incremental Cost:	$43,345.00	$43,345.00	100%
Expected Useful Life:	10	10	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0189	Relief Valve Repair	Phone

Background

Measure Description:

The customer replaced a leaking boiler relief valve on one of their three boilers in their central boiler plant.

SummaryEx-AnteCalc:

The ex-ante savings were calculated assuming a steam loss through the relief valve of [redacted]/hour, and system operating hours of [redacted] per year. The boilers were assumed to be 78% efficient, and the enthalpy of the steam lost was assumed to be [redacted] Btu/lb. The system was also assumed to have [redacted] of feedwater pumps, which were calculated to run less due to the reduced amount of feedwater required. Because this was a relief valve, all of the steam lost through the valve was assumed to result in lost water as well.

CommentsEx-AnteCalc:

The ex-ante calcualtion method for the natural gas savings is reasonable for this type of project. However, the enthalpy of the make-up water was not considered in the ex-ante analysis. Additionally, during the customer interview, the customer indicated that heating is required at the facility [redacted] hours assumed in the ex-ante analysis. Additionally, the customer provided the results of their annual boiler tune up which indicated the boiler is currently operating at 81.2% efficiency instead of the assumed 78%.

The assumption of [redacted] hp of feedwater pumps was not reasonable. Converting the facility steam production of [redacted] per hour to gallons per minute, and applying the standard pump formula for brake horsepower results in approximately 3hp per feedwater pump. This is also consistent with the information obtained during the customer interview. The customer indicated that the boiler feedwater pumps were [redacted] each.

SummaryAdjEx-AnteCalc:

The ex-post savings were calculated using the same methodology was used except the updated operating hours, boiler make-up enthalpy, and appropriate feedwater pump size was used. The increase in operating hours, increased the water savings for this project. However, the inclusion of the make-up water enthalpy reduced the natural gas savings, and the reduction in pump size decreased the electricity savings.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☑ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	5,655	1,177	21%
Gas Savings (m3):	64,197	63,548	99%
Water Savings (L):	688,031	716,170	104%
Incremental Cost:	$2,748.00	$2,748.00	100%
Expected Useful Life:	10	10	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0203	Boiler Controls	Phone

Background

Measure Description:

This project involved the installation of an efficient [redacted] BHP boiler with an economizer and linkageless controls to replace an existing less efficient boiler. The installation of the economizer and the linkageless controls increases the efficiency of the new unit to 85% at full load and 80% at low-fire operation. The new boiler is replacing an existing [redacted]00 HP boiler unit that is greatly oversized. The existing boiler was approximately 20 years old and less efficient than the new boiler.

SummaryEx-AnteCalc:

The ex-ante calculations were not provided, however a pdf of a calculation or savings summary sheet was provided. Based on that information, it is expected that the existing boiler is expected to use approximately [redacted] gas to meet the process loads [redacted]. The installation of the new boilers was assumed to [redacted] he installation of the new boiler is expected to reduce the space heating has usage by 10%.

CommentsEx-AnteCalc:

No justification or documentation was provided for most of the parameters used in the savings estimates. It appears that the total gas usage used in the analysis is consistent with the gas usage for the facility during 2008-2009. The [redacted] in gas usage for the second six month period and heating portions is more reasonable, but is not supported in the analysis

SummaryAdjEx-AnteCalc:

The ex-post calculations were calculated using a boiler calculation developed by Michaels Energy. This calculation takes into account the partial load performance, shell losses, and turndown ratio of the baseline and proposed boilers. The loading for the boiler was calculated based off of the billed usage history, and the hours of operation obtained from the customer. The fixed (process) loads and variable (temperature dependant) loads were set so the summer and total annual gas usages were consistent with the billed histories. Based on the results of this analysis, the ex post savings were found to be less than the ex ante savings estimates.

Reasons for Adjustments:

Ex-Ante

- ☑ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	100,100	24,807	25%
Gas Savings (m3):	66,623	45,217	68%
Water Savings (L):	0	0	0%
Incremental Cost:	$11,206.00	$11,206.00	100%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0207	Fire Supression System	Phone

Background

Measure Description:

The customer replaced their exising water driven fire supression system with a dry chemical supression system. This allowed the customer to no longer heat the fire supression water or the facility as a whole.

SummaryEx-AnteCalc:

The ex-ante savings were calcualted using the billed data for the entire [redacted] The entire gas usage of the [redacted] was divided evenly between the [redacted] identical storage buildings. The usage per building was divided by the annual heating degree days to obtain the usage per building per heating degree day. The typical year was assumed to have [redacted] degree days, which was multiplied by the typical usage per heating degree day to arrive at the annual savings for each building.

The electricity savings for this project were calculated based on the circulation pump and blower fan horsepower. The fans and pumps were assumed to operate [redacted] hours per year.

CommentsEx-AnteCalc:

The ex-ante calculation method is reasonable for this type of project. The usage was normalized to weather, however, not to a typical meteorological year. Additionally, the annual usage of the [redacted] was used to determine the average usage per building instead of the usage for each individual building. As a whole, the ex-ante calculation method will be accurate, however the calculation for each individual building will most likely be different than what was claimed. According to the customer interview, there was an additional 9hp (3 motors 3hp each) of fan motors used in the heating untis that was not originally claimed in the electricity savings for this project.

It should be noted that this project is fundamentally providing an incentive for a customer to no longer use natural gas. During the customer interview, the customer indicated that the gas meters for these buildings have been completely removed as a result of this project. However, based on the purpose of the project, it still meets the program requirements, as well as the intent of the incentive program, and should be considered a viable project.

SummaryAdjEx-AnteCalc:

The savings were calculated as the weather normalized building heating usage. The usage history for each individual building, and historical weather data were used to calculate the gas usage as a funciton of heating degree days. The resulting formula was used in conjuction with the typical yearly heating degree days to arrive at the savings for each building. The sum of which, is the savings for this project. Additionally, the electricity savings were calculated in an identical fashion to the ex-ante analysis, however the additional horsepower for the heater fans was included, resulting in an increase in the electricity savings for this project.

Reasons for Adjustments:

Ex-Ante

- ☑ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Measure Level Report

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	69,031	118,715	172%
Gas Savings (m3):	175,679	114,922	65%
Water Savings (L):	0	0	0%
Incremental Cost:	$475,650.00	$475,650.00	100%
Expected Useful Life:	20	20	100%

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	240,179	156,237	65%
Water Savings (L):	0	0	0%
Incremental Cost:	$31,650.00	$31,650.00	100%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0224	Fire Supression System	Phone

Background

Measure Description:

The customer replaced their exising water driven fire supression system with a dry chemical supression system. This allowed the customer to no longer heat the fire supression water or the facility as a whole.

SummaryEx-AnteCalc:

The ex-ante savings were calcualted using the billed data for the entire [redacted] The entire gas usage of the [redacted] was divided evenly between the [redacted] identical storage buildings. The usage per building was divided by the annual heating degree days to obtain the usage per building per heating degree day. The typical year was assumed to have [redacted] heating degree days, which was multiplied by the typical usage per heating degree day to arrive at the annual savings for each building.

The electricity savings for this project were calculated based on the circulation pump and blower fan horsepower. The fans and pumps were assumed to operate [redacted] hours per year.

CommentsEx-AnteCalc:

The ex-ante calculation method is reasonable for this type of project. The usage was normalized to weather, however, not to a typical meteorological year. Additionally, the annual usage of the [redacted] was used to determine the average usage per building instead of the usage for each individual building. As a whole, the ex-ante calculation method will be accurate, however the calculation for each individual building will most likely be different than what was claimed. According to the customer interview, there was an additional 9hp (3 motors 3hp each) of fan motors used in the heating untis that was not originally claimed in the electricity savings for this project.

SummaryAdjEx-AnteCalc:

The savings were calculated as the weather normalized building heating usage. The usage history, and historical weather data were used to calculate the gas usage as a funciton of heating degree days. The resulting formula was used in conjuction with the typical yearly heating degree days to arrive at the savings for each building. The sum of which, is the savings for this project. Additionally, the electricity savings were calculated in an identical fashion to the ex-ante analysis, however the additional horsepower for the heater fans was included, resulting in an increase in the electricity savings for this project.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☑ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☐ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	53,733	111,742	208%
Gas Savings (m3):	209,106	94,821	45%
Water Savings (L):	0	0	0%
Incremental Cost:	$475,650.00	$475,650.00	100%
Expected Useful Life:	20	20	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0238	Exhaust Heat Recovery	Phone

Background

Measure Description:

The customer installed a heat exchanger to recover heat from the exhaust for a [redacted] structure and to preheat the incoming ventilation air. The heat exchanger was assumed to have a 90% heat recovery effectiveness and recover heat from [redacted] cfm of exhaust air. The recovered heat was used to pre-heat [redacted] cfm of incoming ventilation air.

In addition, scheduling was adjusted for the air handling units in three other areas to reduce the hours of operation during the overnight and weekend hours. In the first area, the scheduling is expected to reduce the hours of operation by [redacted] hours per weekend day. In the second area, the scheduling is expected to reduce the hours of operation by 0.5 hours per weekday, [redacted] per Sunday. For the third area, the scheduling is expected to reduce the hours of operation by 13.5 hours per day.

SummaryEx-AnteCalc:

The savings were calculated using an 8760 analysis. For each hour of the day, the heating savings were calculated based on the energy required to heat the incoming air from the outdoor air temperature to the discharge air temp of 65F. The savings were based on a heating efficiency of 80%. Also, a heat recovery effectiveness of 90% is listed; however, it does not appear to be used in the calculations.

CommentsEx-AnteCalc:

The calculation methodology used to determine the ex ante savings estimates appears reasonable. It appears thath the heat recovery effectiveness was inadvertantily neglected to be included in the analysis. Including this factor would be expected to decrease the savings by approximately 10%.

SummaryAdjEx-AnteCalc:

The ex post savings estimates were calculated using a billed data regression analysis. The gas usage of the facility was normalized on a monthly basis to heating degree days. Based on that analysis, the savings were significantly less than anticipated in the original analysis. It is unclear from discussions with the customer and vendor what the cause of the reduced savings value is.

Reasons for Adjustments:

Ex-Ante

- ☐ Inappropriate Assumptions
- ☐ Calculation/Engineering Error
- ☐ Tracking Error
- ☐ Operated or Installed Diff
- ☑ Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	229,185	6,684	3%
Water Savings (L):	0	0	0%
Incremental Cost:	$419,100.00	$419,100.00	100%
Expected Useful Life:	20	14	70%

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	981	1,013	103%
Gas Savings (m3):	100,428	105,132	105%
Water Savings (L):	308,942	318,876	103%
Incremental Cost:	$3,272.00	$3,272.00	100%
Expected Useful Life:	7	7	100%

Measure Level Report

Project Number:	Measure Type:	Review Type:
0242	Pipe Insulation	Phone

Background

Measure Description:

Installation of pipe insulation on 147ft of bare steam and condensate piping and approximately 70 pipe fittings. The pipe and the fittings ranged in size from [redacted] in diameter and was used to transport steam or condensate with temperatures ranging from [redacted]

The piping was assumed to be located in 75F space and operate [redacted] hours per year

SummaryEx-AnteCalc:

Electronic copies of the ex-ante calculations were not provided, however a pdf of a calculation or savings summary sheet was provided. Based on that information, the heat loss for each section of pipe or fitting was calculated. The heat loss was calculated assuming the pipe was located in 75F space and varied in sized from [redacted] with steam or condensate that varied in temperature from [redacted]. All of the pipe was assumed to operate [redacted]0 hours per year.

CommentsEx-AnteCalc:

No justification or documentation was provided for most of the parameters used in the savings estimates. It appears that methodology used in the analysis was reasonable; however, the heat loss for each section of pipe and each fitting appears excessive.

SummaryAdjEx-AnteCalc:

The heat loss for the pipe was recalculated using NAIMA 3E+ software. The required gas savings were then calculated based on an assumed 78% boiler efficiency. The savings during the winter hours were reduced, however, due to the assumption that 75% of the heat loss during these hours was lost in conditioned spaces. In these spaces, during the heating months, no savings will be realized due to the reduced heat loss from the pipes resulting in increased heat output from the [redacted] system. During the summer hours, 100% of the heat loss was assumed to be "waste" heat. Therefore 100% savings were given for these hours. It was also assumed that 75% of the heat loss during the summer months resulted in increased cooling load, which was met with an HVAC system with a COP of 3.

The heat loss from thet fittings was calculated using curve fits for area and heat loss derived from the Commercial Industrial Standards Energy Use Management Manual, 1984. The gas savings for the fitting insulation was calculated in a similar manner to the pipe insulation.

Reasons for Adjustments:

Ex-Ante

- [x] Inappropriate Assumptions
- [ ] Calculation/Engineering Error
- [ ] Tracking Error
- [ ] Operated or Installed Diff
- [ ] Unknown

Calculations

Measure Level Report

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	49,513	0%
Gas Savings (m3):	67,602	23,486	35%
Water Savings (L):	866,317	0	0%
Incremental Cost:	$90,800.00	$90,800.00	100%
Expected Useful Life:	20	20	100%

Measure Level Report

Calculations

	Ex-Ante:	Ex-Ante Adjusted:	Ex-Ante Realization Rate:
kWh Savings (kWh):	0	0	0%
Gas Savings (m3):	103,193	14,373	14%
Water Savings (L):	0	0	0%
Incremental Cost:	$43,600.00	$43,600.00	100%
Expected Useful Life:	20	20	100%

2011 Evaluation of Distribution Contract Custom Projects

Redacted Version (Customer Names and Locations Removed)

For

Union Gas

50 Keil Drive North
PO Box 2001
Chatham, Ontario, Canada
N7M 5M1

March 12, 2012

Performed By

Diamond Engineering Company
3723 W. Hamilton Road S
Fort Wayne, IN 46814

Table of Contents

Introduction

Union Gas has been undertaking Demand Side Management initiatives to encourage the efficient use of natural gas. In the industrial markets, custom projects represent a significant portion of the DSM savings. A sampling plan randomly selects an appropriate number of sites that are to be audited by an independent third party. The primary objectives of the report on this audit are:

- To review the original customer application and supporting documentation with respect to savings estimates.
- To conduct site visits and verify the system was installed and operational. Verify equipment costs with the customers.
- To discuss the project with service representatives and customers, and determine operating practices.
- To collect operating data and design information.
- To review the information and make an estimate of the rate of annual gas volume savings; and where appropriate, make an estimate of rate of water and electrical savings. Savings estimates are Diamond Engineering's best attempt to determine, with the information provided, what is the actual savings rate.
- Project Costs are solely the representations of the customers interviewed. This review does not constitute a financial audit.

Summary

Thirteen projects were reviewed. Customers invested $ 8,156,557 in these projects. These projects resulted in an annual natural gas savings of between 36,734,842 and 42,333,513 m3. CO_2 emission reduction from these thirteen projects was between 69,040 and 79,562 metric tons per year.

While this audit process consists of a Boolean and numeric analysis of project applications and results, there are other factors that, when considered with the supporting information and data, either add to or detract from the auditor's confidence in the conclusions presented. It should be reported that during every site visit, the customers welcomed the auditor and willingly took the time necessary to explain the project and its results. In one instance, a customer was not able to provide sufficient information to verify a savings element and this element is therefore assumed to have contributed no savings.

This year, the lower than verified savings calculations for natural gas on the project applications indicate Union Gas personnel and their customers were conservative when estimating savings. Union Gas Representatives and Project Managers were always welcomed by the customers, viewed as partners and considered valuable resources.

It would be desirable to encourage Customers to provide internal verification procedures to verify the savings achieved from their projects.

As with any such body of work, the quality of the supporting material for each project varies. Diamond Engineering personnel have used what is in their judgment the best available information to arrive at the savings estimates.

While the execution of each project was verified, this was not a financial audit – project costs are as represented by the customers interviewed.

Summary (continued)

Natural Gas Savings

	Project Number	Estimated Annual Natural Gas Consumption (Normal Cubic Meters) from Application	Estimated Annual Natural Gas Consumption (Normal Cubic Meters) Auditor's Calculations (Minimum)	Estimated Annual Natural Gas Consumption (Normal Cubic Meters) Auditor's Calculations (Maximum)
[redacted]	2011-IND-0335	630,329	2,474,324	2,474,324
[redacted]	2011-IND-0186	8,973,524	13,177,791	17,828,777
[redacted]	2011-IND-0276	517,430	557,410	557,410
[redacted]	2011-IND-0367	906,807	1,002,829	1,002,829
[redacted]	2011-IND-0026	7,053,588	7,130,434	7,130,434
[redacted]	2011-IND-0165	4,369,691	4,074,376	4,288,817
[redacted]	2011-IND-0379	1,801,896	1,372,819	1,372,819
[redacted]	2011-IND-0203	4,138,652	674,703	912,833
[redacted]	2011-IND-0518	187,430	361,071	361,071
[redacted]	2011-IND-0665	1,323,931	1,523,659	1,523,659
[redacted]	2011-IND-0282	1,193,899	1,201,814	1,625,984
[redacted]	2011-IND-0216	2,580,024	2,545,114	2,545,114
[redacted]	2011-IND-0441	760,488	638,498	709,442
Totals		**34,437,689**	**36,734,842**	**42,333,513**

Electrical Savings

	Project Number	Estimated Annual Electrical (kWh) from Application	Estimated Annual Electrical (kWh) Auditor's Calculations (Minimum)	Estimated Annual Electrical (kWh) Auditor's Calculations (Maximum)
[redacted]	2011-IND-0186	1,182,066	1,880,115	2,543,685
[redacted]	2011-IND-0026	26,078,330	25,821,658	25,821,658
[redacted]	2011-IND-0165	135,745	480,862	506,170
[redacted]	2011-IND-0203	394,086	67,431	91,231
[redacted]	2011-IND-0518	766,780	798,807	798,807
[redacted]	2011-IND-0665	343,418	1,523,659	1,523,659
[redacted]	2011-IND-0282	107,835	159,158	215,332
[redacted]	2011-IND-0216	705,002	941,700	941,700
[redacted]	2011-IND-0441	102,356	65,842	73,158
Totals		**29,815,618**	**31,739,233**	**32,515,399**

Summary (continued)

Water Savings

	Project Number	Estimated Annual Water (liters) from Application	Estimated Annual Water (liters) Auditor's Calculations (Minimum)	Estimated Annual Water (liters) Auditor's Calculations (Maximum)
[redacted]	2011-IND-0335	2,022,400	25,147,755	25,147,755
[redacted]	2011-IND-0186	111,015,033	141,898,422	191,980,218
[redacted]	2011-IND-0276	48,452,500	53,378,580	53,378,580
[redacted]	2011-IND-0165	10,260,306	5,242,860	5,825,400
[redacted]	2011-IND-0379	14,453,369	19,539,821	19,539,821
[redacted]	2011-IND-0203	45,455,426	6,545,034	8,855,046
[redacted]	2011-IND-0282	11,698,487	12,136,980	16,420,620
[redacted]	2011-IND-0441	13,784,359	6,814,205	7,571,339
Totals		**257,141,880**	**270,703,657**	**328,718,779**

Project Costs

	Project Number	Estimated Project Costs from Application	Estimated Project Costs from confirmed during site visits
[redacted]	2011-IND-0335	$ 22,190	$ 22,190
[redacted]	2011-IND-0186	3,232,359	3,232,359
[redacted]	2011-IND-0276	777,400	777,400
[redacted]	2011-IND-0367	766,978	766,978
[redacted]	2011-IND-0026	30,582	30,582
[redacted]	2011-IND-0165	405,096	405,096
[redacted]	2011-IND-0379	624,095	624,095
[redacted]	2011-IND-0203	356,170	356,170
[redacted]	2011-IND-0518	454,812	454,812
[redacted]	2011-IND-0665	809,130	809,130
[redacted]	2011-IND-0282	165,626	165,626
[redacted]	2011-IND-0216	435,000	435,000
[redacted]	2011-IND-0441	77,119	77,119
Totals		**$ 8,156,557**	**$ 8,156,557**

The results of this review can also be reported in terms of CO2 emission avoided. For a conversion, the US Department of Energy's Energy Information Agency has calculated an average value of 117.08 Pounds of CO2 emitted per mmBTU of natural gas consumed. Using this factor, the accounts examined in the review process saved the following:

CO2 Emissions Avoided

	Annual Estimated metric tons of CO2 emissions avoided per Application values	Annual Estimated metric tons of CO2 emissions avoided per Auditor's Calculations (Minimum)	Annual Estimated metric tons of CO2 emissions avoided per Auditor's Calculations (Maximum)
Total	**64,722**	**69,040**	**79,562**

Summary (continued)

Equipment life is defined for the purposes of this analysis as estimated life provided the equipment is operated as intended by the designer / manufacturer and receives routine maintenance and repairs. For Project has their estimated useful life increased.

Equipment Life

	Project Number	Estimated Equipment Life from Application	Estimated Equipment Life Auditor's Estimate
[redacted]	2011-IND-0335	10	10
[redacted]	2011-IND-0186	20	20
[redacted]	2011-IND-0276	20	20
[redacted]	2011-IND-0367	20	20
[redacted]	2011-IND-0026	20	20
[redacted]	2011-IND-0165	7	7
[redacted]	2011-IND-0379	20	20
[redacted]	2011-IND-0203	20	20
[redacted]	2011-IND-0518	20	20
[redacted]	2011-IND-0665	20	20
[redacted]	2011-IND-0282	20	20
[redacted]	2011-IND-0216	20	30
[redacted]	2011-IND-0441	10	13.5

[redacted]

Project: 2011-IND-0335

[redacted]

[redacted]

Project: 2011-IND-0335

Site Visit

[redacted]

[redacted]

Project: 2011-IND-0335

[redacted]

[redacted]

Project: 2011-IND-0535

[redacted]

[redacted]

Project: 2011-IND-0335

[redacted]

[redacted]

Project: 2011-IND-0186

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Project: 2011-IND-0186

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Project: 2011-IND-0186

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Project: 2011-IND-0186

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Project: 2011-IND-0186

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Project: 2011-IND-0276

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Project: 2011-IND-0276

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Project: 2011-IND-0367

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Project: 2011-IND-0026

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Project: 2011-IND-0165

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Project: 2011-IND-0165

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Project: 2011-IND-0282

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Project: 2011-IND-0216

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Project: 2011-IND-0216

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Project: 2011-IND-0216

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Project: 2011-IND-0216

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Project: 2011-IND-0441

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Project: 2011-IND-0441

[redacted]

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Project: 2011-IND-0441

[redacted]

[redacted]

Project: 2011-IND-0441

[redacted]

Program Name	Measure Name	End User Account LRAM Rate Class
Commercial New Buildings	Custom - Agriculture	M1 South Commercial
Commercial New Buildings	Custom - Agriculture	M2 South Commercial
Commercial New Buildings	Custom - Agriculture	01 North Commercial
Commercial New Buildings	Custom - Agriculture	M2 South Commercial
Commercial New Buildings	Custom - Agriculture	M1 South Commercial
Commercial New Buildings	Custom - Agriculture	M1 South Commercial
Commercial New Buildings	Custom - Agriculture	M1 South Commercial
Commercial New Buildings	Custom - Agriculture	M1 South Commercial
Commercial Existing Buildings	Custom - Agriculture	M1 South Commercial
Commercial Existing Buildings	Custom - Agriculture	M2 South Commercial
Commercial Existing Buildings	Custom - Agriculture	10 North Commercial
Commercial New Buildings	Custom - New Construction	01 North Commercial
Commercial New Buildings	Custom - New Construction	M1 South Commercial
Commercial New Buildings	Custom - New Construction	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	01 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	01 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Industrial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	01 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	01 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	01 North Commercial

Program Name	Measure Name	End User Account LRAM Rate Class
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	01 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	10 North Industrial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M2 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	01 North Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial
Commercial Existing Buildings	Custom - Retrofit	M1 South Commercial

Building Type	Project Equipment Type	Number of Units	Eq. Life w/ Realisation Rates	Energy Load	Free Rider	Adj. Factor
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
AGRICULT	Other	1	19	Baseload	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
INDUSTRL	Burners	1	19	Baseload	54%	100%
INDUSTRL	Boiler - Steam	1	19	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	19	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	7	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	19	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
INDUSTRL	Boiler - Hot Water	1	19	Baseload	54%	100%
HTEL/MTL	Laundry	1	10	Baseload	54%	100%
INDUSTRL	Reverb. Furnace - Zinv (Galvanizing)	1	2	Baseload	54%	100%
INDUSTRL	Heat Recovery System	1	19	Baseload	54%	100%
HTEL/MTL	Laundry	1	10	Baseload	54%	100%
HEALTH	Laundry	1	10	Baseload	54%	100%
HEALTH	Laundry	1	10	Baseload	54%	100%
HTEL/MTL	Laundry	1	10	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	19	Baseload	54%	100%
HEALTH	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Other	1	19	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
RECREATN	Laundry	1	10	Baseload	54%	100%
HEALTH	Laundry	1	10	Baseload	54%	100%
HTEL/MTL	Laundry	1	10	Baseload	54%	100%
INDUSTRL	Operational Changes	1	19	Baseload	54%	100%
INDUSTRL	Heat Recovery System	1	19	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
INDUSTRL	Heat Recovery System	1	19	Baseload	54%	100%
INDUSTRL	Insulation	3	14	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	19	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Insulation	2	19	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	7	Baseload	54%	100%
HEALTH	Laundry	1	10	Baseload	54%	100%
HEALTH	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Other	1	5	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	7	Baseload	54%	100%
INDUSTRL	Reverb. Furnace - Zinv (Galvanizing)	1	2	Baseload	54%	100%
HEALTH	Steam Distribution System	1	7	Baseload	54%	100%
INDUSTRL	Burners	1	19	Baseload	54%	100%
HTEL/MTL	Laundry	1	10	Baseload	54%	100%
HEALTH	Laundry	1	10	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%

Building Type	Project Equipment Type	Number of Units	Eq. Life w/ Realisation Rates	Energy Load	Free Rider	Adj. Factor
INDUSTRL	Other	1	19	Baseload	54%	100%
INDUSTRL	Insulation	1	5	Baseload	54%	100%
INDUSTRL	Burners	1	19	Baseload	54%	100%
HTEL/MTL	Laundry	1	10	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Other	1	19	Baseload	54%	100%
RETAIL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Burners	1	19	Baseload	54%	100%
SERVICE	Water Heating - Other	1	10	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
INDUSTRL	Heat Recovery System	1	19	Baseload	54%	100%
INDUSTRL	Other	1	19	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
INDUSTRL	Other	1	1	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
INDUSTRL	Other	1	19	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
HTEL/MTL	Laundry	1	10	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	7	Baseload	54%	100%
INDUSTRL	Other	1	19	Baseload	54%	100%
INDUSTRL	Burners	1	1	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	10	Baseload	54%	100%
INDUSTRL	Boiler - Steam	1	19	Baseload	54%	100%
INDUSTRL	Heat Recovery System	1	19	Baseload	54%	100%
INDUSTRL	Heat Recovery System	1	19	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	7	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Other	1	19	Baseload	54%	100%
INDUSTRL	Burners	1	19	Baseload	54%	100%
HEALTH	Laundry	1	10	Baseload	54%	100%
RECREATN	Controls	1	14	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	7	Baseload	54%	100%
HEALTH	Steam Distribution System	1	7	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Boiler - Steam	1	19	Baseload	54%	100%
INDUSTRL	Controls	1	19	Baseload	54%	100%
INDUSTRL	Heat Recovery System	1	19	Baseload	54%	100%
INDUSTRL	Heat Recovery System	1	19	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
INDUSTRL	Water Heating - Other	1	19	Baseload	54%	100%
INDUSTRL	Insulation	1	19	Baseload	54%	100%
SERVICE	Laundry	1	14	Baseload	54%	100%
INDUSTRL	Steam Distribution System	1	7	Baseload	54%	100%
HEALTH	Ventilation controls	2	10	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
MLTUFMLY	Controls	1	10	Weather Sensitive	54%	100%
EDUCATE	Insulation	1	19	Weather Sensitive	54%	100%
EDUCATE	Controls	3	19	Weather Sensitive	54%	100%
HEALTH	Ventilation controls	1	19	Weather Sensitive	54%	100%
RECREATN	Building Automation Systems	1	10	Weather Sensitive	54%	100%
EDUCATE	Insulation	1	19	Weather Sensitive	54%	100%
MLTUFMLY	Insulation	1	10	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%

Building Type	Project Equipment Type	Number of Units	Eq. Life w/ Realisation Rates	Energy Load	Free Rider	Adj. Factor
MLTUFMLY	Controls	1	14	Weather Sensitive	54%	100%
INDUSTRL	Insulation	1	19	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RECREATN	Controls	1	10	Weather Sensitive	54%	100%
RECREATN	Building Automation Systems	1	10	Weather Sensitive	54%	100%
SERVICE	Building Automation Systems	1	10	Weather Sensitive	54%	100%
EDUCATE	Controls	2	19	Weather Sensitive	54%	100%
OFFICE	Controls	1	10	Weather Sensitive	54%	100%
RECREATN	Controls	1	19	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	5	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	5	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RECREATN	Building Automation Systems	1	10	Weather Sensitive	54%	100%
RECREATN	Insulation	1	19	Weather Sensitive	54%	100%
RECREATN	Insulation	1	19	Weather Sensitive	54%	100%
MLTUFMLY	Controls	1	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RETAIL	Controls	1	14	Weather Sensitive	54%	100%
EDUCATE	Controls	4	19	Weather Sensitive	54%	100%
HEALTH	Make Up Air	1	14	Weather Sensitive	54%	100%
RECREATN	Insulation	1	19	Weather Sensitive	54%	100%
EDUCATE	Controls	8	19	Weather Sensitive	54%	100%
SERVICE	Building Automation Systems	1	10	Weather Sensitive	54%	100%
SERVICE	Building Automation Systems	1	10	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	5	14	Weather Sensitive	54%	100%
RECREATN	Controls	1	10	Weather Sensitive	54%	100%
MLTUFMLY	Boiler - Hot Water	1	14	Weather Sensitive	54%	100%
RECREATN	Building Automation Systems	1	10	Weather Sensitive	54%	100%
WAREHSE	Insulation	1	19	Weather Sensitive	54%	100%
RECREATN	Boiler Control System	1	19	Weather Sensitive	54%	100%
EDUCATE	Controls	6	19	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RECREATN	HVAC Units	1	19	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
HEALTH	Make Up Air	2	14	Weather Sensitive	54%	100%
FOODSERV	Controls	1	10	Weather Sensitive	54%	100%
MLTUFMLY	Ventilation controls	1	10	Weather Sensitive	54%	100%
INDUSTRL	Make Up Air	1	19	Weather Sensitive	54%	100%
TRANSPRT	Other	1	19	Weather Sensitive	54%	100%
EDUCATE	Ventilation controls	10	14	Weather Sensitive	54%	100%
RECREATN	Building Automation Systems	1	10	Weather Sensitive	54%	100%
MLTUFMLY	Insulation	1	19	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
CHURCH	Insulation	1	19	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	1	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	6	14	Weather Sensitive	54%	100%
RETAIL	Ventilation controls	7	14	Weather Sensitive	54%	100%
MLTUFMLY	Make Up Air	1	10	Weather Sensitive	54%	100%
MLTUFMLY	Insulation	1	19	Weather Sensitive	54%	100%

Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates	Incremental Costs ($)/Unit w Realisation Rates
74,696.17	0.00	0.00	$7,473.64
244,887.31	0.00	0.00	$42,291.72
76,855.71	0.00	0.00	$27,480.00
63,340.65	0.00	0.00	$21,254.86
23,791.81	0.00	0.00	$28,563.63
21,943.51	0.00	0.00	$21,446.31
318,243.58	0.00	0.00	$68,427.40
29,882.69	0.00	0.00	$25,246.79
26,095.10	0.00	0.00	$55,072.67
27,427.74	0.00	0.00	$29,266.20
118,230.42	0.00	0.00	$47,373.69
856.78	0.00	854.78	$732.80
650.17	0.00	946.24	$732.80
447.18	0.00	1,190.50	$732.80
65,525.24	0.00	0.00	$4,305.20
14,018.18	0.00	0.00	$8,244.00
41,917.40	0.00	0.00	$30,189.53
14,824.63	2,464.16	0.00	$2,465.37
82,917.57	1,474,921.23	0.00	$23,631.54
19,276.90	1,023,565.30	0.00	$23,690.51
47,637.69	0.00	0.00	$54,960.00
2,723.98	710,464.03	0.00	$0.00
31,693.40	0.00	0.00	$2,990.74
113,202.50	0.00	0.00	$4,775.65
6,809.62	1,776,160.08	0.00	$0.00
1,815.99	473,642.69	0.00	$0.00
1,361.66	355,232.02	0.00	$0.00
6,355.30	1,657,749.41	0.00	$0.00
6,763.47	733,020.21	0.00	$1,695.52
44,576.76	747,458.31	0.00	$83,172.80
6,505.64	0.00	1,602.56	$4,487.30
161,481.13	0.00	0.00	$107,186.66
4,170.05	1,088,370.43	0.00	$0.00
16,569.40	4,323,879.06	0.00	$0.00
2,723.98	710,464.03	0.00	$0.00
6,020.98	0.00	0.00	$91.60
31,878.69	8,803,276.96	0.00	$14,106.40
62,253.29	0.00	0.00	$182,641.47
27,423.79	0.00	0.00	$45,854.96
15,692.14	0.00	0.00	$2,640.37
4,194.44	0.00	0.00	$5,802.86
158,374.03	0.00	0.00	$28,991.40
6,237.92	0.00	0.00	$12,274.40
30,873.77	0.00	0.00	$575.25
10,231.91	2,675,577.31	0.00	$0.00
6,852.48	0.00	0.00	$18,472.06
51,854.56	0.00	1,902,950.01	$13,057.58
35,118.98	0.00	0.00	$7,053.20
5,503.35	78,692.54	0.00	$1,425.30
31,693.40	0.00	0.00	$2,990.74
67,305.62	1,128,571.74	0.00	$12,421.88
3,327.33	0.00	0.00	$10,085.16
4,085.64	1,065,696.05	0.00	$0.00
4,659.32	1,214,339.23	0.00	$0.00
26,452.76	0.00	0.00	$6,338.72
14,797.60	0.00	0.00	$9,698.15

Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates	Incremental Costs ($)/Unit w Realisation Rates
27,448.84	0.00	0.00	$22,167.20
28,374.64	0.00	0.00	$8,191.79
49,850.64	0.00	0.00	$11,715.46
5,901.63	1,539,338.74	0.00	$0.00
46,676.95	0.00	0.00	$16,396.40
53,542.62	0.00	11,855.90	$132,133.00
19,763.54	0.00	0.00	$19,539.20
148,784.38	0.00	0.00	$13,648.40
6,648.07	0.00	0.00	$2,748.00
36,005.22	0.00	0.00	$6,320.40
69,792.21	6,884,548.11	0.00	$40,375.45
14,669.01	852,575.61	0.00	$16,855.32
6,164.73	0.00	0.00	$17,150.27
7,552.77	0.00	0.00	$1,374.00
50,182.32	0.00	0.00	$127,684.33
115,842.73	0.00	54,983.19	$435,695.40
31,839.13	0.00	0.00	$34,227.26
17,167.48	0.00	14,720.21	$29,551.08
3,660.33	952,324.13	0.00	$0.00
16,080.79	33,755.32	0.00	$7,167.70
7,862.03	49,507.46	0.00	$14,618.44
10,020.24	0.00	6,892.30	$29,353.22
6,981.73	0.00	0.00	$3,824.80
137,884.50	0.00	42,798.33	$435,695.40
2,208.99	0.00	0.00	$663.18
42,331.50	593,633.15	4,504.21	$2,517.17
43,931.21	0.00	79,729.65	$10,265.09
32,427.97	73,463,955.00	0.00	$271,653.54
5,072.24	0.00	27,711.78	$11,575.49
23,404.08	0.00	0.00	$767.70
6,164.73	0.00	0.00	$19,083.94
5,828.44	0.00	0.00	$2,990.74
68,045.46	0.00	0.00	$39,937.60
58,871.89	0.00	0.00	$6,671.30
3,442.73	896,897.86	0.00	$0.00
6,939.53	0.00	8,485.91	$8,532.54
66,222.22	266,555.16	781.37	$2,997.17
6,990.96	0.00	0.00	$856.58
7,542.88	0.00	0.00	$8,163.39
54,546.23	0.00	0.00	$57,112.60
27,493.68	0.00	0.00	$27,798.77
36,795.84	0.00	0.00	$29,312.00
18,397.92	0.00	0.00	$14,656.00
9,583.06	0.00	0.00	$4,582.75
23,123.84	123,347.55	400.16	$38,105.60
26,749.88	0.00	0.00	$31,785.20
4,044.76	1,434,493.01	5,575.50	$8,273.31
2,947.52	0.00	0.00	$1,000.57
6,157.48	0.00	11,711.74	$15,572.00
680.28	0.00	1,087.22	$732.80
670.94	0.00	932.96	$732.80
10,055.85	0.00	6,849.10	$7,579.73
9,716.92	0.00	0.00	$22,442.00
30,596.82	0.00	62,531.62	$103.37
43,550.73	0.00	349,357.64	$82,311.76
3,322.06	0.00	20,466.86	$12,091.20
38,184.54	0.00	0.00	$66,226.80
20,480.97	0.00	0.00	$39,703.57
957.45	0.00	437.94	$732.80

Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates	Incremental Costs ($)/Unit w Realisation Rates
4,229.39	0.00	16,398.34	$10,579.80
3,626.70	0.00	0.00	$3,664.00
445.20	0.00	750.17	$732.80
3,639.89	0.00	24,620.61	$6,045.60
5,219.81	0.00	10,274.85	$20,385.58
96.93	0.00	17,037.93	$11,030.47
205.07	0.00	345.68	$103.37
11,476.86	0.00	0.00	$11,360.23
2,637.60	0.00	0.00	$6,654.74
1,480.48	0.00	2,888.91	$732.80
974.46	0.00	1,458.23	$732.80
608.41	0.00	1,490.38	$732.80
6,392.88	0.00	7,301.52	$19,683.92
18,265.38	0.00	0.00	$4,237.42
10,220.70	0.00	0.00	$3,158.37
4,229.39	0.00	16,398.34	$10,579.80
926.02	0.00	480.82	$732.80
61,439.60	0.00	352,053.00	$109,969.46
19,640.89	0.00	97,408.76	$103.37
5,772.39	0.00	11,711.74	$11,624.04
36,596.70	0.00	0.00	$32,371.44
1,003.61	0.00	15,936.37	$103.37
10,329.50	0.00	3,982.50	$25,196.41
5,771.73	0.00	6,416.60	$15,252.32
633.16	0.00	1,592.04	$732.80
11,252.00	0.00	45,626.71	$12,091.20
137,132.78	0.00	0.00	$178,551.30
8,264.26	0.00	34,647.75	$44,894.99
10,689.53	0.00	0.00	$11,083.60
123,049.97	0.00	33,067.49	$28,029.60
1,906.33	0.00	3,213.88	$103.37
1,195.71	0.00	1,343.16	$732.80
11,302.12	0.00	21,471.25	$58,183.40
755.89	0.00	1,056.29	$732.80
5,387.30	0.00	7,026.72	$13,725.34
329.70	0.00	37,793.93	$3,967.20
15,393.03	0.00	9,829.61	$4,402.93
178,208.78	0.00	157,144.31	$166,789.86
151,124.59	0.00	0.00	$383,895.60
636.32	0.00	0.00	$938.90
11,274.42	0.00	57,109.05	$65,912.61
17,087.69	0.00	0.00	$19,510.80
776.00	0.00	1,072.22	$732.80
542.47	0.00	1,357.37	$732.80
24,612.11	0.00	0.00	$35,266.00
447.18	0.00	1,190.50	$732.80
4,025.64	0.00	5,597.80	$4,396.80
577.96	0.00	889.82	$732.80
665.15	0.00	919.05	$732.80
28,441.24	0.00	32,278.16	$10,903.15
51,953.47	0.00	0.00	$41,530.52

Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR	Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$95,719.13	$0.00	$0.00	$3,437.88	$92,281.26
$313,809.93	$0.00	$0.00	$19,454.19	$294,355.74
$98,486.46	$0.00	$0.00	$12,640.80	$85,845.66
$81,167.63	$0.00	$0.00	$9,777.24	$71,390.40
$30,487.93	$0.00	$0.00	$13,139.27	$17,348.66
$28,119.43	$0.00	$0.00	$9,865.30	$18,254.13
$407,812.05	$0.00	$0.00	$31,476.60	$376,335.45
$38,293.06	$0.00	$0.00	$11,613.52	$26,679.54
$33,439.46	$0.00	$0.00	$25,333.43	$8,106.04
$35,147.18	$0.00	$0.00	$13,462.45	$21,684.73
$151,505.93	$0.00	$0.00	$21,791.90	$129,714.03
$5,708.05	$0.00	$1,834.68	$2,022.53	$5,520.20
$4,331.56	$0.00	$2,031.00	$2,022.53	$4,340.02
$2,979.23	$0.00	$2,555.27	$2,022.53	$3,511.97
$83,967.07	$0.00	$0.00	$1,980.39	$81,986.68
$17,963.55	$0.00	$0.00	$3,792.24	$14,171.31
$53,714.89	$0.00	$0.00	$13,887.18	$39,827.71
$10,202.30	$11.67	$0.00	$1,134.07	$9,079.91
$106,254.41	$12,912.42	$0.00	$10,870.51	$108,296.33
$24,702.31	$8,960.96	$0.00	$10,897.63	$22,765.63
$61,045.14	$0.00	$0.00	$25,281.60	$35,763.54
$2,426.31	$4,339.89	$0.00	$0.00	$6,766.20
$7,295.26	$0.00	$0.00	$1,375.74	$5,919.52
$145,062.91	$0.00	$0.00	$2,196.80	$142,866.12
$6,065.48	$10,849.73	$0.00	$0.00	$16,915.20
$1,617.54	$2,893.26	$0.00	$0.00	$4,510.80
$1,212.86	$2,169.95	$0.00	$0.00	$3,382.81
$5,660.80	$10,126.41	$0.00	$0.00	$15,787.21
$8,667.02	$6,417.34	$0.00	$779.94	$14,304.42
$57,122.72	$6,543.74	$0.00	$38,259.49	$25,406.97
$8,336.63	$0.00	$668.28	$2,064.16	$6,940.75
$206,929.39	$0.00	$0.00	$49,305.86	$157,623.52
$3,714.35	$6,648.34	$0.00	$0.00	$10,362.69
$14,758.72	$26,412.55	$0.00	$0.00	$41,171.26
$2,426.31	$4,339.89	$0.00	$0.00	$6,766.20
$7,715.56	$0.00	$0.00	$42.14	$7,673.43
$40,850.83	$77,069.61	$0.00	$6,488.94	$111,431.50
$79,774.25	$0.00	$0.00	$84,015.08	-$4,240.82
$35,142.11	$0.00	$0.00	$21,093.28	$14,048.83
$51,674.90	$0.00	$0.00	$3,643.71	$48,031.19
$5,374.95	$0.00	$0.00	$2,669.32	$2,705.64
$202,947.81	$0.00	$0.00	$13,336.04	$189,611.77
$15,987.13	$0.00	$0.00	$11,292.45	$4,694.68
$21,247.31	$0.00	$0.00	$264.61	$20,982.70
$9,113.78	$16,343.84	$0.00	$0.00	$25,457.62
$8,781.09	$0.00	$0.00	$8,497.15	$283.95
$27,220.15	$0.00	$329,151.72	$6,006.49	$350,365.39
$45,003.09	$0.00	$0.00	$3,244.47	$41,758.62
$3,787.40	$372.77	$0.00	$655.64	$3,504.53
$7,295.26	$0.00	$0.00	$1,375.74	$5,919.52
$46,319.69	$5,346.03	$0.00	$5,714.06	$45,951.66
$4,263.80	$0.00	$0.00	$4,639.17	-$375.38
$3,639.17	$6,509.84	$0.00	$0.00	$10,149.00
$4,150.16	$7,417.83	$0.00	$0.00	$11,567.98
$33,897.79	$0.00	$0.00	$2,915.81	$30,981.98
$18,962.32	$0.00	$0.00	$4,461.15	$14,501.17

Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR	Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$35,174.22	$0.00	$0.00	$10,196.91	$24,977.31
$14,894.78	$0.00	$0.00	$3,768.22	$11,126.56
$63,880.92	$0.00	$0.00	$5,389.11	$58,491.81
$5,256.71	$9,403.10	$0.00	$0.00	$14,659.80
$59,814.00	$0.00	$0.00	$7,542.34	$52,271.66
$68,611.99	$0.00	$4,944.03	$60,781.18	$12,774.84
$25,325.91	$0.00	$0.00	$8,988.03	$16,337.88
$190,659.19	$0.00	$0.00	$6,278.26	$184,380.92
$5,921.58	$0.00	$0.00	$1,264.08	$4,657.50
$46,138.75	$0.00	$0.00	$2,907.38	$43,231.37
$89,434.97	$60,271.81	$0.00	$18,572.71	$131,134.07
$18,797.55	$7,464.00	$0.00	$7,753.45	$18,508.11
$7,899.77	$0.00	$0.00	$7,889.12	$10.65
$907.34	$0.00	$0.00	$632.04	$275.30
$64,305.94	$0.00	$0.00	$58,734.79	$5,571.15
$148,446.24	$0.00	$22,928.55	$200,419.88	-$29,045.09
$40,800.13	$0.00	$0.00	$15,744.54	$25,055.60
$21,999.20	$0.00	$6,138.48	$13,593.49	$14,544.19
$3,260.33	$5,817.30	$0.00	$0.00	$9,077.63
$20,606.67	$295.52	$0.00	$3,297.14	$17,605.04
$10,074.76	$433.42	$0.00	$6,724.48	$3,783.70
$12,840.40	$0.00	$2,874.16	$13,502.48	$2,212.08
$4,804.82	$0.00	$0.00	$1,759.41	$3,045.41
$176,691.57	$0.00	$17,847.34	$200,419.88	-$5,880.97
$265.37	$0.00	$0.00	$305.06	-$39.69
$37,705.57	$3,626.23	$1,310.58	$1,157.90	$41,484.47
$56,295.48	$0.00	$33,248.08	$4,721.94	$84,821.62
$41,554.71	$643,151.20	$0.00	$124,960.63	$559,745.28
$6,499.80	$0.00	$11,556.10	$5,324.73	$12,731.17
$16,106.68	$0.00	$0.00	$353.14	$15,753.54
$7,899.77	$0.00	$0.00	$8,778.61	-$878.84
$7,468.83	$0.00	$0.00	$1,375.74	$6,093.09
$87,196.61	$0.00	$0.00	$18,371.30	$68,825.31
$75,441.17	$0.00	$0.00	$3,068.80	$72,372.37
$3,066.51	$5,478.73	$0.00	$0.00	$8,545.24
$7,617.39	$0.00	$3,035.67	$3,924.97	$6,728.08
$45,574.10	$1,262.67	$176.31	$1,378.70	$45,634.37
$4,811.17	$0.00	$0.00	$394.03	$4,417.15
$9,665.79	$0.00	$0.00	$3,755.16	$5,910.63
$69,898.06	$0.00	$0.00	$26,271.80	$43,626.26
$35,231.68	$0.00	$0.00	$12,787.43	$22,444.24
$47,151.89	$0.00	$0.00	$13,483.52	$33,668.37
$23,575.95	$0.00	$0.00	$6,741.76	$16,834.19
$12,280.18	$0.00	$0.00	$2,108.06	$10,172.11
$29,631.96	$1,079.86	$166.87	$17,528.58	$13,350.12
$34,278.53	$0.00	$0.00	$14,621.19	$19,657.34
$4,439.86	$10,773.23	$1,994.52	$3,805.72	$13,401.89
$2,028.48	$0.00	$0.00	$460.26	$1,568.22
$11,106.16	$0.00	$6,815.47	$14,326.24	$3,595.40
$4,532.17	$0.00	$2,333.59	$2,022.53	$4,843.24
$4,469.94	$0.00	$2,002.50	$2,022.53	$4,449.91
$9,068.80	$0.00	$1,992.87	$3,486.67	$7,575.00
$12,588.48	$0.00	$0.00	$10,323.32	$2,265.16
$118,916.56	$0.00	$78,228.98	$142.65	$197,002.89
$56,420.93	$0.00	$145,685.72	$37,863.41	$164,243.24
$2,995.98	$0.00	$5,955.19	$5,561.95	$3,389.22
$49,468.91	$0.00	$0.00	$30,464.33	$19,004.58
$18,470.63	$0.00	$0.00	$18,263.64	$206.99
$6,378.72	$0.00	$939.99	$2,022.53	$5,296.18

Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR	Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$4,696.18	$0.00	$5,866.18	$4,866.71	$5,695.65
$4,698.47	$0.00	$0.00	$1,685.44	$3,013.03
$2,966.05	$0.00	$1,610.15	$2,022.53	$2,553.67
$3,282.61	$0.00	$7,163.80	$2,780.98	$7,665.43
$4,707.45	$0.00	$2,989.65	$9,377.37	-$1,680.27
$87.42	$0.00	$4,957.49	$5,074.02	-$29.11
$531.35	$0.00	$288.31	$95.10	$724.56
$10,350.33	$0.00	$0.00	$5,225.71	$5,124.62
$3,417.07	$0.00	$0.00	$3,061.18	$355.89
$8,219.41	$0.00	$5,167.24	$1,685.44	$11,701.21
$5,410.05	$0.00	$2,608.27	$1,685.44	$6,332.88
$4,053.33	$0.00	$3,198.93	$2,022.53	$5,229.73
$5,765.38	$0.00	$2,124.50	$9,054.61	-$1,164.72
$23,663.20	$0.00	$0.00	$1,949.21	$21,713.99
$13,241.14	$0.00	$0.00	$1,452.85	$11,788.29
$4,696.18	$0.00	$5,866.18	$4,866.71	$5,695.65
$6,169.32	$0.00	$1,032.02	$2,022.53	$5,178.81
$68,220.54	$0.00	$125,939.93	$50,585.95	$143,574.52
$101,780.81	$0.00	$162,481.81	$190.20	$264,072.42
$6,409.47	$0.00	$4,189.64	$5,347.06	$5,252.05
$47,411.83	$0.00	$0.00	$14,890.86	$32,520.97
$10,401.56	$0.00	$53,165.04	$380.40	$63,186.20
$9,315.60	$0.00	$1,158.78	$11,590.35	-$1,115.98
$5,205.20	$0.00	$1,867.02	$7,016.07	$56.16
$3,515.18	$0.00	$2,847.61	$1,685.44	$4,677.35
$10,147.55	$0.00	$13,275.89	$5,561.95	$17,861.49
$152,267.81	$0.00	$0.00	$82,133.60	$70,134.21
$7,453.07	$0.00	$10,081.37	$20,651.70	-$3,117.25
$13,848.53	$0.00	$0.00	$5,098.46	$8,750.07
$159,413.95	$0.00	$13,789.48	$12,893.62	$160,309.82
$14,818.12	$0.00	$8,041.32	$285.30	$22,574.14
$7,966.08	$0.00	$2,882.94	$2,022.53	$8,826.49
$14,642.14	$0.00	$8,953.73	$26,764.37	-$3,168.49
$5,035.91	$0.00	$2,267.20	$2,022.53	$5,280.58
$11,963.76	$0.00	$5,027.34	$12,627.32	$4,363.79
$297.34	$0.00	$10,996.81	$1,824.91	$9,469.24
$13,882.11	$0.00	$2,860.10	$2,025.35	$14,716.86
$230,873.40	$0.00	$65,530.79	$76,723.34	$219,680.86
$195,785.23	$0.00	$0.00	$176,591.98	$19,193.26
$7,065.50	$0.00	$0.00	$4,318.94	$2,746.56
$10,167.77	$0.00	$16,616.88	$30,319.80	-$3,535.15
$22,137.48	$0.00	$0.00	$8,974.97	$13,162.51
$5,169.90	$0.00	$2,301.40	$2,022.53	$5,448.76
$3,614.02	$0.00	$2,913.43	$2,022.53	$4,504.93
$31,885.52	$0.00	$0.00	$16,222.36	$15,663.16
$2,979.23	$0.00	$2,555.27	$2,022.53	$3,511.97
$4,469.94	$0.00	$2,002.50	$2,022.53	$4,449.91
$3,850.52	$0.00	$1,909.90	$2,022.53	$3,737.89
$5,169.90	$0.00	$2,301.40	$2,359.62	$5,111.68
$25,649.55	$0.00	$9,391.90	$5,015.45	$30,026.01
$67,306.86	$0.00	$0.00	$19,104.04	$48,202.82

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Commercial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	10 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M1 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	10 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	10 North Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Commercial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	M5 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - Agriculture	M2 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	20 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial

Program Name	Measure Name	End User Account LRAM Rate Class
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M7 South Industrial
Distribution Contract Markets	Custom - DC	100 North Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	M4 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial
Distribution Contract Markets	Custom - DC	T1 South Industrial

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
AGRICULT	Other	1	4	Baseload	54%
INDUSTRL	Boiler - Hot Water	1	22	Baseload	54%
AGRICULT	Other	1	22	Baseload	54%
AGRICULT	Heat Recovery System	1	11	Baseload	54%
INDUSTRL	Shaft Melter - Aluminum	1	11	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Heat Recovery System	1	11	Baseload	54%
AGRICULT	Heat Recovery System	1	1	Baseload	54%
EDUCATE	Controls	23	22	Baseload	54%
AGRICULT	Other	1	5	Baseload	54%
AGRICULT	Heat Recovery System	1	22	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Other	1	5	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	5	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
EDUCATE	Controls	14	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	11	Baseload	54%
AGRICULT	Other	1	11	Baseload	54%
EDUCATE	Controls	2	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Controls	2	22	Baseload	54%
AGRICULT	Heat Recovery System	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Other	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	5	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
INDUSTRL	Burners	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
AGRICULT	Heat Recovery System	1	1	Baseload	54%
AGRICULT	Heat Recovery System	1	11	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Insulation	1	22	Baseload	54%
AGRICULT	Other	1	16	Baseload	54%
AGRICULT	Other	1	22	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
INDUSTRL	Other	1	16	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Heat Recovery System	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	11	Baseload	54%
INDUSTRL	Controls	6	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	11	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Insulation	1	22	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
INDUSTRL	Insulation	1	16	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	16	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	16	Baseload	54%
AGRICULT	Heat Recovery System	1	1	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Insulation	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Heat Recovery System	1	16	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Other	1	5	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
AGRICULT	Heat Recovery System	1	22	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Other	1	1	Baseload	54%
AGRICULT	Heat Recovery System	1	22	Baseload	54%
UTILITY	Insulation	1	22	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%
INDUSTRL	Controls	2	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Controls	1	16	Baseload	54%
INDUSTRL	Steam Distribution System	1	11	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Make Up Air	1	22	Baseload	54%
HEALTH	Steam Distribution System	1	8	Baseload	54%
UTILITY	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Controls	2	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	5	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	1	3	Baseload	54%
HEALTH	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
EDUCATE	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
AGRICULT	Heat Recovery System	1	22	Baseload	54%
UTILITY	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	1	16	Baseload	54%
INDUSTRL	Insulation	1	5	Baseload	54%
EDUCATE	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
HEALTH	Insulation	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
HEALTH	Heat Recovery System	3	22	Baseload	54%
UTILITY	Steam Distribution System	62	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
RESOURCE	Boiler - Steam	1	22	Baseload	54%
INDUSTRL	HVAC Units	1	22	Baseload	54%
INDUSTRL	Other	2	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
HEALTH	Boiler - Hot Water	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Insulation	1	22	Baseload	54%
UTILITY	Laundry	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
INDUSTRL	Burners	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
EDUCATE	Steam Distribution System	3	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	15	Baseload	54%
EDUCATE	Controls	271	22	Baseload	54%
UTILITY	Controls	1	22	Baseload	54%
HEALTH	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
RESOURCE	Heat Recovery System	1	22	Baseload	54%
EDUCATE	Steam Distribution System	14	8	Baseload	54%
HEALTH	Other	1	22	Baseload	54%
WAREHSE	Insulation	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
EDUCATE	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Controls	3	16	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	5	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
EDUCATE	Steam Distribution System	2	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Other	14	16	Baseload	54%
INDUSTRL	Heat Recovery System	3	22	Baseload	54%
RESOURCE	Insulation	1	22	Baseload	54%
UTILITY	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
EDUCATE	Heat Recovery System	1	22	Baseload	54%
HEALTH	Boiler - Hot Water	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
EDUCATE	Controls	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
HEALTH	Other	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
EDUCATE	Insulation	1	22	Baseload	54%
INDUSTRL	Insulation	2	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
RESOURCE	Burners	1	22	Baseload	54%
EDUCATE	HVAC Units	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
UTILITY	Controls	1	22	Baseload	54%
EDUCATE	Steam Distribution System	4	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
FOODSERV	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	39	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
EDUCATE	Insulation	1	22	Baseload	54%
INDUSTRL	Make Up Air	3	5	Baseload	54%
HEALTH	Controls	1	22	Baseload	54%
HEALTH	Controls	1	22	Baseload	54%
HEALTH	Insulation	1	22	Baseload	54%
HEALTH	HVAC Units	1	22	Baseload	54%
HEALTH	Controls	1	22	Baseload	54%
HEALTH	HVAC Units	1	22	Baseload	54%
HEALTH	Other	1	22	Baseload	54%
EDUCATE	Insulation	1	22	Baseload	54%
EDUCATE	Other	1	1	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Controls	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
INDUSTRL	Heat-Treat Furnace - Radiant T	1	22	Baseload	54%
EDUCATE	Other	1	22	Baseload	54%
EDUCATE	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Insulation	1	11	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
AGRICULT	Heat Recovery System	1	1	Baseload	54%
INDUSTRL	Building Automation Systems	1	22	Baseload	54%
AGRICULT	Heat Recovery System	1	1	Baseload	54%
INDUSTRL	Boiler - Steam	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	2	22	Baseload	54%
INDUSTRL	Steam Distribution System	47	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
EDUCATE	Steam Distribution System	2	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Make Up Air	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
EDUCATE	HVAC Units	1	22	Baseload	54%
HEALTH	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
HEALTH	Insulation	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
AGRICULT	Controls	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
HEALTH	Make Up Air	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
HEALTH	Make Up Air	1	22	Baseload	54%
HEALTH	Insulation	1	22	Baseload	54%
INDUSTRL	Boiler - Steam	1	2	Baseload	54%
HEALTH	Heat Recovery System	1	22	Baseload	54%
UTILITY	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	2	22	Baseload	54%
HEALTH	Other	1	8	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
HEALTH	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Boiler - Steam	9	22	Baseload	54%
INDUSTRL	Other	1	16	Baseload	54%
EDUCATE	Other	1	11	Baseload	54%
HEALTH	Controls	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	28	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Boiler - Steam	2	22	Baseload	54%
INDUSTRL	Make Up Air	1	16	Baseload	54%
EDUCATE	Steam Distribution System	2	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Make Up Air	2	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
UTILITY	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	12	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
EDUCATE	HVAC Units	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	11	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Insulation	1	3	Baseload	54%
HEALTH	Controls	1	22	Baseload	54%
INDUSTRL	Controls	4	22	Baseload	54%
INDUSTRL	Controls	4	22	Baseload	54%
INDUSTRL	Heat Recovery System	4	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
EDUCATE	HVAC Units	1	22	Baseload	54%
INDUSTRL	Boiler - Hot Water	1	22	Baseload	54%
HEALTH	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Other	2	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
UTILITY	Other	1	22	Baseload	54%
INDUSTRL	Other	1	4	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	3	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
AGRICULT	Other	1	4	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	11	Baseload	54%
INDUSTRL	Other	1	16	Baseload	54%
INDUSTRL	Other	1	2	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Burners	1	22	Baseload	54%
UTILITY	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Gas Turbine	1	4	Baseload	54%
INDUSTRL	Insulation	1	11	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	11	Baseload	54%
INDUSTRL	Convection Oven - Curing/Dryi	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	2	Baseload	54%
INDUSTRL	Other	1	1	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Make Up Air	1	5	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Refinery Heater/Reformer	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	HVAC Units	1	22	Baseload	54%
UTILITY	Gas Turbine	1	1	Baseload	54%
INDUSTRL	Refinery Heater/Reformer	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Heat-Treat Furnace - Radiant T	1	22	Baseload	54%
UTILITY	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Make Up Air	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	11	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Controls	1	11	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	3	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
UTILITY	Other	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	1	16	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Boiler - Steam	1	1	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Reheat Furnace	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	2	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	11	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
UTILITY	Insulation	1	22	Baseload	54%
INDUSTRL	Boiler - Steam	2	22	Baseload	54%
UTILITY	Gas Turbine	1	22	Baseload	54%
INDUSTRL	HVAC Units	1	22	Baseload	54%
INDUSTRL	Insulation	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
UTILITY	Gas Turbine	1	1	Baseload	54%
INDUSTRL	Refinery Heater/Reformer	1	22	Baseload	54%
UTILITY	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Make Up Air	1	22	Baseload	54%
INDUSTRL	Heat-Treat Furnace - Radiant T	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
UTILITY	Other	1	1	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Burners	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Heat Recovery System	1	11	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
UTILITY	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	11	Baseload	54%
INDUSTRL	Other	1	4	Baseload	54%
INDUSTRL	Insulation	1	11	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Refinery Heater/Reformer	1	22	Baseload	54%
INDUSTRL	Refinery Heater/Reformer	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	16	Baseload	54%
INDUSTRL	Steam Distribution System	1	11	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	54	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
UTILITY	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	5	Baseload	54%
INDUSTRL	Other	1	5	Baseload	54%
INDUSTRL	Other	1	11	Baseload	54%
HEALTH	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	1	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Boiler - Steam	1	5	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Refinery Heater/Reformer	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	22	Baseload	54%
HEALTH	Heat Recovery System	1	22	Baseload	54%
INDUSTRL	Burners	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Furnace	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Heat Recovery System	1	4	Baseload	54%
INDUSTRL	Steam Distribution System	1	1	Baseload	54%
INDUSTRL	Steam Distribution System	1	8	Baseload	54%
INDUSTRL	Make Up Air	1	22	Baseload	54%
INDUSTRL	Refinery Heater/Reformer	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%

