EP POST.out

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1500	0.0865
0.0610	0.0144	0.1620	0.1009
0.0870	0.0288	0.1740	0.1154
0.1060	0.0433	0.1840	0.1298
0.1230	0.0577	0.1940	0.1442
0.1370	0.0721	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.378	12.25	48.38
OUTFLOW: ID= 1 (0004)	2.280	0.096	12.42	48.36

PEAK FLOW REDUCTION [Qout/Qin](%)= 25.34
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0359

****
** SIMULATION NUMBER: 2 **
****

READ STORM	Filename: C:\Users\mark.sullivan\AppData\Local\Temp\58d7a035-5c9b-4dcd-a8a9-886d29d4331d\7d647cf8
Ptotal= 67.60 mm	Comments: 24-Hour 5-Year SCS Type II Storm Sarnia

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.22	12.75	9.73	19.00	1.08
0.50	0.74	6.75	1.22	13.00	5.14	19.25	1.35
0.75	0.74	7.00	1.22	13.25	4.87	19.50	1.08
1.00	0.74	7.25	1.22	13.50	3.79	19.75	1.35
1.25	0.74	7.50	1.62	13.75	3.52	20.00	1.08
1.50	0.73	7.75	1.35	14.00	2.97	20.25	1.35
1.75	0.76	8.00	1.62	14.25	2.70	20.50	0.81
2.00	0.73	8.25	1.35	14.50	2.16	20.75	0.81
2.25	0.76	8.50	1.89	14.75	1.89	21.00	0.81
2.50	0.87	8.75	1.62	15.00	1.89	21.25	0.81
2.75	0.89	9.00	1.89	15.25	2.16	21.50	0.81
3.00	0.87	9.25	1.89	15.50	1.89	21.75	0.81
3.25	0.89	9.50	2.16	15.75	2.16	22.00	0.81
3.50	0.87	9.75	2.16	16.00	1.89	22.25	0.81
3.75	0.89	10.00	2.43	16.25	2.16	22.50	0.81
4.00	0.89	10.25	2.43	16.50	1.08	22.75	0.81
4.25	0.87	10.50	3.24	16.75	1.35	23.00	0.81
4.50	1.08	10.75	2.97	17.00	1.08	23.25	0.81

4.75	1.08	11.00	4.33	17.25	1.35	23.50	0.81
5.00	1.08	11.25	4.06	17.50	1.08	23.75	0.81
5.25	1.08	11.50	6.49	17.75	1.35	24.00	0.81
5.50	1.08	11.75	6.49	18.00	1.08	24.25	0.81
5.75	1.08	12.00	20.01	18.25	1.35		
6.00	1.08	12.25	82.74	18.50	1.08		
6.25	1.08	12.50	9.73	18.75	1.35		

CALIB		
STANDHYD (0001)	Area (ha)=	2.28
ID= 1 DT= 5.0 min	Total Imp(%)=	90.00

Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.08	12.250	82.74	18.33	1.08
0.167	0.00	6.250	1.08	12.333	9.74	18.42	1.08
0.250	0.00	6.333	1.22	12.417	9.73	18.50	1.08
0.333	0.74	6.417	1.22	12.500	9.73	18.58	1.35
0.417	0.74	6.500	1.22	12.583	9.73	18.67	1.35
0.500	0.74	6.583	1.22	12.667	9.73	18.75	1.35
0.583	0.74	6.667	1.22	12.750	9.73	18.83	1.08
0.667	0.74	6.750	1.22	12.833	5.14	18.92	1.08
0.750	0.74	6.833	1.22	12.917	5.14	19.00	1.08
0.833	0.74	6.917	1.22	13.000	5.14	19.08	1.35
0.917	0.74	7.000	1.22	13.083	4.87	19.17	1.35
1.000	0.74	7.083	1.22	13.167	4.87	19.25	1.35
1.083	0.74	7.167	1.22	13.250	4.87	19.33	1.08
1.167	0.74	7.250	1.22	13.333	3.79	19.42	1.08
1.250	0.74	7.333	1.62	13.417	3.79	19.50	1.08
1.333	0.73	7.417	1.62	13.500	3.79	19.58	1.35
1.417	0.73	7.500	1.62	13.583	3.52	19.67	1.35
1.500	0.73	7.583	1.35	13.667	3.52	19.75	1.35
1.583	0.76	7.667	1.35	13.750	3.52	19.83	1.08
1.667	0.76	7.750	1.35	13.833	2.97	19.92	1.08
1.750	0.76	7.833	1.62	13.917	2.97	20.00	1.08
1.833	0.73	7.917	1.62	14.000	2.97	20.08	1.35
1.917	0.73	8.000	1.62	14.083	2.70	20.17	1.35
2.000	0.73	8.083	1.35	14.167	2.70	20.25	1.35
2.083	0.76	8.167	1.35	14.250	2.70	20.33	0.81
2.167	0.76	8.250	1.35	14.333	2.16	20.42	0.81
2.250	0.76	8.333	1.89	14.417	2.16	20.50	0.81
2.333	0.87	8.417	1.89	14.500	2.16	20.58	0.81
2.417	0.87	8.500	1.89	14.583	1.89	20.67	0.81
2.500	0.87	8.583	1.62	14.667	1.89	20.75	0.81
2.583	0.89	8.667	1.62	14.750	1.89	20.83	0.81
2.667	0.89	8.750	1.62	14.833	1.89	20.92	0.81
2.750	0.89	8.833	1.89	14.917	1.89	21.00	0.81
2.833	0.87	8.917	1.89	15.000	1.89	21.08	0.81
2.917	0.87	9.000	1.89	15.083	2.16	21.17	0.81

EP POST.out

3.000	0.87	9.083	1.89	15.167	2.16	21.25	0.81
3.083	0.89	9.167	1.89	15.250	2.16	21.33	0.81
3.167	0.89	9.250	1.89	15.333	1.89	21.42	0.81
3.250	0.89	9.333	2.16	15.417	1.89	21.50	0.81
3.333	0.87	9.417	2.16	15.500	1.89	21.58	0.81
3.417	0.87	9.500	2.16	15.583	2.16	21.67	0.81
3.500	0.87	9.583	2.16	15.667	2.16	21.75	0.81
3.583	0.89	9.667	2.16	15.750	2.16	21.83	0.81
3.667	0.89	9.750	2.16	15.833	1.89	21.92	0.81
3.750	0.89	9.833	2.43	15.917	1.89	22.00	0.81
3.833	0.89	9.917	2.43	16.000	1.89	22.08	0.81
3.917	0.89	10.000	2.43	16.083	2.16	22.17	0.81
4.000	0.89	10.083	2.43	16.167	2.16	22.25	0.81
4.083	0.87	10.167	2.43	16.250	2.16	22.33	0.81
4.167	0.87	10.250	2.43	16.333	1.08	22.42	0.81
4.250	0.87	10.333	3.24	16.417	1.08	22.50	0.81
4.333	1.08	10.417	3.24	16.500	1.08	22.58	0.81
4.417	1.08	10.500	3.24	16.583	1.35	22.67	0.81
4.500	1.08	10.583	2.97	16.667	1.35	22.75	0.81
4.583	1.08	10.667	2.97	16.750	1.35	22.83	0.81
4.667	1.08	10.750	2.97	16.833	1.08	22.92	0.81
4.750	1.08	10.833	4.33	16.917	1.08	23.00	0.81
4.833	1.08	10.917	4.33	17.000	1.08	23.08	0.81
4.917	1.08	11.000	4.33	17.083	1.35	23.17	0.81
5.000	1.08	11.083	4.06	17.167	1.35	23.25	0.81
5.083	1.08	11.167	4.06	17.250	1.35	23.33	0.81
5.167	1.08	11.250	4.06	17.333	1.08	23.42	0.81
5.250	1.08	11.333	6.49	17.417	1.08	23.50	0.81
5.333	1.08	11.417	6.49	17.500	1.08	23.58	0.81
5.417	1.08	11.500	6.49	17.583	1.35	23.67	0.81
5.500	1.08	11.583	6.49	17.667	1.35	23.75	0.81
5.583	1.08	11.667	6.49	17.750	1.35	23.83	0.81
5.667	1.08	11.750	6.49	17.833	1.08	23.92	0.81
5.750	1.08	11.833	20.01	17.917	1.08	24.00	0.81
5.833	1.08	11.917	20.01	18.000	1.08	24.08	0.81
5.917	1.08	12.000	20.01	18.083	1.35	24.17	0.81
6.000	1.08	12.083	82.73	18.167	1.35	24.25	0.81
6.083	1.08	12.167	82.74	18.250	1.35		

Max.Eff.Inten.(mm/hr)=	82.74	46.67		
over (min)	5.00	10.00		
Storage Coeff. (min)=	3.12 (ii)	6.29 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=	0.27	0.15		
			TOTALS	
PEAK FLOW (cms)=	0.47	0.02	0.493 (iii)	
TIME TO PEAK (hrs)=	12.25	12.25	12.25	
RUNOFF VOLUME (mm)=	66.60	31.08	63.05	
TOTAL RAINFALL (mm)=	67.60	67.60	67.60	
RUNOFF COEFFICIENT =	0.99	0.46	0.93	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)
IN= 2---> OUT= 1

EP POST.out

DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.1500	0.0865
	0.0610	0.0144	0.1620	0.1009
	0.0870	0.0288	0.1740	0.1154
	0.1060	0.0433	0.1840	0.1298
	0.1230	0.0577	0.1940	0.1442
	0.1370	0.0721	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.493	12.25	63.05
OUTFLOW: ID= 1 (0004)	2.280	0.111	12.42	63.02

PEAK FLOW REDUCTION [Qout/Qin](%)= 22.58
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0482

****
** SIMULATION NUMBER: 3 **
****

READ STORM	Filename: C:\Users\mark.sullivan\AppData\Local\Temp\58d7a035-5c9b-4dcd-a8a9-886d29d4331d\1d16d696
Ptotal= 77.60 mm	Comments: 24-Hour 10-Year SCS Type II Storm Sarnia

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.40	12.75	11.17	19.00	1.24
0.50	0.85	6.75	1.40	13.00	5.90	19.25	1.55
0.75	0.85	7.00	1.40	13.25	5.59	19.50	1.24
1.00	0.85	7.25	1.40	13.50	4.35	19.75	1.55
1.25	0.85	7.50	1.86	13.75	4.04	20.00	1.24
1.50	0.84	7.75	1.55	14.00	3.41	20.25	1.55
1.75	0.87	8.00	1.86	14.25	3.10	20.50	0.93
2.00	0.84	8.25	1.55	14.50	2.48	20.75	0.93
2.25	0.87	8.50	2.17	14.75	2.17	21.00	0.93
2.50	0.99	8.75	1.86	15.00	2.17	21.25	0.93
2.75	1.02	9.00	2.17	15.25	2.48	21.50	0.93
3.00	0.99	9.25	2.17	15.50	2.17	21.75	0.93
3.25	1.02	9.50	2.48	15.75	2.48	22.00	0.93
3.50	0.99	9.75	2.48	16.00	2.17	22.25	0.93
3.75	1.02	10.00	2.79	16.25	2.48	22.50	0.93
4.00	1.02	10.25	2.79	16.50	1.24	22.75	0.93
4.25	0.99	10.50	3.72	16.75	1.55	23.00	0.93
4.50	1.24	10.75	3.41	17.00	1.24	23.25	0.93
4.75	1.24	11.00	4.97	17.25	1.55	23.50	0.93
5.00	1.24	11.25	4.66	17.50	1.24	23.75	0.93
5.25	1.24	11.50	7.45	17.75	1.55	24.00	0.93
5.50	1.24	11.75	7.45	18.00	1.24	24.25	0.93
5.75	1.24	12.00	22.97	18.25	1.55		
6.00	1.24	12.25	94.98	18.50	1.24		
6.25	1.24	12.50	11.17	18.75	1.55		

CALIB STANDHYD (0001)	Area (ha)= 2.28

EP POST.out

|ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.24	12.250	94.98	18.33	1.24
0.167	0.00	6.250	1.24	12.333	11.19	18.42	1.24
0.250	0.00	6.333	1.40	12.417	11.17	18.50	1.24
0.333	0.85	6.417	1.40	12.500	11.17	18.58	1.55
0.417	0.85	6.500	1.40	12.583	11.17	18.67	1.55
0.500	0.85	6.583	1.40	12.667	11.17	18.75	1.55
0.583	0.85	6.667	1.40	12.750	11.17	18.83	1.24
0.667	0.85	6.750	1.40	12.833	5.90	18.92	1.24
0.750	0.85	6.833	1.40	12.917	5.90	19.00	1.24
0.833	0.85	6.917	1.40	13.000	5.90	19.08	1.55
0.917	0.85	7.000	1.40	13.083	5.59	19.17	1.55
1.000	0.85	7.083	1.40	13.167	5.59	19.25	1.55
1.083	0.85	7.167	1.40	13.250	5.59	19.33	1.24
1.167	0.85	7.250	1.40	13.333	4.35	19.42	1.24
1.250	0.85	7.333	1.86	13.417	4.35	19.50	1.24
1.333	0.84	7.417	1.86	13.500	4.35	19.58	1.55
1.417	0.84	7.500	1.86	13.583	4.04	19.67	1.55
1.500	0.84	7.583	1.55	13.667	4.04	19.75	1.55
1.583	0.87	7.667	1.55	13.750	4.04	19.83	1.24
1.667	0.87	7.750	1.55	13.833	3.41	19.92	1.24
1.750	0.87	7.833	1.86	13.917	3.41	20.00	1.24
1.833	0.84	7.917	1.86	14.000	3.41	20.08	1.55
1.917	0.84	8.000	1.86	14.083	3.10	20.17	1.55
2.000	0.84	8.083	1.55	14.167	3.10	20.25	1.55
2.083	0.87	8.167	1.55	14.250	3.10	20.33	0.93
2.167	0.87	8.250	1.55	14.333	2.48	20.42	0.93
2.250	0.87	8.333	2.17	14.417	2.48	20.50	0.93
2.333	0.99	8.417	2.17	14.500	2.48	20.58	0.93
2.417	0.99	8.500	2.17	14.583	2.17	20.67	0.93
2.500	0.99	8.583	1.86	14.667	2.17	20.75	0.93
2.583	1.02	8.667	1.86	14.750	2.17	20.83	0.93
2.667	1.02	8.750	1.86	14.833	2.17	20.92	0.93
2.750	1.02	8.833	2.17	14.917	2.17	21.00	0.93
2.833	0.99	8.917	2.17	15.000	2.17	21.08	0.93
2.917	0.99	9.000	2.17	15.083	2.48	21.17	0.93
3.000	0.99	9.083	2.17	15.167	2.48	21.25	0.93
3.083	1.02	9.167	2.17	15.250	2.48	21.33	0.93
3.167	1.02	9.250	2.17	15.333	2.17	21.42	0.93
3.250	1.02	9.333	2.48	15.417	2.17	21.50	0.93
3.333	0.99	9.417	2.48	15.500	2.17	21.58	0.93
3.417	0.99	9.500	2.48	15.583	2.48	21.67	0.93
3.500	0.99	9.583	2.48	15.667	2.48	21.75	0.93
3.583	1.02	9.667	2.48	15.750	2.48	21.83	0.93
3.667	1.02	9.750	2.48	15.833	2.17	21.92	0.93
3.750	1.02	9.833	2.79	15.917	2.17	22.00	0.93
3.833	1.02	9.917	2.79	16.000	2.17	22.08	0.93
3.917	1.02	10.000	2.79	16.083	2.48	22.17	0.93
4.000	1.02	10.083	2.79	16.167	2.48	22.25	0.93

EP POST.out

4.083	0.99	10.167	2.79	16.250	2.48	22.33	0.93
4.167	0.99	10.250	2.79	16.333	1.24	22.42	0.93
4.250	0.99	10.333	3.72	16.417	1.24	22.50	0.93
4.333	1.24	10.417	3.72	16.500	1.24	22.58	0.93
4.417	1.24	10.500	3.72	16.583	1.55	22.67	0.93
4.500	1.24	10.583	3.41	16.667	1.55	22.75	0.93
4.583	1.24	10.667	3.41	16.750	1.55	22.83	0.93
4.667	1.24	10.750	3.41	16.833	1.24	22.92	0.93
4.750	1.24	10.833	4.97	16.917	1.24	23.00	0.93
4.833	1.24	10.917	4.97	17.000	1.24	23.08	0.93
4.917	1.24	11.000	4.97	17.083	1.55	23.17	0.93
5.000	1.24	11.083	4.66	17.167	1.55	23.25	0.93
5.083	1.24	11.167	4.66	17.250	1.55	23.33	0.93
5.167	1.24	11.250	4.66	17.333	1.24	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.24	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.24	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.55	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.55	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.55	23.83	0.93
5.667	1.24	11.750	7.45	17.833	1.24	23.92	0.93
5.750	1.24	11.833	22.97	17.917	1.24	24.00	0.93
5.833	1.24	11.917	22.97	18.000	1.24	24.08	0.93
5.917	1.24	12.000	22.97	18.083	1.55	24.17	0.93
6.000	1.24	12.083	94.97	18.167	1.55	24.25	0.93
6.083	1.24	12.167	94.98	18.250	1.55		

Max.Eff.Inten.(mm/hr)=	94.98	57.97	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.96 (ii)	5.95 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.28	0.15	
			TOTALS
PEAK FLOW (cms)=	0.54	0.03	0.569 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	76.60	38.73	72.81
TOTAL RAINFALL (mm)=	77.60	77.60	77.60
RUNOFF COEFFICIENT =	0.99	0.50	0.94

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1500	0.0865
0.0610	0.0144	0.1620	0.1009
0.0870	0.0288	0.1740	0.1154
0.1060	0.0433	0.1840	0.1298
0.1230	0.0577	0.1940	0.1442
0.1370	0.0721	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.569	12.25	72.81
OUTFLOW: ID= 1 (0004)	2.280	0.121	12.42	72.79

EP POST.out

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.27
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0565

****
** SIMULATION NUMBER: 4 **
****

READ STORM	Filename: C:\Users\mark.sullivan\AppData\Local\Temp\58d7a035-5c9b-4dcd-a8a9-886d29d4331d\6b7e5e22
Ptotal= 90.20 mm	Comments: 24-Hour 25-Year SCS Type II Storm Sarnia

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.62	12.75	12.99	19.00	1.44
0.50	0.99	6.75	1.62	13.00	6.86	19.25	1.80
0.75	0.99	7.00	1.62	13.25	6.49	19.50	1.44
1.00	0.99	7.25	1.62	13.50	5.05	19.75	1.80
1.25	0.99	7.50	2.16	13.75	4.69	20.00	1.44
1.50	0.97	7.75	1.80	14.00	3.97	20.25	1.80
1.75	1.01	8.00	2.16	14.25	3.61	20.50	1.08
2.00	0.97	8.25	1.80	14.50	2.89	20.75	1.08
2.25	1.01	8.50	2.53	14.75	2.53	21.00	1.08
2.50	1.15	8.75	2.16	15.00	2.53	21.25	1.08
2.75	1.19	9.00	2.53	15.25	2.89	21.50	1.08
3.00	1.15	9.25	2.53	15.50	2.53	21.75	1.08
3.25	1.19	9.50	2.89	15.75	2.89	22.00	1.08
3.50	1.15	9.75	2.89	16.00	2.53	22.25	1.08
3.75	1.19	10.00	3.25	16.25	2.89	22.50	1.08
4.00	1.19	10.25	3.25	16.50	1.44	22.75	1.08
4.25	1.15	10.50	4.33	16.75	1.80	23.00	1.08
4.50	1.44	10.75	3.97	17.00	1.44	23.25	1.08
4.75	1.44	11.00	5.77	17.25	1.80	23.50	1.08
5.00	1.44	11.25	5.41	17.50	1.44	23.75	1.08
5.25	1.44	11.50	8.66	17.75	1.80	24.00	1.08
5.50	1.44	11.75	8.66	18.00	1.44	24.25	1.08
5.75	1.44	12.00	26.70	18.25	1.80		
6.00	1.44	12.25	110.40	18.50	1.44		
6.25	1.44	12.50	12.99	18.75	1.80		

CALIB STANDHYD (0001)	Area (ha)= 2.28
ID= 1 DT= 5.0 min	Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

EP POST.out

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.44	12.250	110.40	18.33	1.44
0.167	0.00	6.250	1.44	12.333	13.00	18.42	1.44
0.250	0.00	6.333	1.62	12.417	12.99	18.50	1.44
0.333	0.99	6.417	1.62	12.500	12.99	18.58	1.80
0.417	0.99	6.500	1.62	12.583	12.99	18.67	1.80
0.500	0.99	6.583	1.62	12.667	12.99	18.75	1.80
0.583	0.99	6.667	1.62	12.750	12.99	18.83	1.44
0.667	0.99	6.750	1.62	12.833	6.86	18.92	1.44
0.750	0.99	6.833	1.62	12.917	6.86	19.00	1.44
0.833	0.99	6.917	1.62	13.000	6.86	19.08	1.80
0.917	0.99	7.000	1.62	13.083	6.49	19.17	1.80
1.000	0.99	7.083	1.62	13.167	6.49	19.25	1.80
1.083	0.99	7.167	1.62	13.250	6.49	19.33	1.44
1.167	0.99	7.250	1.62	13.333	5.05	19.42	1.44
1.250	0.99	7.333	2.16	13.417	5.05	19.50	1.44
1.333	0.97	7.417	2.16	13.500	5.05	19.58	1.80
1.417	0.97	7.500	2.16	13.583	4.69	19.67	1.80
1.500	0.97	7.583	1.80	13.667	4.69	19.75	1.80
1.583	1.01	7.667	1.80	13.750	4.69	19.83	1.44
1.667	1.01	7.750	1.80	13.833	3.97	19.92	1.44
1.750	1.01	7.833	2.16	13.917	3.97	20.00	1.44
1.833	0.97	7.917	2.16	14.000	3.97	20.08	1.80
1.917	0.97	8.000	2.16	14.083	3.61	20.17	1.80
2.000	0.97	8.083	1.80	14.167	3.61	20.25	1.80
2.083	1.01	8.167	1.80	14.250	3.61	20.33	1.08
2.167	1.01	8.250	1.80	14.333	2.89	20.42	1.08
2.250	1.01	8.333	2.53	14.417	2.89	20.50	1.08
2.333	1.15	8.417	2.53	14.500	2.89	20.58	1.08
2.417	1.15	8.500	2.53	14.583	2.53	20.67	1.08
2.500	1.15	8.583	2.16	14.667	2.53	20.75	1.08
2.583	1.19	8.667	2.16	14.750	2.53	20.83	1.08
2.667	1.19	8.750	2.16	14.833	2.53	20.92	1.08
2.750	1.19	8.833	2.53	14.917	2.53	21.00	1.08
2.833	1.15	8.917	2.53	15.000	2.53	21.08	1.08
2.917	1.15	9.000	2.53	15.083	2.89	21.17	1.08
3.000	1.15	9.083	2.53	15.167	2.89	21.25	1.08
3.083	1.19	9.167	2.53	15.250	2.89	21.33	1.08
3.167	1.19	9.250	2.53	15.333	2.53	21.42	1.08
3.250	1.19	9.333	2.89	15.417	2.53	21.50	1.08
3.333	1.15	9.417	2.89	15.500	2.53	21.58	1.08
3.417	1.15	9.500	2.89	15.583	2.89	21.67	1.08
3.500	1.15	9.583	2.89	15.667	2.89	21.75	1.08
3.583	1.19	9.667	2.89	15.750	2.89	21.83	1.08
3.667	1.19	9.750	2.89	15.833	2.53	21.92	1.08
3.750	1.19	9.833	3.25	15.917	2.53	22.00	1.08
3.833	1.19	9.917	3.25	16.000	2.53	22.08	1.08
3.917	1.19	10.000	3.25	16.083	2.89	22.17	1.08
4.000	1.19	10.083	3.25	16.167	2.89	22.25	1.08
4.083	1.15	10.167	3.25	16.250	2.89	22.33	1.08
4.167	1.15	10.250	3.25	16.333	1.44	22.42	1.08
4.250	1.15	10.333	4.33	16.417	1.44	22.50	1.08
4.333	1.44	10.417	4.33	16.500	1.44	22.58	1.08
4.417	1.44	10.500	4.33	16.583	1.80	22.67	1.08
4.500	1.44	10.583	3.97	16.667	1.80	22.75	1.08
4.583	1.44	10.667	3.97	16.750	1.80	22.83	1.08
4.667	1.44	10.750	3.97	16.833	1.44	22.92	1.08
4.750	1.44	10.833	5.77	16.917	1.44	23.00	1.08
4.833	1.44	10.917	5.77	17.000	1.44	23.08	1.08
4.917	1.44	11.000	5.77	17.083	1.80	23.17	1.08
5.000	1.44	11.083	5.41	17.167	1.80	23.25	1.08
5.083	1.44	11.167	5.41	17.250	1.80	23.33	1.08

EP POST.out

5.167	1.44	11.250	5.41	17.333	1.44	23.42	1.08
5.250	1.44	11.333	8.66	17.417	1.44	23.50	1.08
5.333	1.44	11.417	8.66	17.500	1.44	23.58	1.08
5.417	1.44	11.500	8.66	17.583	1.80	23.67	1.08
5.500	1.44	11.583	8.66	17.667	1.80	23.75	1.08
5.583	1.44	11.667	8.66	17.750	1.80	23.83	1.08
5.667	1.44	11.750	8.66	17.833	1.44	23.92	1.08
5.750	1.44	11.833	26.70	17.917	1.44	24.00	1.08
5.833	1.44	11.917	26.70	18.000	1.44	24.08	1.08
5.917	1.44	12.000	26.70	18.083	1.80	24.17	1.08
6.000	1.44	12.083	110.39	18.167	1.80	24.25	1.08
6.083	1.44	12.167	110.40	18.250	1.80		

Max.Eff.Inten.(mm/hr)=	110.40	72.74		
over (min)	5.00	10.00		
Storage Coeff. (min)=	2.78 (ii)	5.60 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=	0.28	0.15		
			TOTALS	
PEAK FLOW (cms)=	0.63	0.04	0.666 (iii)	
TIME TO PEAK (hrs)=	12.25	12.25	12.25	
RUNOFF VOLUME (mm)=	89.20	48.82	85.16	
TOTAL RAINFALL (mm)=	90.20	90.20	90.20	
RUNOFF COEFFICIENT =	0.99	0.54	0.94	

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1500	0.0865
0.0610	0.0144	0.1620	0.1009
0.0870	0.0288	0.1740	0.1154
0.1060	0.0433	0.1840	0.1298
0.1230	0.0577	0.1940	0.1442
0.1370	0.0721	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.666	12.25	85.16
OUTFLOW: ID= 1 (0004)	2.280	0.132	12.42	85.14

PEAK FLOW REDUCTION [Qout/Qin](%)= 19.79
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0672

****
** SIMULATION NUMBER: 5 **
****

READ STORM	Filename: C:\Users\mark.sullivan\AppD

EP POST.out
ata\Local\Temp\
58d7a035-5c9b-4dcd-a8a9-886d29d4331d\a1e5d969

| Ptotal= 99.60 mm | Comments: 24-Hour 50-Year SCS Type II Storm Sarnia

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.79	12.75	14.34	19.00	1.59
0.50	1.10	6.75	1.79	13.00	7.57	19.25	1.99
0.75	1.10	7.00	1.79	13.25	7.17	19.50	1.59
1.00	1.10	7.25	1.79	13.50	5.58	19.75	1.99
1.25	1.10	7.50	2.39	13.75	5.18	20.00	1.59
1.50	1.08	7.75	1.99	14.00	4.38	20.25	1.99
1.75	1.12	8.00	2.39	14.25	3.98	20.50	1.20
2.00	1.08	8.25	1.99	14.50	3.19	20.75	1.20
2.25	1.12	8.50	2.79	14.75	2.79	21.00	1.20
2.50	1.27	8.75	2.39	15.00	2.79	21.25	1.20
2.75	1.31	9.00	2.79	15.25	3.19	21.50	1.20
3.00	1.27	9.25	2.79	15.50	2.79	21.75	1.20
3.25	1.31	9.50	3.19	15.75	3.19	22.00	1.20
3.50	1.27	9.75	3.19	16.00	2.79	22.25	1.20
3.75	1.31	10.00	3.59	16.25	3.19	22.50	1.20
4.00	1.31	10.25	3.59	16.50	1.59	22.75	1.20
4.25	1.27	10.50	4.78	16.75	1.99	23.00	1.20
4.50	1.59	10.75	4.38	17.00	1.59	23.25	1.20
4.75	1.59	11.00	6.37	17.25	1.99	23.50	1.20
5.00	1.59	11.25	5.98	17.50	1.59	23.75	1.20
5.25	1.59	11.50	9.56	17.75	1.99	24.00	1.20
5.50	1.59	11.75	9.56	18.00	1.59	24.25	1.20
5.75	1.59	12.00	29.48	18.25	1.99		
6.00	1.59	12.25	121.91	18.50	1.59		
6.25	1.59	12.50	14.34	18.75	1.99		

| CALIB STANDHYD (0001) | Area (ha)= 2.28
|ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.59	12.250	121.91	18.33	1.59
0.167	0.00	6.250	1.59	12.333	14.36	18.42	1.59
0.250	0.00	6.333	1.79	12.417	14.34	18.50	1.59
0.333	1.10	6.417	1.79	12.500	14.34	18.58	1.99
0.417	1.10	6.500	1.79	12.583	14.34	18.67	1.99
0.500	1.10	6.583	1.79	12.667	14.34	18.75	1.99
0.583	1.10	6.667	1.79	12.750	14.34	18.83	1.59
0.667	1.10	6.750	1.79	12.833	7.57	18.92	1.59
0.750	1.10	6.833	1.79	12.917	7.57	19.00	1.59
0.833	1.10	6.917	1.79	13.000	7.57	19.08	1.99
0.917	1.10	7.000	1.79	13.083	7.17	19.17	1.99

