WORK PAPER TABLE - AVOIDED COST MODEL INPUTS (AC 1.1)
INPUTS AND ASSUMPTIONS FOR AVOIDED COST MODEL, BY PROJECT ALTERNATE
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.

Model Inputs

Fixed Input Data		Assumptions / Sources:
MCS O&M and Emissions Cost	**($5,866,617)**	Source: Moreno Valley Compressor Station – PSRP Benefit Analysis Final (95% Reduction)
Future L1600 Replacement Cost	**($337,050,844)**	Based on 16" Alternate Diameter Pipeline running same route as the Proposed Project. Includes 11.9% contingency. This is the more cost effective option than "Replace Line 1600 In-Place With a 16-Inch Pipeline (In-Kind Replacement)" option.
Discount Rate	**7.79%**	SDG&E Business Finance. Authorized Cost of Capital (to change in 2018)
Inflation Rate	**2.90%**	IHS Power Plant Q4 2014 Forecast - Construction Cost Indexes. Cost Trends of Gas Utility Construction. Pacific Region. Average percent change for Transmission Plant from 2017-2025. Provided by SDG&E Finance.
L1600 Hydrotesting Duration (yrs)	**3**	Hydrotesting occurring on shoulder seasons only. See Prepared Direct Testimony of Neil Navin (March 21, 2016).
Est Useful Life of L1600 After Hydrotesting (yrs)	**20**	From Cost Effectiveness Analysis. Installation of new L1600 starts 20 years after hydrotesting and is completed 2 years after that.
Project Lifetime Period (yrs)	**100**	The Role of Pipeline Age in Pipeline Safety, Kiefner and Rosenfield states that "…a well-maintained and periodically assessed pipeline can safely transport natural gas indefinitely." A 100 year lifetime period has been assumed for calculation purposes.

Inputs by Project Alternative

	Avoided Cost Inputs	Proposed Project (Line 3602)	Hydrotest (Line 1600)	Alt. Diameter Pipelines							Replace Line 1600 In-Place	Otay Mesa Alternative	LNG Storage (Peak-Shaver)	Alternate Energy		Offshore Route	Cross-County Pipeline Alts			Second Pipeline Along Line 3010
				10"	12"	16"	20"	24"	30"	42"				Grid-Scale Batteries	Smaller-Scale Batteries		Blythe to Santee 1	Blythe to Santee 2	Cactus City to San Diego	
Footnotes	**ALTERNATIVE REFERENCE:**	***A***	***B***	***C1***	***C2***	***C3***	***C4***	***C5***	***C6***	***C7***	***D***	***E/F***	***G***	***H1***	***H2***	***I***	***J1***	***J2***	***J3***	***K***
N/A	Future L1600 Replacement Cost	✓	×	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	MCS O&M and Emissions Cost	✓	×	✓	✓	×	✓	✓	✓	✓	×	✓	×	×	×	✓	✓	✓	✓	✓
6	MCS Usage %	100%	0%	0%	0%	0%	20%	40%	70%	100%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%
2	Est Time Until Operational (From 2015	6	6	6	6	6	6	6	6	6	11	9	10	10	10	15	10	10	10	11
2,3,5	Annual O&M Cost	$240.0 K	$300.0 K	$240.0 K	$240.0 K	$240.0 K	$240.0 K	$240.0 K	$240.0 K	$240.0 K	$300.0 K	$.0 K	$1200.0 K	$1200.0 K	$1200.0 K	$450.0 K	$1138.1 K	$1139.1 K	$819.3 K	$230.3 K
2,4	TIMP Cost (Pigging Every 7 Years	$500.0 K	$1400.0 K	$500.0 K	$500.0 K	$500.0 K	$500.0 K	$500.0 K	$500.0 K	$500.0 K	$500.0 K	$.0 K	$.0 K	$.0 K	$.0 K	$500.0 K	$1500.0 K	$1500.0 K	$1500.0 K	$500.0 K

Importing Gas[1]

Alternative Pipeline Size	Capacity Needed to Meet PSEP 1-in-10 Year Winter Day Requirements (MMcfd)	System Capacity w/ Line 3010 [MMcfd]	Capacity Shortfall of Min Req [MMcfd]	NG Incremental Transport Cost ($/dekatherm)	NG Incremental Transport Cost ($/MMcf)	Annual Cost to Import NG (2015 $)
10 Inch	630	570	60	0.3	300	6,570,000
12 inch	630	590	40	0.3	300	4,380,000
16 inch	630	630	0	0.3	300	-

Footnotes

1. The 10-inch and 12-inch alternate diameter pipelines do not meet regulatory requirements for natural gas demand on a one in ten year winter day. It is assumed that these alternatives will require the import of gas via the Otay Mesa receipt point. The fixed costs used for these alternatives include the present value of gas required for the period analyzed, assuming a 2015 rate of $0.30/dekatherm, assuming a 60 MMcfd shortfall for the 10-inch pipeline and a 40 MMcfd shortfall for the 12-inch pipeline. It was assumed for either option that the required import capacity would have to be contracted for the entire year.
2. See Prepared Direct Testimony of Neil Navin (March 21, 2016), page 31, workpaper Estimated Fixed and Operating Costs for Proposed Project and Alternatives
3. Following derating, Line 1600 maintenance will fall under the DIMP requirements. These have not been considered as part of this analysis.
4. Costs for pigging Line 1600 after hydrotesting were provided by SDG&E. They are much higher than TIMP costs associated with other options because of multi-diameter segments, potential retrofits of certain segments, and the need to import gas during hydrotesting.
5. The O&M costs of small-scale batteries were assumed to be the same as or similar to the grid-scale option.
6. Savings are based on the "best case" (95%) savings identified in the Moreno Valley Compressor Station - PSRP Benefit Analysis, Pagdanganan, 3-4-2016. Savings for pipelines between 16" and 36" are allocated on a straightline basis. Compression is assumed to not be required for pipelines with a diameter of 36" or greater. It is assumed that no additional compression is required for pipelines with a diameter of 16" or less.

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)

ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS

APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.

		PV (X years after operational)	0	1	2	3	4	5	6	7	8	9	10	11	12	13
		100														
	A ***Proposed Project (Line 3602)***															
		PV	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
									Operational Year							
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ (89,968,134)	$ -	$ -	$ -	$ -	$ -	$ -	$ (6,964,340)	$ (7,166,306)	$ (7,374,129)	$ (7,587,979)	$ (7,808,030)	$ (8,034,463)	$ (8,267,462)	$ (8,507,219)
3	***Total Avoided Costs***	**$ (190,253,617)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (6,964,340)**	**$ (7,166,306)**	**$ (7,374,129)**	**$ (7,587,979)**	**$ (7,808,030)**	**$ (8,034,463)**	**$ (8,267,462)**	**$ (8,507,219)**
	Manual PV calc over 100 yrs for L3602	***$ (190,253,617)***	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ -*	*$ (4,119,369)*	*$ (3,932,490)*	*$ (3,754,088)*	*$ (3,583,780)*	*$ (3,421,199)*	*$ (3,265,993)*	*$ (3,117,828)*	*$ (2,976,384)*
4	Annual O&M Cost	$ 3,680,546	$ -	$ -	$ -	$ -	$ -	$ -	$ 284,907	$ 293,170	$ 301,671	$ 310,420	$ 319,422	$ 328,685	$ 338,217	$ 348,026
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 725,053
7	***Total O&M Costs***	**$ 4,585,126**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 284,907**	**$ 293,170**	**$ 301,671**	**$ 310,420**	**$ 319,422**	**$ 328,685**	**$ 338,217**	**$ 1,073,079**
	B ***Hydrotest Alternate (Line 1600)***															
		PV	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
									Operational Year							
1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 4,242,275	$ -	$ -	$ -	$ -	$ -	$ -	$ 356,134	$ 366,462	$ 377,089	$ 388,025	$ 399,278	$ 410,857	$ 422,772	$ 435,032
5	Pigging to Occur	N/A							FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 1,574,602	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,030,149
7	***Total O&M Costs***	**$ 5,816,878**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 356,134**	**$ 366,462**	**$ 377,089**	**$ 388,025**	**$ 399,278**	**$ 410,857**	**$ 422,772**	**$ 2,465,181**
	C1 ***Alternative Diameter Pipeline (10")***															
		PV	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
									Operational Year							
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ -	$ -	$ -	$ -	$ -	$ -	$ 284,907	$ 293,170	$ 301,671	$ 310,420	$ 319,422	$ 328,685	$ 338,217	$ 348,026
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 725,053
7	Cost of Importing Gas	$ 100,754,939	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,799,336	$ 8,025,517	$ 8,258,256	$ 8,497,746	$ 8,744,181	$ 8,997,762	$ 9,258,697	$ 9,527,199
8	***Total O&M Costs***	**$ 105,340,065**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 284,907**	**$ 293,170**	**$ 301,671**	**$ 310,420**	**$ 319,422**	**$ 328,685**	**$ 338,217**	**$ 1,073,079**
	C2 ***Alternative Diameter Pipeline (12")***															
		PV	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
									Operational Year							
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ -	$ -	$ -	$ -	$ -	$ -	$ 284,907	$ 293,170	$ 301,671	$ 310,420	$ 319,422	$ 328,685	$ 338,217	$ 348,026
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 725,053
7	Cost of Importing Gas	$ 67,169,959	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,199,557	$ 5,350,344	$ 5,505,504	$ 5,665,164	$ 5,829,454	$ 5,998,508	$ 6,172,465	$ 6,351,466
8	***Total O&M Costs***	**$ 71,755,086**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 284,907**	**$ 293,170**	**$ 301,671**	**$ 310,420**	**$ 319,422**	**$ 328,685**	**$ 338,217**	**$ 1,073,079**
	C3 ***Alternative Diameter Pipeline (16")***															
		PV	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
									Operational Year							
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ -	$ -	$ -	$ -	$ -	$ -	$ 284,907	$ 293,170	$ 301,671	$ 310,420	$ 319,422	$ 328,685	$ 338,217	$ 348,026
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 725,053
7	***Total O&M Costs***	**$ 4,585,126**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 284,907**	**$ 293,170**	**$ 301,671**	**$ 310,420**	**$ 319,422**	**$ 328,685**	**$ 338,217**	**$ 1,073,079**
	C4 ***Alternative Diameter Pipeline (20")***															
		PV	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
									Operational Year							
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ (17,993,627)	$ -	$ -	$ -	$ -	$ -	$ -	$ (1,392,868)	$ (1,433,261)	$ (1,474,826)	$ (1,517,596)	$ (1,561,606)	$ (1,606,893)	$ (1,653,492)	$ (1,701,444)
3	***Total Avoided Costs***	**$ (118,279,110)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (1,392,868)**	**$ (1,433,261)**	**$ (1,474,826)**	**$ (1,517,596)**	**$ (1,561,606)**	**$ (1,606,893)**	**$ (1,653,492)**	**$ (1,701,444)**
4	Annual O&M Cost	$ 3,680,546	$ -	$ -	$ -	$ -	$ -	$ -	$ 284,907	$ 293,170	$ 301,671	$ 310,420	$ 319,422	$ 328,685	$ 338,217	$ 348,026
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 725,053
7	***Total O&M Costs***	**$ 4,585,126**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 284,907**	**$ 293,170**	**$ 301,671**	**$ 310,420**	**$ 319,422**	**$ 328,685**	**$ 338,217**	**$ 1,073,079**
	C5 ***Alternative Diameter Pipeline (24")***															
		PV	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
									Operational Year							
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ (35,987,253)	$ -	$ -	$ -	$ -	$ -	$ -	$ (2,785,736)	$ (2,866,522)	$ (2,949,652)	$ (3,035,192)	$ (3,123,212)	$ (3,213,785)	$ (3,306,985)	$ (3,402,888)
3	***Total Avoided Costs***	**$ (136,272,737)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (2,785,736)**	**$ (2,866,522)**	**$ (2,949,652)**	**$ (3,035,192)**	**$ (3,123,212)**	**$ (3,213,785)**	**$ (3,306,985)**	**$ (3,402,888)**
4	Annual O&M Cost	$ 3,680,546	$ -	$ -	$ -	$ -	$ -	$ -	$ 284,907	$ 293,170	$ 301,671	$ 310,420	$ 319,422	$ 328,685	$ 338,217	$ 348,026
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 725,053
7	***Total O&M Costs***	**$ 4,585,126**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 284,907**	**$ 293,170**	**$ 301,671**	**$ 310,420**	**$ 319,422**	**$ 328,685**	**$ 338,217**	**$ 1,073,079**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.