Building Type	Project Equipment Type	Number of Units	Eq. Life w Realisation Rates	Energy Load	Free Rider
INDUSTRL	Controls	1	22	Baseload	54%
INDUSTRL	Insulation	1	22	Baseload	54%
INDUSTRL	Gas Turbine	1	22	Baseload	54%
INDUSTRL	Other	3	22	Baseload	54%
INDUSTRL	Refinery Heater/Reformer	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Steam Distribution System	1	22	Baseload	54%
INDUSTRL	Other	1	22	Baseload	54%
INDUSTRL	Heat Recovery System	1	9	Baseload	54%

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	60,236.19	0.00	0.00
100%	100,651.99	0.00	0.00
100%	574,349.93	0.00	0.00
100%	265,999.51	0.00	0.00
100%	566,573.16	0.00	0.00
100%	276,581.13	0.00	0.00
100%	14,127.83	0.00	0.00
100%	55,839.33	0.00	0.00
100%	3,984.69	0.00	36,212.62
100%	404,677.58	0.00	0.00
100%	201,924.42	0.00	0.00
100%	1,353,978.01	0.00	0.00
100%	515,899.67	0.00	0.00
100%	159,581.62	0.00	0.00
100%	169,311.38	0.00	0.00
100%	87,600.63	0.00	47,456.33
100%	172,103.40	0.00	0.00
100%	1,625,601.02	0.00	0.00
100%	86,051.70	0.00	0.00
100%	25,219.18	0.00	125,315.41
100%	34,420.68	0.00	0.00
100%	146,817.35	0.00	0.00
100%	307,910.52	0.00	0.00
100%	12,651.24	0.00	17,360.68
100%	70,503.20	0.00	0.00
100%	41,128.33	0.00	144,084.38
100%	141,626.85	0.00	0.00
100%	67,548.94	0.00	0.00
100%	450,118.36	0.00	0.00
100%	317,399.93	0.00	0.00
100%	86,051.70	0.00	0.00
100%	378,226.27	0.00	0.00
100%	51,631.02	0.00	0.00
100%	137,627.91	0.00	0.00
100%	6,978.41	0.00	0.00
100%	8,605.17	0.00	0.00
100%	46,729.91	0.00	0.00
100%	51,631.02	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	496,863.61	0.00	0.00
100%	302,601.63	0.00	0.00
100%	179,993.85	0.00	24,243.75
100%	527,678.89	0.00	0.00
100%	181,228.17	0.00	0.00
100%	59,834.98	0.00	0.00
100%	269,290.85	0.00	0.00
100%	88,677.76	0.00	0.00
100%	688,129.68	0.00	0.00
100%	14,917.09	0.00	0.00
100%	77,446.53	0.00	0.00
100%	647,644.83	0.00	0.00
100%	27,949.81	0.00	38,045.45
100%	800,436.47	0.00	0.00
100%	151,494.51	0.00	0.00
100%	17,210.34	0.00	0.00
100%	120,472.38	0.00	0.00
100%	283,970.61	0.00	0.00
100%	51,631.02	0.00	0.00
100%	57,832.22	0.00	0.00
100%	14,940.11	0.00	0.00
100%	86,051.70	0.00	0.00
100%	258,335.97	0.00	0.00
100%	2,403.97	0.00	0.00
100%	649,886.77	0.00	0.00
100%	172,103.40	0.00	0.00
100%	126,466.40	0.00	19,395.00
100%	225,463.13	0.00	0.00
100%	186,566.66	0.00	0.00
100%	141,642.19	0.00	24,351.50
100%	12,907.76	0.00	0.00
100%	168,661.33	0.00	0.00
100%	10,326.20	0.00	0.00
100%	71,971.01	0.00	5,281.06
100%	157,189.60	0.00	0.00
100%	9,766.05	0.00	0.00
100%	109,789.91	0.00	0.00
100%	153,255.99	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	309,786.12	0.00	0.00
100%	129,077.55	0.00	0.00
100%	8,605.17	0.00	0.00
100%	47,199.08	0.00	440,956.27
100%	138,205.61	0.00	0.00
100%	667,437.81	0.00	0.00
100%	51,631.02	0.00	0.00
100%	17,210.34	0.00	0.00
100%	86,051.70	0.00	0.00
100%	107,740.02	0.00	0.00
100%	71,364.81	0.00	0.00
100%	734,284.09	0.00	0.00
100%	3,097.86	0.00	0.00
100%	25,815.51	0.00	0.00
100%	86,051.70	0.00	0.00
100%	682,558.80	0.00	0.00
100%	60,236.19	0.00	0.00
100%	53,516.48	0.00	0.00
100%	77,446.53	0.00	0.00
100%	93,874.18	0.00	0.00
100%	33,625.94	0.00	31,637.56
100%	34,420.68	0.00	0.00
100%	912,430.84	0.00	0.00
100%	25,815.51	0.00	0.00
100%	156,607.52	0.00	0.00
100%	141,626.85	0.00	0.00
100%	137,522.67	0.00	0.00
100%	533,201.55	0.00	0.00
100%	38,403.17	0.00	0.00
100%	283,159.42	0.00	0.00
100%	35,471.94	0.00	0.00
100%	373,245.14	0.00	0.00
100%	152,003.48	1,611,783.84	0.00
100%	97,227.46	23,026.38	0.00
100%	15,900.38	167,640.75	0.00
100%	690,966.65	2,176,506.88	0.00
100%	209,601.11	467,657.33	1,385.67
100%	3,688.71	168,169.16	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	62,651.12	0.00	0.00
100%	105,342.63	0.00	0.00
100%	92,350.47	0.00	0.00
100%	567,206.77	52,144,580.50	0.00
100%	16,925.33	0.00	0.00
100%	8,040.63	0.00	0.00
100%	57,007.88	394,708.19	0.00
100%	73,500.21	0.00	0.00
100%	85,608.84	7,051,262.40	0.00
100%	430,054.61	0.00	0.00
100%	388,513.01	4,294,164.99	0.00
100%	100,620.20	0.00	2,077,218.51
100%	8,155.73	0.00	0.00
100%	296,950.71	3,296,400.60	0.00
100%	80,242.94	0.00	250,195.50
100%	378,397.28	713,219.26	38,571.27
100%	133,293.54	1,141,517.81	3,168.93
100%	5,118,868.14	32,439,322.99	0.00
100%	994,041.83	0.00	0.00
100%	48,028.91	0.00	0.00
100%	49,832.16	0.00	0.00
100%	30,285.81	0.00	0.00
100%	277,732.14	351,669.87	0.00
100%	280,034.16	0.00	0.00
100%	70,861.66	0.00	0.00
100%	499,745.52	0.00	0.00
100%	85,945.37	0.00	0.00
100%	56,783.16	0.00	0.00
100%	16,549.33	78,193.46	0.00
100%	84,374.51	0.00	0.00
100%	716.91	65,928.01	0.00
100%	225,966.28	526,121.89	7,678.27
100%	42,850.46	0.00	0.00
100%	861,711.86	0.00	1,245,040.48
100%	28,594.38	0.00	0.00
100%	977,837.81	0.00	0.00
100%	145,440.53	0.00	79,753.32
100%	26,450.21	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	33,851.75	0.00	0.00
100%	348,810.84	0.00	0.00
100%	103,262.04	0.00	0.00
100%	599,256.37	0.00	9,548.81
100%	789,541.34	4,974,017.75	0.00
100%	4,087.73	0.00	0.00
100%	997,542.00	0.00	0.00
100%	49,339.96	0.00	5,456.46
100%	28,531.89	0.00	103,687.83
100%	842,901.07	0.00	0.00
100%	86,595.42	1,089,460.94	0.00
100%	73,778.64	163,569.49	484.88
100%	1,975,238.40	15,554,715.72	0.00
100%	40,928.82	0.00	0.00
100%	374,661.43	0.00	0.00
100%	3,700.77	0.00	0.00
100%	22,917.16	0.00	0.00
100%	20,960.44	0.00	0.00
100%	322,811.17	0.00	0.00
100%	37,802.46	535,836.75	0.00
100%	310,057.98	336,819.39	27,920.18
100%	48,085.17	0.00	60,787.70
100%	70,346.44	0.00	0.00
100%	119,675.44	902,032.10	0.00
100%	56,542.00	0.00	0.00
100%	4,422.07	0.00	0.00
100%	51,631.02	0.00	0.00
100%	431,404.03	0.00	0.00
100%	521.79	0.00	0.00
100%	25,094.21	278,642.17	0.00
100%	88,629.96	0.00	0.00
100%	57,304.95	0.00	0.00
100%	483,553.55	0.00	0.00
100%	106,945.27	0.00	0.00
100%	2,828,222.31	0.00	759,639.66
100%	127,160.30	0.00	56,331.70
100%	327,887.67	0.00	0.00
100%	30,759.37	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	355,688.40	0.00	475,930.67
100%	80,226.49	0.00	0.00
100%	165,767.36	0.00	50,982.99
100%	212,078.53	0.00	177,338.18
100%	499,745.52	0.00	0.00
100%	138,719.73	106,703.08	0.00
100%	107,219.32	0.00	0.00
100%	12,354.17	124,481.90	511.81
100%	31,569.46	453,080.20	4,978.05
100%	34,872.31	0.00	0.00
100%	1,015,229.19	0.00	665,765.70
100%	134,328.35	0.00	0.00
100%	5,324.24	0.00	0.00
100%	30,245.25	142,898.91	0.00
100%	38,038.14	0.00	0.00
100%	159,934.48	0.00	826,205.45
100%	245,042.36	9,691,010.96	12,285.66
100%	61,791.70	0.00	0.00
100%	12,988.87	0.00	0.00
100%	60,502.57	0.00	0.00
100%	19,058.53	251,043.02	0.00
100%	11,468.44	0.00	0.00
100%	305,085.61	21,733,565.20	0.00
100%	517,170.72	446,493.86	0.00
100%	45,526.28	0.00	0.00
100%	119,118.57	0.00	83,472.85
100%	630,808.29	0.00	0.00
100%	497,717.55	0.00	0.00
100%	207,899.81	0.00	0.00
100%	46,722.24	0.00	154,465.01
100%	29,668.65	0.00	0.00
100%	26,056.67	0.00	215,567.88
100%	12,419.95	0.00	0.00
100%	248,366.03	0.00	0.00
100%	65,041.93	0.00	0.00
100%	235,589.82	0.00	0.00
100%	11,939.81	160,037.40	0.00
100%	1,809,373.47	19,070,953.84	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	356,708.96	0.00	282,200.48
100%	25,815.51	0.00	0.00
100%	436,013.55	0.00	0.00
100%	591,751.78	5,683,807.17	0.00
100%	40,969.38	2,675,803.41	0.00
100%	339,807.75	2,140,814.71	0.00
100%	36,401.51	0.00	0.00
100%	516,841.86	446,493.86	0.00
100%	53,544.99	0.00	0.00
100%	31,719.64	0.00	0.00
100%	67,680.48	0.00	28,925.49
100%	96,932.58	0.00	0.00
100%	138,891.83	0.00	0.00
100%	146,488.49	0.00	166,582.58
100%	94,718.26	0.00	0.00
100%	45,585.48	1,905,770.47	3,921.02
100%	98,700.75	0.00	402,175.80
100%	279,630.75	41,231,374.40	0.00
100%	1,313,253.08	0.00	0.00
100%	2,767.91	181,249.30	0.00
100%	18,350.39	0.00	0.00
100%	1,123,302.45	0.00	130,221.26
100%	378,299.72	0.00	0.00
100%	127,494.64	1,362,078.54	0.00
100%	4,863.84	0.00	0.00
100%	999,436.23	0.00	0.00
100%	376,761.75	1,126,340.62	5,028,923.86
100%	394,463.19	0.00	0.00
100%	30,118.10	0.00	0.00
100%	13,102.88	0.00	85,178.77
100%	109,730.72	629,577.00	373,170.58
100%	224,535.74	2,306,869.14	27,525.82
100%	6,136.53	0.00	0.00
100%	71,123.65	0.00	0.00
100%	134,372.20	5,271,722.65	0.00
100%	104,020.61	0.00	0.00
100%	97,309.67	163,569.49	2,855.38
100%	382,963.06	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	57,798.24	4,097,531.41	0.00
100%	42,038.17	0.00	0.00
100%	124,274.00	0.00	708,092.06
100%	403,489.30	0.00	0.00
100%	137,016.23	391,734.65	1,661.51
100%	68,992.64	4,555,062.78	0.00
100%	15,021.23	127,895.61	593.70
100%	39,823.85	0.00	0.00
100%	74,752.07	0.00	336,431.06
100%	130,993.71	209,043.24	5,803.42
100%	114,325.22	0.00	0.00
100%	55,181.61	729,255.72	0.00
100%	383,286.33	0.00	0.00
100%	39,896.20	0.00	0.00
100%	40,408.12	508,378.58	0.00
100%	87,521.70	0.00	0.00
100%	171,733.98	2,160,610.33	0.00
100%	102,382.89	0.00	0.00
100%	286,956.66	0.00	0.00
100%	33,832.02	0.00	0.00
100%	88,579.54	0.00	187,842.73
100%	8,485.68	0.00	0.00
100%	213,791.89	0.00	0.00
100%	5,386.18	0.00	0.00
100%	221,677.95	0.00	329,712.85
100%	26,236.45	0.00	0.00
100%	139,950.76	0.00	0.00
100%	54,280.54	0.00	0.00
100%	52,671.31	0.00	0.00
100%	219,351.81	0.00	0.00
100%	897,043.48	0.00	0.00
100%	33,697.19	0.00	0.00
100%	13,388.99	0.00	0.00
100%	328,980.58	0.00	0.00
100%	41,221.50	48,016.82	0.00
100%	18,057.70	154,845.81	0.00
100%	93,442.28	0.00	0.00
100%	4,894.53	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	37,716.95	0.00	0.00
100%	29,158.92	145,976.84	0.00
100%	10,987.21	0.00	49,352.22
100%	361,520.18	1,726,898.50	0.00
100%	87,696.00	0.00	0.00
100%	73,409.01	0.00	0.00
100%	2,037.84	0.00	0.00
100%	28,163.57	0.00	0.00
100%	95,722.38	0.00	468,384.94
100%	8,429.78	0.00	0.00
100%	1,940.27	140,228.86	0.00
100%	47,388.73	0.00	0.00
100%	103,552.53	466,119.44	0.00
100%	21,512.93	0.00	0.00
100%	54,280.54	0.00	0.00
100%	9,951.30	0.00	198,065.03
100%	94,945.17	0.00	0.00
100%	34,054.55	0.00	0.00
100%	321,639.33	0.00	0.00
100%	16,581.12	0.00	0.00
100%	1,495,089.64	16,290,255.37	261,898.23
100%	797,519.48	0.00	0.00
100%	1,411,252.26	0.00	0.00
100%	558,054.59	2,812,545.38	0.00
100%	6,189,833.61	0.00	0.00
100%	226,702.93	13,067,725.14	0.00
100%	1,487,391.03	0.00	0.00
100%	330,178.73	0.00	133,205.94
100%	111,630.43	651,406.64	0.00
100%	1,861,873.78	7,712,959.67	0.00
100%	3,349,990.49	11,406,885.95	706,680.53
100%	34,420.68	0.00	0.00
100%	493,323.76	7,492,841.18	0.00
100%	27,087.10	0.00	0.00
100%	137,858.11	1,470,337.80	5,695.67
100%	2,477,412.00	0.00	0.00
100%	1,273,879.77	0.00	0.00
100%	205,587.93	2,251,054.18	15,978.25

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	946,020.60	0.00	0.00
100%	137,555.56	1,225,225.72	0.00
100%	1,687,687.60	3,890,495.29	51,533.59
100%	415,310.72	0.00	0.00
100%	352,737.43	0.00	0.00
100%	261,672.37	2,886,515.62	0.00
100%	709,313.75	6,755,155.66	0.00
100%	4,790,055.27	11,042,141.32	146,265.24
100%	487,643.47	4,618,373.47	79,289.99
100%	645,790.06	0.00	0.00
100%	7,388,842.92	0.00	0.00
100%	4,444,961.65	0.00	0.00
100%	2,307,075.67	24,728,939.74	214,652.01
100%	2,041,458.74	3,343,080.78	2,668,067.79
100%	3,646,410.64	45,943,926.13	0.00
100%	93,705.37	0.00	0.00
100%	188,005.97	0.00	785,523.36
100%	1,242,962.54	0.00	0.00
100%	70,677.50	0.00	0.00
100%	2,137,730.31	21,694,383.98	0.00
100%	43,848.00	0.00	3,437.23
100%	284,264.39	0.00	0.00
100%	2,938,541.68	0.00	0.00
100%	2,294,053.91	25,019,635.35	407,237.35
100%	2,122,293.63	14,986,736.10	257,299.46
100%	222,423.36	0.00	0.00
100%	1,652,081.92	17,774,702.15	154,288.30
100%	287,197.82	0.00	0.00
100%	797,519.48	0.00	0.00
100%	2,662,889.04	28,974,993.21	251,508.97
100%	213,079.36	21,409,879.75	0.00
100%	27,251.53	0.00	6,326.00
100%	13,808.83	0.00	0.00
100%	273,173.04	5,488,620.00	0.00
100%	472,655.13	0.00	0.00
100%	897,286.84	0.00	0.00
100%	1,911,058.08	4,405,413.94	58,354.17
100%	2,736,923.10	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	73,967.19	681,501.50	0.00
100%	3,013,033.96	0.00	188,721.97
100%	957,794.88	5,145,405.83	0.00
100%	1,165,123.58	4,819,091.23	170,815.00
100%	537,886.70	5,462,489.86	0.00
100%	31,432.44	0.00	0.00
100%	25,794.68	273,372.02	2,091.43
100%	954,144.54	13,898,893.77	148,171.34
100%	225,551.92	0.00	0.00
100%	1,030,428.00	0.00	0.00
100%	3,205,836.90	0.00	0.00
100%	934,640.95	0.00	0.00
100%	1,702,540.01	9,408,440.66	86,830.34
100%	20,908.92	315,893.76	2,870.46
100%	41,965.82	134,838.17	0.00
100%	193,334.60	304,495.72	0.00
100%	124,681.79	0.00	0.00
100%	518,781.03	0.00	0.00
100%	407,574.83	0.00	0.00
100%	224,316.50	1,059,874.05	0.00
100%	2,612,069.21	13,142,871.88	0.00
100%	236,886.63	0.00	0.00
100%	440,237.21	3,543,999.78	37,781.46
100%	360,000.85	272,264.61	0.00
100%	1,141,427.02	0.00	0.00
100%	12,174,084.78	111,307,035.37	1,186,606.57
100%	19,468.51	0.00	1,325.33
100%	420,149.34	0.00	0.00
100%	1,308,752.08	12,589,911.71	116,192.21
100%	582,654.42	0.00	0.00
100%	497,955.43	0.00	0.00
100%	733,133.08	2,544,328.36	19,462.88
100%	1,876,702.07	0.00	0.00
100%	522,055.38	1,831,713.92	0.00
100%	470,411.21	0.00	0.00
100%	1,430,753.66	13,763,547.63	127,023.24
100%	1,896,837.08	15,771,690.55	136,901.76
100%	38,050.20	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	2,486,497.31	0.00	0.00
100%	161,534.94	421,212.84	3,087.04
100%	76,789.91	287,857.67	0.00
100%	50,348.47	161,963.80	0.00
100%	31,813.92	3,043,493.60	0.00
100%	96,986.30	122,200.36	0.00
100%	142,712.09	0.00	0.00
100%	23,011.43	0.00	216,080.77
100%	289,762.93	21,018,831.72	0.00
100%	3,170,754.12	26,368,765.05	228,885.78
100%	54,395.64	571,636.54	25,435.47
100%	351.88	7,943,163.15	3,996.45
100%	49,567.97	497,714.52	0.00
100%	683,674.73	6,414,479.16	55,678.74
100%	1,065,714.68	402,832.42	0.00
100%	220,719.87	768,305.64	0.00
100%	597,798.42	3,012,850.96	0.00
100%	1,330,525.90	589,407.84	99,779.73
100%	1,726,136.81	978,815.74	128,129.84
100%	685,583.21	0.00	0.00
100%	815,885.22	0.00	0.00
100%	508,770.54	0.00	0.00
100%	717,878.36	0.00	0.00
100%	2,991,160.38	0.00	0.00
100%	5,529,616.47	45,985,636.42	399,164.19
100%	3,418,925.03	28,172,392.31	300,335.89
100%	704,465.26	0.00	0.00
100%	800,267.66	8,552,638.89	91,176.97
100%	3,461,231.77	69,587,092.00	0.00
100%	1,483,661.76	10,476,982.42	179,873.54
100%	197,502.35	0.00	0.00
100%	106,769.88	13,430,976.00	0.00
100%	139,836.75	617,488.05	0.00
100%	335,249.75	12,228,098.65	0.00
100%	2,137,730.31	21,694,383.98	0.00
100%	620,646.52	5,466,562.20	119,368.68
100%	269,717.82	1,763,126.62	38,500.15
100%	1,308,815.66	882,278.45	123,833.84

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	120,760.68	565,491.44	6,205.32
100%	4,200.64	0.00	817.82
100%	9,836,777.01	119,474,378.51	1,273,676.12
100%	2,218,796.50	0.00	0.00
100%	833,646.95	14,834,727.16	110,288.59
100%	343,111.70	459,331.85	0.00
100%	1,977,293.77	0.00	0.00
100%	72,901.68	965,902.41	0.00
100%	252,544.75	2,693,537.04	10,433.43
100%	111,409.00	0.00	0.00
100%	743,468.05	3,453,146.98	0.00
100%	3,308,287.75	27,507,527.79	238,770.77
100%	22,109.26	0.00	0.00
100%	500,804.45	3,899,808.72	45,652.60
100%	50,788.04	224,270.39	7,949.80
100%	590,074.59	0.00	0.00
100%	1,943,781.84	0.00	0.00
100%	1,023,370.66	0.00	0.00
100%	685,586.50	3,788,634.03	34,964.88
100%	545,941.58	0.00	0.00
100%	301,878.13	1,063,103.72	62,427.12
100%	695,936.82	263,059.87	0.00
100%	1,231,079.74	0.00	0.00
100%	1,941,141.09	0.00	0.00
100%	301,310.30	0.00	0.00
100%	656,004.45	0.00	0.00
100%	1,879,416.26	0.00	0.00
100%	34,713.37	2,456,270.45	0.00
100%	180,019.06	969,042.77	0.00
100%	1,867,924.80	0.00	0.00
100%	729,252.53	6,842,111.54	59,390.72
100%	3,089,957.60	7,123,039.56	94,352.37
100%	504,207.06	0.00	0.00
100%	1,558,648.41	3,706,327.33	80,584.07
100%	1,565,643.27	10,234,515.64	223,483.20
100%	76,481.87	0.00	17,616.05
100%	2,309,907.16	0.00	0.00
100%	5,154,747.86	0.00	0.00

Adj. Factor	Natural Gas Savings (m3)/Unit w Realisation Rates	Water Savings (L)/Unit w Realisation Rates	Electricity Savings (kWh)/Unit w Realisation Rates
100%	95,213.74	503,505.55	107,656.26
100%	310,904.24	0.00	0.00
100%	5,296,132.45	0.00	0.00
100%	8,814.54	0.00	1,472.94
100%	4,622,701.71	0.00	0.00
100%	189,927.61	0.00	0.00
100%	203,620.25	1,845,727.12	19,676.23
100%	149,275.04	0.00	0.00
100%	13,474.49	144,244.16	1,687.37
100%	4,536,790.32	48,919,129.46	424,627.67
100%	788,578.88	0.00	0.00
100%	683,450.01	0.00	0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$10,725.00	$26,193.53	$0.00
$100,493.00	$137,324.61	$0.00
$98,690.15	$783,614.71	$0.00
$250,728.11	$252,775.99	$0.00
$108,850.08	$538,407.36	$0.00
$31,323.00	$120,270.49	$0.00
$7,797.00	$13,425.50	$0.00
$8,935.66	$6,712.29	$0.00
$112.85	$125,039.74	$0.00
$280,569.00	$213,021.79	$0.00
$140,000.00	$275,495.72	$0.00
$120,185.00	$162,757.91	$0.00
$87,650.00	$703,868.06	$0.00
$73,000.00	$217,725.28	$0.00
$40,110.20	$89,125.31	$0.00
$90,349.00	$119,517.98	$0.00
$34,727.94	$74,838.66	$0.00
$895,000.00	$855,714.42	$0.00
$17,400.00	$37,419.33	$0.00
$112.85	$481,709.21	$0.00
$5,782.49	$14,967.73	$0.00
$102,700.00	$139,518.69	$0.00
$170,886.00	$292,603.50	$0.00
$112.85	$34,521.47	$0.00
$9,901.50	$30,658.11	$0.00
$26,300.00	$112,226.92	$0.00
$61,133.14	$193,228.68	$0.00
$5,826.00	$29,373.46	$0.00
$20,210.00	$54,107.47	$0.00
$134,331.17	$433,044.80	$0.00
$15,210.57	$37,419.33	$0.00
$254,252.43	$199,097.85	$0.00
$9,471.00	$22,451.60	$0.00
$7,310.20	$187,772.73	$0.00
$4,467.00	$9,521.00	$0.00
$1,632.30	$3,741.93	$0.00
$8,179.75	$20,320.36	$0.00
$8,955.00	$22,451.60	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$24,985.08	$59,726.58	$0.00
$298,158.64	$287,558.52	$0.00
$24,000.00	$245,574.72	$0.00
$18,730.00	$63,430.80	$0.00
$24,379.50	$78,806.54	$0.00
$129,951.77	$81,635.90	$0.00
$379,111.00	$318,195.28	$0.00
$195,704.45	$120,987.56	$0.00
$34,880.00	$82,718.14	$0.00
$13,748.50	$17,626.10	$0.00
$9,483.32	$33,677.40	$0.00
$36,385.00	$77,851.57	$0.00
$29,020.00	$38,133.34	$0.00
$29,616.96	$96,218.23	$0.00
$104,844.00	$206,691.64	$0.00
$3,507.00	$7,483.87	$0.00
$17,206.15	$52,387.06	$0.00
$52,435.71	$123,483.79	$0.00
$7,305.00	$22,451.60	$0.00
$56,882.00	$54,957.24	$0.00
$13,890.00	$122,301.29	$0.00
$16,237.50	$37,419.33	$0.00
$294,592.00	$245,493.43	$0.00
$1,884.50	$1,045.36	$0.00
$104,357.00	$886,673.45	$0.00
$24,902.67	$74,838.66	$0.00
$18,300.00	$172,544.52	$0.00
$290,188.00	$307,610.77	$0.00
$8,916.00	$22,426.66	$0.00
$19,500.00	$193,249.62	$0.00
$2,576.70	$5,612.90	$0.00
$32,479.50	$73,341.88	$0.00
$1,782.00	$4,490.32	$0.00
$13,200.00	$85,041.27	$0.00
$22,680.00	$68,353.44	$0.00
$1,117.50	$4,246.74	$0.00
$113,529.57	$129,728.25	$0.00
$111,000.00	$209,094.92	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$57,761.67	$134,709.58	$0.00
$18,330.72	$56,128.99	$0.00
$1,044.00	$3,741.93	$0.00
$78,468.35	$55,770.65	$0.00
$20,436.01	$16,613.31	$0.00
$72,299.44	$290,233.37	$0.00
$10,668.00	$22,451.60	$0.00
$2,473.50	$7,483.87	$0.00
$21,756.00	$37,419.33	$0.00
$16,591.50	$46,850.43	$0.00
$11,400.00	$31,032.78	$0.00
$46,955.00	$88,266.23	$0.00
$1,881.72	$4,226.57	$0.00
$8,095.50	$11,225.80	$0.00
$13,185.00	$37,419.33	$0.00
$375,000.00	$806,514.54	$0.00
$10,215.00	$26,193.53	$0.00
$4,725.00	$6,433.07	$0.00
$13,334.10	$33,677.40	$0.00
$13,338.98	$11,284.35	$0.00
$25,600.00	$45,877.57	$0.00
$5,712.00	$14,967.73	$0.00
$511,428.57	$480,302.49	$0.00
$4,421.00	$11,225.80	$0.00
$53,397.50	$213,667.57	$0.00
$115,430.00	$193,228.68	$0.00
$31,420.82	$16,531.22	$0.00
$23,290.00	$64,094.66	$0.00
$10,138.00	$52,395.40	$0.00
$240,000.00	$386,328.74	$0.00
$1,825.00	$48,396.16	$0.00
$12,590.60	$1,018,474.50	$0.00
$149,800.00	$207,386.04	$14,993.47
$9,950.00	$132,652.35	$214.20
$4,756.70	$18,787.96	$1,352.13
$22,190.00	$656,616.92	$14,147.50
$5,028.74	$159,832.15	$2,445.64
$379.30	$5,032.70	$1,564.38

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$12,200.00	$85,478.09	$0.00
$146,700.00	$143,724.28	$0.00
$4,258.00	$70,422.21	$0.00
$777,400.00	$773,868.93	$485,070.10
$12,000.00	$23,092.08	$0.00
$11,245.00	$21,940.47	$0.00
$9,225.70	$43,471.58	$2,064.15
$6,313.41	$38,690.42	$0.00
$24,225.00	$116,800.47	$65,593.71
$58,900.00	$144,506.05	$0.00
$18,540.00	$530,067.98	$39,946.07
$10,225.00	$137,281.23	$0.00
$7,573.00	$11,127.27	$0.00
$186,118.18	$405,144.90	$30,664.46
$89,300.00	$109,479.50	$0.00
$18,698.00	$288,548.32	$3,729.81
$4,377.00	$101,643.51	$5,969.62
$714,332.48	$6,983,931.12	$301,763.78
$766,978.00	$1,356,221.63	$0.00
$32,836.00	$65,528.27	$0.00
$18,975.00	$58,881.90	$0.00
$12,976.83	$15,942.42	$0.00
$4,084.30	$211,785.72	$1,839.07
$89,600.00	$382,064.79	$0.00
$3,824.16	$54,035.83	$0.00
$334,640.00	$681,828.13	$0.00
$133,500.00	$117,259.62	$0.00
$3,445.00	$77,472.14	$0.00
$30,204.00	$22,579.09	$727.39
$47,177.00	$345,349.27	$0.00
$600.00	$60,643.64	$38,023.93
$2,028.00	$172,311.47	$2,751.38
$20,578.04	$58,463.05	$0.00
$943,071.43	$1,175,677.14	$0.00
$12,381.27	$78,025.51	$0.00
$441,463.00	$1,334,113.65	$0.00
$200,000.00	$198,431.88	$0.00
$6,760.00	$36,087.36	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$11,712.00	$46,185.66	$0.00
$362,783.00	$475,900.30	$0.00
$11,378.40	$44,903.19	$0.00
$153,376.00	$817,595.82	$0.00
$45,060.00	$1,077,211.25	$46,270.34
$3,600.00	$16,731.29	$0.00
$674,600.91	$1,360,997.09	$0.00
$36,742.15	$56,352.89	$0.00
$112.85	$10,549,354.63	$0.00
$45,141.92	$1,150,012.63	$0.00
$107,400.00	$118,146.51	$10,134.61
$1,624.47	$56,260.19	$855.39
$624,095.00	$2,694,917.81	$144,696.29
$20,898.00	$55,841.26	$0.00
$85,177.00	$511,169.57	$0.00
$539.00	$39,508.53	$0.00
$45,000.00	$31,267.04	$0.00
$18,850.00	$28,597.39	$0.00
$300,499.00	$440,427.63	$0.00
$3,870.65	$28,826.41	$2,802.18
$5,642.88	$236,435.92	$1,761.41
$18,583.73	$170,452.98	$0.00
$113,927.46	$95,977.22	$0.00
$347.00	$62,997.01	$3,275.54
$35,243.00	$77,143.11	$0.00
$3,600.00	$12,066.51	$0.00
$9,435.00	$22,451.60	$0.00
$2,880.00	$588,586.37	$0.00
$270.20	$8,631.71	$0.00
$17,571.60	$102,711.91	$7,776.13
$92,770.00	$120,922.35	$0.00
$63,143.44	$78,184.05	$0.00
$187,557.73	$659,736.61	$0.00
$10,218.16	$145,910.85	$0.00
$435,000.00	$3,858,686.97	$0.00
$107,623.42	$173,491.23	$0.00
$263,255.00	$447,353.76	$0.00
$22,240.00	$41,966.57	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$329,470.00	$485,283.70	$0.00
$5,150.00	$109,457.07	$0.00
$400.00	$226,164.81	$0.00
$225,000.00	$289,349.48	$0.00
$114,337.00	$681,828.13	$0.00
$2,743.00	$105,781.27	$558.01
$10,409.00	$146,284.75	$0.00
$4,112.50	$16,855.43	$1,157.98
$21,700.00	$43,071.82	$4,214.74
$9,878.00	$33,138.72	$0.00
$22,725.00	$1,385,128.61	$0.00
$180,000.00	$183,270.97	$0.00
$10,435.00	$14,528.27	$0.00
$40,336.00	$41,265.13	$1,329.30
$50,791.00	$51,897.36	$0.00
$399,547.00	$218,206.72	$0.00
$8,920.00	$334,323.70	$90,149.73
$27,667.00	$84,305.54	$0.00
$5,000.00	$70,885.51	$0.00
$45,672.00	$82,546.72	$0.00
$3,789.34	$26,002.52	$2,335.30
$344.00	$341,066.97	$0.00
$291,856.00	$416,243.76	$202,174.47
$626,460.00	$705,602.21	$4,153.47
$55,265.00	$62,113.81	$0.00
$13,099.00	$188,111.62	$0.00
$176,847.00	$860,643.71	$0.00
$238,182.00	$679,061.27	$0.00
$252,371.00	$283,648.24	$0.00
$51,068.00	$63,745.51	$0.00
$55,100.00	$40,478.45	$0.00
$16,150.00	$35,550.44	$0.00
$19,412.00	$16,945.16	$0.00
$188,000.00	$338,858.36	$0.00
$3,280.50	$7,818.51	$0.00
$125,970.00	$321,427.13	$0.00
$1,068.00	$9,104.75	$836.92
$165,641.00	$2,468,619.89	$177,405.77

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$128,500.00	$486,676.11	$0.00
$4,948.50	$11,225.80	$0.00
$310,757.00	$594,875.37	$0.00
$350,000.00	$807,356.93	$52,873.09
$6,502.36	$55,896.60	$24,891.41
$71,492.00	$322,915.03	$13,915.50
$2,160.00	$49,664.43	$0.00
$626,460.00	$705,153.53	$4,153.47
$9,635.00	$73,054.14	$0.00
$34,001.00	$43,276.72	$0.00
$36,950.00	$92,339.91	$0.00
$45,506.00	$132,250.03	$0.00
$6,024.50	$16,695.80	$0.00
$65,700.00	$199,861.67	$0.00
$5,000.00	$11,385.82	$0.00
$4,734.00	$62,194.58	$17,728.25
$249,713.00	$134,662.44	$0.00
$56,736.00	$381,514.40	$383,551.02
$137,231.00	$1,791,737.71	$0.00
$5,492.44	$7,552.79	$3,372.11
$416.00	$657,678.52	$0.00
$130,494.00	$856,578.67	$0.00
$17,000.00	$516,133.47	$0.00
$5,585.62	$173,947.39	$12,670.61
$3,000.00	$13,271.96	$0.00
$112,040.73	$1,363,581.48	$0.00
$226,433.00	$514,035.14	$10,477.68
$42,947.00	$538,186.11	$0.00
$5,832.00	$13,096.77	$0.00
$51,480.00	$17,876.92	$0.00
$468,443.00	$149,711.18	$5,856.58
$4,269.00	$171,220.61	$12,063.88
$688.80	$4,679.43	$0.00
$103,600.00	$97,037.60	$0.00
$36,012.04	$183,330.79	$49,039.71
$15,012.00	$141,920.59	$0.00
$12,310.00	$132,764.52	$1,521.59
$69,106.00	$522,495.90	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$85,876.37	$78,857.07	$38,116.90
$43,867.00	$57,354.81	$0.00
$159,655.00	$169,553.32	$0.00
$33,498.00	$550,500.89	$0.00
$6,299.84	$104,482.26	$2,048.59
$3,689.80	$94,130.15	$42,373.05
$1,761.35	$14,274.48	$831.33
$94,282.87	$54,333.70	$0.00
$187,073.00	$101,988.04	$0.00
$188,000.00	$178,721.35	$1,944.61
$324.00	$26,142.39	$0.00
$29,963.51	$75,287.07	$6,783.83
$97,768.00	$522,936.96	$0.00
$29,313.90	$108,864.81	$0.00
$4,520.00	$30,813.37	$2,658.59
$27,650.00	$119,410.29	$0.00
$16,300.00	$130,956.42	$11,299.01
$50,000.00	$1,257,175.44	$0.00
$40,036.00	$339,069.28	$0.00
$10,557.00	$32,150.14	$0.00
$278,000.00	$120,853.55	$0.00
$479.80	$181,182.17	$0.00
$89,600.00	$291,687.10	$0.00
$10,618.90	$14,697.27	$0.00
$4,035.00	$261,935.66	$0.00
$7,000.00	$71,591.44	$0.00
$189,550.00	$190,941.91	$0.00
$27,580.14	$74,057.68	$0.00
$79,562.00	$143,724.28	$0.00
$283,111.00	$299,272.79	$0.00
$616,000.00	$1,223,881.86	$0.00
$11,140.00	$45,974.78	$0.00
$1,772.25	$10,209.82	$0.00
$80,284.52	$448,844.87	$0.00
$21,626.35	$56,240.59	$446.67
$4,174.90	$13,769.97	$809.77
$21,671.00	$127,488.04	$0.00
$318.33	$80,134.31	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$26,320.00	$51,459.15	$0.00
$479.00	$22,235.25	$763.39
$20,000.00	$14,990.41	$0.00
$23,807.00	$343,548.09	$11,225.01
$34,200.00	$119,648.10	$0.00
$112,979.00	$69,759.66	$0.00
$2,350.00	$2,780.32	$0.00
$5,066.00	$9,463.46	$0.00
$376,274.00	$130,598.89	$0.00
$10,000.00	$46,004.69	$0.00
$2,500.00	$10,588.86	$5,217.86
$15,485.00	$258,619.36	$0.00
$54,231.00	$141,281.97	$4,336.03
$3,448.50	$9,354.83	$0.00
$27,580.14	$74,057.68	$0.00
$40,000.00	$13,577.07	$0.00
$152,280.00	$129,538.51	$0.00
$9,144.00	$25,968.43	$0.00
$6,266.00	$438,828.83	$0.00
$4,806.00	$45,244.93	$0.00
$63,460.00	$1,140,086.44	$85,190.66
$275,000.00	$1,088,096.23	$0.00
$700,000.00	$613,678.90	$0.00
$94,824.00	$761,382.15	$26,163.44
$677,040.00	$2,079,894.96	$0.00
$16,898.00	$309,302.29	$121,561.30
$944,914.40	$2,029,322.93	$0.00
$182,424.83	$450,479.57	$0.00
$27,240.59	$85,124.22	$3,406.56
$74,379.00	$1,419,779.12	$40,335.29
$63,525.00	$4,570,561.73	$106,111.49
$7,948.50	$14,967.73	$0.00
$52,160.84	$376,185.96	$39,184.17
$10,258.00	$36,956.31	$0.00
$27,460.00	$131,004.83	$9,557.34
$150.00	$2,927,321.16	$0.00
$305,000.00	$291,294.06	$0.00
$52,276.00	$280,494.02	$20,940.22

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$695,033.00	$1,290,703.83	$0.00
$8,950.81	$104,893.53	$6,407.38
$253,876.00	$1,286,952.76	$20,345.53
$251,761.20	$180,596.64	$0.00
$448,973.00	$335,201.94	$0.00
$14,086.55	$199,539.29	$15,095.17
$13,021.00	$540,889.97	$35,326.40
$405,095.76	$3,652,675.35	$57,745.40
$42,156.00	$463,401.46	$30,019.87
$184,839.00	$881,084.09	$0.00
$693,464.00	$1,689,583.34	$0.00
$75,362.00	$534,316.39	$0.00
$278,404.00	$3,147,660.22	$230,038.66
$14,248.00	$1,074,621.42	$12,139.69
$496,389.00	$4,974,982.76	$427,389.09
$8,300.00	$127,846.98	$0.00
$460,030.00	$256,506.07	$0.00
$7,040.00	$1,695,836.77	$0.00
$13,478.00	$96,428.89	$0.00
$1,900,000.00	$2,916,613.76	$201,809.99
$2,367.00	$59,824.05	$0.00
$1,631.34	$34,170.63	$0.00
$3,415.74	$4,009,201.28	$0.00
$90,214.00	$1,749,339.77	$130,841.36
$107,134.00	$1,618,363.29	$78,373.84
$315,281.00	$303,463.46	$0.00
$259,355.00	$2,254,019.06	$165,347.51
$44,907.00	$391,838.54	$0.00
$275,000.00	$1,088,096.23	$0.00
$183,145.00	$3,633,114.42	$269,537.18
$600.00	$290,714.96	$199,163.41
$4,817.00	$37,180.65	$0.00
$1,950.00	$18,840.09	$0.00
$31,183.92	$259,592.91	$35,676.56
$199,563.02	$644,867.34	$0.00
$28,925.00	$852,680.40	$0.00
$161,471.74	$1,457,284.80	$23,038.32
$343,215.00	$919,655.18	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$10,322.46	$100,917.19	$6,339.60
$157,016.00	$4,110,834.86	$0.00
$66,126.00	$1,306,768.08	$47,864.66
$26,106.00	$888,469.53	$25,201.66
$169,625.59	$733,866.08	$50,814.30
$7,794.00	$37,140.71	$0.00
$1,079.00	$35,192.99	$2,543.02
$230,116.00	$1,301,787.73	$129,293.16
$48,040.00	$27,112.96	$0.00
$2,200,000.00	$1,405,865.12	$0.00
$124,109.00	$4,373,885.69	$0.00
$82,614.00	$213,721.39	$0.00
$184,640.00	$1,298,278.53	$49,201.88
$10,412.00	$19,869.48	$2,053.34
$50,736.00	$57,256.10	$1,254.32
$21,599.39	$263,776.19	$2,832.54
$3,260.87	$340,219.36	$0.00
$38,362.86	$707,799.25	$0.00
$141,905.75	$556,074.99	$0.00
$51,144.00	$171,053.42	$5,542.66
$322,917.00	$3,563,778.35	$122,260.34
$1,938.00	$28,475.48	$0.00
$5,120.00	$600,637.93	$32,967.73
$25,528.31	$491,167.40	$2,532.72
$113,546.63	$1,557,306.71	$0.00
$455,378.00	$9,283,395.87	$582,085.39
$1,922.92	$26,561.88	$0.00
$0.00	$573,231.03	$0.00
$165,626.07	$1,785,596.77	$117,116.48
$52.88	$553,689.17	$0.00
$9,936.78	$59,857.83	$0.00
$18,278.00	$559,053.49	$13,305.69
$159,000.00	$2,560,479.71	$0.00
$21,512.00	$398,095.37	$9,579.03
$48,236.19	$358,713.90	$0.00
$192,679.00	$1,952,049.70	$128,034.12
$112,170.00	$1,446,440.52	$82,478.80
$1,375.00	$51,913.81	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$299,845.00	$2,362,887.14	$0.00
$3,405.00	$220,390.30	$3,918.29
$72,289.00	$104,768.36	$2,677.77
$801.57	$38,393.42	$847.00
$43,468.00	$43,405.34	$28,311.82
$2,661.00	$132,323.32	$1,136.76
$222,080.00	$194,709.33	$0.00
$167,131.65	$31,395.66	$0.00
$17,827.00	$395,338.25	$195,525.72
$187,119.00	$2,417,870.93	$137,896.70
$3,294.00	$51,691.49	$3,715.69
$2,000.00	$153.01	$23,922.28
$60,000.00	$47,103.82	$3,235.19
$268,200.00	$932,772.07	$59,670.09
$634,669.00	$1,454,008.52	$3,747.31
$54,618.00	$301,139.30	$7,147.09
$74,150.00	$455,853.52	$15,755.85
$24,342.00	$1,014,597.72	$3,082.34
$31,660.00	$1,316,272.36	$5,118.76
$110,353.21	$935,375.91	$0.00
$95,561.00	$1,113,153.53	$0.00
$6,936.55	$694,141.42	$0.00
$3,840.00	$979,437.81	$0.00
$7,040.00	$4,080,991.64	$0.00
$176,241.00	$4,216,630.62	$240,484.05
$121,550.00	$2,607,114.62	$147,328.85
$350,878.00	$961,137.64	$0.00
$79,325.80	$945,599.86	$68,982.26
$1,195.00	$3,289,165.05	$452,322.79
$53,969.00	$1,131,372.06	$54,789.87
$27,445.00	$187,684.00	$0.00
$10,412.00	$101,462.08	$87,302.64
$152,962.00	$190,786.37	$5,744.13
$626,100.00	$457,398.22	$113,750.75
$1,900,000.00	$2,916,613.76	$201,809.99
$74,433.00	$846,779.48	$50,852.19
$7,920.00	$205,674.37	$9,220.35
$10,000.00	$1,785,683.51	$8,207.31

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$3,700.00	$92,086.53	$2,957.26
$2,256.27	$309,481.76	$0.00
$3,232,359.00	$13,420,813.20	$1,111,399.28
$52.88	$2,108,494.42	$0.00
$77,119.11	$792,204.22	$96,427.15
$10,771.00	$261,641.16	$2,402.10
$45,000.00	$1,040,845.05	$0.00
$33,271.64	$38,375.36	$3,507.47
$5,913.00	$239,990.10	$17,508.25
$17,970.00	$152,000.94	$0.00
$39,638.00	$1,014,351.13	$32,122.58
$185,605.30	$2,522,747.74	$143,851.91
$2,478.00	$2,657.69	$0.00
$44,532.00	$381,890.39	$20,394.23
$67,500.00	$69,292.70	$2,086.25
$6,046.96	$805,068.66	$0.00
$168,675.00	$2,652,000.04	$0.00
$238,127.66	$538,701.08	$0.00
$49,101.00	$522,796.66	$19,812.84
$5,760.00	$744,855.76	$0.00
$136,122.00	$411,867.63	$9,889.42
$92,981.00	$949,501.86	$2,447.09
$1,000.00	$1,679,624.45	$0.00
$31,186.20	$2,648,397.13	$0.00
$199,563.02	$411,092.91	$0.00
$65,511.47	$895,020.10	$0.00
$47,944.00	$2,564,182.82	$0.00
$19,599.00	$47,361.20	$22,849.23
$80,332.10	$137,274.24	$5,067.65
$1,964,596.00	$2,548,504.43	$0.00
$245,000.00	$994,956.17	$63,648.11
$464,747.00	$2,356,259.23	$37,250.27
$33,405.00	$219,252.96	$0.00
$73,836.00	$187,360.76	$3,118.42
$11,900.00	$1,193,887.38	$53,521.88
$5,011.90	$104,348.10	$0.00
$3,000.00	$3,151,523.36	$0.00
$285,129.00	$7,032,883.64	$0.00

Incremental Costs ($)/Unit w Realisation Rates	Gas Benefits ($) w/ RR	Water Benefits ($) w/ RR
$93,315.46	$129,904.93	$4,683.81
$147,000.00	$424,182.41	$0.00
$1,636,906.00	$7,225,781.80	$0.00
$17,607.00	$36,078.39	$0.00
$800,000.00	$6,306,986.12	$0.00
$5,760.00	$259,127.86	$0.00
$1,920.00	$277,809.42	$17,169.70
$3,840.00	$203,663.49	$0.00
$2,575.00	$18,383.93	$1,341.82
$356,170.00	$6,189,772.87	$455,065.64
$38,524.04	$1,075,898.11	$0.00
$64,144.00	$567,246.07	$0.00

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$4,933.50	$21,260.03
$0.00	$46,226.78	$91,097.83
$0.00	$45,397.47	$738,217.24
$0.00	$115,334.93	$137,441.06
$0.00	$50,071.04	$488,336.32
$0.00	$14,408.58	$105,861.91
$0.00	$3,586.62	$9,838.88
$0.00	$4,110.40	$2,601.89
$369,054.98	$1,193.95	$492,900.76
$0.00	$129,061.74	$83,960.05
$0.00	$64,400.00	$211,095.72
$0.00	$55,285.10	$107,472.81
$0.00	$40,319.00	$663,549.06
$0.00	$33,580.00	$184,145.28
$0.00	$18,450.69	$70,674.61
$21,027.98	$41,560.54	$98,985.41
$0.00	$15,974.85	$58,863.81
$0.00	$411,700.00	$444,014.42
$0.00	$8,004.00	$29,415.33
$777,384.33	$726.75	$1,258,366.79
$0.00	$2,659.95	$12,307.79
$0.00	$47,242.00	$92,276.69
$0.00	$78,607.56	$213,995.94
$15,385.09	$103.82	$49,802.73
$0.00	$4,554.69	$26,103.42
$127,688.03	$24,196.00	$215,718.95
$0.00	$28,121.24	$165,107.44
$0.00	$2,679.96	$26,693.50
$0.00	$9,296.60	$44,810.87
$0.00	$61,792.34	$371,252.47
$0.00	$6,996.86	$30,422.47
$0.00	$116,956.12	$82,141.73
$0.00	$4,356.66	$18,094.94
$0.00	$3,362.69	$184,410.04
$0.00	$2,054.82	$7,466.18
$0.00	$750.86	$2,991.07
$0.00	$3,762.69	$16,557.68
$0.00	$4,119.30	$18,332.30

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$11,493.14	$48,233.45
$0.00	$137,152.97	$150,405.55
$10,742.44	$11,040.00	$245,277.17
$0.00	$8,615.80	$54,815.00
$0.00	$11,214.57	$67,591.97
$0.00	$59,777.81	$21,858.08
$0.00	$174,391.06	$143,804.22
$0.00	$90,024.05	$30,963.51
$0.00	$16,044.80	$66,673.34
$0.00	$6,324.31	$11,301.79
$0.00	$4,362.33	$29,315.07
$0.00	$16,737.10	$61,114.47
$16,858.00	$13,349.20	$41,642.14
$0.00	$13,623.80	$82,594.43
$0.00	$48,228.24	$158,463.40
$0.00	$1,613.22	$5,870.65
$0.00	$7,914.83	$44,472.23
$0.00	$24,120.43	$99,363.36
$0.00	$3,360.30	$19,091.30
$0.00	$26,165.72	$28,791.52
$0.00	$38,336.40	$83,964.89
$0.00	$7,469.25	$29,950.08
$0.00	$135,512.32	$109,981.11
$0.00	$866.87	$178.49
$0.00	$48,004.22	$838,669.23
$0.00	$11,455.23	$63,383.43
$8,593.95	$8,418.00	$172,720.47
$0.00	$133,486.48	$174,124.29
$0.00	$4,101.36	$18,325.30
$10,790.19	$8,970.00	$195,069.81
$0.00	$1,185.28	$4,427.62
$0.00	$14,940.57	$58,401.31
$0.00	$819.72	$3,670.60
$2,028.93	$6,072.00	$80,998.20
$0.00	$10,432.80	$57,920.64
$0.00	$514.05	$3,732.69
$0.00	$52,223.60	$77,504.65
$0.00	$51,060.00	$158,034.92

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$26,570.37	$108,139.22
$0.00	$8,432.13	$47,696.86
$0.00	$480.24	$3,261.69
$169,410.67	$36,095.44	$189,085.88
$0.00	$9,400.56	$7,212.74
$0.00	$33,257.74	$256,975.63
$0.00	$4,907.28	$17,544.32
$0.00	$1,137.81	$6,346.06
$0.00	$10,007.76	$27,411.57
$0.00	$7,632.09	$39,218.34
$0.00	$5,244.00	$25,788.78
$0.00	$21,599.30	$66,666.93
$0.00	$865.59	$3,360.98
$0.00	$3,723.93	$7,501.87
$0.00	$6,065.10	$31,354.23
$0.00	$172,500.00	$634,014.54
$0.00	$4,698.90	$21,494.63
$0.00	$2,173.50	$4,259.57
$0.00	$6,133.69	$27,543.71
$0.00	$6,135.93	$5,148.42
$14,018.65	$11,776.00	$48,120.22
$0.00	$2,627.52	$12,340.21
$0.00	$235,257.14	$245,045.35
$0.00	$2,033.66	$9,192.14
$0.00	$24,562.85	$189,104.72
$0.00	$53,097.80	$140,130.88
$0.00	$14,453.58	$2,077.64
$0.00	$10,713.40	$53,381.26
$0.00	$4,663.48	$47,731.92
$0.00	$110,400.00	$275,928.74
$0.00	$839.50	$47,556.66
$0.00	$11,583.35	$1,006,891.15
$0.00	$68,908.00	$153,471.51
$0.00	$4,577.00	$128,289.55
$0.00	$2,188.08	$17,952.00
$0.00	$10,207.40	$660,557.03
$345.17	$2,313.22	$160,309.73
$0.00	$174.48	$6,422.60

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$5,612.00	$79,866.09
$0.00	$67,482.00	$76,242.28
$0.00	$1,958.68	$68,463.53
$0.00	$357,604.00	$901,335.03
$0.00	$5,520.00	$17,572.08
$0.00	$10,345.40	$11,595.07
$0.00	$4,243.82	$41,291.91
$0.00	$2,904.17	$35,786.25
$0.00	$11,143.50	$171,250.68
$0.00	$27,094.00	$117,412.05
$0.00	$8,528.40	$561,485.65
$920,418.77	$4,703.50	$1,052,996.50
$0.00	$3,483.58	$7,643.69
$0.00	$85,614.36	$350,195.00
$110,862.02	$41,078.00	$179,263.52
$9,608.07	$8,601.08	$293,285.12
$789.38	$2,013.42	$106,389.08
$0.00	$328,592.94	$6,957,101.96
$0.00	$352,809.88	$1,003,411.75
$0.00	$15,104.56	$50,423.71
$0.00	$8,728.50	$50,153.40
$0.00	$5,969.34	$9,973.07
$0.00	$1,878.78	$211,746.02
$0.00	$41,216.00	$340,848.79
$0.00	$1,759.11	$52,276.72
$0.00	$153,934.40	$527,893.73
$0.00	$61,410.00	$55,849.62
$0.00	$1,584.70	$75,887.44
$0.00	$13,893.84	$9,412.64
$0.00	$65,104.26	$280,245.01
$0.00	$17,112.00	$81,555.57
$1,912.65	$932.88	$176,042.62
$0.00	$9,465.90	$48,997.15
$551,679.38	$433,812.86	$1,293,543.66
$0.00	$11,390.77	$66,634.75
$0.00	$203,072.98	$1,131,040.67
$35,338.82	$92,000.00	$141,770.70
$0.00	$3,109.60	$32,977.76

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$5,387.52	$40,798.14
$0.00	$166,880.18	$309,020.12
$0.00	$5,234.06	$39,669.13
$4,231.09	$70,552.96	$751,273.95
$0.00	$20,727.60	$1,102,753.98
$0.00	$4,968.00	$11,763.29
$0.00	$310,316.42	$1,050,680.67
$2,026.89	$16,901.39	$41,478.39
$12,450,888.31	$14,067.88	$22,986,175.06
$0.00	$20,765.28	$1,129,247.34
$0.00	$49,404.00	$78,877.12
$120.78	$747.26	$56,489.11
$0.00	$287,083.70	$2,552,530.40
$0.00	$9,613.08	$46,228.18
$0.00	$39,181.42	$471,988.15
$0.00	$3,471.16	$36,037.37
$0.00	$20,700.00	$10,567.04
$0.00	$8,671.00	$19,926.39
$0.00	$138,229.54	$302,198.09
$0.00	$1,780.50	$29,848.10
$6,954.89	$2,595.72	$242,556.50
$70,061.95	$25,645.55	$214,869.38
$0.00	$52,406.63	$43,570.58
$0.00	$159.62	$66,112.93
$0.00	$16,211.78	$60,931.33
$0.00	$3,312.00	$8,754.51
$0.00	$4,340.10	$18,111.50
$0.00	$1,324.80	$587,261.57
$0.00	$1,740.09	$6,891.62
$0.00	$24,248.81	$86,239.23
$0.00	$42,674.20	$78,248.15
$0.00	$29,045.98	$49,138.07
$0.00	$86,276.56	$573,460.05
$0.00	$4,700.35	$141,210.50
$336,597.52	$200,100.00	$3,995,184.49
$24,960.66	$49,506.77	$148,945.13
$0.00	$121,097.30	$326,256.46
$0.00	$10,230.40	$31,736.17

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$210,885.62	$151,556.20	$544,613.13
$0.00	$2,369.00	$107,088.07
$22,590.64	$184.00	$248,571.45
$78,578.83	$103,500.00	$264,428.30
$0.00	$52,595.02	$629,233.11
$0.00	$1,261.78	$105,077.50
$0.00	$4,788.14	$141,496.61
$226.78	$1,891.75	$16,348.44
$2,205.78	$9,982.00	$39,510.34
$0.00	$4,543.88	$28,594.84
$295,001.82	$10,453.50	$1,669,676.93
$0.00	$82,800.00	$100,470.97
$0.00	$9,600.20	$4,928.07
$0.00	$18,554.56	$24,039.88
$0.00	$23,363.86	$28,533.50
$366,092.93	$183,791.62	$400,508.02
$5,443.79	$4,103.20	$425,814.02
$0.00	$12,726.82	$71,578.72
$0.00	$9,200.00	$61,685.51
$0.00	$21,009.12	$61,537.60
$0.00	$1,743.10	$26,594.73
$0.00	$6,171.36	$334,895.61
$0.00	$134,253.76	$484,164.46
$0.00	$288,171.60	$421,584.08
$0.00	$25,421.90	$36,691.91
$43,314.69	$18,076.62	$213,349.69
$0.00	$81,349.62	$779,294.09
$0.00	$109,563.72	$569,497.55
$0.00	$116,090.66	$167,557.58
$68,443.69	$23,491.28	$108,697.92
$0.00	$25,346.00	$15,132.45
$95,518.47	$7,429.00	$123,639.91
$0.00	$8,929.52	$8,015.64
$0.00	$86,480.00	$252,378.36
$0.00	$1,509.03	$6,309.48
$0.00	$57,946.20	$263,480.93
$0.00	$491.28	$9,450.39
$0.00	$76,194.86	$2,569,830.80

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$125,043.47	$59,110.00	$552,609.58
$0.00	$2,276.31	$8,949.49
$0.00	$142,948.22	$451,927.15
$0.00	$161,000.00	$699,230.02
$0.00	$2,991.09	$77,796.93
$0.00	$32,886.32	$303,944.22
$0.00	$993.60	$48,670.83
$0.00	$288,171.60	$421,135.40
$0.00	$4,432.10	$68,622.04
$0.00	$15,640.46	$27,636.26
$12,816.93	$16,997.00	$88,159.84
$0.00	$20,932.76	$111,317.27
$0.00	$2,771.27	$13,924.53
$73,813.00	$30,222.00	$243,452.67
$0.00	$2,300.00	$9,085.82
$1,737.41	$2,177.64	$79,482.60
$178,204.72	$114,867.98	$197,999.18
$0.00	$26,098.56	$738,966.86
$0.00	$63,126.26	$1,728,611.45
$0.00	$5,053.04	$5,871.85
$0.00	$8,993.92	$648,684.60
$32,437.99	$60,027.24	$828,989.42
$0.00	$7,820.00	$508,313.47
$0.00	$2,569.39	$184,048.62
$0.00	$2,760.00	$10,511.96
$0.00	$51,538.74	$1,312,042.75
$2,228,324.02	$104,159.18	$2,648,677.66
$0.00	$19,755.62	$518,430.49
$0.00	$2,682.72	$10,414.05
$37,742.84	$23,680.80	$31,938.97
$165,352.47	$215,483.78	$105,436.44
$6,856.65	$1,963.74	$188,177.40
$0.00	$316.85	$4,362.59
$0.00	$47,656.00	$49,381.60
$0.00	$16,565.54	$215,804.96
$0.00	$6,905.52	$135,015.07
$1,265.22	$5,662.60	$129,888.73
$0.00	$31,788.76	$490,707.14