EP POST.out

1.000	1.10	7.083	1.79	13.167	7.17	19.25	1.99
1.083	1.10	7.167	1.79	13.250	7.17	19.33	1.59
1.167	1.10	7.250	1.79	13.333	5.58	19.42	1.59
1.250	1.10	7.333	2.39	13.417	5.58	19.50	1.59
1.333	1.08	7.417	2.39	13.500	5.58	19.58	1.99
1.417	1.08	7.500	2.39	13.583	5.18	19.67	1.99
1.500	1.08	7.583	1.99	13.667	5.18	19.75	1.99
1.583	1.12	7.667	1.99	13.750	5.18	19.83	1.59
1.667	1.12	7.750	1.99	13.833	4.38	19.92	1.59
1.750	1.12	7.833	2.39	13.917	4.38	20.00	1.59
1.833	1.08	7.917	2.39	14.000	4.38	20.08	1.99
1.917	1.08	8.000	2.39	14.083	3.98	20.17	1.99
2.000	1.08	8.083	1.99	14.167	3.98	20.25	1.99
2.083	1.12	8.167	1.99	14.250	3.98	20.33	1.20
2.167	1.12	8.250	1.99	14.333	3.19	20.42	1.20
2.250	1.12	8.333	2.79	14.417	3.19	20.50	1.20
2.333	1.27	8.417	2.79	14.500	3.19	20.58	1.20
2.417	1.27	8.500	2.79	14.583	2.79	20.67	1.20
2.500	1.27	8.583	2.39	14.667	2.79	20.75	1.20
2.583	1.31	8.667	2.39	14.750	2.79	20.83	1.20
2.667	1.31	8.750	2.39	14.833	2.79	20.92	1.20
2.750	1.31	8.833	2.79	14.917	2.79	21.00	1.20
2.833	1.27	8.917	2.79	15.000	2.79	21.08	1.20
2.917	1.27	9.000	2.79	15.083	3.19	21.17	1.20
3.000	1.27	9.083	2.79	15.167	3.19	21.25	1.20
3.083	1.31	9.167	2.79	15.250	3.19	21.33	1.20
3.167	1.31	9.250	2.79	15.333	2.79	21.42	1.20
3.250	1.31	9.333	3.19	15.417	2.79	21.50	1.20
3.333	1.27	9.417	3.19	15.500	2.79	21.58	1.20
3.417	1.27	9.500	3.19	15.583	3.19	21.67	1.20
3.500	1.27	9.583	3.19	15.667	3.19	21.75	1.20
3.583	1.31	9.667	3.19	15.750	3.19	21.83	1.20
3.667	1.31	9.750	3.19	15.833	2.79	21.92	1.20
3.750	1.31	9.833	3.59	15.917	2.79	22.00	1.20
3.833	1.31	9.917	3.59	16.000	2.79	22.08	1.20
3.917	1.31	10.000	3.59	16.083	3.19	22.17	1.20
4.000	1.31	10.083	3.59	16.167	3.19	22.25	1.20
4.083	1.27	10.167	3.59	16.250	3.19	22.33	1.20
4.167	1.27	10.250	3.59	16.333	1.59	22.42	1.20
4.250	1.27	10.333	4.78	16.417	1.59	22.50	1.20
4.333	1.59	10.417	4.78	16.500	1.59	22.58	1.20
4.417	1.59	10.500	4.78	16.583	1.99	22.67	1.20
4.500	1.59	10.583	4.38	16.667	1.99	22.75	1.20
4.583	1.59	10.667	4.38	16.750	1.99	22.83	1.20
4.667	1.59	10.750	4.38	16.833	1.59	22.92	1.20
4.750	1.59	10.833	6.37	16.917	1.59	23.00	1.20
4.833	1.59	10.917	6.37	17.000	1.59	23.08	1.20
4.917	1.59	11.000	6.37	17.083	1.99	23.17	1.20
5.000	1.59	11.083	5.98	17.167	1.99	23.25	1.20
5.083	1.59	11.167	5.98	17.250	1.99	23.33	1.20
5.167	1.59	11.250	5.98	17.333	1.59	23.42	1.20
5.250	1.59	11.333	9.56	17.417	1.59	23.50	1.20
5.333	1.59	11.417	9.56	17.500	1.59	23.58	1.20
5.417	1.59	11.500	9.56	17.583	1.99	23.67	1.20
5.500	1.59	11.583	9.56	17.667	1.99	23.75	1.20
5.583	1.59	11.667	9.56	17.750	1.99	23.83	1.20
5.667	1.59	11.750	9.56	17.833	1.59	23.92	1.20
5.750	1.59	11.833	29.48	17.917	1.59	24.00	1.20
5.833	1.59	11.917	29.48	18.000	1.59	24.08	1.20
5.917	1.59	12.000	29.48	18.083	1.99	24.17	1.20
6.000	1.59	12.083	121.90	18.167	1.99	24.25	1.19
6.083	1.59	12.167	121.91	18.250	1.99		

EP POST.out

Max.Eff.Inten.(mm/hr)=	121.91	84.03	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.68 (ii)	5.38 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.29	0.16	
			TOTALS
PEAK FLOW (cms)=	0.69	0.05	0.739 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	98.60	56.60	94.40
TOTAL RAINFALL (mm)=	99.60	99.60	99.60
RUNOFF COEFFICIENT =	0.99	0.57	0.95

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.1500	0.0865
0.0610	0.0144	0.1620	0.1009
0.0870	0.0288	0.1740	0.1154
0.1060	0.0433	0.1840	0.1298
0.1230	0.0577	0.1940	0.1442
0.1370	0.0721	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.739	12.25	94.40
OUTFLOW: ID= 1 (0004)	2.280	0.140	12.42	94.38

PEAK FLOW REDUCTION [Qout/Qin](%)= 18.89
TIME SHIFT OF PEAK FLOW (min)= 10.00
MAXIMUM STORAGE USED (ha.m.)= 0.0754

****
** SIMULATION NUMBER: 6 **
****

READ STORM
Ptotal=108.90 mm

Filename: C:\Users\mark.sullivan\AppData\Local\Temp\58d7a035-5c9b-4dcd-a8a9-886d29d4331d\bc37ea81
Comments: 24-Hour 100-Year SCS Type II Storm Sarni

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.96	12.75	15.68	19.00	1.74
0.50	1.20	6.75	1.96	13.00	8.28	19.25	2.18
0.75	1.20	7.00	1.96	13.25	7.84	19.50	1.74
1.00	1.20	7.25	1.96	13.50	6.10	19.75	2.18
1.25	1.20	7.50	2.61	13.75	5.66	20.00	1.74
1.50	1.18	7.75	2.18	14.00	4.79	20.25	2.18
1.75	1.22	8.00	2.61	14.25	4.36	20.50	1.31

EP POST.out

2.00	1.18	8.25	2.18	14.50	3.48	20.75	1.31
2.25	1.22	8.50	3.05	14.75	3.05	21.00	1.31
2.50	1.39	8.75	2.61	15.00	3.05	21.25	1.31
2.75	1.44	9.00	3.05	15.25	3.48	21.50	1.31
3.00	1.39	9.25	3.05	15.50	3.05	21.75	1.31
3.25	1.44	9.50	3.48	15.75	3.48	22.00	1.31
3.50	1.39	9.75	3.48	16.00	3.05	22.25	1.31
3.75	1.44	10.00	3.92	16.25	3.48	22.50	1.31
4.00	1.44	10.25	3.92	16.50	1.74	22.75	1.31
4.25	1.39	10.50	5.23	16.75	2.18	23.00	1.31
4.50	1.74	10.75	4.79	17.00	1.74	23.25	1.31
4.75	1.74	11.00	6.97	17.25	2.18	23.50	1.31
5.00	1.74	11.25	6.53	17.50	1.74	23.75	1.31
5.25	1.74	11.50	10.45	17.75	2.18	24.00	1.31
5.50	1.74	11.75	10.45	18.00	1.74	24.25	1.31
5.75	1.74	12.00	32.23	18.25	2.18		
6.00	1.74	12.25	133.29	18.50	1.74		
6.25	1.74	12.50	15.68	18.75	2.18		

CALIB
STANDHYD (0001)
ID= 1 DT= 5.0 min

Area (ha)= 2.28
Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.74	12.250	133.29	18.33	1.74
0.167	0.00	6.250	1.74	12.333	15.70	18.42	1.74
0.250	0.00	6.333	1.96	12.417	15.68	18.50	1.74
0.333	1.20	6.417	1.96	12.500	15.68	18.58	2.18
0.417	1.20	6.500	1.96	12.583	15.68	18.67	2.18
0.500	1.20	6.583	1.96	12.667	15.68	18.75	2.18
0.583	1.20	6.667	1.96	12.750	15.68	18.83	1.74
0.667	1.20	6.750	1.96	12.833	8.28	18.92	1.74
0.750	1.20	6.833	1.96	12.917	8.28	19.00	1.74
0.833	1.20	6.917	1.96	13.000	8.28	19.08	2.18
0.917	1.20	7.000	1.96	13.083	7.84	19.17	2.18
1.000	1.20	7.083	1.96	13.167	7.84	19.25	2.18
1.083	1.20	7.167	1.96	13.250	7.84	19.33	1.74
1.167	1.20	7.250	1.96	13.333	6.10	19.42	1.74
1.250	1.20	7.333	2.61	13.417	6.10	19.50	1.74
1.333	1.18	7.417	2.61	13.500	6.10	19.58	2.18
1.417	1.18	7.500	2.61	13.583	5.66	19.67	2.18
1.500	1.18	7.583	2.18	13.667	5.66	19.75	2.18
1.583	1.22	7.667	2.18	13.750	5.66	19.83	1.74
1.667	1.22	7.750	2.18	13.833	4.79	19.92	1.74
1.750	1.22	7.833	2.61	13.917	4.79	20.00	1.74
1.833	1.18	7.917	2.61	14.000	4.79	20.08	2.18
1.917	1.18	8.000	2.61	14.083	4.36	20.17	2.18
2.000	1.18	8.083	2.18	14.167	4.36	20.25	2.18

EP POST.out

2.083	1.22	8.167	2.18	14.250	4.36	20.33	1.31
2.167	1.22	8.250	2.18	14.333	3.48	20.42	1.31
2.250	1.22	8.333	3.05	14.417	3.48	20.50	1.31
2.333	1.39	8.417	3.05	14.500	3.48	20.58	1.31
2.417	1.39	8.500	3.05	14.583	3.05	20.67	1.31
2.500	1.39	8.583	2.61	14.667	3.05	20.75	1.31
2.583	1.44	8.667	2.61	14.750	3.05	20.83	1.31
2.667	1.44	8.750	2.61	14.833	3.05	20.92	1.31
2.750	1.44	8.833	3.05	14.917	3.05	21.00	1.31
2.833	1.39	8.917	3.05	15.000	3.05	21.08	1.31
2.917	1.39	9.000	3.05	15.083	3.48	21.17	1.31
3.000	1.39	9.083	3.05	15.167	3.48	21.25	1.31
3.083	1.44	9.167	3.05	15.250	3.48	21.33	1.31
3.167	1.44	9.250	3.05	15.333	3.05	21.42	1.31
3.250	1.44	9.333	3.48	15.417	3.05	21.50	1.31
3.333	1.39	9.417	3.48	15.500	3.05	21.58	1.31
3.417	1.39	9.500	3.48	15.583	3.48	21.67	1.31
3.500	1.39	9.583	3.48	15.667	3.48	21.75	1.31
3.583	1.44	9.667	3.48	15.750	3.48	21.83	1.31
3.667	1.44	9.750	3.48	15.833	3.05	21.92	1.31
3.750	1.44	9.833	3.92	15.917	3.05	22.00	1.31
3.833	1.44	9.917	3.92	16.000	3.05	22.08	1.31
3.917	1.44	10.000	3.92	16.083	3.48	22.17	1.31
4.000	1.44	10.083	3.92	16.167	3.48	22.25	1.31
4.083	1.39	10.167	3.92	16.250	3.48	22.33	1.31
4.167	1.39	10.250	3.92	16.333	1.74	22.42	1.31
4.250	1.39	10.333	5.23	16.417	1.74	22.50	1.31
4.333	1.74	10.417	5.23	16.500	1.74	22.58	1.31
4.417	1.74	10.500	5.23	16.583	2.18	22.67	1.31
4.500	1.74	10.583	4.79	16.667	2.18	22.75	1.31
4.583	1.74	10.667	4.79	16.750	2.18	22.83	1.31
4.667	1.74	10.750	4.79	16.833	1.74	22.92	1.31
4.750	1.74	10.833	6.97	16.917	1.74	23.00	1.31
4.833	1.74	10.917	6.97	17.000	1.74	23.08	1.31
4.917	1.74	11.000	6.97	17.083	2.18	23.17	1.31
5.000	1.74	11.083	6.53	17.167	2.18	23.25	1.31
5.083	1.74	11.167	6.53	17.250	2.18	23.33	1.31
5.167	1.74	11.250	6.53	17.333	1.74	23.42	1.31
5.250	1.74	11.333	10.45	17.417	1.74	23.50	1.31
5.333	1.74	11.417	10.45	17.500	1.74	23.58	1.31
5.417	1.74	11.500	10.45	17.583	2.18	23.67	1.31
5.500	1.74	11.583	10.45	17.667	2.18	23.75	1.31
5.583	1.74	11.667	10.45	17.750	2.18	23.83	1.31
5.667	1.74	11.750	10.45	17.833	1.74	23.92	1.31
5.750	1.74	11.833	32.23	17.917	1.74	24.00	1.31
5.833	1.74	11.917	32.23	18.000	1.74	24.08	1.31
5.917	1.74	12.000	32.23	18.083	2.18	24.17	1.31
6.000	1.74	12.083	133.28	18.167	2.18	24.25	1.31
6.083	1.74	12.167	133.29	18.250	2.18		

Max.Eff.Inten.(mm/hr)=	133.29	95.39	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.58 (ii)	5.19 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.29	0.16	
			TOTALS
PEAK FLOW (cms)=	0.76	0.05	0.811 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	107.90	64.49	103.56
TOTAL RAINFALL (mm)=	108.90	108.90	108.90
RUNOFF COEFFICIENT =	0.99	0.59	0.95

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

EP POST.out

```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0004) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.1500      0.0865
                          0.0610     0.0144   |   0.1620      0.1009
                          0.0870     0.0288   |   0.1740      0.1154
                          0.1060     0.0433   |   0.1840      0.1298
                          0.1230     0.0577   |   0.1940      0.1442
                          0.1370     0.0721   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
    INFLOW : ID= 2 (0001)      2.280      0.811     12.25     103.56
    OUTFLOW: ID= 1 (0004)      2.280      0.147     12.42     103.54

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 18.13
                  TIME SHIFT OF PEAK FLOW         (min)= 10.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0836

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 FINISH
================================================================================
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EP POST MISSISSAUGA POND.out