		PV (X years after operational)	14	15	16	17	18	19	20	21	22	23	24	25	26	27
		100														
	A ***Proposed Project (Line 3602)***															
		PV	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (8,753,928)	$ (9,007,792)	$ (9,269,018)	$ (9,537,820)	$ (9,814,416)	$ (10,099,035)	$ (10,391,907)	$ (10,693,272)	$ (11,003,377)	$ (11,322,475)	$ (11,650,826)	$ (11,988,700)	$ (12,336,373)	$ (12,694,127)
3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (8,753,928)**	**$ (9,007,792)**	**$ (9,269,018)**	**$ (9,537,820)**	**$ (9,814,416)**	**$ (10,099,035)**	**$ (10,391,907)**	**$ (10,693,272)**	**$ (11,003,377)**	**$ (11,322,475)**	**$ (346,334,415)**	**$ (356,378,113)**	**$ (12,336,373)**	**$ (12,694,127)**
	Manual PV calc over 100 yrs for L3602	***$ (190,253,617)***	*$ (2,841,358)*	*$ (2,712,457)*	*$ (2,589,403)*	*$ (2,471,933)*	*$ (2,359,791)*	*$ (2,252,737)*	*$ (2,150,539)*	*$ (2,052,978)*	*$ (1,959,842)*	*$ (1,870,932)*	*$ (53,092,583)*	*$ (50,683,985)*	*$ (1,627,679)*	*$ (1,553,838)*
4	Annual O&M Cost	$ 3,680,546	$ 358,118	$ 368,504	$ 379,190	$ 390,187	$ 401,502	$ 413,146	$ 425,127	$ 437,456	$ 450,142	$ 463,196	$ 476,629	$ 490,451	$ 504,674	$ 519,310
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,681	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,081,895
7	***Total O&M Costs***	**$ 4,585,126**	**$ 358,118**	**$ 368,504**	**$ 379,190**	**$ 390,187**	**$ 401,502**	**$ 413,146**	**$ 1,310,808**	**$ 437,456**	**$ 450,142**	**$ 463,196**	**$ 476,629**	**$ 490,451**	**$ 504,674**	**$ 1,601,205**
	B ***Hydrotest Alternate (Line 1600)***															
		PV	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 4,242,275	$ 447,648	$ 460,630	$ 473,988	$ 487,734	$ 501,878	$ 516,432	$ 531,409	$ 546,820	$ 562,677	$ 578,995	$ 595,786	$ 613,064	$ 504,674	$ 519,310
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
6	TIMP Cost	$ 1,574,602	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,479,908	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	***Total O&M Costs***	**$ 5,816,878**	**$ 447,648**	**$ 460,630**	**$ 473,988**	**$ 487,734**	**$ 501,878**	**$ 516,432**	**$ 3,011,317**	**$ 546,820**	**$ 562,677**	**$ 578,995**	**$ 595,786**	**$ 613,064**	**$ 504,674**	**$ 519,310**
	C1 ***Alternative Diameter Pipeline (10")***															
		PV	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (334,683,589)**	**$ (344,389,413)**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ 358,118	$ 368,504	$ 379,190	$ 390,187	$ 401,502	$ 413,146	$ 425,127	$ 437,456	$ 450,142	$ 463,196	$ 476,629	$ 490,451	$ 504,674	$ 519,310
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,681	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,081,895
7	Cost of Importing Gas	$ 100,754,939	$ 9,803,488	$ 10,087,789	$ 10,380,335	$ 10,681,365	$ 10,991,124	$ 11,309,867	$ 11,637,853	$ 11,975,351	$ 12,322,636	$ 12,679,992	$ 13,047,712	$ 13,426,096	$ 13,815,452	$ 14,216,101
8	***Total O&M Costs***	**$ 105,340,065**	**$ 358,118**	**$ 368,504**	**$ 379,190**	**$ 390,187**	**$ 401,502**	**$ 413,146**	**$ 1,310,808**	**$ 437,456**	**$ 450,142**	**$ 463,196**	**$ 476,629**	**$ 490,451**	**$ 504,674**	**$ 1,601,205**
	C2 ***Alternative Diameter Pipeline (12")***															
		PV	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (334,683,589)**	**$ (344,389,413)**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ 358,118	$ 368,504	$ 379,190	$ 390,187	$ 401,502	$ 413,146	$ 425,127	$ 437,456	$ 450,142	$ 463,196	$ 476,629	$ 490,451	$ 504,674	$ 519,310
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,681	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,081,895
7	Cost of Importing Gas	$ 67,169,959	$ 6,535,659	$ 6,725,193	$ 6,920,223	$ 7,120,910	$ 7,327,416	$ 7,539,911	$ 7,758,569	$ 7,983,567	$ 8,215,091	$ 8,453,328	$ 8,698,475	$ 8,950,730	$ 9,210,302	$ 9,477,400
8	***Total O&M Costs***	**$ 71,755,086**	**$ 358,118**	**$ 368,504**	**$ 379,190**	**$ 390,187**	**$ 401,502**	**$ 413,146**	**$ 1,310,808**	**$ 437,456**	**$ 450,142**	**$ 463,196**	**$ 476,629**	**$ 490,451**	**$ 504,674**	**$ 1,601,205**
	C3 ***Alternative Diameter Pipeline (16")***															
		PV	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (334,683,589)**	**$ (344,389,413)**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ 358,118	$ 368,504	$ 379,190	$ 390,187	$ 401,502	$ 413,146	$ 425,127	$ 437,456	$ 450,142	$ 463,196	$ 476,629	$ 490,451	$ 504,674	$ 519,310
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,681	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,081,895
7	***Total O&M Costs***	**$ 4,585,126**	**$ 358,118**	**$ 368,504**	**$ 379,190**	**$ 390,187**	**$ 401,502**	**$ 413,146**	**$ 1,310,808**	**$ 437,456**	**$ 450,142**	**$ 463,196**	**$ 476,629**	**$ 490,451**	**$ 504,674**	**$ 1,601,205**
	C4 ***Alternative Diameter Pipeline (20")***															
		PV	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
2	MCS O&M and Emissions Cost	$ (17,993,627)	$ (1,750,786)	$ (1,801,558)	$ (1,853,804)	$ (1,907,564)	$ (1,962,883)	$ (2,019,807)	$ (2,078,381)	$ (2,138,654)	$ (2,200,675)	$ (2,264,495)	$ (2,330,165)	$ (2,397,740)	$ (2,467,275)	$ (2,538,825)
3	***Total Avoided Costs***	**$ (118,279,110)**	**$ (1,750,786)**	**$ (1,801,558)**	**$ (1,853,804)**	**$ (1,907,564)**	**$ (1,962,883)**	**$ (2,019,807)**	**$ (2,078,381)**	**$ (2,138,654)**	**$ (2,200,675)**	**$ (2,264,495)**	**$ (337,013,754)**	**$ (346,787,153)**	**$ (2,467,275)**	**$ (2,538,825)**
4	Annual O&M Cost	$ 3,680,546	$ 358,118	$ 368,504	$ 379,190	$ 390,187	$ 401,502	$ 413,146	$ 425,127	$ 437,456	$ 450,142	$ 463,196	$ 476,629	$ 490,451	$ 504,674	$ 519,310
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,681	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,081,895
7	***Total O&M Costs***	**$ 4,585,126**	**$ 358,118**	**$ 368,504**	**$ 379,190**	**$ 390,187**	**$ 401,502**	**$ 413,146**	**$ 1,310,808**	**$ 437,456**	**$ 450,142**	**$ 463,196**	**$ 476,629**	**$ 490,451**	**$ 504,674**	**$ 1,601,205**
	C5 ***Alternative Diameter Pipeline (24")***															
		PV	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
2	MCS O&M and Emissions Cost	$ (35,987,253)	$ (3,501,571)	$ (3,603,117)	$ (3,707,607)	$ (3,815,128)	$ (3,925,767)	$ (4,039,614)	$ (4,156,763)	$ (4,277,309)	$ (4,401,351)	$ (4,528,990)	$ (4,660,331)	$ (4,795,480)	$ (4,934,549)	$ (5,077,651)
3	***Total Avoided Costs***	**$ (136,272,737)**	**$ (3,501,571)**	**$ (3,603,117)**	**$ (3,707,607)**	**$ (3,815,128)**	**$ (3,925,767)**	**$ (4,039,614)**	**$ (4,156,763)**	**$ (4,277,309)**	**$ (4,401,351)**	**$ (4,528,990)**	**$ (339,343,920)**	**$ (349,184,893)**	**$ (4,934,549)**	**$ (5,077,651)**
4	Annual O&M Cost	$ 3,680,546	$ 358,118	$ 368,504	$ 379,190	$ 390,187	$ 401,502	$ 413,146	$ 425,127	$ 437,456	$ 450,142	$ 463,196	$ 476,629	$ 490,451	$ 504,674	$ 519,310
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,681	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,081,895
7	***Total O&M Costs***	**$ 4,585,126**	**$ 358,118**	**$ 368,504**	**$ 379,190**	**$ 390,187**	**$ 401,502**	**$ 413,146**	**$ 1,310,808**	**$ 437,456**	**$ 450,142**	**$ 463,196**	**$ 476,629**	**$ 490,451**	**$ 504,674**	**$ 1,601,205**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.