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$39,503.13	$77,470.84
$0.00	$20,178.82	$37,175.99
$313,756.70	$73,441.30	$409,868.71
$0.00	$15,409.08	$535,091.81
$413.88	$2,897.93	$104,046.81
$0.00	$1,697.31	$134,805.89
$183.82	$810.22	$14,479.42
$0.00	$43,370.12	$10,963.58
$149,073.13	$86,053.58	$165,007.58
$2,571.50	$86,480.00	$96,757.46
$0.00	$149.04	$25,993.35
$0.00	$13,783.21	$68,287.69
$0.00	$44,973.28	$477,963.68
$0.00	$26,968.79	$81,896.02
$0.00	$2,079.20	$31,392.76
$0.00	$12,719.00	$106,691.29
$0.00	$7,498.00	$134,757.43
$0.00	$207,000.00	$1,050,175.44
$0.00	$18,416.56	$320,652.72
$0.00	$4,856.22	$27,293.92
$83,233.41	$127,880.00	$76,206.96
$0.00	$6,179.82	$175,002.34
$0.00	$41,216.00	$250,471.10
$0.00	$9,769.39	$4,927.88
$126,672.14	$1,856.10	$386,751.70
$0.00	$6,440.00	$65,151.44
$0.00	$87,193.00	$103,748.91
$0.00	$12,686.86	$61,370.82
$0.00	$73,197.04	$70,527.24
$0.00	$130,231.06	$169,041.73
$0.00	$283,360.00	$940,521.86
$0.00	$5,124.40	$40,850.38
$0.00	$815.24	$9,394.59
$0.00	$36,930.88	$411,913.99
$0.00	$9,948.12	$46,739.14
$0.00	$1,920.45	$12,659.29
$0.00	$9,968.66	$117,519.38
$0.00	$1,757.18	$78,377.13

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$12,107.20	$39,351.95
$0.00	$220.34	$22,778.30
$21,868.04	$9,200.00	$27,658.45
$0.00	$10,951.22	$343,821.87
$0.00	$15,732.00	$103,916.10
$0.00	$51,970.34	$17,789.32
$0.00	$1,081.00	$1,699.32
$0.00	$2,330.36	$7,133.10
$207,542.10	$173,086.04	$165,054.95
$0.00	$18,400.00	$27,604.69
$0.00	$4,600.00	$11,206.72
$0.00	$28,492.40	$230,126.96
$0.00	$24,946.26	$120,671.74
$0.00	$1,586.31	$7,768.52
$0.00	$12,686.86	$61,370.82
$87,762.92	$18,400.00	$82,939.99
$0.00	$70,048.80	$59,489.71
$0.00	$4,206.24	$21,762.19
$0.00	$2,882.36	$435,946.47
$0.00	$4,421.52	$40,823.41
$65,238.59	$29,191.60	$1,261,324.09
$0.00	$126,500.00	$961,596.23
$0.00	$322,000.00	$291,678.90
$0.00	$43,619.04	$743,926.55
$0.00	$311,438.40	$1,768,456.56
$0.00	$7,773.08	$423,090.51
$0.00	$434,660.62	$1,594,662.31
$59,023.76	$83,915.42	$425,587.90
$0.00	$12,530.67	$76,000.11
$0.00	$34,214.34	$1,425,900.06
$313,131.25	$29,221.50	$4,960,582.97
$0.00	$3,656.31	$11,311.42
$0.00	$23,993.99	$391,376.14
$0.00	$4,718.68	$32,237.63
$1,763.49	$12,631.60	$129,694.06
$0.00	$69.00	$2,927,252.16
$0.00	$140,300.00	$150,994.06
$7,079.99	$24,046.96	$284,467.27

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$319,715.18	$970,988.65
$0.00	$4,117.37	$107,183.53
$12,836.97	$116,782.96	$1,203,352.30
$0.00	$115,810.15	$64,786.49
$0.00	$206,527.58	$128,674.36
$0.00	$6,479.81	$208,154.64
$0.00	$5,989.66	$570,226.71
$36,434.53	$186,344.05	$3,560,511.22
$24,549.70	$19,391.76	$498,579.27
$0.00	$85,025.94	$796,058.15
$0.00	$318,993.44	$1,370,589.90
$0.00	$34,666.52	$499,649.87
$95,112.64	$128,065.84	$3,344,745.68
$461,493.52	$6,554.08	$1,541,700.55
$0.00	$228,338.94	$5,174,032.92
$0.00	$3,818.00	$124,028.98
$348,066.63	$211,613.80	$392,958.90
$0.00	$3,238.40	$1,692,598.37
$0.00	$6,199.88	$90,229.01
$0.00	$874,000.00	$2,244,423.75
$1,523.04	$1,088.82	$60,258.27
$0.00	$750.42	$33,420.21
$0.00	$1,571.24	$4,007,630.04
$101,442.43	$41,498.44	$1,940,125.12
$64,093.04	$49,281.64	$1,711,548.53
$0.00	$145,029.26	$158,434.20
$68,365.39	$119,303.30	$2,368,428.66
$0.00	$20,657.22	$371,181.32
$0.00	$126,500.00	$961,596.23
$111,444.02	$84,246.70	$3,929,848.91
$0.00	$276.00	$489,602.37
$2,803.06	$2,215.82	$37,767.89
$0.00	$897.00	$17,943.09
$0.00	$14,344.60	$280,924.86
$0.00	$91,798.99	$553,068.35
$0.00	$13,305.50	$839,374.90
$14,535.97	$74,277.00	$1,420,582.08
$0.00	$157,878.90	$761,776.28

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$4,748.33	$102,508.46
$83,623.00	$72,227.36	$4,122,230.50
$0.00	$30,417.96	$1,324,214.78
$42,549.85	$12,008.76	$944,212.28
$0.00	$78,027.77	$706,652.61
$0.00	$3,585.24	$33,555.47
$926.71	$496.34	$38,166.38
$65,654.95	$105,853.36	$1,390,882.48
$0.00	$22,098.40	$5,014.56
$0.00	$1,012,000.00	$393,865.12
$0.00	$57,090.14	$4,316,795.55
$0.00	$38,002.44	$175,718.95
$21,629.35	$84,934.40	$1,284,175.37
$888.75	$4,789.52	$18,022.05
$0.00	$23,338.56	$35,171.86
$0.00	$9,935.72	$256,673.01
$0.00	$3,000.00	$337,219.36
$0.00	$17,646.92	$690,152.33
$0.00	$65,276.65	$490,798.35
$0.00	$23,526.24	$153,069.85
$0.00	$148,541.82	$3,537,496.87
$0.00	$891.48	$27,584.00
$16,741.02	$2,355.20	$647,991.48
$0.00	$11,743.02	$481,957.09
$0.00	$52,231.45	$1,505,075.26
$295,582.54	$209,473.88	$9,951,589.92
$587.25	$884.54	$26,264.59
$0.00	$0.00	$573,231.03
$51,484.95	$76,187.99	$1,878,010.21
$0.00	$24.32	$553,664.84
$0.00	$4,570.92	$55,286.91
$4,848.19	$8,407.88	$568,799.48
$0.00	$73,140.00	$2,487,339.71
$0.00	$9,895.52	$397,778.89
$0.00	$22,188.65	$336,525.26
$56,284.20	$88,632.34	$2,047,735.68
$34,102.10	$51,598.20	$1,511,423.21
$0.00	$632.50	$51,281.31

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$0.00	$137,928.70	$2,224,958.44
$1,367.87	$1,566.30	$224,110.16
$0.00	$33,252.94	$74,193.19
$0.00	$368.72	$38,871.69
$0.00	$19,995.28	$51,721.87
$0.00	$1,224.06	$132,236.01
$0.00	$102,156.80	$92,552.53
$95,745.73	$76,880.56	$50,260.83
$0.00	$8,200.42	$582,663.55
$57,015.23	$86,074.74	$2,526,708.11
$7,875.31	$1,515.24	$61,767.25
$573.31	$920.00	$23,728.61
$0.00	$27,600.00	$22,739.01
$24,671.33	$123,372.00	$893,741.49
$0.00	$291,947.74	$1,165,808.09
$0.00	$25,124.28	$283,162.11
$0.00	$34,109.00	$437,500.36
$24,855.03	$11,197.32	$1,031,337.77
$31,917.02	$14,563.60	$1,338,744.54
$0.00	$50,762.48	$884,613.43
$0.00	$43,958.06	$1,069,195.47
$0.00	$3,190.81	$690,950.60
$0.00	$1,766.40	$977,671.41
$0.00	$3,238.40	$4,077,753.24
$99,431.41	$81,070.86	$4,475,475.23
$74,813.38	$55,913.00	$2,773,343.85
$0.00	$161,403.88	$799,733.76
$35,029.22	$36,489.87	$1,013,121.47
$0.00	$549.70	$3,740,938.14
$44,806.32	$24,825.74	$1,206,142.52
$0.00	$12,624.70	$175,059.30
$0.00	$4,789.52	$183,975.19
$0.00	$70,362.52	$126,167.97
$0.00	$288,006.00	$283,142.97
$0.00	$874,000.00	$2,244,423.75
$52,892.45	$34,239.18	$916,284.94
$9,590.35	$3,643.20	$220,841.88
$54,870.97	$4,600.00	$1,844,161.80

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$1,545.74	$1,702.00	$94,887.53
$19,568.44	$56,045.75	$273,004.45
$564,367.88	$1,486,885.14	$13,609,695.21
$0.00	$24.32	$2,108,470.10
$34,147.45	$35,474.79	$887,304.03
$0.00	$4,954.66	$259,088.60
$0.00	$20,700.00	$1,020,145.05
$0.00	$15,304.95	$26,577.88
$3,230.39	$2,719.98	$258,008.76
$0.00	$8,266.20	$143,734.74
$0.00	$18,233.48	$1,028,240.23
$59,477.57	$85,378.44	$2,640,698.78
$0.00	$1,139.88	$1,517.81
$11,372.02	$20,484.72	$393,171.92
$3,522.57	$31,050.00	$43,851.52
$0.00	$2,781.60	$802,287.06
$0.00	$77,590.50	$2,574,409.54
$0.00	$109,538.72	$429,162.36
$8,709.72	$22,586.46	$528,732.76
$0.00	$2,649.60	$742,206.16
$27,661.55	$62,616.12	$386,802.49
$0.00	$42,771.26	$909,177.69
$0.00	$460.00	$1,679,164.45
$0.00	$14,345.65	$2,634,051.48
$0.00	$91,798.99	$319,293.92
$0.00	$30,135.28	$864,884.82
$0.00	$22,054.24	$2,542,128.58
$0.00	$9,015.54	$61,194.89
$0.00	$36,952.77	$105,389.13
$0.00	$903,714.16	$1,644,790.27
$26,316.12	$112,700.00	$972,220.40
$23,503.08	$213,783.62	$2,203,228.96
$0.00	$15,366.30	$203,886.66
$3,229.59	$33,964.56	$159,744.21
$55,669.45	$5,474.00	$1,297,604.71
$7,805.70	$2,305.47	$109,848.32
$0.00	$1,380.00	$3,150,143.36
$0.00	$131,159.34	$6,901,724.30

Electricity Benefits ($) w/ RR	Costs ($) w/ RR	Total Adjusted TRC ($) w/ RR
$47,702.66	$42,925.11	$139,366.29
$0.00	$67,620.00	$356,562.41
$0.00	$752,976.76	$6,472,805.04
$1,957.99	$24,297.66	$13,738.72
$0.00	$368,000.00	$5,938,986.12
$0.00	$2,649.60	$256,478.26
$8,718.57	$883.20	$302,814.49
$0.00	$1,766.40	$201,897.09
$747.67	$1,184.50	$19,288.92
$188,153.18	$163,838.20	$6,669,153.49
$0.00	$17,721.06	$1,058,177.05
$0.00	$29,506.24	$537,739.83

2011 AVOIDED COSTS

Inflation Factor	1.9%
Discount Rate	10%

Gas Avoided Costs

	Residential/Commercial				Industrial	
	Baseload (m3)		Weather-Sensitive (m3)		Baseload (m3)	
	Rate	NPV	Rate	NPV	Rate	NPV
1	0.26116	0.26116	0.26671	0.26671	0.26132	0.26132
2	0.26316	0.50040	0.27392	0.51573	0.25936	0.49710
3	0.27487	0.72756	0.27452	0.74260	0.28238	0.73047
4	0.28577	0.94226	0.28793	0.95893	0.28596	0.94532
5	0.29120	1.14116	0.29340	1.15933	0.29139	1.14435
6	0.29673	1.32541	0.29898	1.34497	0.29693	1.32872
7	0.30237	1.49609	0.30466	1.51694	0.30257	1.49951
8	0.30812	1.65420	0.31044	1.67624	0.30832	1.65773
9	0.31397	1.80067	0.31634	1.82382	0.31418	1.80429
10	0.31993	1.93635	0.32235	1.96053	0.32015	1.94007
11	0.32601	2.06204	0.32848	2.08717	0.32623	2.06584
12	0.33221	2.17848	0.33472	2.20449	0.33243	2.18236
13	0.33852	2.28634	0.34108	2.31317	0.33875	2.29029
14	0.34495	2.38626	0.34756	2.41384	0.34518	2.39028
15	0.35151	2.47883	0.35416	2.50710	0.35174	2.48290
16	0.35818	2.56457	0.36089	2.59350	0.35842	2.56871
17	0.36499	2.64400	0.36775	2.67353	0.36523	2.64819
18	0.37192	2.71759	0.37474	2.74767	0.37217	2.72182
19	0.37899	2.78575	0.38186	2.81635	0.37924	2.79003
20	0.38619	2.84890	0.38911	2.87998	0.38645	2.85322
21	0.39353	2.90739	0.39650	2.93891	0.39379	2.91176
22	0.40101	2.96158	0.40404	2.99351	0.40127	2.96598
23	0.40863	3.01178	0.41171	3.04409	0.40890	3.01621
24	0.41639	3.05828	0.41954	3.09094	0.41667	3.06274
25	0.42430	3.10136	0.42751	3.13434	0.42458	3.10585
26	0.43236	3.14126	0.43563	3.17455	0.43265	3.14578
27	0.44058	3.17823	0.44391	3.21180	0.44087	3.18277
28	0.44895	3.21248	0.45234	3.24630	0.44925	3.21704
29	0.45748	3.24420	0.46094	3.27826	0.45778	3.24879
30	0.46617	3.27359	0.46969	3.30787	0.46648	3.27819

Water and Electricity Avoided Costs

	Residential/Commercial/Industrial			
	Water (m3)		Electricity (kWh)	
	Rate	NPV	Rate	NPV
1	1.82908	1.82908	0.08712	0.08712
2	1.86383	3.52347	0.08878	0.16783
3	1.89924	5.09309	0.09047	0.24260
4	1.93533	6.54713	0.09219	0.31186
5	1.97210	7.89411	0.09394	0.37602
6	2.00957	9.14189	0.09572	0.43546
7	2.04775	10.29779	0.09754	0.49051
8	2.08666	11.36858	0.09939	0.54152
9	2.12631	12.36052	0.10128	0.58877
10	2.16671	13.27941	0.10321	0.63254
11	2.20787	14.13064	0.10517	0.67308
12	2.24982	14.91919	0.10717	0.71065
13	2.29257	15.64968	0.10920	0.74544
14	2.33613	16.32637	0.11128	0.77767
15	2.38051	16.95323	0.11339	0.80753
16	2.42574	17.53394	0.11555	0.83519
17	2.47183	18.07188	0.11774	0.86082
18	2.51880	18.57021	0.11998	0.88455
19	2.56666	19.03185	0.12226	0.90654
20	2.61542	19.45949	0.12458	0.92691
21	2.66512	19.85564	0.12695	0.94578
22	2.71575	20.22262	0.12936	0.96326
23	2.76735	20.56258	0.13182	0.97946
24	2.81993	20.87751	0.13432	0.99446
25	2.87351	21.16924	0.13687	1.00835
26	2.92811	21.43949	0.13947	1.02123
27	2.98374	21.68985	0.14212	1.03315
28	3.04043	21.92176	0.14482	1.04420
29	3.09820	22.13660	0.14758	1.05443
30	3.15707	22.33562	0.15038	1.06391

Project ID	TRC Input	Claimed	Verified	Difference from Claimed	TRC Claimed	TRC Verified	Difference in TRC from Claimed	Reasons for adjustments during verification	Audited	Difference from Verified	TRC Audited	Difference in TRC from Verified	Reasons for adjustments during audit
2011 Commercial/Industrial Custom Project Savings Verification, Michaels Energy													
2011-COM-0011	Gas Savings (m3)	139,203	144,571	5,368	$284,681	$192,169	-$92,512	CPSV firm adjusted the way outdoor air temperature assumptions were applied	No change	0	No Change	$0	
	Electricity Savings (kWh)	235,524	68,905	-166,619					No change	0			
	EUL	20	15	-5				CPSV firm adjusted EUL to match average value found in literature review	No change	0			
2011-COM-0013	Gas Savings (m3)	12,176	5,873	-6,303	$83,963	$69,886	-$14,077	CPSV used a different outdoor air temperature input assumption	No change	0	No Change	$0	
	Electricity Savings (kWh)	160,064	171,021	10,957					No change	0			
	EUL	20	15	-5				CPSV firm adjusted EUL to match average value found in literature review	No change	0			
2011-COM-0035	Gas Savings (m3)	57,908	79,151	21,243	$43,458	$71,600	$28,142	CPSV firm corrected the basecase insulation levels to reflect the information provided in the original project file	No change	0	No Change	$0	
2011-COM-0055	Gas Savings (m3)	93,175	97,734	4,559	$216,419	$221,676	$5,258	CPSV applied weather normalized gas meter regression analysis to verify the project	No change	0	No Change	$0	
2011-COM-0062	Gas Savings (m3)	49,178	44,457	-4,721	$690,200	$604,322	-$85,878	CPSV applied gas meter regression analysis to verify the project	No change	0	No Change	$0	
	Water Savings (L)	85,145,984	76,243,254	-8,902,730				CPSV adjusted water savings to be consistent with the gas meter regression analysis	No change	0			
2011-COM-0133	Gas Savings (m3)	270,259	296,826	26,567	$358,399	$369,330	$10,931	CPSV resulted in change in operating hours and normalization for weather conditions.	No change	0	No Change	$0	
	Electricity Savings (kWh)	197,294	47,052	-150,242					No change	0			
	Incremental Cost	$182,085	$95,573	-86,512				CPSV found the installed units were less expensive	No change	0			
2011-COM-0135	Gas Savings (m3)	105,842	55,102	-50,740	$189,855	$94,580	-$95,275	CPSV corrections in the amount of condensate recovered	No change	0	No Change	$0	
	Water Savings (L)	7,979,309	4,764,070	-3,215,239				CPSV corrections in the amount of condensate recovered	No change	0			
2011-COM-0139	Gas Savings (m3)	35,068	8,106	-26,962	$28,314	-$13,457	-$41,771	CPSV adjusted hot water usage as dependent on production instead of being held constant.	No change	0	No Change	$0	
	Electricity Savings (kWh)	502	3	-499					No change	0			
	Incremental Cost	$41,600	$52,349	10,749				CPSV found the installed cost to be more expensive	No change	0			
2011-COM-0150	Gas Savings (m3)	186,609	43,432	-143,177	$250,843	$43,588	-$207,255	CPSV applied of metered regression analysis and normalizing energy usage for weather	No change	0	No Change	$0	
	Electricity Savings (kWh)	41,516	20,393	-21,123					No change	0			
	EUL	20	15.75	-4				CPSV weighted EUL based on savings contribution of the measures installed to the project	No change	0			
2011-COM-0156	Incremental Cost	$8,159	$7,239	-920	$144,698	$145,121	$423	CPSV found the installed cost to be less expensive	No change	0	No Change	$0	
2011-COM-0163	Gas Savings (m3)	179,300	157,739	-21,561	$211,181	$159,784	-$51,398	CPSV adjusted savings due to differences in the operation characteristics obtained from the customer.	No change	0	No Change	$0	
	Incremental Cost	$51,718	$102,027	50,309				CPSV adjusted to reflect equipment invoices instead of vendor quotes.	No change	0			
2011-COM-0177	Gas Savings (m3)	482,626	45,373	-437,253	$598,115	$25,098	-$573,017	CPSV adjusted due to customer reassessment of anticipated grain production	No change	0	No Change	$0	
2011-COM-0178	Gas Savings (m3)	371,379	367,965	-3,414	$465,451	$460,977	-$4,474	CPSV adjustment relating to actual moisture content of the process drying compared to the estimated moisture content	No change	0	No Change	$0	
2011-COM-0182	Gas Savings (m3)	43,132	36,610	-6,522	$45,214	$39,999	-$5,215	CPSV modified for the average outdoor air temperature	No change	0	No Change	$0	
	Electricity Savings (kWh)	40,525	43,516	2,991					No change	0			
2011-COM-0183	Gas Savings (m3)	31,060	2,045	-29,015	$8,073	-$18,094	-$26,167	Result of metered regression analysis.	No change	0	No Change	$0	
2011-COM-0189	Gas Savings (m3)	64,197	63,548	-649	$61,766	$60,057	-$1,709	CPSV included an additional heating term in the savings equation	No change	0	No Change	$0	
	Water Savings (L)	688,031	716,170	28,139					No change	0			
	Electricity Savings (kWh)	5,655	1,177	-4,478					No change	0			
2011-COM-0197	Gas Savings (m3)	171,675	269,609	97,934	$222,580	$350,922	$128,342	CPSV found a change in production hours	No change	0	No Change	$0	
2011-COM-0203	Gas Savings (m3)	66,623	45,217	-21,406	$124,835	$64,679	-$60,156	CPSV corrected through use of meter regression	56,074	10,857	$78,907	$14,228	Auditor adjusted savings to more accurately interpret baseline data. Auditor found verification adjustments overly conservative
	Electricity Savings (kWh)	100,100	24,807	-75,293				Original savings assumption was not supported	No change	0			
2011-COM-0207	Gas Savings (m3)	175,679	114,922	-60,757	$40,861	-$17,577	-$58,437	CPSV adjusted by applying building-specific data instead of average data	No change	0	-$29,091	-$11,514	
	Electricity Savings (kWh)	69,031	118,715	49,684					91,711	-27,004			Auditor adjusted electricity savings by revising a load factor under which an installed motor operates
2011-COM-0210	Gas Savings (m3)	240,179	156,237	-83,942	$300,194	$190,189	-$110,005	CPSV corrected a calculation error	70,140	-86,097	$77,359	-$112,830	Auditor adjusted savings by using a more appropriate heater tank size
2011-COM-0224	Gas Savings (m3)	209,106	94,821	-114,285	$78,144	-$46,892	-$125,036	CPSV adjusted by applying building-specific data instead of average data	No change	0	No Change	$0	
	Electricity Savings (kWh)	53,733	111,742	58,009					No change	0			
2011-COM-0238	Gas Savings (m3)	229,185	6,684	-222,501	$110,836	-$185,364	-$296,200	Savings were adjusted during verification based on meter regression analysis	48,772	42,088	-$138,631	$46,733	Auditor adjusted savings to use of dynamic air densities (instead of static) when calculating savings
	EUL	20	14	-6				EUL revised to be consistent with literature reviews	No change	0			
2011-COM-0240	Gas Savings (m3)	100,428	105,132	4,704	$69,294	$72,586	$3,292	CPSV found an additional unit was repaired	118,569	13,437	$82,011	$9,425	Auditor adjusted savings to account for interactive effects
	Water Savings (L)	308,942	318,876	9,934					356,471	37,595			
	Electricity Savings (kWh)	981	1,013	32					No change	0			
2011-COM-0242	Gas Savings (m3)	67,602	23,486	-44,116	$54,579	$10,122	-$44,457	CPSV adjustment through use of different modelling software	No change	0	No Change	$0	
	Water Savings (L)	866,317	-	-866,317					No change	0			
	Electricity Savings (kWh)	-	49,513	49,513					No change	0			
2011-COM-0302	Gas Savings (m3)	103,193	14,373	-88,820	$115,178	-$1,220	-$116,398	CPSV found future production rates to be lower than originally assumed	No change	0	No Change	$0	

Note: TRC impacts are through a portfolio RR, however these are calculated with actual adjustements for the specific project.

2011 Industrial (Contract) Custom Project Savings Verification, Diamond Engineering													
Project ID	**TRC Input**	**Claimed**	**Verified**	**Difference from Claimed**	**TRC Claimed**	**TRC Verified**	**Difference in TRC from Claimed**	**Reasons for adjustments during verification**	**Audited**	**Difference from Verified**	**TRC Audited**	**Difference in TRC from Verified**	**Reasons for adjustments during audit**
2011-IND-0186	**Gas Savings (m3)**	8,973,524	15,503,284	6,529,760	$11,788,445	$21,298,335	$9,509,889	CPSV found original baseline more conservative than observed by customer during interview	No change	0	No Change	$0	
	Electricity Savings (kWh)	1,182,066	2,211,900	1,029,834					No change	0			
	Water (L)	111,015,033	166,939,320	55,924,287					No change	0			
2011-IND-0026	**Gas Savings (m3)**	7,053,588	7,130,434	76,846	$20,362,925	$20,354,344	-$8,581	CPSV applied a different approach to calculate various heat flows	No change	0	No Change	$0	
	Electricity Savings (kWh)	26,078,330	25,821,658	-256,672					No change	0			
2011-IND-0165	**Gas Savings (m3)**	4,369,691	4,181,597	-188,095	$2,906,987	$2,835,583	-$71,404	CPSV adjustment based on site speicfic more current meter data	No change	0	No Change	$0	
	Electricity Savings (kWh)	135,745	493,516	357,771					No change	0			
	Water (L)	10,260,306	5,534,130	-4,726,176					No change	0			
2011-IND-0367	**Gas Savings (m3)**	906,807	1,002,829	96,022	$837,358	$963,385	$126,027	CPSV adjustment based on site speicfic more current meter data	No change	0	No Change	$0	
2011-IND-0276	**Gas Savings (m3)**	517,430	557,410	39,980	$755,229	$851,798	$96,568	CPSV adjustment based on site speicfic more current meter data	No change	0	No Change	$0	
	Water (L)	48,452,500	53,378,580	4,926,080					No change	0			
2011-IND-0203	**Gas Savings (m3)**	4,138,652	793,768	-3,344,884	$5,842,985	$980,719	-$4,862,266	CPSV adjustment due to a review of ambient air temperature compared with reported plume observations and steam pressure	No change	0	No Change	$0	
	Electricity Savings (kWh)	394,086	79,331	-314,755					No change	0			
	Water (L)	45,455,426	7,700,040	-37,755,386					No change	0			
2011-IND-0216	**Gas Savings (m3)**	2,580,024	2,545,114	-34,910	$3,486,733	$4,098,719	$611,986	CPSV adjusted the leak area based on additional information collected during he site visit.	No change	0	No Change	$0	
	Electricity Savings (kWh)	705,002	941,700	236,698					No change	0			
	EUL	20	30	10				EUL adjusted due to type of equipment and customer maintenance standards	No change	0			
2011-IND-0282	**Gas Savings (m3)**	1,193,899	1,413,899	220,000	$1,641,479	$1,987,181	$345,702	CPSV applied a different savings calculation method and adjusted for ambient temperature	No change	0	No Change	$0	
	Electricity Savings (kWh)	107,835	187,245	79,410					No change	0			
	Water (L)	11,698,487	14,278,800	2,580,313					No change	0			
2011-IND-0665	**Gas Savings (m3)**	1,323,931	1,523,659	199,728	$1,511,862	$2,277,233	$765,371	CPSV applied different approaches to calculate various heat flows	No change	0	No Change	$0	
	Electricity Savings (kWh)	343,418	1,523,659	1,180,241					No change	0			
2011-IND-0379	**Gas Savings (m3)**	1,801,896	1,372,819	-429,077	$2,207,249	$1,689,624	-$517,625	CPSV site visit water and gas meter data revealed a modification to the original project that impacted the savings	No change	0	No Change	$0	
	Water (L)	14,453,369	19,539,821	5,086,452					No change	0			
2011-IND-0441	**Gas Savings (m3)**	760,488	673,970	-86,518	$757,192	$750,187	-$7,005	Change in the estimated leak area resulting from additional information collected by the Auditor during the site visit.	No change	0	No Change	$0	
	Electricity Savings (kWh)	102,356	69,500	-32,856					No change	0			
	Water (L)	13,784,359	7,192,772	-6,591,587					No change	0			
	EUL	10	13.5	4				CPSV adjustment based on weighted average of savings from three measures involved in the project	No change	0			
2011-IND-0518	**Gas Savings (m3)**	187,430	361,071	173,641	$363,725	$605,281	$241,556	CPSV applied alternate approaches to calculate heat flows	No change	0	No Change	$0	
	Electricity Savings (kWh)	766,780	798,807	32,027					No change	0			
2011-IND-0335	**Gas Savings (m3)**	630,329	2,474,324	1,843,995	$564,671	$2,351,571	$1,786,899	CPSV applied an alternate approach to calculating the savings based on an updated leakage rate and duration	No change	0	No Change	$0	
	Water (L)	2,022,400	25,147,755	23,125,355					No change	0			

INVOICE

Diamond Engineering Company
3723 West Hamilton Road
Fort Wayne, IN 46814-9728

← REMIT TO

TEL (260) 625-5494 FAX (248) 479-0989

TO: **Union Gas Limited**
P.O. Box 2001
Chatham, ON N7M 5M1
FAX (519) 436-4665

Invoice Number	**1039**
Date	**12/5/2011**
Your Order #	4500192449
DEC Job Number	**W016**
Ship Date	
Tax Code	**Non Taxable**
Salesman	
Account Number	**UNI001**
Ship Via	**n/a**
FOB	**n/a**
Page	**1 OF 1**
Terms	

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
A	6 sites	DSM Reviews for 2011 Verification	$ 3,600.00 USD	$ 21,600.00 USD
B	725 mi	Mileage for W.E. 12/9/2011	0.50 USD	363.31 USD
C	1 ea	Hotel 12/5/2011, Lansing, MI	109.87 USD	109.87 USD
D	1 ea	Hotel 12/6/2011 Chatham, ONT	94.57 USD	94.57 USD
E	1 ea	Flight from London, ONT to Timmins, ONT	1,690.87 USD	1,690.87 USD
F	1 ea	Rental Car – Timmins to Kapuskasing, ONT	81.51 USD	81.51 USD
G	1 ea	Hotel 12/7/2011 Timmins, ONT	141.91 USD	141.91 USD
H	1 ea	Hotel 12/8/2011 Lansing, MI	99.79 USD	99.79 USD
I	24 hrs	Evaluation of the Non Selected Project	160.00 USD	3,840.00 USD
J	40 hrs	In depth steam trap life analysis	160.00 USD	6,400.00 USD
		Customer Contact Time in Canada (For Tax Purposes)		
		Non-Selected Project – 3 Hours @ $ 160.00 / Hour = $ 480.00		
		Reviews 2 Hours / Review		
		12 Hours @ $ 160 / Hour = $ 1,920.00		
		Total for work conducted in Canada = $ 2,400.00		
		6.97 % of this invoice represents compensation for work conducted in Canada		

Co. Code (XL Mo) 2 Approver Name (print) VICTORIA FALVO
Date 2/7 Signature [signature] Loc Bay St
Amt. $34,421.83 Currency CAD ☐ USD ☒ Tax Code (West)

Cost Element	Cost Assignment	Amount
471035	240919	34,421.83

SRO / SES # (West) PO. #4500192449
Description DC Verification

Total this invoice $ 34,421.83 USD

The Goods and Services Described herein were purchased according to the terms and conditions set forth on the reverse side of this form

INVOICE

Diamond Engineering Company
3723 West Hamilton Road
Fort Wayne, IN 46814-9728

← REMIT TO

TEL (260) 625-5494 FAX (248) 479-0989

TO: **Union Gas Limited**
P.O. Box 2001
Chatham, ON N7M 5M1
FAX (519) 436-4665

Invoice Number	**1044**
Date	**3/12/2012**
Your Order #	4500192449
DEC Job Number	**W016**
Ship Date	
Tax Code	**Non Taxable**
Salesman	
Account Number	**UNI001**
Ship Via	**n/a**
FOB	**n/a**
Page	**1 OF 1**
Terms	

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
A	7 sites	DSM Reviews for 2011 Verification	$ 3,600.00 USD	$ 25,200.00 USD
B	762 mi	Mileage for W.E. 2/11/2012	0.51 USD	388.62 USD
C	2 nights	Hotel 2/6/2012 & 2/7/2012, London, ON	129.95 USD	259.90 USD
D	2 ea	Bluewater Bridge Toll	3.00 USD	6.00 USD
E	3 meals	2/6/2011, 2/7/2011, 2/8/2011	8.00 USD	24.00 USD
F	801 mi	Mileage for W.E. 2/18/2012	0.51 USD	408.51 USD
G	1 night	Hotel 2/13/2011 London, ON	115.26 USD	115.26 USD
H	1 night	Hotel 2/14/2011 Windsor, ON	160.69 USD	160.69 USD
I	3 meals	2/13/2011, 2/14/2011, 2/15/2011	8.00 USD	24.00 USD
J	1 ea	Bluewater Bridge Tolls	3.00 USD	3.00 USD
K	1 ea	Ambassador Bridge Toll	4.00 USD	4.00 USD
		Customer Contact Time in Canada (For Tax Purposes)		
		Selected Project – 14 Hours @ $ 160.00 / Hour = $ 2,240.00		
		8.42% of invoice is for labor conducted while in Canada		
			Total this invoice	$ 26,593.98 USD

The Goods and Services Described herein were purchased according to the terms and conditions set forth on the reverse side of this form

STATEMENT OF WARRANTIES, CONDITIONS AND TERMS LIMITED WARRANTY

LIMITATIONS These express warranties are given in lieu of all other warranties expressed or implied. Diamond Engineering Company is not responsible or liable for loss of product, facilities or damage, or for consequential or incidental damages. Our equipment may be covered by one or more United States Patents.

DELIVERY The responsibility of Diamond Engineering Company for delivery and breakage of materials ends when a receipt is obtained from the Consignor of the carrier. (FOB Customer's facility). Customer should notify Diamond Engineering Company immediately if damages or shortages are discovered, and every reasonable effort shall be made to replace and/or repair as necessary.

CANCELLATIONS OF ORDERS Cancellations made by the customer after placement of a Purchase Order shall obligate the Customer to payment of costs incurred by Diamond Engineering Company in processing that order from date received to date canceled. Change Orders made by the customer after placement of a Purchase Order shall obligate the Customer to payment of all incremental "costs incurred" incurred by Diamond Engineering Company in processing the change order. "Costs incurred" means costs as determined by generally accepted accounting principles.

TITLE The title and right of possession of the equipment herein specified, and any replacement thereof or substitution thereof, and the right to use the same under designs of Diamond Engineering Company, shall not pass from Diamond Engineering Company, and Diamond Engineering Company shall retain a security interest in said equipment until all payments due hereunder, including deferred payments or notes, and payments of any judgments thereon, shall have been fully made in cash. Said equipment shall remain the personal property of Diamond Engineering Company whatever may be the mode of its attachment to the realty and other property, until fully paid for in cash, and PURCHASER authorizes Diamond Engineering Company, at PURCHASER'S expense, to perfect the security interest of Diamond Engineering Company in said equipment and assures retention of title to said equipment by Diamond Engineering Company. If default is made in any of the payments, in the manner and form and at the time as herein specified, Diamond Engineering Company shall be entitled to immediate repossession of said equipment, as well as any accession thereto, and shall be free to enter the premises where such equipment may be located and remove the same as its property, without liability for such removal on Diamond Engineering Company's part. In case notes or trade acceptance are accepted, they shall be mere evidence of indebtedness hereunder and not payment.

SAFEGUARD EQUIPMENT Safety devices required by law or custom, in addition to equipment specified in this proposal, are to be supplied by PURCHASER.

CONFIDENTIAL INFORMATION All drawings, documents, computer programs and other information supplied by the SELLER are supplied on the express condition that the PURCHASER (without written consent of the SELLER) will not give away, lend, exhibit or sell any such drawings or extracts, or use them in any way except to the installation and maintenance of the equipment.

All rights of ownership, distribution, exhibition, sales and disclosure of all drawings, computer programs, and other documents supplied by the SELLER shall remain the property of the SELLER.

LIMITATIONS OF LIABILITY Diamond Engineering Company shall not be liable for any loss, damage, or delay caused by fire, theft, embargoes, civil or military authority, insurrection or riot, or by any cause beyond its control. PURCHASER'S failure to notify Diamond Engineering Company of claimed breach of the contract, due to delay before shipment has been made, shall constitute a waiver by PURCHASER of all claims for loss or damages due to delay. Diamond Engineering Company SHALL NOT BE LIABLE IN ANY EVENT FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGE WHATSOEVER, NOR FOR ANY LOSS IN PROFITS. In case of delay by PURCHASER in furnishing complete information or in approving drawings, shipment shall be extended a reasonable time based on the delay and conditions at Diamond Engineering Company. Orders are not subject to cancellation unless authorized by Diamond Engineering Company and unless cancellations charges are assumed by the PURCHASER. PURCHASER assumes all responsibility for fire, explosions, or other damages, in the starting, adjusting and subsequent operation of the equipment.

ASBESTOS If asbestos is discovered while working with the PURCHASER's equipment, Diamond Engineering Company's contractual obligation shall cease and the removal and disposal of the asbestos shall become the responsibility of the PURCHASER and/or owner of the equipment.

COMPLETION OF INSTALLATION AND FINAL PAYMENT When Diamond Engineering Company is fully responsible for the installation of this equipment, it will submit its final invoice as notification that its portion of the contract is complete. This invoice is due and payable within thirty days. Diamond Engineering Company will correct any deficiencies in the installation during this maximum 30-day period, as well as assist the PURCHASER in conducting qualification tests and in training operators and maintenance personnel. The Diamond Engineering Company extended warranty will become effective on the date of the final invoice.

If Diamond Engineering Company is not fully responsible for the installation of this equipment, it will submit its final invoice, payable net thirty days from invoice date, as notification that its portion of the contract is complete -pending completion of other portions of the installation by other parties. When work which is the responsibility of others is complete, Diamond Engineering Company will complete its work if any remains, correct any deficiencies, and then assist in conducting qualification tests and training operators and maintenance personnel for a maximum 30-day period. The Diamond Engineering Company extended warranty will become effective on the date of the final invoice.

Name and Address

CLARKE, JOHN
3723 W HAMILTON RD S
FORT WAYNE, IN 46814

Confirmation # 82629778

02/08/12 PAGE 1

HAMPTON INN LONDON

Room	502//KXLX
Arrival Date	02/06/12
Departure Date	02/08/12
Adult/Child	1/0
Room Rate	115.00
Rate Plan	V-LV1
HHonors #	389801813
Airline:	AA #20JL630

Hotel Address

840 EXETER ROAD
LONDON, ON N6E 1L5
CA

Reservations
www.hamptoninn.com or
1-800-HAMPTON

DATE	REFERENCE	DESCRIPTION	AMOUNT
02/06/12	279197	DIET COKE / SOUR CREAM PRINGLES	5.00
02/06/12	279260	GUEST ROOM	115.00
02/06/12	279260	HST - ROOM TAX	14.95
02/07/12	279407	GUEST ROOM	115.00
02/07/12	279407	HST - ROOM TAX	14.95
02/08/12	279458	**********1659	(264.90)
		** BALANCE **	0.00

Name and Address

CLARKE, JOHN
3723 W HAMILTON RD S
FORT WAYNE, IN 46814

Confirmation # 88289819

02/14/12 PAGE 1

HAMPTON INN LONDON

Room	404//SXTH
Arrival Date	02/13/12
Departure Date	02/14/12
Adult/Child	1/0
Room Rate	102.00
Rate Plan	L-T3X
HHonors #	389801813
Airline:	AA #20JL630

Hotel Address

840 EXETER ROAD
LONDON, ON N6E 1L5
CA

Reservations
www.hamptoninn.com or
1-800-HAMPTON

DATE	REFERENCE	DESCRIPTION	AMOUNT
02/13/12	280332	GUEST ROOM	102.00
02/13/12	280332	HST - ROOM TAX	13.26
02/14/12	280371	**********1659	(115.26)
		** BALANCE **	0.00

Name and Address	Hotel Address
CLARKE, JOHN 3723 W HAMILTON RD S FORT WAYNE, IN 46814	1840 HURON CHURCH ROAD WINDSOR, ON N9C2L5 CA

HAMPTON INN & SUITES BY HILTON

Reservations
www.hamptoninn.com or
1-800-HAMPTON

Room	201//KXTY
Arrival Date	02/14/12
Departure Date	02/15/12
Adult/Child	1/0
Room Rate	142.20
Rate Plan	S-AAA
HHonors #	389801813
Airline:	AA #20JL630

Confirmation # 85804062

02/15/12 PAGE 1

DATE	REFERENCE	DESCRIPTION	AMOUNT
02/14/12	747661	GUEST ROOM	142.20
02/14/12	747661	HST - ROOM TAX	18.49
02/15/12	747858	**********1659	(160.69)
		** BALANCE **	0.00

Michaels engineering

Michaels energy

400 Main Street, Suite 200
PO Box 2377
La Crosse, WI 54602-2377
(608) 785-1900

PO # 4500192835 payments required in US dollar

Union Gas Limited
Accounts Payable, Chatham
CC: Imran Noorani
PO Box 2001
Chatham, ON N7M 5M1

Invoice number 2882
Date 11/27/2011

Project **UB511AAN Union Gas Limited/2011 Commercial Custom Project Review**

Michaels Engineering Tax ID: 39-1474120

Description	Contract Amount	Percent Complete	Prior Billed	Total Billed	Current Billed
A Management, Weekly Meetings and Status	4,937.00	30.00	0.00	1,481.10	1,481.10
B Calculation Review	23,139.00	25.00	0.00	5,784.75	5,784.75
C Report Writing	1,950.00	0.00	0.00	0.00	0.00
D Discussion with Auditor	2,328.00	0.00	0.00	0.00	0.00
E On-Site Verification	6,525.00	0.00	0.00	0.00	0.00
F Spot Measurements	500.00	0.00	0.00	0.00	0.00
G Expenses	2,500.00	0.00	0.00	0.00	0.00
H Final Calculations	3,085.00	0.00	0.00	0.00	0.00
Total	44,964.00	16.16	0.00	7,265.85	7,265.85

Invoice total **7,265.85**

Approved by:

David A. Waffenschmidt
President

Thank you! Invoices are due and payable within 30 days and may be subject to a 1.5% per month late charge.

Co. Code VGL Mo. 11 Approval Name (print) V. Falvo
Date 12/6 Signature V. Falvo Loc Bay St
Amt. $7265.85 Currency CAD ☐ USD ☒ Tax Code (West)

Cost Element	Cost Assignment	Amount
471035	2409:9	$7265.85

SRO / SES # (West) P.O. # 4500192835
Description Commercial custom verification

Michaels engineering

Michaels energy

400 Main Street, Suite 200
PO Box 2377
La Crosse, WI 54602-2377
(608) 785-1900

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PO # 4500192835 payments required in US dollar

Union Gas Limited
Accounts Payable, Chatham
CC: Imran Noorani
PO Box 2001
Chatham, ON N7M 5M1

Invoice number 3044
Date 01/29/2012

Project **UB511AAN Union Gas Limited/2011 Commercial Custom Project Review**

Michaels Engineering Tax ID: 39-1474120

Description	Contract Amount	Percent Complete	Prior Billed	Total Billed	Current Billed
A Management, Weekly Meetings and Status	4,937.00	50.00	1,481.10	2,468.50	987.40
B Calculation Review	23,139.00	50.00	5,784.75	11,569.50	5,784.75
C Report Writing	1,950.00	0.00	0.00	0.00	0.00
D Discussion with Auditor	2,328.00	0.00	0.00	0.00	0.00
E On-Site Verification	6,525.00	60.00	0.00	3,915.00	3,915.00
F Spot Measurements	500.00	60.00	0.00	300.00	300.00
G Expenses	2,500.00	60.00	0.00	1,500.00	1,500.00
H Final Calculations	3,085.00	60.00	0.00	1,851.00	1,851.00
I Additional On-Site Verification	8,525.00	60.00	0.00	5,115.00	5,115.00
Total	53,489.00	49.95	7,265.85	26,719.00	19,453.15

Invoice total **19,453.15**

Note: All work for task E takes place in Canada.
$3,915 of Task I was in Canada.

Approved by:

David A. Waffenschmidt
President

Co. Code UGL Mo 1 [illegible] L Kuperger
Date 1/29 [illegible] Loc BAY.ST.
Amt $19,453.15 Currency CAD ☐ USD ☒ Tax Code (West) ____

Cost Element	Cost Assignment	Amount
471035	240919	$19,453.15

S.O. / SES # (West) ____ PO # 4500192835
Description comm'l custom verification

Thank you! Invoices are due and payable within 30 days and may be subject to a 1.5% per month late charge.

S10041932S

Michaels engineering

Michaels energy

400 Main Street, Suite 200
PO Box 2377
La Crosse, WI 54602-2377
(608) 785-1900

RECEIVED
MAR 0 6 2012

PO # 4500192835 payments required in US dollar

Union Gas Limited
Accounts Payable, Chatham
CC Imran Noorani
PO Box 2001
Chatham, ON N7M 5M1

Invoice number 3079
Date 02/26/2012

Project UB511AAN Union Gas Limited/2011
Commercial Custom Project Review

Michaels Engineering Tax ID: 39-1474120

Description	Contract Amount	Percent Complete	Prior Billed	Total Billed	Current Billed
A Management, Weekly Meetings and Status	4,937.00	75.00	2,468.50	3,702.75	1,234.25
B Calculation Review	23,130.00	75.00	11,569.50	17,354.25	5,784.75
C Report Writing	1,950.00	50.00	0.00	975.00	975.00
D Discussion with Auditor	2,328.00	0.00	0.00	0.00	0.00
E On-Site Verification	6,525.00	100.00	3,915.00	6,525.00	2,610.00
F Spot Measurements	500.00	100.00	300.00	500.00	200.00
G Expenses	2,500.00	100.00	1,500.00	2,500.00	1,000.00
H Final Calculations	3,085.00	75.00	1,851.00	2,313.75	462.75
I Additional On-Site Verification	8,525.00	100.00	5,115.00	8,525.00	3,410.00
Total	53,489.00	79.26	26,719.00	42,395.75	15,676.75

Invoice total 15,676.75

Note: Tasks E, F, G & I took place in Canada. All other work was completed in the United States.

Approved by:

David A. Wallenschmidt
President

Co. Code UGL Mo 3 Name (new) L. KULPERGER
Date 3/5 Sign L Loc BAYST
Amt $15,676.75 Currency CAD USD X Tax Code (new)

Cost Element	Cost Assignment	Amount
471035	210919	$15,676.75

PO # (new) 4500192835
Description Comm'l custom verification

Thank you! Invoices are due and payable within 30 days and may be subject to a 1.5% per month late charge

5100421357

ROUTE CODE: 2254

Michaels engineering

Michaels energy

400 Main Street, Suite 200
PO Box 2377
La Crosse, WI 54602-2377
(608) 785-1900

PO # 4500192835 payments required in US dollar

Union Gas Limited
Accounts Payable, Chatham
CC: Imran Noorani
PO Box 2005
Chatham, ON N7M 5M1

Invoice number 3144
Date 04/01/2012

Project **UB511AAN Union Gas Limited/2011 Commercial Custom Project Review**

Michaels Engineering Tax ID: 39-1474120

Description	Contract Amount	Percent Complete	Prior Billed	Total Billed	Current Billed
A Management, Weekly Meetings and Status	4,937.00	100.00	3,702.75	4,937.00	1,234.25
B Calculation Review	23,139.00	100.00	17,354.25	23,139.00	5,784.75
C Report Writing	1,950.00	100.00	975.00	1,950.00	975.00
D Discussion with Auditor	2,328.00	100.00	0.00	2,328.00	2,328.00
E On-Site Verification	6,525.00	100.00	6,525.00	6,525.00	0.00
F Spot Measurements	500.00	100.00	500.00	500.00	0.00
G Expenses	2,500.00	100.00	2,500.00	2,500.00	0.00
H Final Calculations	3,085.00	100.00	2,313.75	3,085.00	771.25
I Additional On-Site Verification	8,525.00	100.00	8,525.00	8,525.00	0.00
J Addendum Report	2,500.00	100.00	0.00	2,500.00	2,500.00
Total	55,989.00	100.00	42,395.75	55,989.00	13,593.25

Invoice total **13,593.25**

Approved by:

David A. Waffenschmidt
President

Thank you! Invoices are due and payable within 30 days and may be subject to a 1.5% per month late charge.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Reference: Exhibit A, Tab 1, pages 25-27

Please explain how the cost of delivering CDM programs exceeded the revenue from those programs. Please expand Table 7 to provide a full accounting of the costs and the revenues in 2012. Please provide details of how that loss on those CDM programs is reflected in the calculation of earnings for earnings sharing purposes.

Response:

CDM program start-up costs and program delivery costs were greater than revenue associated with delivering those programs in 2012. Please see the table below for the expanded CDM costs and revenues.

Particulars ($000's)	HPNC	KAM	CCAM	HAP
Revenues	319	239	417	26
Costs				
Salary & Wages, Benefits	316	226	387	7
Employee Expenses	20	15	31	-
Advertising & Promotion	1	-	-	3
General	2	1	4	-
	339	242	422	10
Net Profit (Loss)	**(20)**	**(3)**	**(5)**	**16**

Please refer to Exhibit A, Tab 2, page 6, lines 17-19, Exhibit A, Tab 2, Appendix B, Schedule 1, Note iv) & Appendix D, Schedule 19, Note v) . The estimated loss on CDM recorded in corporate earnings for 2012 has been removed from the earnings sharing calculation.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Reference: Exhibit A, Tab 1

With respect to account 179-126 DSMIDA:

a) P. 32. Please provide details of all changes that have been made to the process of implementation, oversight and review of CPSV studies of custom projects subsequent to the 2011 year currently being trued-up.

b) P. 34. Please explain why the "achievement" in Table 11 for Deep Savings – C/I is not capped at 6%.

c) P. 35. Please show the calculation of 191% of metric in Table 12.

d) P. 36. Please show the calculation of 194% of metric in Table 13.

e) P. 37. Please confirm that the Applicant is seeking to recover from ratepayers the Applicant's calculation of the incentive owing, $8.6 million, on a pre-audited basis. Please confirm that the decision in EB-2011-0327 does not deal with the clearance of unaudited balances of this account.

Response:

a) A revised Custom Projects Saving Verification ("CPSV") process was developed by the Technical Evaluation Committee ("TEC") in June 2012 which resulted in several process implementation, oversight and review changes as follows:

CPSV

In 2011, Commercial/Industrial Custom projects were predominantly verified through desk reviews of the project files coupled with telephone interviews with customers, while the larger Industrial 'Distribution Contract' custom projects were verified through on-site visits to review the project files and interview the customers, in addition to a desk review of the project files. The TEC standardized the CPSV terms of reference for 2012 such that full on-site verification for all custom projects became an expectation with the exception of "projects where the consultant determines that no increase in accuracy/confidence would reasonably be expected from a site visit; the consultant will document the rationale and complete the assessment without a site visit."

Audit Committee ("AC")/Auditor

In addition, in consultation with the ACs, the TEC standardized the Audit RFP which broadened the scope of the audit work by advancing the auditor's involvement in the review of the CPSV projects. This enables the auditor to review the CPSV consultants work in-progress and offer guidance, suggestions, and feedback on their approach before the conclusion of the verification studies. The 2012 Audit RFP stipulates a "provision for the Auditor to work with the selected [CPSV] firm to enable the review of both the draft and final reports and an opportunity to discuss individual projects, any findings and adjustment factors recommended throughout the firm's review."

b) As outlined in Section 11 Incentive Payments in EB-2008-0346 Demand Side Management Guidelines for Natural Gas Utilities, June 30, 2011 page 32:

"For each metric on the scorecard, results will be linearly interpolated between 50% and 100%, and between 100% and 150%. Metric results below 50% will be interpolated using the 50% and 100% targets, metric results above 150% will be interpolated using the 100% and 150% targets".[28]

As shown, in the example in footnote 28 in the DSM Guidelines document, any one metric on a scorecard can either achieve negative results or results that score above 150%. There is no cap at the 50% target or at the 150% target.

"[28] For example, if the 50%, 100% and 150% targets are 40 units, 60 units and 70 units respectively, then a result of 10 units would imply a metric score of -25%.

i.e. $50\% - \frac{(100\%-50\%)}{(60-40)} * (40-10) = -25\%$

A result of 80 units would imply a metric score of 200%.

i.e. $150\% - \frac{(150\%-100\%)}{(70-60)} * (70-80) = 200\%$

c) As illustrated in the OEB's example above in footnote 28, an achievement of 1,456,247,081 m^3 savings would imply a metric score of 191%.

i.e. $150\% - \frac{(150\%-100\%)}{(1{,}250{,}000{,}000 - 1{,}000{,}000{,}000)} * (1{,}250{,}000{,}000 - 1{,}456{,}247{,}081) = 191\%$

d) As illustrated in the OEB's example above in footnote 28, an achievement of 44,042,693 would imply a metric score of 194%.

i.e. $150\% - \frac{(150\%-100\%)}{(37{,}500{,}000 - 30{,}000{,}000)} * (37{,}500{,}000 - 44{,}042{,}693) = 194\%$

e) In accordance with previous Board approved practice, Union is seeking to recover the $8.6 million DSM utility incentive on a pre-audited basis. The variance between the unaudited and audited results will be subject to future true-up.

UNION GAS LIMITED

Answer to Interrogatory from
School Energy Coalition ("SEC")

Reference: Exhibit A, Tab 2, Appendix A, Schedule 12

Please explain the decrease in Billing Revenue of $4.4 million from 2007 to 2012.

Response:

The decrease in the billing revenue is due to the decrease in the number of direct purchase customers between 2007 and 2012.

Year	# of Direct Purchase Customers
2007	461,253
2012	195,183

UNION GAS LIMITED

Answer to Interrogatory from
Vulnerable Energy Consumers Coalition ("VECC")

Reference: Exhibit B, Tab 4, pp 3-4
Exhibit B, Tab 4, Schedule 1

The referenced pages state:

"The total rate class impacts associated with both Union's proposal and the alternative treatment are provided in Schedule 1. Column (e) shows the difference between the two treatments. Where there is a positive number in column (e), the rate class benefits more from Union's proposal than the alternative treatment. Where there is a negative number in column (e), the rate class benefits more from the alternative treatment than Union's proposal."

a) Please confirm that the "alternative treatment" referred to above is the accounting treatment of FTRAM revenues consistent with the Board's EB-2012-0087 Decision. If unable to so confirm, please explain fully.

b) With respect to the referenced schedule, please confirm that under Union's proposal (as compared to the "alternative"), all sales service customers in the South (M1, M2, M4, M5, and M10) and all sales service customers in the North (Rate 01, 10, 20 sales service and bundled DP, and 25) are worse off. If unable to so confirm, please explain fully.

Response:

a) Confirmed.

b) Confirmed. Based on Union's proposal to include 2012 FT-RAM net revenues in utility earnings, subject to earning sharing, sales service customers in Union South and sales service and bundled direct purchase customers in Union North are worse off in comparison to the alternative treatment of FT-RAM net revenues as gas cost reductions. Union's proposal results in earnings sharing of $15.730 million, which Union is proposing to allocate to all rate classes (in-franchise and ex-franchise) based on the allocation of the 2007 Board-approved return on equity. Under Union's proposal, Union South bundled direct purchase customers, and all transportation service customers are better off because all ratepayers benefit from earnings sharing.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference: Exhibit A Tab 1 Appendix A Schedule 5

Preamble: Demand Side Variance Account

a) Adjacent to the 'Particulars' column, Union includes "($000)'s" implying that the numbers in the table ought to be multiplied by 1000. Please confirm that this is an error and that this should be "($)'s"

Response:

Confirmed.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference: Exhibit A Tab 1 Appendix A Schedule 4 page 2 of 3

Preamble: Union calculates the LRAM amounts for 2012. APPrO would like to understand the source and use of the 2012 Rates for the contract accounts.

a) Please provide the source of the 2012 rates illustrated in column (d).

b) Are these rates intended to represent the decremental lost revenue associated with DSM programs?

c) Do these rates incorporate a demand and/or commodity charge component? If so, in those cases where there are 2 blocks of demand and/or commodity charges, which block was used in the rate used in the calculation?

d) Please provide actual throughput for each of the industrial rate classes from 2007 to 2012.

Response:

a) The 2012 rates shown in Exhibit A, Tab 1, Appendix A, Schedule 4, page 2 of 3, column (d) are the simple average of the Board-approved 2012 delivery commodity rates. Please see Attachment 1.

b) Yes, the simple average of the quarterly Board-approved 2012 delivery rates are used to calculate the 2012 lost revenue associated with 2011 audited DSM volumes.

c) The 2012 rates include the delivery commodity charge only.

Where there are two blocks of delivery commodity charges, Union has used the delivery block in which the volume savings are expected to occur. For Rate M4 in Union South and Rate 20 in Union North, Union has used the first delivery commodity block as the majority of the volumes are first block volumes. For Rate T1 in Union South, Union has used the second block transportation commodity charge.

d) The actual throughput volumes for each industrial contract rate class, from 2007 to 2012, are presented in the table below.

Union Gas Limited

Total Throughput Volumes ($10^6 m^3$)

Industrial (Contract Rate) Classes

Line No	Rate Class	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Actual
1	M4	519	521	446	439	442	429
2	M7	585	553	309	315	258	142
3	20	452	481	557	546	645	653
4	100	2,015	1,965	1,806	1,883	1,892	1,913
5	T1	3,825	3,759	3,446	4,102	4,607	5,025
6	M5	504	498	476	525	511	469
7	25	422	307	200	220	158	207
8	**Total**	**8,323**	**8,084**	**7,241**	**8,030**	**8,513**	**8,838**

LRAM Class Description	Approved 2012 Rates: EB-2011-0382 Jan-12 Approved ($/10^{3}m^3)	EB-2012-0070 Apr-12 Approved ($/10^{3}m^3)	EB-2012-0249 Jul-12 Approved ($/10^{3}m^3)	EB-2012-0345 Oct-12 Approved ($/10^{3}m^3)	2012 Average Unit Rate ($/10^{3}m^3)
M1 South Residential	38.627	38.139	38.247	38.387	38.350
M1 South Commercial	38.627	38.139	38.247	38.387	38.350
M1 South Industrial	38.627	38.139	38.247	38.387	38.350
M2 South Commercial	41.506	40.875	41.014	41.194	41.147
M2 South Industrial	41.506	40.875	41.014	41.194	41.147
M4 South Industrial	5.762	5.361	5.450	5.564	5.534
M5 South Industrial	18.465	18.047	18.139	18.258	18.227
M7 South Industrial	0.897	0.485	0.576	0.694	0.663
T1 South Industrial	1.127	1.127	1.127	1.127	1.127
01 North Residential	89.601	89.049	89.172	89.329	89.288
01 North Commercial	83.524	82.972	83.095	83.252	83.211
10 North Commercial	57.232	56.988	57.042	57.112	57.093
10 North Industrial	52.608	52.364	52.418	52.488	52.469
20 North Industrial	2.634	2.599	2.607	2.617	2.615
100 North Industrial	1.635	1.553	1.571	1.595	1.588

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference: Exhibit A Tab 1 Appendix B Schedule 3

Preamble: This table provides a table illustrating the compressor fuel and UFG related to FT RAM

a) Please explain this table in more detail.

b) Please indicate whether these volumes represent actual compressor fuel and UFG volumes incurred for the transactions.

c) What do the "Adjustments" represent in rows 9-12?

d) The first column indicates that in all cases the receipt point is Dawn and delivery points are east of Dawn. Does this imply that all of these transactions used Union's Dawn-Parkway system to effectuate the FT-RAM transaction?

e) Since these transactions were most likely executed on a case by case basis, please indicate if the economics used WACOG to assess the value of the fuel and UFG requirements.

f) Please explain why WACOG is the appropriate price used to value fuel and UFG rather than the spot price on the day the transaction was transacted.

g) Please recalculate this table using the Dawn spot price in effect on the day that the transaction occurred.

Response:

a) The purpose of Exhibit A, Tab 1, Appendix B, Schedule 3 is to summarize the calculation of compressor fuel and unaccounted for gas ("UFG") costs on Union's Dawn to Parkway system that are attributable to FT-RAM related exchange transactions. Details are as follows:

- Lines 1 through 8 represent actual total exchange volumes that flowed on Dawn-Parkway
- The adjustments in rows 9 to 12 remove non FT-RAM transactional volumes included in lines 1 to 8.

- Line 13 is calculated as line 8 less line 12 and represents only the FT-RAM related exchange volumes.
- Line 14 is equal to actual Dawn to Parkway compressor fuel divided by actual Dawn to Parkway volumes
- Line 15 is equal to the Board approved UFG ratio

b) Compressor Fuel and UFG volumes are not tracked at the individual service level. FT-RAM related Compressor Fuel volumes are calculated using actual Dawn to Parkway Compressor Fuel ratios. FT-RAM related UFG volumes are calculated using the Board approved UFG ratio.

c) Please refer to the response to part a above.

d) Yes, all of these transactions used Union's Dawn to Parkway system.

e) These transactions were executed on a case by case basis. When Union estimates costs associated with compressor fuel and UFG requirements of individual deals, Board approved WACOG is used as the basis for the estimate.

f) Using WACOG for the Dawn to Parkway transactions is consistent with the pricing of the service and how Union's actual total company compressor fuel and UFG expenses are valued.

g) Union was unable to complete the response in a reasonable timeframe using daily transaction volumes and daily Dawn spot prices. In order to provide a proxy of the magnitude of this alternate approach, Union has updated the table using the monthly average Dawn spot price for the month in which the transactions occurred. Please refer to Attachment 1 for the recalculated table.