```
       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O    Company

        OOO     T      T    H   H    Y    M   M   OOO                Serial
```


***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual Otthymo 2.4\VO2\voin.dat

Output filename:
C:\Users\mark.sullivan\AppData\Local\Temp\26b19c33-92b6-46d3-963b-4d66ac4f1477\Scenario.out
Summary filename:
C:\Users\mark.sullivan\AppData\Local\Temp\26b19c33-92b6-46d3-963b-4d66ac4f1477\Scenario.sum

DATE: 09/17/2012 TIME: 11:08:15

USER:

COMMENTS: _____

****
** SIMULATION NUMBER: 1 **
****

READ STORM	Filename: C:\Users\mark.sullivan\AppData\Local\Temp\26b19c33-92b6-46d3-963b-4d66ac4f1477\80349ae5
Ptotal= 52.50 mm	Comments: 24-Hour 2-Year SCS Type II Storm Sarnia

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	0.94	12.75	7.56	19.00	0.84
0.50	0.58	6.75	0.94	13.00	3.99	19.25	1.05
0.75	0.58	7.00	0.94	13.25	3.78	19.50	0.84
1.00	0.58	7.25	0.94	13.50	2.94	19.75	1.05
1.25	0.58	7.50	1.26	13.75	2.73	20.00	0.84

1.50	0.57	7.75	1.05	14.00	2.31	20.25	1.05
1.75	0.59	8.00	1.26	14.25	2.10	20.50	0.63
2.00	0.57	8.25	1.05	14.50	1.68	20.75	0.63
2.25	0.59	8.50	1.47	14.75	1.47	21.00	0.63
2.50	0.67	8.75	1.26	15.00	1.47	21.25	0.63
2.75	0.69	9.00	1.47	15.25	1.68	21.50	0.63
3.00	0.67	9.25	1.47	15.50	1.47	21.75	0.63
3.25	0.69	9.50	1.68	15.75	1.68	22.00	0.63
3.50	0.67	9.75	1.68	16.00	1.47	22.25	0.63
3.75	0.69	10.00	1.89	16.25	1.68	22.50	0.63
4.00	0.69	10.25	1.89	16.50	0.84	22.75	0.63
4.25	0.67	10.50	2.52	16.75	1.05	23.00	0.63
4.50	0.84	10.75	2.31	17.00	0.84	23.25	0.63
4.75	0.84	11.00	3.36	17.25	1.05	23.50	0.63
5.00	0.84	11.25	3.15	17.50	0.84	23.75	0.63
5.25	0.84	11.50	5.04	17.75	1.05	24.00	0.63
5.50	0.84	11.75	5.04	18.00	0.84	24.25	0.63
5.75	0.84	12.00	15.54	18.25	1.05		
6.00	0.84	12.25	64.26	18.50	0.84		
6.25	0.84	12.50	7.56	18.75	1.05		

CALIB
STANDHYD (0001) | Area (ha)= 2.28
ID= 1 DT= 5.0 min | Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	0.84	12.250	64.26	18.33	0.84
0.167	0.00	6.250	0.84	12.333	7.57	18.42	0.84
0.250	0.00	6.333	0.94	12.417	7.56	18.50	0.84
0.333	0.58	6.417	0.94	12.500	7.56	18.58	1.05
0.417	0.58	6.500	0.94	12.583	7.56	18.67	1.05
0.500	0.58	6.583	0.94	12.667	7.56	18.75	1.05
0.583	0.58	6.667	0.94	12.750	7.56	18.83	0.84
0.667	0.58	6.750	0.94	12.833	3.99	18.92	0.84
0.750	0.58	6.833	0.94	12.917	3.99	19.00	0.84
0.833	0.58	6.917	0.94	13.000	3.99	19.08	1.05
0.917	0.58	7.000	0.94	13.083	3.78	19.17	1.05
1.000	0.58	7.083	0.94	13.167	3.78	19.25	1.05
1.083	0.58	7.167	0.94	13.250	3.78	19.33	0.84
1.167	0.58	7.250	0.95	13.333	2.94	19.42	0.84
1.250	0.58	7.333	1.26	13.417	2.94	19.50	0.84
1.333	0.57	7.417	1.26	13.500	2.94	19.58	1.05
1.417	0.57	7.500	1.26	13.583	2.73	19.67	1.05
1.500	0.57	7.583	1.05	13.667	2.73	19.75	1.05
1.583	0.59	7.667	1.05	13.750	2.73	19.83	0.84
1.667	0.59	7.750	1.05	13.833	2.31	19.92	0.84
1.750	0.59	7.833	1.26	13.917	2.31	20.00	0.84
1.833	0.57	7.917	1.26	14.000	2.31	20.08	1.05

EP POST MISSISSAUGA POND.out

1.917	0.57	8.000	1.26	14.083	2.10	20.17	1.05
2.000	0.57	8.083	1.05	14.167	2.10	20.25	1.05
2.083	0.59	8.167	1.05	14.250	2.10	20.33	0.63
2.167	0.59	8.250	1.05	14.333	1.68	20.42	0.63
2.250	0.59	8.333	1.47	14.417	1.68	20.50	0.63
2.333	0.67	8.417	1.47	14.500	1.68	20.58	0.63
2.417	0.67	8.500	1.47	14.583	1.47	20.67	0.63
2.500	0.67	8.583	1.26	14.667	1.47	20.75	0.63
2.583	0.69	8.667	1.26	14.750	1.47	20.83	0.63
2.667	0.69	8.750	1.26	14.833	1.47	20.92	0.63
2.750	0.69	8.833	1.47	14.917	1.47	21.00	0.63
2.833	0.67	8.917	1.47	15.000	1.47	21.08	0.63
2.917	0.67	9.000	1.47	15.083	1.68	21.17	0.63
3.000	0.67	9.083	1.47	15.167	1.68	21.25	0.63
3.083	0.69	9.167	1.47	15.250	1.68	21.33	0.63
3.167	0.69	9.250	1.47	15.333	1.47	21.42	0.63
3.250	0.69	9.333	1.68	15.417	1.47	21.50	0.63
3.333	0.67	9.417	1.68	15.500	1.47	21.58	0.63
3.417	0.67	9.500	1.68	15.583	1.68	21.67	0.63
3.500	0.67	9.583	1.68	15.667	1.68	21.75	0.63
3.583	0.69	9.667	1.68	15.750	1.68	21.83	0.63
3.667	0.69	9.750	1.68	15.833	1.47	21.92	0.63
3.750	0.69	9.833	1.89	15.917	1.47	22.00	0.63
3.833	0.69	9.917	1.89	16.000	1.47	22.08	0.63
3.917	0.69	10.000	1.89	16.083	1.68	22.17	0.63
4.000	0.69	10.083	1.89	16.167	1.68	22.25	0.63
4.083	0.67	10.167	1.89	16.250	1.68	22.33	0.63
4.167	0.67	10.250	1.89	16.333	0.84	22.42	0.63
4.250	0.67	10.333	2.52	16.417	0.84	22.50	0.63
4.333	0.84	10.417	2.52	16.500	0.84	22.58	0.63
4.417	0.84	10.500	2.52	16.583	1.05	22.67	0.63
4.500	0.84	10.583	2.31	16.667	1.05	22.75	0.63
4.583	0.84	10.667	2.31	16.750	1.05	22.83	0.63
4.667	0.84	10.750	2.31	16.833	0.84	22.92	0.63
4.750	0.84	10.833	3.36	16.917	0.84	23.00	0.63
4.833	0.84	10.917	3.36	17.000	0.84	23.08	0.63
4.917	0.84	11.000	3.36	17.083	1.05	23.17	0.63
5.000	0.84	11.083	3.15	17.167	1.05	23.25	0.63
5.083	0.84	11.167	3.15	17.250	1.05	23.33	0.63
5.167	0.84	11.250	3.15	17.333	0.84	23.42	0.63
5.250	0.84	11.333	5.04	17.417	0.84	23.50	0.63
5.333	0.84	11.417	5.04	17.500	0.84	23.58	0.63
5.417	0.84	11.500	5.04	17.583	1.05	23.67	0.63
5.500	0.84	11.583	5.04	17.667	1.05	23.75	0.63
5.583	0.84	11.667	5.04	17.750	1.05	23.83	0.63
5.667	0.84	11.750	5.04	17.833	0.84	23.92	0.63
5.750	0.84	11.833	15.54	17.917	0.84	24.00	0.63
5.833	0.84	11.917	15.54	18.000	0.84	24.08	0.63
5.917	0.84	12.000	15.54	18.083	1.05	24.17	0.63
6.000	0.84	12.083	64.25	18.167	1.05	24.25	0.63
6.083	0.84	12.167	64.26	18.250	1.05		

Max.Eff.Inten.(mm/hr)=	64.26	30.64	
over (min)	5.00	10.00	
Storage Coeff. (min)=	3.46 (ii)	6.95 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.26	0.14	
			TOTALS
PEAK FLOW (cms)=	0.36	0.02	0.378 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	51.50	20.33	48.38
TOTAL RAINFALL (mm)=	52.50	52.50	52.50
RUNOFF COEFFICIENT =	0.98	0.39	0.92

EP POST MISSISSAUGA POND.out

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0690	0.2160
0.0080	0.0650	0.0790	0.2880
0.0400	0.0720	0.0890	0.3610
0.0560	0.1440	0.0900	0.3740

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.378	12.25	48.38
OUTFLOW: ID= 1 (0004)	2.280	0.033	12.83	47.48

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.79
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.0706

****
** SIMULATION NUMBER: 2 **
****

READ STORM
Ptotal= 67.60 mm

Filename: C:\Users\mark.sullivan\AppData\Local\Temp\26b19c33-92b6-46d3-963b-4d66ac4f1477\7d647cf8
Comments: 24-Hour 5-Year SCS Type II Storm Sarnia

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.22	12.75	9.73	19.00	1.08
0.50	0.74	6.75	1.22	13.00	5.14	19.25	1.35
0.75	0.74	7.00	1.22	13.25	4.87	19.50	1.08
1.00	0.74	7.25	1.22	13.50	3.79	19.75	1.35
1.25	0.74	7.50	1.62	13.75	3.52	20.00	1.08
1.50	0.73	7.75	1.35	14.00	2.97	20.25	1.35
1.75	0.76	8.00	1.62	14.25	2.70	20.50	0.81
2.00	0.73	8.25	1.35	14.50	2.16	20.75	0.81
2.25	0.76	8.50	1.89	14.75	1.89	21.00	0.81
2.50	0.87	8.75	1.62	15.00	1.89	21.25	0.81
2.75	0.89	9.00	1.89	15.25	2.16	21.50	0.81
3.00	0.87	9.25	1.89	15.50	1.89	21.75	0.81
3.25	0.89	9.50	2.16	15.75	2.16	22.00	0.81
3.50	0.87	9.75	2.16	16.00	1.89	22.25	0.81
3.75	0.89	10.00	2.43	16.25	2.16	22.50	0.81
4.00	0.89	10.25	2.43	16.50	1.08	22.75	0.81
4.25	0.87	10.50	3.24	16.75	1.35	23.00	0.81
4.50	1.08	10.75	2.97	17.00	1.08	23.25	0.81
4.75	1.08	11.00	4.33	17.25	1.35	23.50	0.81
5.00	1.08	11.25	4.06	17.50	1.08	23.75	0.81

EP POST MISSISSAUGA POND.out

5.25	1.08	11.50	6.49	17.75	1.35	24.00	0.81
5.50	1.08	11.75	6.49	18.00	1.08	24.25	0.81
5.75	1.08	12.00	20.01	18.25	1.35		
6.00	1.08	12.25	82.74	18.50	1.08		
6.25	1.08	12.50	9.73	18.75	1.35		

CALIB		
STANDHYD (0001)	Area (ha)=	2.28
ID= 1 DT= 5.0 min	Total Imp(%)=	90.00

Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.08	12.250	82.74	18.33	1.08
0.167	0.00	6.250	1.08	12.333	9.74	18.42	1.08
0.250	0.00	6.333	1.22	12.417	9.73	18.50	1.08
0.333	0.74	6.417	1.22	12.500	9.73	18.58	1.35
0.417	0.74	6.500	1.22	12.583	9.73	18.67	1.35
0.500	0.74	6.583	1.22	12.667	9.73	18.75	1.35
0.583	0.74	6.667	1.22	12.750	9.73	18.83	1.08
0.667	0.74	6.750	1.22	12.833	5.14	18.92	1.08
0.750	0.74	6.833	1.22	12.917	5.14	19.00	1.08
0.833	0.74	6.917	1.22	13.000	5.14	19.08	1.35
0.917	0.74	7.000	1.22	13.083	4.87	19.17	1.35
1.000	0.74	7.083	1.22	13.167	4.87	19.25	1.35
1.083	0.74	7.167	1.22	13.250	4.87	19.33	1.08
1.167	0.74	7.250	1.22	13.333	3.79	19.42	1.08
1.250	0.74	7.333	1.62	13.417	3.79	19.50	1.08
1.333	0.73	7.417	1.62	13.500	3.79	19.58	1.35
1.417	0.73	7.500	1.62	13.583	3.52	19.67	1.35
1.500	0.73	7.583	1.35	13.667	3.52	19.75	1.35
1.583	0.76	7.667	1.35	13.750	3.52	19.83	1.08
1.667	0.76	7.750	1.35	13.833	2.97	19.92	1.08
1.750	0.76	7.833	1.62	13.917	2.97	20.00	1.08
1.833	0.73	7.917	1.62	14.000	2.97	20.08	1.35
1.917	0.73	8.000	1.62	14.083	2.70	20.17	1.35
2.000	0.73	8.083	1.35	14.167	2.70	20.25	1.35
2.083	0.76	8.167	1.35	14.250	2.70	20.33	0.81
2.167	0.76	8.250	1.35	14.333	2.16	20.42	0.81
2.250	0.76	8.333	1.89	14.417	2.16	20.50	0.81
2.333	0.87	8.417	1.89	14.500	2.16	20.58	0.81
2.417	0.87	8.500	1.89	14.583	1.89	20.67	0.81
2.500	0.87	8.583	1.62	14.667	1.89	20.75	0.81
2.583	0.89	8.667	1.62	14.750	1.89	20.83	0.81
2.667	0.89	8.750	1.62	14.833	1.89	20.92	0.81
2.750	0.89	8.833	1.89	14.917	1.89	21.00	0.81
2.833	0.87	8.917	1.89	15.000	1.89	21.08	0.81
2.917	0.87	9.000	1.89	15.083	2.16	21.17	0.81
3.000	0.87	9.083	1.89	15.167	2.16	21.25	0.81
3.083	0.89	9.167	1.89	15.250	2.16	21.33	0.81

EP POST MISSISSAUGA POND.out

3.167	0.89	9.250	1.89	15.333	1.89	21.42	0.81
3.250	0.89	9.333	2.16	15.417	1.89	21.50	0.81
3.333	0.87	9.417	2.16	15.500	1.89	21.58	0.81
3.417	0.87	9.500	2.16	15.583	2.16	21.67	0.81
3.500	0.87	9.583	2.16	15.667	2.16	21.75	0.81
3.583	0.89	9.667	2.16	15.750	2.16	21.83	0.81
3.667	0.89	9.750	2.16	15.833	1.89	21.92	0.81
3.750	0.89	9.833	2.43	15.917	1.89	22.00	0.81
3.833	0.89	9.917	2.43	16.000	1.89	22.08	0.81
3.917	0.89	10.000	2.43	16.083	2.16	22.17	0.81
4.000	0.89	10.083	2.43	16.167	2.16	22.25	0.81
4.083	0.87	10.167	2.43	16.250	2.16	22.33	0.81
4.167	0.87	10.250	2.43	16.333	1.08	22.42	0.81
4.250	0.87	10.333	3.24	16.417	1.08	22.50	0.81
4.333	1.08	10.417	3.24	16.500	1.08	22.58	0.81
4.417	1.08	10.500	3.24	16.583	1.35	22.67	0.81
4.500	1.08	10.583	2.97	16.667	1.35	22.75	0.81
4.583	1.08	10.667	2.97	16.750	1.35	22.83	0.81
4.667	1.08	10.750	2.97	16.833	1.08	22.92	0.81
4.750	1.08	10.833	4.33	16.917	1.08	23.00	0.81
4.833	1.08	10.917	4.33	17.000	1.08	23.08	0.81
4.917	1.08	11.000	4.33	17.083	1.35	23.17	0.81
5.000	1.08	11.083	4.06	17.167	1.35	23.25	0.81
5.083	1.08	11.167	4.06	17.250	1.35	23.33	0.81
5.167	1.08	11.250	4.06	17.333	1.08	23.42	0.81
5.250	1.08	11.333	6.49	17.417	1.08	23.50	0.81
5.333	1.08	11.417	6.49	17.500	1.08	23.58	0.81
5.417	1.08	11.500	6.49	17.583	1.35	23.67	0.81
5.500	1.08	11.583	6.49	17.667	1.35	23.75	0.81
5.583	1.08	11.667	6.49	17.750	1.35	23.83	0.81
5.667	1.08	11.750	6.49	17.833	1.08	23.92	0.81
5.750	1.08	11.833	20.01	17.917	1.08	24.00	0.81
5.833	1.08	11.917	20.01	18.000	1.08	24.08	0.81
5.917	1.08	12.000	20.01	18.083	1.35	24.17	0.81
6.000	1.08	12.083	82.73	18.167	1.35	24.25	0.81
6.083	1.08	12.167	82.74	18.250	1.35		

Max.Eff.Inten.(mm/hr)=	82.74	46.67	
over (min)	5.00	10.00	
Storage Coeff. (min)=	3.12 (ii)	6.29 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.27	0.15	
			TOTALS
PEAK FLOW (cms)=	0.47	0.02	0.493 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	66.60	31.08	63.05
TOTAL RAINFALL (mm)=	67.60	67.60	67.60
RUNOFF COEFFICIENT =	0.99	0.46	0.93

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)				
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)

EP POST MISSISSAUGA POND.out

0.0000	0.0000	0.0690	0.2160
0.0080	0.0650	0.0790	0.2880
0.0400	0.0720	0.0890	0.3610
0.0560	0.1440	0.0900	0.3740

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.493	12.25	63.05
OUTFLOW: ID= 1 (0004)	2.280	0.044	12.83	62.14

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.87
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.0889

****
** SIMULATION NUMBER: 3 **
****

READ STORM	Filename: C:\Users\mark.sullivan\AppData\Local\Temp\26b19c33-92b6-46d3-963b-4d66ac4f1477\1d16d696
Ptotal= 77.60 mm	Comments: 24-Hour 10-Year SCS Type II Storm Sarnia

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.40	12.75	11.17	19.00	1.24
0.50	0.85	6.75	1.40	13.00	5.90	19.25	1.55
0.75	0.85	7.00	1.40	13.25	5.59	19.50	1.24
1.00	0.85	7.25	1.40	13.50	4.35	19.75	1.55
1.25	0.85	7.50	1.86	13.75	4.04	20.00	1.24
1.50	0.84	7.75	1.55	14.00	3.41	20.25	1.55
1.75	0.87	8.00	1.86	14.25	3.10	20.50	0.93
2.00	0.84	8.25	1.55	14.50	2.48	20.75	0.93
2.25	0.87	8.50	2.17	14.75	2.17	21.00	0.93
2.50	0.99	8.75	1.86	15.00	2.17	21.25	0.93
2.75	1.02	9.00	2.17	15.25	2.48	21.50	0.93
3.00	0.99	9.25	2.17	15.50	2.17	21.75	0.93
3.25	1.02	9.50	2.48	15.75	2.48	22.00	0.93
3.50	0.99	9.75	2.48	16.00	2.17	22.25	0.93
3.75	1.02	10.00	2.79	16.25	2.48	22.50	0.93
4.00	1.02	10.25	2.79	16.50	1.24	22.75	0.93
4.25	0.99	10.50	3.72	16.75	1.55	23.00	0.93
4.50	1.24	10.75	3.41	17.00	1.24	23.25	0.93
4.75	1.24	11.00	4.97	17.25	1.55	23.50	0.93
5.00	1.24	11.25	4.66	17.50	1.24	23.75	0.93
5.25	1.24	11.50	7.45	17.75	1.55	24.00	0.93
5.50	1.24	11.75	7.45	18.00	1.24	24.25	0.93
5.75	1.24	12.00	22.97	18.25	1.55		
6.00	1.24	12.25	94.98	18.50	1.24		
6.25	1.24	12.50	11.17	18.75	1.55		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 2.28 Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.05	0.23

EP POST MISSISSAUGA POND.out

Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.24	12.250	94.98	18.33	1.24
0.167	0.00	6.250	1.24	12.333	11.19	18.42	1.24
0.250	0.00	6.333	1.40	12.417	11.17	18.50	1.24
0.333	0.85	6.417	1.40	12.500	11.17	18.58	1.55
0.417	0.85	6.500	1.40	12.583	11.17	18.67	1.55
0.500	0.85	6.583	1.40	12.667	11.17	18.75	1.55
0.583	0.85	6.667	1.40	12.750	11.17	18.83	1.24
0.667	0.85	6.750	1.40	12.833	5.90	18.92	1.24
0.750	0.85	6.833	1.40	12.917	5.90	19.00	1.24
0.833	0.85	6.917	1.40	13.000	5.90	19.08	1.55
0.917	0.85	7.000	1.40	13.083	5.59	19.17	1.55
1.000	0.85	7.083	1.40	13.167	5.59	19.25	1.55
1.083	0.85	7.167	1.40	13.250	5.59	19.33	1.24
1.167	0.85	7.250	1.40	13.333	4.35	19.42	1.24
1.250	0.85	7.333	1.86	13.417	4.35	19.50	1.24
1.333	0.84	7.417	1.86	13.500	4.35	19.58	1.55
1.417	0.84	7.500	1.86	13.583	4.04	19.67	1.55
1.500	0.84	7.583	1.55	13.667	4.04	19.75	1.55
1.583	0.87	7.667	1.55	13.750	4.04	19.83	1.24
1.667	0.87	7.750	1.55	13.833	3.41	19.92	1.24
1.750	0.87	7.833	1.86	13.917	3.41	20.00	1.24
1.833	0.84	7.917	1.86	14.000	3.41	20.08	1.55
1.917	0.84	8.000	1.86	14.083	3.10	20.17	1.55
2.000	0.84	8.083	1.55	14.167	3.10	20.25	1.55
2.083	0.87	8.167	1.55	14.250	3.10	20.33	0.93
2.167	0.87	8.250	1.55	14.333	2.48	20.42	0.93
2.250	0.87	8.333	2.17	14.417	2.48	20.50	0.93
2.333	0.99	8.417	2.17	14.500	2.48	20.58	0.93
2.417	0.99	8.500	2.17	14.583	2.17	20.67	0.93
2.500	0.99	8.583	1.86	14.667	2.17	20.75	0.93
2.583	1.02	8.667	1.86	14.750	2.17	20.83	0.93
2.667	1.02	8.750	1.86	14.833	2.17	20.92	0.93
2.750	1.02	8.833	2.17	14.917	2.17	21.00	0.93
2.833	0.99	8.917	2.17	15.000	2.17	21.08	0.93
2.917	0.99	9.000	2.17	15.083	2.48	21.17	0.93
3.000	0.99	9.083	2.17	15.167	2.48	21.25	0.93
3.083	1.02	9.167	2.17	15.250	2.48	21.33	0.93
3.167	1.02	9.250	2.17	15.333	2.17	21.42	0.93
3.250	1.02	9.333	2.48	15.417	2.17	21.50	0.93
3.333	0.99	9.417	2.48	15.500	2.17	21.58	0.93
3.417	0.99	9.500	2.48	15.583	2.48	21.67	0.93
3.500	0.99	9.583	2.48	15.667	2.48	21.75	0.93
3.583	1.02	9.667	2.48	15.750	2.48	21.83	0.93
3.667	1.02	9.750	2.48	15.833	2.17	21.92	0.93
3.750	1.02	9.833	2.79	15.917	2.17	22.00	0.93
3.833	1.02	9.917	2.79	16.000	2.17	22.08	0.93
3.917	1.02	10.000	2.79	16.083	2.48	22.17	0.93
4.000	1.02	10.083	2.79	16.167	2.48	22.25	0.93
4.083	0.99	10.167	2.79	16.250	2.48	22.33	0.93
4.167	0.99	10.250	2.79	16.333	1.24	22.42	0.93
4.250	0.99	10.333	3.72	16.417	1.24	22.50	0.93
4.333	1.24	10.417	3.72	16.500	1.24	22.58	0.93

EP POST MISSISSAUGA POND.out

4.417	1.24	10.500	3.72	16.583	1.55	22.67	0.93
4.500	1.24	10.583	3.41	16.667	1.55	22.75	0.93
4.583	1.24	10.667	3.41	16.750	1.55	22.83	0.93
4.667	1.24	10.750	3.41	16.833	1.24	22.92	0.93
4.750	1.24	10.833	4.97	16.917	1.24	23.00	0.93
4.833	1.24	10.917	4.97	17.000	1.24	23.08	0.93
4.917	1.24	11.000	4.97	17.083	1.55	23.17	0.93
5.000	1.24	11.083	4.66	17.167	1.55	23.25	0.93
5.083	1.24	11.167	4.66	17.250	1.55	23.33	0.93
5.167	1.24	11.250	4.66	17.333	1.24	23.42	0.93
5.250	1.24	11.333	7.45	17.417	1.24	23.50	0.93
5.333	1.24	11.417	7.45	17.500	1.24	23.58	0.93
5.417	1.24	11.500	7.45	17.583	1.55	23.67	0.93
5.500	1.24	11.583	7.45	17.667	1.55	23.75	0.93
5.583	1.24	11.667	7.45	17.750	1.55	23.83	0.93
5.667	1.24	11.750	7.45	17.833	1.24	23.92	0.93
5.750	1.24	11.833	22.97	17.917	1.24	24.00	0.93
5.833	1.24	11.917	22.97	18.000	1.24	24.08	0.93
5.917	1.24	12.000	22.97	18.083	1.55	24.17	0.93
6.000	1.24	12.083	94.97	18.167	1.55	24.25	0.93
6.083	1.24	12.167	94.98	18.250	1.55		

Max.Eff.Inten.(mm/hr)=	94.98	57.97	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.96 (ii)	5.95 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.28	0.15	
			TOTALS
PEAK FLOW (cms)=	0.54	0.03	0.569 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25
RUNOFF VOLUME (mm)=	76.60	38.73	72.81
TOTAL RAINFALL (mm)=	77.60	77.60	77.60
RUNOFF COEFFICIENT =	0.99	0.50	0.94

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0690	0.2160
0.0080	0.0650	0.0790	0.2880
0.0400	0.0720	0.0890	0.3610
0.0560	0.1440	0.0900	0.3740

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.569	12.25	72.81
OUTFLOW: ID= 1 (0004)	2.280	0.047	12.83	71.91

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.22
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.1027

EP POST MISSISSAUGA POND.out

****
** SIMULATION NUMBER: 4 **
****

READ STORM	Filename: C:\Users\mark.sullivan\AppData\Local\Temp\26b19c33-92b6-46d3-963b-4d66ac4f1477\6b7e5e22
Ptotal= 90.20 mm	Comments: 24-Hour 25-Year SCS Type II Storm Sarnia

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.62	12.75	12.99	19.00	1.44
0.50	0.99	6.75	1.62	13.00	6.86	19.25	1.80
0.75	0.99	7.00	1.62	13.25	6.49	19.50	1.44
1.00	0.99	7.25	1.62	13.50	5.05	19.75	1.80
1.25	0.99	7.50	2.16	13.75	4.69	20.00	1.44
1.50	0.97	7.75	1.80	14.00	3.97	20.25	1.80
1.75	1.01	8.00	2.16	14.25	3.61	20.50	1.08
2.00	0.97	8.25	1.80	14.50	2.89	20.75	1.08
2.25	1.01	8.50	2.53	14.75	2.53	21.00	1.08
2.50	1.15	8.75	2.16	15.00	2.53	21.25	1.08
2.75	1.19	9.00	2.53	15.25	2.89	21.50	1.08
3.00	1.15	9.25	2.53	15.50	2.53	21.75	1.08
3.25	1.19	9.50	2.89	15.75	2.89	22.00	1.08
3.50	1.15	9.75	2.89	16.00	2.53	22.25	1.08
3.75	1.19	10.00	3.25	16.25	2.89	22.50	1.08
4.00	1.19	10.25	3.25	16.50	1.44	22.75	1.08
4.25	1.15	10.50	4.33	16.75	1.80	23.00	1.08
4.50	1.44	10.75	3.97	17.00	1.44	23.25	1.08
4.75	1.44	11.00	5.77	17.25	1.80	23.50	1.08
5.00	1.44	11.25	5.41	17.50	1.44	23.75	1.08
5.25	1.44	11.50	8.66	17.75	1.80	24.00	1.08
5.50	1.44	11.75	8.66	18.00	1.44	24.25	1.08
5.75	1.44	12.00	26.70	18.25	1.80		
6.00	1.44	12.25	110.40	18.50	1.44		
6.25	1.44	12.50	12.99	18.75	1.80		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 2.28 Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.44	12.250	110.40	18.33	1.44
0.167	0.00	6.250	1.44	12.333	13.00	18.42	1.44
0.250	0.00	6.333	1.62	12.417	12.99	18.50	1.44
0.333	0.99	6.417	1.62	12.500	12.99	18.58	1.80

EP POST MISSISSAUGA POND.out

0.417	0.99	6.500	1.62	12.583	12.99	18.67	1.80
0.500	0.99	6.583	1.62	12.667	12.99	18.75	1.80
0.583	0.99	6.667	1.62	12.750	12.99	18.83	1.44
0.667	0.99	6.750	1.62	12.833	6.86	18.92	1.44
0.750	0.99	6.833	1.62	12.917	6.86	19.00	1.44
0.833	0.99	6.917	1.62	13.000	6.86	19.08	1.80
0.917	0.99	7.000	1.62	13.083	6.49	19.17	1.80
1.000	0.99	7.083	1.62	13.167	6.49	19.25	1.80
1.083	0.99	7.167	1.62	13.250	6.49	19.33	1.44
1.167	0.99	7.250	1.62	13.333	5.05	19.42	1.44
1.250	0.99	7.333	2.16	13.417	5.05	19.50	1.44
1.333	0.97	7.417	2.16	13.500	5.05	19.58	1.80
1.417	0.97	7.500	2.16	13.583	4.69	19.67	1.80
1.500	0.97	7.583	1.80	13.667	4.69	19.75	1.80
1.583	1.01	7.667	1.80	13.750	4.69	19.83	1.44
1.667	1.01	7.750	1.80	13.833	3.97	19.92	1.44
1.750	1.01	7.833	2.16	13.917	3.97	20.00	1.44
1.833	0.97	7.917	2.16	14.000	3.97	20.08	1.80
1.917	0.97	8.000	2.16	14.083	3.61	20.17	1.80
2.000	0.97	8.083	1.80	14.167	3.61	20.25	1.80
2.083	1.01	8.167	1.80	14.250	3.61	20.33	1.08
2.167	1.01	8.250	1.80	14.333	2.89	20.42	1.08
2.250	1.01	8.333	2.53	14.417	2.89	20.50	1.08
2.333	1.15	8.417	2.53	14.500	2.89	20.58	1.08
2.417	1.15	8.500	2.53	14.583	2.53	20.67	1.08
2.500	1.15	8.583	2.16	14.667	2.53	20.75	1.08
2.583	1.19	8.667	2.16	14.750	2.53	20.83	1.08
2.667	1.19	8.750	2.16	14.833	2.53	20.92	1.08
2.750	1.19	8.833	2.53	14.917	2.53	21.00	1.08
2.833	1.15	8.917	2.53	15.000	2.53	21.08	1.08
2.917	1.15	9.000	2.53	15.083	2.89	21.17	1.08
3.000	1.15	9.083	2.53	15.167	2.89	21.25	1.08
3.083	1.19	9.167	2.53	15.250	2.89	21.33	1.08
3.167	1.19	9.250	2.53	15.333	2.53	21.42	1.08
3.250	1.19	9.333	2.89	15.417	2.53	21.50	1.08
3.333	1.15	9.417	2.89	15.500	2.53	21.58	1.08
3.417	1.15	9.500	2.89	15.583	2.89	21.67	1.08
3.500	1.15	9.583	2.89	15.667	2.89	21.75	1.08
3.583	1.19	9.667	2.89	15.750	2.89	21.83	1.08
3.667	1.19	9.750	2.89	15.833	2.53	21.92	1.08
3.750	1.19	9.833	3.25	15.917	2.53	22.00	1.08
3.833	1.19	9.917	3.25	16.000	2.53	22.08	1.08
3.917	1.19	10.000	3.25	16.083	2.89	22.17	1.08
4.000	1.19	10.083	3.25	16.167	2.89	22.25	1.08
4.083	1.15	10.167	3.25	16.250	2.89	22.33	1.08
4.167	1.15	10.250	3.25	16.333	1.44	22.42	1.08
4.250	1.15	10.333	4.33	16.417	1.44	22.50	1.08
4.333	1.44	10.417	4.33	16.500	1.44	22.58	1.08
4.417	1.44	10.500	4.33	16.583	1.80	22.67	1.08
4.500	1.44	10.583	3.97	16.667	1.80	22.75	1.08
4.583	1.44	10.667	3.97	16.750	1.80	22.83	1.08
4.667	1.44	10.750	3.97	16.833	1.44	22.92	1.08
4.750	1.44	10.833	5.77	16.917	1.44	23.00	1.08
4.833	1.44	10.917	5.77	17.000	1.44	23.08	1.08
4.917	1.44	11.000	5.77	17.083	1.80	23.17	1.08
5.000	1.44	11.083	5.41	17.167	1.80	23.25	1.08
5.083	1.44	11.167	5.41	17.250	1.80	23.33	1.08
5.167	1.44	11.250	5.41	17.333	1.44	23.42	1.08
5.250	1.44	11.333	8.66	17.417	1.44	23.50	1.08
5.333	1.44	11.417	8.66	17.500	1.44	23.58	1.08
5.417	1.44	11.500	8.66	17.583	1.80	23.67	1.08
5.500	1.44	11.583	8.66	17.667	1.80	23.75	1.08
5.583	1.44	11.667	8.66	17.750	1.80	23.83	1.08

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                5.667    1.44 |11.750    8.66 |17.833    1.44 | 23.92    1.08
                5.750    1.44 |11.833   26.70 |17.917    1.44 | 24.00    1.08
                5.833    1.44 |11.917   26.70 |18.000    1.44 | 24.08    1.08
                5.917    1.44 |12.000   26.70 |18.083    1.80 | 24.17    1.08
                6.000    1.44 |12.083  110.39 |18.167    1.80 | 24.25    1.08
                6.083    1.44 |12.167  110.40 |18.250    1.80 |

     Max.Eff.Inten.(mm/hr)=     110.40        72.74
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       2.78 (ii)    5.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.28         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.63         0.04          0.666 (iii)
     TIME TO PEAK    (hrs)=      12.25        12.25          12.25
     RUNOFF VOLUME    (mm)=      89.20        48.82          85.16
     TOTAL RAINFALL   (mm)=      90.20        90.20          90.20
     RUNOFF COEFFICIENT   =       0.99         0.54           0.94

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  80.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| RESERVOIR (0004) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0690      0.2160
                          0.0080     0.0650   |   0.0790      0.2880
                          0.0400     0.0720   |   0.0890      0.3610
                          0.0560     0.1440   |   0.0900      0.3740

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0001)      2.280      0.666     12.25       85.16
     OUTFLOW: ID= 1 (0004)      2.280      0.051     12.83       84.26

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.63
                   TIME SHIFT OF PEAK FLOW         (min)= 35.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.1208

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  ***************************
  ** SIMULATION NUMBER:   5 **
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|    READ STORM    |    Filename: C:\Users\mark.sullivan\AppD
|                  |              ata\Local\Temp\
|                  |              26b19c33-92b6-46d3-963b-4d66ac4f1477\a1e5d969
| Ptotal= 99.60 mm |    Comments: 24-Hour 50-Year SCS Type II Storm Sarnia
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    0.00 |  6.50    1.79 | 12.75   14.34 | 19.00    1.59
                0.50    1.10 |  6.75    1.79 | 13.00    7.57 | 19.25    1.99
```

0.75	1.10	7.00	1.79	13.25	7.17	19.50	1.59
1.00	1.10	7.25	1.79	13.50	5.58	19.75	1.99
1.25	1.10	7.50	2.39	13.75	5.18	20.00	1.59
1.50	1.08	7.75	1.99	14.00	4.38	20.25	1.99
1.75	1.12	8.00	2.39	14.25	3.98	20.50	1.20
2.00	1.08	8.25	1.99	14.50	3.19	20.75	1.20
2.25	1.12	8.50	2.79	14.75	2.79	21.00	1.20
2.50	1.27	8.75	2.39	15.00	2.79	21.25	1.20
2.75	1.31	9.00	2.79	15.25	3.19	21.50	1.20
3.00	1.27	9.25	2.79	15.50	2.79	21.75	1.20
3.25	1.31	9.50	3.19	15.75	3.19	22.00	1.20
3.50	1.27	9.75	3.19	16.00	2.79	22.25	1.20
3.75	1.31	10.00	3.59	16.25	3.19	22.50	1.20
4.00	1.31	10.25	3.59	16.50	1.59	22.75	1.20
4.25	1.27	10.50	4.78	16.75	1.99	23.00	1.20
4.50	1.59	10.75	4.38	17.00	1.59	23.25	1.20
4.75	1.59	11.00	6.37	17.25	1.99	23.50	1.20
5.00	1.59	11.25	5.98	17.50	1.59	23.75	1.20
5.25	1.59	11.50	9.56	17.75	1.99	24.00	1.20
5.50	1.59	11.75	9.56	18.00	1.59	24.25	1.20
5.75	1.59	12.00	29.48	18.25	1.99		
6.00	1.59	12.25	121.91	18.50	1.59		
6.25	1.59	12.50	14.34	18.75	1.99		

CALIB	
STANDHYD (0001)	Area (ha)= 2.28
ID= 1 DT= 5.0 min	Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.59	12.250	121.91	18.33	1.59
0.167	0.00	6.250	1.59	12.333	14.36	18.42	1.59
0.250	0.00	6.333	1.79	12.417	14.34	18.50	1.59
0.333	1.10	6.417	1.79	12.500	14.34	18.58	1.99
0.417	1.10	6.500	1.79	12.583	14.34	18.67	1.99
0.500	1.10	6.583	1.79	12.667	14.34	18.75	1.99
0.583	1.10	6.667	1.79	12.750	14.34	18.83	1.59
0.667	1.10	6.750	1.79	12.833	7.57	18.92	1.59
0.750	1.10	6.833	1.79	12.917	7.57	19.00	1.59
0.833	1.10	6.917	1.79	13.000	7.57	19.08	1.99
0.917	1.10	7.000	1.79	13.083	7.17	19.17	1.99
1.000	1.10	7.083	1.79	13.167	7.17	19.25	1.99
1.083	1.10	7.167	1.79	13.250	7.17	19.33	1.59
1.167	1.10	7.250	1.79	13.333	5.58	19.42	1.59
1.250	1.10	7.333	2.39	13.417	5.58	19.50	1.59
1.333	1.08	7.417	2.39	13.500	5.58	19.58	1.99
1.417	1.08	7.500	2.39	13.583	5.18	19.67	1.99
1.500	1.08	7.583	1.99	13.667	5.18	19.75	1.99
1.583	1.12	7.667	1.99	13.750	5.18	19.83	1.59