		PV (X years after operational)	28	29	30	31	32	33	34	35	36	37	38	39	40
		100													
	A ***Proposed Project (Line 3602)***														
		PV	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (13,062,257)	$ (13,441,063)	$ (13,830,853)	$ (14,231,948)	$ (14,644,675)	$ (15,069,370)	$ (15,506,382)	$ (15,956,067)	$ (16,418,793)	$ (16,894,938)	$ (17,384,891)	$ (17,889,053)	$ (18,407,836)
3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (13,062,257)**	**$ (13,441,063)**	**$ (13,830,853)**	**$ (14,231,948)**	**$ (14,644,675)**	**$ (15,069,370)**	**$ (15,506,382)**	**$ (15,956,067)**	**$ (16,418,793)**	**$ (16,894,938)**	**$ (17,384,891)**	**$ (17,889,053)**	**$ (18,407,836)**
	Manual PV calc over 100 yrs for L3602	***$ (190,253,617)***	*$ (1,483,346)*	*$ (1,416,053)*	*$ (1,351,812)*	*$ (1,290,486)*	*$ (1,231,942)*	*$ (1,176,053)*	*$ (1,122,701)*	*$ (1,071,768)*	*$ (1,023,146)*	*$ (976,730)*	*$ (932,420)*	*$ (890,120)*	*$ (849,739)*
4	Annual O&M Cost	$ 3,680,546	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,321,578	$ -	$ -	$ -	$ -	$ -	$ -
7	***Total O&M Costs***	**$ 4,585,126**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 616,479**	**$ 1,955,935**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 753,054**
	B ***Hydrotest Alternate (Line 1600)***														
		PV	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 4,242,275	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
6	TIMP Cost	$ 1,574,602	$ -	$ -	$ -	$ -	$ -	$ 1,284,332	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,568,863
7	***Total O&M Costs***	**$ 5,816,878**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 1,900,812**	**$ 634,357**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 2,321,917**
	C1 ***Alternative Diameter Pipeline (10")***														
		PV	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,321,578	$ -	$ -	$ -	$ -	$ -	$ -
7	Cost of Importing Gas	$ 100,754,939	$ 14,628,368	$ 15,052,590	$ 15,489,115	$ 15,938,300	$ 16,400,510	$ 16,876,125	$ 17,365,533	$ 17,869,133	$ 18,387,338	$ 18,920,571	$ 19,469,267	$ 20,033,876	$ 20,614,859
8	***Total O&M Costs***	**$ 105,340,065**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 616,479**	**$ 1,955,935**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 753,054**
	C2 ***Alternative Diameter Pipeline (12")***														
		PV	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,321,578	$ -	$ -	$ -	$ -	$ -	$ -
7	Cost of Importing Gas	$ 67,169,959	$ 9,752,245	$ 10,035,060	$ 10,326,077	$ 10,625,533	$ 10,933,674	$ 11,250,750	$ 11,577,022	$ 11,912,755	$ 12,258,225	$ 12,613,714	$ 12,979,512	$ 13,355,917	$ 13,743,239
8	***Total O&M Costs***	**$ 71,755,086**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 616,479**	**$ 1,955,935**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 753,054**
	C3 ***Alternative Diameter Pipeline (16")***														
		PV	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
4	Annual O&M Cost	$ 3,680,546	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,321,578	$ -	$ -	$ -	$ -	$ -	$ -
7	***Total O&M Costs***	**$ 4,585,126**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 616,479**	**$ 1,955,935**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 753,054**
	C4 ***Alternative Diameter Pipeline (20")***														
		PV	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ (17,993,627)	$ (2,612,451)	$ (2,688,213)	$ (2,766,171)	$ (2,846,390)	$ (2,928,935)	$ (3,013,874)	$ (3,101,276)	$ (3,191,213)	$ (3,283,759)	$ (3,378,988)	$ (3,476,978)	$ (3,577,811)	$ (3,681,567)
3	***Total Avoided Costs***	**$ (118,279,110)**	**$ (2,612,451)**	**$ (2,688,213)**	**$ (2,766,171)**	**$ (2,846,390)**	**$ (2,928,935)**	**$ (3,013,874)**	**$ (3,101,276)**	**$ (3,191,213)**	**$ (3,283,759)**	**$ (3,378,988)**	**$ (3,476,978)**	**$ (3,577,811)**	**$ (3,681,567)**
4	Annual O&M Cost	$ 3,680,546	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,321,578	$ -	$ -	$ -	$ -	$ -	$ -
7	***Total O&M Costs***	**$ 4,585,126**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 616,479**	**$ 1,955,935**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 753,054**
	C5 ***Alternative Diameter Pipeline (24")***														
		PV	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2	MCS O&M and Emissions Cost	$ (35,987,253)	$ (5,224,903)	$ (5,376,425)	$ (5,532,341)	$ (5,692,779)	$ (5,857,870)	$ (6,027,748)	$ (6,202,553)	$ (6,382,427)	$ (6,567,517)	$ (6,757,975)	$ (6,953,956)	$ (7,155,621)	$ (7,363,134)
3	***Total Avoided Costs***	**$ (136,272,737)**	**$ (5,224,903)**	**$ (5,376,425)**	**$ (5,532,341)**	**$ (5,692,779)**	**$ (5,857,870)**	**$ (6,027,748)**	**$ (6,202,553)**	**$ (6,382,427)**	**$ (6,567,517)**	**$ (6,757,975)**	**$ (6,953,956)**	**$ (7,155,621)**	**$ (7,363,134)**
4	Annual O&M Cost	$ 3,680,546	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,321,578	$ -	$ -	$ -	$ -	$ -	$ -
7	***Total O&M Costs***	**$ 4,585,126**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 616,479**	**$ 1,955,935**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 753,054**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)

ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS

APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.		PV (X years after operational)	41	42	43	44	45	46	47	48	49	50	51	52	53
1		100													
2	**A** ***Proposed Project (Line 3602)***														
3		**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
4	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5	**2** MCS O&M and Emissions Cost	$ (89,968,134)	$ (18,941,663)	$ (19,490,971)	$ (20,056,209)	$ (20,637,839)	$ (21,236,337)	$ (21,852,190)	$ (22,485,904)	$ (23,137,995)	$ (23,808,997)	$ (24,499,458)	$ (25,209,942)	$ (25,941,030)	$ (26,693,320)
6	**3** ***Total Avoided Costs***	**$ (190,253,617)**	**$ (18,941,663)**	**$ (19,490,971)**	**$ (20,056,209)**	**$ (20,637,839)**	**$ (21,236,337)**	**$ (21,852,190)**	**$ (22,485,904)**	**$ (23,137,995)**	**$ (23,808,997)**	**$ (24,499,458)**	**$ (25,209,942)**	**$ (25,941,030)**	**$ (26,693,320)**
7															
8	***Manual PV calc over 100 yrs for L3602***	***$ (190,253,617)***	*$ (811,189)*	*$ (774,389)*	*$ (739,258)*	*$ (705,721)*	*$ (673,705)*	*$ (643,142)*	*$ (613,965)*	*$ (586,112)*	*$ (559,522)*	*$ (534,139)*	*$ (509,907)*	*$ (486,775)*	*$ (464,692)*
9															
10															
11	**4** Annual O&M Cost	$ 3,680,546	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
12	**5** Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
13	**6** TIMP Cost	$ 904,581	$ 1,614,360	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,972,005	$ -	$ -	$ -	$ -	$ -
14	**7** ***Total O&M Costs***	**$ 4,585,126**	**$ 2,389,253**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 919,886**	**$ 2,918,567**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
15															
16	**B** ***Hydrotest Alternate (Line 1600)***														
17		**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
18	**1** Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
19	**2** MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
20	**3** ***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
21															
22	**4** Annual O&M Cost	$ 4,242,275	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
23	**5** Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
24	**6** TIMP Cost	$ 1,574,602	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,916,428	$ -	$ -	$ -	$ -	$ -	$ -
25	**7** ***Total O&M Costs***	**$ 5,816,878**	**$ 774,893**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 2,836,314**	**$ 946,562**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
26															
27	**C1** ***Alternative Diameter Pipeline (10")***														
28		**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
29	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
30	**2** MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
31	**3** ***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
32															
33	**4** Annual O&M Cost	$ 3,680,546	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
34	**5** Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
35	**6** TIMP Cost	$ 904,581	$ 1,614,360	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,972,005	$ -	$ -	$ -	$ -	$ -
36	**7** Cost of Importing Gas	$ 100,754,939	$ 21,212,689	$ 21,827,857	$ 22,460,865	$ 23,112,230	$ 23,782,485	$ 24,472,177	$ 25,181,870	$ 25,912,145	$ 26,663,597	$ 27,436,841	$ 28,232,509	$ 29,051,252	$ 29,893,739
37	**8** ***Total O&M Costs***	**$ 105,340,065**	**$ 2,389,253**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 919,886**	**$ 2,918,567**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
38															
39	**C2** ***Alternative Diameter Pipeline (12")***														
40		**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
41	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
42	**2** MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
43	**3** ***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
44															
45	**4** Annual O&M Cost	$ 3,680,546	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
46	**5** Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
47	**6** TIMP Cost	$ 904,581	$ 1,614,360	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,972,005	$ -	$ -	$ -	$ -	$ -
48	**7** Cost of Importing Gas	$ 67,169,959	$ 14,141,793	$ 14,551,905	$ 14,973,910	$ 15,408,154	$ 15,854,990	$ 16,314,785	$ 16,787,914	$ 17,274,763	$ 17,775,731	$ 18,291,227	$ 18,821,673	$ 19,367,501	$ 19,929,159
49	**8** ***Total O&M Costs***	**$ 71,755,086**	**$ 2,389,253**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 919,886**	**$ 2,918,567**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
50															
51	**C3** ***Alternative Diameter Pipeline (16")***														
52		**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
53	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
54	**2** MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
55	**3** ***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
56															
57	**4** Annual O&M Cost	$ 3,680,546	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
58	**5** Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
59	**6** TIMP Cost	$ 904,581	$ 1,614,360	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,972,005	$ -	$ -	$ -	$ -	$ -
60	**7** ***Total O&M Costs***	**$ 4,585,126**	**$ 2,389,253**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 919,886**	**$ 2,918,567**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
61															
62	**C4** ***Alternative Diameter Pipeline (20")***														
63		**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
64	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
65	**2** MCS O&M and Emissions Cost	$ (17,993,627)	$ (3,788,333)	$ (3,898,194)	$ (4,011,242)	$ (4,127,568)	$ (4,247,267)	$ (4,370,438)	$ (4,497,181)	$ (4,627,599)	$ (4,761,799)	$ (4,899,892)	$ (5,041,988)	$ (5,188,206)	$ (5,338,664)
66	**3** ***Total Avoided Costs***	**$ (118,279,110)**	**$ (3,788,333)**	**$ (3,898,194)**	**$ (4,011,242)**	**$ (4,127,568)**	**$ (4,247,267)**	**$ (4,370,438)**	**$ (4,497,181)**	**$ (4,627,599)**	**$ (4,761,799)**	**$ (4,899,892)**	**$ (5,041,988)**	**$ (5,188,206)**	**$ (5,338,664)**
67															
68	**4** Annual O&M Cost	$ 3,680,546	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
69	**5** Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
70	**6** TIMP Cost	$ 904,581	$ 1,614,360	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,972,005	$ -	$ -	$ -	$ -	$ -
71	**7** ***Total O&M Costs***	**$ 4,585,126**	**$ 2,389,253**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 919,886**	**$ 2,918,567**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
72															
73	**C5** ***Alternative Diameter Pipeline (24")***														
74		**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
75	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
76	**2** MCS O&M and Emissions Cost	$ (35,987,253)	$ (7,576,665)	$ (7,796,388)	$ (8,022,484)	$ (8,255,136)	$ (8,494,535)	$ (8,740,876)	$ (8,994,362)	$ (9,255,198)	$ (9,523,599)	$ (9,799,783)	$ (10,083,977)	$ (10,376,412)	$ (10,677,328)
77	**3** ***Total Avoided Costs***	**$ (136,272,737)**	**$ (7,576,665)**	**$ (7,796,388)**	**$ (8,022,484)**	**$ (8,255,136)**	**$ (8,494,535)**	**$ (8,740,876)**	**$ (8,994,362)**	**$ (9,255,198)**	**$ (9,523,599)**	**$ (9,799,783)**	**$ (10,083,977)**	**$ (10,376,412)**	**$ (10,677,328)**
78															
79	**4** Annual O&M Cost	$ 3,680,546	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
80	**5** Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
81	**6** TIMP Cost	$ 904,581	$ 1,614,360	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,972,005	$ -	$ -	$ -	$ -	$ -
82	**7** ***Total O&M Costs***	**$ 4,585,126**	**$ 2,389,253**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 919,886**	**$ 2,918,567**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
83															
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WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	54	55	56	57	58	59	60	61	62	63	64	65	66
1			100													
2																
3	A	***Proposed Project (Line 3602)***														
4			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
5																
6	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (27,467,427)	$ (28,263,982)	$ (29,083,638)	$ (29,927,063)	$ (30,794,948)	$ (31,688,001)	$ (32,606,953)	$ (33,552,555)	$ (34,525,579)	$ (35,526,821)	$ (36,557,099)	$ (37,617,255)	$ (38,708,155)
8	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (27,467,427)**	**$ (28,263,982)**	**$ (29,083,638)**	**$ (29,927,063)**	**$ (30,794,948)**	**$ (31,688,001)**	**$ (32,606,953)**	**$ (33,552,555)**	**$ (34,525,579)**	**$ (35,526,821)**	**$ (36,557,099)**	**$ (37,617,255)**	**$ (38,708,155)**
9																
10		***Manual PV calc over 100 yrs for L3602***	***$ (190,253,617)***	*$ (443,611)*	*$ (423,486)*	*$ (404,274)*	*$ (385,934)*	*$ (368,425)*	*$ (351,711)*	*$ (335,756)*	*$ (320,524)*	*$ (305,983)*	*$ (292,102)*	*$ (278,850)*	*$ (266,200)*	*$ (254,124)*
11																
12																
13	4	Annual O&M Cost	$ 3,680,546	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
14	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
15	6	TIMP Cost	$ 904,581	$ -	$ 2,408,882	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942,546	$ -	$ -	$ -	$ -
16	7	***Total O&M Costs***	**$ 4,585,126**	**$ 1,123,677**	**$ 3,565,146**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 1,372,616**	**$ 4,354,968**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
17																
18	B	***Hydrotest Alternate (Line 1600)***														
19			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
20																
21	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
24																
25																
26	4	Annual O&M Cost	$ 4,242,275	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
27	5	Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
28	6	TIMP Cost	$ 1,574,602	$ 2,340,994	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,859,617	$ -	$ -	$ -	$ -	$ -
29	7	***Total O&M Costs***	**$ 5,816,878**	**$ 3,464,671**	**$ 1,156,264**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 4,232,233**	**$ 1,412,422**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
30																
31	C1	***Alternative Diameter Pipeline (10")***														
32																
33			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
34	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
37																
38																
39	4	Annual O&M Cost	$ 3,680,546	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
40	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
41	6	TIMP Cost	$ 904,581	$ -	$ 2,408,882	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942,546	$ -	$ -	$ -	$ -
42	7	Cost of Importing Gas	$ 100,754,939	$ 30,760,657	$ 31,652,716	$ 32,570,645	$ 33,515,193	$ 34,487,134	$ 35,487,261	$ 36,516,392	$ 37,575,367	$ 38,665,053	$ 39,786,339	$ 40,940,143	$ 42,127,407	$ 43,349,102
43	8	***Total O&M Costs***	**$ 105,340,065**	**$ 1,123,677**	**$ 3,565,146**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 1,372,616**	**$ 4,354,968**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
44																
45	C2	***Alternative Diameter Pipeline (12")***														
46			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
47																
48	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
49	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
51																
52																
53	4	Annual O&M Cost	$ 3,680,546	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
54	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
55	6	TIMP Cost	$ 904,581	$ -	$ 2,408,882	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942,546	$ -	$ -	$ -	$ -
56	7	Cost of Importing Gas	$ 67,169,959	$ 20,507,105	$ 21,101,811	$ 21,713,763	$ 22,343,462	$ 22,991,423	$ 23,658,174	$ 24,344,261	$ 25,050,245	$ 25,776,702	$ 26,524,226	$ 27,293,429	$ 28,084,938	$ 28,899,401
57	8	***Total O&M Costs***	**$ 71,755,086**	**$ 1,123,677**	**$ 3,565,146**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 1,372,616**	**$ 4,354,968**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
58																
59	C3	***Alternative Diameter Pipeline (16")***														
60			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
61																
62	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
63	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
64	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
65																
66																
67	4	Annual O&M Cost	$ 3,680,546	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
68	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
69	6	TIMP Cost	$ 904,581	$ -	$ 2,408,882	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942,546	$ -	$ -	$ -	$ -
70	7	***Total O&M Costs***	**$ 4,585,126**	**$ 1,123,677**	**$ 3,565,146**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 1,372,616**	**$ 4,354,968**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
71																
72	C4	***Alternative Diameter Pipeline (20")***														
73			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
74																
75	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
76	2	MCS O&M and Emissions Cost	$ (17,993,627)	$ (5,493,485)	$ (5,652,796)	$ (5,816,728)	$ (5,985,413)	$ (6,158,990)	$ (6,337,600)	$ (6,521,391)	$ (6,710,511)	$ (6,905,116)	$ (7,105,364)	$ (7,311,420)	$ (7,523,451)	$ (7,741,631)
77	3	***Total Avoided Costs***	**$ (118,279,110)**	**$ (5,493,485)**	**$ (5,652,796)**	**$ (5,816,728)**	**$ (5,985,413)**	**$ (6,158,990)**	**$ (6,337,600)**	**$ (6,521,391)**	**$ (6,710,511)**	**$ (6,905,116)**	**$ (7,105,364)**	**$ (7,311,420)**	**$ (7,523,451)**	**$ (7,741,631)**
78																
79																
80	4	Annual O&M Cost	$ 3,680,546	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
81	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
82	6	TIMP Cost	$ 904,581	$ -	$ 2,408,882	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942,546	$ -	$ -	$ -	$ -
83	7	***Total O&M Costs***	**$ 4,585,126**	**$ 1,123,677**	**$ 3,565,146**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 1,372,616**	**$ 4,354,968**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
84																
85	C5	***Alternative Diameter Pipeline (24")***														
86			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
87																
88	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
89	2	MCS O&M and Emissions Cost	$ (35,987,253)	$ (10,986,971)	$ (11,305,593)	$ (11,633,455)	$ (11,970,825)	$ (12,317,979)	$ (12,675,201)	$ (13,042,781)	$ (13,421,022)	$ (13,810,232)	$ (14,210,728)	$ (14,622,839)	$ (15,046,902)	$ (15,483,262)
90	3	***Total Avoided Costs***	**$ (136,272,737)**	**$ (10,986,971)**	**$ (11,305,593)**	**$ (11,633,455)**	**$ (11,970,825)**	**$ (12,317,979)**	**$ (12,675,201)**	**$ (13,042,781)**	**$ (13,421,022)**	**$ (13,810,232)**	**$ (14,210,728)**	**$ (14,622,839)**	**$ (15,046,902)**	**$ (15,483,262)**
91																
92																
93	4	Annual O&M Cost	$ 3,680,546	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
94	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
95	6	TIMP Cost	$ 904,581	$ -	$ 2,408,882	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942,546	$ -	$ -	$ -	$ -
96	7	***Total O&M Costs***	**$ 4,585,126**	**$ 1,123,677**	**$ 3,565,146**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 1,372,616**	**$ 4,354,968**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
97																