Union Gas Limited
Summary of Compressor Fuel and UFG Costs Related to FT-RAM Optimization (Restated Using Monthly Average Dawn Spot Price)
For the Year Ended December 31, 2012

Line No.	Particulars	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
	FT-RAM Exchange Volumes (GJ's)													
	Paths With FT-RAM Related Compressor Fuel and UFG:													
1	Dawn to Iroquois	1,641,269	1,127,784	1,356,131	64,753	106,244	240,000	183,019	12,959	72,061	244,629	2,004,500	1,416,466	8,469,815
2	Dawn to Niagara	269,767	24,054	2,954	-	-	7,280	-	-	-	-	1,287	-	305,342
3	Dawn to Enbridge CDA	1,456,959	1,524,497	1,258,455	1,459,481	1,457,715	1,385,335	1,436,613	1,426,062	1,380,060	1,429,579	410,117	149,968	14,774,841
4	Dawn to Enbridge EDA	35,497	49,870	-	-	-	-	-	-	-	-	336	682	86,385
5	Dawn to East Hereford	-	-	37,554	265,868	21,207	243,921	365,580	146,955	84,052	11,307	17,000	-	1,193,444
6	Dawn to Chippawa	-	-	-	-	-	-	-	-	-	-	10,860	-	10,860
7	Dawn to Napierville	140,401	346,229	124,881	64,648	30,549	204,065	478,709	246,105	147,117	187,204	189,786	374,286	2,533,980
8	Total Volume Prior to Adjustments	3,543,893	3,072,434	2,779,975	1,854,750	1,615,715	2,080,601	2,463,921	1,832,081	1,683,290	1,872,719	2,633,886	1,941,402	27,374,667
9	Dawn to Iroquois Adjustment	(687,081)	(455,979)	(413,081)	-	-	-	-	-	-	-	(450,000)	(465,000)	(2,471,141)
10	Dawn to TCPL Niagara Adjustment	(269,767)	-	-	-	-	-	-	-	-	-	-	-	(269,767)
11	Dawn to Enbridge CDA Adjustment	(400,000)	(768,000)	(631,000)	(1,459,481)	(1,457,715)	(1,385,335)	(1,436,613)	(1,426,062)	(1,380,060)	(1,429,579)	(53,322)	-	(11,827,167)
12	Total Adjustments	(1,356,848)	(1,223,979)	(1,044,081)	(1,459,481)	(1,457,715)	(1,385,335)	(1,436,613)	(1,426,062)	(1,380,060)	(1,429,579)	(503,322)	(465,000)	(14,568,075)
13	Total Volume Subject to Compressor Fuel and UFG	2,187,045	1,848,455	1,735,894	395,269	158,000	695,266	1,027,308	406,019	303,230	443,140	2,130,564	1,476,402	12,806,592
	Dawn to Parkway Actual Fuel Rates:													
14	Compressor Fuel	0.746%	0.613%	0.690%	0.625%	0.538%	0.631%	0.515%	0.501%	0.499%	0.559%	0.641%	0.639%	
15	UFG	0.328%	0.328%	0.328%	0.328%	0.328%	0.328%	0.328%	0.328%	0.328%	0.328%	0.328%	0.328%	
16	Compressor Fuel (Line 13 x Line 14)	16,312	11,333	11,977	2,470	850	4,385	5,291	2,036	1,512	2,476	13,654	9,431	81,726
17	UFG (Line 13 x Line 15)	7,174	6,063	5,694	1,296	518	2,280	3,370	1,332	995	1,453	6,988	4,843	42,006
18	Total Fuel Volumes	23,485	17,396	17,671	3,767	1,369	6,666	8,660	3,367	2,506	3,929	20,642	14,273	123,732
19	Monthly Average Dawn Spot Price (CAD$/GJ)	$ 2.970	$ 2.810	$ 2.421	$ 2.159	$ 2.520	$ 2.511	$ 2.995	$ 2.889	$ 2.892	$ 3.352	$ 3.825	$ 3.525	
20	Total Fuel Costs (Line 18 x Line 19)	$ 69,745	$ 48,874	$ 42,788	$ 8,133	$ 3,449	$ 16,737	$ 25,939	$ 9,728	$ 7,247	$ 13,170	$ 78,964	$ 50,313	$ 375,087

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference: Exhibit A Tab 2 Appendix A Schedule 7

Preamble: Union provides Weather Normalized volumes by service and rate class.

a) Please explain how Union calculates weather normalized volumes for each contract rate class.

b) Please provide the actual volumes for 2011 and 2012. Include the normalized volumes beside the actual volumes for comparative purposes.

Response:

a) The weather normalized term in Exhibit A, Tab 2, Appendix A, Schedule 7 refers to the general service rates only. The reported actual volumes for contract rate classes are used. Union did not weather normalize contract rate volumes.

b) Please see the table below for actual 2011 and 2012 contract rate class volumes.

	Union Gas Limited		
	Total Throughput Volumes (10^6m^3)		
	Industrial (Contract Rate) Classes		
Line		2011	2012
No	**Rate Class**	**Actual**	**Actual**
1	M4	442	429
2	M7	258	142
3	20	645	653
4	100	1,892	1,913
5	T1	4,607	5,025
6	M5	511	469
7	25	158	207
8	**Total**	**8,513**	**8,838**
9	M9	60	58
10	M10	0	0
11	T3	264	239
12	**Total**	**324**	**297**
13	**All Contract Rates**	**8,837**	**9,135**

The table below compares the actual and weather normalized throughput volumes for 2011 and 2012 for the general service rate classes.

Union Gas - Annual Throughput Volumes

general service rates only

Line No.		Actual Volumes: 10^3m^3	
	General Service Rates	**2011**	**2012**
1	Rate M1 Firm	2,921,555	2,575,006
2	Rate M2 Firm	1,131,885	1,015,294
3	Rate 01 Firm	906,255	847,925
4	Rate 10 Firm	340,431	327,250
5	Total General Service	5,300,126	4,765,476

		Normalized Volumes[1]: 10^3m^3	
	General Service Rates	**2011**	**2012**
6	Rate M1 Firm	2,948,404	2,915,425
7	Rate M2 Firm	1,142,286	1,113,518
8	Rate 01 Firm	926,578	930,014
9	Rate 10 Firm	347,199	353,517
10	Total General Service	5,364,467	5,312,474

note 1 Each year was normalized using the respective annual budget weather normal based on the blended 55:45 methodology

Source EB 2013-0109 Schedules 5 & 6

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference: Exhibit A Tab 3 Page 2 of 11

Preamble: Union indicates that it proposes to allocate UDC in proportion to the "2007 excess peak over annual average" for Rates 1, 10 and 20 sales and bundled direct purchase customers. APPrO would like to better understand this allocation.

a) Please explain the "excess peak over annual average" calculation.

b) What is the delivery point to Union for those customers who are bundled direct purchase customers?

c) What transportation arrangements do Union hold for sales customers?

d) What transportation contracts do Union hold for bundled direct purchase customers?

e) To the extent that there are reasonable differences in the contracts being held for sales versus bundled DP customers, please explain why this cost allocation methodology is appropriate.

Response:

a) The excess peak over annual average calculation is the difference between the design day peak demands and the average annual day demands by rate class.

b) For Rates 1, 10 and 20 bundled direct purchase customers, the delivery point to Union is Empress.

c) and d) Union procures and manages the upstream transportation capacity required to meet the needs of both system sales customers and bundled direct purchase customers in Union North in aggregate. Please see Exhibit C, Tab 2, page 28 of the Sussex Report for further details.

e) There is no difference in the Union North upstream transportation contracts designed to serve sales service customers versus bundled direct purchase customers. As described in parts c) and d) above, Union's upstream transportation contracts in Union North are design to meet the overall requirements of sales service and bundled direct purchase customers.

Notwithstanding the response above, the allocation of the Union North UDC deferral account balance to rate classes in proportion to the 2007 excess peak over annual average is appropriate as it allocates the UDC deferral account balance in a manner consistent with the allocation of UDC costs in approved rates.

UNION GAS LIMITED

Answer to Interrogatory from
Association of Power Producers of Ontario ("APPRO")

Reference: Exhibit A Tab 3 Appendix A Schedule 2 page 4 of 6

Preamble: Union determines the unitized rate for recovery of the deferral account and ESM balances. APPrO would like to know how this be applied

a) Please indicate if the unitized rate in column (f) will be applied to the customers' CD, the annual volume, or some other method.

b) Please provide a sample calculation to illustrate how the one-time charge would be calculated.

Response:

a) The unitized rate in Exhibit A, Tab 3, Appendix A, Schedule 2, page 4 of 6, column (f) will be applied to the contract rate customer's actual 2012 volumes.

b) As an example, for a Rate 100 T-service customer with 2012 actual volumes of 30,000,000 m^3, the one- time adjustment would be a charge of $5,850. Please see the table below.

Rate 100 T-service customer		
2012 Annual Volume (m^3)	Unit Rate for Disposition (cents/m^3)	One Time Adjustment ($)
30,000,000	0.0195	5,805.00

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 2 to 6

The evidence indicates that the "unabsorbed" gas volume embedded in rates is a total of 4.6 PJs consisting of 4.4 PJs in the North and 0.2 PJs in the South. Please provide a step by step description of the derivation of the "unabsorbed" volume amounts for the North and the South at the time that the Base Rates were set.

Response:

On a planned basis, the unabsorbed volume amounts are determined through the Gas Supply Plan. The process Union follows to create the annual Gas Supply Plan is outlined in detail at Sections 4 and 5 of the evidence (Exhibit B, Tab 3, pages 17-30) and is consistent with the methodology used at the time base rates were set.

To summarize, the key inputs to the Gas Supply Plan are:

- Union North design day demand
- Union North and South monthly demand forecast
- Union North and South upstream transportation contracts and tolls
- Monthly commodity forecast
- System sales and bundled direct purchase storage requirements – calculated from the monthly demand forecast

These inputs are entered into the SENDOUT gas supply planning software to ensure that the assets incorporated in the gas supply plan meet annual, seasonal and design day demands. The SENDOUT model determines the amount of unutilized capacity, supply and associated costs required to meet customer demands. The results of the 2007 Gas Supply Plan were 4.4 PJ of UDC in Union North and 0.2 PJ in Union South.

The calculated level of UDC can change each year in the Gas Supply Plan. Any differences between what is collected in rates and actual UDC costs incurred is either refunded or collected through the deferral disposition.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 2 to 6

The evidence indicates that for 2012, the actual UDC volume was 13.7 PJs in the North and 10.7 PJs in the South, for a total of 24.4 PJs, and these volumes are described as being in excess of "planned levels":

a) What were the 2012 "planned levels" of UDC volumes in each of the North and South respectively, and describe step by step how each of these planned volume levels were derived?

b) Describe step by step how actual volume levels of UDC in the North and South of 13.7 and 10.7 PJs respectively were derived?

c) What is the volume variance in each of the North and South:

   i. between 2012 planned and actual levels of UDC? and

   ii. between the volumes embedded in Base Rates and the actual levels of UDC in the North and South in 2012?

d) Please specify the extent to which the foregoing volume variances were "offset" by direct purchasers returning to system in 2012.

Response:

a) The 2012 planned levels of UDC were 10.3 PJs for Union North and no UDC in Union South. For Union South, Dawn purchases are used to balance supply and demand so upstream transportation capacity flows at a 100% load factor. The volumes were derived following the same process outlined in the response to Exhibit D7.1.

b) Please refer to refer to the response to Exhibit D8.3.

c)

i) As noted in 2 a) above, the planned level of UDC for Union North was 10.3 PJ for 2012 and 0 PJ for Union South. The volume variance is shown in the following table.

(PJ)	Actual UDC	2012 Planned UDC	Variance
North	13.7	10.3	3.4
South	10.7	0	10.7

ii) The volume variance between UDC embedded in rates and actual levels of UDC in Union North is shown in the following table.

(PJ)	Actual UDC	UDC in Rates	Variance
North	13.7	4.4	9.3
South	10.7	0.2	10.5

d) Please refer to Exhibit D3.4.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 2 to 6

The evidence indicates that the amounts recovered in rates for UDC total $7.330M consisting of $6.67M in the North and $0.117M in the South:

a) Are these amounts based on 2007 costs applied to the 4.4 and 0.2 PJs of forecast UDC embedded in Base Rates? If not, then on what costs are these values based?

b) Please show step by step how the $7.330M was derived?

Response:

a) 2012 Board-approved rates included planned UDC costs of $7.330 million in Union North and $0.117 million in Union South, for a total of $7.447 million. These amounts are associated with 2007 planned UDC of 4.4 PJ and 0.2 PJ in Union North and Union South, respectively, and the costs in rates were updated to reflect approved TCPL tolls that were in effect March 1, 2011. TCPL tolls remained constant throughout 2012.

b) Please see Attachment 1.

UNION GAS LIMITED
2012 Planned UDC in Rates (1)

Line No.	Particulars	2007 Forecast (10^3m^3) (a)	Planned UDC in Rates ($000's) (b)	Planned UDC in Rates ($/10^3m^3$) (c) = (b / a)
	Union North			
1	R01	905,311	5,395	5.9594
2	R10	379,141	1,727	4.5545
3	R20	171,554	208	1.2141
4	R25	-	-	-
5	R77	-	-	-
6	R100	-	-	-
7	Total Union North		7,330	
	Union South			
8	M2	2,249,002	116	0.0515
9	M4	23,609	1	0.0515
10	M5A	-		-
11	M7	-		-
12	M9	-		-
13	M10	202	0	0.0515
14	Total Union South		117	
15	Grand Total (line 7 + line 14)		7,447	

Notes:
(1) Reflects Interim TCPL tolls effective March 1, 2011, updated in Union's rates with the April 2011 QRAM filing (EB-2011-0029).

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 2 to 6

The evidence indicates that the costs reflected in the UDC variance account for the total capacity unutilized in 2012 are $13.292M. This amount is partially offset by transportation releases having a value of $7.865M, leaving an actual cost difference of $5.427M, of which $3.039M is attributable to the North and $2.387M is attributable to the South:

a) Please provide step by step descriptions of the derivation of the amount of $13.292M and each of the net amounts allocated to the North and South of $3.039M and $2.387M respectively.

Response:

a) For the derivation of the total demand charges for the unutilized capacity of $13.292 million, please refer to Exhibit D8.1.

   Consistent with past UDC variance account dispositions, Union is proposing to assign the net UDC cost of $5.427 million to each operating area in proportion to the actual excess supply. In Union North, there was 13.7 PJ of excess supply while Union South had 10.7 PJ of excess supply (total of 24.4 PJ's of excess). The resulting assignment of the net UDC cost is 56% to Union North (13.7/24.4) and 44% to Union South.

   The above calculation results in an assignment of $3.039 million of the net UDC cost to Union North (56% of $5.427M) and $2.387 to Union South.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 2 to 6

The "transportation releases" in 2012 of $7.865M are discussed in greater detail in Exhibit B, Tab 2 at pages 9 and 10, and shown in Table 1 of that Exhibit at page 9, under lines 1 and 2 in an amount of $7.3M. In connection with this evidence, please provide the following information:

a) Please provide a breakdown of the $7.865M referenced at Exhibit A, Tab 1, page 4 and reconcile that amount with the $7.3M shown in Table 1 of Exhibit B, Tab 2 at page 3 under lines 1 and 2 of the Table. Please provide a breakdown of these amounts between the North and the South.

b) The evidence indicates that a UDC assignments/releases are only those which take place when a system supply surplus gives rise to a transportation surplus. When did Union first establish this criterion as a basis for limiting the benefits received from assigning to third parties Upstream Transportation surpluses?

c) Was the system supply surplus criterion for limiting the recording of the benefits of transportation assignments in the UDC deferral account ever specifically presented by Union to the Board for approval and specifically approved?

d) Does this limiting criterion find expression in the Accounting Order for the UDC deferral account 179-08?

e) Has the consideration Union realizes from transportation releases been credited to the UDC deferral account for many years? If so, for how long?

f) Please indicate how transportation releases are priced.

g) Does the assignee pay the demand charge directly to TransCanada PipeLines ("TCPL")? If so, is the consideration which Union receives for the transaction reflected as a discount to the TCPL demand charge with Union paying that discounted demand charge to the assignee and recording the difference between the discounted demand charge and the full demand charge as a credit to the UDC deferral account? Please provide a numerical illustration which is typical for this type of transaction.

h) Please provide a table showing the value of transportation releases credited to UDC for the last twenty (20) years, i.e. for the period 1993 to 2012.

i) Are the system supply surpluses which give rise to transportation assignments/ releases temporary? What is the range of periods, either days or months, over which a transportation assignment/release caused by a system supply surplus can operate?

j) Has Union heretofore required an incentive to engage in transportation assignments/releases, the benefits of which are recorded in UDC deferral account 179-08 attributable to system supply surpluses? If the answer is no, then please explain why an incentive is not required for Union to engage in such transactions?

k) Does Union accept that, as a regulated monopoly gas distributor, it has an obligation to mitigate UDC and other pass-through costs for items that it acquires for utility purposes without receiving an incentive payment for discharging that obligation?

l) Is Union seeking in this case an incentive for engaging in transportation assignments/releases in 2012 which were attributable to gas supply surpluses?

m) Do transportation assignments/releases prompted by a system supply surplus, along with transportation assignments/releases prompted by other factors, contribute to the strength of the secondary market?

n) Are the benefits derived from transportation assignments/releases recorded in the UDC allocated to those who paid for the costs of the Upstream Transportation assets temporarily assigned?

Response:

a) The $7.865 million referenced at Exhibit A, Tab 1, page 4 is the total value of the unutilized transportation capacity on TCPL and other upstream transportation capacity that was released net of any revenue that was used to offset the cost of UDC. The $7.3 million shown at Exhibit B, Tab 2, page 9 is the total of 1) system supply balancing (LBA) ($0.6 million) on TCPL and 2) UDC assignments ($6.7 million) from firm TCPL upstream capacity. The difference between $6.7 million and $7.865 million is the value of the unutilized transportation capacity, other than TCPL, that was released net of any revenue that was used to offset the cost of UDC.

b) to e) The benefit derived from temporary assignment of unutilized TCPL capacity in the North has been deferred since before the merger of Centra Ontario and Union in the mid 90's. Originally captured in deferral account 179-88 it was consolidated into account 179-100 in RP-1999-0017 and then moved into account 179-108 in EB-2011-0210.
Union records as a debit or credit in Deferral Account No. 179-108, the benefit from the temporary assignment of unutilized capacity under Union's TCPL transportation contracts to

the Northern and Eastern Operations Area. The benefit will be equal to the recovery of pipeline demand charges and other charges resulting from the temporary assignment of unutilized capacity that have been included in gas sales rates.

The reference to unutilized capacity was to recognize that Union was not purchasing supply and was not utilizing the transportation capacity.

f) Releases of transportation capacity that are a result of UDC are offered to the secondary market through a Request for Proposals ("RFP") process. Approximately 250 secondary market participants are contacted, and Union requests bids for the upstream transportation capacity. The party who bids the highest value and meets Union's credit conditions is assigned the upstream transportation capacity.

g) When Union releases TCPL unutilized upstream transportation capacity, the capacity is assigned to a third party. TCPL will invoice the third party directly. This includes the demand charge along with any variable charges. If Union agreed to assign the upstream transportation during the RFP process at a rate that is lower than the regulated demand charge invoiced by TCPL to the assignee, the assignee or third party will invoice Union for this difference. This amount is recorded in the UDC deferral account.

A hypothetical numerical example is illustrated below:
Part A - Before a temporary assignment
Union has a contract for 5,000 GJ/d from Empress to Union WDA from November 1, 2011 to October 31, 2012. The regulated demand charge for this service is $0.8562/GJ/d.

Part B – Temporary assignment specifics
Union temporarily assigns 5,000 GJ/d from Empress to Union WDA to Party A for the month of October, 2012 at a rate of $0.40/GJ/d.

Part C – Invoicing the temporary assignment
Union does not receive an invoice from TCPL for the Empress to WDA for the month of October 2012.

Party A receives an invoice from TCPL for 5,000 GJ/d (the quantity of the temporary assignment) for $132,711. (Calculated as 5,000 GJ/d * $0.8562 x 31 days)
Party A invoices Union the difference between the TCPL demand charge and the agreed upon value for the temporary assignment, a charge of $70,711 (Calculated as 5,000 GJ * 31 days * [$0.8562-$0.40/GJ/d]). This will be recorded in the UDC deferral account as a debit of $70,711.

Part D – Rate Payer impact

Actual UDC cost	$132,711
Released Value	$ 62,000

Net UDC Costs $ 70,711

h) Information from 2007 to 2011 was provided in the table in Exhibit J4.1a) in EB-2011-0210 and can be found at Attachment 1. In 2012, UDC costs incurred totalled $13.292 million. The released value was $7.865 million for a net UDC cost of $5.427 million, as noted at EB-2013-0109, Exhibit A, Tab 1, page 4, lines 11-14.

i) Yes, the system supply surpluses which give rise to transportation assignments / releases to manage UDC are temporary. In 2012, Union released unutilized transportation capacity for daily, monthly and 3 month periods of time during March to October.

j) Union incurs UDC when there is more system supply than is required to meet seasonal demands. In order to mitigate these costs, Union releases upstream transportation capacity in the secondary market. Union passes through 100% of the net proceeds from system supply balancing (UDC assignments) to ratepayers through the UDC deferral account. The supply and the associated transportation capacity are no longer required. In this circumstance, Union has not sold a service or taken on risk, so no incentive is required.

In the circumstance in which the supply is still required, but there is temporary surplus of a portion of the upstream transportation capacity path, Union may optimize the temporary surplus capacity and sell a service, thereby taking on risk. Union believes there should be a balance between risk and reward. An incentive is appropriate for Union to generate transportation exchange revenue via optimizing the upstream transportation portfolio.

k) No. As a regulated utility, Union has an obligation to ensure that costs are prudently incurred.

l) As discussed in Exhibit A, Tab 1, p. 4 Union credited proceeds from UDC assignments to ratepayers. Union is not seeking to change how these transactions were recorded.

m) This response was provided by Stephen Acker: With regard to the relative strength of the secondary market, it is immaterial why any specific asset, or assets, are assigned/released. Participants in the secondary market usually are not aware of, nor are they interested in why, any asset or service is being made available. What secondary market participants are interested in is whether or not they can acquire an asset or service for a cost that makes economic sense based upon their own set of criteria.

Regardless of the why any particular asset has been made available for assignment/release, the strength of the secondary market, herein characterized by its liquidity and depth, is most certainly increased when assets are used to provide incremental services to market participants at locations where buying and selling occurs.

Whether assets are assigned/released or not is not what contributes to the strength of the secondary market; what does contribute to the strength of the secondary market is whether or

not assets are used to provide *incremental* services to secondary market participants.

n) Yes. As described in Exhibit A, Tab 3, page 2 of 11, the portion of the UDC deferral account related to Union North is allocated to sales service and bundled direct purchase customers in a manner consistent with the allocation of UDC costs in approved rates. As Union provides transportation in Union South to sales service customers only, UDC related to Union South is applicable solely to sales service customers. Accordingly, the portion of the UDC deferral account related to Union South is allocated to sales service customers only.

UNION GAS LIMITED

Undertaking of Mr. Thompson
To Ms. Evers

For 2007 to 2012, please provide flow through to ratepayers of capacity-release-type transactions, LBA fees transactions, capacity assignment cases not already filed, and other RAM optimization transactions.

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a) As described at Exhibit J.C.4-7-10, page 2, paragraph 1, where Union releases unutilized pipe to the market due to excess supply to the plan, any value received for the pipe is credited to ratepayers to offset UDC costs. The chart below provides the total UDC costs incurred, the released value of the pipe, and the net UDC costs that were charged to ratepayers.

$000's	**2007**	**2008**	**2009**	**2010**	**2011**	**2012 (YTD May)**
UDC Costs Incurred	$5,202	$12	$3,273	$9,645	$834	$3,814
Released Value	($4,016)	$0	($1,338)	($7,257)	($309)	($2,847)
Net UDC Costs	$1,186	$12	$1,935	$2,387	$525	$967

Releasing the pipe to the market to obtain value is Union's preferred approach. However, as described at Transcript, Day 3, page 10, lines 21-25, in some instances, the pipe may be unutilized for a term that is less than a month or there may not be market value for the pipe.

If the empty pipe is TCPL capacity, when Union leaves the pipe empty, RAM credits are generated and Union's S&T department will act on market opportunities to utilize RAM credits. From 2007 to 2012, there was one month only when RAM credits of $240,000 were generated resulting in revenues of $60,000 which flowed through UDC to ratepayers.

b) As described at Exhibit J.C.4-7-10, page 2, paragraph 2, the benefit to ratepayers for RAM credits used to fund a base minimal level of interruptible transportation to manage LBA fees is provided at Exhibit J.3.2.

c) As described at Exhibit J.C.4-7-10, page 2, paragraphs 3 and 4, S&T revenue generated for optimizing the transportation portfolio by assigning long-haul firm transportation and utilizing the RAM program is provided at Exhibit J.C-4-7-9, Attachment 2.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 5 and 6

Please provide a copy of the Accounting Order that pertains to this account.

Response:

Please see Attachment 1.

UNION GAS LIMITED

Accounting Entries for
Upstream Transportation FT-RAM Optimization
Deferral Account No. 179-130

Account numbers are from the Uniform System of Accounts for Gas Utilities, Class A prescribed under the Ontario Energy Board Act.

Debit	-	Account No. 579 Miscellaneous Operating Revenue
Credit	-	Account No. 179-130 Other Deferred Charges – Upstream Transportation FT-RAM Optimization

To record as a credit in Deferral Account No. 179-130 the ratepayer portion of net revenues related to FT-RAM optimization as ordered by the Board in EB-2012-0087. Net revenue is defined as FT-RAM optimization revenue less related third party costs and incremental compressor fuel and UFG costs directly attributable to the provision of FT-RAM optimization transportation services.

Debit	-	Account No. 323 Other Interest Expense
Credit	-	Account No. 179-130 Other Deferred Charges – Upstream Transportation FT-RAM Optimization

To record, as a credit in Deferral Account No. 179-130, interest on the balance in Deferral Account No. 179-130. Simple interest will be computed monthly upon finalization of the year- end balance in the said account in accordance with the methodology approved by the Board in EB-2006-0117.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 5 and 6

Was the 2011 balance in this deferral account which was cleared to ratepayers in an amount of about $19.8M?

Response:

The amount of the Upstream Transportation FT-RAM Optimization Deferral Account payable to ratepayers in 2011 was $18.9 million. Please see Exhibit A, Tab 1, Appendix B, Schedule 2.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 5 and 6

Please identify the number of system gas users and bundled customers in each rate classes to whom the amount was cleared, along with the amounts cleared to each rate class.

Response:

Please see Attachment 1.

UNION GAS LIMITED
Acount 179-130 - Upstream Transportation FT-RAM Optimization
Board-approved Disposition of 2011 Balance by Rate Class

Line No.	Particulars	FT-RAM Optimization Amount ($000's) (1)	Number of Customers	
			Sales Service	Bundled Direct Purchase
		(a)	(b)	(c)
	Union North			
1	Rate 01	(5,509)	238,492	80,643
2	Rate 10	(2,241)	914	1,134
3	Rate 20	(942)	19	4
4	Rate 25	(167)	-	74
5	Rate 100	-		
6	Total Union North	(8,859)	239,425	81,855
	Union South			
7	Rate M1	(8,731)	828,220	
8	Rate M2	(1,538)	3,197	
9	Rate M4	(98)	11	
10	Rate M5A	(70)	5	
11	Rate M7	-	-	
12	Rate M9	-	-	
13	Rate M10	(0)	1	
14	Rate T1	-	-	
15	Rate T3	-	-	
16	Total Union South	(10,436)	831,434	-
17	Total Ratepayer Portion of 2011 FT-RAM Optimization (line 6 + line 16)	(19,295)	1,070,859	81,855

Note:
(1) EB-2012-0087, Rate Order, Working Papers, Schedule 1, Page 1, Line 2.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 5 and 6

Does adhering to the EB-2012-0087 Decision for 2012 produce an incentive benefit to Union of $3.664M as shown in Exhibit A, Tab 1, Appendix B, Schedule 2, line 9, column (b)?

Response:

Yes. However, as outlined at Exhibit B, Tab 1, page 5 the 2011 Deferrals proceeding (EB-2012-0087) treatment of net FT-RAM revenue is inconsistent with the historical treatment of upstream transportation exchange revenue and the terms of Union's QRAM related gas supply deferral accounts, which were disposed of in 2012 by final orders of the Board and which orders cannot be changed retroactively. It also represents a significant departure from the EB-2007-0606 and EB-2009-0101 Board Approved Settlement Agreements for Union's 2008-2012 IRM.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 5 and 6

Does adhering to the EB-2012-0087 Decision lead to an allocation to certain ratepayers of a refund of $32.977M apart from the total deferral account debit amount which Union proposes to recover from ratepayers of $15.929M as shown in Exhibit A, Tab 1, Appendix A, Schedule 1?

Response:

Yes. Please refer to Exhibit A, Tab 1, Appendix B, Schedule 1 for the Deferral Account Balances schedule including the $32.977 million in deferral account 179-130.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference : Exhibit A, Tab 1, pages 5 and 6

Please reconcile the $37.3M shown in Table 1 at Exhibit B, Tab 2, page 9 with the $36.6M shown in Exhibit A, Tab 1, Appendix B, Schedule 1, line 7, column (b).

Response:

Please see Attachment 1.

UNION GAS LIMITED

Year Ended December 31

Line No.	Particulars ($000's)	Note	2012
1	FT-RAM Revenue	(1)	40,004
2	Less: 3rd Party Upstream Costs	(2)	2,727
3		(3)	37,277
4	Less:		
	UFG	(4)	215
	Compressor Fuel	(5)	421
5	FT-RAM Revenue (net of 3rd Party Upstream Costs, Compressor Fuel and UFG Costs)	(6)	36,641

Notes:
(1) Exhibit A, Tab 1, Appendix B, Schedule 2, Line 1
(2) Exhibit A, Tab 1, Appendix B, Schedule 2, Line 5
(3) Table 1, Exhibit B, Tab 2, Page 9
(4) Exhibit A, Tab 1, Appendix B, Schedule 2, Line 3
(5) Exhibit A, Tab 1, Appendix B, Schedule 2, Line 4
(6) Exhibit A, Tab 1, Appendix B, Schedule 2, Line 7

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 1, pages 5 and 6

Please provide an Exhibit that presents all exchanges in each of the years 2007 to 2012 inclusive in the format of Table 1 at Exhibit B, Tab 2, page 9.

Response:

Please see Attachment 1 which shows transportation exchange service and FT-RAM related activity for 2007 to 2012. The attachment shows the utility use of FT-RAM and all transportation exchange service revenue for these years.

Evaluation of Exchanges
2007-2012 Activity
$Millions

		2007 Results	2008 Results	2009 Results	2010 Results	2011 Results	2012 Results	Criteria			Conclusion*
								Temporary Surplus	Unplanned	Sold as Service	
	Utility Use of FT-RAM										
①	System Supply Balancing (LBA)	$0.30	$0.60	$0.10	$0.20	$0.60	$0.60	✓	✓	X	Cost Reduction
②	System Supply Balancing (UDC Assignments)	$0	$0	$1.00	$6.20	$0.10	$6.70	✓	**both planned and unplanned**	**N/A**	Cost Reduction
	Total Utility Benefit	**$0.30**	**$0.60**	**$1.10**	**$6.40**	**$0.70**	**$7.30**				
	Exchange Services										
③	Transportation Exchanges - Base	$3.0	$6.6	$6.5	$8.0	$9.7	$14.3	✓	✓	✓	Revenue
	Total Transportation Exchanges - Base	**$3.0**	**$6.6**	**$6.5**	**$8.0**	**$9.7**	**$14.3**				
	Exchange Services and Use of FT-RAM										
④	Transportation Exchanges - FT-RAM related (Summer**)	0	$1.4	$2.2	$2.0	$4.3	$3.7	✓	✓	✓	Revenue
⑤	Transportation Exchanges FT-RAM related (Winter)	0	$0.5	$1.6	($1.0)	$3.3	$1.8	✓	✓	✓	Revenue
⑥	Transportation Exchanges - Transportation Assignments (Summer**)	$0.1	$3.0	$8.0	$8.0	$11.9	$25.9	✓	✓	✓	Revenue
⑦	Transportation Exchanges - Transportation Assignments (Winter)	$0.3	$0.1	$2.2	$2.7	$2.5	$5.9	X	✓	✓	Revenue
	Total Transportation Exchanges - FT-RAM related	**$0.4**	**$5.0**	**$14.0**	**$11.7**	**$22.0**	**$37.3**				
	Total All Transportation Exchanges	**$3.4**	**$11.6**	**$20.5**	**$19.7**	**$31.7**	**$51.6**				

* If transaction was underpinned by temporary surplus asset and sold as a service, it is classified as revenue. If Union assumed incremental risk, regardless if the asset is temporary surplus, it is classified as revenue. All other cases, it is classified as cost reduction.

** Summer defined in this analysis as Summer months April - October plus shoulder months, March & November

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 2, pages 1 to 10

The IRM Agreement calls for Earnings Sharing to be based on "corporate earnings". In its proposal at Exhibit A, Tab 2, page 5, Union states that it has reversed the $19.8M reduction to 2012 "corporate earnings" that stems from the Board's EB-2012-0087 Decision with respect to Union's inappropriate classification of FT-RAM exchange net revenues as "earnings" rather than as Upstream Transportation cost reductions:

a) Why has Union reversed this transaction which appears in the 2012 corporate accounts?

b) Please re-calculate the proposed 2012 earnings sharing amount at Exhibit A, Tab 2, Appendix B, Schedule 1 with the reversal of $19.8M for 2011 removed from the 2012 adjustments listed in Note (ii).

Response:

a) As described at Exhibit A, Tab 2, pages 4-5 the Board's decision regarding 2011, which was rendered in 2012, had the effect of reducing 2012 corporate earnings by $19.8 million. The $19.8 million has been reversed for purposes of calculating utility earnings in 2012 because it has already been recorded for utility purposes in the 2011 deferral disposition proceeding.

b) Given the response in part a) it would not be appropriate to perform this calculation because utility earnings would be misstated. Utility earnings would be understated for purposes of calculating earnings sharing in 2012.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 2, pages 1 to 10

Please provide the excerpts from USGAAP referenced at Exhibit A, Tab 2, page 5.

Response:

Please refer to paragraphs 980-405-25-1 and 450-20-25-2 of the Financial Accounting Standards Board Accounting Standards Codification.

980-405-25-1:

"refunds that meet the criteria of accrual of loss contingencies shall be recorded as liabilities and as reductions of revenue or as expenses of the regulated entity"

450-20-25-2:

An estimated loss from a loss contingency shall be accrued by a charge to income if both of the following conditions are met:

a) It is probable that a liability had been incurred at the date of the financial statements
b) The amount of loss can be reasonably estimated

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 2, pages 1 to 10

Assume that the Board adheres to the findings of fact made at pages 25 to 30 in the EB-2012-0087 Decision and Order to the effect that:

i. Union's treatment of net FT-RAM exchange revenues as profits or earnings is inconsistent with the IRM Settlement Agreement and Framework and contrary to the long-standing regulatory principle that the cost of gas and Upstream Transportation are to be treated as pass-through items; and

ii. Union's treatment of net FT-RAM exchanges as revenues had never been approved by the Board because Union had never made sufficient disclosure of the details of those transactions to enable such an approval to have been granted; and

iii. and, as a result, rejects Union's proposal to re-classify 2012 FT-RAM net revenues as "earnings" rather than as "gas cost reductions".

In that scenario, are the 2012 adjusted corporate earnings before taxes of $276.855M as shown at line 15, column (d) of Exhibit A, Tab 2, Schedule 19, with the result that:

a) System gas and bundled T ratepayers will receive the benefit of the credit amount of $32.977M;

b) The debit amount of $15.929M shown at Exhibit A, Tab 1, Appendix A, Schedule 1, will, to the extent the amount is approved by the Board, be cleared to all ratepayers; and

c) There will be no earnings sharing.

Response:

The allocation of 2012 deferral account balances and earnings sharing for that scenario is included at Exhibit A, Tab 3, Appendix B, Schedule 1, page 1.

a) In that scenario, the credit amount of $32.977 million in deferral account 179-130 will be allocated to Union North sales service and bundled direct purchase customers and Union South sales service customers, as approved by the Board in EB-2012-0087.

b) Regardless of the Board's Decision regarding the treatment of 2012 net FT-RAM revenue, the deferral balances that total a debit of $15.929 million will be allocated as outlined in accordance with Exhibit A, Tab 3, Appendix A, Schedule 1, page 1.

c) Confirmed, there will be no earnings sharing.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 2, pages 1 to 10

Is Union's proposal, in substance, a proposal to increase its incentive share of 2012 net FT-RAM exchange revenues from 10% to about 50%?

Response:

Union's proposal results in Union retaining a larger share of net FT-RAM exchange revenue (close to 50%). Union's proposal treats net FT-RAM revenue as utility revenue subject to earnings sharing pursuant to the EB-2007-0606 and EB-2009-0101 Settlement Agreements for Union's 2008-2012 IRM.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 2, pages 1 to 10

If the Board characterizes Union's proposal as, substantively, a request to increase its incentive share of 2012 net FT-RAM exchange revenues, then, is Union indifferent to the classification of net FT-RAM exchange revenues?

Response:

Even though Union would be indifferent financially if its incentive share was increased to match Union's proposal and the revenue was treated as a gas cost offset, Union does not support this treatment. In principle, Union's proposal is consistent with the treatment of net FT-RAM revenue in 2008 through 2010 and with the EB-2007-0606 and EB-2009-0101 Settlement Agreements for Union's 2008-2012 IRM.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit B, Tab 2, pages 1 to 82

For each of the three (3) cases described in section 9 of this testimony and for each of the six (6) cases described in section 12, provide typical examples of the amounts which would be paid by all parties so that in each case, we will have concrete numerical examples of the financial impacts being described in the testimony.

Response:

Please see Attachment 1.

In all six cases:

a) Union purchases the planned gas supplies at Empress;
b) The costs of TCPL transportation to the ratepayer is unchanged; and,
c) The transportation exchange revenues (line d) are offset by the costs incurred by this activity (line e).

Numerical Examples of Transportation Exchanges Cases 1 - 6

		Base				FT-RAM Related		Transportation Assignments					
		Case 1 1 Day - Summer		Case 2 1 Month - Winter		Case 3 1 Day - Summer		Case 4 1 Month - Summer		Case 5 1 Month - Winter		Case 6 5 Month - Winter	
$/GJ		Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Union paid to Gas supplier		WACOG	WACOG	WACOG	WACOG	WACOG	WACOG	WACOG	WACOG	WACOG	WACOG	WACOG	WACOG
Union paid to TCPL *													
Empress-EDA FT	(a)	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ -	$ 2.29	$ -	$ 2.29	$ -
Union paid to S&T Customer													
Empress-EDA FT	(b)								$ 2.29		$ 2.29		$ 2.29
S&T Customer paid to TCPL													
Empress-EDA FT	(c)								$ 2.29		$ 2.29		$ 2.29
S&T customer paid to Union													
Exchange revenue	(d)		($0.40)		($0.40)		($0.40)		($0.45)		($0.60)		($0.60)
Union paid to TCPL - S&T cost													
STS costs					$ 0.09		$ -						$ 0.09
Parkway to ECDA - IT Fuel							$ 0.03						
Parkway to ECDA IT (offset by FT-RAM credits)							$ 0.12						
Empress-Dawn IT (offset by FT-RAM credits)							$ 1.77						
FT-RAM Credits applied **							($1.89)						
Total S&T costs	(e)		$ -		$ 0.09		$ 0.03		$ -		$ -		$ 0.09
Costs to Rate Payer	(a)+(b)	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29	$ 2.29
Contribution to Exchange Revenue and Earnings Sharing	(d)+(e)		($0.40)		($0.31)		($0.37)		($0.45)		($0.60)		($0.51)

* Excludes STS Demand charges which remain unchanged in all cases
** There are FT-RAM Credits remaining after these are applied

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 4, pages 1 to 17

The evidence at page 12 indicates that Union currently holds 67,327 Gjs/day of firm transportation on TCPL from Empress to Union's CDA through to October 31, 2013, and refers to additional FT capacity of 8,145 Gjs/day from Empress to Union's CDA obtained by way of a permanent assignment from a third party:

a) What is the total capacity which Union has under contract with TCPL beyond October 31, 2013?

Response:

The total capacity which Union has under contract with TCPL on the Empress to Union CDA path beyond October 31, 2013 is 67,327 GJ/d. Of this amount, Union replaced 8,145 GJ/d of Empress to Union CDA annually renewed capacity with a permanent assignment of 8,145 GJ/d that renews January 1, 2016 (3 year term with renewal rights).

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters ("CME")

Reference: Exhibit A, Tab 3, Appendix B, Schedule 3

Please broaden the response to interrogatory no. 10 from the London Property Management Association ("LPMA") to include therein the typical and the largest bundled contract customers in the North who benefit from an outcome in this proceeding that adheres to the Board's EB-2012-0087 Decision.

Response:

Please see Attachment 1.

UNION GAS LIMITED

Calculation of 2012 Deferral Impacts for Typical and Largest Bundled Contract Customers in Union North

Line No.	Particulars (1)	Rate Component	Annual Volume for 2012 Deferral Disposition (m^3)	Earnings Sharing: Unit Rate for Recovery/(Refund) (cents/m^3)	Earnings Sharing: Bill Impact ($)	FT-RAM Deferral: Unit Rate for Recovery/(Refund) (cents/m^3)	FT-RAM Deferral: Bill Impact ($)	Difference ($)
			(a)	(b)	(c) = (a x b) / 100	(d)	(e) = (a x d) / 100	(f) = (e - c)
1	Average Rate 20	Delivery	5,334,770	0.0710	3,787.69	0.1105	5,894.92	
2		Commodity	5,334,770	-	-	-	-	
3		Transportation	5,334,770	(0.1018)	(5,428.45)	(1.6829)	(89,779.55)	
4				(0.0308)	(1,640.76)	(1.5724)	(83,884.63)	
5	Sales Service				(1,640.76)		(83,884.63)	(82,243.86)
6	Direct Purchase Bundled T				(1,640.76)		(83,884.63)	(82,243.86)
7	Largest Rate 20	Delivery	10,922,297	0.0710	7,754.83	0.1105	12,069.14	
8		Commodity	10,922,297	-	-	-	-	
9		Transportation	10,922,297	(0.1018)	(11,114.10)	(1.6829)	(183,812.79)	
10				(0.0308)	(3,359.27)	(1.5724)	(171,743.65)	
11	Sales Service				(3,359.27)		(171,743.65)	(168,384.39)
12	Direct Purchase Bundled T				(3,359.27)		(171,743.65)	(168,384.39)
13	Average Rate 25	Delivery	783,487	(0.0416)	(325.93)	0.0143	112.04	
14		Commodity	783,487	-	-	-	-	
15		Transportation	783,487	-	-	(0.6434)	(5,040.96)	
16				(0.0416)	(325.93)	(0.6291)	(4,928.92)	
17	Sales Service				(325.93)		(4,928.92)	(4,602.99)
18	Largest Rate 25	Delivery	8,063,442	(0.0416)	(3,354.39)	0.0143	1,153.07	
19		Commodity	8,063,442	-	-	-	-	
20		Transportation	8,063,442	-	-	(0.6434)	(51,880.19)	
21				(0.0416)	(3,354.39)	(0.6291)	(50,727.12)	
22	Sales Service				(3,354.39)		(50,727.12)	(47,372.72)

Note:
(1) There are no sales service or direct purchase bundled-T customers in Rate 100.

UNION GAS LIMITED

Answer to Interrogatory from
Canadian Manufacturers & Exporters (“CME”)

Ref: Exhibit A, Tab 4
Exhibit B, Tab 3
Exhibit C, Tab 2
Exhibit C, Tab 3

The Gas Supply Planning evidence at Exhibit B, Tab 3, at page 4 and 5 indicates that the territory Union labels as "Union North" includes communities located in the following delivery areas of the TransCanada PipeLines Limited ("TCPL") Mainline system:

i) Manitoba Delivery Area ("MDA");
ii) Western Delivery Area ("WDA");
iii) Northern Delivery Area ("NDA");
iv) Sault Ste. Marie Delivery Area ("SSMDA");
v) North Central Delivery Area ("NCDA"); and
vi) East Delivery Area ("EDA").

This evidence, at pages 5 and 6, also indicates that Union uses a portfolio of contracted firm assets, including TCPL long-haul transportation, TCPL short-haul transportation and TCPL firm Storage Transportation Service ("STS") to meet the needs of Union North. The experts' reports, hich Union has provided at Exhibit C, Tabs 2 and 3 with respect to Union's Gas Supply Planning, appear to be premised on the continued use of this traditional mix of transportation assets to support Union's delivery of gas to areas within Union North.

The evidence pertaining to Union's Incremental Transportation Contracting Analysis at Exhibit A, Tab 4, suggests that, as of November 1, 2013, Union will only be holding 8,145 Gjs/day of TCPL long-haul capacity from Empress to the Union Central Delivery Area ("CDA") which is located in territory designated by Union as "Union South". All of this evidence suggests that, for the period commencing November 1, 2013, the portfolio of firm transportation assets to be used to meet the needs of customers located in Union North may be materially different from the historic mix of transportation assets which the experts considered in the course of providing their evidence at Exhibit C, Tabs 2 and 3.

The evidence at Exhibit B, Tab 2, page 17 indicates that Union's Gas Supply Plan is a five (5) year rolling plan prepared annually with the primary focus being on the first two (2) years of the five (5) year planning horizon.

In connection with all of this evidence, please provide the following information:

a) Please advise whether the 2013 update of the annual five (5) year rolling Gas Supply Plan has been completed, and if so, the date on which that process was completed.

b) If the 2013 update of the annual Gas Supply Plan has not yet been completed, then on what date is it likely to be completed?

c) Please produce, in confidence if necessary, the currently approved version of the Union's five (5) year rolling Gas Supply Plan and advise of the date on which the Plan was approved by Union's management and its Board of Directors if director approval of the Plan is required.

d) For the period November 1, 2013 and beyond, please list each of the points at which Union plans to purchase the commodity it needs to satisfy the requirements of its system supply customers and its bundled T customers in its Northern and Southern operations areas, and specify the volume of commodity Union is planning to acquire at each of those points.

e) Please describe and list each firm transportation contract Union holds as of November 1, 2013, which Union plans to use to transport and deliver gas commodity to its system gas and bundled T customers in all of the delivery areas within Union North for the period November 1, 2013 and beyond.

f) What incremental TCPL short-haul capacity or other transportation services has Union acquired to replace the 67,327 Gjs/day of firm transportation on TCPL from Empress to Union CDA under the auspices of a contract which expires on October 31, 2013, as described at Exhibit A, Tab 4, page 12?

g) Do the Gas Supply Plans completed in either 2012 or 2013 contain Union's analysis of the economic feasibility of decreasing its use of TCPL long-haul and increasing its use of TCPL short-haul to provide delivery services to all delivery areas located in Union North?

h) If such an economic feasibility analysis is not in either of the 2012 or 2013 Gas Supply Plans, production of which has been requested under subparagraph (c) of this Supplementary Interrogatory, then please produce the document which contains that analysis and include therein the assumptions with respect to the pricing of TCPL short-haul services on which that analysis is based.

i) What assumptions have been made in the economic feasibility analysis of providing transportation of gas to delivery areas in Union North under the auspices of more TCPL short-haul services and less TCPL long-haul services with respect to the extent to which gas transportation will continue to be available from TCPL on its existing Northern line, including its North Bay Short Cut?

j) If the current economic feasibility analysis of using more short-haul and less long-haul services from TCPL does not reflect TCPL's plan to convert parts of its Northern line and the

North Bay Short Cut to carry oil rather than gas, then please update and produce the results of the economic feasibility analysis to reflect such an assumption.

k) What assumption does the current economic feasibility analysis pertaining to the transportation of gas to delivery areas located in Union North make with respect to the pricing of incremental facilities that TCPL must either build or acquire to provide additional short-haul services from Dawn, Parkway and/or Maple to delivery points in delivery areas located within Union North?

l) What is the sensitivity of the outcome of these economic feasibility analyses to increases in the costs of such incremental short-haul services?

m) Did Union share its five (5) year Gas Supply Plan for the period commencing November 1, 2013, with the experts who have provided evidence at Exhibit C, Tabs 2 and 3? If so, were either of the experts asked to evaluate the costs and risks to Union and its customers associated with that five (5) year Gas Supply Plan?

n) If the experts were asked to provide such an evaluation, then please supplement the evidence provided by each expert at Exhibits C, Tab 2 and C, Tab 3 with their evaluations of the economic feasibility of Union's five (5) year Gas Supply Plan for the period commencing November 1, 2013.

Response:

a)– c) Union's Gas Supply Plan is a five-year rolling plan that is prepared annually, with a primary focus on the first 2 years of the plan. The preparation of the Gas Supply Plan is detailed at Exhibit B, Tab 2, page 17-21. Union does not expect any material changes to the Gas Supply Plan for 2013/14 from what was approved by the Board in EB-2011-0210. The 2013/14 Gas Supply Plan is in the process of being finalized. Although the Plan does not require Board of Directors approval, it does receive executive approval. It is expected to be finalized and approved during the third quarter of 2013.

d) This information is not yet available for 2013/2014 since the Gas Supply Plan is not yet finalized. For the later years of the plan, this level of detail would not be defined since the primary focus of the plan is on the first 2 years.

e) Union's transportation portfolio for November 1, 2013 has not yet been finalized. Please see Attachment 1 for the list of firm transportation contracts Union has entered into to date to serve the annual load in Union North. Additional transportation capacity may be purchased prior to November 1, 2013 for the coming gas year to meet system and bundled T requirements as determined by the final Gas Supply Plan.

Please see Exhibit B Tab 3 page 21 and page 29 and FRPO interrogatory Exhibit D8.40 for a detailed description of the use of Empress-Union CDA contract for peak/design day in Union North.

f) This Interrogatory appears to be predicated on the assumption that Union will only hold 8,145 GJ/d of Empress to Union CDA capacity in the future and that this will result in significant change to Union's Gas Supply Plan and upstream transportation capacity. This is not the case. Union continues to hold 67,327 GJ/d of Empress to Union CDA transportation Capacity past October 31, 2013. Since the evidence was prepared, any of the Empress-CDA contracts with an end date of October 31, 2013 have been renewed through to October 31, 2014. Therefore, the entire quantity of 67,327 GJ/d will continue beyond October 31, 2013.

g) - l) The Gas Supply Plan for 2013 was approved by the Board in EB-2011-0210 and does not contemplate replacement of TCPL long haul transportation capacity with short haul transportation capacity. Union has filed evidence in EB-2012-0074 regarding replacing a portion of TCPL long haul transportation capacity with short haul transportation capacity effective November 1, 2015. The economic analysis will be reviewed as part of that proceeding.

m)-n) Union did not ask Sussex to review or evaluate the 2013/2014 Gas Supply Plan. As directed by the Board in EB-2011-0201, Sussex was engaged to review the Gas Supply Planning Principles and Processes for the Gas Supply Plan filed in EB-2011-0210 and not any one specific path or strategy. The scope of the review was defined by the Board and the list of items to be included in the review is detailed in Exhibit B, Tab 5, page 2. Intervenors provided comments on the draft RFP and the results of the review were shared with stakeholders in an information session.

As indicated above, Union does not expect any material changes to the Gas Supply Plan for 2013/14 from what was approved by the Board in EB-2011-0210. However, TCPL currently has filed a tariff revision application which could have a significant impact on Union's Gas Supply Plan as early as the effective date determined by the NEB. TCPL's requested changes that directly impact Union's Gas Supply Plan include:

Alternate Receipt Points and/or Diversions and/or delivery areas

- Introduce a change to the definition of specific paths. This definition revision would alter the Alternate Receipt and/or Diversion points or delivery areas available to Shippers on some paths.
- Gives TCPL the unilateral right to alter the Alternate Receipt and/or Diversions points or delivery areas available on any given path ("in-path") from time to time.
- Remove Shippers ability to divert downstream of the path contracted.

Any one of these three changes decreases Union's ability to divert existing contracts. As noted on page 21 of Exhibit B tab 3, Union relies on diversions of the Union South Empress to Union CDA TCPL contract to meet design day needs in certain Union North delivery areas. The proposal would remove the efficiencies currently found in the Gas Supply Plan and would visit additional costs on Union North customer as additional firm assets into or out of each of the specified Union North delivery areas will be required to meet design day demands.

Renewal Rights

- Gives TCPL the ability to trigger an Early Long Term Renewal Option in situations of Major Expansions, significant maintenance requirements, and opportunities to redeploy substantial existing assets (i.e. the Energy East Pipeline – conversion to oil). This Early Renewal Option would force Shippers to either contract for a period of ten to fifteen years or forego their contracted capacity.
- Provide TCPL with the discretion to decline certain contract renewals.

Union primarily holds annual renewal contracts with TCPL and this change would, at a minimum, limit Union's ability to respond to market demand changes and potentially, limit Union's ability to meet customer requirements. These renewal right restrictions present the potential for increased constraints and incremental costs as TCPL considers opportunities to "re-purpose" various portions of its capacity.

UNION GAS LIMITED

Summary of Transportation Contracts - Effective November 1, 2013 as at July 17, 2013*
Northern and Eastern Operations Areas

Line No.	Transportation Path	Primary Receipt Point	Primary Delivery Point	Contract Quantity	Contract Units	Contract Termination Date		Renewal Rights
		(a)	(b)	(c)	(d)	(e)		(f)
	TransCanada Pipeline							
1	Empress to Union NCDA FT	Empress	Union NCDA	1,545	GJ	01-Nov-2014		Yes
2	Empress to Union NCDA FT	Empress	Union NCDA	9,211	GJ	01-Jan-2015	**	Yes
3	**Total Empress to Union NCDA**			**10,756**				
4	Empress to Union EDA FT	Empress	Union EDA	8,675	GJ	01-Nov-2014		Yes
5	Empress to Union EDA FT	Empress	Union EDA	50,426	GJ	01-Jan-2015	**	Yes
6	**Total Empress to Union EDA**			**59,101**				
7	Empress to Union NDA FT	Empress	Union NDA	64,715	GJ	01-Jan-2015	**	Yes
8	Empress to Union WDA FT	Empress	Union WDA	39,880	GJ	01-Jan-2015	**	Yes
9	Empress to Union SSMDA FT	Empress	Union SSMDA	2,700	GJ	01-Jan-2015	**	Yes
10	Empress to Union MDA FT	Empress	Union MDA	4,522	GJ	01-Jan-2015	**	Yes
11	Parkway to Union EDA FT	Parkway	Union EDA	30,000	GJ	01-Nov-2016		Yes
12	Parkway to Union EDA FT	Parkway	Union EDA	5,000	GJ	01-Nov-2017		Yes
	Total Parkway to Union EDA			**35,000**				
13	Parkway to Union CDA FT	Parkway	Union CDA	16,000	GJ	01-Nov-2014		Yes
14	**TCPL FT - Total**			**232,674**	GJ			
	TransCanada Storage Transportation Service Firm Withdrawal							
15	NCDA	Parkway	Union NCDA	13,704	GJ	01-Jan-2015	**	Yes
16	WDA	Parkway	Union WDA	31,420	GJ	01-Jan-2015	**	Yes
17	SSMDA	Dawn	Union SSMDA	35,022	GJ	01-Jan-2015	**	Yes
18	NDA	Parkway	Union NDA	48,375	GJ	01-Jan-2015	**	Yes
19	EDA	Parkway	Union EDA	68,520	GJ	01-Jan-2015	**	Yes
20	**TCPL Firm STS Withdrawal - Total**			**197,041**	GJ			
	TransCanada Storage Transportation Service Firm Injection							
21	WDA	Union WDA	Parkway	3,150	GJ	01-Jan-2015	**	Yes
22	EDA	Union EDA	Parkway	47,571	GJ	01-Jan-2015	**	Yes
23	NDA	Union NDA	Parkway	49,100	GJ	01-Jan-2015	**	Yes
24	**TCPL Firm STS Injection - Total**			**99,821**	GJ			
	MichCon/GLGT/TCPL							
25	TCPL to Union SSMDA	SS Marie	Union SSMDA	6,143	GJ	01-Nov-2014		Yes
26	GLGT to TCPL	Belle River Mills	SS Marie	5,829	DTH	01-Nov-2014		Yes
27	MichCon to GLGT	MichCon Generic	Belle River Mills	5,829	DTH	01-Nov-2014		No
28	**MichCon/GLGT/TCPL FT - Total**			**6,143**	GJ			
	Centra Transmission Holdings Inc.							
29	Centra Transmission Holdings Inc.	Spruce	Union MDA	169.97	10^3m^3	01-Nov-2014		Yes
30	Centra Pipelines Minnesota Inc.	Sprague	Baudette	6,000	MCF	01-Nov-2014		Yes
31	**CTHI FT - Total**			**6,414**	GJ			

Notes:

* Additional transportation capacity may be contracted between the preparation of this document and November 1, 2013.

** Termination date granted by TCPL is reflected. Termination date requested is October 31, 2015. This renewal term issue is currently before the NEB. The contract end dates will reflect the NEB Decision when it is issued.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 1, Page 3 of 41

Please provide a breakdown of the months and paths (receipt and delivery) of the UDC incurred?

a) For those same months, please provide the market value (basis) between the receipt and delivery points for the paths that incurred UDC.

Response:

A detailed breakdown of the UDC costs incurred and the released value is provided in Attachment 1.

a) Since Union uses an RFP process for releases, the value Union received from the releases is the market value for that transportation capacity for that time period.

			Demand Charges for Unutilized Transportation Capacity ($ million)									Released Value ($ million)								
Path/Hub	**Receipt**	**Delivery**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Total**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Total**
Alliance	CREC	Chicago	-	-	-	-	-	-	-	0.13	**0.13**	-	-	-	-	-	-	-	-	**-**
GLGT/TCPL	BRM	SSMDA	-	0.01	0.01	0.01	0.01	0.01	0.01	0.01	**0.09**	-	-	-	-	-	0.00	0.00	0.00	**0.01**
PEPL	PEPL Field Zone	Ojibway	0.01	-	0.33	0.32	0.32	0.32	0.31	0.19	**1.81**	-	-	0.12	0.06	0.03	0.07	0.17	0.05	**0.50**
TCPL	Empress	MDA	-	0.04	0.09	0.09	0.09	0.09	0.09	0.09	**0.57**	-	0.03	0.07	0.05	0.05	0.08	0.06	0.04	**0.38**
TCPL	Empress	SSMDA	-	-	0.10	0.10	0.10	0.10	0.10	0.10	**0.60**	-	-	0.07	0.06	0.06	0.09	0.08	0.04	**0.39**
TCPL	Empress	WDA	1.10	0.96	1.10	1.06	1.08	1.08	1.08	1.08	**8.54**	0.91	0.82	0.80	0.60	0.65	0.95	0.78	0.46	**5.97**
TGC/PEPL	TGC Field Zone	Ojibway	0.01	0.06	0.06	0.06	0.12	0.11	0.06	0.06	**0.52**	-	0.07	0.02	0.02	0.03	0.04	0.04	0.10	**0.32**
Vector	Chicago	Dawn	-	-	-	-	0.31	0.30	-	0.44	**1.05**	-	-	-	-	0.09	0.12	-	0.10	**0.30**
Grand Total			**1.12**	**1.06**	**1.69**	**1.64**	**2.03**	**2.01**	**1.64**	**2.10**	**13.29**	**0.91**	**0.92**	**1.08**	**0.79**	**0.91**	**1.35**	**1.13**	**0.78**	**7.87**

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 1, Page 5 of 41

Please describe the specific prohibitions that are currently in place that preclude Union from simply purchasing index gas at the receipt point of its delivery path and selling for what the market would bear at the delivery point as opposed to generating UDC.

a) What regulatory or other changes would need to be effected to allow such a clearing of excess pipe capacity without the cost burden to ratepayers?

Response:

The OEB Act (Section 36.1) states that Union can only sell gas in accordance with an Order from the Board.

In E.B.R.O. 499 Union requested approval, on a trial basis, to provide a supplemental gas supply service for the sale of gas to ex-franchise customers at negotiated rates under the C1 rate schedule. The Board denied Union's proposal. In doing so, the Board noted opposition by intervenors largely because it would involve Union selling commodity gas in a competitive market.

a) An order from the Board would be required for Union to engage in the contemplated activity. Union minimizes the cost of UDC by releasing the unfilled capacity to the secondary market.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 1, Page 5 of 41

Please define how excess supply is calculated to the respective operating areas?

Response:

The excess supply for each respective operating area, is calculated based on the variance of actual use relative to the planned use in each operating area. As discussed at Exhibit A, Tab 1, page 3, line 5-16, these variances include consumption changes due primarily to weather and return to system supply.

Union assigns the total cost of UDC in proportion to the actual excess supply for each operating area as discussed at Exhibit A, Tab 1, page 5, line 5-8.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 1, Page 6 of 41

What is the current status of the $32.977 million in credits? Please differentiate between 2011 and 2012 credits in answering the following questions.

a) Have they been credited to ratepayers through QRAM?

b) If not, why not?

c) What is Union's proposed approach for recovery if the Board determined that, in this case, Union's proposal for 2012 treatment of the disputed benefits would be accepted?

d) What is Union's proposed approach for recovery if the Board determined that, in this case, Union's proposal for 2011 treatment of the disputed benefits would be accepted?