1.667	1.12	7.750	1.99	13.833	4.38	19.92	1.59
1.750	1.12	7.833	2.39	13.917	4.38	20.00	1.59
1.833	1.08	7.917	2.39	14.000	4.38	20.08	1.99
1.917	1.08	8.000	2.39	14.083	3.98	20.17	1.99
2.000	1.08	8.083	1.99	14.167	3.98	20.25	1.99
2.083	1.12	8.167	1.99	14.250	3.98	20.33	1.20
2.167	1.12	8.250	1.99	14.333	3.19	20.42	1.20
2.250	1.12	8.333	2.79	14.417	3.19	20.50	1.20
2.333	1.27	8.417	2.79	14.500	3.19	20.58	1.20
2.417	1.27	8.500	2.79	14.583	2.79	20.67	1.20
2.500	1.27	8.583	2.39	14.667	2.79	20.75	1.20
2.583	1.31	8.667	2.39	14.750	2.79	20.83	1.20
2.667	1.31	8.750	2.39	14.833	2.79	20.92	1.20
2.750	1.31	8.833	2.79	14.917	2.79	21.00	1.20
2.833	1.27	8.917	2.79	15.000	2.79	21.08	1.20
2.917	1.27	9.000	2.79	15.083	3.19	21.17	1.20
3.000	1.27	9.083	2.79	15.167	3.19	21.25	1.20
3.083	1.31	9.167	2.79	15.250	3.19	21.33	1.20
3.167	1.31	9.250	2.79	15.333	2.79	21.42	1.20
3.250	1.31	9.333	3.19	15.417	2.79	21.50	1.20
3.333	1.27	9.417	3.19	15.500	2.79	21.58	1.20
3.417	1.27	9.500	3.19	15.583	3.19	21.67	1.20
3.500	1.27	9.583	3.19	15.667	3.19	21.75	1.20
3.583	1.31	9.667	3.19	15.750	3.19	21.83	1.20
3.667	1.31	9.750	3.19	15.833	2.79	21.92	1.20
3.750	1.31	9.833	3.59	15.917	2.79	22.00	1.20
3.833	1.31	9.917	3.59	16.000	2.79	22.08	1.20
3.917	1.31	10.000	3.59	16.083	3.19	22.17	1.20
4.000	1.31	10.083	3.59	16.167	3.19	22.25	1.20
4.083	1.27	10.167	3.59	16.250	3.19	22.33	1.20
4.167	1.27	10.250	3.59	16.333	1.59	22.42	1.20
4.250	1.27	10.333	4.78	16.417	1.59	22.50	1.20
4.333	1.59	10.417	4.78	16.500	1.59	22.58	1.20
4.417	1.59	10.500	4.78	16.583	1.99	22.67	1.20
4.500	1.59	10.583	4.38	16.667	1.99	22.75	1.20
4.583	1.59	10.667	4.38	16.750	1.99	22.83	1.20
4.667	1.59	10.750	4.38	16.833	1.59	22.92	1.20
4.750	1.59	10.833	6.37	16.917	1.59	23.00	1.20
4.833	1.59	10.917	6.37	17.000	1.59	23.08	1.20
4.917	1.59	11.000	6.37	17.083	1.99	23.17	1.20
5.000	1.59	11.083	5.98	17.167	1.99	23.25	1.20
5.083	1.59	11.167	5.98	17.250	1.99	23.33	1.20
5.167	1.59	11.250	5.98	17.333	1.59	23.42	1.20
5.250	1.59	11.333	9.56	17.417	1.59	23.50	1.20
5.333	1.59	11.417	9.56	17.500	1.59	23.58	1.20
5.417	1.59	11.500	9.56	17.583	1.99	23.67	1.20
5.500	1.59	11.583	9.56	17.667	1.99	23.75	1.20
5.583	1.59	11.667	9.56	17.750	1.99	23.83	1.20
5.667	1.59	11.750	9.56	17.833	1.59	23.92	1.20
5.750	1.59	11.833	29.48	17.917	1.59	24.00	1.20
5.833	1.59	11.917	29.48	18.000	1.59	24.08	1.20
5.917	1.59	12.000	29.48	18.083	1.99	24.17	1.20
6.000	1.59	12.083	121.90	18.167	1.99	24.25	1.19
6.083	1.59	12.167	121.91	18.250	1.99		

Max.Eff.Inten.(mm/hr)=	121.91	84.03	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.68 (ii)	5.38 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.29	0.16	
			TOTALS
PEAK FLOW (cms)=	0.69	0.05	0.739 (iii)
TIME TO PEAK (hrs)=	12.25	12.25	12.25

EP POST MISSISSAUGA POND.out

RUNOFF VOLUME (mm)=	98.60	56.60	94.40
TOTAL RAINFALL (mm)=	99.60	99.60	99.60
RUNOFF COEFFICIENT =	0.99	0.57	0.95

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)
IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0690	0.2160
0.0080	0.0650	0.0790	0.2880
0.0400	0.0720	0.0890	0.3610
0.0560	0.1440	0.0900	0.3740

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.739	12.25	94.40
OUTFLOW: ID= 1 (0004)	2.280	0.054	12.83	93.50

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.27
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.1339

****
** SIMULATION NUMBER: 6 **
****

READ STORM
Ptotal=108.90 mm

Filename: C:\Users\mark.sullivan\AppData\Local\Temp\26b19c33-92b6-46d3-963b-4d66ac4f1477\bc37ea81
Comments: 24-Hour 100-Year SCS Type II Storm Sarni

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.00	6.50	1.96	12.75	15.68	19.00	1.74
0.50	1.20	6.75	1.96	13.00	8.28	19.25	2.18
0.75	1.20	7.00	1.96	13.25	7.84	19.50	1.74
1.00	1.20	7.25	1.96	13.50	6.10	19.75	2.18
1.25	1.20	7.50	2.61	13.75	5.66	20.00	1.74
1.50	1.18	7.75	2.18	14.00	4.79	20.25	2.18
1.75	1.22	8.00	2.61	14.25	4.36	20.50	1.31
2.00	1.18	8.25	2.18	14.50	3.48	20.75	1.31
2.25	1.22	8.50	3.05	14.75	3.05	21.00	1.31
2.50	1.39	8.75	2.61	15.00	3.05	21.25	1.31
2.75	1.44	9.00	3.05	15.25	3.48	21.50	1.31
3.00	1.39	9.25	3.05	15.50	3.05	21.75	1.31
3.25	1.44	9.50	3.48	15.75	3.48	22.00	1.31
3.50	1.39	9.75	3.48	16.00	3.05	22.25	1.31
3.75	1.44	10.00	3.92	16.25	3.48	22.50	1.31
4.00	1.44	10.25	3.92	16.50	1.74	22.75	1.31
4.25	1.39	10.50	5.23	16.75	2.18	23.00	1.31

EP POST MISSISSAUGA POND.out

4.50	1.74	10.75	4.79	17.00	1.74	23.25	1.31
4.75	1.74	11.00	6.97	17.25	2.18	23.50	1.31
5.00	1.74	11.25	6.53	17.50	1.74	23.75	1.31
5.25	1.74	11.50	10.45	17.75	2.18	24.00	1.31
5.50	1.74	11.75	10.45	18.00	1.74	24.25	1.31
5.75	1.74	12.00	32.23	18.25	2.18		
6.00	1.74	12.25	133.29	18.50	1.74		
6.25	1.74	12.50	15.68	18.75	2.18		

CALIB	
STANDHYD (0001)	Area (ha)= 2.28
ID= 1 DT= 5.0 min	Total Imp(%)= 90.00 Dir. Conn.(%)= 90.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.05	0.23
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	123.29	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	6.167	1.74	12.250	133.29	18.33	1.74
0.167	0.00	6.250	1.74	12.333	15.70	18.42	1.74
0.250	0.00	6.333	1.96	12.417	15.68	18.50	1.74
0.333	1.20	6.417	1.96	12.500	15.68	18.58	2.18
0.417	1.20	6.500	1.96	12.583	15.68	18.67	2.18
0.500	1.20	6.583	1.96	12.667	15.68	18.75	2.18
0.583	1.20	6.667	1.96	12.750	15.68	18.83	1.74
0.667	1.20	6.750	1.96	12.833	8.28	18.92	1.74
0.750	1.20	6.833	1.96	12.917	8.28	19.00	1.74
0.833	1.20	6.917	1.96	13.000	8.28	19.08	2.18
0.917	1.20	7.000	1.96	13.083	7.84	19.17	2.18
1.000	1.20	7.083	1.96	13.167	7.84	19.25	2.18
1.083	1.20	7.167	1.96	13.250	7.84	19.33	1.74
1.167	1.20	7.250	1.96	13.333	6.10	19.42	1.74
1.250	1.20	7.333	2.61	13.417	6.10	19.50	1.74
1.333	1.18	7.417	2.61	13.500	6.10	19.58	2.18
1.417	1.18	7.500	2.61	13.583	5.66	19.67	2.18
1.500	1.18	7.583	2.18	13.667	5.66	19.75	2.18
1.583	1.22	7.667	2.18	13.750	5.66	19.83	1.74
1.667	1.22	7.750	2.18	13.833	4.79	19.92	1.74
1.750	1.22	7.833	2.61	13.917	4.79	20.00	1.74
1.833	1.18	7.917	2.61	14.000	4.79	20.08	2.18
1.917	1.18	8.000	2.61	14.083	4.36	20.17	2.18
2.000	1.18	8.083	2.18	14.167	4.36	20.25	2.18
2.083	1.22	8.167	2.18	14.250	4.36	20.33	1.31
2.167	1.22	8.250	2.18	14.333	3.48	20.42	1.31
2.250	1.22	8.333	3.05	14.417	3.48	20.50	1.31
2.333	1.39	8.417	3.05	14.500	3.48	20.58	1.31
2.417	1.39	8.500	3.05	14.583	3.05	20.67	1.31
2.500	1.39	8.583	2.61	14.667	3.05	20.75	1.31
2.583	1.44	8.667	2.61	14.750	3.05	20.83	1.31
2.667	1.44	8.750	2.61	14.833	3.05	20.92	1.31
2.750	1.44	8.833	3.05	14.917	3.05	21.00	1.31
2.833	1.39	8.917	3.05	15.000	3.05	21.08	1.31

EP POST MISSISSAUGA POND.out

2.917	1.39	9.000	3.05	15.083	3.48	21.17	1.31
3.000	1.39	9.083	3.05	15.167	3.48	21.25	1.31
3.083	1.44	9.167	3.05	15.250	3.48	21.33	1.31
3.167	1.44	9.250	3.05	15.333	3.05	21.42	1.31
3.250	1.44	9.333	3.48	15.417	3.05	21.50	1.31
3.333	1.39	9.417	3.48	15.500	3.05	21.58	1.31
3.417	1.39	9.500	3.48	15.583	3.48	21.67	1.31
3.500	1.39	9.583	3.48	15.667	3.48	21.75	1.31
3.583	1.44	9.667	3.48	15.750	3.48	21.83	1.31
3.667	1.44	9.750	3.48	15.833	3.05	21.92	1.31
3.750	1.44	9.833	3.92	15.917	3.05	22.00	1.31
3.833	1.44	9.917	3.92	16.000	3.05	22.08	1.31
3.917	1.44	10.000	3.92	16.083	3.48	22.17	1.31
4.000	1.44	10.083	3.92	16.167	3.48	22.25	1.31
4.083	1.39	10.167	3.92	16.250	3.48	22.33	1.31
4.167	1.39	10.250	3.92	16.333	1.74	22.42	1.31
4.250	1.39	10.333	5.23	16.417	1.74	22.50	1.31
4.333	1.74	10.417	5.23	16.500	1.74	22.58	1.31
4.417	1.74	10.500	5.23	16.583	2.18	22.67	1.31
4.500	1.74	10.583	4.79	16.667	2.18	22.75	1.31
4.583	1.74	10.667	4.79	16.750	2.18	22.83	1.31
4.667	1.74	10.750	4.79	16.833	1.74	22.92	1.31
4.750	1.74	10.833	6.97	16.917	1.74	23.00	1.31
4.833	1.74	10.917	6.97	17.000	1.74	23.08	1.31
4.917	1.74	11.000	6.97	17.083	2.18	23.17	1.31
5.000	1.74	11.083	6.53	17.167	2.18	23.25	1.31
5.083	1.74	11.167	6.53	17.250	2.18	23.33	1.31
5.167	1.74	11.250	6.53	17.333	1.74	23.42	1.31
5.250	1.74	11.333	10.45	17.417	1.74	23.50	1.31
5.333	1.74	11.417	10.45	17.500	1.74	23.58	1.31
5.417	1.74	11.500	10.45	17.583	2.18	23.67	1.31
5.500	1.74	11.583	10.45	17.667	2.18	23.75	1.31
5.583	1.74	11.667	10.45	17.750	2.18	23.83	1.31
5.667	1.74	11.750	10.45	17.833	1.74	23.92	1.31
5.750	1.74	11.833	32.23	17.917	1.74	24.00	1.31
5.833	1.74	11.917	32.23	18.000	1.74	24.08	1.31
5.917	1.74	12.000	32.23	18.083	2.18	24.17	1.31
6.000	1.74	12.083	133.28	18.167	2.18	24.25	1.31
6.083	1.74	12.167	133.29	18.250	2.18		

Max.Eff.Inten.(mm/hr)=	133.29		95.39	
over (min)	5.00		10.00	
Storage Coeff. (min)=	2.58	(ii)	5.19	(ii)
Unit Hyd. Tpeak (min)=	5.00		10.00	
Unit Hyd. peak (cms)=	0.29		0.16	
				TOTALS
PEAK FLOW (cms)=	0.76		0.05	0.811 (iii)
TIME TO PEAK (hrs)=	12.25		12.25	12.25
RUNOFF VOLUME (mm)=	107.90		64.49	103.56
TOTAL RAINFALL (mm)=	108.90		108.90	108.90
RUNOFF COEFFICIENT =	0.99		0.59	0.95

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 80.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0004)

EP POST MISSISSAUGA POND.out

IN= 2---> OUT= 1
DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0690	0.2160
0.0080	0.0650	0.0790	0.2880
0.0400	0.0720	0.0890	0.3610
0.0560	0.1440	0.0900	0.3740

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0001)	2.280	0.811	12.25	103.56
OUTFLOW: ID= 1 (0004)	2.280	0.057	12.92	102.65

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.98
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.1473

FINISH

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Stage-Storage-Discharge Tables

Cooling Tower Storage area is 73.3 m long by 17.6 m wide.
There is additional storage in the Pump House and Connection Trench

Total Surface Area =	1442.0	m2	From Dillon Report (April 26, 2007)
Max Height =	1.0	m	
Orifice Size =	300.0	mm	
Orifice Area =	0.0707	m2	
Cd =	0.6200	orifice plate	

Stage (m)	Storage (m3)	Discharge (m3/s)
0.0	0.0	0.000
0.1	144.2	0.061
0.2	288.4	0.087
0.3	432.6	0.106
0.4	576.8	0.123
0.5	721.0	0.137
0.6	865.2	0.150
0.7	1009.4	0.162
0.8	1153.6	0.174
0.9	1297.8	0.184
1.0	1442.0	0.194

25 mm Rainfall Event
Determine Amount of Runoff

Rainfall (mm)	25	
Total Area (ha)	2.28	
Drainage Area	Area (ha)	CN
Developed	2.166	98
Undeveloped	0.114	80
Area Weighted CN	97.1	
Runoff Amount (mm)	20	
Runoff Volume (m3)	456	

25 mm Rainfall Event
Determine Drawdown time in Cooling Tower Basin

T, detention tim, sec = (2 x Ap x (h1^0.5 - h2^0.5)) / (C x Ao x (2g)^0.5)

with	Ap =	surface area of pond, m2 =	1369	
	hi =	starting water elevation, m =	0.33	
	h2 =	ending water elevation, m =	0.01	
	C =	dischage coefficient =	0.63	
	Ao =	area of orifice, m2 =	0.004418	
	g =	gravity, m/s^2	9.81	
	Orifice dia, m =		0.075	
	T =		90619.5	seconds
			25.2	hours

17.6 APPENDIX 17.6 - Archaeological Assessment East Site

STAGE 1 ARCHAEOLOGICAL ASSESSMENT
(Revised Sept. 28, 2012)

REPORT

Green Electron Power Plant
E. ½, Lot 26, Concession 2,
Moore Twp., Lambton Co., ON.

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Greenfield South Power Corporation
1796 Mattawa Ave.,
Mississauga, On. L4K 1K1
(Ph) 416-451-8603 / 416-234-1301
mdevuono@easternpower.on.ca

September 28, 2012

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A.A.M.
Archaeological Assessments and Mitigation
Connecting with the soul of the land, locating where the ancestors walked…a vital part of our existence.

Archaeological Assessments and Mitigation **August 8, 2012**
Box 791, Grand Bend, ON. N0M 1T0

Dear Ministry of Tourism and Culture,

1. a) David Riddell
   b) # PO77
   c) Box 791, Grand Bend, ON.
   N0M 1T0
   aam@davidriddell.ca
   519-238-6966, 250-418-5109
   d) Archaeological Assessments and Mitigation
   e) 

2. a) # PO77- 006- 2012
   b) Stage 1
   c) Green Electron Power Plant
   d) Lambton County, Moore Twp., E. 1/2 Lot 26, Con. 2

3. a) Eastern Power Limited
   b) Matthew DeVuono
   c) 1796 Mattawa Ave,
   Mississauga, On., L4K 1K1
   (PH) 416- 451- 8603 / 416-234-1301
   Email: mdevuono@easternpower.on.ca
   d) Plan 24 RP25R 1585

4. a) County of Lambton Planning and Development Services
   b) Dave Posliff, Manager
   789 Broadway St., Box 3000, Wyoming, ON. N0N 1T0 519-845-0801
   Email:
   c) N/A
   d) Planning Act
   e) Plan 24 RP25R 1585

5. a) 08/10/2012
   b) " I the undersigned hereby declare that, to the best of my knowledge, the information in this report and submitted in support of this report is complete and accurate in every way, and I am aware of the penalties against providing false information under section 69 of the *Ontario Heritage Act"*
   c) original
   d) N/A
   e) N/A
   f) N/A

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Acknowledgements	Matthew DeVuono, Eastern Energy Corp.
Project Director, Archaeologist	David Riddell, M.A.
Background Research	David Riddell Bob Smith
Report Preparation	David Riddell Maureen Erb
Ministry of Tourism and Culture	Robert Von Bitter

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1.0: Executive Summary

In early August of 2012, Archaeological Assessments and Mitigation was contacted by the proponent, Eastern Energy Limited, to undertake a Stage 1 Archaeological Assessment on the "Lambton East" property, an approximately 75 acre tract of the eastern half of Lot 26, Concession 2, Moore Township. (proposed development is referred to as "Green Electron Power Plant").

The contract between these two parties was signed on August 4th, 2012, and Stage 1 research was completed the following week. The results are submitted herein, and summarized as follows.

The study area consists of cultivated agricultural field, and woodlot in the southern most portion of the property. There are no topographic features or watercourses present, indicating low pre-contact First Nations settlement potential. Additionally, there were no Euro-Canadian records of evidence of settlement on the property.

It is therefore recommended that the subject property be issued a standard condition of development approval.

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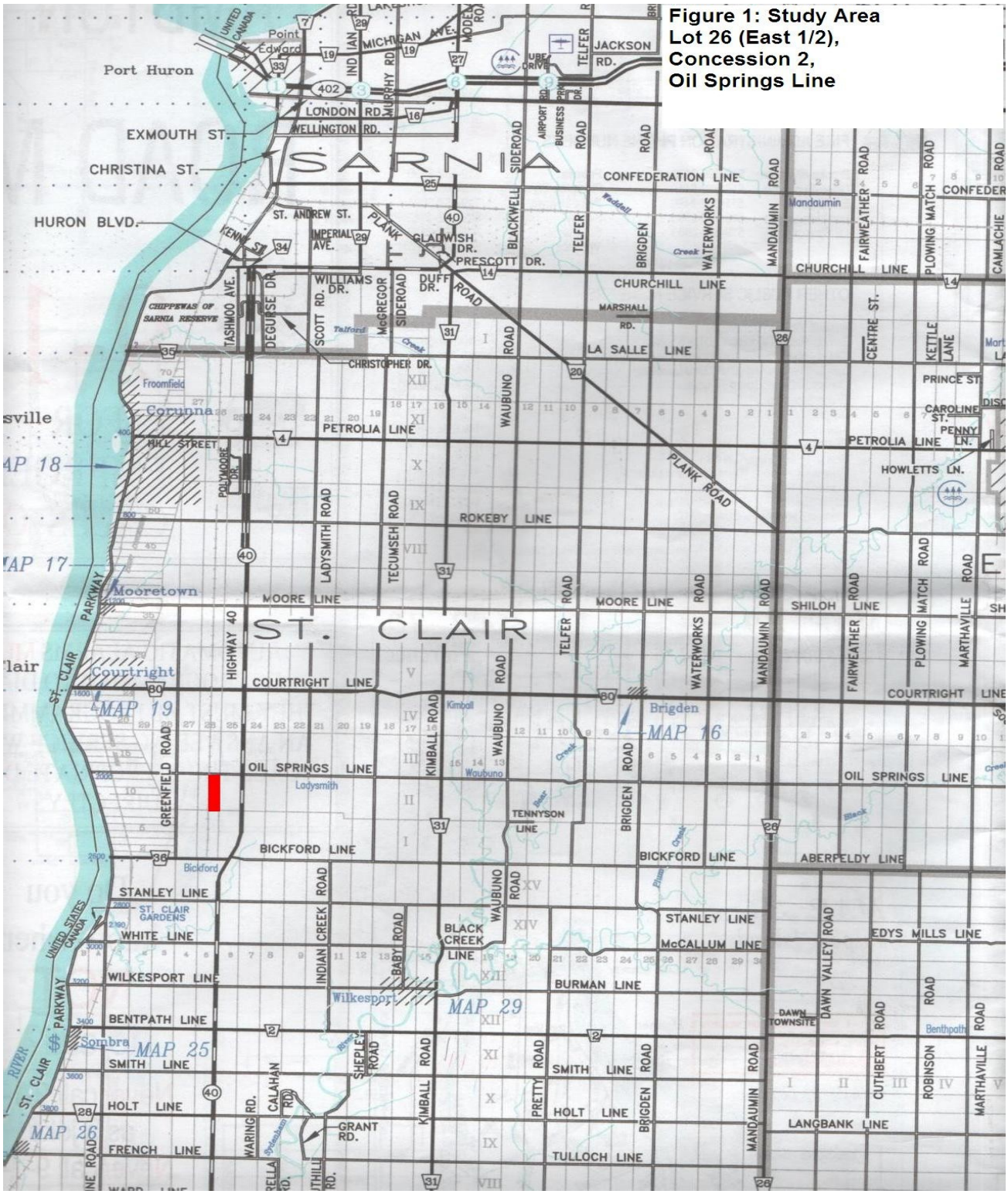

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2.0: Background Research - Development Context

The proposed development, "Green Electron Power Plant" will be a facility generating steam energy. The construction will be exposing subsurface soil stratigraphy and geomorphology (see expedite letter, development map). A class environmental assessment was therefore designated, resulting in the necessity of an archaeological assessment.

In compliance with the provincial regulations stipulated in the "Archaeological Assessment Technical Guidelines" the Stage 1 Archaeological Background Study included:

a. A review of the land use history, including pertinent historic maps

b. An examination of the National Site Registration database to determine the presence of known archaeological sites within and surrounding (250 meters) the project area.

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2.1: Study Area Physiography, Site Potential

The study area, as is the case with much of Lambton County in proximity to the St. Clair River, is contained within an expansive, flat clay plain, providing little topography and poor drainage. As the Historical Atlas of Lambton County explains (referring to Moore Township): ***" The topographical characteristics of the territory are almost the exact counterpart of those of most of the other townships of the low, alluvial district of the Western peninsula, and more particularly of Lambton County, …"*** (page 16).

Again, citing from the Historical Atlas, the preoccupation with turning the flat heavy land into a farmable proposition is related: ***" From the fact that there are nearly $20,000 of outstanding drainage debentures against the township, it is but fair to suppose that energetic efforts have been commenced to convert the former impenetrable swamp, covering the central portion of the township, into a valuable and fertile section…"*** (page 16).

Since there are no watercourses within the 300 meter limit of the study area, combined with poorly drained, heavy clay soils and low topography, the potential for First Nations settlement in particular is low. The archaeological site database indicates that there are no registered archaeological sites within the 250 meter radius of the study area.

Distance to modern or ancient water sources is generally accepted as the most important determinant of past human settlement patterns and, considered alone, may result in a determination of archaeological potential. However, any combination of two or more other criteria, such as well-drained soils, or topographic variability, may also indicate archaeological potential.

The property itself is primarily composed of cultivated field (approximately 65 acres), and the southernmost portion of the lot is in woodlot(approximately 10 acres). A drainage ditch cuts across the property in the north half section running from northwest to southeast. The ditch is part of a larger drain which eventually drains into a watershed, but is not itself a natural feature of this watershed.
There is a spur railway line which runs from Sarnia to Port Lambton bordering the lot on the west side.

The criteria used by the Ontario Ministry of Tourism and Culture to determine potential for historic archaeological sites includes the presence of: 1. particular, resource-specific features that would have attracted past subsistence or extractive uses; 2. areas of initial, non-aboriginal settlement; 3. early historic transportation routes; 4. properties designated under the Ontario Heritage Act. In terms of specific historic aboriginal records, Treaty No. 27 &1/2 and Treaty No. 7 were the transactions which occurred between the British crown and the Chippewa bands within the study area (Appendix B).

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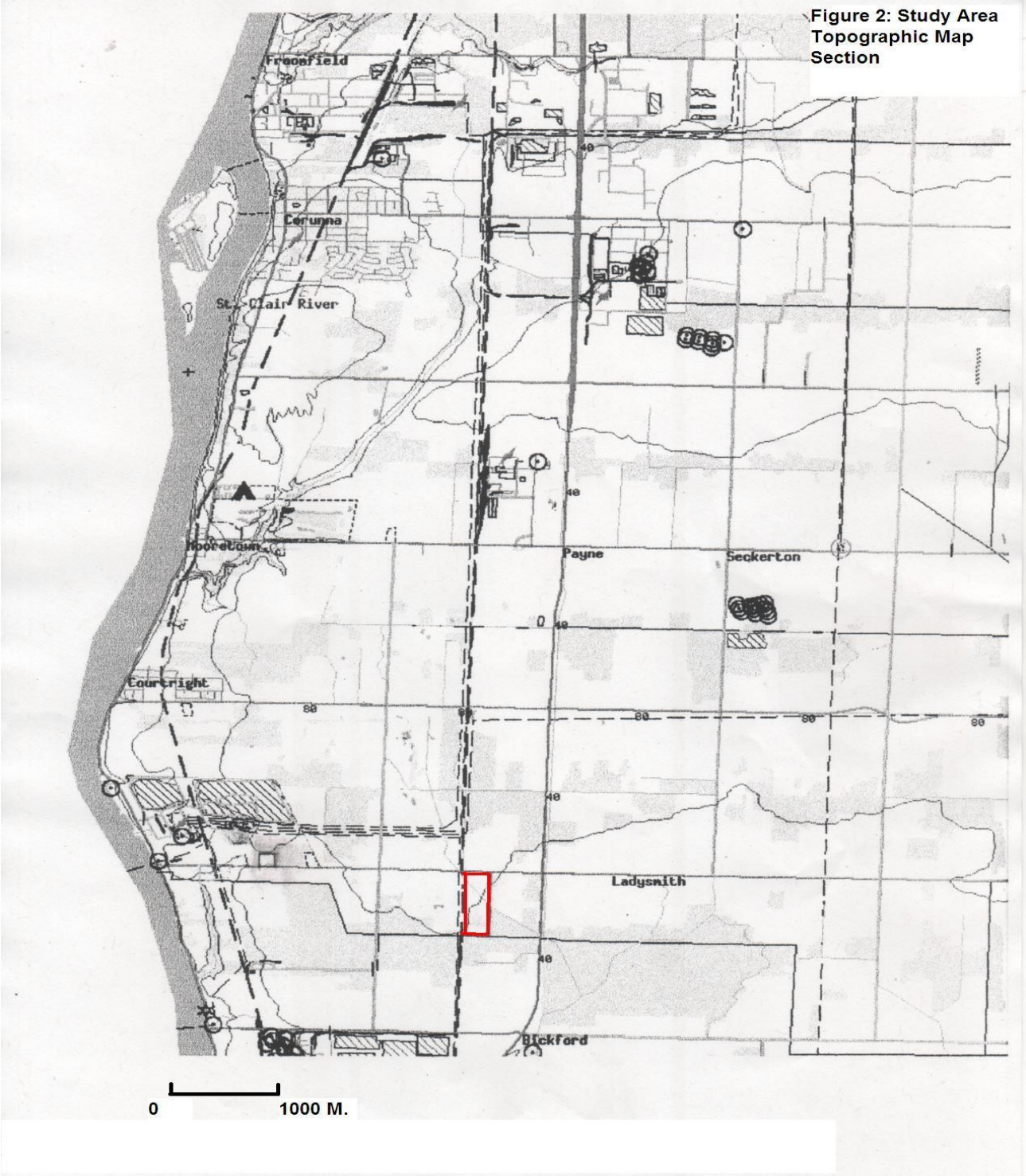

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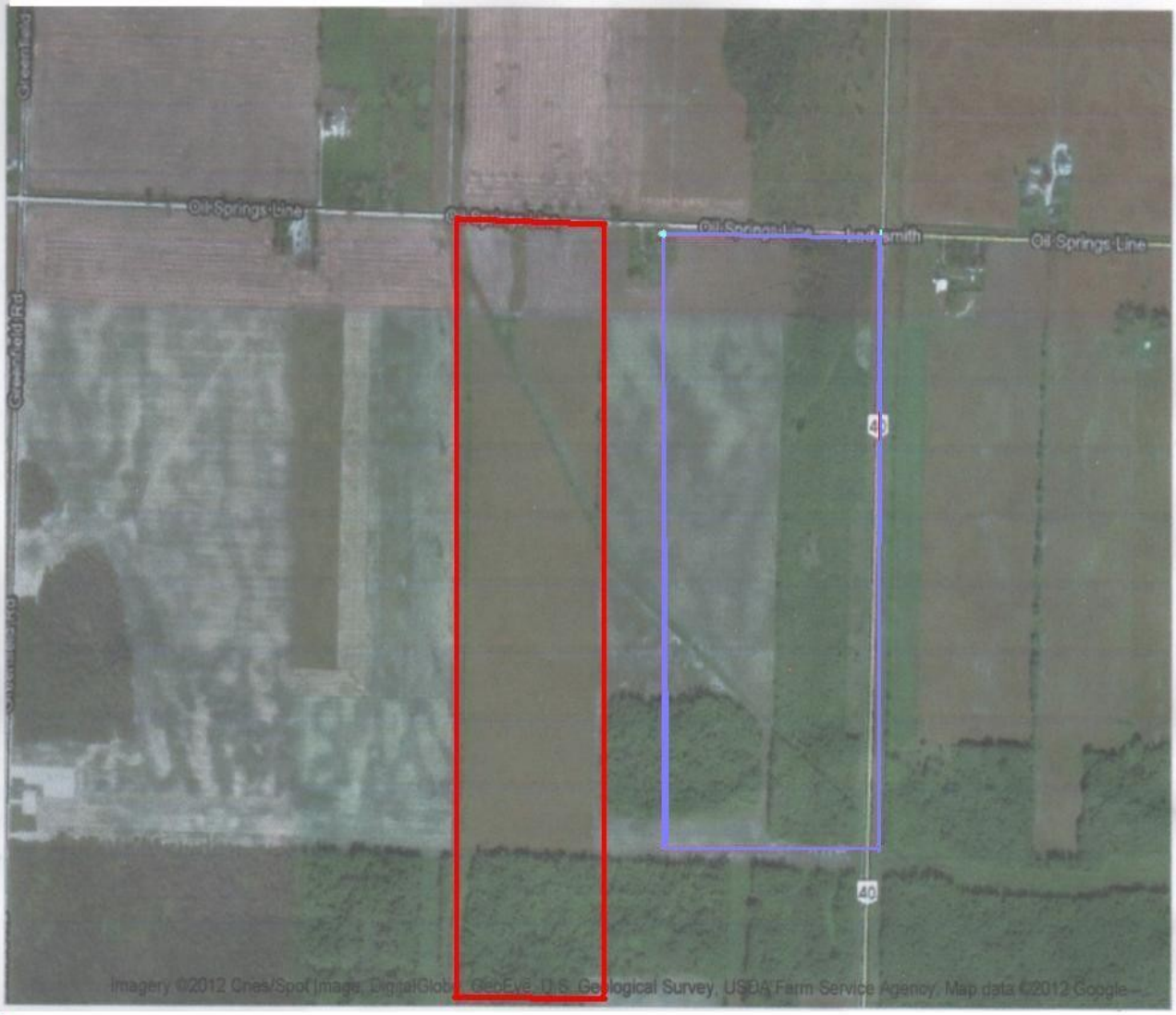
Figure 2a

Study Area (outlined in red)
Topography
(Note Irrigation Ditch
to North



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2.2: Historical Research: Nineteenth Century Land Records

The nearest commercial center to the subject property in the nineteenth century was the village of Courtright, located approximately 5km. to the northwest, on the shores of the St. Clair River. Aside from a local post office in Ladysmith, located about 3 km. to the east of the property, Courtright would have provided the bulk of services for the inhabitants of the property. The village itself was a terminus for the Canada Southern Railway line, and boasted two groceries, general store, several blacksmith shops, wagon and cooperage, two steam planning mills, two hotels, a school and Methodist church.