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	67	68	69	70	71	72	73	74	75	76	77	78	79
2			100													
3	A	***Proposed Project (Line 3602)***														
4			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
6	**1**	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	**2**	MCS O&M and Emissions Cost	$ (89,968,134)	$ (39,830,691)	$ (40,985,781)	$ (42,174,369)	$ (43,397,426)	$ (44,655,951)	$ (45,950,974)	$ (47,283,552)	$ (48,654,775)	$ (50,065,764)	$ (51,517,671)	$ (53,011,683)	$ (54,549,022)	$ (56,130,944)
8	**3**	***Total Avoided Costs***	**$ (190,253,617)**	**$ (39,830,691)**	**$ (40,985,781)**	**$ (42,174,369)**	**$ (43,397,426)**	**$ (44,655,951)**	**$ (45,950,974)**	**$ (47,283,552)**	**$ (48,654,775)**	**$ (50,065,764)**	**$ (51,517,671)**	**$ (53,011,683)**	**$ (54,549,022)**	**$ (56,130,944)**
9																
10		***Manual PV calc over 100 yrs for L3602***	***$ (190,253,617)***	*$ (242,595)*	*$ (231,589)*	*$ (221,083)*	*$ (211,053)*	*$ (201,479)*	*$ (192,339)*	*$ (183,613)*	*$ (175,283)*	*$ (167,331)*	*$ (159,740)*	*$ (152,493)*	*$ (145,575)*	*$ (138,971)*
11																
12																
13	**4**	Annual O&M Cost	$ 3,680,546	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
14	**5**	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
15	**6**	TIMP Cost	$ 904,581	$ -	$ -	$ 3,594,437	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,390,748	$ -	$ -	$ -
16	**7**	***Total O&M Costs***	**$ 4,585,126**	**$ 1,629,451**	**$ 1,676,705**	**$ 5,319,767**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 2,048,162**	**$ 6,498,307**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
17																
18	B	***Hydrotest Alternate (Line 1600)***														
19			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
20																
21	**1**	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	**2**	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	**3**	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
24																
25																
26	**4**	Annual O&M Cost	$ 4,242,275	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
27	**5**	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
28	**6**	TIMP Cost	$ 1,574,602	$ -	$ 3,493,136	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,267,005	$ -	$ -	$ -	$ -
29	**7**	***Total O&M Costs***	**$ 5,816,878**	**$ 1,629,451**	**$ 5,169,841**	**$ 1,725,330**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 6,315,167**	**$ 2,107,559**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
30																
31	C1	***Alternative Diameter Pipeline (10")***														
32			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
33																
34	**1**	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35	**2**	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	**3**	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
37																
38																
39	**4**	Annual O&M Cost	$ 3,680,546	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
40	**5**	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
41	**6**	TIMP Cost	$ 904,581	$ -	$ -	$ 3,594,437	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,390,748	$ -	$ -	$ -
42	**7**	Cost of Importing Gas	$ 100,754,939	$ 44,606,226	$ 45,899,806	$ 47,230,901	$ 48,600,597	$ 50,010,014	$ 51,460,305	$ 52,952,653	$ 54,488,280	$ 56,068,441	$ 57,694,425	$ 59,367,564	$ 61,089,223	$ 62,860,810
43	**8**	***Total O&M Costs***	**$ 105,340,065**	**$ 1,629,451**	**$ 1,676,705**	**$ 5,319,767**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 2,048,162**	**$ 6,498,307**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
44																
45	C2	***Alternative Diameter Pipeline (12")***														
46			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
47																
48	**1**	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
49	**2**	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	**3**	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
51																
52																
53	**4**	Annual O&M Cost	$ 3,680,546	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
54	**5**	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
55	**6**	TIMP Cost	$ 904,581	$ -	$ -	$ 3,594,437	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,390,748	$ -	$ -	$ -
56	**7**	Cost of Importing Gas	$ 67,169,959	$ 29,737,484	$ 30,599,871	$ 31,487,267	$ 32,400,398	$ 33,340,009	$ 34,306,870	$ 35,301,769	$ 36,325,520	$ 37,378,960	$ 38,462,950	$ 39,578,376	$ 40,726,149	$ 41,907,207
57	**8**	***Total O&M Costs***	**$ 71,755,086**	**$ 1,629,451**	**$ 1,676,705**	**$ 5,319,767**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 2,048,162**	**$ 6,498,307**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
58																
59	C3	***Alternative Diameter Pipeline (16")***														
60			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
61																
62	**1**	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
63	**2**	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
64	**3**	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
65																
66																
67	**4**	Annual O&M Cost	$ 3,680,546	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
68	**5**	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
69	**6**	TIMP Cost	$ 904,581	$ -	$ -	$ 3,594,437	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,390,748	$ -	$ -	$ -
70	**7**	***Total O&M Costs***	**$ 4,585,126**	**$ 1,629,451**	**$ 1,676,705**	**$ 5,319,767**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 2,048,162**	**$ 6,498,307**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
71																
72	C4	***Alternative Diameter Pipeline (20")***														
73			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
74																
75	**1**	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
76	**2**	MCS O&M and Emissions Cost	$ (17,993,627)	$ (7,966,138)	$ (8,197,156)	$ (8,434,874)	$ (8,679,485)	$ (8,931,190)	$ (9,190,195)	$ (9,456,710)	$ (9,730,955)	$ (10,013,153)	$ (10,303,534)	$ (10,602,337)	$ (10,909,804)	$ (11,226,189)
77	**3**	***Total Avoided Costs***	**$ (118,279,110)**	**$ (7,966,138)**	**$ (8,197,156)**	**$ (8,434,874)**	**$ (8,679,485)**	**$ (8,931,190)**	**$ (9,190,195)**	**$ (9,456,710)**	**$ (9,730,955)**	**$ (10,013,153)**	**$ (10,303,534)**	**$ (10,602,337)**	**$ (10,909,804)**	**$ (11,226,189)**
78																
79																
80	**4**	Annual O&M Cost	$ 3,680,546	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
81	**5**	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
82	**6**	TIMP Cost	$ 904,581	$ -	$ -	$ 3,594,437	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,390,748	$ -	$ -	$ -
83	**7**	***Total O&M Costs***	**$ 4,585,126**	**$ 1,629,451**	**$ 1,676,705**	**$ 5,319,767**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 2,048,162**	**$ 6,498,307**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
84																
85	C5	***Alternative Diameter Pipeline (24")***														
86			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
87																
88	**1**	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
89	**2**	MCS O&M and Emissions Cost	$ (35,987,253)	$ (15,932,277)	$ (16,394,313)	$ (16,869,748)	$ (17,358,970)	$ (17,862,380)	$ (18,380,390)	$ (18,913,421)	$ (19,461,910)	$ (20,026,305)	$ (20,607,068)	$ (21,204,673)	$ (21,819,609)	$ (22,452,377)
90	**3**	***Total Avoided Costs***	**$ (136,272,737)**	**$ (15,932,277)**	**$ (16,394,313)**	**$ (16,869,748)**	**$ (17,358,970)**	**$ (17,862,380)**	**$ (18,380,390)**	**$ (18,913,421)**	**$ (19,461,910)**	**$ (20,026,305)**	**$ (20,607,068)**	**$ (21,204,673)**	**$ (21,819,609)**	**$ (22,452,377)**
91																
92																
93	**4**	Annual O&M Cost	$ 3,680,546	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
94	**5**	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
95	**6**	TIMP Cost	$ 904,581	$ -	$ -	$ 3,594,437	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,390,748	$ -	$ -	$ -
96	**7**	***Total O&M Costs***	**$ 4,585,126**	**$ 1,629,451**	**$ 1,676,705**	**$ 5,319,767**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 2,048,162**	**$ 6,498,307**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
97																

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)

ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS

APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.