Response:

a) No, the $32.977 million in 2012 Upstream Transportation FT-RAM Optimization credits has not been credited to ratepayers through QRAM.

b) As described in Exhibit A, Tab 1, page 6 and Exhibit B, Union is proposing to include 2012 FT-RAM revenues in utility earnings, subject to earnings sharing, rather than treat FT-RAM revenues as gas cost reductions.

c) If the Board approves Union's proposal to include 2012 FT-RAM revenues in utility earnings, subject to earnings sharing, rather than treat FT-RAM revenues as gas cost reductions, Union will credit ratepayers $15.730 million associated with 2012 earnings sharing. In this case, the balance in the Upstream Transportation FT-RAM Optimization deferral account would be zero.

d) If the Board does not approve Union's proposal to include 2012 FT-RAM revenues in utility earnings, subject to earnings sharing, and directs Union to treat 2012 FT-RAM revenues as gas cost reductions (similar to the Board's Decision in EB-2012-0087), Union will credit certain ratepayers $32.977 million associated with the Upstream Transportation FT-RAM Optimization deferral account. In this case, there would be no earnings available for sharing with ratepayers.

Filed: 2013-07-24
EB-2013-0109
Exhibit D8.5

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 1, Page 7 of 41

Please confirm that Union's storage operations are regulated but the price of storage above the 100 PJ is not regulated.

Response:

Confirmed. In the Board's Natural Gas Electricity Interface ("NGEIR") Decision[1], it was determined that the market for Union's ex-franchise storage services was a competitive market and that Union would no longer be subject to rate regulation for those services. The Board determined that Union should reserve 100 PJ of storage space at cost based rates to accommodate in-franchise growth, and that 100 PJ would be considered regulated storage capacity. The Board stopped regulating the prices charged for the amount of storage space remaining (above 100 PJ).

[1] EB-2005-0551 Decision with Reasons issued on November 7, 2006.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 1, Page 31 of 41

Independent of deferral account treatment, please provide the resulting balance of customer supplied fuel for 2012.

a) Please provide a breakdown of the HST implications of this area of Union's business.

b) Please provide any reconciliations performed with the customers to net out balances in the customer supplied fuel account

---

Response:

a) and b) The HST impact with respect to Union's own use is calculated on Union's net own use gas purchases (i.e. net of customer supplied fuel). There is no HST implication on the fuel in kind supplied to Union by customers, which is not purchased by Union. There are no reconciliations performed.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 1, Appendix A, Schedule 2

Please provide the actual cost of compressor fuel used to generate the revenues in this variance account.

a) Please provide the cost of compressor fuel that was allocated for customer's that supplied their own compressor fuel.

b) Please provide the value of compressor fuel received from those customers for those transactions where customers supplied their own compressor fuel.

Response:

a) and b) Compressor Fuel is tracked by individual compressor activity. It is not tracked at the individual service level. Where required, for reporting purposes, Union calculates the costs attributable to an individual service using activity as the allocator.

For the short term storage deferral, compressor fuel is allocated as follows:

Actual storage compressor fuel X (Short term storage activity/ total storage activity).

Customers do not supply their own fuel for short term storage services; therefore no Customer Supplied Fuel is allocated to this deferral account.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 1, Appendix B, Schedule 3

Please provide a verbal explanation of the transactions that occurred that contributed to the Dawn to Enbridge CDA in Line 3 to stay relatively constant from January to October.

a) Please describe why the November and December numbers were so much lower?

b) Please elaborate as to the use of any excess capacity created during November and December as a result of Union's answer in a) and the weather experienced.

c) Please provide a detailed description of the transactions that contribute to lines 9 to 11 in this schedule.

d) In lines 14 through 18, Union provides a calculation of volumes. Specific to each the Compressor Fuel and UFG, please clarify is this a calculated number?

    i. If so, what was the actual number for the period?

    ii. In the case of compressor fuel, for the calculated fuel costs, using the WACOG for each month, please provide the value of the fuel received in these transactions?

    iii. If there was no fuel received, what was Union's actual fuel nominated to TCPL to effect these transactions?

Response:

a) FT- RAM related transportation exchange quantities are lower in November and December than January through October because TCPL contracted to others incremental services from Parkway starting November 1, 2012 of approximately 210,000 GJ/d. This resulted in less capacity available for use on TCPL's system for delivery to Enbridge CDA through Parkway.

b) As a result of the new contracts on TCPL's system, the upstream transportation resource that was used to provide Dawn to Enbridge CDA exchanges from January to October 2012 could no longer be reliably used to provide exchange services on this path. The upstream transportation that was temporarily surplus generated less exchange activity due to lack of take away capacity downstream.

c) Please see the response to Exhibit D6.3 a).

d) i) Compressor Fuel is tracked by individual compressor activity. It is not tracked at the individual service level. Actual total Union compressor fuel was $22.9 million, of which $0.4 million was allocated to FT RAM related exchanges.

UFG is not tracked at the service level. Actual total Union UFG for 2012 was $12.9 million, of which $0.2 million was allocated to FT-RAM exchanges.

ii) Union did not receive fuel related to any exchange service transactions.

iii) The fuel nominated to TCPL for these transactions was 87,027 GJ.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 2, Appendix B, Schedule 1

On what authority is Union relying on for the proposed reversal of 2011 decision?

a) What would the ratepayer impact be if the 2011 reversal was done in that year and the 2012 disposition was cleared to revenue only this year?

Response:

Please refer to Exhibit D3.6.

a) Please refer to Exhibit D7.13.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 3, Page 10 of 11, Lines 20-21

Please provide the resulting bill impacts that would flow out of an application of the treatment of FT-RAM transactions from the EB-2012-0087 decision.

Response:

Please see Exhibit B, Tab 4, Schedule 2, pages 1-3, under the heading "FT-RAM Deferral" for the bill impacts for customers in each rate class based on the treatment of FT-RAM related transportation exchange revenues as a gas cost reduction. Please see the same schedule under the heading "Earnings Sharing" for the bill impacts for customers in each rate class under Union's proposal to include FT-RAM revenues in utility earnings, subject to earnings sharing.

Filed: 2013-07-24
EB-2013-0109
Exhibit D8.11

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 4, Schedule 2 & EB-2012-0087 Exhibit B7.7

Please add TCPL CDA to the Table in Schedule 2

Response:

Please see Attachment 1 in which Union has added the requested information which shows that Union CDA from Empress on TCPL is the most expensive supply option. This attachment also reflects corrections to the original filed schedule 2 as described below.

When reviewing the landed costs analysis in Exhibit A Tab 4 Schedules 1 through 4 in early July it was determined that there were incorrect cell references for conversion units in the schedules. These have been corrected and some notes have been added for clarity and the revised schedules are attached to this response at Attachment 2 for reference. The evidence corrections will be filed separately in the Board's RESS as well.

The changes include columns (C) and (K) which are provided on the tables for informational purposes only and are not used in the calculation of the Landed Cost $US/mmBtu column (J). In addition, Schedule 3 now shows 2 rows of information previously not displayed in the lower table on the page. The changes are minor in nature and don't change the relative outcome of the landed cost in any of the instances so there was no impact to the outcome of the analysis in this evidence.

Schedule 2 (REVISED July 4, 2013) Including Empress-CDA
2012-2013 Transportation Contracting Analysis

	Route	Point of Supply	Basis Differential $US/mmBtu	Supply Cost $US/mmBtu	Unitized Demand Charge $US/mmBtu	Commodity Charge $US/mmBtu	Fuel Charge $US/mmBtu	100% LF Transportation Inclusive of Fuel $US/mmBtu	Landed Cost $US/mmBtu	**Landed Cost $Cdn/Gj**	Point of Delivery
	(A)	(B)	(C)	(D) = Nymex + C	(E)	(F)	(G)	(I) = E + F + G	(J) = D + I	**(K)**	(L)
	Dawn	Dawn	0.245	3.9160	0.0000	0.0000	0.0000	0.0000	$3.92	**$ 3.72**	Dawn
*	**PEPL (2012-2013)**	Panhandle Field Zone	-0.175	3.4960	0.2249	0.0441	0.1940	0.4630	$3.96	**$ 3.76**	Ojibway
*	**Vector (2012-2013)**	Chicago	0.084	3.7542	0.1800	0.0018	0.0420	0.2238	$3.98	**$ 3.78**	Dawn
	Trunkline/Panhandle	Trunkline Field Zone 1A	-0.040	3.6308	0.1900	0.0248	0.1391	0.3538	$3.98	**$ 3.79**	Ojibway
	Vector	Chicago	0.084	3.7542	0.2500	0.0018	0.0420	0.2938	$4.05	**$ 3.85**	Dawn
	TCPL Niagara	Niagara	0.266	3.9369	0.1329	0.0000	0.0000	0.1329	$4.07	**$ 3.87**	Kirkwall
	Panhandle Longhaul	Panhandle Field Zone	-0.175	3.4960	0.4251	0.0441	0.1940	0.6632	$4.16	**$ 3.95**	Ojibway
	Alliance/Vector	CREC	-0.400	3.2704	1.7275	-0.2875	0.1874	1.6275	$4.90	**$ 4.66**	Dawn
	TCPL SWDA (1)	Empress	-0.520	3.1503	1.8638	0.1276	0.0539	2.0453	$5.20	**$ 4.94**	Dawn
	TCPL CDA	Empress	-0.520	3.1503	2.2083	0.1512	0.0539	2.4134	$5.56	**$ 5.29**	Union CDA

(1) For reference only

Sources for Assumptions:

Gas Supply Prices (Col D): ICE Settlement Data; July 31, 2012

Fuel Ratios (Col G): Average ratio over the previous 12 months or Pipeline Forecast

Transportation Tolls (Cols E & F): Tolls in effect on Alternative Routes at the time of Union's Analysis (TCPL 2012 Approved Interim Tolls)

Foreign Exchange (Col K) $1 US = $1.003 CDN From Bank of Canada Closing Rate July 31, 2012

Energy Conversions (Col K) 1 dth = 1 mmBtu = 1.055056

Union's Analysis Completed: Aug-12

* Indicates path referenced in evidence for this analysis

Schedule 1
2012-2016 Transportation Contracting Analysis

	Route	Point of Supply	Basis Differential $US/mmBtu	Supply Cost $US/mmBtu	Unitized Demand Charge $US/mmBtu	Commodity Charge $US/mmBtu	Fuel Charge $US/mmBtu	100% LF Transportation Inclusive of Fuel $US/mmBtu	Landed Cost $US/mmBtu	Landed Cost $Cdn/Gj	Point of Delivery
	(A)	(B)	(C)	(D) = Nymex + C	(E)	(F)	(G)	(I) = E + F + G	(J) = D + I	(K)	(L)
	Trunkline/Panhandle	Trunkline Field Zone 1A	-0.039	4.2431	0.1900	0.0248	0.1587	0.3735	$4.62	**$ 4.36**	Ojibway
*	**Vector**	Chicago	0.185	4.4674	0.2500	0.0018	0.0487	0.3005	$4.77	**$ 4.50**	Dawn
	Dawn	Dawn	0.542	4.8247	0.0000	0.0000	0.0000	0.0000	$4.82	**$ 4.56**	Dawn
	Panhandle Longhaul	Panhandle Field Zone	-0.141	4.1414	0.4251	0.0441	0.2174	0.6866	$4.83	**$ 4.56**	Ojibway
	TCPL Niagara	Niagara	0.546	4.8291	0.1337	0.0000	0.0000	0.1337	$4.96	**$ 4.69**	Kirkwall
	Alliance/Vector	CREC	-0.564	3.7189	1.7275	-0.2875	0.2116	1.6517	$5.37	**$ 5.07**	Dawn
	TCPL SWDA (1)	Empress	-0.350	3.9328	1.8752	0.1284	0.0661	2.0696	$6.00	**$ 5.67**	Dawn

(1) For reference only

Assumptions used in Devleoping Long-term Transportation Contracting Analysis:

	Annual Gas Supply & Fuel Ratio Forecasts	Point of Supply Col (B) above	Dec 2012 - Nov 2013 $US/mmBtu	Dec 2013 - Nov 2014 $US/mmBtu	Dec 2014 - Nov 2015 $US/mmBtu	Dec 2015 - Nov 2016 $US/mmBtu	Average Annual Gas Supply Cost $US/mmBtu	Fuel Ratio Forecasts Col (G) above
	Henry Hub (NYMEX) $US/mmBtu		$4.26	$4.16	$4.30	$4.41	$4.28	
	Trunkline/Panhandle	Trunkline Field Zone 1A	$4.23	$4.12	$4.26	$4.37	$4.24	3.74%
*	**Vector**	Chicago	$4.41	$4.34	$4.51	$4.61	$4.47	1.09%
	Dawn	Dawn	$4.77	$4.70	$4.87	$4.96	$4.82	N/A
	Panhandle Longhaul	Panhandle Field Zone	$4.13	$4.01	$4.16	$4.26	$4.14	5.25%
	TCPL Niagara	Niagara	$4.78	$4.70	$4.87	$4.97	$4.83	0.00%
	Alliance/Vector	CREC	$3.71	$3.59	$3.75	$3.82	$3.72	5.69%
	TCPL SWDA	Empress	$3.91	$3.80	$3.97	$4.06	$3.93	1.68%

Sources for Assumptions:

Gas Supply Prices (Col D): ICF International Q4 2012 Base Case

Fuel Ratios (Col G): Average ratio over the previous 12 months or Pipeline Forecast

Transportation Tolls (Cols E & F): Tolls in effect on Alternative Routes at the time of Union's Analysis (TCPL 2012 Approved Interim Tolls)

Foreign Exchange (Col K) $1 US = $0.997 CDN Bank of Canada Closing Rate - Nov 1, 2012

Energy Conversions (Col K) 1 dth = 1 mmBtu = 1.055056

Union's Analysis Completed: Nov-12

* Indicates path referenced for this analysis

Schedule 2
2012-2013 Transportation Contracting Analysis

	Route	Point of Supply	Basis Differential $US/mmBtu	Supply Cost $US/mmBtu	Unitized Demand Charge $US/mmBtu	Commodity Charge $US/mmBtu	Fuel Charge $US/mmBtu	100% LF Transportation Inclusive of Fuel $US/mmBtu	Landed Cost $US/mmBtu	**Landed Cost $Cdn/Gj**	Point of Delivery
	(A)	(B)	(C)	(D) = Nymex + C	(E)	(F)	(G)	(I) = E + F + G	(J) = D + I	**(K)**	(L)
	Dawn	Dawn	0.245	3.9160	0.0000	0.0000	0.0000	0.0000	$3.92	**$ 3.72**	Dawn
*	**PEPL (2012-2013)**	Panhandle Field Zone	-0.175	3.4960	0.2249	0.0441	0.1940	0.4630	$3.96	**$ 3.76**	Ojibway
*	**Vector (2012-2013)**	Chicago	0.084	3.7542	0.1800	0.0018	0.0420	0.2238	$3.98	**$ 3.78**	Dawn
	Trunkline/Panhandle	Trunkline Field Zone 1A	-0.040	3.6308	0.1900	0.0248	0.1391	0.3538	$3.98	**$ 3.79**	Ojibway
	Vector	Chicago	0.084	3.7542	0.2500	0.0018	0.0420	0.2938	$4.05	**$ 3.85**	Dawn
	TCPL Niagara	Niagara	0.266	3.9369	0.1329	0.0000	0.0000	0.1329	$4.07	**$ 3.87**	Kirkwall
	Panhandle Longhaul	Panhandle Field Zone	-0.175	3.4960	0.4251	0.0441	0.1940	0.6632	$4.16	**$ 3.95**	Ojibway
	Alliance/Vector	CREC	-0.400	3.2704	1.7275	-0.2875	0.1874	1.6275	$4.90	**$ 4.66**	Dawn
	TCPL SWDA (1)	Empress	-0.520	3.1503	1.8638	0.1276	0.0539	2.0453	$5.20	**$ 4.94**	Dawn

(1) For reference only

Sources for Assumptions:

Gas Supply Prices (Col D): ICE Settlement Data; July 31, 2012

Fuel Ratios (Col G): Average ratio over the previous 12 months or Pipeline Forecast

Transportation Tolls (Cols E & F): Tolls in effect on Alternative Routes at the time of Union's Analysis (TCPL 2012 Approved Interim Tolls)

Foreign Exchange (Col K) $1 US = $1.003 CDN From Bank of Canada Closing Rate July 31, 2012

Energy Conversions (Col K) 1 dth = 1 mmBtu = 1.055056

Union's Analysis Completed: Aug-12

* Indicates path referenced in evidence for this analysis

Schedule 3
2012-2017 Transportation Contracting Analysis

	Route	Point of Supply	Basis Differential $US/mmBtu	Supply Cost $US/mmBtu	Unitized Demand Charge $US/mmBtu	Commodity Charge $US/mmBtu	Fuel Charge $US/mmBtu	100% LF Transportation Inclusive of Fuel $US/mmBtu	Landed Cost $US/mmBtu	**Landed Cost $Cdn/Gj**	Point of Delivery
	(A)	(B)	(C)	(D) = Nymex + C	(E)	(F)	(G)	(I) = E + F + G	(J) = D + I	**(K)**	(L)
	Trunkline/Panhandle	Trunkline Field Zone 1A	-0.038	4.7416	0.1900	0.0248	0.1816	0.3964	$5.14	**$4.88**	Ojibway
*	**PEPL (2012-2017)**	Panhandle Field Zone	-0.217	4.5624	0.3200	0.0441	0.2532	0.6173	$5.18	**$4.92**	Ojibway
	Vector	Chicago	0.143	4.9218	0.2500	0.0018	0.0551	0.3069	$5.23	**$4.97**	Dawn
	Dawn	Dawn	0.506	5.2855	0.0000	0.0000	0.0000	0.0000	$5.29	**$5.02**	Dawn
	Panhandle Longhaul	Panhandle Field Zone	-0.217	4.5624	0.4251	0.0441	0.2532	0.7224	$5.28	**$5.02**	Ojibway
	TCPL Niagara	Niagara	0.518	5.2969	0.1329	0.0000	0.0000	0.1329	$5.43	**$5.16**	Kirkwall
	Alliance/Vector	CREC	-0.618	4.1608	1.7275	-0.2875	0.2384	1.6785	$5.84	**$5.55**	Dawn
	TCPL SWDA (1)	Empress	-0.407	4.3718	1.8638	0.1276	0.0748	2.0661	$6.44	**$6.12**	Dawn

(1) For reference only

Assumptions used in Devleoping Long-term Transportation Contracting Analysis:

	Annual Gas Supply & Fuel Ratio Forecasts	Point of Supply Col (B) above	Nov 2012 - Oct 2013 $US/mmBtu	Nov 2013 - Oct 2014 $US/mmBtu	Nov 2014 - Oct 2015 $US/mmBtu	Nov 2015 - Oct 2016 $US/mmBtu	Nov 2016 - Oct 2017 $US/mmBtu	Average Annual Gas Supply Cost $US/mmBtu Col (D) above	Fuel Ratio Forecasts Col (G) above
	Henry Hub (NYMEX)		$4.01	$4.30	$4.43	$4.91	$6.25	$4.78	
	Trunkline/Panhandle	Trunkline Field Zone 1A	$3.98	$4.27	$4.40	$4.87	$6.20	$4.74	3.83%
*	**PEPL**	Panhandle Field Zone	$3.82	$4.12	$4.25	$4.67	$5.95	$4.56	5.55%
	Vector	Chicago	$4.12	$4.45	$4.59	$5.05	$6.39	$4.92	1.12%
	Dawn	Dawn	$4.46	$4.82	$4.97	$5.41	$6.76	$5.29	N/A
	Panhandle Longhaul	Panhandle Field Zone	$3.82	$4.12	$4.25	$4.67	$5.95	$4.56	5.55%
	TCPL Niagara	Niagara	$4.47	$4.83	$4.98	$5.43	$6.78	$5.30	0.00%
	Alliance/Vector	CREC	$3.41	$3.70	$3.84	$4.27	$5.58	$4.16	5.73%
	TCPL SWDA	Empress	$3.60	$3.91	$4.05	$4.49	$5.82	$4.37	1.71%

Sources for Assumptions:

Gas Supply Prices (Col D): ICF International Q3 2012 Base Case

Fuel Ratios (Col G): Average ratio over the previous 12 months or Pipeline Forecast

Transportation Tolls (Cols E & F): Tolls in effect on Alternative Routes at the time of Union's Analysis (TCPL 2012 Approved Interim Tolls)

Foreign Exchange (Col K) $1 US = $1.003 CDN From Bank of Canada Closing Rate July 31, 2012

Energy Conversions (Col K) 1 dth = 1 mmBtu = 1.055056

Union's Analysis Completed: Aug-12

* indicates path referenced in evidence for this analysis

Schedule 4
2012-2017 Transportation Contracting Analysis

	Route	Point of Supply	Basis Differential $US/mmBtu	Supply Cost $US/mmBtu	Unitized Demand Charge $US/mmBtu	Commodity Charge $US/mmBtu	Fuel Charge $US/mmBtu	100% LF Transportation Inclusive of Fuel $US/mmBtu	Landed Cost $US/mmBtu	**Landed Cost $Cdn/Gj**	Point of Delivery
	(A)	(B)	(C)	(D) = Nymex + C	(E)	(F)	(G)	(I) = E + F + G	(J) = D + I	**(K)**	(L)
	Vector	Chicago	0.052	5.8863	0.2500	0.0019	0.0712	0.3231	$6.21	**$ 5.66**	Dawn
*	**Panhandle Longhaul**	Panhandle Field Zone	-0.349	5.4854	0.4251	0.0442	0.3203	0.7896	$6.28	**$ 5.72**	Ojibway
	Trunkline/Panhandle	Trunkline Field Zone	0.049	5.8841	0.1926	0.0274	0.2507	0.4707	$6.35	**$ 5.79**	Ojibway
	Dawn	Dawn	0.675	6.5101	0.0000	0.0000	0.0000	0.0000	$6.51	**$ 5.94**	Dawn
	Alliance/Vector	CREC	-0.973	4.8615	1.6991	-0.2875	0.2825	1.6941	$6.56	**$ 5.98**	Dawn
	TCPL Niagara	Niagara	0.757	6.5922	0.1386	0.0000	0.0000	0.1386	$6.73	**$ 6.14**	Kirkwall
	TCPL SWDA (1)	Empress	-0.859	4.9754	1.9430	0.1330	0.1209	2.1970	$7.17	**$ 6.54**	Dawn

(1) For reference only

Assumptions used in Developing Long-term Transportation Contracting Analysis:

	Annual Gas Supply & Fuel Ratio Forecasts	Point of Supply Col (B) above	Nov 2012 - Oct 2013 $US/mmBtu	Nov 2013 - Oct 2014 $US/mmBtu	Nov 2014 - Oct 2015 $US/mmBtu	Nov 2015 - Oct 2016 $US/mmBtu	Nov 2016 - Oct 2017 $US/mmBtu	Average Annual Gas Supply Cost $US/mmBtu	Fuel Ratio Forecasts Col (G) above
	Henry Hub (NYMEX) $US/mmBtu		$5.11	$5.65	$6.07	$5.94	$6.40	$5.83	
	Vector	Chicago	$5.18	$5.69	$6.12	$6.00	$6.44	$5.89	1.21%
*	**Panhandle Longhaul**	Panhandle Field Zone	$4.80	$5.33	$5.74	$5.58	$5.98	$5.49	5.84%
	Trunkline/Panhandle	Trunkline Field Zone	$5.14	$5.69	$6.12	$6.00	$6.46	$5.88	4.26%
	Dawn	Dawn	$5.77	$6.26	$6.77	$6.65	$7.10	$6.51	N/A
	Alliance/Vector	CREC	$4.13	$4.64	$5.11	$5.02	$5.41	$4.86	5.81%
	TCPL Niagara	Niagara	$5.85	$6.35	$6.85	$6.72	$7.19	$6.59	0.00%
	TCPL SWDA	Empress	$4.23	$4.75	$5.23	$5.14	$5.53	$4.98	2.43%

Sources for Assumptions:

Gas Supply Prices (Cols C & D):	ICF International; April 2011	
Transportation Tolls (Cols E & F):	Tolls in effect on Alternative Routes at the time of Union's Analysis (TCPL March 2011 Approved Interim Tolls)	
Fuel Ratios (Col G):	Average ratio over the previous 12 months or Pipeline Forecast	
Foreign Exchange (Col K)	$1 US =	$0.962 CDN
Energy Conversions (Col K)	1 dth = 1 mmBtu =	1.055056
Union's Analysis Completed:	May-11	

* Indicates path referenced in evidence for this analysis

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit A, Tab 4, Schedule 2 & EB-2012-0087 Exhibit B7.7

Please update for 2012 planned and actual and present the IRR Exhibit B7.7 from EB-2012-0087.

Response:

Please see attached. Attachment 1 shows that there was no planned UDC on the South Union upstream transportation portfolio (Column 'N'). Attachment 2 shows the actual UDC as a percentage of the total capacity for a given route (Column 'D') and the percentage of the total capacity that was optimized (Column 'F').

EB-2012-0087 Response to B7.7
Updated for 2013

Route	Point of Supply	Basis Differential $US/mmBtu	Supply Cost $US/mmBtu	Unitized Demand Charge $US/mmBtu	Commodity Charge $US/mmBtu	Fuel Charge $US/mmBtu	100% LF Transportation Inclusive of Fuel $US/mmBtu	Landed Cost $US/mmBtu	**Landed Cost $Cdn/Gj**	Point of Delivery	*Planned Percentage of Supply Portfolio*	*Planned UDC as a Percentage of Route Total*
(A)	(B)	(C)	(D) = Nymex + C	(E)	(F)	(G)	(I) = E + F + G	(J) = D + I	**(K)**	(L)	(M)	(N)
Dawn	Dawn	0.245	3.9160	0.0000	0.0000	0.0000	0.0000	$3.92	**$ 3.72**	Dawn	*6.9%*	*0%*
PEPL (2012-2013)	Panhandle Field Zone	-0.175	3.4960	0.2249	0.0441	0.1940	0.4630	$3.96	**$ 3.76**	Ojibway	*4.1%*	*0%*
Vector (2012-2013)	Chicago	0.084	3.7542	0.1800	0.0018	0.0420	0.2238	$3.98	**$ 3.78**	Dawn	*3.5%*	*0%*
Trunkline/Panhandle	Trunkline Field Zone 1A	-0.040	3.6308	0.1900	0.0248	0.1391	0.3538	$3.98	**$ 3.79**	Ojibway	*6.8%*	*0%*
Vector	Chicago	0.084	3.7542	0.2500	0.0018	0.0420	0.2938	$4.05	**$ 3.85**	Dawn	*22.0%*	*0%*
TCPL Niagara	Niagara	0.266	3.9369	0.1329	0.0000	0.0000	0.1329	$4.07	**$ 3.87**	Kirkwall	*6.9%*	*0%*
Panhandle Longhaul	Panhandle Field Zone	-0.175	3.4960	0.4251	0.0441	0.1940	0.6632	$4.16	**$ 3.95**	Ojibway	*8.5%*	*0%*
Alliance/Vector	CREC	-0.400	3.2704	1.7275	-0.2875	0.1874	1.6275	$4.90	**$ 4.66**	Dawn	*28.2%*	*0%*
TCPL SWDA (1)	Empress	-0.520	3.1503	1.8638	0.1276	0.0539	2.0453	$5.20	**$ 4.94**	Dawn	*0.0%*	*0%*
TCPL CDA	*Empress*	*-0.520*	*3.1503*	*2.2083*	*0.1512*	*0.0539*	*2.4134*	*$5.56*	***$ 5.29***	*Union CDA*	*13.1%*	*0%*
TOTAL											*100.0%*	

(1) For reference only

Sources for Assumptions:

Gas Supply Prices (Col D): ICE Settlement Data; July 31, 2012

Fuel Ratios (Col G): Average ratio over the previous 12 months or Pipeline Forecast

Transportation Tolls (Cols E & F): Tolls in effect on Alternative Routes at the time of Union's Analysis (TCPL 2012 Approved Interim Tolls)

Foreign Exchange (Col K) $1 US = $1.003 CDN From Bank of Canada Closing Rate July 31, 2012

Energy Conversions (Col K) 1 dth = 1 mmBtu = 1.055056

Union's Analysis Completed: Aug-12

* Indicates path referenced in evidence for this analysis

EB-2012-0087 Response to B7.7
Updated for 2013

Route	Point of Supply	Point of Delivery	*Actual Reduced Gas Supply Purchases as a Percentage of Route Total (%)*	*Actual Percentage Used for Optimization (%)*	*Amount of Short-Term Transportation and Exchange Revenue ($000s Cdn)*		*Amount of S&T Transportation and Exchange Revenue in Rates ($Cdn)*
(A)	(B)	(C)	*(D)*	*(E)*	*(F)*		*(G)*
Dawn	Dawn	Dawn	*30%*	*n/a*	n/a		NOTE 1
Trunkline/Panhandle	Trunkline Field Zone 1A	Ojibway	*38%*	*51%*	57		
Vector	Chicago	Dawn	*16%*	*0%*	0		
TCPL Niagara	Niagara	Kirkwall		*0%*	0		
Panhandle Longhaul	Panhandle Field Zone	Ojibway	*33%*	*0%*	0		
Alliance/Vector	CREC	Dawn		*0%*	0		
TCPL SWDA (1)	Empress	Dawn		*n/a*	n/a		
TCPL Union CDA	Empress	Union CDA		96% (3)	18,493	(2)	

Sources for Assumptions:

Energy Conversions (Col K) 1 dth = 1 mmBtu = 1.055056

Union's Analysis Completed: Jul 2013

Note 1 Embedded in rates is a level of transportation and exchange revenue of $11.4 million. This figure cannot be broken out between transportation and exchanges or by transportation path.

Footnotes

(1) not a contract in Union's portfolio

(2) approximation

(3) All supplies for Empress-Parkway contract continued to be purchased at Empress. All supplies were transported to Union's markets.

In the winter, supplies not delivered to Parkway were primarily delivered to Union's northern markets, depending on the month, weather, and market factors. Since the supplies did not arrive at Parkway and it generated RAM credits, the revenue was included as optimization.

In the summer, supplies not delivered to Parkway were delivered primarily to Dawn. Since the supplies did not arrive at Parkway and it generated RAM credits, the revenue was included as optimization.

This level of optimization is dependent upon TCPL's RAM program.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 1, page 1 of 39

Preamble: Union's proposed treatment is consistent with the treatment of upstream transportation exchange revenue for 2008, 2009 and 2010 and the IRM Settlement Agreement.

Please provide by specific reference, the Board's determination in EB-2012-0087 that speaks to the consistency of Union's proposed treatment with the IRM Settlement Agreement.

Response:

There are no specific references.

Filed: 2013-07-24
EB-2013-0109
Exhibit D8.14

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 1, page 2 of 39 and EB-2010-0210 Exhibit J3.6, J7.3

Please update to April 2013 and present Undertaking J3.6.

Response:

Please see Attachment 1. No annual assignments have been completed since October, 2011.

Capacity Assignments*
Exhibit J3.6 (EB-2011-0210) Updated to April, 2013
gj/d

Line No.	Receipt Point	Delivery Area		Winter 07/08 Nov '07	Dec '07	Jan '08	Feb '08	Mar '08	Summer '08 Apr '08	May '08	June '08	Jul '08	Aug '08	Sept '08	Oct '08
1	Empress	Eastern Zone	TOTAL	-	35,000	35,000	35,000	35,000	65,753	80,753	60,753	60,753	60,753	65,753	65,753
2			Monthly		35,000	35,000	35,000	35,000	13,000	28,000	8,000	8,000	8,000	13,000	13,000
3			Seasonal						52,753	52,753	52,753	52,753	52,753	52,753	52,753
4	Empress	Northern Zone	TOTAL	-	-	-	-	-	5,000	5,000	5,000	5,000	5,000	5,000	5,000
5			Seasonal						5,000	5,000	5,000	5,000	5,000	5,000	5,000
6	Empress	Western Zone	TOTAL	-	-	-	-	-	-	-	-	12,000	12,000	8,000	5,000
7			Monthly									12,000	12,000	8,000	5,000

Line No.	Receipt Point	Delivery Area		Winter 08/09 Nov '08	Dec '08	Jan '09	Feb '09	Mar '09	Summer '09 Apr '09	May '09	June '09	Jul '09	Aug '09	Sept '09	Oct '09
8	Empress	Eastern Zone	TOTAL	28,000	48,000	48,000	48,000	48,000	77,556	97,556	97,556	108,556	108,556	108,556	97,556
9			Monthly		20,000	20,000	20,000	20,000	9,556	29,556	29,556	40,556	40,556	40,556	29,556
10			Seasonal						40,000	40,000	40,000	40,000	40,000	40,000	40,000
11			Annual	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000
12	Empress	Northern Zone	TOTAL	8,000	8,000	8,000	8,000	8,000	-	-	-	-	40,000	-	30,000
13			UDC										40,000		30,000
14			Seasonal	8,000	8,000	8,000	8,000	8,000							
15	Empress	Western Zone	TOTAL	-	-	-	-	-	-	-	-	-	-	-	20,000
16			UDC	-	-	-	-	-	-	-	-	-	-	-	20,000

Line No.	Receipt Point	Delivery Area		Winter 09/10 Nov '09	Dec '09	Jan '10	Feb '10	Mar '10	Summer '10 Apr '10	May '10	June '10	Jul '10	Aug '10	Sept '10	Oct '10
17	Empress	Eastern Zone	TOTAL	80,000	80,000	80,000	80,000	80,000	92,832	92,832	92,832	92,832	92,832	92,832	92,832
18			Seasonal	20,000	20,000	20,000	20,000	20,000	32,832	32,832	32,832	32,832	32,832	32,832	32,832
19			Annual	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
20	Empress	Northern Zone	TOTAL	20,062	20,062	-	-	-	-	30,000	40,000	40,000	40,000	40,000	20,000
21			UDC							30,000	40,000	40,000	40,000	40,000	20,000
22			Monthly	20,062	20,062										
23	Empress	Western Zone		-	-	-	-	-	-	-	-	-	-	-	-

Line No.	Receipt Point	Delivery Area		Winter 10/11 Nov '10	Dec '10	Jan '11	Feb '11	Mar '11	Summer 11 Apr '11	May '11	June '11	July '11	Aug '11	Sept '11	Oct '11
24	Empress	Eastern Zone	TOTAL	60,000	60,000	60,000	60,000	60,000	60,000	96,796	110,000	110,000	110,000	110,000	110,000
25			Monthly							36,796	50,000	50,000	50,000	50,000	50,000
26			Annual	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
27	Empress	Northern Zone	TOTAL	-	-	-	-	-	40,000	40,000	49,000	49,000	49,000	49,000	49,000
			UDC							5,000					
28			Monthly						40,000	35,000	49,000	49,000	49,000	49,000	49,000
29	Empress	Western Zone	TOTAL	-	-	-	-	-	-	-	-	-	-	-	-

Line No.	Receipt Point	Delivery Area		Winter 11/12 Nov '11	Dec '11	Jan '12	Feb '12	Mar '12	Summer 12 Apr '12	May '12	June '12	July '12	Aug '12	Sept '12	Oct '12
30	Empress	Eastern Zone	TOTAL	74,796	60,000	60,000	60,000	80,000	117,796	117,796	117,796	117,796	117,796	117,796	117,796
31			Monthly	74,796	60,000	60,000	60,000	80,000							
32			Seasonal						117,796	117,796	117,796	117,796	117,796	117,796	117,796
33	Empress	Northern Zone	TOTAL	-	-	-	-	-	42,000	50,500	50,500	50,500	50,500	50,500	42,000
			UDC							2,000	2,000	2,000	2,000	2,000	2,000
34			Monthly							8,500	8,500	8,500	8,500	8,500	
35			Seasonal						40,000	40,000	40,000	40,000	40,000	40,000	40,000
36	Empress	Western Zone	TOTAL	-	-	-	-	33,340	30,000	33,430	33,430	33,430	33,430	33,430	33,430
37			UDC	-	-	-	-	33,340	30,000	33,430	33,430	33,430	33,430	33,430	33,430

Line No.	Receipt Point	Delivery Area		Winter 12/13 Nov '12	Dec '12	Jan '13	Feb '13	Mar '13	Summer 13 Apr '13
30	Empress	Eastern Zone	TOTAL	70,000	70,000	73,796	73,796	75,796	40,000
31			Monthly	70,000	70,000	73,796	73,796	75,796	40,000
32			Seasonal						
33	Empress	Northern Zone	TOTAL	-		-	-	-	
34			Monthly						
35			Seasonal						
36	Empress	Western Zone	TOTAL	-	-	-	-	-	

* not including capacity assignments to Union's franchise customers

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 1, page 2 of 39 and EB-2010-0210 Exhibit J3.6, J7.3

Please update and present Exhibit J7.3 for 2012

Response:

Please see Attachment 1.

Empress - Parkway (CDA) Capacity Assignments for 2012

Updated Exhibit J7.3 (EB-2011-0210)

	Redelivery Point				Net Proceeds*
GJ/d	WDA	NDA	SWDA (Dawn)	TOTAL	($000's)
Jan-12	30,000	28,000		58,000	$ 1,166
Feb-12	30,000	28,000		58,000	$ 1,209
Mar-12	20,000	28,000	10,000	58,000	$ 1,345
Apr-12			69,000	69,000	$ 1,686
May-12			69,000	69,000	$ 1,742
Jun-12			69,000	69,000	$ 1,686
Jul-12			69,000	69,000	$ 1,742
Aug-12			69,000	69,000	$ 1,742
Sep-12			69,000	69,000	$ 1,686
Oct-12			69,000	69,000	$ 1,742
Nov-12			61,204	61,204	$ 1,249
Dec-12	10,000	31,204	20,000	61,204	$ 1,291

* Net proceeds represent net revenue from capacity release/exchange transaction, less incremental costs incurred as a result of the transaction.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 1, page 2 of 39 and EB-2010-0210 Exhibit J3.6, J7.3

Please provide the same type of undertaking in Exhibit 7.3 for the Eastern Delivery Area providing both 2011 and 2012 figures.

a) For each EDA assignment, please provide the specified locations, by month, that the counter-party was obligated to deliver.

Response:

a) Please see Attachment 1 and 2.

Empress-Eastern Zone (EDA) Capacity Assignments for 2011
Updated Exhibit J7.3 (EB-2011-0210) for EDA

	a	b	c	d	e
	Redelivery Point (GJ/d)				**Net Proceeds***
	WDA	**NDA**	**SWDA**	**TOTAL**	**($000's)**
GJ/d			(Dawn)		
Jan-11	10,000	10,000	-	20,000	$ 176
Feb-11	10,000	10,000	-	20,000	$ 115
Mar-11	10,000	10,000	-	20,000	$ 197
Apr-11	-	-	20,000	20,000	$ 191
May-11	-	-	20,000	20,000	$ 204
Jun-11	-	-	33,000	33,000	$ 370
Jul-11	-	-	33,000	33,000	$ 382
Aug-11	-	-	33,000	33,000	$ 388
Sep-11	-	-	33,000	33,000	$ 376
Oct-11	-	-	33,000	33,000	$ 376
Nov-11	-	-	-	-	$ -
Dec-11	-	-	-	-	$ -

* Net proceeds represent net revenue from capacity release/exchange transaction, less incremental costs incurred as a result of the transaction.

Empress -Eastern Zone (EDA) Capacity Assignments for 2012
Updated Exhibit J7.3 (EB-2011-0210) for EDA

	a	b	c	d	e
	Redelivery Point				**Net Proceeds***
	WDA	**NDA**	**SWDA**	**TOTAL**	**($000's)**
GJ/d			(Dawn)		
Jan-12	-	-	-	-	$ -
Feb-12	-	-	-	-	$ -
Mar-12	-	-	20,000	20,000	$ 668
Apr-12	-	-	40,000	40,000	$ 953
May-12	-	-	40,000	40,000	$ 990
Jun-12	-	-	40,000	40,000	$ 956
Jul-12	-	-	40,000	40,000	$ 982
Aug-12	-	-	40,000	40,000	$ 990
Sep-12	-	-	40,000	40,000	$ 960
Oct-12	-	-	40,000	40,000	$ 987
Nov-12	-	-	-	-	$ -
Dec-12	-	-	-	-	$ -

* Net proceeds represent net revenue from capacity release/exchange transaction, less incremental costs incurred as a result of the transaction.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 1, page 5 of 39, Table 1

Taking into account impact of ESM and potential other dispersals (in the Board ordered treatment), please summarize Union's proposed treatment versus the Board-ordered treatment of FT-RAM by providing:

a) Gross revenue to shareholders

b) Gross revenue to ratepayers

Response:

a) and b)

	Proposed Treatment	Treatment per EB-2012-0087
	(Millions)	
a) Revenue to shareholders	$21.6	$4.3
b) Revenue to ratepayers	$15.7	$33.0
Total	$37.3	$37.3

Note: Shareholder portion includes revenue to cover applicable fuel costs.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 1, Page 22 of 39

Please confirm that DOS-MN was provided as a point-to-point service in addition to keeping the FT demand right in the original contract.

a) Please confirm that DOS-MN had no demand charge.

b) Please confirm that all of the original demand rights to the original delivery location were maintained when DOS-MN was elected.

c) As a result, what ratepayer risk was created through the election of DOS-MN?

Response:

Confirmed.

a) Confirmed.

b) Confirmed.

c) There were no ratepayer risks created through the election of DOS-MN.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 1, Page 22 of 39

Please confirm that the AOS was provided as an interruptible service in addition to keeping the FT demand right in the original contract.

a) Please confirm that AOS had no demand charge.

b) Please confirm that all of the original demand rights to the original delivery location were maintained when AOS was elected.

c) As a result, what ratepayer risk was created through the election of the AOS service?

Response:

Confirmed.

a) Confirmed.

b) Confirmed.

c) There was no ratepayer risk created through the election of the AOS.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 1, Page 32 of 39, Table 4

Using the same table, for each of the years, please provide the total deferral account dispositions using Union's proposed treatment versus the Board-ordered treatment of FT-RAM by providing:

a) Gross revenue to shareholders

b) Gross revenue to ratepayers

Response:

a) and b) Please see D8.17 for the table for 2012, restating information for prior years is not appropriate.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 1 of 82

Please provide all internal emails, memos or other communication including presentations to Union's senior management or Board of directors that were generated by Union staff in reviewing the Preliminary Issue in EB-2012-0087 and contributed to the decision to submit evidence that did not follow the Board's directives in that case.

Response:

This is not an appropriate interrogatory. It is seeking information regarding the development of Union's position in this case, rather than clarification of the evidence filed.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 28 of 82

Please provide all internal studies, memos, emails or other company internal company correspondence that resulted in the termination of annual assignments of firm transportation rights.

Response:

Union does not have any correspondence that resulted in the termination of annual assignments of firm upstream transportation capacity. After two trial years of annual assignments, these arrangements have not been repeated since October, 2011 due to overall risks. For example, S&T did not have reasonable assurance that the temporary surplus transaction quantity would be available for the entire term, or that the FT-RAM program would continue for the transaction duration.

Please also refer to Exhibit B, Tab 2, page 71 to 72 and Exhibit D1.7.

Filed: 2013-07-24
EB-2013-0109
Exhibit D8.23

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 28 of 82

Please provide details for all exchanges or assignments that required action by S&T to support delivery requirements.

Response:

Please see response to Exhibit D1.6 a).

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 29 of 82

Please provide the STS credit level on a monthly basis during the IR term.

Response:

Please see Attachment 1.

Union is eligible to earn STS credits on unused STS capacity in the winter for EDA capacity (STS withdrawals) and in the summer for NDA and WDA capacity (STS injections). To qualify for the credits in each delivery area, TCPL tracks the running balance of injections vs. withdrawals for each delivery area since 2003 and the net balance must be positive for each delivery area (meaning that the total injections are greater than the total withdrawals for that delivery area).

In 2012, Union did not qualify to earn STS credits on the unused EDA STS capacity because the EDA STS balance was not positive as Union had withdrawn more supply than it had injected using its STS capacity since 2003.

STS RAM Credits

	2008	2009	2010	2011	2012
January	$ 159,274	$ 125,151	$ 226,493	$ 95,134	$ -
February	$ 160,552	$ 184,239	$ 231,468	$ 87,384	$ -
March	$ 193,599	$ 270,181	$ 381,296	$ 123,110	$ -
April	$ 50,679	$ 53,139	$ 40,273	$ 195,761	$ -
May	$ 31,428	$ 33,024	$ 228,803	$ 329,339	$ -
June	$ 19,367	$ 10,804	$ 294,315	$ 462,273	$ 53,641
July	$ 23,736	$ 8,167	$ 343,129	$ 481,751	$ 206,164
August	$ 19,388	$ 233,590	$ 348,676	$ 467,602	$ 188,507
September	$ 40,163	$ 13,791	$ 257,706	$ 400,834	$ 90,869
October	$ 32,745	$ 64,251	$ 118,664	$ 209,474	$ 7,455
November	$ 158,261	$ 241,023	$ 351,603	$ 250,385	$ -
December	$ 125,838	$ 182,436	$ 211,542	$ 179,514	$ -
TOTAL	$ 1,015,030	$ 1,419,795	$ 3,033,967	$ 3,282,560	$ 546,636

Filed: 2013-07-24
EB-2013-0109
Exhibit D8.25

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 40 of 82

Please provide the amount of spot gas bought at Dawn for storage fill by month during the summer of 2012.

Response:

Dawn delivered supplies are a component of Union South planned supplies every month of the year. In the summer of 2012, Union purchased 0.3 PJ in May, 0.3 PJ in June, and 0.5 PJ in September of Dawn delivered supply. Union normally refers to spot gas as gas that is required above the plan to meet incremental demands. There was no "spot" gas bought at Dawn in the summer of 2012.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 48 of 82

For each month of 2012, please provide the amount of FT-RAM used for LBA fees, the amount for exchange services and the resulting LBA fees, UDC assignment and resulting UDC fees.

Response:

Please see Attachment 1.

The stated request contains 5 specific items, which are described in the following attachment from Columns A through E.

Columns A and C both relate to LBA fees. Through the use of FT-RAM credits, Union was able to reduce LBA fees for utility customers by $665,000. The LBA fees that remained in 2012 were $613,000.

Utility customers also benefitted from the FT-RAM program through the incremental value it brought to UDC assignments. When Union released TCPL transportation capacity for purposes of mitigating system supply length (UDC), customers benefitted from the enhanced value this capacity had due to the associated FT-RAM credits. The total value of the UDC assignments in 2012 for TCPL capacity was $6.7 million (Column D). UDC costs that were incurred and could not be mitigated for Union North customers was approximately $3.0 million (Column E).

Column B represents FT-RAM credits used by the S&T Group for transportation exchanges. It does not represent the revenue generated from applying these credits. The revenue generated from these credits was $5.5 million, as shown in Exhibit B, Tab 2, Page 9, Table 1, lines 4 & 5.

2012

($000's)	A Utility Use of FT-RAM LBA	B FT-RAM credits related to Transportation Exchanges	C Actual LBA Fees	D Utility Use of FT-RAM UDC Assignments	E UDC Costs Incurred (North)
Jan	$ 57	$ 776	$ 86	$ -	$ -
Feb	$ 106	$ 794	$ 47	$ -	$ -
Mar	$ 87	$ 1,215	$ 24	$ 913	$ 185
Apr	$ 57	$ 341	$ 7	$ 855	$ 151
May	$ 25	$ 729	$ 30	$ 936	$ 368
Jun	$ 58	$ 725	$ 99	$ 710	$ 552
Jul	$ 62	$ 447	$ 24	$ 758	$ 521
Aug	$ 36	$ 413	$ 26	$ 1,115	$ 164
Sep	$ 21	$ 404	$ 23	$ 923	$ 356
Oct	$ 12	$ 776	$ 12	$ 541	$ 738
Nov	$ 83	$ 701	$ 189	$ -	$ -
Dec	$ 61	$ 753	$ 46	$ -	$ -
TOTAL	$ 665	$ 8,074	$ 613	$ 6,751	$ 3,034

Column A - FT-RAM credits that were used to reduce LBA fees on behalf of utility customers.
Column B - FT-RAM credits used by S&T for transportation exchanges (FT-RAM related). It does not represent the revenue generated from applying these credits.
Column C - Represents actual LBA fees remaining after FT-RAM credits were applied.
Column D - Proceeds from UDC assignments of TCPL capacity due to system supply length. Since this capacity is FT-RAM eligible, its value is enhanced on the secondary market.
Column E - Actual UDC costs that could not be mitigated.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 53-54 of 82 and Table 5

Please provide the additional gas that could have been delivered to Dawn if the surplus FT-RAM credits in Table 5 were used to buy additional Empress to Dawn capacity?

Response:

Effective July 1, 2013 the FT-RAM program was discontinued by TCPL. Generating surplus FT- RAM credits to buy incremental Empress to Dawn capacity is not currently an option for Union.

In 2012, Union did not require incremental supply at Empress since Union had 24.4 PJ of excess supply due primarily to warmer than normal weather.

Table 5 filed at Exhibit B, Tab 2, page 54 is replicated below. Union indicated that there were surplus FT-RAM credits of $0.36 for every GJ of Empress to Union EDA gas that flowed on an interruptible basis (IT) to Dawn.

Table 5
Creation and Use of FT-RAM Credits

	$/GJ
FT-RAM credits generated on full Empress to Union EDA path	$2.32
FT-RAM credits used to offset incremental costs of interruptible transport of supply from Empress to Dawn	($1.96)
Surplus FT-RAM credits, representing temporarily surplus portion of Empress to Union EDA path distance	$0.36

If Union were to flow additional supply to Dawn using IT from Empress, and considering the credit value of $0.36 for each GJ, Union could flow 0.2 PJ of additional supply for every 1.0 PJ that was flowed as IT rather than FT from Empress to Dawn ($0.36 divided by $1.96, rounded).

During April to October of 2012, Union flowed an average of 12,598 GJ/d of Empress to Union EDA gas supply as IT to Dawn rather than FT to the Union EDA. Therefore, Union could have flowed 2,520 GJ/d of additional gas supply (0.2 x 12,598) using "surplus FT-RAM credits".

The savings related to purchasing additional supply at Empress and replacing Dawn supply is approximately $0.35 million based on the average Empress to Dawn spread for the April to October 2012 timeframe. The revenue generated by S&T transactions during this timeframe using these credits was $1.4 million. Under Union's earnings sharing proposal, the benefit to rate payers using surplus FT-RAM to generate S&T revenue is $0.9 million greater than using surplus FT-RAM benefits to reduce gas costs (based on 90% earnings sharing).

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 67 of 82 lines 5 to 7

Preamble: Union's evidence states:"Second, S&T provides a transportation exchange service, where gas is provided to the S&T Customer at Empress and the S&T Customer provides gas to Union at the Union NDA on a firm basis".

How does Union verify that the gas is delivered on a firm basis (i.e., does Union require proof of underpinning firm contracts)?

Response:

When a counterparty signs Union's exchange contract they contractually agree to provide firm deliveries to Union, and there are penalties in place if the counterparty fails to meet their obligations. Union does not require proof of underpinning contracts.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 2, Page 70 of 82 lines 8 to 15

Does Union not have contractual provisions that would hold the counter-party responsible for these costs?

Response:

Yes, the transportation exchange contract contains provisions that hold the counterparty responsible for any costs incurred due to a delivery shortfall.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 3, Page 21

Do Union North customers get allocated any of the TCPL CDA demand charges? If so, how are these costs allocated?

Response:

No, Union North customers do not get allocated any of the TCPL Empress-Union CDA demand charges.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 3, Page 40

Does Union's concern about availability apply to delivery areas west of North Bay?

a) If so, what evidence does Union have regarding lack of availability in those areas?

Response:

The referenced evidence at Exhibit B, Tab 3, page 40 refers to availability of STFT service on TCPL.

Union does have concern about the availability of firm services for delivery areas both west and east of North Bay. This concern arises from the following recent market developments, impacting both FT and STFT service:

- On June 12, 2013, TCPL revised its Daily FT open season for firm, non-renewable transport capacity. This open season outlined TCPL delivery areas where firm transportation, non-renewable (FT-NR) capacity will only be available until November 2015. The existing capacity is only being offered until TCPL takes a line out of service to convert to oil. When this capacity conversion occurs, there is a significant amount of capacity that is removed from the market, including this capacity that is being offered on a temporary basis only.

- TCPL held a binding open season (dated May 13, 2013 - June 13, 2013) to support a conversion of a large portion of the Mainline natural gas capacity to an oil pipeline. TCPL has stated that:

  - "After the transfer, there will continue to be sufficient capacity to meet current firm transportation requirements on the vast majority of the Mainline. However, current firm requirements exceed the capacity that would be available after the transfer by approximately 300 TJ/d to the Union EDA and export points east of and including Iroquois."[1]

  In addition to the firm capacity that will be taken out of service, a portion of capacity that is used today to provide IT and STFT service will no longer be available after the conversion. For Union's in-franchise customers, this will primarily affect the Union EDA.

[1] TransCanada Pipelines Ltd. Non-Critical Notice issued April 2, 2013

- Union has observed that STFT capacity has not been available for contracting into the Union SSMDA since summer, 2012.

In addition to concerns regarding service availability, Union is also extremely concerned about price certainty for the STFT service as was described at Exhibit B, Tab 3 pages 41 and 42. On July 9, 2013, TCPL posted its Canadian Mainline Winter 2013/2014 Open Season for winter (5 month) STFT and ST-SN (Short-Term, Short-Notice) capacity. The minimum floor bid price for winter STFT is stated as between 230% and 290% of the TCPL FT toll. Parties are invited to bid prices higher than these floor prices to try and secure capacity.

Further, on July 16, 2013, TCPL posted its Canadian Mainline Winter 2013/2014 Open Season for monthly STFT and ST-SN capacity. The minimum floor bid price for this monthly winter STFT is stated as 1200% of the TCPL FT toll for all paths. The cost of one month of STFT at the toll of 1200% is exactly the same as paying for FT for the entire year. Again, these are the minimum bid floor prices and higher prices may be required to secure the capacity required.

This would mean that for most paths the total demand charge for twelve (12) months of FT capacity is equal to or less than the total demand charge for the equivalent amount of seasonal (5 months) or monthly STFT capacity.

In a recent letter to the OEB, Enbridge (Attachment 1) has also expressed concern with the price of STFT service, and as a result is seeking to convert winter STFT service to annual FT service for purposes of system reliability.

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July 12, 2013

VIA RESS Email and COURIER

Ms Kirsten Walli
Board Secretary
Ontario Energy Board
2300 Yonge Street, Suite 2700
Toronto, Ontario, M4P 1E4

Dear Ms Walli:

Re: Enbridge Gas Distribution Inc. ("Enbridge")
EB-2010-0231 – System Reliability

The Ontario Energy Board Decision and Order in the EB-2010-0231 proceeding accepted the Settlement Agreement which set out the terms of a long term resolution of the System Reliability issue. Included in that Settlement Agreement was an assignment of short haul transportation capacity to agents for mass market customers and a replacement of that capacity with Short Term Firm Transportation ("STFT").

The Settlement Agreement also identified that in the event of a material change in circumstances that affected either security of supply to Enbridge's franchise area and/or the long term resolution that Enbridge would notify parties to the Settlement Agreement.

Enbridge would like to notify the Board and interested parties that there is a change to the long term resolution of the Settlement Agreement. Enbridge plans to acquire one year of TCPL FT capacity effective November 1, 2013 instead of acquiring five months of STFT.

On July 9, 2013 TCPL posted its Canadian Mainline Winter 2013/2014 Open Season for STFT and ST-SN. Enbridge has reviewed the TCPL Open Season for STFT for the winter period November 2013 to March 2014 and the associated prices for that service. The minimum floor bid price for winter STFT is 290% of the TCPL FT toll. The open season will close on Monday, July 15, 2013 @ 8:00 MDT.

The current Empress to CDA FT toll on TCPL is $1.5659/gj which would mean that the STFT toll will be $4.5411/gj. The impact of the higher toll would mean that Enbridge would have to pay approximately $4.5 million more on an annual basis if it were to acquire 5 months of STFT as opposed to 12 months of FT. Enbridge believes that it is in the best interests of our customers to acquire the FT transportation at a reduced cost which will still allow Enbridge to satisfy its ability to have firm transportation throughout the winter months to meet the demands of its customers.

Due to the time sensitive nature of the Open Season Enbridge plans to proceed and bid for TCPL FT capacity effective November 1, 2013.

Please do not hesitate to contact me with any questions.

Yours Truly

[original signed]

Norm Ryckman
Director, Regulatory Affairs

cc: EB-2010-0231 and EB-2012-0459 Interested Parties

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 4

Please detail the current status of the FT-RAM net revenues:

a) For 2012.
b) For 2011.

Response:

a) The treatment of 2012 net FT-RAM revenue is the subject of the current proceeding. The proposed method and timing of 2012 deferral account balances and earnings sharing disposition is detailed in Exhibit A, Tab 3, page 7, beginning at line 9.

b) The 2011 net FT-RAM revenue was included in deferral account 179-130 in accordance with the Board's EB-2012-0087 Decisions. The disposition of 2011 deferral account balances and earnings sharing is set out in the EB-2012-0087 Rate Order, which had an effective date of April 1, 2013.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 4

If the Board rejects Union's proposal to overturn the Board's decision in EB-2012-0087, please detail Union's proposed dispositions:

a) of 2012 net revenues?

b) of 2011 net revenues?

Response:

a) Please see Exhibit A, Tab 1, Appendix B, Schedules 1 to 3.

b) The disposition of 2011 net FT-RAM revenue would be unaffected by such a decision.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 4, page 2, lines 11 to 15

What principle(s) underlies the determination that Dawn-Parkway exchange revenues should not be included in optimizations as decided by the Board in EB-2010-0130?

Response:

Prior to the EB-2011-0210 decision, revenues from exchanges and stand alone Dawn-Parkway transportation were treated similarly. Therefore, prior to 2013, Union did not distinguish the component of exchange revenue that related specifically to the use of Union's Dawn-Parkway system.

As a result of the Board's decision in EB-2011-0210, the Gas Supply Optimization Variance Account was established with the intent to capture net revenues related to gas supply optimization activities. In the EB-2011-0210 Decision and Order the Board defined optimization as:

> *any market-based opportunity to extract value from the upstream supply portfolio held by Union to serve in-franchise bundled customers, including, but not limited to, all FT-RAM activities and exchanges*.[1]

As a result of this Decision, in 2013 Union began tracking Dawn-Parkway revenue related to exchanges separate from revenue related to upstream transportation optimization. Since Union's Dawn to Parkway transportation is not part of the upstream transportation portfolio, nor is it a pass-through cost, it should be excluded from the optimization deferral when used to facilitate an exchange transaction.

In addition, from a commercial perspective, such treatment preserves Union's indifference as to whether Dawn-Parkway capacity is sold as transportation or if it is used to support an exchange service. This allows Union to best utilize this capacity to meet market opportunities as they develop and change over time.

[1] EB-2011-0210 Decision and Order, October 24, 2012. Page 39

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 4, page 3,. lines 14 to 16

What principle underlies the determination of which type of customers realize the benefit?

a) Why would that principle not be a relevant consideration for who benefits from optimization transactions?

Response:

a) The principle underlying the alternative gas cost deferral treatment of net FT-RAM revenue described at lines 14-16 is cost causality.

In EB-2012-0087, the Board determined that net FT-RAM revenue should be treated as gas cost reductions and tracked in the Upstream Transportation FT-RAM Optimization Deferral Account (179-130). In accordance with the Board's Decision, Union allocated and disposed of the balance in account 179-130 to the customers for whom Union holds TCPL transportation capacity and provides the upstream transportation service.

The portion of the deferral account balance related to Union North was allocated to sales service and bundled direct purchase customers in each rate class in proportion to the allocation of 2007 Board-approved TCPL FT transportation demand costs. The portion of the deferral account balance related to Union South was applicable to sales service customers only, and accordingly was allocated to Union South sales service customers based on sales service volumes. The Board approved Union's allocation methodology for the Upstream Transportation FT-RAM Optimization Deferral Account in the EB-2012-0087 Decision and Rate Order.

For the reasons described in Exhibit B, Tab 1, Union believes the net FT-RAM revenue should be treated as utility revenue subject to earnings sharing pursuant to the EB-2007-0606 and EB-2009-0101 Settlement Agreements for Union's 2008-2012 IRM.

Filed: 2013-07-24
EB-2013-0109
Exhibit D8.36

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit B, Tab 4, page 4, lines 11 to 13

What was the purpose of the previewed presentation to the customer groups?

a) What criteria were used to choose the groups?

Response:

The purpose of the presentation was to help customer groups understand 1) Union's proposed treatment of 2012 net FT-RAM revenue, 2) the 2012 deferral account balances and earnings sharing amount both under Union's proposed treatment and the EB-2012-0087 alternative treatment, and 3) estimated rate class and bill impacts under each of Union's proposed treatment and the EB-2012-0087 alternative treatment of 2012 net FT-RAM revenue.

a) Union presented to the customer groups for whom the overall positive impacts of Union's proposed treatment versus the EB-2012-0087 alternative treatment could be substantial, and absent the presentations, may not be aware of the impacts.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit C, Tab 2, page 19

Did Sussex compare predicted 0 HDD from analysis on page 19 to summer volumes from NCDA?

a) If not, could Union please provide the comparison to validate the assumptions?

