1   UNDERTAKING NO. J3.3: TO ADVISE HOW THE REAR LOT REMEDIATION PROGRAM CMI

2   SAVINGS WERE VALUED.

3

4   **RESPONSE:**

5   CMI calculations and value conversion for a specific 2016 project is listed below:

6

7   Project ID 150039 Rear Lot Supply Remediation – Royal Orchard – East – Phase 2

8

9   Frequency of Failure (FAIL) is: 2 failures per year

10

11   • Estimated number of customers affected by 1 failure is: 157 customers + 100 customers

12   outside of the Rear Lot area. Total = 157 + 100 = 257 (assuming 255 residential and 2

13   commercial)

14   • Estimated number of customers affected by 2 failures is: 257 x 2 = 514 customers

15   • Peak load lost = 255x 3kW+ 2x 1000 kW= 2765kW

16   • Redundancy Lost in case of failure = 20 hours

17   • Frequency of interruption is: 2 failures per year

18   • Duration of interruption is: for 157 customers inside of Rear Lot area is 4 hours; for 100

19   customers outside of Rear Lot area is 1 hour. Weighted average is 2.8 hours per

20   customer per interruption.

21   • No of Customers (NCUS) affected per failure is: 255 residential + 2 commercial = 257

22   • CMI per 1 failure is: 257 x 2.8 hour x 60 min = 43,176 CMI

23   • CMI per 2 failures is: 43,176 x 2 = 86,352 CMI

24   • Customer Interruption Costs (frequency and Duration) at PowerStream for Mixed

25   Residential and Commercial Customers is valued at $ 20/Kw and $20/kWh

26

27   The total Duration is calculated as follows:

28   Duration = DUR+DURR*0.05 = 2.8+1 = 3.8 hours

29

30   DUR represents the duration of the outage that is experienced by customers, where DURR

31   represents the duration for which redundancy will be lost. Running without redundancy is clearly

1 not as significant as actual customer outage, but during that period of time it is possible that a

2 second failure will occur and then customers will experience lengthy outages. Computing the

3 likelihood of a secondary failure is complex and varies from situation to situation, so 5% has

4 been chosen as a reasonable average expectation. This 5% value has been used by

5 Copperleaf at other utilities.

6

7 The total Reliability Value is calculated as follows:

8 • Reliability Cost = CMI Cost*0.89 + (Frequency Cost + Duration Cost)*0.11

9 • CMI Cost ($) = FAIL*Duration*60*NCUS*$1/minute = 2*60*257*3.8*1= 117,192

10 • Frequency Cost ($) = FAIL*PEAK*frequency cost per kW= 2x2765*20= 110,600

11 • Duration Cost ($) = FAIL*PEAK*Duration*duration cost per kWh= 2*2765*3.8*20=420, 280

12 • Reliability Cost ($) = 117,192*.89+ (110,600+420,280)*.11= 162697.68/1000=162,697.68

13 • Each value units is represented by 1000$ and hence the total value is =162.70