		PV (X years after operational)	80	81	82	83	84	85	86	87	88	89	90	91	92
2		100													
3	**A** ***Proposed Project (Line 3602)***														
4		**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
6	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	**2** MCS O&M and Emissions Cost	$ (89,968,134)	$ (57,758,741)	$ (59,433,744)	$ (61,157,323)	$ (62,930,885)	$ (64,755,881)	$ (66,633,802)	$ (68,566,182)	$ (70,554,601)	$ (72,600,685)	$ (74,706,104)	$ (76,872,581)	$ (79,101,886)	$ (81,395,841)
8	**3** ***Total Avoided Costs***	**$ (190,253,617)**	**$ (57,758,741)**	**$ (59,433,744)**	**$ (61,157,323)**	**$ (62,930,885)**	**$ (64,755,881)**	**$ (66,633,802)**	**$ (68,566,182)**	**$ (70,554,601)**	**$ (72,600,685)**	**$ (74,706,104)**	**$ (76,872,581)**	**$ (79,101,886)**	**$ (81,395,841)**
10	***Manual PV calc over 100 yrs for L3602***	***$ (190,253,617)***	*$ (132,667)*	*$ (126,648)*	*$ (120,903)*	*$ (115,418)*	*$ (110,182)*	*$ (105,183)*	*$ (100,411)*	*$ (95,856)*	*$ (91,508)*	*$ (87,356)*	*$ (83,393)*	*$ (79,610)*	*$ (75,998)*
13	**4** Annual O&M Cost	$ 3,680,546	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
14	**5** Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
15	**6** TIMP Cost	$ 904,581	$ -	$ -	$ -	$ 5,363,473	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,551,696	$ -	$ -
16	**7** ***Total O&M Costs***	**$ 4,585,126**	**$ 2,362,878**	**$ 2,431,401**	**$ 2,501,912**	**$ 7,937,940**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 3,056,185**	**$ 9,696,510**	**$ 3,236,014**	**$ 3,329,858**
18	**B** ***Hydrotest Alternate (Line 1600)***														
19		**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
21	**1** Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	**2** MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	**3** ***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
26	**4** Annual O&M Cost	$ 4,242,275	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
27	**5** Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
28	**6** TIMP Cost	$ 1,574,602	$ -	$ -	$ 5,212,316	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,367,051	$ -	$ -	$ -
29	**7** ***Total O&M Costs***	**$ 5,816,878**	**$ 2,362,878**	**$ 2,431,401**	**$ 7,714,228**	**$ 2,574,467**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 9,423,236**	**$ 3,144,814**	**$ 3,236,014**	**$ 3,329,858**
31	**C1** ***Alternative Diameter Pipeline (10")***														
34	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35	**2** MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	**3** ***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
39	**4** Annual O&M Cost	$ 3,680,546	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
40	**5** Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
41	**6** TIMP Cost	$ 904,581	$ -	$ -	$ -	$ 5,363,473	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,551,696	$ -	$ -
42	**7** Cost of Importing Gas	$ 100,754,939	$ 64,683,774	$ 66,559,603	$ 68,489,832	$ 70,476,037	$ 72,519,842	$ 74,622,917	$ 76,786,982	$ 79,013,805	$ 81,305,205	$ 83,663,056	$ 86,089,284	$ 88,585,874	$ 91,154,864
43	**8** ***Total O&M Costs***	**$ 105,340,065**	**$ 2,362,878**	**$ 2,431,401**	**$ 2,501,912**	**$ 7,937,940**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 3,056,185**	**$ 9,696,510**	**$ 3,236,014**	**$ 3,329,858**
45	**C2** ***Alternative Diameter Pipeline (12")***														
48	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
49	**2** MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	**3** ***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
53	**4** Annual O&M Cost	$ 3,680,546	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
54	**5** Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
55	**6** TIMP Cost	$ 904,581	$ -	$ -	$ -	$ 5,363,473	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,551,696	$ -	$ -
56	**7** Cost of Importing Gas	$ 67,169,959	$ 43,122,516	$ 44,373,069	$ 45,659,888	$ 46,984,025	$ 48,346,561	$ 49,748,612	$ 51,191,321	$ 52,675,870	$ 54,203,470	$ 55,775,371	$ 57,392,856	$ 59,057,249	$ 60,769,909
57	**8** ***Total O&M Costs***	**$ 71,755,086**	**$ 2,362,878**	**$ 2,431,401**	**$ 2,501,912**	**$ 7,937,940**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 3,056,185**	**$ 9,696,510**	**$ 3,236,014**	**$ 3,329,858**
59	**C3** ***Alternative Diameter Pipeline (16")***														
62	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
63	**2** MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
64	**3** ***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
67	**4** Annual O&M Cost	$ 3,680,546	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
68	**5** Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
69	**6** TIMP Cost	$ 904,581	$ -	$ -	$ -	$ 5,363,473	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,551,696	$ -	$ -
70	**7** ***Total O&M Costs***	**$ 4,585,126**	**$ 2,362,878**	**$ 2,431,401**	**$ 2,501,912**	**$ 7,937,940**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 3,056,185**	**$ 9,696,510**	**$ 3,236,014**	**$ 3,329,858**
72	**C4** ***Alternative Diameter Pipeline (20")***														
75	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
76	**2** MCS O&M and Emissions Cost	$ (17,993,627)	$ (11,551,748)	$ (11,886,749)	$ (12,231,465)	$ (12,586,177)	$ (12,951,176)	$ (13,326,760)	$ (13,713,236)	$ (14,110,920)	$ (14,520,137)	$ (14,941,221)	$ (15,374,516)	$ (15,820,377)	$ (16,279,168)
77	**3** ***Total Avoided Costs***	**$ (118,279,110)**	**$ (11,551,748)**	**$ (11,886,749)**	**$ (12,231,465)**	**$ (12,586,177)**	**$ (12,951,176)**	**$ (13,326,760)**	**$ (13,713,236)**	**$ (14,110,920)**	**$ (14,520,137)**	**$ (14,941,221)**	**$ (15,374,516)**	**$ (15,820,377)**	**$ (16,279,168)**
80	**4** Annual O&M Cost	$ 3,680,546	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
81	**5** Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
82	**6** TIMP Cost	$ 904,581	$ -	$ -	$ -	$ 5,363,473	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,551,696	$ -	$ -
83	**7** ***Total O&M Costs***	**$ 4,585,126**	**$ 2,362,878**	**$ 2,431,401**	**$ 2,501,912**	**$ 7,937,940**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 3,056,185**	**$ 9,696,510**	**$ 3,236,014**	**$ 3,329,858**
85	**C5** ***Alternative Diameter Pipeline (24")***														
88	**1** Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
89	**2** MCS O&M and Emissions Cost	$ (35,987,253)	$ (23,103,496)	$ (23,773,498)	$ (24,462,929)	$ (25,172,354)	$ (25,902,352)	$ (26,653,521)	$ (27,426,473)	$ (28,221,840)	$ (29,040,274)	$ (29,882,442)	$ (30,749,033)	$ (31,640,755)	$ (32,558,336)
90	**3** ***Total Avoided Costs***	**$ (136,272,737)**	**$ (23,103,496)**	**$ (23,773,498)**	**$ (24,462,929)**	**$ (25,172,354)**	**$ (25,902,352)**	**$ (26,653,521)**	**$ (27,426,473)**	**$ (28,221,840)**	**$ (29,040,274)**	**$ (29,882,442)**	**$ (30,749,033)**	**$ (31,640,755)**	**$ (32,558,336)**
93	**4** Annual O&M Cost	$ 3,680,546	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
94	**5** Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
95	**6** TIMP Cost	$ 904,581	$ -	$ -	$ -	$ 5,363,473	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,551,696	$ -	$ -
96	**7** ***Total O&M Costs***	**$ 4,585,126**	**$ 2,362,878**	**$ 2,431,401**	**$ 2,501,912**	**$ 7,937,940**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 3,056,185**	**$ 9,696,510**	**$ 3,236,014**	**$ 3,329,858**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	93	94	95	96	97	98	99	100	101	102	103	104	105
2			100													
3	A	***Proposed Project (Line 3602)***														
4			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
5																
6	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (83,756,320)	$ (86,185,254)	$ (88,684,626)	$ (91,256,480)	$ (93,902,918)	$ (96,626,103)	$ (99,428,260)	$ (102,311,679)	$ (105,278,718)	$ (108,331,801)	$ (111,473,423)	$ (114,706,152)	$ (118,032,631)
8	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (83,756,320)**	**$ (86,185,254)**	**$ (88,684,626)**	**$ (91,256,480)**	**$ (93,902,918)**	**$ (96,626,103)**	**$ (99,428,260)**	**$ (102,311,679)**	**$ (105,278,718)**	**$ (108,331,801)**	**$ (111,473,423)**	**$ (114,706,152)**	**$ (118,032,631)**
9																
10		***Manual PV calc over 100 yrs for L3602***	***$ (190,253,617)***	*$ (72,551)*	*$ (69,259)*	*$ (66,117)*	*$ (63,118)*	*$ (60,254)*	*$ (57,521)*	*$ (54,911)*	*$ (52,420)*	*$ (50,042)*	*$ (47,772)*	*$ (45,605)*	*$ (43,536)*	*$ (41,561)*
11																
12																
13	4	Annual O&M Cost	$ 3,680,546	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
14	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
15	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ 8,003,157	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,776,175	$ -
16	7	***Total O&M Costs***	**$ 4,585,126**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 3,733,251**	**$ 11,844,673**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 4,560,315**	**$ 14,468,739**	**$ 4,828,648**
17																
18	B	***Hydrotest Alternate (Line 1600)***														
19			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
20																
21	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
24																
25																
26	4	Annual O&M Cost	$ 4,242,275	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
27	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
28	6	TIMP Cost	$ 1,574,602	$ -	$ -	$ -	$ 7,777,607	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,500,656	$ -	$ -
29	7	***Total O&M Costs***	**$ 5,816,878**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 11,510,858**	**$ 3,841,516**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 14,060,971**	**$ 4,692,564**	**$ 4,828,648**
30																
31	C1	***Alternative Diameter Pipeline (10")***														
32			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
33																
34	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
37																
38																
39	4	Annual O&M Cost	$ 3,680,546	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
40	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
41	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ 8,003,157	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,776,175	$ -
42	7	Cost of Importing Gas	$ 100,754,939	$ 93,798,355	$ 96,518,507	$ 99,317,544	$ 102,197,753	$ 105,161,488	$ 108,211,171	$ 111,349,295	$ 114,578,424	$ 117,901,199	$ 121,320,333	$ 124,838,623	$ 128,458,943	$ 132,184,253
43	8	***Total O&M Costs***	**$ 105,340,065**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 3,733,251**	**$ 11,844,673**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 4,560,315**	**$ 14,468,739**	**$ 4,828,648**
44																
45	C2	***Alternative Diameter Pipeline (12")***														
46			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
47																
48	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
49	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
51																
52																
53	4	Annual O&M Cost	$ 3,680,546	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
54	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
55	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ 8,003,157	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,776,175	$ -
56	7	Cost of Importing Gas	$ 67,169,959	$ 62,532,237	$ 64,345,672	$ 66,211,696	$ 68,131,835	$ 70,107,658	$ 72,140,781	$ 74,232,863	$ 76,385,616	$ 78,600,799	$ 80,880,222	$ 83,225,749	$ 85,639,295	$ 88,122,835
57	8	***Total O&M Costs***	**$ 71,755,086**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 3,733,251**	**$ 11,844,673**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 4,560,315**	**$ 14,468,739**	**$ 4,828,648**
58																
59	C3	***Alternative Diameter Pipeline (16")***														
60			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
61																
62	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
63	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
64	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
65																
66																
67	4	Annual O&M Cost	$ 3,680,546	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
68	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
69	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ 8,003,157	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,776,175	$ -
70	7	***Total O&M Costs***	**$ 4,585,126**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 3,733,251**	**$ 11,844,673**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 4,560,315**	**$ 14,468,739**	**$ 4,828,648**
71																
72	C4	***Alternative Diameter Pipeline (20")***														
73			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
74																
75	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
76	2	MCS O&M and Emissions Cost	$ (17,993,627)	$ (16,751,264)	$ (17,237,051)	$ (17,736,925)	$ (18,251,296)	$ (18,780,584)	$ (19,325,221)	$ (19,885,652)	$ (20,462,336)	$ (21,055,744)	$ (21,666,360)	$ (22,294,685)	$ (22,941,230)	$ (23,606,526)
77	3	***Total Avoided Costs***	**$ (118,279,110)**	**$ (16,751,264)**	**$ (17,237,051)**	**$ (17,736,925)**	**$ (18,251,296)**	**$ (18,780,584)**	**$ (19,325,221)**	**$ (19,885,652)**	**$ (20,462,336)**	**$ (21,055,744)**	**$ (21,666,360)**	**$ (22,294,685)**	**$ (22,941,230)**	**$ (23,606,526)**
78																
79																
80	4	Annual O&M Cost	$ 3,680,546	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
81	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
82	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ 8,003,157	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,776,175	$ -
83	7	***Total O&M Costs***	**$ 4,585,126**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 3,733,251**	**$ 11,844,673**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 4,560,315**	**$ 14,468,739**	**$ 4,828,648**
84																
85	C5	***Alternative Diameter Pipeline (24")***														
86			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
87																
88	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
89	2	MCS O&M and Emissions Cost	$ (35,987,253)	$ (33,502,526)	$ (34,474,101)	$ (35,473,850)	$ (36,502,592)	$ (37,561,167)	$ (38,650,441)	$ (39,771,304)	$ (40,924,672)	$ (42,111,487)	$ (43,332,720)	$ (44,589,369)	$ (45,882,461)	$ (47,213,052)
90	3	***Total Avoided Costs***	**$ (136,272,737)**	**$ (33,502,526)**	**$ (34,474,101)**	**$ (35,473,850)**	**$ (36,502,592)**	**$ (37,561,167)**	**$ (38,650,441)**	**$ (39,771,304)**	**$ (40,924,672)**	**$ (42,111,487)**	**$ (43,332,720)**	**$ (44,589,369)**	**$ (45,882,461)**	**$ (47,213,052)**
91																
92																
93	4	Annual O&M Cost	$ 3,680,546	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
94	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
95	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ 8,003,157	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,776,175	$ -
96	7	***Total O&M Costs***	**$ 4,585,126**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 3,733,251**	**$ 11,844,673**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 4,560,315**	**$ 14,468,739**	**$ 4,828,648**
97																