The earliest transaction recorded on the property (the east ¾) is in 1855, where a Hugh Johnston, the initial ("grantor") "discharged" 150 ac. to Charles Middleton. There is a gap in the records from1857 (T. Forsyth is listed as the landholder at this time) to 1866, where Hugh Johnston once again appears on the ledger as the grantor, the transaction to a George B. Johnston (again, the east ¾). The Atlas shows the Johnstons as owning tracts of land near Courtright. In the same owning tracts of land near Courtright. In the same year, the latter grants the parcel to John Miller, and in 1869, the parcel is in the hands of Robert Gurd. Gurd is shown as the grantor in the same year of the parcel to Thomas Neal. This name is on the study area property in the Historical Atlas (Figure 2), as "Captain Thomas Neal". This family is of some prominence in the region, as "subscribers" to the county atlas. Neal's residence is situated on the shores of the St. Clair River due west of Lot 26, as is his son's, Alvin Neal, who settled in Moore Twp. From Detroit in 1860. They are shown as owning 226 acres. The Neals (Thomas, Alvin and William) are involved in various transactions of this parcel of land (including between themselves) from this period up until 1887, when Alvin Neal grants the land back to John Ferguson. Ferguson's name is on the ledger in several places from 1885 to 1889. One of these transactions is with the "Lambton Loan & I. Company" (1887), with Ferguson as the grantor to the latter of 76 acres and a mortgage of $835. Another business/company name appears on the ledger at an earlier date (1885), that of the "North of Scotland C.M. Company", but this referring to the west ¼ of the lot and a smaller mortgage. Both these companies appear on the list in several instances from 1885 to 1890, both as "grantors" and "grantees". This leads one to believe that there was a business boom in the nearby settlements at this time.
Meanwhile, in the latter decade of the nineteenth century, a name of considerable noteworthiness, Raymond Baby (as in the "Baby House" in Windsor) appears on the scene as a grantee and grantor in the same year (1890). The land then reverts back to John Ferguson, who remains the grantee well into the 20th century.

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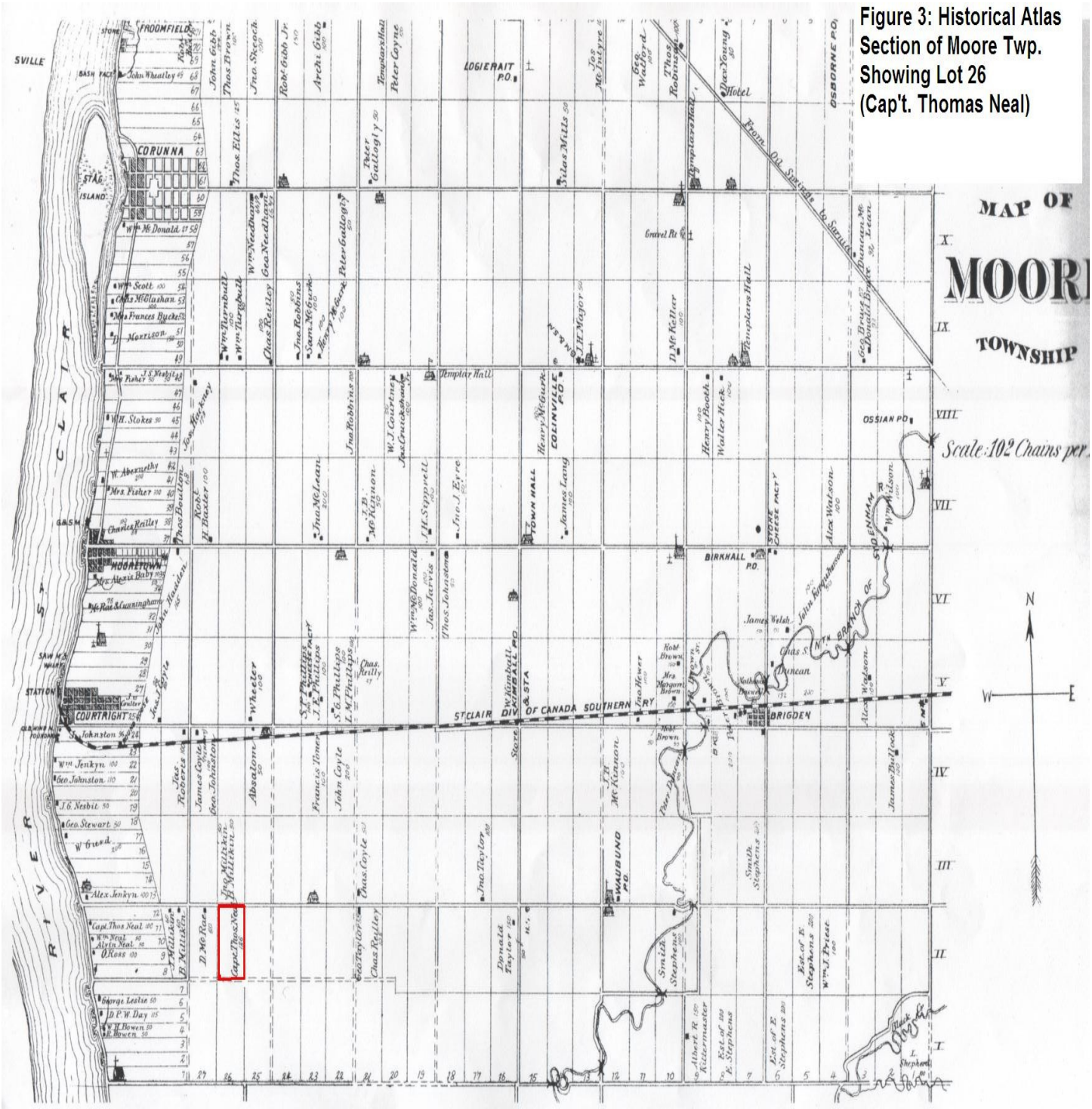

Figure 3: Historical Atlas Section of Moore Twp. Showing Lot 26 (Cap't. Thomas Neal)

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3.0: Results, Interpretation

The parcel of land, east ½ of Lot 26, Concession 2, Moore Township in Lambton County appears to have offered no attraction to that of First Nations settlement throughout history. It is situated far enough to the east of the major waterway, the St. Clair river, a major transportation/trade/ settlement corridor for numerous First peoples, and not within proximity to other water sources, to have been undesirable for these groups to settle in.

As far as Euro-Canadian settlement of the property goes, again the desirable place of residence was along the shores of the St.Clair River, with the allocation of lands further inland left for the purpose of agricultural use. This pattern gradually shifted towards the latter part of the nineteenth century, with residences becoming more prevalent along the concession roads and railway lines. An inspection of the north section of the property along the concession road however, has not revealed any evidence of 19th century occupation here. Farm structures are present, however, both to the east and west of the study area property, indicative of those locations as the residences throughout the historical period.

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4.0: Recommendations

Based on the lack of both First Nations and Euro-Canadian settlement on the subject property, it is recommended that the property be issued a letter of clearance for the development plans as provided.

Should deeply buried cultural remains be encountered during the development process, however, the proponent should contact the Ministry of Tourism, Culture and Sport, Archaeological office at 416- 314- 7174.

In the event that human remains are encountered, the proponent should contact both the Ministry of Tourism, Culture and Sport at the above number, and the Registrar or Deputy Registrar of Cemeteries Unit of the Ministry of Consumer and Commercial Relations at 416- 326- 8392.

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5.0: References Cited

1. Historical Atlas of Lambton County, 1849 - Beldon, Sarnia 1880.

2. Lambton County Archives, Central Library, Wyoming, Ontario

3. Morris, J.L. 1943 Indians of Ontario (1964 reprint).
Department of Lands and Forests, Government of Ontario

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Appendix A

Cultural Chronology

Period	Characteristics	Time	Comments
Early Paleo-Indian	Fluted Projectiles	9000 - 8400 B.C.	spruce parkland/caribou hunters
Late Paleo-Indian	Hi-Lo Projectiles	8400 - 8000B.C.	smaller but more numerous sites
Early Archaic	Kirk and Bifurcate Base Points	8000 - 6000 B.C.	slow population growth
Middle Archaic	Brewerton-like points	6000 - 2500 B.C.	environment similar to present
Late Archaic	Lamoka (narrow points)	2000 - 1800 B.C.	increasing site size
	Broadpoints	1800 - 1500 B.C.	large chipped lithic tools
	Small Points	1500 - 1100B.C.	introduction of bow hunting
Terminal Archaic	Hind Points	1100 - 950 B.C.	emergence of true cemeteries
Early Woodland	Meadowood Points	950 - 400 B.C.	introduction of pottery
Middle Woodland	Dentate/Pseudo-Scallop Pottery	400 B.C. - A.D.500	increased sedentism
	Princess Point	A.D. 550 - 900	introduction of corn
Late Woodland	Early Ontario Iroquoian	A.D. 900 - 1300	emergence of agricultural villages
	Middle Ontario Iroquoian	A.D. 1300 - 1400	long longhouses (100m +)
	Late Ontario Iroquoian	A.D. 1400 - 1650	tribal warfare and displacement
Contact Aboriginal	Various Algonkian Groups	A.D. 1700 - 1875	early written records and treaties
Historic	Euro-Canadian	A.D. 1796 - present	European settlement

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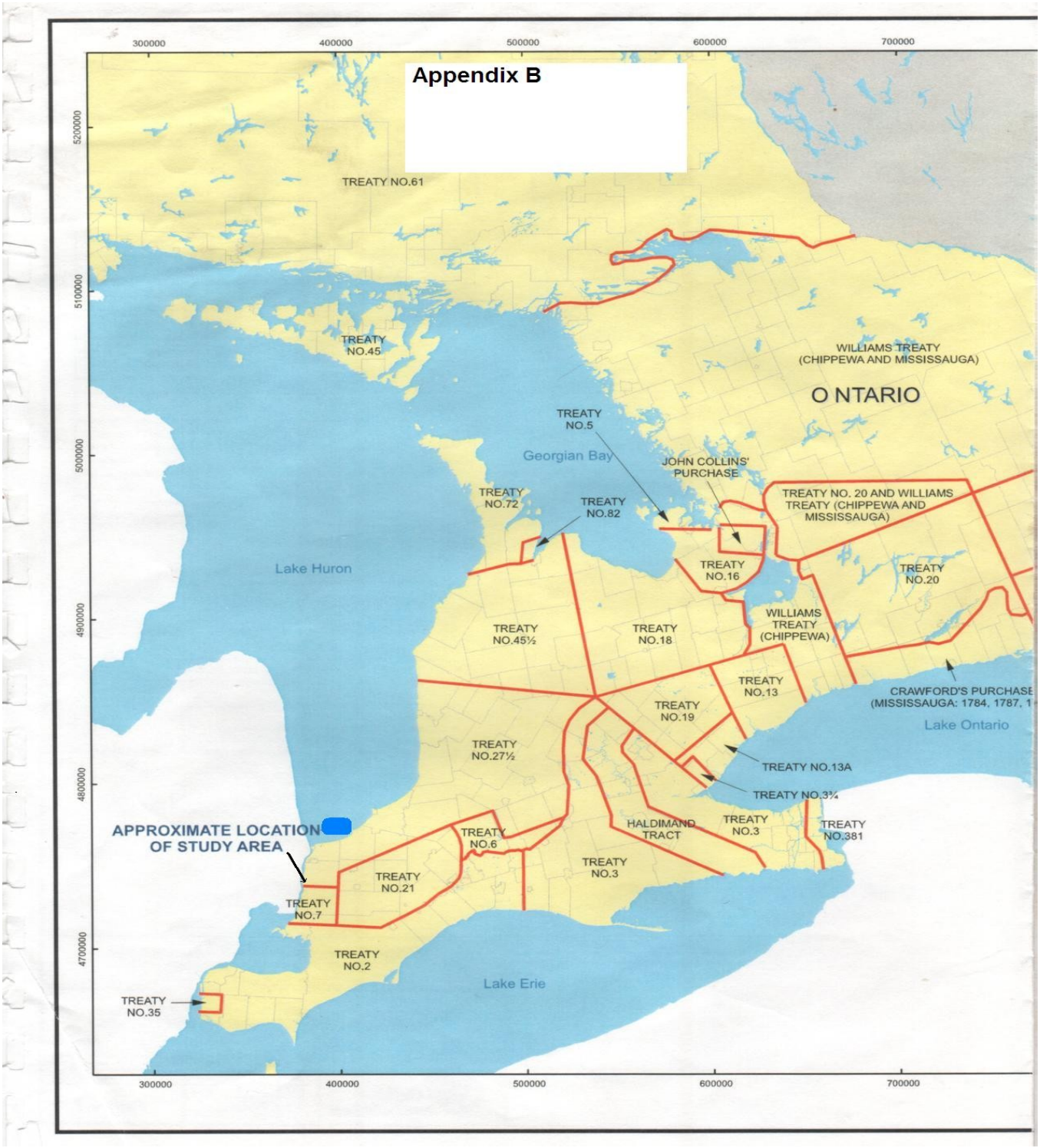

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17.7 APPENDIX 17.7 - Public Consultation Report

Green Electron Power Project
Environmental Screening Process

Public Consultation Report

November 5, 2012

Prepared By: Monika Vogt, BSc
Reviewed By: Bruce Holbein, Ph.D.
Approved By: Hubert Vogt, P.Eng

GREENFIELD SOUTH POWER PROJECT
Public Consultation Report

Table of Contents

1. Introduction

This report documents the public consultation process required as part of the environmental screening process for the Green Electron Power Project. The environmental screening process is applicable to the Green Electron Power Project because it is a Category B electricity project under Ontario Regulation 116/01 of the Environmental Assessment Act.

The proponent of the Green Electron Power Project is Greenfield South Power Corporation.

The Green Electron Power Project is part of the Ontario Government's initiative to improve air quality in Ontario by phasing out the use of coal-fired electricity generation.
The purpose of the public consultation process is to "allow the proponent to identify and address public concerns and issues and to provide the public with an opportunity to receive information and make meaningful input into the project review and development." This report describes all of the steps taken by the proponent of the project to comply with the public consultation requirements set out in Ontario Regulation 116/01 together with explanations and analyses supporting this compliance, as well as a listing of all of the concerns and issues raised by the public consultation process matched with the response of the proponent to these issues.

The major components of the public consultation process for the Green Electron Power Project included:

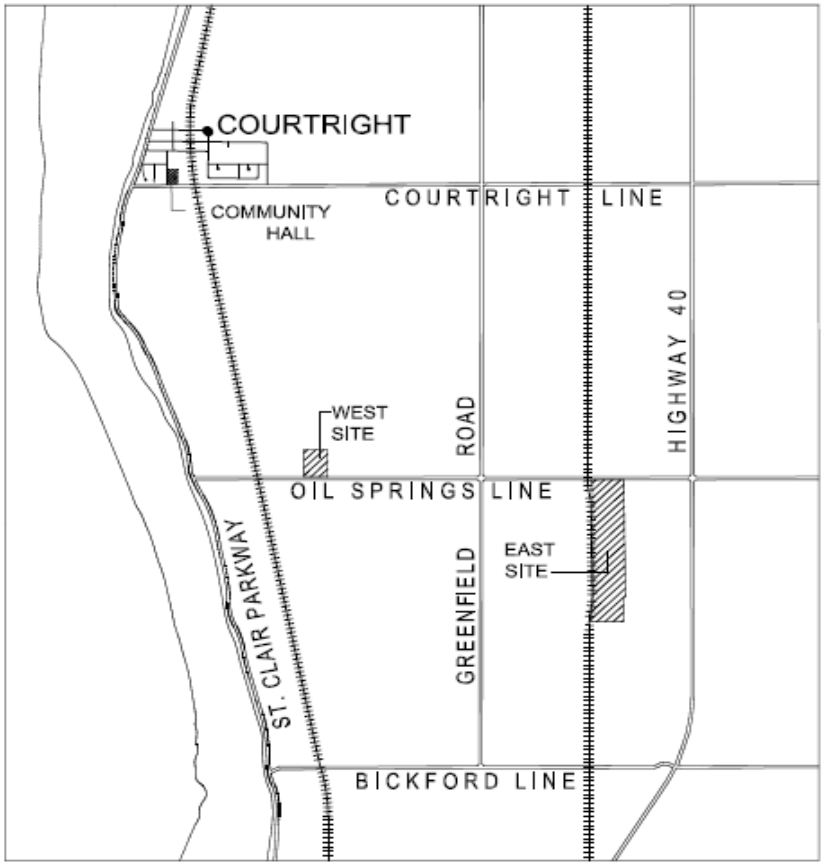
1. Public notices that were published in the local newspapers, delivered to local residents and businesses and interested members of the public;
2. Written information that was delivered, mailed or e-mailed to local residents and businesses and interested members of the public;
3. Two public open house events for the project held on August 16, 2012 and September 12, 2012;
4. Questionnaires completed by attendees of open house events;
5. Correspondence received from concerned members of the public; and
6. The placement of the environmental screening report in the public library, in local municipal offices and on a project web site for 30 days of review.

The public consultation process presented both the East and West candidate sites together (see Section 2 - Project Description) so this report addresses both sites.
In parallel with the public consultation process a separate consultation process was undertaken with affected government departments and public agencies at the federal, provincial and municipal levels, as well as potentially affected First Nations. The results of the government agencies consultation are reported on separately and therefore are not addressed in this report.

2. Project Description

The Green Electron Power Project involves the construction and operation of an electricity generating plant that was proposed in response to the Ontario Ministry of Energy's Request for Proposals for new clean energy supply to facilitate the phasing-out of coal-fired electricity generation in Ontario. The project was selected by the Ontario Ministry of Energy and is expected to be in-service by 2014. The plant will have a capacity of about 300 MW configured as a combined cycle power plant to be fueled only with natural gas. The project will be located in St. Clair Township at one of two sites on Oil Springs Line near Greenfield Road (see Fig. 2.1) on land that is in each case zoned for power generation uses. The sites are located adjacent to one of Hydro One's 230 kV transmission corridors.

Figure 2.1 - Location of Proposed Green Electron Power Project



The configuration of the power plant will utilize one gas turbine generator set and the exhaust gas from the gas turbine will be ducted to a water-tube, heat recovery steam generator (HRSG) equipped with a duct burner fuelled by natural gas. The steam from the HRSG will drive a steam turbine generator set. The plant will also include steam condensing equipment, steam condensate and boiler feedwater equipment, as well as boiler make-up water treatment system.

3. Public Notices and Information

The environmental screening process mandates a public notice of the commencement of an environmental screening, notice of commencement of entering the environmental review stage and notice of completion of the screening/environmental review.

Public notification of the Green Electron Power Project began with publication, in the Sarnia Observer, on July 30 and 31, 2012, and the Wallaceburg Courier on August 9, 2012, of the Notice of Commencement of Environmental Screening and Review. A copy of the notice was also sent to the clerks of St. Clair Township. A copy of the Notice of Commencement that was published on July 30, 31 and August 1 and 9, 2012 is in Appendix A2.

The Wallaceburg Courier and the Sarnia Observer were chosen for publication of the notices because the project site is located in St. Clair Township. Both the Sarnia Observer and the Wallaceburg Courier are paid circulation news papers that have subscribers and other readers in the vicinity of the proposed project sites.

The Minister of Energy announced the relocation to St. Clair Township of the Green Electron Power Plant on July 10, 2012 by press release that was widely distributed to the news media and was extensively reported on as a result. The press release is attached in Appendix A1. Following the public announcement of the relocation of the Green Electron Power Plant there was additional consultation with key government and public agencies in preparation of the continuation of the public consultation process.

The regulations allow a proponent of a project to decide to proceed directly to the environmental review stage without issuing a screening report if there are potential environmental effects or public concerns that require further assessment and resolution. The potential impact of air emissions and noise impacts from the project were identified as requiring further assessment and resolution, and this was indicated as is required on the public notices.

Between August 2, 2012 and August 9, 2012 copies of the notice were delivered by mail to local residents and businesses within a 1600 meter radius of the project.

The notices gave the prospective locations and a brief description of the project, gave notice that the project would be going through the environmental screening process, invited members of the public to attend open house events on August 16 and September 12, 2012 and also provided contact information for anyone to obtain further information on the project.

Upon conclusion of the report on the Environmental Review, a notice of completion is to be published in the local papers and delivered to local residents and businesses. The notice will be published in the same newspapers and delivered to the same residents and business owners as the August 9, 2012 notice and additionally will be delivered or emailed to those members of the public who have indicated an interest in the project either by attending the open house or by contacting the proponent. This will also include any members of the public whose interest in the project was made aware to the proponent by a government body such as the Ministry of the Environment.

A copy of the Notice of Completion of Environmental Screening and Environmental Review, which is to be sent out, can be found in Appendix A2.

4. Open House

On August 16, 2012 and September 12, 2012 open houses for the Green Electron Power Project were held at the Courtright Community Hall, 1594 Third St., Courtright, Ontario, about 3 km north of the west project site and about 5 km north of the east project site.. Both events ran for 4 hours from 4 - 8 pm. At each event it was made clear that two sites were under consideration, gave each of their locations, and indicated that only one site would be chosen as the location of the project.

The purpose of the open house information session was to introduce and familiarize nearby residents, business owners and other interested citizens with the Green Electron Power Project, and to seek comments and concerns at this early stage of the environmental screening process in order that they be properly addressed in the environmental review

The general format of the open house was that upon arriving in the room in which the open house was held, members of the public were greeted and signed in by open house staff. This allowed the proponent to keep a record of how many individuals arrived and to create a database of attendees by collecting their contact information to ensure continued dispersal of information. At the time of sign-in open house attendees were given a one page summary of environmental impacts of the project and a questionnaire and told that they could read the environmental impact sheets, view the display boards spread around the room, ask questions and make comments to one of the experts available around the display boards. The attendees were also asked fill out and return the questionnaire before leaving by handing the completed questionnaire back to the open house staff. Several individuals requested to email, mail or fax their survey to allow them more time for comments.

An informal open house format was chosen over a lecture format because it would allow members of the public greater scheduling flexibility as it allowed the public to drop in to obtain information at their convenience. Also, this format provides a welcoming atmosphere for people without extensive expertise in electricity generating plants to become better informed about the project and to offer honest feedback. Many people would feel intimidated by having to ask questions and make comments at a microphone in front of a large gathering. The open house format was specifically designed to allow one-on-one contact between project experts and attendees. This method allowed the experts to respond to questions in detail and at length as well as allowing for all of an individual's questions to be addressed. The experts staffing the open house included four professional engineers, one biologist (Ph.D.), one architect, one geoscientist and one engineering student who were carefully briefed on the anticipated impacts of the project and also briefed on fostering reasonable dialogue with members of the general public who did not have as much knowledge or experience with electrical power plants similar to the one being proposed.

Generally the open houses ran smoothly with a high degree of cooperation by the public, with a frank and thorough discussion of the impacts of the project on their neighborhood and on the environment and with several exit surveys being substantially filled out. Approximately 36 individuals signed in and 24 completed surveys were handed in. Typical attendance time ranged from 15 minutes to over 1 hour. Several local politicians attended, including Mayor Steve Arnold, Deputy Mayor Peter Gilliland, Councillor Pat Carswell-Alexander and Councillor Darrell Randell.

Some of the issues raised by members of the public tended to center on their opinion that there might be better sites for such power plant and the affects that the plant would pose on the employment ratings . The most prevalent concerns expressed were about air quality impacts, noise impacts, visual impacts, distance to nearby residents and property value impacts. Otherwise the atmosphere of the open houses was positive with questions pertaining to general information about Green Electron and previous endeavors made by Eastern Power.

The display materials, summary of environmental impacts sheet and questionnaire are shown in Appendix A3.

5. Correspondence

As of October 19, 2012 only one piece of correspondence was received by the proponent from a member of the public. The letter writer indicated concerns about the construction traffic, construction personnel and noise involved with the project. The writer also indicated concern that he hoped the facility would not be built “close to the river” since “we have little environment left concerning waterfront”. Finally the letter writer suggested that he would be open to the proponent purchasing his property so as to “eliminate concerns as Shell did”. The concerns raised in the letter are all reasonably addressed by the Environmental Screening and Review Report. The Project will not be built on waterfront property and thus will not result in the disappearance of any natural waterfront areas. Construction workers will be supervised while on-site and thus will not pose any material safety risk for local residents. The traffic during construction can be reasonably accommodated by the existing roads and any noise from the project will be mitigated to meet the stringent night time limits.

.

6. Discussion of Issues Raised at the Open Houses

A full set of comments received from the 24 open house questionnaires is in Appendix A4.

The following is a summary of answers to the open house questionnaires. The question asked is shown in italics. The percentages shown are based on the 24 questionnaires handed in. The numbers in parenthesis after some comments indicate that substantially the same comment or concern as share by that number of exit survey respondents.

General:

1. *How did you hear about this Open House?*
    - 50% of people heard about the open house by newspaper.
    - 4% of individuals heard about the open house by a notice at their door.
    - 4% of individuals heard about the open house by a website
    - 63% of individuals heard about the open house by an "other" method.
        - by the radio
        - from a co-worker
        - by email notice
        - from a county council
        - from the sign out front the community hall

2. *Have you received/read the General Information sheet?*
    - 96% of individuals had read the General Information sheet.
    - 4% had not read the General Information sheet.

3. *Are you familiar with the site for the Greenfield St. Clair Plant?*
    - 92% of individuals responded that they were familiar with this.
    - 13% said that no, they weren't familiar with this.