Response:

Sussex did not compare predicted 0 HDD to Summer volumes in the NCDA.

a) Union does not use planned consumption at 0 HDD in relation to design day planning.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit C, Tab 2, page 19

Preamble: The Sussex report indicates other utilities removed base load to develop the predicted Design Day.

In the view of Sussex, would the removal of base load provide a more accurate projection of Design Day flows?

a) Did Union Gas remove base load to develop the predicted Design Day?

b) If not, did Sussex do the analysis to compare the impact?

c) Has Union compared the results of removing base load?

   i. Please provide the results of the comparison.

Response:

The following response was provided by Sussex Economic Advisors:

In the Sussex benchmarking analysis attached as Appendix C to the Sussex report, 1 local distribution company ("LDC") out of the 21 reviewed removed base load volumes as part of the design day demand forecast. Based on our review of the design day demand practices of other local distribution companies and our gas supply experience in general, the approach to design day demand forecasting is usually specific to the individual LDC's circumstances and as such the inclusion or exclusion of base load volume is unique to that LDC and either approach has merit.

a) No, Union does not remove "base load" when calculating the impact of the design day temperature.

b) The following response was provided by Sussex Economic Advisors:

   Sussex did not perform the requested analysis.

c) Union has not compared the results of removing "base load" with its current practice.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit C, Tab 2, page 24

Please provide the impact of the recommendation to decrease design day heating degree days to 43.1 from 44 on:

a) the Gas Supply plan

b) on the Parkway obligation

c) on any major in-franchise projects.

Response:

a) Union notes the recommendation was to decrease design day heating degree days to 43.1 HDD for Union South. The impact of adopting this recommendation is a reduction to design day demands in Union South by less than 20 TJ/d.

   This change has no impact to the key inputs and assumptions in the current Gas Supply Plan, as follows:

   - In-franchise monthly demand forecast – no impact as forecast is based on weather normal demands, not design day demand.
   - In-franchise storage – no impact as the Aggregate Excess calculation is based on the monthly demand forecast.
   - Upstream transportation portfolio – no impact as South upstream portfolio is sized to meet monthly demand forecast.

   The reduction in demand would reduce the in-franchise demand requirement on the Dawn-Parkway system and would be captured in the next re-basing process.

b) There would be no impact on the Parkway obligation. The decrease in the design day heating degree day assumption from 44 HDD to 43.1 HDD only impacts the design day demand for heat sensitive customers. Parkway obligations are based on the weather normalized annual customer demand forecast, not design day demand.

c) The impact of a shift from 44 HDD to 43.1 HDD to Union South is very minor, and does not impact any major in-franchise projects.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit C, Tab 2, page 28, Table 4 and Tab 3, page 4

Preamble: The Northern Gas Supply calls for 57 TJ to be diverted from the south to meet North demand requirements.

Diversion costs are the costs related to out of path transportation service on TCPL and are assignable to Union North sales service and bundled direct purchase customers.

How does Union allocate the costs associated with these diversions? Please identify demand and commodity costs in the explanation?

a) What specifically is meant by out of path in the Concentric reference?

b) Does this approach capture the proposed 57TJ transfer?

Response:

There is no allocation of costs between Union North and Union South for this design day upstream diversion. Union South pays the full demand charge for the TCPL Empress-Union CDA contract on that day. Union South pays a reduced commodity charge on the day the gas flows to the NDA, than it would normally incur if the gas flowed all the way to the Union CDA on that day. The Gas Supply Plan has the Empress – Union CDA contract flowing at 100% load factor to meet the Union South annual demand requirement.

On the same day that the upstream diversion is scheduled Union withdraws an equivalent amount of gas from North allocated storage at Dawn and transports the gas from Dawn to the Union CDA. Union North customers pay for the cost of the TCPL Dawn-Union CDA transportation. Overall, there is no net impact from a volumetric perspective as demands are met at each location and gas flowed where required on that day.

On the day of the upstream diversion Union South customers land gas in the Union CDA at a slightly reduced cost than normally would be incurred on the day to flow the gas all the way from Empress to the Union CDA.

Union North customers pay for TCPL Dawn-Union CDA transportation capacity to facilitate the design day upstream diversion activity which is a lower cost to holding firm TCPL transport from Empress or Parkway to meet design day demand.

The use of this upstream diversion is an example of the efficiency built into the integrated gas supply portfolio. This Empress to Union CDA capacity is held as an asset to serve Union South annual needs, and is used on peak or design day to meet market requirements in Union North. Absent this efficiency, more firm transportation capacity would be needed to meet design day in Union North at a greater cost to Union North customers.

This response was provided by Concentric Energy Advisors:

a) Out of path diversion refers to the delivery of gas at a secondary delivery point and/or delivery area downstream of the primary delivery point or delivery area specified in the Company's transportation contract(s).

b) Based on the definition in part a), this is not applicable.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit C, Tab 2, page 31 and EB-2010-0210 Exhibit J7.3

In evaluating the plan, how did Sussex review the right sizing of Union's Gas Supply plan by delivery area? Please provide the specific results.

a) If Sussex has evaluated by area, please explain how a right-sized Gas Supply plan could allow an assignment of a Firm Transport contract in exchange for deliveries to upstream points on an annualized basis (see Exhibit J7.3).

Response:

The following responses were provided by Sussex Economic Advisors:

Sussex evaluated the appropriateness (i.e., size of the Union gas supply portfolio) for both Union North and Union South. In addition, for Union North the six Gas Supply Planning Areas (i.e., Manitoba Delivery Area, Western Delivery Area, Northern Delivery Area, Sault Ste. Marie Delivery Area, North Central Delivery Area and Eastern Delivery Area) were reviewed. Sussex reviewed the design day temperature, the design day demand and the Union gas supply resources to serve the forecasted requirement. Please see the table on P. 28 of the Sussex report for the comparison of design day demand to Union capacity and supply for the Union North Gas Supply Planning Areas.

a) Please refer to Exhibit D3.12.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: EB-2013-0109 Evidence and IRR's Related to Upstream Capacity Utilization

Preamble: Throughout the evidence and IRR's, Union has provided information on how it managed its upstream portfolio throughout the Incentive Regulation period. While aspects of how Gas Supply planned for meeting peak day deliveries and how Gas Control implemented the deliveries to Ontario are provided in the evidence, we believe that it would be helpful to summarize the volume of gas that was available to the respective delivery areas during the months of January. To simplify the exercise, please provide the days that were the highest and lowest in the respective months.

1) Please provide the highest and lowest daily deliveries available in the month of January to the respective delivery areas by completing the table in Attachment 1.

Response:

The Union EDA is part of the Union North operating area and aligns with a delivery area on the TCPL Mainline in Eastern Ontario. Union North delivery areas are physically separated from Union's Dawn storage and transmission pipeline assets. Therefore, Union EDA requires upstream transportation services to meet the winter design day demand requirement. The Union North gas supply portfolio ensures there is sufficient, but not excess, firm transportation services available to meet the design day demand requirement in the delivery area.

The requested quantities for Union EDA are provided in Attachment 1.

The Union CDA is a TCPL term for four stations: Bronte, Burlington, Hamilton Gate and Nanticoke. These stations form part of the Union South operating area. In Union South, the Dawn-Parkway system, other transmission systems within the franchise, utility storage assets, distribution assets and the upstream transportation portfolio are all required to meet the winter design day demand requirement. In the case of Union South, the upstream transportation

portfolio is designed to meet annual (rather than peak) demand requirements and flows on an average daily basis (annual demand divided by 365).

Accordingly, Union does not hold the TCPL Empress to Union CDA capacity to serve design day demands in the Union South. The TCPL Empress to Union CDA capacity is held as a resource to serve Union South annual needs, and is used on a design day to assist in meeting market requirements in the Union North (see EB-2013-0109, Exhibit D8.40). Design day demands in Union South are met through the combination of the assets noted above.

Since Union does not calculate the peak day demands and contractual requirements of Union CDA independent of Union South peak day demands and requirements, the requested information is not available.

January Highest and Lowest Daily Contractually Available Volumes (GJs)
2008-2012

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	**Year**	**Delivery Area**	**Calendar Day (1)**	**Peak Day Requirement (Design Day) (2)**	**Market Requirement**	**Contracted Daily Capacity as per Gas Supply Plan (3) (4)**	**Amount Released for Exchange or Assignment**	**Contractually Available Capacity (5)**
2								
3	2012	EDA - Highest	20-Jan	156,894	122,306	162,291	43,921	162,291
4		EDA - Lowest	31-Jan		58,269	162,291	66,046	162,291
5								-
6	2011	EDA - Highest	23-Jan	149,910	139,265	162,411	21,171	162,411
7		EDA - Lowest	01-Jan		44,731	162,411	35,545	162,411
8								-
9	2010	EDA - Highest	28-Jan	146,033	134,364	163,918	34,000	163,918
10		EDA - Lowest	24-Jan		52,148	163,918	34,000	163,918
11								-
12	2009	EDA - Highest	15-Jan	149,058	133,641	163,918	-	163,918
13		EDA - Lowest	27-Jan		77,224	163,918	20,000	163,918
14								-
15	2008	EDA - Highest	02-Jan	147,559	145,472	165,260	-	165,260
16		EDA - Lowest	11-Jan		48,870	165,260	-	165,260

(1) Highest/lowest day based on the highest/lowest nominated EDA market requirement.
(2) Peak Day Requirement is a single value for the entire year.
(3) Contracted Daily Capacity includes - FT Empress to Union EDA (net of assignments for infranchise customers),FT Parkway to Union EDA and STS Withdrawals.
(4) The Contracted Capacity shown includes full STS Withdrawal rights, which are pooled across Union North in order to efficiently serve design day requirements.
(5) Contractually available capacity equals Contracted Daily Capacity per Gas Supply Plan. System customers continue to have full access to contracted capacity since transactions completed by the S&T Group are interruptible or are met using incremental assets as required at the expense of S&T.

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

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Reference: Exhibit D9.3

Preamble: The interrogatory was seeking understanding of the nature of optimizations that were executed in 2012. While the detail was helpful in viewing the timing and term of the transaction, part iii) of the question requested the particular resource sold. The answers provided are generic and lack specificity.

2) Please provide the particular resource sold specified as:

a) Capacity Assignment (e.g., Empress to CDA capacity in exchange for deliveries at NDA)

b) Exchange (e.g., Empress to EDA exchange service)

Union can provide its own specific terminology that fits but we are trying to understand the type of optimization and the assets used for those purposes.

Response:

a) Please see Attachment 1.

b) To provide an FT-RAM transportation exchange service, the S&T Group utilizes any or all of the following resources: temporary surplus upstream transportation capacity, transportation on Union's system and purchased resources. For the FT-RAM exchanges completed in 2012, the resources used are provided in Attachment 2. Using line 5 as an example Union used its own Dawn-Parkway assets, temporary surplus upstream capacity on TCPL, as well as purchased TCPL services such as Interruptible Transportation or exchanges purchased from the secondary market.

In 2012, temporary surplus upstream transportation capacity that the S&T Group utilized included:

- TCPL Firm Transportation (FT):

  - Empress to Union CDA
  - Empress to Union EDA
  - Empress to Union NCDA
  - Empress to Union SSMDA
  - Empress to Union NDA
  - Empress to Union WDA
  - Empress to Centra MDA
  - Parkway to Union EDA
  - Dawn to Union CDA
- TCPL Storage Transportation Service (STS)

The Union transportation used as a resource for FT-RAM transactions in 2012 was Dawn-Parkway transportation.

In 2012 purchased resources used to provide FT-RAM exchange services included:

- TCPL Short Term Firm Transportation (STFT) - Union EDA to Iroquois
- TCPL Interruptible Transportation Services (IT)
- Firm Exchange Services from secondary market participants - Union SSMDA to Dawn

Union is unable to provide any further detail regarding which specific resource was used in each transaction. Union does not attach specific upstream transportation resources or purchased resources (interruptible transportation) to each exchange transaction, but rather utilizes the entire portfolio of upstream transportation and purchased resources to meet market demands, maximize the exchange services available, and minimize costs. In addition, as the reliability of discretionary services on TCPL changes, the use of specific upstream transportation service may also change through the term of any particular exchange. This portfolio approach often results in a daily change in use of the upstream transportation and purchased resource used to serve exchange services.

2012 Transportation Exchange Services and use of FT-RAM

Line No	Capacity Assignments Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold
1	September-12-11	January-01-12	March-31-12	91	Empress to Union CDA Capacity Release, delivery to Union NDA
2	December-14-11	January-01-12	March-31-12	91	Empress to Union CDA Capacity Release, delivery to Union NDA
3	September-12-11	January-01-12	March-31-12	91	Empress to Union CDA Capacity Release, delivery to Union WDA
4	September-23-11	January-01-12	February-29-12	60	Empress to Union CDA Capacity Release, delivery to Union WDA
5	November-22-11	January-01-12	March-31-12	91	Empress to Union CDA Capacity Release, delivery to Union WDA in January, February/Dawn in Mar
6	December-13-11	January-01-12	March-31-12	91	Empress to Union NCDA and Empress to Union CDA Capacity Release, delivery to Union NDA
7	September-23-11	March-01-12	March-31-12	31	Empress to Union CDA Capacity Release, delivery to Union WDA
8	January-18-12	March-01-12	March-31-12	31	Empress to Union EDA Capacity Release, delivery to Dawn
9	November-21-11	April-01-12	October-31-12	214	Empress to Union CDA Capacity Release, delivery to Dawn
10	November-23-11	April-01-12	October-31-12	214	Empress to Union EDA Capacity Release, delivery to Dawn
11	December-08-11	April-01-12	October-31-12	214	Empress to Union NDA Capacity Release, delivery to Dawn
12	November-29-11	April-01-12	October-31-12	214	Empress to Union CDA Capacity Release, delivery to Dawn
13	March-27-12	April-01-12	October-31-12	214	Empress to Union EDA Capacity Release, delivery to Dawn
14	November-29-11	April-01-12	October-31-12	214	Empress to Union CDA Capacity Release, delivery to Dawn
15	November-22-11	April-01-12	October-31-12	214	Empress to Union EDA Capacity Release, delivery to Dawn
16	January-09-12	April-01-12	October-31-12	214	Empress to Union EDA Capacity Release, delivery to Dawn
17	November-30-11	April-01-12	October-31-12	214	Empress to Union NCDA Capacity Release, delivery to Dawn
18	January-09-12	April-01-12	October-31-12	214	Empress to Union NDA Capacity Release, delivery to Dawn
19	December-09-11	April-01-12	October-31-12	214	Empress to Union CDA Capacity Release, delivery to Dawn
20	February-07-12	May-01-12	September-30-12	153	Empress to Union NDA Capacity Release, delivery to Dawn
21	September-19-12	November-01-12	December-31-12	61	Empress to Union CDA Capacity Release, delivery to Dawn in November/Union NDA in December
22	October-22-12	November-01-12	December-31-12	61	Empress to Union NCDA Capacity Release, delivery to Dawn in November/Union NDA in December
23	October-11-12	November-01-12	December-31-12	61	Empress to Union CDA Capacity Release, delivery to Dawn
24	October-10-12	November-01-12	December-31-12	61	Empress to Union CDA Capacity Release, delivery to Dawn in November/Union NDA in December
25	October-10-12	November-01-12	December-31-12	61	Empress to Union NCDA and Empress to Union CDA Capacity Release, delivery to Dawn in November/ Union NDA in December
26	September-19-12	November-01-12	December-31-12	61	Empress to Union CDA Capacity Release, delivery to Dawn
27	September-17-12	November-01-12	December-31-12	61	Empress to Union CDA Capacity Release, delivery to Dawn in November/Union NDA in December
28	October-16-12	November-01-12	December-31-12	61	Empress to Union CDA Capacity Release, delivery to Dawn in November/Union NDA in December
29	October-11-12	November-01-12	December-31-12	61	Empress to Union CDA Capacity Release, delivery to Dawn in November/Union NDA in December

2012 Transportation Exchange Services and use of FT-RAM

Exchanges

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold
1	November-30-11	December-01-11	December-01-11	1	Upstream transportation, purchased resource
2	November-30-11	December-01-11	December-01-11	1	Upstream transportation, purchased resource
3	December-15-11	December-16-11	December-31-11	16	Union transportation, upstream transportation, purchased resource
4	December-29-11	January-01-12	January-31-12	31	Union transportation, upstream transportation, purchased resource
5	December-22-11	January-01-12	January-31-12	31	Union transportation, upstream transportation, purchased resource
6	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource
7	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource
8	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource
9	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource
10	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource
11	January-04-12	January-05-12	January-05-12	1	Union transportation, upstream transportation, purchased resource
12	January-04-12	January-05-12	January-05-12	1	Union transportation, upstream transportation, purchased resource
13	January-05-12	January-06-12	January-06-12	1	Union transportation, upstream transportation, purchased resource
14	January-05-12	January-06-12	January-06-12	1	Union transportation, upstream transportation, purchased resource
15	January-06-12	January-07-12	January-09-12	3	Union transportation, upstream transportation, purchased resource
16	January-09-12	January-09-12	January-09-12	1	Union transportation, upstream transportation, purchased resource
17	January-09-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource
18	January-09-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource
19	January-09-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource
20	January-09-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource
21	January-10-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource
22	January-10-12	January-11-12	January-11-12	1	Union transportation, upstream transportation, purchased resource
23	January-10-12	January-11-12	January-11-12	1	Union transportation, upstream transportation, purchased resource
24	January-10-12	January-11-12	January-11-12	1	Union transportation, upstream transportation, purchased resource
25	January-11-12	January-11-12	January-11-12	1	Union transportation, upstream transportation, purchased resource
26	January-11-12	January-12-12	January-12-12	1	Union transportation, upstream transportation, purchased resource
27	January-11-12	January-12-12	January-12-12	1	Union transportation, upstream transportation, purchased resource
28	January-12-12	January-12-12	January-12-12	1	Union transportation, upstream transportation, purchased resource
29	January-12-12	January-13-12	January-13-12	1	Union transportation, upstream transportation, purchased resource
30	January-12-12	January-13-12	January-13-12	1	Union transportation, upstream transportation, purchased resource
31	January-13-12	January-14-12	January-17-12	4	Upstream transportation, purchased resource
32	January-13-12	January-14-12	January-17-12	4	Union transportation, upstream transportation, purchased resource
33	January-13-12	January-14-12	January-17-12	4	Union transportation, upstream transportation, purchased resource
34	January-13-12	January-14-12	January-17-12	4	Union transportation, upstream transportation, purchased resource
35	January-13-12	January-14-12	January-17-12	4	Union transportation, upstream transportation, purchased resource
36	January-13-12	January-14-12	January-16-12	3	Upstream transportation, purchased resource
37	January-13-12	January-14-12	January-17-12	4	Upstream transportation, purchased resource
38	January-13-12	January-14-12	January-17-12	4	Union transportation, upstream transportation, purchased resource
39	January-17-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource
40	January-17-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource
41	January-17-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource
42	January-17-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource
43	January-18-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource
44	January-18-12	January-19-12	January-19-12	1	Union transportation, upstream transportation, purchased resource
45	January-18-12	January-19-12	January-19-12	1	Union transportation, upstream transportation, purchased resource
46	January-19-12	January-19-12	January-19-12	1	Union transportation, upstream transportation, purchased resource
47	January-18-12	January-19-12	January-19-12	1	Upstream transportation, purchased resource
48	January-19-12	January-20-12	January-20-12	1	Union transportation, upstream transportation, purchased resource
49	January-19-12	January-20-12	January-20-12	1	Union transportation, upstream transportation, purchased resource
50	January-19-12	January-20-12	January-20-12	1	Union transportation, upstream transportation, purchased resource
51	January-31-12	January-20-12	January-31-12	12	Union transportation, upstream transportation, purchased resource
52	January-20-12	January-21-12	January-23-12	3	Union transportation, upstream transportation, purchased resource
53	January-20-12	January-21-12	January-23-12	3	Union transportation, upstream transportation, purchased resource
54	January-20-12	January-21-12	January-23-12	3	Union transportation, upstream transportation, purchased resource
55	January-23-12	January-24-12	January-24-12	1	Union transportation, upstream transportation, purchased resource
56	January-23-12	January-24-12	January-24-12	1	Union transportation, upstream transportation, purchased resource
57	January-23-12	January-24-12	January-24-12	1	Union transportation, upstream transportation, purchased resource
58	January-23-12	January-24-12	January-24-12	1	Union transportation, upstream transportation, purchased resource
59	January-24-12	January-25-12	January-25-12	1	Union transportation, upstream transportation, purchased resource
60	January-24-12	January-25-12	January-25-12	1	Union transportation, upstream transportation, purchased resource
61	January-24-12	January-25-12	January-25-12	1	Union transportation, upstream transportation, purchased resource
62	January-24-12	January-25-12	January-25-12	1	Union transportation, upstream transportation, purchased resource
63	January-25-12	January-26-12	January-26-12	1	Union transportation, upstream transportation, purchased resource
64	January-25-12	January-26-12	January-26-12	1	Union transportation, upstream transportation, purchased resource
65	January-26-12	January-27-12	January-27-12	1	Union transportation, upstream transportation, purchased resource
66	January-26-12	January-27-12	January-27-12	1	Union transportation, upstream transportation, purchased resource
67	January-27-12	January-28-12	January-30-12	3	Union transportation, upstream transportation, purchased resource
68	January-27-12	January-28-12	January-30-12	3	Union transportation, upstream transportation, purchased resource
69	January-27-12	January-28-12	January-30-12	3	Union transportation, upstream transportation, purchased resource
70	January-30-12	January-31-12	January-31-12	1	Union transportation, upstream transportation, purchased resource
71	January-30-12	January-31-12	January-31-12	1	Union transportation, upstream transportation, purchased resource
72	January-26-12	February-01-12	February-29-12	29	Union transportation, upstream transportation, purchased resource
73	January-31-12	February-01-12	February-01-12	1	Union transportation, upstream transportation, purchased resource
74	February-29-12	February-01-12	February-29-12	29	Union transportation, upstream transportation, purchased resource
75	February-01-12	February-02-12	February-02-12	1	Union transportation, upstream transportation, purchased resource
76	February-01-12	February-02-12	February-02-12	1	Union transportation, upstream transportation, purchased resource
77	February-02-12	February-02-12	February-02-12	1	Union transportation, upstream transportation, purchased resource
78	February-02-12	February-03-12	February-03-12	1	Union transportation, upstream transportation, purchased resource

2012 Transportation Exchange Services and use of FT-RAM

Exchanges

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold
79	February-02-12	February-03-12	February-03-12	1	Union transportation, upstream transportation, purchased resource
80	February-06-12	February-07-12	February-07-12	1	Union transportation, upstream transportation, purchased resource
81	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource
82	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource
83	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource
84	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource
85	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource
86	February-08-12	February-09-12	February-09-12	1	Union transportation, upstream transportation, purchased resource
87	February-08-12	February-09-12	February-09-12	1	Union transportation, upstream transportation, purchased resource
88	February-08-12	February-09-12	February-09-12	1	Union transportation, upstream transportation, purchased resource
89	February-08-12	February-09-12	February-09-12	1	Union transportation, upstream transportation, purchased resource
90	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource
91	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource
92	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource
93	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource
94	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource
95	February-10-12	February-12-12	February-12-12	1	Union transportation, upstream transportation, purchased resource
96	February-13-12	February-14-12	February-14-12	1	Union transportation, upstream transportation, purchased resource
97	February-13-12	February-14-12	February-14-12	1	Union transportation, upstream transportation, purchased resource
98	February-13-12	February-14-12	February-14-12	1	Union transportation, upstream transportation, purchased resource
99	February-14-12	February-15-12	February-15-12	1	Union transportation, upstream transportation, purchased resource
100	February-15-12	February-16-12	February-16-12	1	Union transportation, upstream transportation, purchased resource
101	February-15-12	February-16-12	February-16-12	1	Union transportation, upstream transportation, purchased resource
102	February-15-12	February-16-12	February-16-12	1	Union transportation, upstream transportation, purchased resource
103	February-16-12	February-17-12	February-17-12	1	Union transportation, upstream transportation, purchased resource
104	February-16-12	February-17-12	February-17-12	1	Union transportation, upstream transportation, purchased resource
105	February-17-12	February-18-12	February-21-12	4	Union transportation, upstream transportation, purchased resource
106	February-17-12	February-18-12	February-21-12	4	Union transportation, upstream transportation, purchased resource
107	February-17-12	February-18-12	February-21-12	4	Upstream transportation, purchased resource
108	February-17-12	February-18-12	February-21-12	4	Upstream transportation, purchased resource
109	February-17-12	February-18-12	February-21-12	4	Union transportation, upstream transportation, purchased resource
110	February-17-12	February-18-12	February-21-12	4	Union transportation, upstream transportation, purchased resource
111	February-21-12	February-22-12	February-22-12	1	Upstream transportation, purchased resource
112	February-21-12	February-22-12	February-22-12	1	Union transportation, upstream transportation, purchased resource
113	February-24-12	February-25-12	February-27-12	3	Union transportation, upstream transportation, purchased resource
114	February-27-12	February-28-12	February-28-12	1	Union transportation, upstream transportation, purchased resource
115	February-28-12	February-29-12	February-29-12	1	Upstream transportation, purchased resource
116	February-28-12	February-29-12	February-29-12	1	Union transportation, upstream transportation, purchased resource
117	February-29-12	March-01-12	March-01-12	1	Union transportation, upstream transportation, purchased resource
118	February-29-12	March-01-12	March-01-12	1	Union transportation, upstream transportation, purchased resource
119	February-24-12	March-01-12	March-31-12	31	Union transportation, upstream transportation, purchased resource
120	March-06-12	March-01-12	March-06-12	6	Union transportation, upstream transportation, purchased resource
121	March-30-12	March-01-12	March-31-12	31	Union transportation, upstream transportation, purchased resource
122	March-30-12	March-01-12	March-31-12	31	Union transportation, upstream transportation, purchased resource
123	February-24-12	March-01-12	March-31-12	31	Upstream transportation, purchased resource
124	March-02-12	March-02-12	March-02-12	1	Union transportation, upstream transportation, purchased resource
125	March-02-12	March-03-12	March-05-12	3	Upstream transportation, purchased resource
126	March-02-12	March-03-12	March-05-12	3	Union transportation, upstream transportation, purchased resource
127	March-02-12	March-03-12	March-05-12	3	Upstream transportation, purchased resource
128	March-02-12	March-03-12	March-05-12	3	Union transportation, upstream transportation, purchased resource
129	March-05-12	March-06-12	March-06-12	1	Union transportation, upstream transportation, purchased resource
130	March-09-12	March-10-12	March-10-12	1	Union transportation, upstream transportation, purchased resource
131	March-12-12	March-13-12	March-13-12	1	Upstream transportation, purchased resource
132	March-14-12	March-15-12	March-15-12	1	Upstream transportation, purchased resource
133	March-16-12	March-17-12	March-19-12	3	Upstream transportation, purchased resource
134	March-19-12	March-20-12	March-20-12	1	Upstream transportation, purchased resource
135	March-19-12	March-20-12	March-20-12	1	Upstream transportation, purchased resource
136	March-20-12	March-21-12	March-21-12	1	Upstream transportation, purchased resource
137	March-21-12	March-22-12	March-22-12	1	Union transportation, upstream transportation, purchased resource
138	March-22-12	March-23-12	March-23-12	1	Union transportation, upstream transportation, purchased resource
139	March-22-12	March-23-12	March-23-12	1	Upstream transportation, purchased resource
140	March-23-12	March-24-12	March-26-12	3	Upstream transportation, purchased resource
141	March-23-12	March-24-12	March-26-12	3	Upstream transportation, purchased resource
142	March-26-12	March-27-12	March-27-12	1	Union transportation, upstream transportation, purchased resource
143	March-27-12	March-28-12	March-28-12	1	Upstream transportation, purchased resource
144	March-28-12	March-29-12	March-29-12	1	Upstream transportation, purchased resource
145	March-28-12	March-29-12	March-29-12	1	Upstream transportation, purchased resource
146	March-28-12	March-29-12	March-29-12	1	Union transportation, upstream transportation, purchased resource
147	March-29-12	March-30-12	March-31-12	2	Upstream transportation, purchased resource
148	March-29-12	March-30-12	March-31-12	2	Upstream transportation, purchased resource
149	March-27-12	April-01-12	April-30-12	30	Union transportation, upstream transportation, purchased resource
150	April-17-12	April-01-12	April-17-12	17	Union transportation, upstream transportation, purchased resource
151	April-30-12	April-01-12	April-30-12	30	Union transportation, upstream transportation, purchased resource
152	March-16-12	April-01-12	April-30-12	30	Upstream transportation, purchased resource
153	April-02-12	April-02-12	April-02-12	1	Union transportation, upstream transportation, purchased resource
154	April-02-12	April-02-12	April-02-12	1	Union transportation, upstream transportation, purchased resource
155	April-02-12	April-03-12	April-03-12	1	Union transportation, upstream transportation, purchased resource
156	April-03-12	April-04-12	April-04-12	1	Union transportation, upstream transportation, purchased resource

2012 Transportation Exchange Services and use of FT-RAM

Exchanges

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold
157	April-03-12	April-04-12	April-04-12	1	Union transportation, upstream transportation, purchased resource
158	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource
159	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource
160	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource
161	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource
162	April-05-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource
163	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource
164	April-06-12	April-06-12	April-06-12	1	Union transportation, upstream transportation, purchased resource
165	April-07-12	April-08-12	April-09-12	2	Union transportation, upstream transportation, purchased resource
166	April-09-12	April-10-12	April-10-12	1	Union transportation, upstream transportation, purchased resource
167	April-13-12	April-16-12	April-16-12	1	Union transportation, upstream transportation, purchased resource
168	April-16-12	April-17-12	April-17-12	1	Upstream transportation, purchased resource
169	April-17-12	April-17-12	April-17-12	1	Union transportation, upstream transportation, purchased resource
170	April-17-12	April-18-12	April-18-12	1	Upstream transportation, purchased resource
171	April-17-12	April-18-12	April-18-12	1	Upstream transportation, purchased resource
172	April-18-12	April-19-12	April-19-12	1	Upstream transportation, purchased resource
173	April-19-12	April-20-12	April-19-12	0	Upstream transportation, purchased resource
174	April-20-12	April-21-12	April-23-12	3	Upstream transportation, purchased resource
175	April-23-12	April-23-12	April-23-12	1	Union transportation, upstream transportation, purchased resource
176	April-23-12	April-23-12	April-23-12	1	Upstream transportation, purchased resource
177	April-23-12	April-24-12	April-24-12	1	Upstream transportation, purchased resource
178	April-24-12	April-25-12	April-25-12	1	Upstream transportation, purchased resource
179	April-24-12	April-25-12	April-25-12	1	Upstream transportation, purchased resource
180	April-24-12	April-25-12	April-25-12	1	Upstream transportation, purchased resource
181	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource
182	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource
183	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource
184	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource
185	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource
186	April-30-12	May-01-12	May-01-12	1	Upstream transportation, purchased resource
187	April-27-12	May-01-12	May-31-12	31	Union transportation, upstream transportation, purchased resource
188	May-01-12	May-01-12	May-01-12	1	Upstream transportation, purchased resource
189	May-01-12	May-01-12	May-01-12	1	Union transportation, upstream transportation, purchased resource
190	April-24-12	May-01-12	May-31-12	31	Upstream transportation, purchased resource
191	May-01-12	May-02-12	May-02-12	1	Upstream transportation, purchased resource
192	May-02-12	May-02-12	May-02-12	1	Upstream transportation, purchased resource
193	May-02-12	May-03-12	May-31-12	29	Upstream transportation, purchased resource
194	May-07-12	May-08-12	May-08-12	1	Upstream transportation, purchased resource
195	May-08-12	May-09-12	May-09-12	1	Upstream transportation, purchased resource
196	May-08-12	May-09-12	May-09-12	1	Upstream transportation, purchased resource
197	May-08-12	May-09-12	May-09-12	1	Upstream transportation, purchased resource
198	May-31-12	May-13-12	May-31-12	19	Union transportation, upstream transportation, purchased resource
199	May-15-12	May-16-12	May-16-12	1	Upstream transportation, purchased resource
200	May-15-12	May-16-12	May-16-12	1	Upstream transportation, purchased resource
201	May-15-12	May-16-12	May-16-12	1	Upstream transportation, purchased resource
202	May-16-12	May-17-12	May-17-12	1	Upstream transportation, purchased resource
203	May-17-12	May-18-12	May-18-12	1	Upstream transportation, purchased resource
204	May-23-12	May-24-12	May-24-12	1	Upstream transportation, purchased resource
205	May-23-12	May-24-12	May-24-12	1	Upstream transportation, purchased resource
206	May-23-12	May-24-12	May-24-12	1	Upstream transportation, purchased resource
207	May-24-12	May-25-12	May-25-12	1	Upstream transportation, purchased resource
208	May-24-12	May-25-12	May-25-12	1	Upstream transportation, purchased resource
209	May-25-12	May-26-12	May-29-12	4	Upstream transportation, purchased resource
210	May-25-12	May-26-12	May-29-12	4	Union transportation, upstream transportation, purchased resource
211	May-25-12	May-26-12	May-29-12	4	Upstream transportation, purchased resource
212	May-25-12	May-26-12	May-29-12	4	Upstream transportation, purchased resource
213	May-29-12	May-29-12	May-29-12	1	Union transportation, upstream transportation, purchased resource
214	May-29-12	May-29-12	May-29-12	1	Union transportation, upstream transportation, purchased resource
215	May-30-12	May-29-12	May-29-12	1	Union transportation, upstream transportation, purchased resource
216	May-29-12	May-30-12	May-30-12	1	Upstream transportation, purchased resource
217	May-30-12	May-30-12	May-30-12	1	Union transportation, upstream transportation, purchased resource
218	May-29-12	May-30-12	May-30-12	1	Upstream transportation, purchased resource
219	May-30-12	May-31-12	May-31-12	1	Upstream transportation, purchased resource
220	May-30-12	May-31-12	May-31-12	1	Upstream transportation, purchased resource
221	May-30-12	June-01-12	June-30-12	30	Upstream transportation, purchased resource
222	May-29-12	June-01-12	June-30-12	30	Union transportation, upstream transportation, purchased resource
223	May-11-12	June-01-12	June-30-12	30	Upstream transportation, purchased resource
224	June-29-12	June-05-12	June-30-12	26	Union transportation, upstream transportation, purchased resource
225	June-05-12	June-06-12	June-06-12	1	Upstream transportation, purchased resource
226	June-06-12	June-07-12	June-07-12	1	Upstream transportation, purchased resource
227	June-07-12	June-09-12	June-11-12	3	Union transportation, upstream transportation, purchased resource
228	June-08-12	June-09-12	June-11-12	3	Upstream transportation, purchased resource
229	June-11-12	June-11-12	June-11-12	1	Union transportation, upstream transportation, purchased resource
230	June-11-12	June-12-12	June-12-12	1	Union transportation, upstream transportation, purchased resource
231	June-11-12	June-12-12	June-12-12	1	Upstream transportation, purchased resource
232	June-11-12	June-12-12	June-12-12	1	Upstream transportation, purchased resource
233	June-12-12	June-13-12	June-13-12	1	Upstream transportation, purchased resource
234	June-12-12	June-13-12	June-13-12	1	Upstream transportation, purchased resource

Exchanges

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold
235	June-12-12	June-13-12	June-13-12	1	Upstream transportation, purchased resource
236	June-13-12	June-14-12	June-14-12	1	Upstream transportation, purchased resource
237	June-14-12	June-15-12	June-15-12	1	Upstream transportation, purchased resource
238	June-15-12	June-16-12	June-18-12	3	Upstream transportation, purchased resource
239	June-15-12	June-16-12	June-18-12	3	Upstream transportation, purchased resource
240	June-18-12	June-18-12	June-18-12	1	Union transportation, upstream transportation, purchased resource
241	June-18-12	June-19-12	June-19-12	1	Upstream transportation, purchased resource
242	June-18-12	June-19-12	June-19-12	1	Upstream transportation, purchased resource
243	June-19-12	June-19-12	June-19-12	1	Union transportation, upstream transportation, purchased resource
244	June-19-12	June-19-12	June-19-12	1	Union transportation, upstream transportation, purchased resource
245	June-18-12	June-19-12	June-19-12	1	Upstream transportation, purchased resource
246	June-19-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource
247	June-19-12	June-20-12	June-20-12	1	Union transportation, upstream transportation, purchased resource
248	June-21-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource
249	June-19-12	June-20-12	June-20-12	1	Union transportation, upstream transportation, purchased resource
250	June-19-12	June-20-12	June-20-12	1	Union transportation, upstream transportation, purchased resource
251	June-19-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource
252	June-19-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource
253	June-19-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource
254	June-20-12	June-21-12	June-21-12	1	Union transportation, upstream transportation, purchased resource
255	June-20-12	June-21-12	June-21-12	1	Union transportation, upstream transportation, purchased resource
256	June-20-12	June-21-12	June-21-12	1	Upstream transportation, purchased resource
257	June-20-12	June-21-12	June-21-12	1	Union transportation, upstream transportation, purchased resource
258	June-20-12	June-21-12	June-21-12	1	Union transportation, upstream transportation, purchased resource
259	June-21-12	June-22-12	June-22-12	1	Upstream transportation, purchased resource
260	June-21-12	June-22-12	June-22-12	1	Upstream transportation, purchased resource
261	June-22-12	June-22-12	June-22-12	1	Union transportation, upstream transportation, purchased resource
262	June-21-12	June-22-12	June-22-12	1	Upstream transportation, purchased resource
263	June-21-12	June-22-12	June-22-12	1	Union transportation, upstream transportation, purchased resource
264	June-21-12	June-22-12	June-22-12	1	Upstream transportation, purchased resource
265	June-22-12	June-23-12	June-25-12	3	Upstream transportation, purchased resource
266	June-25-12	June-23-12	June-24-12	2	Union transportation, upstream transportation, purchased resource
267	June-25-12	June-25-12	June-25-12	1	Union transportation, upstream transportation, purchased resource
268	June-25-12	June-26-12	June-26-12	1	Upstream transportation, purchased resource
269	June-26-12	June-27-12	June-27-12	1	Union transportation, upstream transportation, purchased resource
270	June-27-12	June-27-12	June-27-12	1	Union transportation, upstream transportation, purchased resource
271	June-27-12	June-28-12	June-28-12	1	Union transportation, upstream transportation, purchased resource
272	June-27-12	June-28-12	June-28-12	1	Union transportation, upstream transportation, purchased resource
273	June-28-12	June-29-12	June-29-12	1	Union transportation, upstream transportation, purchased resource
274	June-29-12	June-29-12	June-29-12	1	Union transportation, upstream transportation, purchased resource
275	June-28-12	June-29-12	June-30-12	2	Union transportation, upstream transportation, purchased resource
276	June-29-12	June-29-12	June-29-12	1	Union transportation, upstream transportation, purchased resource
277	June-29-12	June-30-12	June-30-12	1	Union transportation, upstream transportation, purchased resource
278	June-28-12	July-01-12	July-31-12	31	Union transportation, upstream transportation, purchased resource
279	June-29-12	July-01-12	July-03-12	3	Union transportation, upstream transportation, purchased resource
280	July-31-12	July-01-12	July-31-12	31	Union transportation, upstream transportation, purchased resource
281	June-29-12	July-01-12	July-02-12	2	Union transportation, upstream transportation, purchased resource
282	July-04-12	July-04-12	July-04-12	1	Union transportation, upstream transportation, purchased resource
283	July-05-12	July-05-12	July-05-12	1	Union transportation, upstream transportation, purchased resource
284	July-05-12	July-05-12	July-05-12	1	Union transportation, upstream transportation, purchased resource
285	July-05-12	July-05-12	July-05-12	1	Union transportation, upstream transportation, purchased resource
286	July-05-12	July-06-12	July-06-12	1	Union transportation, upstream transportation, purchased resource
287	July-06-12	July-06-12	July-06-12	1	Union transportation, upstream transportation, purchased resource
288	July-05-12	July-06-12	July-06-12	1	Upstream transportation, purchased resource
289	July-05-12	July-06-12	July-06-12	1	Union transportation, upstream transportation, purchased resource
290	July-06-12	July-07-12	July-08-12	2	Union transportation, upstream transportation, purchased resource
291	July-06-12	July-07-12	July-09-12	3	Union transportation, upstream transportation, purchased resource
292	July-09-12	July-10-12	July-10-12	1	Union transportation, upstream transportation, purchased resource
293	July-10-12	July-10-12	July-10-12	1	Union transportation, upstream transportation, purchased resource
294	July-09-12	July-10-12	July-10-12	1	Upstream transportation, purchased resource
295	July-10-12	July-11-12	July-11-12	1	Union transportation, upstream transportation, purchased resource
296	July-11-12	July-12-12	July-12-12	1	Union transportation, upstream transportation, purchased resource
297	July-12-12	July-13-12	July-13-12	1	Union transportation, upstream transportation, purchased resource
298	July-13-12	July-13-12	July-13-12	1	Union transportation, upstream transportation, purchased resource
299	July-13-12	July-14-12	July-16-12	3	Union transportation, upstream transportation, purchased resource
300	July-13-12	July-14-12	July-16-12	3	Union transportation, upstream transportation, purchased resource
301	July-16-12	July-16-12	July-16-12	1	Union transportation, upstream transportation, purchased resource
302	July-16-12	July-16-12	July-16-12	1	Union transportation, upstream transportation, purchased resource
303	July-16-12	July-17-12	July-17-12	1	Union transportation, upstream transportation, purchased resource
304	July-16-12	July-17-12	July-17-12	1	Union transportation, upstream transportation, purchased resource
305	July-16-12	July-17-12	July-17-12	1	Union transportation, upstream transportation, purchased resource
306	July-16-12	July-17-12	July-17-12	1	Union transportation, upstream transportation, purchased resource
307	July-17-12	July-18-12	July-18-12	1	Union transportation, upstream transportation, purchased resource
308	July-18-12	July-18-12	July-18-12	1	Union transportation, upstream transportation, purchased resource
309	July-18-12	July-18-12	July-18-12	1	Union transportation, upstream transportation, purchased resource
310	July-19-12	July-19-12	July-19-12	1	Union transportation, upstream transportation, purchased resource
311	July-24-12	July-25-12	July-25-12	1	Upstream transportation, purchased resource
312	July-25-12	July-26-12	July-26-12	1	Upstream transportation, purchased resource

2012 Transportation Exchange Services and use of FT-RAM

Exchanges

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold
313	July-25-12	July-26-12	July-26-12	1	Upstream transportation, purchased resource
314	July-26-12	July-26-12	July-26-12	1	Union transportation, upstream transportation, purchased resource
315	July-25-12	July-26-12	July-26-12	1	Upstream transportation, purchased resource
316	July-26-12	July-27-12	July-27-12	1	Union transportation, upstream transportation, purchased resource
317	July-26-12	July-27-12	July-27-12	1	Upstream transportation, purchased resource
318	July-26-12	July-27-12	July-27-12	1	Upstream transportation, purchased resource
319	July-31-12	August-01-12	August-01-12	1	Upstream transportation, purchased resource
320	July-31-12	August-01-12	August-01-12	1	Upstream transportation, purchased resource
321	July-25-12	August-01-12	August-31-12	31	Union transportation, upstream transportation, purchased resource
322	August-01-12	August-02-12	August-02-12	1	Upstream transportation, purchased resource
323	August-03-12	August-02-12	August-02-12	1	Union transportation, upstream transportation, purchased resource
324	August-02-12	August-02-12	August-02-12	1	Union transportation, upstream transportation, purchased resource
325	August-01-12	August-02-12	August-02-12	1	Upstream transportation, purchased resource
326	August-02-12	August-03-12	August-03-12	1	Upstream transportation, purchased resource
327	August-03-12	August-04-12	August-07-12	4	Union transportation, upstream transportation, purchased resource
328	August-03-12	August-07-12	August-07-12	1	Upstream transportation, purchased resource
329	August-08-12	August-08-12	August-08-12	1	Union transportation, upstream transportation, purchased resource
330	August-10-12	August-10-12	August-10-12	1	Union transportation, upstream transportation, purchased resource
331	August-10-12	August-11-12	August-13-12	3	Union transportation, upstream transportation, purchased resource
332	August-24-12	August-25-12	August-27-12	3	Upstream transportation, purchased resource
333	August-24-12	August-25-12	August-27-12	3	Upstream transportation, purchased resource
334	August-28-12	August-29-12	August-29-12	1	Upstream transportation, purchased resource
335	August-29-12	August-30-12	August-30-12	1	Upstream transportation, purchased resource
336	August-28-12	September-01-12	September-30-12	30	Union transportation, upstream transportation, purchased resource
337	October-03-12	September-01-12	September-30-12	30	Union transportation, upstream transportation, purchased resource
338	September-04-12	September-04-12	September-04-12	1	Union transportation, upstream transportation, purchased resource
339	September-05-12	September-05-12	September-05-12	1	Union transportation, upstream transportation, purchased resource
340	September-05-12	September-06-12	September-06-12	1	Union transportation, upstream transportation, purchased resource
341	September-06-12	September-07-12	September-07-12	1	Union transportation, upstream transportation, purchased resource
342	September-07-12	September-08-12	September-10-12	3	Union transportation, upstream transportation, purchased resource
343	September-17-12	September-17-12	September-17-12	1	Union transportation, upstream transportation, purchased resource
344	September-17-12	September-17-12	September-17-12	1	Upstream transportation, purchased resource
345	September-17-12	September-18-12	September-18-12	1	Union transportation, upstream transportation, purchased resource
346	September-18-12	September-19-12	September-19-12	1	Union transportation, upstream transportation, purchased resource
347	September-19-12	September-20-12	September-20-12	1	Upstream transportation, purchased resource
348	September-19-12	September-20-12	September-20-12	1	Union transportation, upstream transportation, purchased resource
349	September-20-12	September-21-12	September-21-12	1	Upstream transportation, purchased resource
350	September-20-12	September-21-12	September-21-12	1	Upstream transportation, purchased resource
351	September-21-12	September-22-12	September-24-12	3	Upstream transportation, purchased resource
352	September-21-12	September-22-12	September-24-12	3	Upstream transportation, purchased resource
353	September-21-12	September-22-12	September-24-12	3	Upstream transportation, purchased resource
354	September-21-12	September-22-12	September-24-12	3	Upstream transportation, purchased resource
355	September-26-12	October-01-12	October-31-12	31	Union transportation, upstream transportation, purchased resource
356	October-31-12	October-01-12	October-31-12	31	Union transportation, upstream transportation, purchased resource
357	September-05-12	October-01-12	October-31-12	31	Upstream transportation, purchased resource
358	October-05-12	October-06-12	October-08-12	3	Union transportation, upstream transportation, purchased resource
359	October-09-12	October-10-12	October-10-12	1	Upstream transportation, purchased resource
360	October-10-12	October-11-12	October-11-12	1	Upstream transportation, purchased resource
361	October-10-12	October-11-12	October-11-12	1	Upstream transportation, purchased resource
362	October-10-12	October-11-12	October-11-12	1	Upstream transportation, purchased resource
363	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource
364	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource
365	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource
366	October-11-12	October-12-12	October-12-12	1	Union transportation, upstream transportation, purchased resource
367	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource
368	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource
369	October-12-12	October-13-12	October-15-12	3	Upstream transportation, purchased resource
370	October-12-12	October-13-12	October-15-12	3	Union transportation, upstream transportation, purchased resource
371	October-12-12	October-13-12	October-15-12	3	Upstream transportation, purchased resource
372	October-15-12	October-15-12	October-15-12	1	Union transportation, upstream transportation, purchased resource
373	October-15-12	October-15-12	October-15-12	1	Union transportation, upstream transportation, purchased resource
374	October-15-12	October-15-12	October-15-12	1	Union transportation, upstream transportation, purchased resource
375	October-15-12	October-16-12	October-16-12	1	Upstream transportation, purchased resource
376	October-15-12	October-16-12	October-16-12	1	Upstream transportation, purchased resource
377	October-15-12	October-16-12	October-16-12	1	Upstream transportation, purchased resource
378	October-15-12	October-16-12	October-16-12	1	Union transportation, upstream transportation, purchased resource
379	October-15-12	October-16-12	October-16-12	1	Union transportation, upstream transportation, purchased resource
380	October-15-12	October-16-12	October-16-12	1	Upstream transportation, purchased resource
381	October-16-12	October-17-12	October-17-12	1	Upstream transportation, purchased resource
382	October-16-12	October-17-12	October-17-12	1	Upstream transportation, purchased resource
383	October-16-12	October-17-12	October-17-12	1	Union transportation, upstream transportation, purchased resource
384	October-16-12	October-17-12	October-17-12	1	Union transportation, upstream transportation, purchased resource
385	October-16-12	October-17-12	October-17-12	1	Union transportation, upstream transportation, purchased resource
386	October-16-12	October-17-12	October-17-12	1	Union transportation, upstream transportation, purchased resource
387	October-17-12	October-18-12	October-18-12	1	Upstream transportation, purchased resource
388	October-17-12	October-18-12	October-18-12	1	Upstream transportation, purchased resource
389	October-17-12	October-18-12	October-18-12	1	Upstream transportation, purchased resource
390	October-17-12	October-18-12	October-18-12	1	Union transportation, upstream transportation, purchased resource

2012 Transportation Exchange Services and use of FT-RAM

Exchanges

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold
391	October-17-12	October-18-12	October-18-12	1	Union transportation, upstream transportation, purchased resource
392	October-17-12	October-18-12	October-18-12	1	Upstream transportation, purchased resource
393	October-18-12	October-19-12	October-19-12	1	Upstream transportation, purchased resource
394	October-18-12	October-19-12	October-19-12	1	Upstream transportation, purchased resource
395	October-19-12	October-20-12	October-22-12	3	Upstream transportation, purchased resource
396	October-22-12	October-23-12	October-23-12	1	Upstream transportation, purchased resource
397	October-22-12	October-23-12	October-23-12	1	Upstream transportation, purchased resource
398	October-23-12	October-24-12	October-24-12	1	Upstream transportation, purchased resource
399	October-23-12	October-24-12	October-24-12	1	Upstream transportation, purchased resource
400	October-23-12	October-24-12	October-24-12	1	Upstream transportation, purchased resource
401	October-23-12	October-24-12	October-24-12	1	Union transportation, upstream transportation, purchased resource
402	October-24-12	October-25-12	October-25-12	1	Upstream transportation, purchased resource
403	October-24-12	October-25-12	October-25-12	1	Upstream transportation, purchased resource
404	October-24-12	October-25-12	October-25-12	1	Upstream transportation, purchased resource
405	October-25-12	October-26-12	October-26-12	1	Upstream transportation, purchased resource
406	October-25-12	October-26-12	October-26-12	1	Upstream transportation, purchased resource
407	October-25-12	October-26-12	October-26-12	1	Upstream transportation, purchased resource
408	October-26-12	October-27-12	October-29-12	3	Upstream transportation, purchased resource
409	October-26-12	October-27-12	October-29-12	3	Upstream transportation, purchased resource
410	October-26-12	October-27-12	October-29-12	3	Upstream transportation, purchased resource
411	October-30-12	October-31-12	October-31-12	1	Upstream transportation, purchased resource
412	October-30-12	October-31-12	October-31-12	1	Upstream transportation, purchased resource
413	January-28-13	November-01-12	March-31-13	151	Union transportation, upstream transportation, purchased resource
414	October-26-12	November-01-12	November-30-12	30	Union transportation, upstream transportation, purchased resource
415	October-29-12	November-01-12	November-30-12	30	Union transportation, upstream transportation
416	November-30-12	November-01-12	November-30-12	30	Union transportation, upstream transportation, purchased resource
417	November-02-12	November-03-12	November-05-12	3	Union transportation, upstream transportation, purchased resource
418	November-02-12	November-03-12	November-05-12	3	Union transportation, upstream transportation, purchased resource
419	November-05-12	November-05-12	November-05-12	1	Union transportation, upstream transportation, purchased resource
420	November-05-12	November-06-12	November-06-12	1	Union transportation, upstream transportation, purchased resource
421	November-05-12	November-06-12	November-06-12	1	Union transportation, upstream transportation, purchased resource
422	November-05-12	November-06-12	November-06-12	1	Union transportation, upstream transportation, purchased resource
423	November-05-12	November-06-12	November-06-12	1	Union transportation, upstream transportation, purchased resource
424	November-06-12	November-07-12	November-07-12	1	Union transportation, upstream transportation, purchased resource
425	November-06-12	November-07-12	November-07-12	1	Union transportation, upstream transportation, purchased resource
426	November-08-12	November-08-12	November-08-12	1	Union transportation, upstream transportation, purchased resource
427	November-07-12	November-08-12	November-08-12	1	Union transportation, upstream transportation, purchased resource
428	November-07-12	November-08-12	November-08-12	1	Union transportation, upstream transportation, purchased resource
429	November-09-12	November-09-12	November-09-12	1	Union transportation, upstream transportation, purchased resource
430	November-08-12	November-09-12	November-09-12	1	Union transportation, upstream transportation, purchased resource
431	November-09-12	November-10-12	November-12-12	3	Union transportation, upstream transportation, purchased resource
432	November-12-12	November-13-12	November-13-12	1	Union transportation, upstream transportation, purchased resource
433	November-12-12	November-13-12	November-13-12	1	Union transportation, upstream transportation, purchased resource
434	November-13-12	November-13-12	November-13-12	1	Union transportation, upstream transportation, purchased resource
435	November-13-12	November-14-12	November-14-12	1	Union transportation, upstream transportation, purchased resource
436	November-13-12	November-14-12	November-14-12	1	Union transportation, upstream transportation, purchased resource
437	November-13-12	November-14-12	November-14-12	1	Union transportation, upstream transportation, purchased resource
438	November-14-12	November-15-12	November-15-12	1	Union transportation, upstream transportation, purchased resource
439	November-14-12	November-15-12	November-30-12	16	Union transportation, upstream transportation, purchased resource
440	November-15-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource
441	November-16-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource
442	November-15-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource
443	November-15-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource
444	November-15-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource
445	November-16-12	November-17-12	November-19-12	3	Union transportation, upstream transportation, purchased resource
446	November-16-12	November-17-12	November-19-12	3	Union transportation, upstream transportation, purchased resource
447	November-16-12	November-17-12	November-19-12	3	Union transportation, upstream transportation, purchased resource
448	November-19-12	November-19-12	November-19-12	1	Union transportation, upstream transportation, purchased resource
449	November-20-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource
450	November-19-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource
451	November-19-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource
452	November-19-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource
453	November-19-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource
454	November-21-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource
455	November-20-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource
456	November-20-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource
457	November-20-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource
458	November-20-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource
459	November-21-12	November-22-12	November-22-12	1	Union transportation, upstream transportation, purchased resource
460	November-21-12	November-22-12	November-26-12	5	Union transportation, upstream transportation, purchased resource
461	November-21-12	November-22-12	November-26-12	5	Union transportation, upstream transportation, purchased resource
462	November-21-12	November-22-12	November-26-12	5	Union transportation, upstream transportation, purchased resource
463	November-21-12	November-22-12	November-26-12	5	Union transportation, upstream transportation, purchased resource
464	November-26-12	November-27-12	November-27-12	1	Upstream transportation, purchased resource
465	November-26-12	November-27-12	November-27-12	1	Upstream transportation, purchased resource
466	November-26-12	November-27-12	November-27-12	1	Union transportation, upstream transportation, purchased resource
467	November-26-12	November-27-12	November-27-12	1	Upstream transportation, purchased resource
468	November-27-12	November-28-12	November-28-12	1	Union transportation, upstream transportation, purchased resource

2012 Transportation Exchange Services and use of FT-RAM

Exchanges

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold
469	November-27-12	November-28-12	November-28-12	1	Union transportation, upstream transportation, purchased resource
470	November-28-12	November-29-12	November-29-12	1	Union transportation, upstream transportation, purchased resource
471	November-28-12	November-29-12	November-29-12	1	Union transportation, upstream transportation, purchased resource
472	November-28-12	November-29-12	November-29-12	1	Union transportation, upstream transportation, purchased resource
473	November-29-12	November-30-12	November-30-12	1	Union transportation, upstream transportation, purchased resource
474	November-29-12	November-30-12	November-30-12	1	Union transportation, upstream transportation, purchased resource
475	November-30-12	December-01-12	December-01-12	1	Union transportation, upstream transportation, purchased resource
476	November-30-12	December-01-12	December-03-12	3	Union transportation, upstream transportation, purchased resource
477	November-30-12	December-01-12	December-03-12	3	Union transportation, upstream transportation, purchased resource
478	November-30-12	December-01-12	December-03-12	3	Union transportation, upstream transportation, purchased resource
479	December-03-12	December-04-12	December-04-12	1	Union transportation, upstream transportation, purchased resource
480	December-03-12	December-04-12	December-04-12	1	Union transportation, upstream transportation, purchased resource
481	December-04-12	December-05-12	December-05-12	1	Union transportation, upstream transportation, purchased resource
482	December-04-12	December-05-12	December-05-12	1	Union transportation, upstream transportation, purchased resource
483	December-05-12	December-06-12	December-06-12	1	Union transportation, upstream transportation, purchased resource
484	December-05-12	December-06-12	December-06-12	1	Union transportation, upstream transportation, purchased resource
485	December-05-12	December-06-12	December-06-12	1	Union transportation, upstream transportation, purchased resource
486	December-05-12	December-06-12	December-06-12	1	Union transportation, upstream transportation, purchased resource
487	December-06-12	December-07-12	December-07-12	1	Union transportation, upstream transportation, purchased resource
488	December-06-12	December-07-12	December-07-12	1	Union transportation, upstream transportation, purchased resource
489	December-07-12	December-08-12	December-09-12	2	Union transportation, upstream transportation, purchased resource
490	December-07-12	December-08-12	December-10-12	3	Union transportation, upstream transportation, purchased resource
491	December-07-12	December-08-12	December-10-12	3	Union transportation, upstream transportation, purchased resource
492	December-07-12	December-08-12	December-10-12	3	Union transportation, upstream transportation, purchased resource
493	December-10-12	December-11-12	December-11-12	1	Union transportation, upstream transportation, purchased resource
494	December-10-12	December-11-12	December-11-12	1	Union transportation, upstream transportation, purchased resource
495	December-11-12	December-12-12	December-12-12	1	Union transportation, upstream transportation, purchased resource
496	December-11-12	December-12-12	December-12-12	1	Union transportation, upstream transportation, purchased resource
497	December-11-12	December-12-12	December-12-12	1	Union transportation, upstream transportation, purchased resource
498	December-12-12	December-13-12	December-13-12	1	Union transportation, upstream transportation, purchased resource
499	December-12-12	December-13-12	December-13-12	1	Union transportation, upstream transportation, purchased resource
500	December-13-12	December-14-12	December-14-12	1	Union transportation, upstream transportation, purchased resource
501	December-13-12	December-14-12	December-14-12	1	Union transportation, upstream transportation, purchased resource
502	December-14-12	December-15-12	December-16-12	2	Union transportation, upstream transportation, purchased resource
503	December-14-12	December-15-12	December-17-12	3	Union transportation, upstream transportation, purchased resource
504	December-14-12	December-15-12	December-17-12	3	Union transportation, upstream transportation, purchased resource
505	December-14-12	December-15-12	December-17-12	3	Union transportation, upstream transportation, purchased resource
506	December-14-12	December-15-12	December-17-12	3	Union transportation, upstream transportation, purchased resource
507	December-18-12	December-19-12	December-19-12	1	Upstream transportation, purchased resource
508	December-18-12	December-19-12	December-19-12	1	Union transportation, upstream transportation, purchased resource
509	December-18-12	December-19-12	December-19-12	1	Upstream transportation, purchased resource
510	December-19-12	December-20-12	December-20-12	1	Upstream transportation, purchased resource
511	December-19-12	December-20-12	December-20-12	1	Upstream transportation, purchased resource
512	December-19-12	December-20-12	December-20-12	1	Union transportation, upstream transportation, purchased resource
513	December-19-12	December-20-12	December-20-12	1	Union transportation, upstream transportation, purchased resource
514	December-20-12	December-21-12	December-21-12	1	Upstream transportation, purchased resource
515	December-20-12	December-21-12	December-21-12	1	Upstream transportation, purchased resource
516	December-21-12	December-22-12	December-24-12	3	Upstream transportation, purchased resource
517	December-21-12	December-22-12	December-26-12	5	Union transportation, upstream transportation, purchased resource
518	December-21-12	December-22-12	December-24-12	3	Upstream transportation, purchased resource
519	December-21-12	December-22-12	December-24-12	3	Upstream transportation, purchased resource
520	December-21-12	December-22-12	December-24-12	3	Union transportation, upstream transportation, purchased resource
521	December-21-12	December-22-12	December-24-12	3	Union transportation, upstream transportation, purchased resource
522	December-24-12	December-25-12	December-26-12	2	Union transportation, upstream transportation, purchased resource
523	December-24-12	December-25-12	December-26-12	2	Upstream transportation, purchased resource
524	December-24-12	December-25-12	December-26-12	2	Upstream transportation, purchased resource
525	December-24-12	December-25-12	December-26-12	2	Union transportation, upstream transportation, purchased resource
526	December-24-12	December-25-12	December-26-12	2	Union transportation, upstream transportation, purchased resource
527	December-24-12	December-25-12	December-26-12	2	Union transportation, upstream transportation, purchased resource
528	December-26-12	December-27-12	December-27-12	1	Upstream transportation, purchased resource
529	December-26-12	December-27-12	December-27-12	1	Upstream transportation, purchased resource
530	December-27-12	December-27-12	December-27-12	1	Union transportation, upstream transportation, purchased resource
531	December-26-12	December-27-12	December-27-12	1	Union transportation, upstream transportation, purchased resource
532	December-27-12	December-28-12	December-28-12	1	Union transportation, upstream transportation
533	December-27-12	December-28-12	December-28-12	1	Union transportation, upstream transportation, purchased resource
534	December-27-12	December-28-12	December-28-12	1	Union transportation, upstream transportation, purchased resource
535	December-27-12	December-28-12	December-28-12	1	Union transportation, upstream transportation, purchased resource
536	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource
537	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource
538	December-28-12	December-29-12	December-31-12	3	Upstream transportation, purchased resource
539	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource
540	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource
541	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource

Filed: 2013-09-24
EB-2013-0109
Exhibit D8.44
SUPPLEMENTAL

UNION GAS LIMITED

Answer to Interrogatory from
Federation of Rental-housing Providers of Ontario ("FRPO")

Reference: Exhibit D9.3

Please confirm that the date in line 57 of the list of transactions is incorrect and please provide the corrected date.