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	106	107	108	109	110	111	112	113	114	115	116
1														
2			100											
3	A	***Proposed Project (Line 3602)***												
4			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
5														
6	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
7	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (121,455,577)	$ (124,977,789)	$ (128,602,145)	$ (132,331,607)	$ (136,169,223)	$ (140,118,131)	$ (144,181,557)	$ (148,362,822)	$ (152,665,344)	$ (157,092,638)	$ (161,648,325)
8	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (121,455,577)**	**$ (124,977,789)**	**$ (128,602,145)**	**$ (132,331,607)**	**$ (136,169,223)**	**$ (140,118,131)**	**$ (144,181,557)**	**$ (148,362,822)**	**$ (152,665,344)**	**$ (157,092,638)**	**$ (161,648,325)**
9														
10		***Manual PV calc over 100 yrs for L3602***	***$ (190,253,617)***	*$ (39,675)*										
11														
12														
13	4	Annual O&M Cost	$ 3,680,546	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
14	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
15	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
16	7	***Total O&M Costs***	**$ 4,585,126**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 5,570,606**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
17														
18	B	***Hydrotest Alternate (Line 1600)***												
19			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
20														
21	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
22	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
23	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
24														
25														
26	4	Annual O&M Cost	$ 4,242,275	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
27	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
28	6	TIMP Cost	$ 1,574,602	$ -	$ -	$ -	$ -	$ 11,605,430	$ -	$ -	$ -	$ -	$ -	$ -
29	7	***Total O&M Costs***	**$ 5,816,878**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 17,176,036**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
30														
31	C1	***Alternative Diameter Pipeline (10")***												
32			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
33														
34	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
35	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
36	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
37														
38														
39	4	Annual O&M Cost	$ 3,680,546	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
40	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
41	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
42	7	Cost of Importing Gas	$ 100,754,939	$ 136,017,596	$ 139,962,106	$ 144,021,007	$ 148,197,616	$ 152,495,347	$ 156,917,712	$ 161,468,326	$ 166,150,908	$ 170,969,284	$ 175,927,393	$ 181,029,287
43	8	***Total O&M Costs***	**$ 105,340,065**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 5,570,606**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
44														
45	C2	***Alternative Diameter Pipeline (12")***												
46			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
47														
48	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
49	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
51														
52														
53	4	Annual O&M Cost	$ 3,680,546	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
54	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
55	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
56	7	Cost of Importing Gas	$ 67,169,959	$ 90,678,397	$ 93,308,071	$ 96,014,005	$ 98,798,411	$ 101,663,565	$ 104,611,808	$ 107,645,551	$ 110,767,272	$ 113,979,523	$ 117,284,929	$ 120,686,192
57	8	***Total O&M Costs***	**$ 71,755,086**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 5,570,606**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
58														
59	C3	***Alternative Diameter Pipeline (16")***												
60			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
61														
62	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
63	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
64	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
65														
66														
67	4	Annual O&M Cost	$ 3,680,546	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
68	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
69	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
70	7	***Total O&M Costs***	**$ 4,585,126**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 5,570,606**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
71														
72	C4	***Alternative Diameter Pipeline (20")***												
73			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
74														
75	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
76	2	MCS O&M and Emissions Cost	$ (17,993,627)	$ (24,291,115)	$ (24,995,558)	$ (25,720,429)	$ (26,466,321)	$ (27,233,845)	$ (28,023,626)	$ (28,836,311)	$ (29,672,564)	$ (30,533,069)	$ (31,418,528)	$ (32,329,665)
77	3	***Total Avoided Costs***	**$ (118,279,110)**	**$ (24,291,115)**	**$ (24,995,558)**	**$ (25,720,429)**	**$ (26,466,321)**	**$ (27,233,845)**	**$ (28,023,626)**	**$ (28,836,311)**	**$ (29,672,564)**	**$ (30,533,069)**	**$ (31,418,528)**	**$ (32,329,665)**
78														
79														
80	4	Annual O&M Cost	$ 3,680,546	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
81	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
82	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
83	7	***Total O&M Costs***	**$ 4,585,126**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 5,570,606**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
84														
85	C5	***Alternative Diameter Pipeline (24")***												
86			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
87														
88	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
89	2	MCS O&M and Emissions Cost	$ (35,987,253)	$ (48,582,231)	$ (49,991,115)	$ (51,440,858)	$ (52,932,643)	$ (54,467,689)	$ (56,047,252)	$ (57,672,623)	$ (59,345,129)	$ (61,066,137)	$ (62,837,055)	$ (64,659,330)
90	3	***Total Avoided Costs***	**$ (136,272,737)**	**$ (48,582,231)**	**$ (49,991,115)**	**$ (51,440,858)**	**$ (52,932,643)**	**$ (54,467,689)**	**$ (56,047,252)**	**$ (57,672,623)**	**$ (59,345,129)**	**$ (61,066,137)**	**$ (62,837,055)**	**$ (64,659,330)**
91														
92														
93	4	Annual O&M Cost	$ 3,680,546	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
94	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
95	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
96	7	***Total O&M Costs***	**$ 4,585,126**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 5,570,606**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
97														

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)

ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS

APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.