4. *How close to either Green Electron candidate site do you live or work? (please indicate H for home and W for work)*

	West Site	East Site
0.5 km or less	21%	8%
0.6-0.9 km	8%	13%
1-2 km	29%	13%
Over 2 km	42%	46%

5. *Did this Open House improve your familiarity with the various environmental emissions from the power plant?*
    - 63% of the individuals responded that the Open House did improve it.
    - 38% of the individuals responded that they were not.
        - I was already informed due to previous exposure
        - Understand things better now

6. *Do you regard some options for electricity production as significantly worse from the environment or human health than others? If so, please indicate which ones you feel are worse.*
    - 67% of the individuals indicated that they did regard it as significantly worse.
    - 25% of the individuals indicated that they did not regard it as significantly worse.

    Comments included:
        - nuclear dangerous
        - coal, potentially hydro and wind
        - wind
        - coal, nuclear
        - coal, oil

7. *Do you feel it is important to connect new power plants to the existing transmission lines so as to avoid running new high voltage lines through rural or urban areas and to also save on power costs?*
    - 92% of the individuals answered yes.
    - 8% of the individuals answered no.

    Comments included:
        - decreasing cost, efficiency, health
        - I would expect new high voltage lines to be required sooner rather than later
        - If the current ones are adequate
        - Put the damn thing in the GTA

Green Electron Power Plant Site:

8. *Are you aware that the Green Electron Power Plant must meet provincial noise and air emission regulations?*
    - 96% of individuals indicated that they were aware of this.
    - 8% of respondents indicated that they were not aware of this.

    Comments included:
        - Not concerned with any emissions (3)
        - Should not meet, should Exceed (1)
        - Provincial and federal regulated (1)

9. *Are you concerned that the Green Electron Power Plant will have significant negative impacts? Please indicate your concerns.*

Air Quality:

- 17% of responses indicated that they were concerned with the air quality.
- 83% of responses indicated that they were not concerned with air quality.

Comments included:

- Traffic, dust, noise during construction (4)
- People in the area being subject to loss of sleep, peace of mind and heavy traffic (1)
- minimal, clean energy (1)

Water Quality:

- 8% of responses indicated that they were concerned with water quality.
- 79% of responses indicated that they were not concerned with water quality.

Comments included:

- Increases in water temperature (1)
- Where is the outtake into the river located? (1)
- Maybe? (1)
- Not sure, no information provided (1)

Noise Emission:

- 17% of responses indicated that they were concerned with noise emissions.
- 79% of responses indicated that they were not concerned with noise emissions.

Comments included:

- Will be in immediate area of my house/shop (2)
- minimal, few residents (1)
- not a significance (2)
- Steam from Greenfield is too loud (1)
- will see later when open/running (2)

Other:

- Young women will be close to construction and subject to crime from transient workers (1)
- Price (1)
- Loss of employment from OPG (1)
- Loss of employment from present plant (3)

Economy:

10. *Should Ontario be able to supply all of the electricity it consumes?*

- 92% of individuals responded yes to this question.
- 8% of individuals responded no to this question.

Comments included:

- maintain the level of maximum capacity output and surplus (1)
- they are currently have too much and very expensive (1)

11. *Are you concerned about electricity it consumes?*
    - 46% of individuals indicate that they were concerned.
    - 54% of individuals indicated that they were not concerned.

    Comments included:
    - due to an overloaded transmission system, hydro give frequent blips (3).
    - not at present but as economy picks up and industry ramps up, different story (2)
    - Ontario has an abundance of power which we are selling to the US at a loss according to recent news paper article we have read (1)

12. *Are you concerned about the cost of electricity rising?*
    - 96% of respondents were concerned with this.
    - 4% of responses were not concerned with this.

    Comments included:
    - I don't believe we should be overloaded with wind turbines (1)
    - Too expensive (2)

13. *Are you in favor of economic growth and industry growing?.*
    - 92% of respondents indicated that they are in favor.
    - 4% of respondents indicated that they are not in favor.

    Comments included:
    - Yes, if property planned and not purchased through any cost (1)
    - We have enough in southwest Ontario (2)

14. *Do you feel that a cleaner secure energy supply will promote economic development and prosperity for St. Clair, Lambton and Ontario in general?*
    - 83% of individuals responded that they did.
    - 17% of individuals responded that they did not.

    Comments included:
    - yes but not wind (2)
    - in short term likely, buy maybe not in the long term (4)
    - the energy supply is already in place (3)

Information Provided:

15. *Do you feel that this open house and the information provided has been helpful to you?*
    - 96% of the responses indicated that information was helpful.
    - 4% of the responses indicated that the information was not helpful.

    Comments included:
    - Yes, very informative (4)
    - Very professional staff (4)

16. *Do you have other concerns or comments at this time?*
    - 13% of individuals indicated that there were no other comments.
    - 75% of individuals indicated that they did have additional concerns.

    Comments included:
    - I am a supporter of a construction site that has room for adding addition capacity (1)
    - time will tell (2)
    - surface water/extracting infrastructures/prefer west site (4)
    - will running these types of plants result in a reduction in the administrative costs pm electricity bills due to Ontario hydro (1)

17. *Would you like additional information?*
    - 46% of individuals indicated that they would like additional information.
    - 50% of individuals indicated that they would not like additional information.

    Comments included:
    - Where, when start/finish (6)
    - Anything about your company history or press releases concerning this particular site would be appreciated (6)
    - Contact information for those requesting engineering service or construction support (1)
    - which site will you choose and why? (6)

APPENDIX - A1

MNISTRY OF ENERGY PRESS RELEASE

Statement from Ontario Minister of Energy

http://news.ontario.ca/mei/en/2012/07/statement-from-ontario-minister-of-energy.html

July 10, 2012 3:00 PM

Today, Chris Bentley, Minister of Energy, issued the following statement on the Greenfield South Power natural gas plant:

"Last year, after listening to the community's concerns, our government made a commitment to residents in Mississauga and Etobicoke to relocate the Greenfield South Power natural gas plant. The commitment was supported by both opposition parties.

Today, I am pleased to announce that the Ontario Power Authority (OPA) has reached an agreement with Greenfield to relocate the plant. The government has accepted the OPA's recommendation to relocate the 300 megawatt natural gas plant on part of Ontario Power Generation's Lambton Generating Station site.

The new site will take advantage of existing transmission and other infrastructure, as well as the expertise of local workers. The construction of the plant is expected to provide up to 200 jobs over the next two years.

I would like to thank the OPA and Greenfield Power for the work they have done over the past several months to reach this agreement.

The total cost of relocation is approximately $180 million. This includes a settlement agreement with EIG, the financier of the Greenfield South Power project, on behalf of Greenfield, the OPA and the Province. The settlement is necessary in order to relocate the plant and resolves all outstanding legal proceedings. The total relocation cost also includes all payments made in relation to the original site, including construction costs, design costs, and permitting costs.

Today's announcement helps support Ontario's plan to modernize the Province's electricity infrastructure, clean up the air we breathe and end the use of coal by 2014."

CONTACTS

- For media inquiries call:
- Jennifer Kett
  Minister's Office
  416-327-6747
  jennifer.kett@ontario.ca
- Georgina Kourakos
  Communications Branch

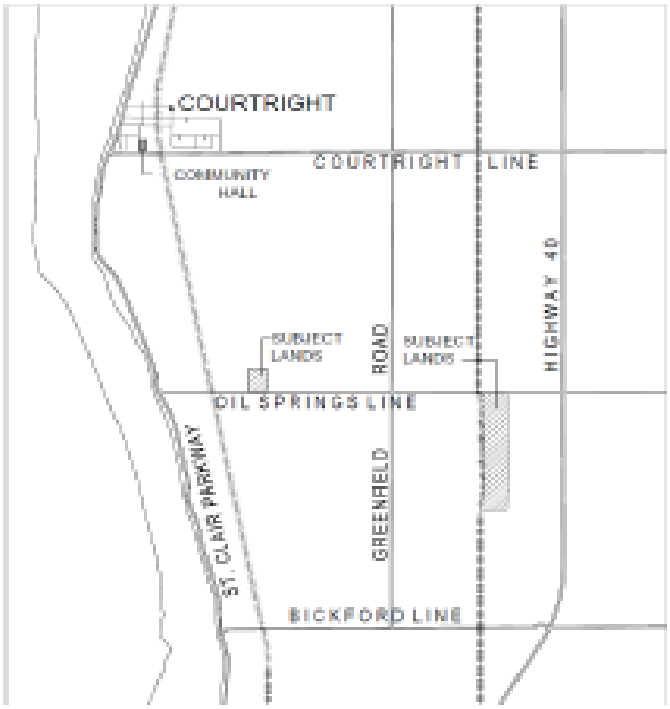
416-325-0294
georgina.kourakos2@ontario.ca

- For public inquiries call:
  TTY: 1-800-239-4224
  1-888-668-4636

Ministry of Energy

APPENDIX - A2 - PUBLIC NOTICES AND INFORMATION

NOTICE OF COMMENCEMENT OF ENVIRONMENTAL SCREENING AND REVIEW



Greenfield South Power Corporation, an affiliate of Eastern Power Limited, is planning to construct and operate a natural gas fueled electricity generating facility (nominal capacity 300 MW) at one of two sites on Oil Springs Line., St. Clair Township (see map). This power project will improve electricity supply in Ontario.

The main components of this combined cycle facility will be a gas turbine, heat recovery boiler, a steam turbine, cooling tower and an electrical substation. The facility will be connected to the 230 kV Hydro One electricity transmission grid adjacent to the site and receive natural gas from nearby supply lines. The facility will be operated by qualified stationary engineers and will meet all applicable regulations, by-laws and legislation.

This project is subject to the Ontario Ministry of the Environment's environmental assessment requirements for electricity projects. The Environmental Screening of the project will be directly entering the Environmental Review stage in which the air and noise emissions will be subject to more detailed study. You are invited to attend open houses to obtain further information and to discuss this project:

Thurs., August 16th and/or Wed., September 12, 2012 from 4 – 8 pm
at the Courtright Community Hall
1594 Third St. Courtright ON N0N 1HO

To comment on this project, or for more information, please contact:

Hubert S. Vogt, Vice President
Eastern Power Limited
2275 Lake Shore Boulevard West, Suite 401
Toronto, Ontario M8V 3Y3
Tel: 416-234-1301 Fax: (416) 234-8336
E-mail: hvogt@easternpower.on.ca

NOTICE OF COMPLETION OF ENVIRONMENTAL REVIEW

Greenfield South Power Corporation, an affiliate of Eastern Power Limited, is proposing to construct and operate a natural gas fueled electricity generating facility (nominal capacity 300 MW) at one of two sites on Oil Springs Line, St. Clair Township (see map). This power project will improve electricity supply and facilitate phasing out of coal-fired electricity generation in Ontario.

The main components of this combined cycle facility will be a gas turbine, heat recovery boiler, steam turbine, cooling tower and, electrical substation. The facility will be connected to the 230 kV Hydro One electricity transmission grid directly adjacent to each of the project site and receive natural gas from nearby supply lines. The facility will be operated by qualified stationary engineers and will meet all applicable regulations, by-laws and legislation.

This project is being reviewed under the Ontario Ministry of the Environment's environmental screening process for electricity projects, including an Environmental Review stage in which the air and noise emissions were subject to more detailed study.

The environmental screening and review has found that with the mitigation measures detailed in the Environmental Screening and Review Report, the project will not have Net Effects and the proponent intends to proceed with the project subject to mitigation and other approvals. The Environmental Screening and Review Report may be viewed at www.greenelectron.ca or at the following locations:

St. Clair Township
Municipal Offices
1155 Emily Street, Mooretown ON
(519) 867-2021

Lambton Library
Corunna Branch
417 Lyndoch Street, Corunna, ON
(519) 862-1132

If there remain environmental concerns regarding the project, please raise them with the proponent in writing:

Hubert S. Vogt, Vice President, or
Bruce E. Holbein Ph.D., Environmental Manager
Eastern Power Limited
2275 Lake Shore Boulevard West, Suite 401
Toronto, Ontario M8V 3Y3
Tel: 416-234-1301 Fax: (416) 234-8336
E-mail: info@greenelectron.ca
Web Site: www.greenelectron.ca

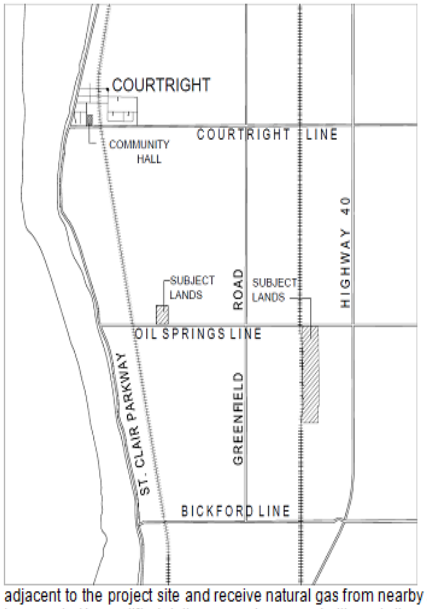
If the matter is not reasonably resolved, a written request may be made to the Director of the Environmental Assessment and Approvals Branch, Ontario Ministry of the Environment, (2 St. Clair Ave West, Floor 12A, Toronto, M4V 1L5), to elevate the project to an individual environmental assessment. An elevation request must be made in accordance with the provisions set out in the MOE's Environmental Screening Process for Electricity Projects, with a copy sent to the proponent. The last day that comments or elevations requests will be received is December 6, 2012.

APPENDIX A3
OPEN HOUSE MATERIALS

Green Electron Power Plant

First Open House
August 16, 2012

NOTICE OF COMMENCEMENT OF ENVIRONMENTAL SCREENING AND REVIEW



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The main components of this combined cycle facility will be a gas turbine, heat recovery boiler, a steam turbine, cooling tower and an electrical substation. The facility will be connected to the 230 kV Hydro One electricity transmission grid adjacent to the project site and receive natural gas from nearby supply lines. The facility will be operated by qualified stationary engineers and will meet all applicable regulations, by-laws and legislation.

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Thursday, August 16th and/or Wednesday, September 12, 2012 from 4 – 8 pm
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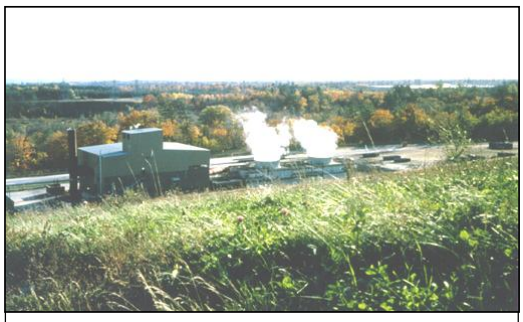
To comment on this project, or for more information, please contact:

Hubert S. Vogt, Vice President
Eastern Power Limited
2275 Lake Shore Boulevard West, Suite 401
Toronto, Ontario M8V 3Y3
Tel: 416-234-1301 Fax: (416) 234-8336
E-mail: hvogt@easternpower.on.ca

Eastern Power –Over 20 Years Successfully Serving Ontario's Power Needs



Brock West

Renewable Power for Pickering since 1991

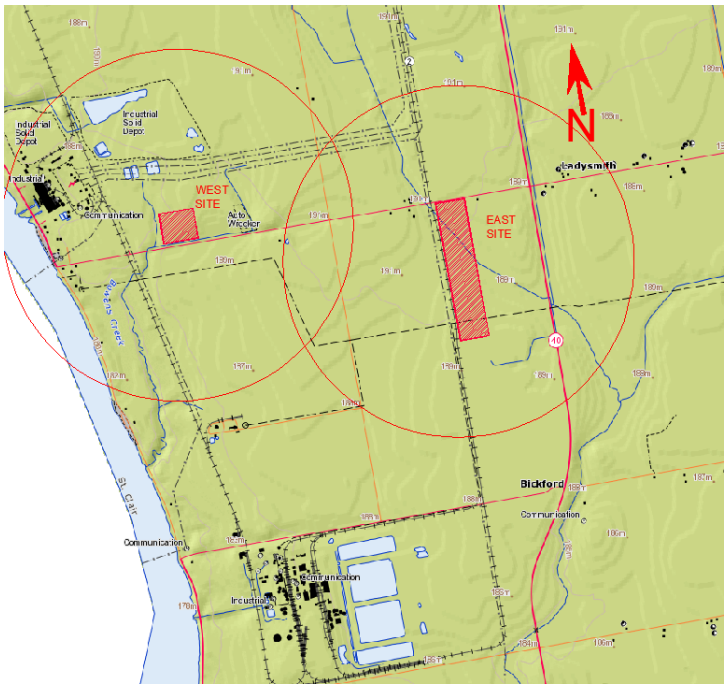
Keele Valley

Renewable Power for Vaughan since 1995

Green Electron - Eastern Power

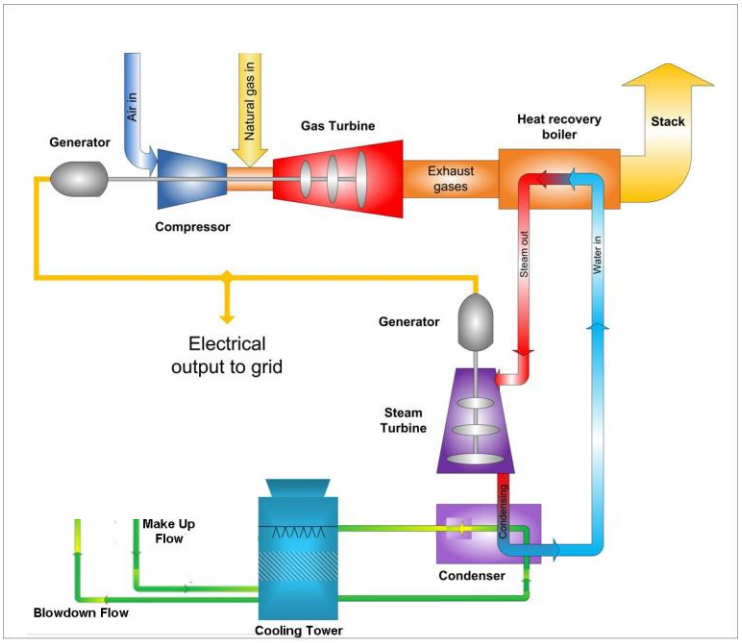
- Since 1985
- 100% Ontario-owned
- Ontario based
- Principals are Professional Engineers
- Build, own and operate power plants
- Environmental and Engineering Awards

Green Electron Power Plant Location



County of Lambton

Green Electron Power Plant Process



http://www.knottingleypower.co.uk/wp-content/uploads/2011/01/CCGT-Diagram-Updated.jpg

Combined Cycle Process Diagram

Green Electron Power Plant Process

- Compact, approx. 300 MW size
- Similar to Industrial Neighbours
- Clean; releases very low amounts of pollutants and clean water vapour
- High Efficiency Combined Cycle
- Beside existing electrical transmission line
- Beside existing natural gas supply

Green Electron Power Plant Construction

- 24 months construction
- Net positive environmental impact
- Improved energy supply for Ontario
- A new clean generation facility
- Economic benefits to St. Clair, Lambton

Green Electron
Noise Mitigation Features

- Designed to meet urban setting
- Stack and Air Inlet Silencers
- Gas Turbine Indoors
- Acoustically Insulated Building
- Steam Vented to Condenser

Green Electron Natural Gas Power Emissions Comparison

Emission	Natural Gas Reduction vs. Coal
NO_2	78% ⇩
SO_2	95% ⇩
Particulates	99% ⇩
Mercury	100% ⇩
CO_2	52% ⇩

NREL 2000, Life cycle assessment of a natural gas combined-cycle power generation system (NREL/TP-570-27715)

GREEN ELECTRON POWER PROJECT

GENERAL INFORMATION

The Green Electron Power Project provides a new, clean, high-efficiency, compact, electricity generating facility for Ontario. This project is part of the Ontario government's program to improve air quality by phasing out coal-fired electricity generation in Ontario. To be located in St. Clair Township at one of two sites on Oils Springs Line near Greenfield Road, the new plant will be fueled by natural gas. This plant is expected to operate only during periods of high and intermediate electricity demand, (eg. daytimes on non-holiday weekdays).

The new facility will be similar in appearance and quality to its other nearby industrial neighbours and its flue gas stack will only be about 43 meters high.

This new facility will be clean because its emissions will be just a fraction of those from a coal-fired facility of similar size. Toxic mercury emissions from coal burning, that have been a human health concern for many years, will be completely eliminated. Particulates, sulphur dioxide and nitrogen dioxide emissions that greatly affect our air quality, will be reduced by about 80% - 95%. In fact, the highest projected concentration of NO_2 emission from the new facility will be less than 10% of the maximum permitted under Ontario's Environmental Protection Act. Greenhouse gas emissions will be reduced by about 50%, therefore contributing to Canada's commitments on climate change. The construction of this project will facilitate the complete phasing out of Ontario's coal-fired generating stations. It is estimated that the phase out of these coal fired stations will in each year prevent an average of 660 premature deaths, 920 hospital admissions and 1,090 emergency room visits, and will save about $ 371 million annually in environmental related damages.

The new generating facility will use modern, high-efficiency, low NOx, combined-cycle technology, consisting of a gas turbine-driven electricity generator, heat recovery boiler, steam turbine driven electricity generator, and condenser/cooling tower. The facility will be designed to reduce noise emissions so as to meet municipal and provincial standards. Noise reduction features include inlet air silencing for the gas turbine, enclosure of major plant equipment, either inside buildings or within acoustical enclosures, and sound absorbing insulation for the heat recovery boiler.

A key reason for locating the facility in St. Clair Township is the close proximity to an existing high-voltage electrical transmission line and natural gas pipeline for direct interconnections. The plant will also make excellent use of industrially zoned lands which allow electricity generation.

Construction of the facility is expected to last about 24 months and will involve typical medium industrial construction methods. Best practical techniques will be used to prevent negative off-site impacts. The facility will result in only minor long-term changes in vehicle traffic density due to the plant staffing of about 6 persons on weekdays and 2 on weekends, nights and holidays, as well as from occasional deliveries of maintenance and operating supplies.

The project will bring to St. Clair Township and Lambton County highly skilled jobs, increased industrial property tax revenues, improved energy supply stability and other local area economic benefits. The local purchase of supplies and services, as well as other local spending, is expected to inject over $3.8 million dollars annually into the local economy and create economic spin-off benefits of up to 4 times this amount.

APPENDIX A4: IMAGES OF THE OPEN HOUSE ON AUGUST 16, 2012

17.8 APPENDIX 17.8 - Government Agency Consultation Report

Green Electron Power Project
Environmental Screening and Review Process

Government Agency Consultation Report

November 5, 2012

Prepared by: Monika T. Vogt, BSc
Reviewed by: Bruce E. Holbein, Ph.D.
Approved by: Hubert S. Vogt, P.Eng

GREEN ELECTRON POWER PROJECT
Government Agency Consultation Report

Table of Contents

1. Introduction

This report documents the public consultation process required as part of the environmental screening process for the Green Electron Power Project (the project). The environmental screening process is applicable to the Green Electron Power Project because it is a Category B electricity project under Ontario Regulation 116/01 of the *Environmental Assessment Act*.

The proponent of the Green Electron Power Project is Greenfield South Power Corporation.

The Green Electron Power Project is part of the Ontario Government's initiative to improve air quality in Ontario by phasing out the use of coal-fired electricity generation. To offset this loss of generating capacity in Ontario, the Ministry of Energy issued a Request for Proposals (RFP) in August 2004 for offers of "clean energy supply" and demand management projects. The Green Electron Power Project is a result of that process.

The purpose of government agency consultation is to "inform and receive input from all government agencies with jurisdiction or a program interest related to a particular electricity project". The proponent, in consultation with government agencies, identified twenty one (21) government agencies that might reasonably have jurisdiction over the project or might have a program interest in the project, and they are listed in Appendix H-A1. This report documents the steps taken by the proponent of the project to seek consultative input and also comply with the agency consultation set out in Ontario Regulation 116/01.

The major components of the government agency consultation process for the Green Electron Power Project included:

1. Meetings with government bodies and agencies;
2. A specific outreach/consultation process with First Nations
3. Written information that was mailed or e-mailed to various government bodies and agencies, depending on the contact information that was provided, as per O.Reg 116/01;
4. Public open house events for the project held on August 16, 2012 and September 12, 2012 which were attended by some representatives from government bodies and agencies;
5. Copies of public notices that were sent to government bodies and agencies;
6. Correspondence between the government agencies and the proponent;
7. The provision of a draft of the Environmental Screening and Review Report to the Ministry of the Environment (MOE) for review;
8. The provision of the completed Environmental Screening and Review Report to various government agencies, i.e., as had requested receipt of a copy of this report.

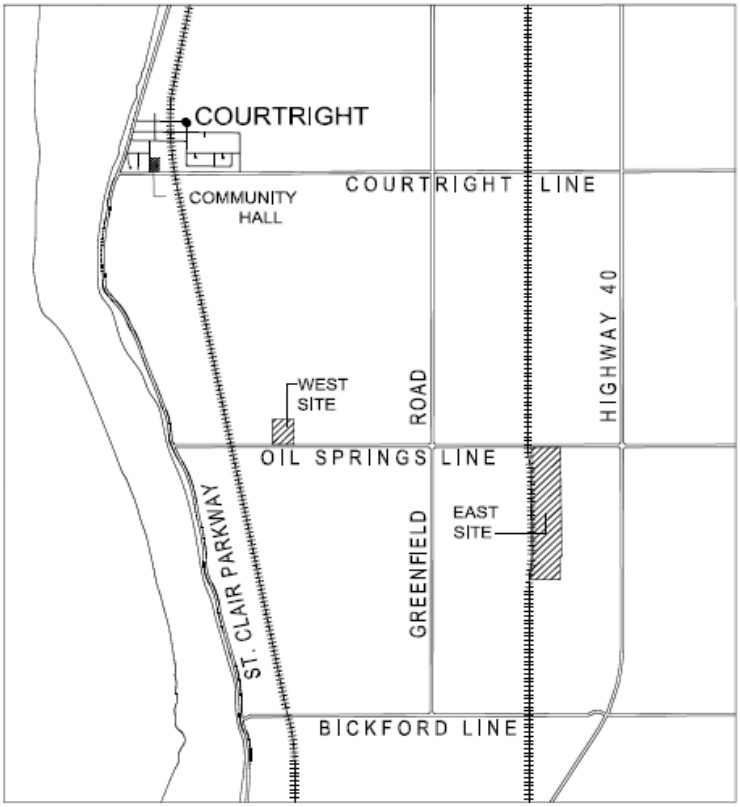
Twenty one agencies were identified within federal, provincial, regional and municipal jurisdictions for consultation as per O.Reg 116/01. These agencies have been provided

with copies of the mandatory notices as well as all information as given to the public. First Nations with potential interest in consultation about the project were identified through meetings and discussions with St. Clair Township officials, Ontario Power Authority officials and officials of the Ministry of Environment. Greenfield South Power Corporation understands that the MOE has Crown responsibility for First Nation consultation (to be carried out by the proponent) for this project.

2. Project Description

The Green Electron Power Project involves the construction and operation of an electricity generating plant that was proposed in response to the Ontario Ministry of Energy's Request for Proposals for new clean energy supply to facilitate the phasing-out of coal-fired electricity generation in Ontario. The project was selected by the Ontario Ministry of Energy and is expected to be in-service by 2014. The plant will have a capacity of about 300 MW configured as a combined cycle power plant to be fueled with natural gas. The project will be located in St. Clair Township on one of two sites on Oil Springs Line near Greenfield Road (see Fig. 2.1) on land that is zoned for power generation uses. The sites are each located adjacent to one of Hydro One's 230 kV high voltage electricity transmission corridors.

Figure 2.1 - Location of Proposed Green Electron Power Project



The configuration of the power plant will utilize one gas turbine generator set and the exhaust gas from the gas turbine will be ducted to a water-tube, heat recovery steam generator (HRSG) equipped with a duct burner fuelled by natural gas. The steam from the HRSG will drive a steam turbine generator set. The plant will also include steam condensing equipment, steam condensate and boiler feed water equipment, as well as a boiler make-up water treatment system, associated electrical and control equipment and a high voltage transmission interconnection.

3. Notices and Information Provided to Government Agencies

The Notice of Commencement of an Environmental Screening was sent to the clerk of the St. Clair Township on August 9, 2012. This notice was also published on July 30, 31, and August 1, 2012 in the Sarnia Observer and on August 9, 2012 in the Wallaceburg Courier. The notice gave the location and a brief description of the project, gave notice that the project would be going through the environmental screening process, invited interested individuals to attend either or both of two open house information sessions on August 16, 2012 or September 12, 2012 and invited individuals to contact the proponent for additional information as desired.