Response:

With respect to the transaction noted on line 57, the original contract was executed on January 20, 2012. The terms of this interruptible contract were amended on January 31, 2012 to reflect the actual quantities transacted during the term of the arrangement. The transaction date of January 31, 2012 on line 57 represents this amendment date.

UNION GAS LIMITED

Answer to Interrogatory from
Ontario Greenhouse Vegetable Growers ("OGVG")

Reference: Exhibit A, Tab 1, Appendix A, Schedule 4 Page 2

Please explain why the 2011 LRAM amounts, for most classes, are materially higher then the 2012 amounts.

Response:

The variance in LRAM volumetric reduction between column A (163,703 10^3m^3) on Schedule 4 page 2 vs column A (109,246 10^3m^3) on Schedule 4 page 3 is explained in Union's response at Exhibit D1.1.

UNION GAS LIMITED

Answer to Interrogatory from
Ontario Greenhouse Vegetable Growers ("OGVG")

Reference: Exhibit A, Tab 1, Appendix A, Schedule 5

Exhibit A, Tab 1, Appendix A, Schedule 5 indicates that, with respect to the variance between the settled 2012 DSM budgets in EB-2011-0327 and the actual 2012 DSM budgets, 4 rate classes experienced a decrease in DSM spending, 4 classes experienced an increase in DSM spending ranging from 1.3% to 39.1%, and the M4 class experienced an increase in DSM spending of 72.3%.

a) Please confirm OGVG's understanding that it is Union's position that a 72.3% increase in the DSM budget allocated to the M4 class as between the originally 2012 budgeted amount of $1,572,105 and the actual 2012 amount of $2,708,435 is permissible pursuant to page 4 of the Settlement Agreement in EB-2011-0327 dated January 31, 2012.

b) OGVG is interested in understanding how much of each rate class' costs are DSM related, particularly in view of the increase (72.3%) in the DSM costs allocated to the M4 class in 2012. Please express, by rate class, the percentage of the total claimed 2012 distribution costs that are made up of the combination of 2012 DSM and DSM Incentive Amounts, including the amounts claimed within the relevant 2012 deferral and variance accounts. Please also include the number of customers per class for 2012, as well as the subset of customers within the class (expressing that subset both in actual numbers and as a percentage of the total number of customers in the class) that participated in 2012 DSM programs. Please provide the analysis in table form and include all base numbers and references for the sources of those numbers in the table.

Response:

a) Confirmed. As outlined on page 22 of the Settlement Agreement, a shift in Resource Acquisition budget between rate classes shall be limited to an increase of 100% of the amount allocated to the rate class (including program budget, allocated portfolio budget and allocated Low-income costs). The 72.3% increase falls within this provision.

b) Please see Attachment 1.

Summary of 2012 DSM Costs in Rates and 2012 DSM-related Deferrals by Rate Class

		Customers			2012 Approved Rates					2012 DSM-related Deferrals (5)				Total DSM Costs	
Line No.	Particulars ($000's)	Board-approved Number by Rate Class (1)	Number participating in 2012 DSM Programs	Percent participating in DSM programs	2012 Board-approved Revenue (2)	2012 DSM Costs in Approved 2012 Rates (3)	2012 DSM Costs per Settlement Agreement (4)	Approved DSM in 2012 Rates	DSM as a percent of approved 2012 Rates	179-75 LRAM	179-111 DSMVA	179-126 DSM Incentive	Total DSM-related Deferrals	Amount in 2012 rates and 2012 deferrals	Overall Percent of 2012 Distribution Revenue
		(a)	(b)	(c)=(b/a)	(d)	(e)	(f)	(g)=(e+f)	(h) = (g/d)	(i)	(j)	(k)	(l)=(i+j+k)	(m)=(g+l)	(n)= (m/d)
1	M1	980,085	62,301	6.4%	361,255	13,058	(2,834)	10,224	2.8%	611	(295)	3,509	3,824	14,048	3.9%
2	M2	6,978	467	6.7%	49,238	3,587	224	3,811	7.7%	636	(71)	1,058	1,623	5,434	11.0%
3	M4	194	60	30.9%	12,251	1,356	216	1,572	12.8%	104	1,136	616	1,856	3,428	28.0%
4	M5	136	35	25.7%	8,646	1,430	1,195	2,624	30.4%	417	(534)	478	360	2,984	34.5%
5	M7	7	2	28.6%	5,967	650	236	886	14.8%	10	(432)	92	(331)	555	9.3%
6	T1	59	30	50.8%	56,243	2,984	1,330	4,314	7.7%	159	445	1,300	1,905	6,218	11.1%
7	Rate 01	295,672	15,809	5.3%	133,984	4,188	(537)	3,651	2.7%	355	(634)	441	162	3,813	2.8%
8	Rate 10	2,962	178	6.0%	21,316	1,279	(118)	1,160	5.4%	272	356	303	931	2,091	9.8%
9	Rate 20	64	28	43.8%	7,245	968	(14)	953	13.2%	27	373	296	696	1,649	22.8%
10	Rate 100	19	13	67.2%	15,095	1,456	303	1,759	11.7%	39	24	506	569	2,328	15.4%
11	Total	1,286,176	78,923	6.1%	671,242	30,954	0	30,954	4.6%	2,629	368	8,598	11,595	42,549	6.3%

Notes:
(1) EB-2011-0025, Rate Order, Working Papers, Schedule 4, column (a) i.e. Annual billing units / 12
(2) EB-2011-0025, Rate Order, Working Papers, Schedule 3, Page 1, column (k)
(3) EB-2011-0025, Rate Order, Working Papers, Schedule 16, column (e)
(4) EB-2012-0087, Rate Order, Working Papers, Schedule 1, page 1, line 28
(5) EB-2013-0109, Exhibit A, Tab 3, Appendix A, Schedule 1, page 1, lines 5, 7, 16

UNION GAS LIMITED

Answer to Interrogatory from
Ontario Greenhouse Vegetable Growers ("OGVG")

Reference: Exhibit B, Tab 2, page 13 lines 18-19

"All FT-Ram related transportation exchange services in 2012 were sold on a daily, monthly, or seasonal basis. There were no annual transactions."

a) Please provide a table showing all of the FT-RAM related transportation exchange services for 2012 that includes:

   i. the date the transaction was made,
   ii. the day, month, or season (the first and last day of the transaction period plus the total number of days)the transaction related to,
   iii. the particular resource that was sold,
   iv. the net value of the transaction (with all transactions presumed to total $37.3M)

b) In EB-2011-0210, Exhibit J3.1 Union provided a graph illustrating, in part, the difference between Union's contracted capacity and Union's contracted capacity net of annual assignments. Please provide a similar graph for the year 2012, but instead of showing contracted capacity net of annual assignments (of which Union has stated there were none), provide a line indicating the contracted capacity net of the seasonal assignments referred to at Exhibit B, Tab 2, page 9, Table 1 line 6 totaling $25.9M.

Response:

a) Please see Attachment 1.

b) Please see Attachment 2. Exhibit J3.1 is updated to include data up to June, 2013 and to reflect contracted capacity net of seasonal assignments for the Union EDA. The referenced revenue of $25.9 million in the question relates to summer transportation assignments for all delivery areas, including Union EDA. The value of the transportation assignments for Union EDA as reflected in the attached graph is $7.6 million.

Union confirms there were no annual assignments for any delivery area in 2012.

2012 Transportation Exchange Services and use of FT-RAM

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold	Revenue $Thousands
1	November-30-11	December-01-11	December-01-11	1	Upstream transportation, purchased resource	20.3
2	November-30-11	December-01-11	December-01-11	1	Upstream transportation, purchased resource	8.7
3	December-15-11	December-16-11	December-31-11	1	Union transportation, upstream transportation, purchased resource	(0.5)
4	December-29-11	January-01-12	January-31-12	31	Union transportation, upstream transportation, purchased resource	29.1
5	September-12-11	January-01-12	March-31-12	91	Upstream transportation	564.2
6	December-14-11	January-01-12	March-31-12	91	Upstream transportation	500.5
7	September-12-11	January-01-12	March-31-12	91	Upstream transportation	919.1
8	December-22-11	January-01-12	January-31-12	1	Union transportation, upstream transportation, purchased resource	13.1
9	September-23-11	January-01-12	February-29-12	60	Upstream transportation	612.0
10	November-22-11	January-01-12	March-31-12	91	Upstream transportation	819.0
11	December-13-11	January-01-12	March-31-12	91	Upstream transportation	418.6
12	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource	16.0
13	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource	39.5
14	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource	5.1
15	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource	11.9
16	January-03-12	January-04-12	January-04-12	1	Union transportation, upstream transportation, purchased resource	3.8
17	January-04-12	January-05-12	January-05-12	1	Union transportation, upstream transportation, purchased resource	8.7
18	January-04-12	January-05-12	January-05-12	1	Union transportation, upstream transportation, purchased resource	4.5
19	January-05-12	January-06-12	January-06-12	1	Union transportation, upstream transportation, purchased resource	7.0
20	January-05-12	January-06-12	January-06-12	1	Union transportation, upstream transportation, purchased resource	6.8
21	January-06-12	January-07-12	January-09-12	3	Union transportation, upstream transportation, purchased resource	0.8
22	January-09-12	January-09-12	January-09-12	1	Union transportation, upstream transportation, purchased resource	6.3
23	January-09-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource	7.0
24	January-09-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource	1.4
25	January-09-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource	3.2
26	January-09-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource	10.7
27	January-10-12	January-10-12	January-10-12	1	Union transportation, upstream transportation, purchased resource	2.8
28	January-10-12	January-11-12	January-11-12	1	Union transportation, upstream transportation, purchased resource	11.2
29	January-10-12	January-11-12	January-11-12	1	Union transportation, upstream transportation, purchased resource	14.2
30	January-10-12	January-11-12	January-11-12	1	Union transportation, upstream transportation, purchased resource	17.0
31	January-11-12	January-11-12	January-11-12	1	Union transportation, upstream transportation, purchased resource	2.8
32	January-11-12	January-12-12	January-12-12	1	Union transportation, upstream transportation, purchased resource	8.6
33	January-11-12	January-12-12	January-12-12	1	Union transportation, upstream transportation, purchased resource	1.3
34	January-12-12	January-12-12	January-12-12	1	Union transportation, upstream transportation, purchased resource	2.7
35	January-12-12	January-13-12	January-13-12	1	Union transportation, upstream transportation, purchased resource	7.1
36	January-12-12	January-13-12	January-13-12	1	Union transportation, upstream transportation, purchased resource	19.4
37	January-13-12	January-14-12	January-17-12	4	Upstream transportation, purchased resource	28.4
38	January-13-12	January-14-12	January-17-12	4	Union transportation, upstream transportation, purchased resource	56.7
39	January-13-12	January-14-12	January-17-12	4	Union transportation, upstream transportation, purchased resource	51.1
40	January-13-12	January-14-12	January-17-12	1	Union transportation, upstream transportation, purchased resource	12.2
41	January-13-12	January-14-12	January-17-12	1	Union transportation, upstream transportation, purchased resource	36.5
42	January-13-12	January-14-12	January-16-12	3	Upstream transportation, purchased resource	0.4
43	January-13-12	January-14-12	January-17-12	1	Upstream transportation, purchased resource	9.0
44	January-13-12	January-14-12	January-17-12	1	Union transportation, upstream transportation, purchased resource	70.9
45	January-17-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource	3.9
46	January-17-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource	14.0
47	January-17-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource	2.7
48	January-17-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource	2.2
49	January-18-12	January-18-12	January-18-12	1	Union transportation, upstream transportation, purchased resource	10.7
50	January-18-12	January-19-12	January-19-12	1	Union transportation, upstream transportation, purchased resource	16.3
51	January-18-12	January-19-12	January-19-12	1	Union transportation, upstream transportation, purchased resource	16.2
52	January-19-12	January-19-12	January-19-12	1	Union transportation, upstream transportation, purchased resource	31.1
53	January-18-12	January-19-12	January-19-12	1	Upstream transportation, purchased resource	(0.9)
54	January-19-12	January-20-12	January-20-12	1	Union transportation, upstream transportation, purchased resource	5.1
55	January-19-12	January-20-12	January-20-12	1	Union transportation, upstream transportation, purchased resource	11.4
56	January-19-12	January-20-12	January-20-12	1	Union transportation, upstream transportation, purchased resource	16.2
57	January-31-12	January-20-12	January-31-12	1	Union transportation, upstream transportation, purchased resource	71.9
58	January-20-12	January-21-12	January-23-12	3	Union transportation, upstream transportation, purchased resource	67.6
59	January-20-12	January-21-12	January-23-12	1	Union transportation, upstream transportation, purchased resource	43.3
60	January-20-12	January-21-12	January-23-12	1	Union transportation, upstream transportation, purchased resource	42.9
61	January-23-12	January-24-12	January-24-12	1	Union transportation, upstream transportation, purchased resource	8.5
62	January-23-12	January-24-12	January-24-12	1	Union transportation, upstream transportation, purchased resource	10.1
63	January-23-12	January-24-12	January-24-12	1	Union transportation, upstream transportation, purchased resource	5.1
64	January-23-12	January-24-12	January-24-12	1	Union transportation, upstream transportation, purchased resource	7.8
65	January-24-12	January-25-12	January-25-12	1	Union transportation, upstream transportation, purchased resource	16.0
66	January-24-12	January-25-12	January-25-12	1	Union transportation, upstream transportation, purchased resource	0.8
67	January-24-12	January-25-12	January-25-12	1	Union transportation, upstream transportation, purchased resource	9.5
68	January-24-12	January-25-12	January-25-12	1	Union transportation, upstream transportation, purchased resource	4.7
69	January-25-12	January-26-12	January-26-12	1	Union transportation, upstream transportation, purchased resource	8.8
70	January-25-12	January-26-12	January-26-12	1	Union transportation, upstream transportation, purchased resource	3.0
71	January-26-12	January-27-12	January-27-12	1	Union transportation, upstream transportation, purchased resource	8.0
72	January-26-12	January-27-12	January-27-12	1	Union transportation, upstream transportation, purchased resource	2.0
73	January-27-12	January-28-12	January-30-12	3	Union transportation, upstream transportation, purchased resource	24.1

2012 Transportation Exchange Services and use of FT-RAM

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold	Revenue $Thousands
74	January-27-12	January-28-12	January-30-12	3	Union transportation, upstream transportation, purchased resource	5.6
75	January-27-12	January-28-12	January-30-12	3	Union transportation, upstream transportation, purchased resource	6.6
76	January-30-12	January-31-12	January-31-12	1	Union transportation, upstream transportation, purchased resource	8.7
77	January-30-12	January-31-12	January-31-12	1	Union transportation, upstream transportation, purchased resource	2.3
78	January-26-12	February-01-12	February-29-12	29	Union transportation, upstream transportation, purchased resource	19.3
79	January-31-12	February-01-12	February-01-12	1	Union transportation, upstream transportation, purchased resource	0.1
80	February-29-12	February-01-12	February-29-12	29	Union transportation, upstream transportation, purchased resource	200.9
81	February-01-12	February-02-12	February-02-12	1	Union transportation, upstream transportation, purchased resource	1.8
82	February-01-12	February-02-12	February-02-12	1	Union transportation, upstream transportation, purchased resource	2.6
83	February-02-12	February-02-12	February-02-12	1	Union transportation, upstream transportation, purchased resource	1.2
84	February-02-12	February-03-12	February-03-12	1	Union transportation, upstream transportation, purchased resource	4.0
85	February-02-12	February-03-12	February-03-12	1	Union transportation, upstream transportation, purchased resource	9.1
86	February-06-12	February-07-12	February-07-12	1	Union transportation, upstream transportation, purchased resource	1.5
87	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource	13.3
88	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource	5.2
89	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource	4.9
90	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource	2.0
91	February-07-12	February-08-12	February-08-12	1	Union transportation, upstream transportation, purchased resource	15.3
92	February-08-12	February-09-12	February-09-12	1	Union transportation, upstream transportation, purchased resource	3.7
93	February-08-12	February-09-12	February-09-12	1	Union transportation, upstream transportation, purchased resource	2.8
94	February-08-12	February-09-12	February-09-12	1	Union transportation, upstream transportation, purchased resource	3.9
95	February-08-12	February-09-12	February-09-12	1	Union transportation, upstream transportation, purchased resource	7.5
96	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource	37.4
97	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource	3.6
98	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource	21.7
99	February-10-12	February-11-12	February-13-12	2	Union transportation, upstream transportation, purchased resource	1.9
100	February-10-12	February-11-12	February-13-12	3	Union transportation, upstream transportation, purchased resource	3.7
101	February-10-12	February-12-12	February-12-12	1	Union transportation, upstream transportation, purchased resource	0.0
102	February-13-12	February-14-12	February-14-12	3	Union transportation, upstream transportation, purchased resource	7.4
103	February-13-12	February-14-12	February-14-12	1	Union transportation, upstream transportation, purchased resource	2.5
104	February-13-12	February-14-12	February-14-12	1	Union transportation, upstream transportation, purchased resource	0.3
105	February-14-12	February-15-12	February-15-12	1	Union transportation, upstream transportation, purchased resource	0.2
106	February-15-12	February-16-12	February-16-12	1	Union transportation, upstream transportation, purchased resource	1.2
107	February-15-12	February-16-12	February-16-12	1	Union transportation, upstream transportation, purchased resource	1.3
108	February-15-12	February-16-12	February-16-12	1	Union transportation, upstream transportation, purchased resource	0.1
109	February-16-12	February-17-12	February-17-12	1	Union transportation, upstream transportation, purchased resource	1.2
110	February-16-12	February-17-12	February-17-12	1	Union transportation, upstream transportation, purchased resource	0.7
111	February-17-12	February-18-12	February-21-12	4	Union transportation, upstream transportation, purchased resource	8.0
112	February-17-12	February-18-12	February-21-12	4	Union transportation, upstream transportation, purchased resource	20.5
113	February-17-12	February-18-12	February-21-12	4	Upstream transportation, purchased resource	26.8
114	February-17-12	February-18-12	February-21-12	4	Upstream transportation, purchased resource	52.3
115	February-17-12	February-18-12	February-21-12	4	Union transportation, upstream transportation, purchased resource	5.4
116	February-17-12	February-18-12	February-21-12	4	Union transportation, upstream transportation, purchased resource	0.8
117	February-21-12	February-22-12	February-22-12	1	Upstream transportation, purchased resource	12.0
118	February-21-12	February-22-12	February-22-12	1	Union transportation, upstream transportation, purchased resource	1.0
119	February-24-12	February-25-12	February-27-12	3	Union transportation, upstream transportation, purchased resource	1.4
120	February-27-12	February-28-12	February-28-12	1	Union transportation, upstream transportation, purchased resource	1.4
121	February-28-12	February-29-12	February-29-12	1	Upstream transportation, purchased resource	28.0
122	February-28-12	February-29-12	February-29-12	1	Union transportation, upstream transportation, purchased resource	1.3
123	September-23-11	March-01-12	March-31-12	31	Upstream transportation	279.0
124	January-18-12	March-01-12	March-31-12	31	Upstream transportation	682.0
125	February-29-12	March-01-12	March-01-12	1	Union transportation, upstream transportation, purchased resource	0.9
126	February-29-12	March-01-12	March-01-12	1	Union transportation, upstream transportation, purchased resource	3.0
127	February-24-12	March-01-12	March-31-12	31	Union transportation, upstream transportation, purchased resource	15.7
128	March-06-12	March-01-12	March-06-12	1	Union transportation, upstream transportation, purchased resource	0.3
129	March-30-12	March-01-12	March-31-12	31	Union transportation, upstream transportation, purchased resource	29.7
130	March-30-12	March-01-12	March-31-12	31	Union transportation, upstream transportation, purchased resource	59.4
131	February-24-12	March-01-12	March-31-12	31	Upstream transportation, purchased resource	(213.9)
132	March-02-12	March-02-12	March-02-12	1	Union transportation, upstream transportation, purchased resource	2.9
133	March-02-12	March-03-12	March-05-12	3	Upstream transportation, purchased resource	15.7
134	March-02-12	March-03-12	March-05-12	3	Union transportation, upstream transportation, purchased resource	82.3
135	March-02-12	March-03-12	March-05-12	3	Upstream transportation, purchased resource	15.8
136	March-02-12	March-03-12	March-05-12	3	Union transportation, upstream transportation, purchased resource	80.2
137	March-05-12	March-06-12	March-06-12	1	Union transportation, upstream transportation, purchased resource	22.3
138	March-09-12	March-10-12	March-10-12	1	Union transportation, upstream transportation, purchased resource	6.0
139	March-12-12	March-13-12	March-13-12	1	Upstream transportation, purchased resource	54.8
140	March-14-12	March-15-12	March-15-12	1	Upstream transportation, purchased resource	13.8
141	March-16-12	March-17-12	March-19-12	3	Upstream transportation, purchased resource	81.6
142	March-19-12	March-20-12	March-20-12	1	Upstream transportation, purchased resource	27.6
143	March-19-12	March-20-12	March-20-12	1	Upstream transportation, purchased resource	5.9
144	March-20-12	March-21-12	March-21-12	1	Upstream transportation, purchased resource	41.7
145	March-21-12	March-22-12	March-22-12	1	Union transportation, upstream transportation, purchased resource	7.9
146	March-22-12	March-23-12	March-23-12	1	Union transportation, upstream transportation, purchased resource	3.4

2012 Transportation Exchange Services and use of FT-RAM

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold	Revenue $Thousands
147	March-22-12	March-23-12	March-23-12	1	Upstream transportation, purchased resource	1.1
148	March-23-12	March-24-12	March-26-12	3	Upstream transportation, purchased resource	40.2
149	March-23-12	March-24-12	March-26-12	3	Upstream transportation, purchased resource	36.3
150	March-26-12	March-27-12	March-27-12	1	Union transportation, upstream transportation, purchased resource	11.2
151	March-27-12	March-28-12	March-28-12	1	Upstream transportation, purchased resource	5.0
152	March-28-12	March-29-12	March-29-12	1	Upstream transportation, purchased resource	35.3
153	March-28-12	March-29-12	March-29-12	1	Upstream transportation, purchased resource	13.7
154	March-28-12	March-29-12	March-29-12	1	Union transportation, upstream transportation, purchased resource	7.5
155	March-29-12	March-30-12	March-31-12	1	Upstream transportation, purchased resource	21.7
156	March-29-12	March-30-12	March-31-12	2	Upstream transportation, purchased resource	13.3
157	November-21-11	April-01-12	October-31-12	214	Upstream transportation	3,697.3
158	November-23-11	April-01-12	October-31-12	214	Upstream transportation	1,776.2
159	December-08-11	April-01-12	October-31-12	214	Upstream transportation	1,754.8
160	November-29-11	April-01-12	October-31-12	214	Upstream transportation	3,552.4
161	March-27-12	April-01-12	October-31-12	214	Upstream transportation	1,712.0
162	March-27-12	April-01-12	April-30-12	30	Union transportation, upstream transportation, purchased resource	6.2
163	November-29-11	April-01-12	October-31-12	214	Upstream transportation	3,165.9
164	November-22-11	April-01-12	October-31-12	214	Upstream transportation	1,819.0
165	January-09-12	April-01-12	October-31-12	214	Upstream transportation	1,626.4
166	November-30-11	April-01-12	October-31-12	214	Upstream transportation	1,449.4
167	April-17-12	April-01-12	April-17-12	1	Union transportation, upstream transportation, purchased resource	1.1
168	April-30-12	April-01-12	April-30-12	19	Union transportation, upstream transportation, purchased resource	27.5
169	January-09-12	April-01-12	October-31-12	214	Upstream transportation	1,455.2
170	March-16-12	April-01-12	April-30-12	30	Upstream transportation, purchased resource	(72.0)
171	December-09-11	April-01-12	October-31-12	214	Upstream transportation	1,540.8
172	April-02-12	April-02-12	April-02-12	1	Union transportation, upstream transportation, purchased resource	4.8
173	April-02-12	April-02-12	April-02-12	1	Union transportation, upstream transportation, purchased resource	27.1
174	April-02-12	April-03-12	April-03-12	1	Union transportation, upstream transportation, purchased resource	13.6
175	April-03-12	April-04-12	April-04-12	1	Union transportation, upstream transportation, purchased resource	10.9
176	April-03-12	April-04-12	April-04-12	1	Union transportation, upstream transportation, purchased resource	15.6
177	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource	0.6
178	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource	0.6
179	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource	8.8
180	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource	0.2
181	April-05-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource	0.3
182	April-04-12	April-05-12	April-05-12	1	Union transportation, upstream transportation, purchased resource	0.7
183	April-06-12	April-06-12	April-06-12	1	Union transportation, upstream transportation, purchased resource	51.4
184	April-07-12	April-08-12	April-09-12	1	Union transportation, upstream transportation, purchased resource	53.8
185	April-09-12	April-10-12	April-10-12	1	Union transportation, upstream transportation, purchased resource	7.5
186	April-13-12	April-16-12	April-16-12	1	Union transportation, upstream transportation, purchased resource	14.7
187	April-16-12	April-17-12	April-17-12	1	Upstream transportation, purchased resource	4.4
188	April-17-12	April-17-12	April-17-12	1	Union transportation, upstream transportation, purchased resource	14.7
189	April-17-12	April-18-12	April-18-12	1	Upstream transportation, purchased resource	4.8
190	April-17-12	April-18-12	April-18-12	1	Upstream transportation, purchased resource	3.9
191	April-18-12	April-19-12	April-19-12	1	Upstream transportation, purchased resource	4.8
192	April-19-12	April-20-12	April-19-12	1	Upstream transportation, purchased resource	1.3
193	April-20-12	April-21-12	April-23-12	3	Upstream transportation, purchased resource	28.5
194	April-23-12	April-23-12	April-23-12	1	Union transportation, upstream transportation, purchased resource	12.3
195	April-23-12	April-23-12	April-23-12	1	Upstream transportation, purchased resource	8.0
196	April-23-12	April-24-12	April-24-12	1	Upstream transportation, purchased resource	1.3
197	April-24-12	April-25-12	April-25-12	1	Upstream transportation, purchased resource	1.7
198	April-24-12	April-25-12	April-25-12	1	Upstream transportation, purchased resource	25.0
199	April-24-12	April-25-12	April-25-12	1	Upstream transportation, purchased resource	9.0
200	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource	3.5
201	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource	25.0
202	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource	10.7
203	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource	25.5
204	April-25-12	April-26-12	April-26-12	1	Upstream transportation, purchased resource	10.8
205	April-30-12	May-01-12	May-01-12	1	Upstream transportation, purchased resource	2.7
206	February-07-12	May-01-12	September-30-12	153	Upstream transportation	585.2
207	April-27-12	May-01-12	May-31-12	31	Union transportation, upstream transportation, purchased resource	5.1
208	May-01-12	May-01-12	May-01-12	1	Upstream transportation, purchased resource	8.9
209	May-01-12	May-01-12	May-01-12	1	Union transportation, upstream transportation, purchased resource	12.3
210	April-24-12	May-01-12	May-31-12	31	Upstream transportation, purchased resource	(184.5)
211	May-01-12	May-02-12	May-02-12	1	Upstream transportation, purchased resource	3.3
212	May-02-12	May-02-12	May-02-12	1	Upstream transportation, purchased resource	7.2
213	May-02-12	May-03-12	May-31-12	20	Upstream transportation, purchased resource	42.6
214	May-07-12	May-08-12	May-08-12	1	Upstream transportation, purchased resource	18.2
215	May-08-12	May-09-12	May-09-12	1	Upstream transportation, purchased resource	13.2
216	May-08-12	May-09-12	May-09-12	1	Upstream transportation, purchased resource	9.9
217	May-08-12	May-09-12	May-09-12	1	Upstream transportation, purchased resource	1.4
218	May-31-12	May-13-12	May-31-12	19	Union transportation, upstream transportation, purchased resource	11.9
219	May-15-12	May-16-12	May-16-12	1	Upstream transportation, purchased resource	12.7

2012 Transportation Exchange Services and use of FT-RAM

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold	Revenue $Thousands
220	May-15-12	May-16-12	May-16-12	1	Upstream transportation, purchased resource	8.0
221	May-15-12	May-16-12	May-16-12	1	Upstream transportation, purchased resource	8.0
222	May-16-12	May-17-12	May-17-12	1	Upstream transportation, purchased resource	8.0
223	May-17-12	May-18-12	May-18-12	1	Upstream transportation, purchased resource	8.0
224	May-23-12	May-24-12	May-24-12	1	Upstream transportation, purchased resource	19.0
225	May-23-12	May-24-12	May-24-12	1	Upstream transportation, purchased resource	5.6
226	May-23-12	May-24-12	May-24-12	1	Upstream transportation, purchased resource	4.8
227	May-24-12	May-25-12	May-25-12	1	Upstream transportation, purchased resource	17.5
228	May-24-12	May-25-12	May-25-12	1	Upstream transportation, purchased resource	12.0
229	May-25-12	May-26-12	May-29-12	4	Upstream transportation, purchased resource	44.4
230	May-25-12	May-26-12	May-29-12	1	Union transportation, upstream transportation, purchased resource	10.6
231	May-25-12	May-26-12	May-29-12	4	Upstream transportation, purchased resource	46.8
232	May-25-12	May-26-12	May-29-12	4	Upstream transportation, purchased resource	25.2
233	May-29-12	May-29-12	May-29-12	1	Union transportation, upstream transportation, purchased resource	15.6
234	May-29-12	May-29-12	May-29-12	1	Union transportation, upstream transportation, purchased resource	8.0
235	May-30-12	May-29-12	May-29-12	1	Union transportation, upstream transportation, purchased resource	1.8
236	May-29-12	May-30-12	May-30-12	1	Upstream transportation, purchased resource	11.2
237	May-30-12	May-30-12	May-30-12	1	Union transportation, upstream transportation, purchased resource	3.1
238	May-29-12	May-30-12	May-30-12	1	Upstream transportation, purchased resource	2.1
239	May-30-12	May-31-12	May-31-12	1	Upstream transportation, purchased resource	7.5
240	May-30-12	May-31-12	May-31-12	1	Upstream transportation, purchased resource	1.9
241	May-30-12	June-01-12	June-30-12	30	Upstream transportation, purchased resource	17.5
242	May-29-12	June-01-12	June-30-12	30	Union transportation, upstream transportation, purchased resource	1.9
243	May-11-12	June-01-12	June-30-12	30	Upstream transportation, purchased resource	(159.6)
244	June-29-12	June-05-12	June-30-12	19	Union transportation, upstream transportation, purchased resource	104.2
245	June-05-12	June-06-12	June-06-12	1	Upstream transportation, purchased resource	3.0
246	June-06-12	June-07-12	June-07-12	1	Upstream transportation, purchased resource	3.0
247	June-07-12	June-09-12	June-11-12	3	Union transportation, upstream transportation, purchased resource	10.8
248	June-08-12	June-09-12	June-11-12	3	Upstream transportation, purchased resource	9.5
249	June-11-12	June-11-12	June-11-12	1	Union transportation, upstream transportation, purchased resource	2.4
250	June-11-12	June-12-12	June-12-12	1	Union transportation, upstream transportation, purchased resource	1.1
251	June-11-12	June-12-12	June-12-12	1	Upstream transportation, purchased resource	3.8
252	June-11-12	June-12-12	June-12-12	1	Upstream transportation, purchased resource	6.6
253	June-12-12	June-13-12	June-13-12	1	Upstream transportation, purchased resource	3.1
254	June-12-12	June-13-12	June-13-12	1	Upstream transportation, purchased resource	6.0
255	June-12-12	June-13-12	June-13-12	1	Upstream transportation, purchased resource	3.1
256	June-13-12	June-14-12	June-14-12	1	Upstream transportation, purchased resource	0.9
257	June-14-12	June-15-12	June-15-12	1	Upstream transportation, purchased resource	0.9
258	June-15-12	June-16-12	June-18-12	3	Upstream transportation, purchased resource	29.7
259	June-15-12	June-16-12	June-18-12	3	Upstream transportation, purchased resource	9.8
260	June-18-12	June-18-12	June-18-12	1	Union transportation, upstream transportation, purchased resource	4.5
261	June-18-12	June-19-12	June-19-12	1	Upstream transportation, purchased resource	10.8
262	June-18-12	June-19-12	June-19-12	1	Upstream transportation, purchased resource	6.8
263	June-19-12	June-19-12	June-19-12	1	Union transportation, upstream transportation, purchased resource	13.4
264	June-19-12	June-19-12	June-19-12	1	Union transportation, upstream transportation, purchased resource	25.8
265	June-18-12	June-19-12	June-19-12	1	Upstream transportation, purchased resource	3.5
266	June-19-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource	21.6
267	June-19-12	June-20-12	June-20-12	1	Union transportation, upstream transportation, purchased resource	19.6
268	June-21-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource	31.8
269	June-19-12	June-20-12	June-20-12	1	Union transportation, upstream transportation, purchased resource	3.3
270	June-19-12	June-20-12	June-20-12	1	Union transportation, upstream transportation, purchased resource	9.0
271	June-19-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource	20.0
272	June-19-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource	12.3
273	June-19-12	June-20-12	June-20-12	1	Upstream transportation, purchased resource	8.4
274	June-20-12	June-21-12	June-21-12	1	Union transportation, upstream transportation, purchased resource	5.7
275	June-20-12	June-21-12	June-21-12	1	Union transportation, upstream transportation, purchased resource	41.3
276	June-20-12	June-21-12	June-21-12	1	Upstream transportation, purchased resource	9.1
277	June-20-12	June-21-12	June-21-12	1	Union transportation, upstream transportation, purchased resource	5.7
278	June-20-12	June-21-12	June-21-12	1	Union transportation, upstream transportation, purchased resource	11.3
279	June-21-12	June-22-12	June-22-12	1	Upstream transportation, purchased resource	13.3
280	June-21-12	June-22-12	June-22-12	1	Upstream transportation, purchased resource	12.7
281	June-22-12	June-22-12	June-22-12	1	Union transportation, upstream transportation, purchased resource	16.2
282	June-21-12	June-22-12	June-22-12	1	Upstream transportation, purchased resource	12.7
283	June-21-12	June-22-12	June-22-12	1	Union transportation, upstream transportation, purchased resource	10.3
284	June-21-12	June-22-12	June-22-12	1	Upstream transportation, purchased resource	8.2
285	June-22-12	June-23-12	June-25-12	3	Upstream transportation, purchased resource	14.9
286	June-25-12	June-23-12	June-24-12	1	Union transportation, upstream transportation, purchased resource	81.3
287	June-25-12	June-25-12	June-25-12	1	Union transportation, upstream transportation, purchased resource	40.5
288	June-25-12	June-26-12	June-26-12	1	Upstream transportation, purchased resource	1.8
289	June-26-12	June-27-12	June-27-12	1	Union transportation, upstream transportation, purchased resource	4.9
290	June-27-12	June-27-12	June-27-12	1	Union transportation, upstream transportation, purchased resource	2.4
291	June-27-12	June-28-12	June-28-12	1	Union transportation, upstream transportation, purchased resource	2.6
292	June-27-12	June-28-12	June-28-12	1	Union transportation, upstream transportation, purchased resource	6.5

2012 Transportation Exchange Services and use of FT-RAM

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold	Revenue $Thousands
293	June-28-12	June-29-12	June-29-12	1	Union transportation, upstream transportation, purchased resource	2.8
294	June-29-12	June-29-12	June-29-12	1	Union transportation, upstream transportation, purchased resource	1.0
295	June-28-12	June-29-12	June-30-12	2	Union transportation, upstream transportation, purchased resource	20.7
296	June-29-12	June-29-12	June-29-12	1	Union transportation, upstream transportation, purchased resource	6.4
297	June-29-12	June-30-12	June-30-12	1	Union transportation, upstream transportation, purchased resource	1.0
298	June-28-12	July-01-12	July-31-12	31	Union transportation, upstream transportation, purchased resource	1.9
299	June-29-12	July-01-12	July-03-12	1	Union transportation, upstream transportation, purchased resource	9.1
300	July-31-12	July-01-12	July-31-12	31	Union transportation, upstream transportation, purchased resource	277.7
301	June-29-12	July-01-12	July-02-12	2	Union transportation, upstream transportation, purchased resource	9.1
302	July-04-12	July-04-12	July-04-12	1	Union transportation, upstream transportation, purchased resource	9.0
303	July-05-12	July-05-12	July-05-12	1	Union transportation, upstream transportation, purchased resource	3.0
304	July-05-12	July-05-12	July-05-12	1	Union transportation, upstream transportation, purchased resource	20.8
305	July-05-12	July-05-12	July-05-12	1	Union transportation, upstream transportation, purchased resource	22.8
306	July-05-12	July-06-12	July-06-12	1	Union transportation, upstream transportation, purchased resource	4.4
307	July-06-12	July-06-12	July-06-12	1	Union transportation, upstream transportation, purchased resource	12.9
308	July-05-12	July-06-12	July-06-12	1	Upstream transportation, purchased resource	5.1
309	July-05-12	July-06-12	July-06-12	1	Union transportation, upstream transportation, purchased resource	0.4
310	July-06-12	July-07-12	July-08-12	2	Union transportation, upstream transportation, purchased resource	24.3
311	July-06-12	July-07-12	July-09-12	1	Union transportation, upstream transportation, purchased resource	12.2
312	July-09-12	July-10-12	July-10-12	1	Union transportation, upstream transportation, purchased resource	0.7
313	July-10-12	July-10-12	July-10-12	1	Union transportation, upstream transportation, purchased resource	11.9
314	July-09-12	July-10-12	July-10-12	1	Upstream transportation, purchased resource	5.5
315	July-10-12	July-11-12	July-11-12	1	Union transportation, upstream transportation, purchased resource	29.7
316	July-11-12	July-12-12	July-12-12	1	Union transportation, upstream transportation, purchased resource	33.2
317	July-12-12	July-13-12	July-13-12	1	Union transportation, upstream transportation, purchased resource	23.3
318	July-13-12	July-13-12	July-13-12	1	Union transportation, upstream transportation, purchased resource	17.3
319	July-13-12	July-14-12	July-16-12	3	Union transportation, upstream transportation, purchased resource	43.3
320	July-13-12	July-14-12	July-16-12	1	Union transportation, upstream transportation, purchased resource	11.3
321	July-16-12	July-16-12	July-16-12	1	Union transportation, upstream transportation, purchased resource	4.3
322	July-16-12	July-16-12	July-16-12	1	Union transportation, upstream transportation, purchased resource	8.1
323	July-16-12	July-17-12	July-17-12	1	Union transportation, upstream transportation, purchased resource	6.6
324	July-16-12	July-17-12	July-17-12	1	Union transportation, upstream transportation, purchased resource	7.0
325	July-16-12	July-17-12	July-17-12	1	Union transportation, upstream transportation, purchased resource	7.0
326	July-16-12	July-17-12	July-17-12	1	Union transportation, upstream transportation, purchased resource	10.1
327	July-17-12	July-18-12	July-18-12	1	Union transportation, upstream transportation, purchased resource	4.6
328	July-18-12	July-18-12	July-18-12	1	Union transportation, upstream transportation, purchased resource	6.9
329	July-18-12	July-18-12	July-18-12	1	Union transportation, upstream transportation, purchased resource	11.1
330	July-19-12	July-19-12	July-19-12	1	Union transportation, upstream transportation, purchased resource	29.8
331	July-24-12	July-25-12	July-25-12	1	Upstream transportation, purchased resource	15.4
332	July-25-12	July-26-12	July-26-12	1	Upstream transportation, purchased resource	16.0
333	July-25-12	July-26-12	July-26-12	1	Upstream transportation, purchased resource	15.4
334	July-26-12	July-26-12	July-26-12	1	Union transportation, upstream transportation, purchased resource	22.4
335	July-25-12	July-26-12	July-26-12	1	Upstream transportation, purchased resource	15.3
336	July-26-12	July-27-12	July-27-12	1	Union transportation, upstream transportation, purchased resource	3.2
337	July-26-12	July-27-12	July-27-12	1	Upstream transportation, purchased resource	16.0
338	July-26-12	July-27-12	July-27-12	1	Upstream transportation, purchased resource	16.0
339	July-31-12	August-01-12	August-01-12	1	Upstream transportation, purchased resource	7.2
340	July-31-12	August-01-12	August-01-12	1	Upstream transportation, purchased resource	7.4
341	July-25-12	August-01-12	August-31-12	31	Union transportation, upstream transportation, purchased resource	1.9
342	August-01-12	August-02-12	August-02-12	1	Upstream transportation, purchased resource	14.3
343	August-03-12	August-02-12	August-02-12	1	Union transportation, upstream transportation, purchased resource	4.8
344	August-02-12	August-02-12	August-02-12	1	Union transportation, upstream transportation, purchased resource	30.5
345	August-01-12	August-02-12	August-02-12	1	Upstream transportation, purchased resource	14.3
346	August-02-12	August-03-12	August-03-12	1	Upstream transportation, purchased resource	3.1
347	August-03-12	August-04-12	August-07-12	4	Union transportation, upstream transportation, purchased resource	82.9
348	August-03-12	August-07-12	August-07-12	1	Upstream transportation, purchased resource	6.0
349	August-08-12	August-08-12	August-08-12	1	Union transportation, upstream transportation, purchased resource	14.2
350	August-10-12	August-10-12	August-10-12	1	Union transportation, upstream transportation, purchased resource	1.1
351	August-10-12	August-11-12	August-13-12	3	Union transportation, upstream transportation, purchased resource	8.3
352	August-24-12	August-25-12	August-27-12	3	Upstream transportation, purchased resource	27.2
353	August-24-12	August-25-12	August-27-12	3	Upstream transportation, purchased resource	26.6
354	August-28-12	August-29-12	August-29-12	1	Upstream transportation, purchased resource	14.9
355	August-29-12	August-30-12	August-30-12	1	Upstream transportation, purchased resource	7.4
356	August-28-12	September-01-12	September-30-12	30	Union transportation, upstream transportation, purchased resource	3.3
357	October-03-12	September-01-12	September-30-12	30	Union transportation, upstream transportation, purchased resource	88.6
358	September-04-12	September-04-12	September-04-12	1	Union transportation, upstream transportation, purchased resource	15.4
359	September-05-12	September-05-12	September-05-12	1	Union transportation, upstream transportation, purchased resource	11.3
360	September-05-12	September-06-12	September-06-12	1	Union transportation, upstream transportation, purchased resource	11.5
361	September-06-12	September-07-12	September-07-12	1	Union transportation, upstream transportation, purchased resource	0.6
362	September-07-12	September-08-12	September-10-12	3	Union transportation, upstream transportation, purchased resource	3.9
363	September-17-12	September-17-12	September-17-12	1	Union transportation, upstream transportation, purchased resource	28.3
364	September-17-12	September-17-12	September-17-12	1	Upstream transportation, purchased resource	1.3
365	September-17-12	September-18-12	September-18-12	1	Union transportation, upstream transportation, purchased resource	5.7

2012 Transportation Exchange Services and use of FT-RAM

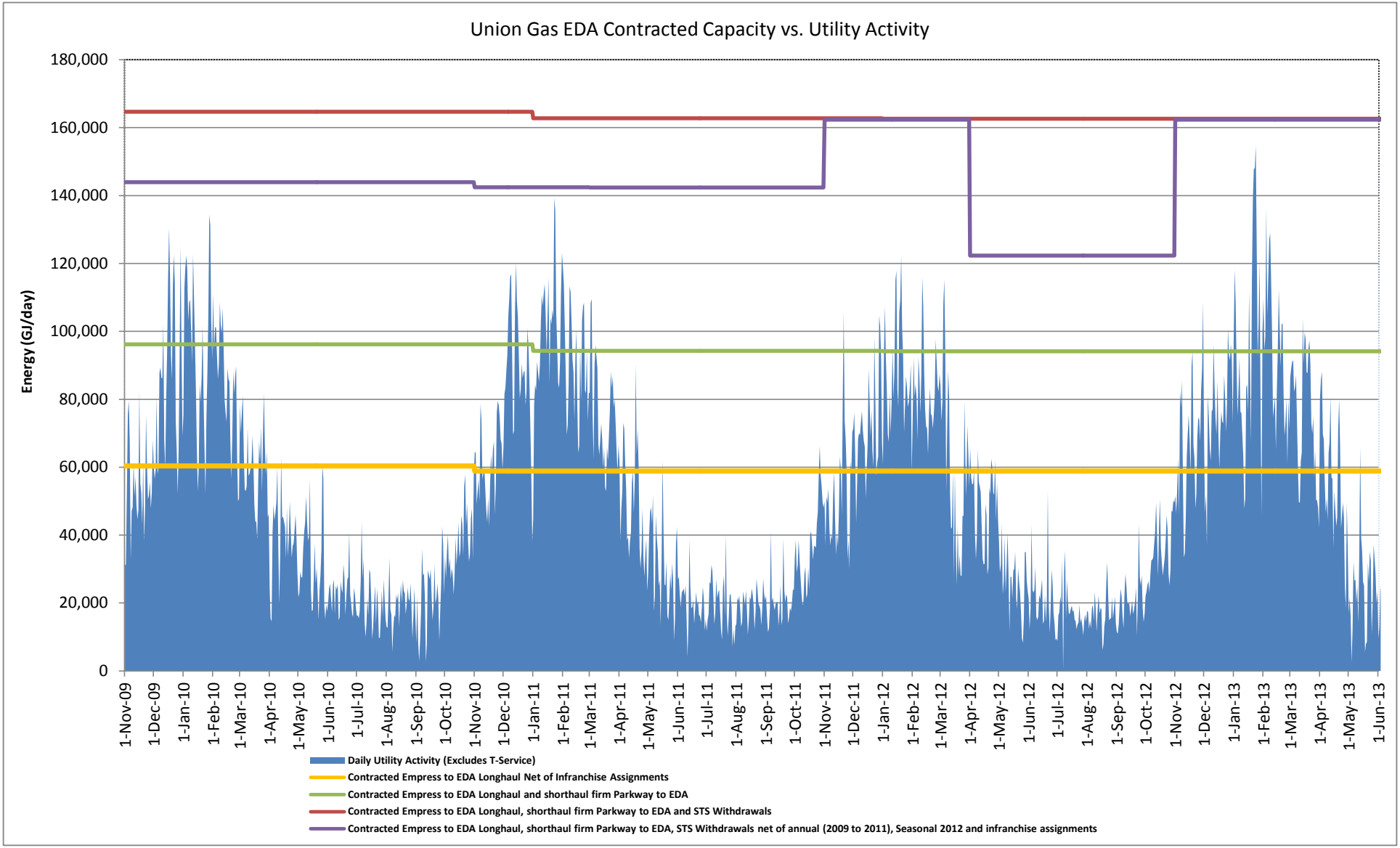
Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold	Revenue $Thousands
366	September-18-12	September-19-12	September-19-12	1	Union transportation, upstream transportation, purchased resource	8.8
367	September-19-12	September-20-12	September-20-12	1	Upstream transportation, purchased resource	8.1
368	September-19-12	September-20-12	September-20-12	1	Union transportation, upstream transportation, purchased resource	11.0
369	September-20-12	September-21-12	September-21-12	1	Upstream transportation, purchased resource	8.1
370	September-20-12	September-21-12	September-21-12	1	Upstream transportation, purchased resource	4.9
371	September-21-12	September-22-12	September-24-12	3	Upstream transportation, purchased resource	40.5
372	September-21-12	September-22-12	September-24-12	3	Upstream transportation, purchased resource	7.0
373	September-21-12	September-22-12	September-24-12	3	Upstream transportation, purchased resource	14.6
374	September-21-12	September-22-12	September-24-12	3	Upstream transportation, purchased resource	13.9
375	September-26-12	October-01-12	October-31-12	31	Union transportation, upstream transportation, purchased resource	5.4
376	October-31-12	October-01-12	October-31-12	27	Union transportation, upstream transportation, purchased resource	115.1
377	September-05-12	October-01-12	October-31-12	31	Upstream transportation, purchased resource	(117.8)
378	October-05-12	October-06-12	October-08-12	3	Union transportation, upstream transportation, purchased resource	6.5
379	October-09-12	October-10-12	October-10-12	1	Upstream transportation, purchased resource	1.6
380	October-10-12	October-11-12	October-11-12	1	Upstream transportation, purchased resource	1.5
381	October-10-12	October-11-12	October-11-12	1	Upstream transportation, purchased resource	21.0
382	October-10-12	October-11-12	October-11-12	1	Upstream transportation, purchased resource	8.9
383	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource	3.1
384	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource	9.5
385	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource	8.9
386	October-11-12	October-12-12	October-12-12	1	Union transportation, upstream transportation, purchased resource	3.2
387	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource	8.7
388	October-11-12	October-12-12	October-12-12	1	Upstream transportation, purchased resource	9.3
389	October-12-12	October-13-12	October-15-12	3	Upstream transportation, purchased resource	15.7
390	October-12-12	October-13-12	October-15-12	3	Union transportation, upstream transportation, purchased resource	7.6
391	October-12-12	October-13-12	October-15-12	3	Upstream transportation, purchased resource	10.0
392	October-15-12	October-15-12	October-15-12	1	Union transportation, upstream transportation, purchased resource	4.1
393	October-15-12	October-15-12	October-15-12	1	Union transportation, upstream transportation, purchased resource	9.5
394	October-15-12	October-15-12	October-15-12	1	Union transportation, upstream transportation, purchased resource	10.9
395	October-15-12	October-16-12	October-16-12	1	Upstream transportation, purchased resource	3.3
396	October-15-12	October-16-12	October-16-12	1	Upstream transportation, purchased resource	18.8
397	October-15-12	October-16-12	October-16-12	1	Upstream transportation, purchased resource	9.9
398	October-15-12	October-16-12	October-16-12	1	Union transportation, upstream transportation, purchased resource	8.3
399	October-15-12	October-16-12	October-16-12	1	Union transportation, upstream transportation, purchased resource	3.9
400	October-15-12	October-16-12	October-16-12	1	Upstream transportation, purchased resource	9.8
401	October-16-12	October-17-12	October-17-12	1	Upstream transportation, purchased resource	2.2
402	October-16-12	October-17-12	October-17-12	1	Upstream transportation, purchased resource	5.8
403	October-16-12	October-17-12	October-17-12	1	Union transportation, upstream transportation, purchased resource	5.4
404	October-16-12	October-17-12	October-17-12	1	Union transportation, upstream transportation, purchased resource	6.5
405	October-16-12	October-17-12	October-17-12	1	Union transportation, upstream transportation, purchased resource	15.7
406	October-16-12	October-17-12	October-17-12	1	Union transportation, upstream transportation, purchased resource	0.9
407	October-17-12	October-18-12	October-18-12	1	Upstream transportation, purchased resource	1.8
408	October-17-12	October-18-12	October-18-12	1	Upstream transportation, purchased resource	10.8
409	October-17-12	October-18-12	October-18-12	1	Upstream transportation, purchased resource	5.3
410	October-17-12	October-18-12	October-18-12	1	Union transportation, upstream transportation, purchased resource	7.4
411	October-17-12	October-18-12	October-18-12	1	Union transportation, upstream transportation, purchased resource	4.4
412	October-17-12	October-18-12	October-18-12	1	Upstream transportation, purchased resource	10.6
413	October-18-12	October-19-12	October-19-12	1	Upstream transportation, purchased resource	9.5
414	October-18-12	October-19-12	October-19-12	1	Upstream transportation, purchased resource	4.6
415	October-19-12	October-20-12	October-22-12	3	Upstream transportation, purchased resource	5.3
416	October-22-12	October-23-12	October-23-12	1	Upstream transportation, purchased resource	1.8
417	October-22-12	October-23-12	October-23-12	1	Upstream transportation, purchased resource	21.5
418	October-23-12	October-24-12	October-24-12	1	Upstream transportation, purchased resource	1.8
419	October-23-12	October-24-12	October-24-12	1	Upstream transportation, purchased resource	12.0
420	October-23-12	October-24-12	October-24-12	1	Upstream transportation, purchased resource	8.5
421	October-23-12	October-24-12	October-24-12	1	Union transportation, upstream transportation, purchased resource	5.9
422	October-24-12	October-25-12	October-25-12	1	Upstream transportation, purchased resource	3.5
423	October-24-12	October-25-12	October-25-12	1	Upstream transportation, purchased resource	13.9
424	October-24-12	October-25-12	October-25-12	1	Upstream transportation, purchased resource	4.4
425	October-25-12	October-26-12	October-26-12	1	Upstream transportation, purchased resource	1.4
426	October-25-12	October-26-12	October-26-12	1	Upstream transportation, purchased resource	22.4
427	October-25-12	October-26-12	October-26-12	1	Upstream transportation, purchased resource	9.0
428	October-26-12	October-27-12	October-29-12	3	Upstream transportation, purchased resource	10.5
429	October-26-12	October-27-12	October-29-12	3	Upstream transportation, purchased resource	63.3
430	October-26-12	October-27-12	October-29-12	3	Upstream transportation, purchased resource	26.0
431	October-30-12	October-31-12	October-31-12	1	Upstream transportation, purchased resource	5.9
432	October-30-12	October-31-12	October-31-12	1	Upstream transportation, purchased resource	2.9
433	September-19-12	November-01-12	December-31-12	61	Upstream transportation	366.0
434	October-22-12	November-01-12	December-31-12	61	Upstream transportation	183.0
435	October-11-12	November-01-12	December-31-12	61	Upstream transportation	515.5
436	October-10-12	November-01-12	December-31-12	61	Upstream transportation	366.0
437	October-10-12	November-01-12	December-31-12	61	Upstream transportation	189.1
438	January-28-13	November-01-12	March-31-13	61	Union transportation, upstream transportation, purchased resource	420.0

2012 Transportation Exchange Services and use of FT-RAM

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold	Revenue $Thousands
439	October-26-12	November-01-12	November-30-12	30	Union transportation, upstream transportation, purchased resource	11.4
440	September-19-12	November-01-12	December-31-12	61	Upstream transportation	457.5
441	September-17-12	November-01-12	December-31-12	61	Upstream transportation	416.4
442	October-16-12	November-01-12	December-31-12	61	Upstream transportation	186.6
443	October-29-12	November-01-12	November-30-12	30	Union transportation, upstream transportation	1.5
444	November-30-12	November-01-12	November-30-12	30	Union transportation, upstream transportation, purchased resource	149.5
445	October-11-12	November-01-12	December-31-12	61	Upstream transportation	183.0
446	November-02-12	November-03-12	November-05-12	3	Union transportation, upstream transportation, purchased resource	33.0
447	November-02-12	November-03-12	November-05-12	3	Union transportation, upstream transportation, purchased resource	4.2
448	November-05-12	November-05-12	November-05-12	1	Union transportation, upstream transportation, purchased resource	32.9
449	November-05-12	November-06-12	November-06-12	1	Union transportation, upstream transportation, purchased resource	7.4
450	November-05-12	November-06-12	November-06-12	1	Union transportation, upstream transportation, purchased resource	5.5
451	November-05-12	November-06-12	November-06-12	1	Union transportation, upstream transportation, purchased resource	39.3
452	November-05-12	November-06-12	November-06-12	1	Union transportation, upstream transportation, purchased resource	18.5
453	November-06-12	November-07-12	November-07-12	1	Union transportation, upstream transportation, purchased resource	31.1
454	November-06-12	November-07-12	November-07-12	1	Union transportation, upstream transportation, purchased resource	38.9
455	November-08-12	November-08-12	November-08-12	1	Union transportation, upstream transportation, purchased resource	12.0
456	November-07-12	November-08-12	November-08-12	1	Union transportation, upstream transportation, purchased resource	31.4
457	November-07-12	November-08-12	November-08-12	1	Union transportation, upstream transportation, purchased resource	53.8
458	November-09-12	November-09-12	November-09-12	1	Union transportation, upstream transportation, purchased resource	8.5
459	November-08-12	November-09-12	November-09-12	1	Union transportation, upstream transportation, purchased resource	53.8
460	November-09-12	November-10-12	November-12-12	3	Union transportation, upstream transportation, purchased resource	5.5
461	November-12-12	November-13-12	November-13-12	1	Union transportation, upstream transportation, purchased resource	6.0
462	November-12-12	November-13-12	November-13-12	1	Union transportation, upstream transportation, purchased resource	1.8
463	November-13-12	November-13-12	November-13-12	1	Union transportation, upstream transportation, purchased resource	17.4
464	November-13-12	November-14-12	November-14-12	1	Union transportation, upstream transportation, purchased resource	26.9
465	November-13-12	November-14-12	November-14-12	1	Union transportation, upstream transportation, purchased resource	16.9
466	November-13-12	November-14-12	November-14-12	1	Union transportation, upstream transportation, purchased resource	17.9
467	November-14-12	November-15-12	November-15-12	1	Union transportation, upstream transportation, purchased resource	1.8
468	November-14-12	November-15-12	November-30-12	16	Union transportation, upstream transportation, purchased resource	0.2
469	November-15-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource	11.0
470	November-16-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource	10.6
471	November-15-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource	22.9
472	November-15-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource	24.9
473	November-15-12	November-16-12	November-16-12	1	Union transportation, upstream transportation, purchased resource	12.0
474	November-16-12	November-17-12	November-19-12	3	Union transportation, upstream transportation, purchased resource	45.8
475	November-16-12	November-17-12	November-19-12	3	Union transportation, upstream transportation, purchased resource	90.2
476	November-16-12	November-17-12	November-19-12	3	Union transportation, upstream transportation, purchased resource	59.8
477	November-19-12	November-19-12	November-19-12	1	Union transportation, upstream transportation, purchased resource	11.8
478	November-20-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource	17.5
479	November-19-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource	30.9
480	November-19-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource	17.9
481	November-19-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource	47.4
482	November-19-12	November-20-12	November-20-12	1	Union transportation, upstream transportation, purchased resource	32.9
483	November-21-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource	16.2
484	November-20-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource	28.9
485	November-20-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource	65.8
486	November-20-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource	3.3
487	November-20-12	November-21-12	November-21-12	1	Union transportation, upstream transportation, purchased resource	32.9
488	November-21-12	November-22-12	November-22-12	1	Union transportation, upstream transportation, purchased resource	18.1
489	November-21-12	November-22-12	November-26-12	5	Union transportation, upstream transportation, purchased resource	36.3
490	November-21-12	November-22-12	November-26-12	5	Union transportation, upstream transportation, purchased resource	150.9
491	November-21-12	November-22-12	November-26-12	5	Union transportation, upstream transportation, purchased resource	79.8
492	November-21-12	November-22-12	November-26-12	5	Union transportation, upstream transportation, purchased resource	79.8
493	November-26-12	November-27-12	November-27-12	1	Upstream transportation, purchased resource	14.3
494	November-26-12	November-27-12	November-27-12	1	Upstream transportation, purchased resource	6.5
495	November-26-12	November-27-12	November-27-12	1	Union transportation, upstream transportation, purchased resource	11.2
496	November-26-12	November-27-12	November-27-12	1	Upstream transportation, purchased resource	13.1
497	November-27-12	November-28-12	November-28-12	1	Union transportation, upstream transportation, purchased resource	11.2
498	November-27-12	November-28-12	November-28-12	1	Union transportation, upstream transportation, purchased resource	40.9
499	November-28-12	November-29-12	November-29-12	1	Union transportation, upstream transportation, purchased resource	23.6
500	November-28-12	November-29-12	November-29-12	1	Union transportation, upstream transportation, purchased resource	28.9
501	November-28-12	November-29-12	November-29-12	1	Union transportation, upstream transportation, purchased resource	43.5
502	November-29-12	November-30-12	November-30-12	1	Union transportation, upstream transportation, purchased resource	17.2
503	November-29-12	November-30-12	November-30-12	1	Union transportation, upstream transportation, purchased resource	12.6
504	November-30-12	December-01-12	December-01-12	1	Union transportation, upstream transportation, purchased resource	0.1
505	November-30-12	December-01-12	December-03-12	3	Union transportation, upstream transportation, purchased resource	5.8
506	November-30-12	December-01-12	December-03-12	3	Union transportation, upstream transportation, purchased resource	80.2
507	November-30-12	December-01-12	December-03-12	3	Union transportation, upstream transportation, purchased resource	0.0
508	December-03-12	December-04-12	December-04-12	1	Union transportation, upstream transportation, purchased resource	1.7
509	December-03-12	December-04-12	December-04-12	1	Union transportation, upstream transportation, purchased resource	0.0
510	December-04-12	December-05-12	December-05-12	1	Union transportation, upstream transportation, purchased resource	1.9
511	December-04-12	December-05-12	December-05-12	1	Union transportation, upstream transportation, purchased resource	0.0

2012 Transportation Exchange Services and use of FT-RAM

Line No	Transaction Date	Contract Start Date	Contract End Date	# of Days Contracted in 2012	Resource Sold	Revenue $Thousands
512	December-05-12	December-06-12	December-06-12	1	Union transportation, upstream transportation, purchased resource	47.5
513	December-05-12	December-06-12	December-06-12	1	Union transportation, upstream transportation, purchased resource	15.3
514	December-05-12	December-06-12	December-06-12	1	Union transportation, upstream transportation, purchased resource	0.0
515	December-05-12	December-06-12	December-06-12	1	Union transportation, upstream transportation, purchased resource	0.0
516	December-06-12	December-07-12	December-07-12	1	Union transportation, upstream transportation, purchased resource	2.5
517	December-06-12	December-07-12	December-07-12	1	Union transportation, upstream transportation, purchased resource	0.0
518	December-07-12	December-08-12	December-09-12	1	Union transportation, upstream transportation, purchased resource	0.0
519	December-07-12	December-08-12	December-10-12	3	Union transportation, upstream transportation, purchased resource	5.6
520	December-07-12	December-08-12	December-10-12	3	Union transportation, upstream transportation, purchased resource	0.0
521	December-07-12	December-08-12	December-10-12	3	Union transportation, upstream transportation, purchased resource	0.5
522	December-10-12	December-11-12	December-11-12	1	Union transportation, upstream transportation, purchased resource	5.4
523	December-10-12	December-11-12	December-11-12	1	Union transportation, upstream transportation, purchased resource	0.0
524	December-11-12	December-12-12	December-12-12	1	Union transportation, upstream transportation, purchased resource	1.9
525	December-11-12	December-12-12	December-12-12	1	Union transportation, upstream transportation, purchased resource	15.4
526	December-11-12	December-12-12	December-12-12	1	Union transportation, upstream transportation, purchased resource	0.0
527	December-12-12	December-13-12	December-13-12	1	Union transportation, upstream transportation, purchased resource	1.9
528	December-12-12	December-13-12	December-13-12	1	Union transportation, upstream transportation, purchased resource	0.0
529	December-13-12	December-14-12	December-14-12	1	Union transportation, upstream transportation, purchased resource	0.0
530	December-13-12	December-14-12	December-14-12	1	Union transportation, upstream transportation, purchased resource	1.8
531	December-14-12	December-15-12	December-16-12	1	Union transportation, upstream transportation, purchased resource	0.1
532	December-14-12	December-15-12	December-17-12	3	Union transportation, upstream transportation, purchased resource	42.6
533	December-14-12	December-15-12	December-17-12	3	Union transportation, upstream transportation, purchased resource	1.7
534	December-14-12	December-15-12	December-17-12	3	Union transportation, upstream transportation, purchased resource	0.1
535	December-14-12	December-15-12	December-17-12	3	Union transportation, upstream transportation, purchased resource	9.0
536	December-18-12	December-19-12	December-19-12	1	Upstream transportation, purchased resource	6.4
537	December-18-12	December-19-12	December-19-12	1	Union transportation, upstream transportation, purchased resource	4.9
538	December-18-12	December-19-12	December-19-12	1	Upstream transportation, purchased resource	9.2
539	December-19-12	December-20-12	December-20-12	1	Upstream transportation, purchased resource	6.0
540	December-19-12	December-20-12	December-20-12	1	Upstream transportation, purchased resource	3.2
541	December-19-12	December-20-12	December-20-12	1	Union transportation, upstream transportation, purchased resource	2.1
542	December-19-12	December-20-12	December-20-12	1	Union transportation, upstream transportation, purchased resource	2.0
543	December-20-12	December-21-12	December-21-12	1	Upstream transportation, purchased resource	4.2
544	December-20-12	December-21-12	December-21-12	1	Upstream transportation, purchased resource	4.4
545	December-21-12	December-22-12	December-24-12	3	Upstream transportation, purchased resource	12.2
546	December-21-12	December-22-12	December-26-12	5	Union transportation, upstream transportation, purchased resource	0.3
547	December-21-12	December-22-12	December-24-12	3	Upstream transportation, purchased resource	13.3
548	December-21-12	December-22-12	December-24-12	3	Upstream transportation, purchased resource	11.9
549	December-21-12	December-22-12	December-24-12	3	Union transportation, upstream transportation, purchased resource	11.4
550	December-21-12	December-22-12	December-24-12	3	Union transportation, upstream transportation, purchased resource	5.2
551	December-24-12	December-25-12	December-26-12	1	Union transportation, upstream transportation, purchased resource	5.3
552	December-24-12	December-25-12	December-26-12	1	Upstream transportation, purchased resource	14.5
553	December-24-12	December-25-12	December-26-12	1	Upstream transportation, purchased resource	2.6
554	December-24-12	December-25-12	December-26-12	1	Union transportation, upstream transportation, purchased resource	5.3
555	December-24-12	December-25-12	December-26-12	1	Union transportation, upstream transportation, purchased resource	0.0
556	December-24-12	December-25-12	December-26-12	1	Union transportation, upstream transportation, purchased resource	4.3
557	December-26-12	December-27-12	December-27-12	1	Upstream transportation, purchased resource	5.7
558	December-26-12	December-27-12	December-27-12	1	Upstream transportation, purchased resource	0.5
559	December-27-12	December-27-12	December-27-12	1	Union transportation, upstream transportation, purchased resource	13.0
560	December-26-12	December-27-12	December-27-12	1	Union transportation, upstream transportation, purchased resource	0.0
561	December-27-12	December-28-12	December-28-12	1	Union transportation, upstream transportation	42.2
562	December-27-12	December-28-12	December-28-12	1	Union transportation, upstream transportation, purchased resource	58.6
563	December-27-12	December-28-12	December-28-12	1	Union transportation, upstream transportation, purchased resource	52.2
564	December-27-12	December-28-12	December-28-12	1	Union transportation, upstream transportation, purchased resource	0.0
565	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource	0.2
566	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource	104.4
567	December-28-12	December-29-12	December-31-12	3	Upstream transportation, purchased resource	1.3
568	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource	137.7
569	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource	0.1
570	December-28-12	December-29-12	December-31-12	3	Union transportation, upstream transportation, purchased resource	27.6
571					Upstream transportation, purchased resource	(2,727.0)
572						37,277.1


Union Gas EDA Contracted Capacity vs. Utility Activity
Energy (GJ/day)
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1-Nov-09
1-Dec-09
1-Jan-10
1-Feb-10
1-Mar-10
1-Apr-10
1-May-10
1-Jun-10
1-Jul-10
1-Aug-10
1-Sep-10
1-Oct-10
1-Nov-10
1-Dec-10
1-Jan-11
1-Feb-11
1-Mar-11
1-Apr-11
1-May-11
1-Jun-11
1-Jul-11
1-Aug-11
1-Sep-11
1-Oct-11
1-Nov-11
1-Dec-11
1-Jan-12
1-Feb-12
1-Mar-12
1-Apr-12
1-May-12
1-Jun-12
1-Jul-12
1-Aug-12
1-Sep-12
1-Oct-12
1-Nov-12
1-Dec-12
1-Jan-13
1-Feb-13
1-Mar-13
1-Apr-13
1-May-13
1-Jun-13
Daily Utility Activity (Excludes T-Service)
Contracted Empress to EDA Longhaul Net of Infranchise Assignments
Contracted Empress to EDA Longhaul and shorthaul firm Parkway to EDA
Contracted Empress to EDA Longhaul, shorthaul firm Parkway to EDA and STS Withdrawals
Contracted Empress to EDA Longhaul, shorthaul firm Parkway to EDA, STS Withdrawals net of annual (2009 to 2011), Seasonal 2012 and infranchise assignments

Filed: 2013-09-24
EB-2013-0109
Exhibit D10.1

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit A, Tab 1, Appendix A, Schedule 4, Page 1Acct 179-75

a) Please provide support and explanations for the reduction in M1 and Rate 01 LRAM amounts in 2012 relative to 2011.

b) Provide the forecast LRAM amounts for 2011, 2012 and 2013 for these classes as well as the overall totals. Please provide comment/explanations of material differences.