Representatives of the proponent met with the Mayor, Deputy Mayor and key planning and development staff of the St. Clair Township and Lambton County on July 16, 2012, to inform the Township about the proposed project and to seek advice as to requirements under the Planning Act that would apply to the project, and to seek advice as to which other municipalities and/or planning authorities should be advised of the project. On August 13, 2012 the proponent also gave a presentation about the project at the August 13, 2012 meeting of the full St. Clair Township Council.

On July 25, 2012 a representative of the proponent attended a meeting with the development staff of St. Clair Township to discuss the need for minor variances in regards to set backs and height limits and to determine what would be acceptable to the Township. An application for minor variances for the east site was filed with the Township shortly thereafter and on August 27, 2012 the Committee of Adjustment for St. Clair Township approved the minor variances.

Shortly after the relocation of the Green Electron Power Project was announced, the notice of commencement of screening was published in the local newspapers which also indicated that the project would be directly entering the environmental review stage of the environmental screening process. The regulations allow a proponent of a project to decide to proceed directly to the environmental review stage without issuing a screening report if there are potential environmental effects or public concerns that require further assessment and resolution. The potential impact of air emissions and noise impacts from the project were identified as requiring further assessment and resolution, and this was indicated as is required on the public notices. This notice was also sent on July 26, 2012 to the Chiefs of the two First Nations located closest to the sites (Aamjiwnaang First Nation and Walpole Island First Nation) and more recently on August 29, 2012 to the Kettle and Stoney Point First Nation and Oneida First Nation, and on September 11,

2012 to the Chippewas of the Thames First Nation, Munsee-Delaware First Nation, Moravian of the Thames First Nation and Caldwell First Nation. On September 25, 2012, a letter was sent by courier to the to the respective Chiefs of the Aamjiwnaang First Nation, the Kettle and Stoney Point First Nation, Oneida First Nation, Chippewas of the Thames First Nation, Munsee-Delaware First Nation, Moravian of the Thames First Nation and Caldwell First Nation. These letters informed the recipients that the Environmental Screening Report was being finalized and requested that if there were any final environmental concerns with respect to the Green Electron Power Project for them to forward these to the proponent, and also offering to meet with any First Nation . The Walpole Island First Nation chief received a separate letter, sent on September 25, 2012, by courier, speaking of points brought up in a meeting that was held between them and senior representatives of the proponent. This letter additionally requested that if there were any additional concerns regarding the Green Electron Power project to contact the president of the proponent company.

On October 15, 2012 the president of the proponent telephoned all the First Nations that had not responded to the earlier letters to request a meeting with the Chiefs in order to discuss the Green Electron Power Project.

Upon contacting each of the First Nations, Mr. Vogt requested to speak with the Chief directly. Details of each telephone call by Mr. Vogt to each First Nations can be seen on Table 3.1 of Appendix A3 on pages 65-72.

On August 9, 2012 the Notice of Commencement of Screening was emailed, or mailed if an email address was not available, to all government agencies listed in Section 4 of this report asking that they respond in writing before September 15, 2012 so that the comments and concerns be properly addressed in the environmental screening process. The comments that were received from the government agencies are summarized in Section 4 of this report. A copy of the letter is in Appendix A2 of the Public Consultation Report.

On September 25, 2012 a letter was sent by email or mail to all government agencies listed in Section 4 of this report, who had not yet responded to the previous letter. This letter indicated that the Environmental Screening Report was being finalized, and if there were any concerns about the Green Electron Power Project to respond as soon as possible.

All responses from Government Agencies received by the proponent by November 2, 2012 have been addressed in this report.

In addition, senior company officials visited the office of the St. Clair Region Conservation Authority (SCRCA) on August 13, 2012 to review the project with SCRCA officials and seek input as to any comments or concerns they might have.

Senior company officials also met personally with Chief Kewayosh of the Walpole Island First Nation and other senior First Nation officials to review the project with them, invite them to the two open house events and to seek any comments they might have on the project.

On November 2, 2012 a draft of the Environmental Screening and Review Report (ESRR) was couriered to the Walpole Island First Nation for their review and any

comments or concerns they might have. The transmittal letters can be found in Appendix A3.

The possibilities for local employment of community members including First Nation residents was discussed in particular.

A first meeting was held with the MOE on July 30, 2012 where representatives of the EAAB and representatives of both the MOE district and regional offices met with the proponent and discussed the project. This was then followed by various telephone conferences, meetings and exchanges of information leading to submission of a draft ESRR on Sept 20, 2012 for additional MOE consultative review input prior to finalization and issuance of a statement of completion to the MOE, and, leading to the 30 day public review phase.

Upon completion of the Environmental Screening and Review Report, a notice of completion is to be published in the local newspapers and mailed and emailed to all affected government agencies. A copy of the Notice of Completion of Environmental Screening and Environmental Review, which is to be sent out, can be found in the Public Consultation Report.

4. Meetings with Government Agencies

AGENCY	DATE	COMMENTS
St. Clair Township and Lambton County	July 16,2012	Attended by the Mayor and Deputy Mayor of St. Clair Township, as well as key development staff of St. Clair Township and Lambton County
St. Clair Township	July 25 2012	Meeting with the development staff of St. Clair Township regarding minor variances
Ministry of the Environment (at Southwest Region offices in London, Ontario0	July 30, 2012	Attended by EA Coordinator for Southwest Region and Senior Program Support Coordinator of the Environment Assessment and Approvals Branch [Bruce to complete and check] as well as …. By teleconference from Toronto
Ministry of the Environment	July 30, 2012	Meeting in London with EAAB , Regional and District MOE officials
St. Clair Region Conservation Authority (SCRCA)	August 13, 2012	Attended by staff of the SCRCA Environmental and Permit planning officials as well a technical officials
St. Clair Township Council	August 13,2012	Gave a presentation and answered questions posed by several members of council

5. Summary of Government Agency Comments and Responses

Agency/comment date	Comment see Appendix A2 for copies of correspondence	Response see Appendix A2 for copies of correspondence
Ministry of Tourism, Culture and Sport October 4, 2012	Thank you for your follow up email. Our apologies for the delay in response time. As this is a review, it does not fall within our Ministry's jurisdiction. Please contact the Ministry of the Environment or else the Environmental Commissioner of Ontario. Kind regards	The Ministry of the Environment has been consulted as suggested.
Ministry of Energy and Infrastructure	Thank you for circulating Infrastructure Ontario (formerly the Ontario Realty Corporation) on your notice for a proposed clean electricity generating station. Infrastructure Ontario (IO) is the strategic manager of the government's real estate property with a mandate of maintaining and optimizing value of the portfolio, while ensuring real estate decisions reflect public policy objectives of the government. *As you may be aware, IO is responsible for managing real estate property that is owned by the Ministry of infrastructure (MOI).* Our preliminary review of your notice and supporting information indicates that IO-managed property is directly in the study area. As a result, your proposal may have the potential to impact this property and/or the activities of tenants present on IO-managed lands. Please note that Hydro One managed lands, on behalf of IO, are also in the study area and are subject to the same requirements as those directly managed by IO. Attached please find a map that identifies these properties to assist you in identifying and avoiding potential impacts on IO-managed lands.	The map provided by IO will be used to identify and avoid potential impacts on IO-managed lands.

	Potential Negative Impacts to IO Tenants and Lands **General Impacts** Negative environmental impacts associated with the project design and construction, such as the potential for dewatering, dust, noise and vibration impacts, and impacts to natural heritage features/habitat and functions, should be avoided and/or appropriately mitigated in accordance with applicable regulations best practices and Ministry of Natural Resources (MNR) and Ministry of the Environment (MOE) standards. Avoidance and mitigation options that characterize baseline conditions and quantify the potential impacts should be present as part of the EA project file. Details of appropriate mitigation, contingency plans and triggers for implementing contingency plans should also be present.	Any negative environmental impacts associated with the project design and construction, such as the potential for dewatering, dust, noise and vibration impacts, and impacts to natural heritage features/habitat and functions, will be avoided and/or appropriately mitigated in accordance with applicable regulations best practices and Ministry of Natural Resources (MNR) and Ministry of the Environment (MOE) standards. Avoidance and mitigation options that require characterization of baseline conditions and quantification of the potential impacts will form part of the EA project file. Where required, details of appropriate mitigation, contingency plans and triggers for implementing contingency plans will also form part of the project file.

	Impacts to Land holdings Negative impacts to land holdings, such as the taking of developable parcels of IO managed land or fragmentation of utility or transportation corridors, should be avoided. If the potential for such impacts is present as part of this undertaking, you should contact the undersigned to discuss these issues at the earliest possible stage of your study. If takings are suggested as part of any alternative these should be appropriately mapped and quantified within EA report documentation. In addition, details of appropriate mitigation and or next steps related to compensation for any required takings should be present.	The project will not require the taking of any IO managed land or require any fragmentation of utility or transportation corridors.
	Potential Triggers Related to MOI's Class EA IO is required to follow the MOI Class Environmental Assessment Process for Realty Activities Not Related to Electricity Projects (MOI Class EA). The MOI Class EA applies to a wide range of realty and planning activities including leasing or letting, planning approvals, disposition, granting of easements, demolition and property maintenance/repair. For details on the MOI Class EA please visit the Environment and Heritage page of our website found at the following internet link: http://www.infrastructureontario.ca/What-We Do/Buildings/Realty-Services/Environmental-Management/Class-EAs/. If the MOI Class EA is triggered, and deferral to another ministry's or agency's Class EA or individual EA is requested, the alternative EA will be subject to a critical review prior to approval for any signoff of a deferral by the proponent. The alternative EA needs to fulfill the minimum criteria of the MOI Class EA. When evaluating an alternative EA there must be explicit reference to the corresponding	Although no MOI Class EA is expected to be triggered, should any MOI Class EA be required the actions recommended by MOI will be followed.

	undertaking in the MOI Class EA (*e.g.*, if the proponent identifies the need to acquire land owned by MOI, then "acquisition of MOI-owned land", or similar statement, must be referenced in the EA document). Furthermore, sufficient levels of consultation with MOI's/IO's specific stakeholders, such as the Ontario Ministry of Natural Resources, must be documented with the relevant information corresponding to MOI's/IO's undertaking and the associated maps. In addition to archaeological and heritage reports, a Phase I Environmental Site Assessment (ESA), on IO lands should also be incorporated into the alternative EA study. Deficiencies in any of these requirements could result in an inability to defer to the alternative EA study and require completing MOI's Class EA prior to commencement of the proposed undertaking.	
	Green Energy Act and Associated Projects Undertakings that involve the planning, designing, establishing, constructing, operating, changing, expanding or retiring of a renewable energy generation facility or renewable energy testing facility is exempt from following the MOI Class EA process. To obtain approval, these projects have a specific EA process that exempts these projects from the IO, MOI EA process.	The project does not involve the planning, designing, establishing, constructing, operating, changing, expanding or retiring of any renewable energy generation facility or renewable energy testing facility.
	Deferral to an alternative EA including the Renewable Energy EA Once a renewable energy approval has been granted, or deferral to another EA, for a project that will impact IO managed lands meets all MOI requirements, the proponent will be required to complete IO's "Application of Client Ministry or Agency's Class EA or Declaration Order" form. All documentation, backup information, approvals and any required permits, associated with the Green Energy Act or alternative EA approval is to be provided to IO, prior to any development or construction, on the proposed lands,	The project does not involve the planning, designing, establishing, constructing, operating, changing, expanding or retiring of any renewable energy generation facility or renewable energy testing facility.

	managed by IO.	
	Additional Studies Outside of an EA Process Gaps may still exist, that are not necessarily evaluated by the Green Energy Act or the alternative EA. IO may require additional reports, or studies to satisfy any due diligence concerns. For example, should the proposed activities impact cultural heritage features on IO managed lands, a request to examine cultural heritage issues, which can include the cultural landscape, archaeology and places of sacred and secular value, could be required prior to commencement of the renewable energy project. This requirement may be independent and outside of any EA process.	The project will not impact any cultural heritage features of any IO managed lands.
	Concluding Comments If the project directly affects all or in part any IO-managed property, please send the undersigned a copy of the DRAFT EA report and allow sufficient time (minimum of 30 calendar days) for comments and discussion prior to finalizing the report. Thank you for the opportunity to provide initial comments on this undertaking. If you have any questions on the above I can be reached at the contacts below.	The project will not directly affect any IO-managed property.
Canadian Environmental Assessment Agency September 17, 2012	**RE: Greenfield South Power Corporation's natural gas-fired electrical generating facility (300 MW), St. Clair Township, near Sarnia, Ontario** I am writing in response to your letter dated September 4 about the above-noted project. As part of the Government of Canada's plan for Responsible Resources Development which seeks to modernize the regulatory system for project	Meetings were held with the CEAA/MOE Sept 21, 2012, information including a draft CEAA-compliant project description, the Green Electron project draft ESRR and draft public and the ESRR appendices government agency consultation reports were provided for review.

	reviews, the former *Canadian Environmental Assessment Act* was repealed when the new *Canadian Environment Assessment Act, 2012* (CEAA 2012) can into force on July 6, 2012. Under CEAA 2012, a federal environmental assessment may be required for those project listed in the *Regulations Designating Physical Activities* (the Regulations). The construction, operation, decommissioning and abandonment of a fossil fuel-fired electrical generating station, with a production capacity of 200 MW or more, is listed in the Regulations. Subsection 8. (1) of CEAA 2012 required the proponent of a designated project to submit a description of the project to the Agency. The information that must be included in a project description is set out in the *Prescribed Information for the Description of a Designated Project Regulation.* Based on that information, the Agency would determine whether a federal environment assessment is required and, if so, ensure that such an assessment is conducted. For more information about CEAA 2012, including how to prepare and submit a project description, please refer to the Agency's website at: *www.ceaa-acee.gc.ca* Staff in our office would be pleased to meet with Greenfield South Power Corporation and/or Eastern Power Limited to discuss CEAA 2012, the Regulations and proposed project. Please do not hesitate to contact me at 416-952-1576 or via email at Anjala.Puvananatha@ceaa-acee.gc.ca to set up meeting. Sincerely Anjala Puvananatha, Director Canadian Environmental Assessment Agency, Ontario Region	Formal submission of a project description for CEAA review was made on October 16, 2012 after discussion with CEAA officials and CEAA review of draft materials

Ministry of the Environment October 12, 2012	**Green Electron Power Project Oil Springs Road, St. Clair Township, Ontario** **Draft Environmental Screening And Review Report, Dated September 20th, 2012**	
	Section 4.1, Surface Water, Pgs. 15-16 This ministry has noted that the exact means of sewage effluent discharge is not fully defined as yet for this project. One alternative, identified in the Draft Environmental Review Report, is to route sewage to the Courtright Waste Water Treatment Plant. Other alternatives identified include: treating sewage on-site and routed to the Government Drain No. 10 adjacent to the facility, or to the drainage canal at CF Industries, or to a new outfall in the St. Clair River. Section 1.6.4.2 of the 2005 Provincial Policy Statement states that: *"Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas. Intensification and redevelopment within settlement areas on existing municipal sewage services and municipal water services should be promoted wherever, feasible."* On Pg 32, in Section 3.1 Community Services or Infrastructure of the Draft Environmental Review Report, it is stated that: *"Lambton Area Water Supply staff and CF Industries officials have both indicated that existing water supply systems can accommodate the water supply requirements with the existing infrastructure. Additionally, St. Clair Township officials have confirmed that the Courtright WWTF has capacity to receive and treat the Green Electron project wastewater."*	Subsequent to the draft dated Sept 15, 2012 the proponent has decided after consultation with the MOE to no longer pursue discharge of treated wastewater to Government Drain No. 10 for the East site or Hawkins drain for the West site. The option of a discrete new outfall to the St. Clair River has been determined to likely require longer term multi-jurisdictional approvals and is not being further pursued at this time. Nonetheless it remains a potentially viable future option. The options for treatment of the wastewater at the Courtright Municipal treatment facility and treatment of the wastewater on site with treated water discharge to the canal at CF industries both remain potentially viable based on the projected quantity and quality of the

	With respect to the option of directing sewage effluent to the Courtright Waste Water Treatment Plant, has the municipality confirmed to the proponent whether the two proposed sites for the Green Electron Energy Project are located within the current approved sanitary sewage service area associated with the Courtright Waste Water Treatment Plant? If one or the other of the two proposed sites is not located in the current approved sewer service area, is the Municipality willing to undertake an Addendum (as applicable) to the Courtright Waste Water Treatment Plant Class EA to facilitate expansion of the current sanitary sewage service area to service either one of the sites? Can the anticipated effluent generated by this proposed project meet the municipality's sewer use by-law requirements? Has the proponent, in concert with the municipality, confirmed that the expected quality and quantity of effluent to be treated at the Courtright Waste Water Treatment Plant will not compromise the current performance and capacity of the Waste Water Treatment Plant? Is there sufficient "uncommitted"reserve capacity it the Courtright Waste Water Treatment Plant to service either site? This ministry recommends that written confirmation with respect to all of the foregoing be sought by the proponent from the municipality including but not limited to confirmation that the municipality is willing to accept all the industrial / sanitary sewage waste water generated by this proposed facility at its municipal sewage treatment works. If the answer to all of the foregoing questions is "Yes", and given the content of Section 1.6.4.2 of the 2005 Provincial Policy Statement, is there any need for the proponent to further explore any other industrial / sanitary sewage treatment options with respect to this proposed project? Please advise this ministry accordingly. With respect to the other surface water discharge options presented in the	wastewater and both options are subject to additional ongoing commercial considerations with the respective municipal and industrial service providers. In the case of the Courtright WWTF it has been confirmed that their approvals presently do not permit receipt of the project's wastewater as this is outside of their present service area. A draft services usage contract has been provided to the proponent for the use of the CF Industries (Terra Canada) outfall for wastewater discharge. Both options are assessed to have no net negative impacts based on established performance for other similar power projects with similar treatment needs and especially with similar discharge routes in the case of use of the CF canal. It is understood that municipal treatment would not require separate MOE compliance approvals.

	Draft Environmental Review Report, water quality information should be provided with respect to the expected influent to be treated. The majority of this ministry's comments on surface water and this proposed project will be provided to the proponent once the proposed industrial sewage discharge information is provided to this ministry by the proponent. Ideally, this information should be provided to, reviewed and commented upon by ministry staff prior to the proponent issuing the Notice of Completion of the Environmental Review Report for this project. There is concern that process wastewater (including cooling water, blowdown from boilers and recycled flows) may be contaminated with oil/grease, TSS, metals, chlorine, sulphates, nitrates, high values of hardness, potentially low pH values and high temperature. Such potential contaminants need to be analyzed and if needed addressed with adequate treatment and the assimilative capacity analysis on the receiver and a defined mixing zone. In short, the proponent should decide upon, define, and provide their rationale for the "actual means of sewage effluent discharge and treatment" that is being proposed for this project, including but not limited to the provision of all necessary technical background support studies for the option chosen. Ideally, this information should be reviewed and commented upon by ministry staff prior to the proponent issuing the Notice of Completion for this project. Section 4.1 of the Draft Environmental Review Report also briefly describes the stormwater management strategy for this proposed project. The potential for accidental spills and leaks during both the construction and operational stages of this project that could conceivably allow contaminated runoff to enter Government Drain #10 should be addressed including appropriate mitigation measures during both stages (i.e. constriction / operation) in the Final Environmental Review Report.	It is also understood that treatment/discharge at CF industries would require MOE compliance approval. GSPC recognizes for this approval an application would be made detailing the water quality for treatment, the treatment process train and treated water quality in relation to establishing approval conditions. The option of a discrete new outfall to the St. Clair River has been determined to likely require longer term multi-jurisdictional approvals and is not being further pursued at this time. Nonetheless it remains a potentially viable future option. The proponent has received written confirmation from the Township for the willingness and capacity to accept the industrial sewage generated by the facility. This document is available in Appendix A4 page 132 .

		A draft services usage contract has been provided to the proponent for the use of the CF Industries (Terra Canada) outfall for wastewater discharge. Due to an ongoing economic and logistical feasibility concerns, both options for discharge are still under consideration by the proponent The process wastewater will not be contaminated with oil or grease. The process waste water will meet sewer use limts of the local municipality. The potential contaminants mentioned have been reviewed, as has the assimilative capacity on the receiver and a defined mixing zone. This review has shown that the process waste water flow comprises less than 0.0004% of the flow of the St Clair River and thus is well with the assimilative capacity of the receiver within a reasonable mixing zone. The need for specific temperature and contaminant mitigation will be addressed in the

		application for an Environmental Compliance Approval. Subsequent to the draft dated Sept 15, 2012 the proponent has decided to no longer pursue discharge of process blow down water to Government Drain No. 10. The need for specific temperature and contaminant mitigation will be addressed in the application for an Environmental Compliance Approval should this option be utilized. It is understood that municipal treatment would not require separate MOE compliance approvals. The additional Appendices 17.9 and 34.9 of the ERR provide an environmental management plan which includes provision for spill prevention and mitigation strategies for the project.

	Section 4.3, Sedimentation and Soil, Shoreline or Riverbank Erosion, Pg. 16 This ministry recommends that the proponent identify which Conservation Authority(ies) are active in this area and provide a record of their consultation, if any, with these Conservation Authority(ies) pertaining to sedimentation and soil, shoreline or riverbank erosion.	Consultation with the SCRCA has occurred early in the project planning Section 4.3 has been revised to reference key responses of the St. Clair Region Conservation Authority as set out in greater detail in Table 5 of the Government Agency Consultation Report (Appendix 17.8./34.8 ##)
	Section 4.4, Accidental Spills, Pg. 17 There is no reference in this section of any transformer / electrical substation needed and how secondary spill containment will be provided. This should be addressed and explained by the proponent in the Final Environmental Review Report. .	Section 4.4 has been revised to include description of the secondary spill containment for the transformers
	Sections 5.4 & 22.4 Impact on Hazardous, Unstable or Contaminated Lands, Pg. 21 &71: Staff of this ministry reviewed the list of active and former waste disposal sites presented in the MOE's June 1991 Waste Disposal Site Inventory (refer to attachment). There are waste disposal sites listed in MOE's June 1991 Waste Disposal Site Inventory situated nearby to both the proposed East and West Sites. Generally speaking, MOE considers the most significant contaminant discharges to be normally within 500 meters of the perimeter of a fill area. Depending upon the soil type, the presence of underground utilities, pipelines etc. are all factors that could conceivably act as a conduit for the migration of methane gas and leachate from these waste sites.	The proponent has reviewed the MOE's June 1991 Waste Disposal Site Inventory for all sites listed in Moore and Somna townships in Lambton County (now known as St. Clair Township) and determined that there are only two waste disposal sites of significance to the project: The ash and sludge disposal site still operated by OPG at their Lambton Generating Station (# A31802) which is about 100 m north of the West site, and an aluminum catalyst

	The proponent should, prior to finalizing the Environmental Review Report, review the waste sites listed in the MOE June 1991 Waste Site Inventory, and make a determination as to the potential impact, if any, on the two proposed sites, and the need, if any, for any methane gas and/or leachate studies, as well as the applicability of Section 46 of the Environmental Protection Act for the subject properties. It should be noted that the aforementioned June 1991 waste disposal site listings have not been updated since the early 1990's. If the Owner and/or the Municipality are aware of any other waste disposal sites on or within 500 meters of the properties the subject of these two proposed development sites, the proponent should make a determination on potential impacts, if any, the potential need, if any, for any methane gas and/or leachate studies, as well as the applicability or not of Section 46 of the Environmental Protection Act for such sites on the subject properties as well. . Section 46 of the Environmental Protection Act states that: *No use shall be made of land or land covered by water which has been used for the disposal of waste within a period of twenty-five years from the year in which such land ceased to be so used unless the approval of the Minister for the proposed use has been given.* With respect to environmental site suitability, MOE noted in its review of this proposal, that an independent environmental site assessment ESA Phase I study/report is reportedly underway for completion by LVM in late Sept, 2012. This ESAI will reportedly be completed in accordance with CSA 768/01 of Ontario Regulation 153/04 under the Environmental Protection Act. The findings of this assessment, and any recommendations contained therein, should be presented in the Final	disposal site (# A 31803) once operated by Du Pont Canada (closed in September 1980) that is about 400m west of the East Site. Neither waste disposal site poses any significant impact on the site since these sites do not contain any organic matter that could produce methane gas. The proponent has commissioned an ESA Phase 1 Study as per CSA 768/01 for both the East site and the West site found the potential for leachate from these sites impacting the project to be not material Neither the East site or the West site has been utilized for waste disposal in the last 25 years.

	Environmental Review Report.	
	Air: 1. There is some inconsistency in this report on the nominal capacity of the Green Electron Project, with the nominal capacity stated as being either 300 MW or 330 MW. 2. Figure 3.1 Simplified Process Flowsheet Diagram of Green Electron Power Facility: This figure is not legible and could be replaced by Figure 3 in Chapters 17.2 and 34.2. 3. Table 6.2 Emissions Summary for Greenfield South in Comparison to Coal: There are some discrepancies between the annual emissions reported in this table and the annual emissions reported in Chapters 17.2 and 34.2. Specifically, annual emissions for the following contaminants do not agree: a) NO_2: 84 tonnes in the ESSR and 94.9 tonnes in Table 10 in the Chaptersth b) SO_2: 20 tonnes in the ESSR and 0.90 tonnes in Table 20 in the Chapters c) CO_2: 231 kilotonnes in the ESSR and 336 kilotonnes (339 kilotonnes $CO_{2(equivalent)}$) in Table 3 in the Chapters 4. Though details of emissions calculations and dispersion calculations were not presented, it was noted that the maximum ground level	Sections 17.2 and 34.2 have been updated to the correct nominal capacity of about 300 MW Figure 3.1 and Figure 3 in Sections 17.2 and 32.4 have been updated for better resolution . Table 6.3 has been updated to reflect the correct annual emissions and these are now consistent with the annual emissions in Chapters 17.2 and 34.2 The maximum ground level

	concentrations of oxides of nitrogen, the most significant air contaminant of gas power generation, were only 6.2% and 2.9% of Ministry 1-hour limit and 24 hour limit respectively	concentration of oxides of nitrogen as presented in Table 6.1 are correct. The sample emission calculations can be found in Appendix B of Sections 17.2 and 34.2
	<u>Section 6.5 Pg. 25 & Section 23.5 Pg. 75, Noise Impacts:</u> Noise Limits: The reported noise limit for the West Site is 40 dBA. The noise limits reported in the Noise Feasibility Study Report for the West Site are 40 dBA for the east residence and 45 dBA for the west residences. The noise limits should be based on the Noise Feasibility Study Reports. Noise Control Measures: The recommended noise control measures for the East and West Sites are not the same as the corresponding noise control measures recommended in the Noise Feasibility Study Reports. The recommended noise control measures should be based on the Noise Feasibility Study Reports.	Sections 6.5 and 23.5 have been updated to reflect the correct noise limit of 45 dBA for the West Site These sections have been updated based on the Noise Feasibility Study Reports
	<u>Section 8.3, Wetlands, Pg. 28:</u> Although the Bickford Oak Woods Complex may not be directly affected by construction activities, it may be affected by the discharge of cooling water (increased flow or temperature). This will need to be further explored by the proponent. <u>General Comments:</u> There is mention of possible in water work for replacement of culverts including use of coffer dams. If the proponent takes more than 50,000 litres a day during construction of the culverts a Permit to Take Water	Subsequent to the draft dated Sept 15, 2012 the proponent has decided to no longer pursue discharge of process blow down water to Government Drain No. 10 and thus the discharge of blowdown will not affect the Bickford Oak Woods Complex. Comment noted and proponent will

	(PTTW) is necessary from this ministry. Should process water not come from a municipal source, Eastern Power is reportedly exploring the possibility of utilizing water from CF-Terra Industries. An amendment to CF-Terra Industries existing PTTW may be required, or Easter Power may need to obtain its own PTTW.	apply for a PTTW if necessary. Comment noted and proponent will apply for a PTTW or amendment to CF Industries' existing PTTW if this water source is utilized for the project.
	Appendix 17.2 & Appendix 34.2 Air Quality Impact Study Green Electron Power Project (East Site) & (West Site),Township of St. Clair, Ontario, Dated Sept. 2012 Because of the high degree of similarity between these two draft air quality impact study appendices, the following comments apply to both Appendix 17.2 and 34.2:	
	1. In these appendices, the project is sometimes referred to as the "Greenfield South Power Project", instead of the newer name of "Green Electron Project".	The project name has been corrected where necessary.
	2. The appendices meet most, but not all, of the requirements for the Emission Summary and Dispersion Modelling (ESDM) report as stipulated in section 26 of *Ontario Regulation 419/05 – Local Air Quality (O.Reg. 419/05)*. Before submitting this report in support of an Environmental Compliance Approval (ECA) application, the missing information will need to be added. The following comments contain details on the additional information that is required. Additional guidance on preparing an ESDM report is given in the MOE document *Guideline A-10: Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report* (http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079006.pdf).	The proponent will ensure that all of the requirements of an ESDM are met for the ECA application.

	3. Section 1.1 Project Description: a. Although Figure 2 (Site Plan) is said to show the location of the emission stack, the stack is not clearly identified on the plan. b. According to section 26(1)(9) of *O.Reg. 419/05*, the site plan will also need to include • "i. the property boundary," • "ii. the co-ordinates for sufficient points on the property boundary to accurately describe the boundary," • "iii. each source of contaminant identified … " • "iv. the location, dimensions and elevation of every structure on the property" c. No information is provided to support the stated electrical generation efficiency of 48%.	Figure 2 has been revised to include the stack locations The proponent will ensure that the ESDM report, in support for an ECA application, will include the required information in accordance with section 26(1)(9) of O.Reg. 419/05 Further information to support the generation efficiency of 48% has been added.
	4. Section 2.1 Existing Climate Conditions: Reference is made to a Figure 10 which consists of a wind rose for the area but this figure is missing	Figure 9 (revised from Figure 10) has been included.
	5. Section 2.2 Existing Air Quality and Table 2 Summary of MOE Ambient Air Quality in Sarnia: a) The text states that the 90th percentiles shown are based on 3 MOE air sampling stations, but a reference was also made to the SLEA air sampling stations. It is not clear from which three stations the data were obtained since the MOE only had one monitoring station in the Sarnia area for the time period of the data (2006 to 2010). The specific SLEA monitoring stations and the specific parameters obtained from these stations needs to be provided.	The text has been modified to include only the MOE Sarnia monitoring station and the SLEA monitoring station in River Bend, Corruna. This data is now presented in Tables 2 and 2a, respectively. For the SLEA data the 90th percentile were calculated based on the data received.

	b) While the averaging period for the maximum concentrations is provided in Table 2, the averaging period for the 90th percentiles was not clearly stated. c) For nitrogen dioxide and sulphur dioxide, the 1-hour maximum is also relevant since criteria are available for this averaging period but was not included in Table 2.	Table 2 has been updated to indicate the averaging period of 1 hr for the 90th percentile emissions Table 2 has been updated to include the 1-hour nitrogen dioxide and sulphur dioxide criteria
	6. <u>Section 4 Operating Scenarios:</u> a) The text refers to a "Table xx" which summarizes the emission rates. However, this table was not included in this section. b) Although the sources of the emission rates are given as either the manufacturer or the US EPA document AP-42, no supporting information is provided for the calculation of the various emission rates for the different operating scenarios. At a minimum, the original emission rate or factor provided by the manufacturer or the US EPA AP-42 document is required along with sample calculations. (See clause 26(1)(7) of *O.Reg. 419/05*.) This information could be included in an Appendix to the appendicie.	The text has been updated to include Table 9, which summarizes the various start-up emission rates The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with section 26(1)(7) of O.Reg. 419/05
	7. <u>Section 5 Greenhouse Gases:</u> a) The emission rates used to calculate the greenhouse gas emissions and a sample calculation are required, preferably in an Appendix to the appendicie. b) For the information of the proponent, this facility meets the federal	The text has been updated to include a sample calculation of the greenhouse gas emissions, which can be found in Appendix B to the respective appendices.

	reporting thresholds for greenhouse gases. Once operational, this facility will need to report its emissions of greenhouse gases to Environment Canada's Greenhouse Gas Reporting Program (http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=040E378D-1).	The proponent will ensure that once the facility is in operation, the proponent will report the facility's greenhouse gases to Environment Canada's Greenhouse Gas Reporting Program
	8.Section 6 Emission Limits for Gas Turbines: The Air Quality Impact Study is reviewed against Ministry documents entitled "Guideline A-5, Atmospheric Emission for Stationary Combustion Turbines, March 1994" and "Ontario Regulation 419/05, Air Pollution-Local Air Quality, April 1, 2010" The proposed gas turbine meets the emission limits of oxides of nitrogen, carbon monoxide and sulphur dioxide required by Guideline A-5. Though details of emissions calculations and dispersion calculations were not presented, it was noted that the ground level concentrations of the major air contaminants were in compliance with the Regulation 419/05 limits for these air contaminants. FYI: Prior to A-5 the Ministry was of the position that the limits within A-5 applied at all times (i.e. includes start-up and shut down). On June 8, 2010 Standards Branch & Approvals Branch modified A-5 so that it only applies to full load operations when applied to natural gas power plants (see attached). a) The inputs for the "power output" and "heat output" need to be provided because the calculated emission limint for NOx could not be verified. b) The formula for "C" needs to be re-formatted in Chapter 17.2.	The text has been updated to include the sample calculations for the emission rates and dispersion calculations. This can now be found in Appendix B to the respective appendices. The proponent acknowledges the modified A-5 treatment for natural gas power plants. The "power output" and "heat input" have been included in the respective Appendix B to each appendix

	c) The concentration of contaminants in the exhaust gas (*i.e.,* NO_x – 10.1 ppm, CO – 8.4 ppm and SO_2 – 0.086 ppm) are provided for comparison to the calculated limits, but no information is provided in support of these concentrations.	Formula "C" has been re-formatted in Chapter 17.2 The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with Guideline A-10 and O.Reg. 419/05
	9. Section 7 Proposed Emissions Monitoring System: This section notes that the facility "will require an emissions monitoring program that may include predictive/parametric emissions monitoring, continuous emissions monitoring, stack sampling, fuel analysis and/or comparison to published emission factors." A more definitive statement on what will be included in the monitoring program is preferable.	The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with Guideline A-10 and O.Reg. 419/05. However, the selection of an emissions monitoring program will depend on the specific approach of compliance with Guideline A-5 and O.Reg. 397/01.
	10. Section 8.2 Methodology: a) The air dispersion model (Aermod) was the appropriate model for this modelling exercise and the receptor grid and specific receptors chosen were appropriate. b) While the text states that the London regional meteorological data set was used in the assessment, it is not clear which of the four available data sets was actually used. Three of the data sets have been pre-processed	The proponent acknowledges the MOE's concurrence with the appropriateness of the use of the AERMOD model, receptor grid, and chosen receptors. The London regional meteorological data set for "crops" was used for the

	assuming the surrounding land-use fits entirely into a specific category, namely "crops", "forest" and "urban" land-use. The fourth data set consists of unprocessed hourly surface and upper air data which would allow a modeller to specify the land use by sector around a facility when the meteorological data files are further processed. The meteorological data set that was used needs to be clarified. c) It does not appear that the surrounding terrain was incorporated into the modelling. This modelling decision may be appropriate, but this decision and the basis for the decision should be clearly stated in this appendicie. d) While the text states that BPIP, the building downwash pre-processor, was used in the assessment, details of the BPIP analysis (*e.g.*, building heights, input and output files, scaled site map with location and heights of all buildings) were not included in this appendicie.	assessment. The text has been updated to clearly state which data set was used for the assessment. The surrounding terrain was incorporated in the modelling. The text has been updated to list the appropriate terrain data. The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with Guideline A-10 and O.Reg. 419/05
	11. <u>Section 8.4 Plume Visibility:</u> Similar facilities sometimes release a yellow plume during start up. Staff of this ministry's Sarnia District Office has reviewed data regarding these plumes and it seems to be due to elevated SOX & NOX that occur during start-up when the equipment is not operating at optimal efficiency. In the past, this yellow plume has been present <u>and</u> the site was still in compliance with the applicable limits. MOE requests that Company review and revise Section 8.4 as applicable.	Section 8.4 has been revised as appropriate. Final ESRR will indicate that at start up a yellow plume may be visible but startup emissions are included in the air mission assessments with the worst case emissions of startup followed by full load provided in the report

	12. <u>Section 9 Dispersion Modelling Results:</u> Clause 26(1)(12) of *O.Reg. 419/05* requires that an electronic copy of the input files used and the output files produced by the air dispersion model be included with the ESDM report. Since these files were not provided, a complete review of the air dispersion modelling could not be undertaken.	The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with Guideline A-10 and O.Reg. 419/05.
	13. <u>Section 9.1 Summary of Emissions:</u> a) As noted earlier in comment 6b, the emission factors used to develop the emission rates for the different scenarios as summarized in Tables 7 to 9 are needed as well as sample calculations. b) Table 6 appears to be the equivalent of the "Source Summary Table" required by clause 26(1)(8) of *O.Reg. 419/05*. Some required parameters are missing from this table, however, namely, the averaging period for the emission rates and the volumetric flow rate for discharges (*i.e.*, mass flow rate was provided instead). c) The data quality provided in Tables 6 to 8 is based on a scale from "A" to "E". For the purposes of *O.Reg. 419/05*, however, data quality needs to be classified as "Highest", "Above Average", "Average" or "Marginal/Uncertain". (See the Chapter 8 of the MOE document *Guideline A-10: Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report* for more details on this classification method.) Although the data quality for the manufacturer's data is classified as "Average", without supporting information from the manufacturer, the data quality can only be classified as	The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with Guideline A-10 and O.Reg. 419/05 The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with Guideline A-10 and O.Reg. 419/05 The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with Guideline A-10 and O.Reg. 419/05

	"Marginal/Uncertain".	
	14. Section 9.2 Annual Emissions: For the information of the proponent, this facility meets the federal reporting thresholds for some of the criteria air contaminants (*i.e.*, nitrogen dioxide, carbon monoxide, particulate matter and volatile organic compounds). Once operational, this facility will need to report its missions of criteria air contaminants to Environment Canada's National Pollutant Release Inventory (NPRI) (http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=4A577BB9-1).	The proponent will report its emission to the NPRI as required.
	15. Section 9.3 Compliance with Point of Impingement Criteria: As required by section 26(1)(15) of *O.Reg. 419/05*, the emission summary tables 11 and 12 also need to be included in the Executive Summary for this appendicie.	The proponent will ensure that the ESDM report, in support of an ECA application, will include the required information in accordance with Guideline A-10 and O.Reg. 419/05
	16. Section 9.4 Indirect Air Quality Impacts and Contribution to Regional Smog: Isopleths are said to be shown in "Figures x through x" and the highest concentrations are found in three zones "located from xxx to xxx m from the stack". These isopleths, and the accompanying summary, still need to be added to the appendices.	The corresponding isopleths have been included
	17. Appendix A of Appendices 17.2 and 34.2, Cooling Tower Icing Study	Comment noted.

	Though details of dispersion calculations were not presented, it was noted that the icing potential was almost negligible.	
	Air Summary While the air dispersion modelling shows that the air quality criteria would be met, there was insufficient information in Appendices 17.2 and 34.2 to be able to fully assess either the emission rates or the air dispersion modelling. This ministry can therefore not confirm the conclusions from the modelling study. When an application for an Environmental Compliance Approval is to be submitted for approval, the application should be prepared in accordance with the Ministry document entitled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Version 2", providing details of emissions calculations and dispersion calculations as a minimum. Information on cumulative environmental impact assessment and consultation including public consultation, agency consultation, and consultation with First Nations and Other Aboriginal Communities should be updated and included in the application.	Sample calculations, manufacturer's guaranteed emission rates, AERMOD input files have been includes in the Appendix B of the respective appendices. The proponent acknowledges the application requirements of the an ECA and will comply with the MOE document, "Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Version 2", The proponent acknowledges these requirements for the ECA application for this facility.
	Appendix 17.3 Draft Noise Feasibility Study Proposed Green Electron East Site Power Project, Courtright, Ontario Dated September 14, 2012	
	Administrative Noise Control Measures: the operational restraints pertaining to the Gas Compressors, Cooling Tower and Set-Up	This will be included in the Acoustic Assessment Report.

	Transformers should be included as administrative noise control measures in section 6.1 of the report.	
	Acoustic Barriers: figures (to scale) should be provided to show the locations, lengths and heights of the recommended sound barriers for the Cooling Tower, Set-Up Transformers, and Ventilation Fans (Exhaust Openings).	Figure 3 will be updated to include a label for the acoustic barriers around the ventilation fans.
	Vacant Lots: the adjacent lands to the east and west are zoned Agricultural 'A1', where future residences may be located. Therefore, these lands should be included in the noise analysis as vacant lots.	Based on direction/information we have received from the MOE in past, Agricultural lots which do not have an existing dwelling do not need to be considered as receptors, with exception of renewable energy projects. We understand the draft of NPC 300 includes direction on this matter, however it is still in draft. Can the MOE direct us to existing policy documentation that codifies the requirement to assess vacant Agricultural lots as noise sensitive receptors for industrial projects?
	Zoning Map: the location of the site is not shown on the zoning map. The zoning map should show the location of the site and the surrounding land uses within 1,000 metres from the site in all cardinal directions.	The project location will be noted.

	Sound Level Calculations: one full set of sound level calculations (Cadna-A output tables with 1/1 Octave Band Centre Frequencies) at the worst case (i.e. nearest and most exposed) point of reception should be included in the report.	Will be included in final report.
	Appendix 17.4 Draft Green Electron Power Project Township Of St. Clair, Lambton County, Ontario Natural Resources Baseline Report And Environmental Impact Study East Site, Dated September 2012	
	Section 2.3, Aquatic Ecosystem, Pgs 13 to 15: The Government Drain #10 is classified as a Class C municipal drain, however sections of the report indicate that the drain was dry at the time of site visit. This may indicate the drain requires reclassification to an F. There is also the potential that the drain may provide spawning habitat for Northern Pike which should be further assessed. The results of this assessment may alter the classification as well. There is no indication of total suspended solids in the Government Drain #10. This should be further explored before conclusions are drawn on surface water impacts due to the potential discharge containing elevated solids.	This classification is provided by others including the SCRCA and the proponent is not responsible for any re-classification; while there was no observable flow at a site visit in July 2012, there was water in the system and it was therefore not dry. The option for potential discharge to Government Drain #10 is no longer being considered fot his project.
	Appendix 17.5 Draft Conceptual Stormwater Management Plan Green Electron Power Project Township of St. Clair, Lambton County, Ontario, Dated September 2012	
	Section 2 Existing Conditions, Pg. 2-1: A very brief reference is made to "an ash disposal site" as being located to the north-east of the West Site. Please provide further details / elaboration on the nature of this "ash disposal site" in the Final	Further details on the ash disposal site to the north and west of the site have been included. No material

	Environmental Review Report, the distance separation between it and the subject property; and what impact, if any, it will have on the Green Electron Energy Project	impact on the project is expected.
	<u>Section 3 Design Criteria, Pg. 3-1:</u> Clarification is required regarding the anticipated amount of stormwater discharge and also an explanation why quality control would not be necessary. If there is any anticipated discharge during overflow situations, quality and quantity control would be necessary and included in an Environmental Compliance Approval application for this project. The proposed plan notes the use of the cooling tower basin as acting as a SWM Pond to provide quality and quantity controls to pre-development levels. Noting that this is a conceptual plan, details of the cooling tower basin are necessary including spillway, expected pond performance, spillway, outlet structure and elevation of the freeboard. For the SWM Plan detail design, it is recommended that the proponent confirm that the cooling tower basin will comply with the design parameters of this ministry's Stormwater Design Manual.	Any stormwater collected in the cooling tower basin will be used in the evaporative cooling process and thus there will be no need for a spillway or outlet structure and therefore quality control would not be necessary. The total capacity of the cooling tower basin is about 4440 m^3, of which a freeboard of about 4200 m^3 will be available to accommodate a 100 yr storm. The proponent has reviewed the MOE's Stormwater Design Manual and notes that the Manual does not apply to the cooling tower basin. Quality control, retention time of 24 hrs, spillway, etc does not apply since all stormwater collected will be used in the evaporative cooling process.
	<u>Section 5 Proposed Cooling Tower Basin, Pg. 5-1 to 5-2:</u> If there is to be any stormwater discharge there should be some form of quality control measures in the form of periodic sampling of the discharge.	There will be no discharge of stormwater from the cooling tower basin where it will be used in the

	It appears that stormwater would be mixing with process water. If this mixture is to be discharged to the natural drainage area (i.e. open the sluice gate) this discharge should be considered a wastewater effluent discharge and not a stormwater discharge. If the site is not considered a contaminated site it may be reasonable to address stormwater management only for the developed portion. However, if the site is contaminated or if there are other quality control issues with the site it may be necessary to capture and treat all of the runoff. Please provide clarification supporting the option to only capture and treat the developed portion of the site.	cooling process. Once the stormwater enters the cooling tower basin it will be treated as process water and any discharge via blowdown, etc. will be in accordance with the ECA and/or sewer use by-law of the municipality as applicable. The East site is not contaminated as assessed in a site specific (ESA Phase I investigations) and thus only the stormwater runoff from the developed area will be captured and treated. There is no history of contamination of the West site or visible evidence as to contamination. Additional assessment are being carried out to ensure that there has been no contaminants entering the West site from neighboring property land uses pertaining to waste treatment.
	Appendix 17.6 Draft Stage 1 Archaeological Assessment Green Electron Plant E.1/2, Lot 26, Concession 2, Moore Twp, Lambton Co., On, Dated August 8th, 2012	
	Has the proponent approached staff of the Ministry of Culture and Recreation with respect to archaeological assessment of this proposed project? This ministry defers the Province's comments, if any, on	The proponent's archaeological consultant has submitted the Phase 1 archaeological assessments reports for both the East and the West sites

	Appendix 17.6 to staff of the Ministry of Culture & Recreation.	to the Ministry of Culture and Recreation
	Appendix 17.7 Green Electron Power Project Environmental Screening Process Public Consultation Report, Dated September 20th, 2012	
	This ministry has no comments to offer with respect to the contents of Appendix 17.7.	Comment noted.
	Appendix 17.8 Green Electron Power Project Environmental Screening Process Government Agency Consultation Report, Dated September 20, 2012	
	Section 3 Notices and Information Provided to Government Agencies, Pg. 3: Reference is made in this Section of Appendix 17.8 of the Draft Environmental Review Report to Notices that were sent to First Nations. In an e-mail to this ministry dated October 2nd, 2012, the proponent also kindly put together a chart outlining the Notices that have been sent to First Nations. In response, as noted in this ministry's e-mail to the proponent of September 27th, 2012, with the exception of the one meeting that reportedly took place with Walpole Island First Nation (WIFN), in August of 2012, based upon the information provided to date, there is no indication of what "actual consultation", if any, has taken place with other First Nations communities. On August 21st, 2012, ministry staff advised the proponent that "meaningful" First Nations consultation includes not only providing notice, but also personally following up with First Nations with offers to personally meet, giving the community a chance to articulate any	The referenced chart outlining the outreach/consultation activities with the First nations has been included in the Governemnt and Agencies Consultation Report Appendices 17.8 and 34.8; follow up letter were delivered by courier and records of delivery/receipt were obtained. When no written responses were received from certain First Nations the president of the proponent company telephoned the offices of the respective chiefs of the the First Nations to follow up and again offered to come to meet with them. Other than Walpole Island First Nation, to date none of have

	concerns regarding impacts that the project has on rights or interests, and then the proponent, demonstrating in the Final Environmental Review Report, specific details / information on what was discussed with First Nations, what concerns if any were raised, and how those concerns, if any, were addressed. Sending notification letters alone to First Nations, without any subsequent personal follow-up and offers to personally meet with First Nations is not in and of itself considered First Nations Consultation. Through an e-mail dated September 11th, 2012, listings of First Nations communities that need to be consulted with respect to this project were provided to the proponent by this ministry. Neither Draft Appendix 17.8, nor the Chart that accompanied the proponent's e-mail to this ministry dated October 2nd, 2012 indicate any acknowledgement letters or phone calls confirming that the First Nations actually received the proponent's notices and offers to meet. Does the proponent have any additional First Nation consultation initiatives planned for the future? Given the timelines and priority of this project, if Eastern Power is having difficulty obtaining responses from First Nations communities, this can be communicated to the Crown, and the Crown can assist where possible.	accepted this offer. One Chief indicated the prject was not in their traditional territory. One Chief indicated that he was unsure if they intended to get involved. The proponent remains open to consultation with First Nations that chose to participate.
	<u>Section 5 Summary of Government Agency Comments and Responses, Pgs. 6 & 7:</u> Reference is made to the Ontario Ministry of Environment. The comments presented were <u>not</u> provided by the Ontario Ministry of Environment (Provincial), but rather, they appear to have been provided by Environment Canada (Federal). Please correct this error in the Appendix that accompanies the Final Environmental Review Report.	Comment noted and a correction has been made.

	Appendix 34.3 Draft Noise Feasibility Study Proposed Green Electron West Site Power Project, Courtright, Ontario Dated September 14th, 2012	
	Administrative Noise Control Measures: the operational restraints pertaining to the Gas Compressors, Cooling Tower and Set-Up Transformers should be included as administrative noise control measures in section 6.1 of the report.	This will be included in the Acoustic Assessment Report.
	Area Classification: the area located to the west of the site is classified as a Class 1 Area (Urban). A Class 2 Area (Urban) would be more appropriate classification, as the noise environment of this area could be dominated by natural sounds during the night.	Measurements and observations indicate that the receptors along St. Clair Parkway are in an urban acoustical environment. Sound from both the existing OPG site and a facility in the US are significant during all hours. Road traffic is dominant during daytime hours.
	Zoning Map: the location of the site is not shown on the zoning map. The zoning map should show the location of the site and the surrounding land uses within 1,000 metres from the site in all cardinal directions.	The project location will be noted.
	Sound Level Calculations: one full set of sound level calculations (Cadna-A output tables with 1/1 Octave Band Centre Frequencies) at the worst case (i.e. nearest and most exposed) point of reception should be included in the report.	Will be included in the final report.
	Appendix 34.4 Draft Green Electron Power Project Township Of St. Clair, Lambton County, Ontario Natural Resources Baseline Report And Environmental Impact Study West Site, Dated September 2012	
	Figure 2-2 West Site Aquatics Assessment Summary Map, Pg. 24: It appears that Bowens Creek was only assessed upstream of the project. Downstream assessment will be necessary to determine potential affects	The proponent no longer intends to discharge process waste water into Bowens Creek.

	on surface water features.	
	Appendix 34.6 Draft Stage 1 Archaeological Assessment Green Electron Plant **Lot 13, Concession 2, Moore Twp, Lambton Co., On, Dated August 2012**	
	Has the proponent approached staff of the Ministry of Culture and Recreation with respect to archaeological assessment of this proposed project? This ministry defers the Province's comments, if any, on Appendix 34.6 to staff of the Ministry of Culture & Recreation.	The proponent's archaeological consultant has submitted the Stage 1 archaeological assessments reports for both the East and the West sites to the Ministry of Culture and Recreation.
	Other General Comments:	
	1) Given the proximity of the proposed Green Electron Energy Project to the USA/Canada border, stack emissions from this project could conceivably cross the USA/Canada (Ontario) border. As such, the proponent needs to notify Environment Canada of the emissions from this proposed facility since the site is within 100 km of the border. In years past, the contact person from Environment Canada for trans-boundary emissions was Ms. Anita Wong, P.Eng., Air and Inventories Division, Environmental Protection Branch, Environment Canada – Ontario Region, Phone (416) 739-5885 or fax at (416) 739-4251. It is my understanding that the information provided by the proponent to Environment Canada is documented on a website which is reviewed by the USA. 2) The Great Lakes Charter speaks to the principle of prior notice and consultation to bordering States and Provinces of any new or increased diversion or consumptive use of the water resources of the Great Lakes	The air emissions modeling of the Green Electron Power Project indicates that, at the closest point of the USA/Canada (Ontario) border, the emissions of NO_x will increase the ambient NOx concentration This, however, is less than 10 % of the MOE 1 hour Ambient Air Quality criteria for NO_x The impact in respect of other emission species will be of even lower percentage of the respective ambient concentrations. Therefore the Green Electron Power Project will have negligible impact on air quality in the USA, and if the contribution of

	Basin which exceeds 5,000,000 gallons (19 million litres) per day average in any 30 day period. If it is anticipated that any aspect of this proposed project will trigger the "Notice & Consultation Procedures" associated with the Great Lakes Charter, a discussion of such should be provided in the Final Environmental Review Report.	the Project to Ontario's off-coal initiative is considered the Project will result in dramatically improved air quality in the USA. The proponent will notify Environment Canada of the emissions from the Green Electron Power Plant Even at continuous operation for 30 days at full load the Green Electron Power Project's water consumption will be less than the 19 million litres and thus will not trigger the "Notice and Consultation Procedures" under the Great Lakes Charter. This has been included in the final revision of the Environmental Screening and Review Report for the Project.
Ministry of Natural Resources	**No response received; General information provided to consultants inquiring as to SAR in region of sites during preparation of reprts in appendices 17.4 and 34.4**	SAR were not found during field studies of site and provisions have been made in Appendices 17.4 and 34.4 should SAR be found later during project phases.
St. Clair Region Conservation Authority September 18, 2012	**For the East Site:** Authority staff have reviewed the submitted topographic survey and site plan, and the following response is based on discussion between staff of the SCRCA (Girish Sankar, Water Resources Engineer - Dallas Cundick, Regulations Officer - and Michelle Fletcher, Natural Heritage and Regulations Technician).	GSPC is in the process of establishing and refining the Regional Floodline through consulting engineers that have experience with floodline mapping in St. Clair Township. GSPC will be seeking the referenced permission

	The subject property is traversed by Government Drain No. 10 and its associated floodplain. The regulated area of the Authority includes those areas susceptible to flooding and erosion, as well as the Provincially Significant Wetlands, plus all lands within 120 metres of the wetland boundary. The area regulated by the Authority is depicted on the attached map.	for the East site. This is not applicable to the West site.
	For the East Site: Based on current hazard mapping, on-site investigation completed August 21, 2012, and review of the attached topographic survey, the Authority can confirm that the majority of the subject property is identified as being susceptible to flooding during a regional storm flooding event. The property, and specifically the proposed location of the Eastern Energy Power Project as depicted on the attached site plan, is therefore, impacted by the hazards land regulation of the Authority, implemented pursuant to Section 28 of the *Conservation Authorities Act*. The regulation is entitled "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" (O.R. 171/06). This means that the proponent must obtain permission from the Authority prior to the commencement of a development activity on the subject property. Development activities include: construction, reconstruction or placement of a structure; placement or removal of fill; re-grading, or altering a watercourse.	We are in the process of establishing the regional flood line and will be seeking the referenced permission for the East site. This is not applicable to the West site. GSPC is in the process of establishing and refining the Regional Floodline through consulting engineers that have experience with floodline mapping in St. Clair Township. GSPC will be seeking the referenced permission for the East site. This is not applicable to the West site.

	For the East Site: In your email you inquired about proposed ground floor elevations being established for the proposed development. The ability to establish ground floor elevation requirements for the proposed development on the property is premature from a floodplain hazard perspective. For this area the Authority has received estimated engineered floodline mapping derived from coarse 1:10,000 OBM mapping obtained in the 1980's. The floodplain analysis depicts the entire property as being floodprone under Regional storm conditions. The regional storm flooding event is equivalent to flooding that would be expected during a Hurricane Hazel storm event. The greatest hazard limit on the subject property is the Regional floodline. A detailed Regional/1:100 year floodline mapping study is necessary to establish a building envelope outside the Regional flood level. The Regional flood level is the regulatory standard at this location. Any building envelope must be situated outside the erosion hazard as well. A list of engineering firms that can carry out these works is attached. Any engineering questions should be directed to Girish Sankar at Ext. 247 gsankar@scrca.on.ca.	We are in the process of establishing the regional Floodline and will be seeking the referenced permission for the East site. This is not applicable to the West site. GSPC is in the process of establishing and refining the Regional Floodline through consulting engineers that have experience with floodline mapping in St. Clair Township. GSPC will be seeking the referenced permission for the East site. This is not applicable to the West site.
Canadian Environmental Assessment Agency		Letter received Sept 17, 2012 as to new CEAA 2012 notification rules; in consultation with CEAA as to satisfying any additional requirements beyond MOE EAAB requirements
Aboriginal Affairs and Northern Development September 4, 2012	Thank you for your notice of the Green Electron Power Project Environmental Review. Our department does not have any concerns or comments at this time. For future notifications please direct them to EACoordination_ON@aandc.gc.ca. Thank you.	No response was required for this email.

Canadian Food Inspection Agency August 21, 2012	Received the following advice regarding the movement of wood in a regulated Emerald Ash Borer (EAB) zone: "As St. Clair Township is well within South West Ontario, the only concern from an EAB perspective would be that any Ash materials moved from the site stay within the current regulated zone for EAB, which can be found online at: -Natalie Avoledo	The Project is not expected to involve cutting of any Ash materials (as defined in the CFIA regulations). In the event that any cutting of Ash materials is required for the project, the regulations restricting the movement of Ash materials to within the EAB Zone will be complied with.