Response:

a) Please see Exhibit D1.1.

b) The table below outlines the m3 savings for an entire year of volumetric savings (subsequent year savings). There are no material differences between 2011 and 2012. The 2013 annual LRAM savings is expected to be similar to the 2012 pre-audit annual savings.

	2011 LRAM	2012 LRAM
Rate	Annual savings (10^3m^3) - Post-audit	Annual savings (10^3m^3) - Pre-audit
01 Commercial	1,256	1,122
01 Residential	1,653	722
10 Commercial	1,549	2,976
10 Industrial	484	1,236
M1 Residential	5,387	4,104
M1 Commercial	4,447	4,332
M1 Industrial	1,246	71
M2 Commercial	6,064	7,227
M2 Industrial	3,129	2,476
Total General Service	25,215	24,266
M4	7,981	14,510
M5	14,414	9,569
M7	12,780	3,050
T1	86,670	77,370
R20	4,577	7,739
R100	12,067	21,634
Total Contract	138,489	133,871
Grand Total	163,704	158,138

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit A, Tab 1 page 24, Appendix A, Schedule 1, Page 1 and Schedule 8. Acct 179-118

Please provide the explanation(s) for the large variance in Rate 10 forecast vs. actual volume decline in both 2011 and 2012.

Response:

The variance between target and actual average use for Rate 10 can be attributed to the manner in which the target is determined, and changes in actual average use from year to year.

For 2011, the target was based on a 3-year moving average using the 2007 to 2009 percentage change in average use. For 2012, the target was based on a 3-year moving average using the 2008 to 2010 percentage change in average use. In other words, the target is a lagging indicator of changes in average use, which can result in variances between target and actual average use.

Furthermore, there are variances in actual average use in Rate 10 from year to year that are driven by the size and composition of the rate class. The Rate 10 rate class serves a small number of customers, predominantly commercial and industrial customers. Changes in the number of commercial and industrial customers, with wide ranging annual usage levels, has resulted in variances in Rate 10 actual average use in 2011 and 2012.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit A, Tab 1, Page 27 and Table 7 Acct 179-123 CDM

Please provide more information on the nature of the costs in Table 3-for example are they O&M and do they include a mark-up or fee.

Response:

Please refer to Exhibit D4.3 for a breakdown of the costs. The costs are fully allocated O&M costs for providing the services, and do not include any markup.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit A, Tab 1 Appendix A, Schedule 1, Page 1and Pages 38-40 Acct 179-127

a) Please provide details regarding the Board approved recovery of the total amount in 2012.

b) Please explain why the $7.8 million could not be recovered over two years given the materiality of the amount?

Response:

a) In EB-2011-0025 the Board approved the establishment of the Pension Charge on Transition to U.S. GAAP Deferral Account. As part of this proceeding Union is now seeking Board approval for the amount captured in the deferral account.

b) Union has proposed the entire balance for recovery in this proceeding since it is now reporting under U.S. GAAP, under which the entire amount would have already been amortized into rates.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit A, Tab 2, Appendix A, Schedule 13 and Board Staff IR#2

In addition to the variance explanations requested in BSIR#2, please provide details of the changes in O&M expenses for the following lines from 2011 (actual) to 2012 (actual):

ii. Line 2 – Benefits- breakout pension costs;
v. Line 6 – Consulting; and,
vii. Line 17– Lease

Response:

Please see Attachment 1.

UNION GAS LIMITED

Operating and Maintenance Expense by Cost Type

Calendar 2012 Actual vs. Calendar 2011 Actual

Line No.	Notes:	($ 000's)
2	Benefits	
	2012 Actual	83,891
	2011 Actual	81,179
	Difference	2,712
2 a	Pension Benefits	
	2012 Actual	49,980
	2011 Actual	48,301
	Difference	1,679
	Reasons:	
	Higher defined benefit pension plan expense	1,245
	Higher defined contribution pension plan expense	434
	Tota 2012 Actual vs. 2011 Actual Difference	1,679
2 b	Non-Pension Benefits	
	2012 Actual	33,911
	2011 Actual	32,878
	Difference	1,033
	Reasons:	
	WSIB Surcharge in 2012 (vs. rebate in 2011)	1,500
	Taxable benefit on Long Service Awards	400
	Benefit plan contribution holiday	(800)
	Other	(67)
	Total 2012 Actual vs. 2011 Actual Difference	1,033
6	Consulting	
	2012 Actual	7,787
	2011 Actual	7,713
	Difference	74
	Reasons:	
	Higher NEB Hearing costs in 2012	700
	Management training program in 2011	(400)
	Other	(226)
	Total 2012 Actual vs. 2011 Actual Difference	74

17	Lease	
	2012 Actual	4,496
	2011 Actual	4,092
	Difference	404

Reasons:	
2012 retropayment - Annual Highway Agreement - MTO	236
Other	168
Total 2012 Actual vs. 2011 Actual Difference	404

Filed: 2013-09-24
EB-2013-0109
Exhibit D10.6

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit A, Tab 3, Page 7 and Appendix A Schedules 1-3

a) Please provide a Schedule that shows for each class the total impact (credit or charge) of including FTRAM revenue in Earnings as an offset to deferral and variance account balances.

b) Provide a discussion of the bill impacts (credit and Charge) for each class.

Response:

a) Please see Exhibit A, Tab 3, Appendix A, Schedule 1, page 1 for the impact of including FT-RAM revenues in utility earnings, subject to earnings sharing.

b) Please see Exhibit B, Tab 4, Schedule 2, pages 1-3, under the heading "Earnings Sharing" for the bill impacts for customers in each rate class under Union's proposal to include FT-RAM revenues in utility earnings, subject to earnings sharing.

Filed: 2013-09-24
EB-2013-0109
Exhibit D10.7

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit A, Tab 3 Pages 8&9 and Appendix B Schedules 1-3

a) Please provide a Schedule that shows for each class the total impact (credit or charge) of NOT including FT-RAM revenue in Earnings, but including it in deferral and variance account balances.

b) Provide a discussion of the bill impacts (credit and Charge) for each class.

Response:

a) Please see Exhibit A, Tab 3, Appendix B, Schedule 1, page 1 for the impact of not including FT-RAM revenue in utility earnings, subject to earnings sharing, but rather as a gas cost reduction.

b) Please see Exhibit B, Tab 4, Schedule 2, pages 1-3, under the heading "FT-RAM Deferral" for the bill impacts for customers in each rate class based on the treatment of FT-RAM revenues as a gas cost reduction.

Filed: 2013-09-24
EB-2013-0109
Exhibit D10.8

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit B Tab1 Page 5 Table 1 and pages 39-40

a) Confirm that the Board has not approved including FT-RAM revenue as utility earnings for sharing between Union and ratepayers.

b) Please indicate how much revenue will accrue to Union's shareholder and ratepayers in each case- if FT-RAM revenue is, or is not included as revenue for earnings sharing or treated as a gas cost reduction.

c) Of the grounds 1-6 that Union has set out to support the request for changing the treatment of FT-RAM revenue, please indicate which were in place at the time of the EB-2012-087 Decision.

d) Please explain why Union has determined that the approved method for treating FT-RAM is not the primary option and has decided to revert to prior treatment. List and discuss the reasons.

Response:

a) Please refer to Exhibit D8.32.

b) Please refer to Exhibit D8.17.

c) New information since the EB-2012-0087 Decision includes: the reports provided by Stephen Acker in Exhibit C, Tab 1 and by Sussex Economic Advisors in Exhibit C, Tab 2; the Board's March 14, 2013 EB-2012-0055 Decision on Enbridge's 2011 Deferral Account Disposition proceeding; and, a more complete evidentiary record from Union on transportation exchange revenue.

d) Please see Exhibit B, Tab 1, pages 5 to 6.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit B, Tab 4, Page 3 and Schedule 1 and Appendix A

Preamble: "Specifically, Union South bundled direct purchase customers, Union North transportation service customers and ex-franchise customers realize a benefit under Union's proposal. That is, the rate impacts are either higher credits, or lower debits than under the alternative gas cost deferral treatment.

In the alternative gas cost deferral treatment, only Union South sales service and Union North sales service and bundled direct purchase customers realize a benefit. That is, the rate impacts are either higher credits, or lower debits than under Union's proposal."

a) Confirm in March 2013, Union has presented its proposal to representatives of larger use and direct purchase customers (APPrO, CME and IGUA).

b) Please explain why representatives of small volume customers were not provided with a similar presentation based on slides 10-14 in the Appendix.

c) Please provide Union's similar conclusion to that on Slides 6 and 7 for larger use/direct purchase customers for the impact on small volume customers on Slides 10 and 13.

d) Please provide a version of Schedule 1 and Schedule 2 that shows the Base Deferral Account balances to be cleared to each class along with the offsets of Earnings Sharing and FT-RAM revenue.

e) Please provide details regarding which customers pay for the transportation assets used for 2012 base exchanges, including FT-RAM. Be specific as to the baseline capacity used to generate the each type of exchange revenue and also who would pay for these assets in rates if there were no exchanges.

Response:

a) Confirmed.

b) Please refer to Exhibit D8.36.

c) Please see Exhibit B, Tab 4, Schedule 1.
d) Please see Attachment 1 and Attachment 2.

e) Transportation exchange services are used to optimize Union's suite of assets including upstream transportation assets, Union's Dawn to Parkway transmission system, and supplemental purchased resources.

For an explanation of the treatment of upstream transportation assets please refer to Exhibit D2.18 and Exhibit D8.35.

The costs associated with Union's Dawn to Parkway transmission system are recovered in Union South delivery rates, Union North storage rates and ex-franchise transportation rates.

The cost for supplemental purchased resources is recorded against S&T revenue.

For the resource used to generate each type of exchange revenue, please refer to Exhibit D8.43.

UNION GAS LIMITED

Calculation of 2012 Deferral Impacts by Rate Class

Line No.	Rate Class	Particulars ($)	Customers	Consumption (10^3m^3)	Earnings Sharing			FT-RAM Deferral			Difference
					Base Deferral	Earnings Sharing	Total	Base Deferral	FT-RAM Deferral	Total	
			(a)	(b)	(c)	(d)	(e) = (c+d)	(f)	(g)	(h) = (f+g)	(i) = (h-e)
	Union South										
1	M1	Sales Service		1,985,247 (1)	9,621,735	(5,613,268)	4,008,467	9,621,735	(14,558,504)	(4,936,769)	(8,945,237)
2		Direct Purchase		247,631 (1)	966,506	(700,175)	266,330	966,506	0	966,506	700,175
3				2,232,879 (1)	10,588,241	(6,313,443)	4,274,798	10,588,241	(14,558,504)	(3,970,263)	(8,245,061)
4	M2	Sales Service		412,655 (1)	1,566,890	(496,418)	1,070,472	1,566,890	(3,026,144)	(1,459,254)	(2,529,726)
5		Direct Purchase		385,090 (1)	1,098,844	(463,257)	635,587	1,098,844	0	1,098,844	463,257
6				797,745 (1)	2,665,734	(959,675)	1,706,059	2,665,734	(3,026,144)	(360,410)	(2,066,469)
7	M4	Sales Service	15	20,353 (2)	109,712	(12,148)	97,564	109,712	(78,867)	30,845	(66,719)
8		Direct Purchase	146	408,288 (2)	1,997,268	(243,693)	1,753,575	1,997,268	0	1,997,268	243,693
9			161	428,641 (2)	2,106,980	(255,841)	1,851,140	2,106,980	(78,867)	2,028,113	176,973
10	M5	Sales Service	10	19,039 (2)	27,925	(6,351)	21,573	27,925	(73,774)	(45,849)	(67,423)
11		Direct Purchase	134	451,207 (2)	436,827	(150,524)	286,303	436,827	0	436,827	150,524
12			144	470,246 (2)	464,752	(156,876)	307,876	464,752	(73,774)	390,978	83,102
13	M7	Direct Purchase	4	141,165 (2)	(202,623)	(158,644)	(361,267)	(202,623)	0	(202,623)	158,644
14			4	141,165 (2)	(202,623)	(158,644)	(361,267)	(202,623)	0	(202,623)	158,644
15	M9	Direct Purchase	3	57,878 (2)	9,330	(13,291)	(3,960)	9,330	0	9,330	13,291
16			3	57,878 (2)	9,330	(13,291)	(3,960)	9,330	0	9,330	13,291
17	M10	Sales Service	3	118 (2)	398	(378)	20	398	(457)	(59)	(79)
18		Direct Purchase	1	79 (2)	228	(254)	(26)	228	0	228	254
19			4	197 (2)	625	(632)	(6)	625	(457)	169	175
20	T1	Direct Purchase	60	5,023,637 (2)	2,734,706	(778,218)	1,956,488	2,734,706	0	2,734,706	778,218
21			60	5,023,637 (2)	2,734,706	(778,218)	1,956,488	2,734,706	0	2,734,706	778,218
22	T3	Direct Purchase	1	239,361 (2)	97,624	(93,748)	3,876	97,624	0	97,624	93,748
23			1	239,361 (2)	97,624	(93,748)	3,876	97,624	0	97,624	93,748
24	**Total Union South**	**Sales Service**			**11,326,660**	**(6,128,563)**	**5,198,097**	**11,326,660**	**(17,737,746)**	**(6,411,086)**	**(11,609,183)**
25		**Direct Purchase**			**7,138,710**	**(2,601,804)**	**4,536,906**	**7,138,710**	**0**	**7,138,710**	**2,601,804**
26					**18,465,370**	**(8,730,367)**	**9,735,003**	**18,465,370**	**(17,737,746)**	**727,624**	**(9,007,380)**
	Union North										
27	Rate 01	Sales Service & Bundled T		714,975 (1)	(2,430,620)	(2,701,031)	(5,131,651)	(2,430,620)	(9,477,094)	(11,907,714)	(6,776,063)
28				714,975 (1)	(2,430,620)	(2,701,031)	(5,131,651)	(2,430,620)	(9,477,094)	(11,907,714)	(6,776,063)
29	Rate 10	Sales Service & Bundled T		241,642 (1)	(1,964,705)	(498,327)	(2,463,032)	(1,964,705)	(3,854,333)	(5,819,038)	(3,356,006)
30		T-Service		427 (1)	(1,943)	(880)	(2,823)	(1,943)	0	(1,943)	880
31				242,068 (1)	(1,966,648)	(499,207)	(2,465,855)	(1,966,648)	(3,854,333)	(5,820,981)	(3,355,126)
32	Rate 20	Sales Service	2	6,471 (2)	563	(2,555)	(1,992)	563	(102,316)	(101,753)	(99,761)
33		Bundled DP	18	96,026 (2)	8,350	(37,909)	(29,558)	8,350	(1,518,320)	(1,509,969)	(1,480,411)
34		T-Service	36	552,219 (2)	676,916	(218,003)	458,914	676,916	0	676,916	218,003
35			56	654,716 (2)	685,829	(258,466)	427,364	685,829	(1,620,636)	(934,806)	(1,362,170)
36	Rate 100	T-Service	17	1,912,232 (2)	716,413	(342,029)	374,384	716,413	0	716,413	342,029
37			17	1,912,232 (2)	716,413	(342,029)	374,384	716,413	0	716,413	342,029
38	Rate 25	Sales Service	58	44,659 (2)	6,376	(24,951)	(18,576)	6,376	(287,345)	(280,969)	(262,394)
39		T-Service	43	162,978 (2)	23,267	(91,058)	(67,790)	23,267	0	23,267	91,058
40			101	207,636 (2)	29,643	(116,009)	(86,366)	29,643	(287,345)	(257,702)	(171,336)
41	**Total Union North**	**Sales Service & Bundled T**			**(4,380,036)**	**(3,264,773)**	**(7,644,809)**	**(4,380,036)**	**(15,239,408)**	**(19,619,444)**	**(11,974,635)**
42		**T-Service**			**1,414,654**	**(651,970)**	**762,685**	**1,414,654**	**0**	**1,414,654**	**651,090**
43					**(2,965,381)**	**(3,916,743)**	**(6,882,124)**	**(2,965,381)**	**(15,239,408)**	**(18,204,789)**	**(11,323,545)**

Notes:

(1) Based on forecast consumption for the period October 1, 2013 to March 31, 2014.

(2) Based on 2012 actual annual volume.

UNION GAS LIMITED
Calculation of 2012 Deferral Impacts for Customers within each Rate Class

Line No.	Particulars	Rate Component	Volume for 2012 Deferral Disposition (m^3)		Earnings Sharing: Base Deferral Unit Rate Recovery/(Refund) (cents/m^3)	Earnings Sharing: Earnings Sharing Unit Rate Recovery/(Refund) (cents/m^3)	Earnings Sharing: Total Unit Rate Recovery/(Refund) (cents/m^3)	Earnings Sharing: Base Deferral Bill Impact ($)	Earnings Sharing: Earnings Sharing Bill Impact ($)	Earnings Sharing: Total Bill Impact ($)	FT-RAM Deferral: Base Deferral Unit Rate Recovery/(Refund) (cents/m^3)	FT-RAM Deferral: FT-RAM Deferral Unit Rate Recovery/(Refund) (cents/m^3)	FT-RAM Deferral: Total Unit Rate Recovery/(Refund) (cents/m^3)	FT-RAM Deferral: Base Deferral Bill Impact ($)	FT-RAM Deferral: FT-RAM Deferral Bill Impact ($)	FT-RAM Deferral: Total Bill Impact ($)	Difference: Base Deferral ($)	Difference: FT-RAM Deferral ($)	Difference: Total ($)
			(a)		(b)	(c)	(d)	(e) = (a x b) / 100	(f) = (a x c) / 100	(g) = (a x d) / 100	(h)	(i)	(j)	(k) = (a x h) / 100	(l) = (a x i) / 100	(m) = (a x j) / 100	(n) = (k - e)	(o) = (l - f)	(p) = (m - g)
1	Average Rate 01	Delivery	1,733	(1)	0.0379	(0.3778)	(0.3399)	0.66	(6.55)	(5.89)	0.0379	-	0.0379	0.66	-	0.66			
2	Annual Volume of 2,200 m^3	Commodity	1,733	(1)	-	-	-	-	-	-	-	-	-	-	-	-			
3		Transportation	1,733	(1)	(0.3779)	-	(0.3779)	(6.55)	-	(6.55)	(0.3779)	(1.3255)	(1.7034)	(6.55)	(22.96)	(29.51)			
4					(0.3400)	(0.3778)	(0.7178)	(5.89)	(6.55)	(12.44)	(0.3400)	(1.3255)	(1.6655)	(5.89)	(22.96)	(28.85)			
5	Sales Service							(5.89)	(6.55)	(12.44)				(5.89)	(22.96)	(28.85)	-	(16.42)	(16.42)
6	Direct Purchase Bundled T							(5.89)	(6.55)	(12.44)				(5.89)	(22.96)	(28.85)	-	(16.42)	(16.42)
7	Small Rate 10	Delivery	43,200	(1)	(0.4552)	(0.2062)	(0.6614)	(196.65)	(89.08)	(285.73)	(0.4552)	-	(0.4552)	(196.65)	-	(196.65)			
8	Annual Volume of 60,000 m^3	Commodity	43,200	(1)	-	-	-	-	-	-	-	-	-	-	-	-			
9		Transportation	43,200	(1)	(0.3578)	-	(0.3578)	(154.57)	-	(154.57)	(0.3578)	(1.5951)	(1.9529)	(154.57)	(689.09)	(843.66)			
10					(0.8130)	(0.2062)	(1.0192)	(351.22)	(89.08)	(440.30)	(0.8130)	(1.5951)	(2.4081)	(351.22)	(689.09)	(1,040.31)			
11	Sales Service							(351.22)	(89.08)	(440.30)				(351.22)	(689.09)	(1,040.31)	-	(600.01)	(600.01)
12	Direct Purchase Bundled T							(351.22)	(89.08)	(440.30)				(351.22)	(689.09)	(1,040.31)	-	(600.01)	(600.01)
13	T-Service							(196.65)	(89.08)	(285.73)				(196.65)	-	(196.65)	-	89.08	89.08
14	Average Rate 10	Delivery	66,961	(1)	(0.4552)	(0.2062)	(0.6614)	(304.81)	(138.07)	(442.88)	(0.4552)	-	(0.4552)	(304.81)	-	(304.81)			
15	Annual Volume of 93,000 m^3	Commodity	66,961	(1)	-	-	-	-	-	-	-	-	-	-	-	-			
16		Transportation	66,961	(1)	(0.3578)	-	(0.3578)	(239.59)	-	(239.59)	(0.3578)	(1.5951)	(1.9529)	(239.59)	(1,068.09)	(1,307.68)			
17					(0.8130)	(0.2062)	(1.0192)	(544.39)	(138.07)	(682.47)	(0.8130)	(1.5951)	(2.4081)	(544.39)	(1,068.09)	(1,612.49)			
18	Sales Service							(544.39)	(138.07)	(682.47)				(544.39)	(1,068.09)	(1,612.49)	-	(930.02)	(930.02)
19	Direct Purchase Bundled T							(544.39)	(138.07)	(682.47)				(544.39)	(1,068.09)	(1,612.49)	-	(930.02)	(930.02)
20	T-service							(304.81)	(138.07)	(442.88)				(304.81)	-	(304.81)	-	138.07	138.07
21	Large Rate 10	Delivery	180,001	(1)	(0.4552)	(0.2062)	(0.6614)	(819.37)	(371.16)	(1,190.53)	(0.4552)	-	(0.4552)	(819.37)	-	(819.37)			
22	Annual Volume of 250,000 m^3	Commodity	180,001	(1)	-	-	-	-	-	-	-	-	-	-	-	-			
23		Transportation	180,001	(1)	(0.3578)	-	(0.3578)	(644.05)	-	(644.05)	(0.3578)	(1.5951)	(1.9529)	(644.05)	(2,871.20)	(3,515.25)			
24					(0.8130)	(0.2062)	(1.0192)	(1,463.41)	(371.16)	(1,834.57)	(0.8130)	(1.5951)	(2.4081)	(1,463.41)	(2,871.20)	(4,334.62)			
25	Sales Service							(1,463.41)	(371.16)	(1,834.57)				(1,463.41)	(2,871.20)	(4,334.62)	-	(2,500.04)	(2,500.04)
26	Direct Purchase Bundled T							(1,463.41)	(371.16)	(1,834.57)				(1,463.41)	(2,871.20)	(4,334.62)	-	(2,500.04)	(2,500.04)
27	T-Service							(819.37)	(371.16)	(1,190.53)				(819.37)	-	(819.37)	-	371.16	371.16
28	Small Rate 20	Delivery	3,000,000	(2)	0.1105	(0.0395)	0.0710	3,315.00	(1,185.00)	2,130.00	0.1105	-	0.1105	3,315.00	-	3,315.00			
29		Commodity	3,000,000	(2)	-	-	-	-	-	-	-	-	-	-	-	-			
30		Transportation	3,000,000	(2)	(0.1018)	-	(0.1018)	(3,052.68)	-	(3,052.68)	(0.1018)	(1.5812)	(1.6829)	(3,052.68)	(47,434.72)	(50,487.40)			
31					0.0087	(0.0395)	(0.0308)	262.32	(1,185.00)	(922.68)	0.0087	(1.5812)	(1.5724)	262.32	(47,434.72)	(47,172.40)			
32	Sales Service							262.32	(1,185.00)	(922.68)				262.32	(47,434.72)	(47,172.40)	-	(46,249.72)	(46,249.72)
33	Direct Purchase Bundled T							262.32	(1,185.00)	(922.68)				262.32	(47,434.72)	(47,172.40)	-	(46,249.72)	(46,249.72)
34	T-Service							3,315.00	(1,185.00)	2,130.00				3,315.00	-	3,315.00	-	1,185.00	1,185.00
35	Average Rate 20	Delivery	11,691,000	(2)	0.1105	(0.0395)	0.0710	12,918.56	(4,617.95)	8,300.61	0.1105	-	0.1105	12,918.56	-	12,918.56			
36		Commodity	11,691,000	(2)	-	-	-	-	-	-	-	-	-	-	-	-			
37		Transportation	11,691,000	(2)	(0.1018)	-	(0.1018)	(11,896.30)	-	(11,896.30)	(0.1018)	(1.5812)	(1.6829)	(11,896.30)	(184,853.09)	(196,749.39)			
38					0.0087	(0.0395)	(0.0308)	1,022.26	(4,617.95)	(3,595.69)	0.0087	(1.5812)	(1.5724)	1,022.26	(184,853.09)	(183,830.84)			
39	Sales Service							1,022.26	(4,617.95)	(3,595.69)				1,022.26	(184,853.09)	(183,830.84)	-	(180,235.15)	(180,235.15)
40	Direct Purchase Bundled T							1,022.26	(4,617.95)	(3,595.69)				1,022.26	(184,853.09)	(183,830.84)	-	(180,235.15)	(180,235.15)
41	T-service							12,918.56	(4,617.95)	8,300.61				12,918.56	-	12,918.56	-	4,617.95	4,617.95
42	Large Rate 20	Delivery	15,000,000	(2)	0.1105	(0.0395)	0.0710	16,575.00	(5,925.00)	10,650.00	0.1105	-	0.1105	16,575.00	-	16,575.00			
43		Commodity	15,000,000	(2)	-	-	-	-	-	-	-	-	-	-	-	-			
44		Transportation	15,000,000	(2)	(0.1018)	-	(0.1018)	(15,263.40)	-	(15,263.40)	(0.1018)	(1.5812)	(1.6829)	(15,263.40)	(237,173.59)	(252,436.99)			
45					0.0087	(0.0395)	(0.0308)	1,311.60	(5,925.00)	(4,613.40)	0.0087	(1.5812)	(1.5724)	1,311.60	(237,173.59)	(235,861.99)			
46	Sales Service							1,311.60	(5,925.00)	(4,613.40)				1,311.60	(237,173.59)	(235,861.99)	-	(231,248.59)	(231,248.59)
47	Direct Purchase Bundled T							1,311.60	(5,925.00)	(4,613.40)				1,311.60	(237,173.59)	(235,861.99)	-	(231,248.59)	(231,248.59)
48	T-Service							16,575.00	(5,925.00)	10,650.00				16,575.00	-	16,575.00	-	5,925.00	5,925.00
49	Average Rate 25	Delivery	2,055,000	(2)	0.0143	(0.0559)	(0.0416)	293.87	(1,148.75)	(854.88)	0.0143	-	0.0143	293.87	-	293.87			
50		Commodity	2,055,000	(2)	-	-	-	-	-	-	-	-	-	-	-	-			
51		Transportation	2,055,000	(2)	-	-	-	-	-	-	-	(0.6434)	(0.6434)	-	(13,221.87)	(13,221.87)			
52					0.0143	(0.0559)	(0.0416)	293.87	(1,148.75)	(854.88)	0.0143	(0.6434)	(0.6291)	293.87	(13,221.87)	(12,928.01)			
53	Sales Service							293.87	(1,148.75)	(854.88)				293.87	(13,221.87)	(12,928.01)	-	(12,073.13)	(12,073.13)
54	T-Service							293.87	(1,148.75)	(854.88)				293.87	-	293.87	-	1,148.75	1,148.75
55	Small Rate 100	Delivery	27,000,000	(2)	0.0374	(0.0179)	0.0195	10,098.00	(4,833.00)	5,265.00	0.0374	-	0.0374	10,098.00	-	10,098.00			
56	T-Service				0.0374	(0.0179)	0.0195	10,098.00	(4,833.00)	5,265.00	0.0374	-	0.0374	10,098.00	-	10,098.00	-	4,833.00	4,833.00
57	Average Rate 100	Delivery	112,484,000	(2)	0.0374	(0.0179)	0.0195	42,069.02	(20,134.64)	21,934.38	0.0374	-	0.0374	42,069.02	-	42,069.02			
58	T-service				0.0374	(0.0179)	0.0195	42,069.02	(20,134.64)	21,934.38	0.0374	-	0.0374	42,069.02	-	42,069.02	-	20,134.64	20,134.64
59	Large Rate 100	Delivery	486,300,000	(2)	0.0374	(0.0179)	0.0195	181,876.20	(87,047.70)	94,828.50	0.0374	-	0.0374	181,876.20	-	181,876.20			
60	T-Service				0.0374	(0.0179)	0.0195	181,876.20	(87,047.70)	94,828.50	0.0374	-	0.0374	181,876.20	-	181,876.20	-	87,047.70	87,047.70

UNION GAS LIMITED

Calculation of 2012 Deferral Impacts for Customers within each Rate Class

Line No.	Particulars	Rate Component	Volume for 2012 Deferral Disposition (m^3)		Earnings Sharing: Base Deferral Unit Rate Recovery/(Refund) (cents/m^3)	Earnings Sharing: Earnings Sharing Unit Rate Recovery/(Refund) (cents/m^3)	Earnings Sharing: Total Unit Rate Recovery/(Refund) (cents/m^3)	Earnings Sharing: Base Deferral Bill Impact ($)	Earnings Sharing: Earnings Sharing Bill Impact ($)	Earnings Sharing: Total Bill Impact ($)	FT-RAM Deferral: Base Deferral Unit Rate Recovery/(Refund) (cents/m^3)	FT-RAM Deferral: FT-RAM Deferral Unit Rate Recovery/(Refund) (cents/m^3)	FT-RAM Deferral: Total Unit Rate Recovery/(Refund) (cents/m^3)	FT-RAM Deferral: Base Deferral Bill Impact ($)	FT-RAM Deferral: FT-RAM Deferral Bill Impact ($)	FT-RAM Deferral: Total Bill Impact ($)	Difference: Base Deferral ($)	Difference: FT-RAM Deferral ($)	Difference: Total ($)
			(a)		(b)	(c)	(d)	(e) = (a x b) / 100	(f) = (a x c) / 100	(g) = (a x d) / 100	(h)	(i)	(j)	(k) = (a x h) / 100	(l) = (a x i) / 100	(m) = (a x j) / 100	(n) = (k - e)	(o) = (l - f)	(p) = (m - g)
1	Average Rate M1	Delivery	1,679	(1)	0.3903	(0.2827)	0.1076	6.55	(4.75)	1.81	0.3903	-	0.3903	6.55	-	6.55			
2	Annual Volume of 2,200 m³	Commodity	1,679	(1)	0.0944	-	0.0944	1.58	-	1.58	0.0944	(0.7333)	(0.6389)	1.58	(12.31)	(10.72)			
3					0.4847	(0.2827)	0.2020	8.14	(4.75)	3.39	0.4847	(0.7333)	(0.2486)	8.14	(12.31)	(4.17)			
4	Sales Service							8.14	(4.75)	3.39				8.14	(12.31)	(4.17)	-	(7.56)	(7.56)
5	Direct Purchase							6.55	(4.75)	1.81				6.55	-	6.55	-	4.75	4.75
6	Small Rate M2	Delivery	45,840	(1)	0.2853	(0.1203)	0.1650	130.78	(55.15)	75.64	0.2853	-	0.2853	130.78	-	130.78			
7	Annual Volume of 60,000 m³	Commodity	45,840	(1)	0.0944	-	0.0944	43.27	-	43.27	0.0944	(0.7333)	(0.6389)	43.27	(336.14)	(292.87)			
8					0.3797	(0.1203)	0.2594	174.05	(55.15)	118.91	0.3797	(0.7333)	(0.3536)	174.05	(336.14)	(162.09)			
9	Sales Service							174.05	(55.15)	118.91				174.05	(336.14)	(162.09)	-	(281.00)	(281.00)
10	Direct Purchase							130.78	(55.15)	75.64				130.78	-	130.78	-	55.15	55.15
11	Average Rate M2	Delivery	55,772	(1)	0.2853	(0.1203)	0.1650	159.12	(67.09)	92.02	0.2853	-	0.2853	159.12	-	159.12			
12	Annual Volume of 73,000 m³	Commodity	55,772	(1)	0.0944	-	0.0944	52.65	-	52.65	0.0944	(0.7333)	(0.6389)	52.65	(408.98)	(356.33)			
13					0.3797	(0.1203)	0.2594	211.77	(67.09)	144.67	0.3797	(0.7333)	(0.3536)	211.77	(408.98)	(197.21)			
14	Sales Service							211.77	(67.09)	144.67				211.77	(408.98)	(197.21)	-	(341.88)	(341.88)
15	Direct Purchase							159.12	(67.09)	92.02				159.12	-	159.12	-	67.09	67.09
16	Large Rate M2	Delivery	191,000	(1)	0.2853	(0.1203)	0.1650	544.92	(229.77)	315.15	0.2853	-	0.2853	544.92	-	544.92			
17	Annual Volume of 250,000 m³	Commodity	191,000	(1)	0.0944	-	0.0944	180.30	-	180.30	0.0944	(0.7333)	(0.6389)	180.30	(1,400.60)	(1,220.30)			
18					0.3797	(0.1203)	0.2594	725.23	(229.77)	495.45	0.3797	(0.7333)	(0.3536)	725.23	(1,400.60)	(675.38)			
19	Sales Service							725.23	(229.77)	495.45				725.23	(1,400.60)	(675.38)	-	(1,170.83)	(1,170.83)
20	Direct Purchase							544.92	(229.77)	315.15				544.92	-	544.92	-	229.77	229.77
21	Small Rate M4	Delivery	875,000	(2)	0.4892	(0.0597)	0.4295	4,280.50	(522.38)	3,758.13	0.4892	-	0.4892	4,280.50	-	4,280.50			
22		Commodity	875,000	(2)	0.0499	-	0.0499	436.63	-	436.28	0.0499	(0.3875)	(0.3376)	436.63	(3,390.63)	(2,954.29)			
23					0.5391	(0.0597)	0.4794	4,717.13	(522.38)	4,194.41	0.5391	(0.3875)	0.1516	4,717.13	(3,390.63)	1,326.21			
24	Sales Service							4,717.13	(522.38)	4,194.41				4,717.13	(3,390.63)	1,326.21	-	(2,868.25)	(2,868.19)
25	Direct Purchase							4,280.50	(522.38)	3,758.13				4,280.50	-	4,280.50	-	522.38	522.38
26	Average Rate M4	Delivery	2,662,000	(2)	0.4892	(0.0597)	0.4295	13,022.50	(1,589.21)	11,433.29	0.4892	-	0.4892	13,022.50	-	13,022.50			
27		Commodity	2,662,000	(2)	0.0499	-	0.0499	1,328.34	-	1,327.29	0.0499	(0.3875)	(0.3376)	1,328.34	(10,315.25)	(8,987.78)			
28					0.5391	(0.0597)	0.4794	14,350.84	(1,589.21)	12,760.58	0.5391	(0.3875)	0.1516	14,350.84	(10,315.25)	4,034.72			
29	Sales Service							14,350.84	(1,589.21)	12,760.58				14,350.84	(10,315.25)	4,034.72	-	(8,726.04)	(8,725.86)
30	Direct Purchase							13,022.50	(1,589.21)	11,433.29				13,022.50	-	13,022.50	-	1,589.21	1,589.21
31	Large Rate M4	Delivery	4,019,000	(2)	0.4892	(0.0597)	0.4295	19,660.95	(2,399.34)	17,261.61	0.4892	-	0.4892	19,660.95	-	19,660.95			
32		Commodity	4,019,000	(2)	0.0499	-	0.0499	2,005.48	-	2,003.90	0.0499	(0.3875)	(0.3376)	2,005.48	(15,573.63)	(13,569.46)			
33					0.5391	(0.0597)	0.4794	21,666.43	(2,399.34)	19,265.50	0.5391	(0.3875)	0.1516	21,666.43	(15,573.63)	6,091.49			
34	Sales Service							21,666.43	(2,399.34)	19,265.50				21,666.43	(15,573.63)	6,091.49	-	(13,174.28)	(13,174.01)
35	Direct Purchase							19,660.95	(2,399.34)	17,261.61				19,660.95	-	19,660.95	-	2,399.34	2,399.34
36	Small Rate M5	Delivery	825,000	(2)	0.0968	(0.0334)	0.0635	798.60	(275.55)	523.88	0.0968	-	0.0968	798.60	-	798.60			
37		Commodity	825,000	(2)	0.0499	-	0.0499	411.68	-	411.35	0.0499	(0.3875)	(0.3376)	411.68	(3,196.88)	(2,785.47)			
38					0.1467	(0.0334)	0.1134	1,210.28	(275.55)	935.22	0.1467	(0.3875)	(0.2408)	1,210.28	(3,196.88)	(1,986.87)			
39	Sales Service							1,210.28	(275.55)	935.22				1,210.28	(3,196.88)	(1,986.87)	-	(2,921.33)	(2,922.09)
40	Direct Purchase							798.60	(275.55)	523.88				798.60	-	798.60	-	275.55	274.73
41	Average Rate M5	Delivery	3,266,000	(2)	0.0968	(0.0334)	0.0635	3,161.49	(1,090.84)	2,073.91	0.0968	-	0.0968	3,161.49	-	3,161.49			
42		Commodity	3,266,000	(2)	0.0499	-	0.0499	1,629.73	-	1,628.45	0.0499	(0.3875)	(0.3376)	1,629.73	(12,655.75)	(11,027.08)			
43					0.1467	(0.0334)	0.1134	4,791.22	(1,090.84)	3,702.36	0.1467	(0.3875)	(0.2408)	4,791.22	(12,655.75)	(7,865.60)			
44	Sales Service							4,791.22	(1,090.84)	3,702.36				4,791.22	(12,655.75)	(7,865.60)	-	(11,564.91)	(11,567.95)
45	Direct Purchase							3,161.49	(1,090.84)	2,073.91				3,161.49	-	3,161.49	-	1,090.84	1,087.58
46	Large Rate M5	Delivery	11,004,000	(2)	0.0968	(0.0334)	0.0635	10,651.87	(3,675.34)	6,987.54	0.0968	-	0.0968	10,651.87	-	10,651.87			
47		Commodity	11,004,000	(2)	0.0499	-	0.0499	5,491.00	-	5,486.66	0.0499	(0.3875)	(0.3376)	5,491.00	(42,640.50)	(37,153.10)			
48					0.1467	(0.0334)	0.1134	16,142.87	(3,675.34)	12,474.20	0.1467	(0.3875)	(0.2408)	16,142.87	(42,640.50)	(26,501.23)			
49	Sales Service							16,142.87	(3,675.34)	12,474.20				16,142.87	(42,640.50)	(26,501.23)	-	(38,965.16)	(38,975.43)
50	Direct Purchase							10,651.87	(3,675.34)	6,987.54				10,651.87	-	10,651.87	-	3,675.34	3,664.33
51	Small Rate M7	Delivery	28,327,000	(2)	(0.1435)	(0.1124)	(0.2559)	(40,649.25)	(31,839.55)	(72,488.79)	(0.1435)	-	(0.1435)	(40,649.25)	-	(40,649.25)			
52	Direct Purchase				(0.1435)	(0.1124)	(0.2559)	(40,649.25)	(31,839.55)	(72,488.79)	(0.1435)	-	(0.1435)	(40,649.25)	-	(40,649.25)	-	31,839.55	31,839.55
53	Average Rate M7	Delivery	35,291,000	(2)	(0.1435)	(0.1124)	(0.2559)	(50,642.59)	(39,667.08)	(90,309.67)	(0.1435)	-	(0.1435)	(50,642.59)	-	(50,642.59)			
54	Direct Purchase				(0.1435)	(0.1124)	(0.2559)	(50,642.59)	(39,667.08)	(90,309.67)	(0.1435)	-	(0.1435)	(50,642.59)	-	(50,642.59)	-	39,667.08	39,667.08
55	Large Rate M7	Delivery	45,238,000	(2)	(0.1435)	(0.1124)	(0.2559)	(64,916.53)	(50,847.51)	(115,764.04)	(0.1435)	-	(0.1435)	(64,916.53)	-	(64,916.53)			
56	Direct Purchase				(0.1435)	(0.1124)	(0.2559)	(64,916.53)	(50,847.51)	(115,764.04)	(0.1435)	-	(0.1435)	(64,916.53)	-	(64,916.53)	-	50,847.51	50,847.51

UNION GAS LIMITED

Calculation of 2012 Deferral Impacts for Customers within each Rate Class

					Earnings Sharing						FT-RAM Deferral						Difference		
Line No.	Particulars	Rate Component		Volume for 2012 Deferral Disposition (m^3)	Base Deferral Unit Rate Recovery/(Refund) (cents/m^3)	Earnings Sharing Unit Rate Recovery/(Refund) (cents/m^3)	Total Unit Rate Recovery/(Refund) (cents/m^3)	Base Deferral Bill Impact ($)	Earnings Sharing Bill Impact ($)	Total Bill Impact ($)	Base Deferral Unit Rate Recovery/(Refund) (cents/m^3)	FT-RAM Deferral Unit Rate Recovery/(Refund) (cents/m^3)	Total Unit Rate Recovery/(Refund) (cents/m^3)	Base Deferral Bill Impact ($)	FT-RAM Deferral Bill Impact ($)	Total Bill Impact ($)	Base Deferral ($)	FT-RAM Deferral ($)	Total ($)
				(a)	(b)	(c)	(d)	(e) = (a x b) / 100	(f) = (a x c) / 100	(g) = (a x d) / 100	(h)	(i)	(j)	(k) = (a x h) / 100	(l) = (a x i) / 100	(m) = (a x j) / 100	(n) = (k - e)	(o) = (l - f)	(p) = (m - g)
1	Small Rate T1	Delivery		7,537,000	0.0544	(0.0155)	0.0389	4,100.13	(1,168.24)	2,931.89	0.0544	-	0.0544	4,100.13	-	4,100.13			
2	Direct Purchase				0.0544	(0.0155)	0.0389	4,100.13	(1,168.24)	2,931.89	0.0544	-	0.0544	4,100.13	-	4,100.13	-	1,168.24	1,168.24
3	Average Rate T1	Delivery		82,265,000	0.0544	(0.0155)	0.0389	44,752.16	(12,751.08)	32,001.09	0.0544	-	0.0544	44,752.16	-	44,752.16			
4	Direct Purchase				0.0544	(0.0155)	0.0389	44,752.16	(12,751.08)	32,001.09	0.0544	-	0.0544	44,752.16	-	44,752.16	-	12,751.08	12,751.08
5	Large Rate T1	Delivery		197,789,850	0.0544	(0.0155)	0.0389	107,597.68	(30,657.43)	76,940.25	0.0544	-	0.0544	107,597.68	-	107,597.68			
6	Direct Purchase				0.0544	(0.0155)	0.0389	107,597.68	(30,657.43)	76,940.25	0.0544	-	0.0544	107,597.68	-	107,597.68	-	30,657.43	30,657.43
7	Largest Rate T1	Delivery		628,870,000	0.0544	(0.0155)	0.0389	342,105.28	(97,474.85)	244,630.43	0.0544	-	0.0544	342,105.28	-	342,105.28			
8	Direct Purchase				0.0544	(0.0155)	0.0389	342,105.28	(97,474.85)	244,630.43	0.0544	-	0.0544	342,105.28	-	342,105.28	-	97,474.85	97,474.85

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit B, Tab 5, Pages 6 and 7 &
Exhibit C Tab2 Sussex Report

a) Please provide details of Unions plans to provide the Transparency and Stakeholder involvement on gas supply plans as recommended by Sussex and accepted by Union.

b) Please indicate what output(s) will be provided from the review the cost of service, rate level, and rate design for St. Clair Pipeline and Bluewater Pipeline, What will be the time frame?

c) Please confirm the specific Design Day HDDs that Union will use for each of the South and the North.

d) Please confirm/list which weather stations are used to determine the DD HDDs. Union North has 13 stations. London Airport data is used for Union South.

e) Also please provide details regarding whether these are the same stations and weighted in the same way as the small volume HDD and volume forecasts for each type of customer (residential, commercial etc.). If they are not the same, please provide the rationale.

f) Please provide a Summary Comparison of Unions DD methodology (North and South) with that of Enbridge Gas Distribution. Include critical inputs such as weather station data.

Response:

a) Per Union's evidence and Settlement Agreement in EB-2013-0202 (Union's 2014-2018 Incentive Regulation Mechanism), Union will hold an annual stakeholder meeting where Union will:

i. Review the previous year's financial results (e.g. earnings, capital spending) and other key operating parameters (e.g. SQI performance) for the most recently completed year;
ii. Present and explain market conditions and expected changes/trends, and the impact these may have on regulated operations;
iii. Present and review the gas supply plan for the coming year;
iv. Present new capital projects that meet the major capital addition pass-through criteria; and,

v. Present the results of any customer surveys undertaken during the year.

b) Union is still formulating the process to review the cost of service, rate level and rate design for St. Clair and Bluewater Pipelines as per the recommendations. This would include the documented process itself, triggers, inputs/outputs and resulting actions. It is expected that any actions triggered by this process/review would be communicated in the annual Gas Supply plan review described in part a) iii above.

c) For Union South in-franchise design day demand purposes, Union has adopted a revised design day temperature of 43.1 Degree Days as per the recommendation in the Sussex report. For Union North design day demand purposes the North is segmented into six distinct geographic areas each with a corresponding design degree day:

MDA – 54.7 DD
WDA – 51.6 DD
SSMDA – 48.2 DD
NDA – 51.9 DD
NCDA – 49.0 DD
EDA – 47.1 DD

d) The Union South design day demand is derived using data obtained from the London Airport weather station. The Union North design day demand is derived using data obtained from six municipalities located across the North franchise area. The weather stations used are:

MDA – International Falls (KINL)
WDA – Thunder Bay (CYQT)
SSMDA - Sault Ste. Marie (KCIU)
NDA – Sudbury (CYSB)
NCDA – Muskoka (CYQA)
EDA – Kingston (CYGK)

e) Please see Exhibit D1.9.

f) Union's design day methodology is described at Exhibit C, Tab 2, pages 15 to 24. Union understands that Enbridge filed evidence on its Design Criteria in its 2013 Rebasing proceeding (EB-2011-0354) at Exhibit D1, Tab 2 Schedule 3 and that this item was settled in the Settlement Agreement that was accepted by the Board in that case.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit C, Tab 1 Acker Report

Preamble: By its very definition, optimization creates risk - an asset is being used for a purpose other than its original intention, and there needs to be an incentive to do so. While the value of incentives may vary amongst market participants, their complete absence would result in less optimization due to inadequate return potential for the level of risk accepted when undertaking optimization.

a) Please provide your assessment of who bears the risk of base exchanges with/without FT-RAM. In your answer include any examples of LDCs that have been denied recovery from customers of the costs of the underlying transportation tolls.

b) In your view, what is a reasonable incentive (cost plus) for an LDC to undertake optimization transactions. Please compare to fees/profit realized by marketers and brokers.

c) How will the removal FT-RAM and the Toll Decision of the NEB affect the liquidity and depth of the Ontario secondary gas market? Please discuss as how this relates to exchanges in 2014 onward.

Response:

a) This response was provided by Steve Acker:

An exchange service, by its very definition, has implied risks; failure of the exchange provider to perform, failure of the exchange purchaser to perform, failure of the exchange purchaser to pay the provider for the service(s) purchased. The risks to the provider to perform can be mitigated by choosing to provide the exchange service on an interruptible basis, with the acceptable causes for interruption being as broad as possible. The risk to the provider of financial non-performance can be managed through rigorous credit due diligence, but it cannot be eliminated completely. All of these risks are traditionally dealt with through the contract negotiated between the two parties involved in the exchange.

Regardless of whether the provider of an exchange service utilizes TCPL Firm Transportation ("FT") or Interruptible Transportation ("IT") service to provide the service, the choice made to provide the service as "firm" or "interruptible" provides the first opportunity to manage

risk. IT exchanges are less risky to the provider, but more risky to the purchaser. Since the TCPL FT-RAM service generates financial credits to be applied only against contracted TCPL IT service, exchange service risk would be best managed by offering services on an interruptible basis.

By default, exchange services provided using TCPL FT service with the receipt and delivery points of the exchange being the originally contracted points mitigate the risk of the exchange service provider failing to perform. Should the TCPL FT service be diverted to a secondary delivery point in order to complete an exchange, all of the risks described above must be considered to some degree.

I have no knowledge of any information relating to LDC cost recovery of transportation tolls.

b) Please refer to Exhibit D3.13.

c) This response was provided by Steve Acker:

Any reduction in the access to transportation services will have a negative impact on the liquidity and depth of the Ontario secondary gas market. With the removal of the FT-RAM service, holders of periodically underutilized TCPL FT service will have reduced opportunities to apply financial credits towards the cost of TCPL IT service which could be used to provide exchange services to secondary market participants. In light of the recent Toll Decision of the NEB to remove FT-RAM, all holders of TCPL FT service will face a greater challenge to mitigate Unabsorbed Demand Charges. To the extent that periodically underutilized TCPL FT service is not used to somehow provide an incremental service, the secondary gas market in Ontario will be negatively impacted.

In addition, Union has provided this response:

The removal of the FT-RAM program and changes to TCPL tolls as a result of the NEB Decision in TCPL's Compliance Filing (RH-003-2011) will impact the liquidity and depth of the secondary market.

As discussed in Exhibit C, Tab 1, exchange transactions increase activity in the secondary market, which benefits all natural gas market participants and results in lower overall costs for Ontario energy consumers. The FT-RAM service allowed the S&T Group to monetize temporary surplus capacity in the Gas Supply Plan that otherwise would not be fully utilized. The elimination of the FT-RAM program resulted in significantly reduced opportunities to monetize these temporary surplus capacity assets. As Union and other market participants reduce transportation exchange services, the liquidity in the secondary market is also reduced.

The RH-003-2011 tolls, implemented July 1, 2013, are also impacting the secondary market. This Decision provides TCPL with considerable flexibility for setting tolls for discretionary services, such as interruptible and short-term firm transportation ("STFT") services. TCPL has used this flexibility to set tolls at significant premiums in order to encourage contracting for FT service. For example, in the open season for July STFT capacity released on July 5, 2013, the minimum bid price was set at 290% of FT tolls for all paths. As of July 31, 2013, remaining summer season capacity was offered at 500% of FT tolls. For the winter season, as offered in the open season effective July 17-23, 2013, monthly STFT capacity was available at the minimum bid price of 1200% of FT tolls for all paths. Minimum prices for IT service to export points of Iroquois and East Hereford have fluctuated as high as 635% of FT tolls since July 1st. Since secondary market transactions often require the use of these discretionary services, the premium-priced tolls make most of these transactions economically unfeasible. Since the secondary market therefore presents fewer options for customers, customers must turn to firm transportation contracts and commit to paying for the service for the full year.

There are also potential ripple effects resulting from the RH-003-2001 toll decision which may impact the secondary market as well. Since the Decision, TCPL has proposed a number of tariff amendments, including significant restrictions on diversions and alternate receipt points on FT contracts. This change will further limit participants' ability to provide exchange services using this capacity, thus reduce secondary market transactions, and therefore further compromise the depth and liquidity of that market.

UNION GAS LIMITED

Answer to Interrogatory from
Energy Probe

Reference: Exhibit C Tab 3 Appendix B Concentric Report Account 179-131

Preamble: The Board directs Union to establish a symmetrical variance account to capture the variance in actual net revenues related to gas supply optimization activities and the amount built into rates.

a) Please provide the Accounting Order(s) for Account 179-131.

b) Please advise whether Union Gas is or is not liable for any loss relative to the cost/tolls paid by ratepayers for the utility transportation used to facilitate optimization activity.

c) If not, please explain what is meant by "symmetrical variance account". For example, does this relate to the net gain/loss of each transaction?

Response:

a) Please see Attachment 1.

b) All incremental costs to provide transportation exchange services, including optimization of temporary surplus of upstream transportation capacity in the Gas Supply Plan, are recorded against S&T exchange revenue.

As proposed in this application and consistent with the 2008-2012 IRM, in 2012 Union bore all of the risk of meeting the S&T exchange forecast included in rates.

c) With a symmetrical variance account all revenues and associated costs related to gas supply optimization activities are captured and compared to the amount built into rates beginning in 2013. If 90% of total revenue less total costs is higher than what is built into rates, the difference will be refunded to ratepayers through the disposition of the deferral account balance. If 90% of the total revenue less total costs is lower than what is built into rates, the difference will be charged to ratepayers through the disposition of the deferral account balance.

UNION GAS LIMITED

Accounting Entries for
Upstream Transportation Optimization
Deferral Account No. 179-131

Account numbers are from the Uniform System of Accounts for Gas Utilities, Class A prescribed under the Ontario Energy Board Act.

Debit	-	Account No. 179-131 Other Deferred Charges – Upstream Transportation Optimization
Credit	-	Account No. 626 Exchange Gas

To record as a debit in Deferral Account No. 179-131 a receivable from customers and a reduction in cost of gas for the unit rate of optimization revenues refunded to in-franchise customers multiplied by the actual distribution transportation volumes.

Debit	-	Account No. 579 Miscellaneous Operating Revenue
Credit	-	Account No. 179-131 Other Deferred Charges – Upstream Transportation Optimization

To record as a credit in Deferral Account No. 179-131 a payable to customers and a reduction in transportation revenue equal to the ratepayer portion (90%) of the actual net revenue from gas supply optimization activities.

Debit	-	Account No. 323 Other Interest Expense
Credit	-	Account No. 179-131 Other Deferred Charges – Upstream Transportation Optimization

To record, as a debit (credit) in Deferral Account No. 179-131, interest on the balance in Deferral Account No. 179-131. Simple interest will be computed monthly upon finalization of the year- end balance in the said account in accordance with the methodology approved by the Board in EB-2006-0117.