			PV (X years after operational)	0	1	2	3	4	5	6	7	8	9	10	11	12	13
1																	
2			100														
98	C6	***Alternative Diameter Pipeline (30")***															
99			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
100										Operational Year							
101	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
102	2	MCS O&M and Emissions Cost	$ (62,977,694)	$ -	$ -	$ -	$ -	$ -	$ -	$ (4,875,038)	$ (5,016,414)	$ (5,161,890)	$ (5,311,585)	$ (5,465,621)	$ (5,624,124)	$ (5,787,224)	$ (5,955,053)
103	3	***Total Avoided Costs***	**$ (163,263,177)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (4,875,038)**	**$ (5,016,414)**	**$ (5,161,890)**	**$ (5,311,585)**	**$ (5,465,621)**	**$ (5,624,124)**	**$ (5,787,224)**	**$ (5,955,053)**
104																	
105																	
106	4	Annual O&M Cost	$ 3,680,546	$ -	$ -	$ -	$ -	$ -	$ -	$ 284,907	$ 293,170	$ 301,671	$ 310,420	$ 319,422	$ 328,685	$ 338,217	$ 348,026
107	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
108	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 725,053
109	7	***Total O&M Costs***	**$ 4,585,126**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 284,907**	**$ 293,170**	**$ 301,671**	**$ 310,420**	**$ 319,422**	**$ 328,685**	**$ 338,217**	**$ 1,073,079**
110																	
111	C7	***Alternative Diameter Pipeline (42")***															
112			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
113										Operational Year							
114	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
115	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ -	$ -	$ -	$ -	$ -	$ -	$ (6,964,340)	$ (7,166,306)	$ (7,374,129)	$ (7,587,979)	$ (7,808,030)	$ (8,034,463)	$ (8,267,462)	$ (8,507,219)
116	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (6,964,340)**	**$ (7,166,306)**	**$ (7,374,129)**	**$ (7,587,979)**	**$ (7,808,030)**	**$ (8,034,463)**	**$ (8,267,462)**	**$ (8,507,219)**
117																	
118																	
119	4	Annual O&M Cost	$ 3,680,546	$ -	$ -	$ -	$ -	$ -	$ -	$ 284,907	$ 293,170	$ 301,671	$ 310,420	$ 319,422	$ 328,685	$ 338,217	$ 348,026
120	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
121	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 725,053
122	7	***Total O&M Costs***	**$ 4,585,126**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 284,907**	**$ 293,170**	**$ 301,671**	**$ 310,420**	**$ 319,422**	**$ 328,685**	**$ 338,217**	**$ 1,073,079**
123																	
124	D	***Replace Line 1600 In-Place***															
125			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
126															Operational Year		
127	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130																	
131																	
132	4	Annual O&M Cost	$ 3,647,596	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 410,857	$ 422,772	$ 435,032
133	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
134	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
135	7	***Total O&M Costs***	**$ 4,364,782**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 410,857**	**$ 422,772**	**$ 435,032**
136																	
137	E/F	***Otay Mesa Alternative***															
138			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
139													Operational Year				
140	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
141	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
143																	
144																	
145	4	Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5	***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147																	
148	G	***LNG Storage (Peak-Shaver)***															
149			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
150														Operational Year			
151	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
152	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
154																	
155																	
156	4	Annual O&M Cost	$ 15,283,747	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,597,111	$ 1,643,427	$ 1,691,086	$ 1,740,128
157	5	***Total O&M Costs***	**$ 15,283,747**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,597,111**	**$ 1,643,427**	**$ 1,691,086**	**$ 1,740,128**
158																	
159	H1	***Alternative Energy (Grid-Scale Battery)***															
160			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
161														Operational Year			
162	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
163	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
165																	
166																	
167	4	Annual O&M Cost	$ 15,283,747	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,597,111	$ 1,643,427	$ 1,691,086	$ 1,740,128
168	5	***Total O&M Costs***	**$ 15,283,747**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,597,111**	**$ 1,643,427**	**$ 1,691,086**	**$ 1,740,128**
169																	
170	H2	***Alternative Energy (Smaller-Scale Battery)***															
171			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
172														Operational Year			
173	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
174	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
176																	
177																	
178	4	Annual O&M Cost	$ 15,283,747	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,597,111	$ 1,643,427	$ 1,691,086	$ 1,740,128
179	5	***Total O&M Costs***	**$ 15,283,747**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,597,111**	**$ 1,643,427**	**$ 1,691,086**	**$ 1,740,128**
180																	
181	I	***Off-shore Route***															
182			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
183																	
184	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
185	2	MCS O&M and Emissions Cost	$ (59,240,789)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
186	3	***Total Avoided Costs***	**$ (159,526,272)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
187																	
188																	
189	4	Annual O&M Cost	$ 4,544,076	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
190	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
191	6	TIMP Cost	$ 595,634	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
192	7	***Total O&M Costs***	**$ 5,139,710**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
193																	
194	J1	***Blythe to Santee Alternative 1***															
195			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
196														Operational Year			
197	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
198	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (7,808,030)	$ (8,034,463)	$ (8,267,462)	$ (8,507,219)
199	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (7,808,030)**	**$ (8,034,463)**	**$ (8,267,462)**	**$ (8,507,219)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1																	
2			100														
98	C6	*Alternative Diameter Pipeline (30")*															
99			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
100																	
101	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
102	2	MCS O&M and Emissions Cost	$ (62,977,694)	$ (6,127,750)	$ (6,305,455)	$ (6,488,313)	$ (6,676,474)	$ (6,870,092)	$ (7,069,324)	$ (7,274,335)	$ (7,485,290)	$ (7,702,364)	$ (7,925,732)	$ (8,155,578)	$ (8,392,090)	$ (8,635,461)	$ (8,885,889)
103	3	***Total Avoided Costs***	**$ (163,263,177)**	**$ (6,127,750)**	**$ (6,305,455)**	**$ (6,488,313)**	**$ (6,676,474)**	**$ (6,870,092)**	**$ (7,069,324)**	**$ (7,274,335)**	**$ (7,485,290)**	**$ (7,702,364)**	**$ (7,925,732)**	**$ (342,839,167)**	**$ (352,781,503)**	**$ (8,635,461)**	**$ (8,885,889)**
104																	
105																	
106	4	Annual O&M Cost	$ 3,680,546	$ 358,118	$ 368,504	$ 379,190	$ 390,187	$ 401,502	$ 413,146	$ 425,127	$ 437,456	$ 450,142	$ 463,196	$ 476,629	$ 490,451	$ 504,674	$ 519,310
107	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
108	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,681	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,081,895
109	7	***Total O&M Costs***	**$ 4,585,126**	**$ 358,118**	**$ 368,504**	**$ 379,190**	**$ 390,187**	**$ 401,502**	**$ 413,146**	**$ 1,310,808**	**$ 437,456**	**$ 450,142**	**$ 463,196**	**$ 476,629**	**$ 490,451**	**$ 504,674**	**$ 1,601,205**
110																	
111	C7	*Alternative Diameter Pipeline (42")*															
112			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
113																	
114	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
115	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (8,753,928)	$ (9,007,792)	$ (9,269,018)	$ (9,537,820)	$ (9,814,416)	$ (10,099,035)	$ (10,391,907)	$ (10,693,272)	$ (11,003,377)	$ (11,322,475)	$ (11,650,826)	$ (11,988,700)	$ (12,336,373)	$ (12,694,127)
116	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (8,753,928)**	**$ (9,007,792)**	**$ (9,269,018)**	**$ (9,537,820)**	**$ (9,814,416)**	**$ (10,099,035)**	**$ (10,391,907)**	**$ (10,693,272)**	**$ (11,003,377)**	**$ (11,322,475)**	**$ (346,334,415)**	**$ (356,378,113)**	**$ (12,336,373)**	**$ (12,694,127)**
117																	
118																	
119	4	Annual O&M Cost	$ 3,680,546	$ 358,118	$ 368,504	$ 379,190	$ 390,187	$ 401,502	$ 413,146	$ 425,127	$ 437,456	$ 450,142	$ 463,196	$ 476,629	$ 490,451	$ 504,674	$ 519,310
120	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
121	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 885,681	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,081,895
122	7	***Total O&M Costs***	**$ 4,585,126**	**$ 358,118**	**$ 368,504**	**$ 379,190**	**$ 390,187**	**$ 401,502**	**$ 413,146**	**$ 1,310,808**	**$ 437,456**	**$ 450,142**	**$ 463,196**	**$ 476,629**	**$ 490,451**	**$ 504,674**	**$ 1,601,205**
123																	
124	D	*Replace Line 1600 In-Place*															
125			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
126																	
127	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130																	
131																	
132	4	Annual O&M Cost	$ 3,647,596	$ 447,648	$ 460,630	$ 473,988	$ 487,734	$ 501,878	$ 516,432	$ 531,409	$ 546,820	$ 562,677	$ 578,995	$ 595,786	$ 613,064	$ 630,843	$ 649,137
133	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
134	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ 836,463	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,021,773	$ -	$ -
135	7	***Total O&M Costs***	**$ 4,364,782**	**$ 447,648**	**$ 460,630**	**$ 473,988**	**$ 487,734**	**$ 1,338,341**	**$ 516,432**	**$ 531,409**	**$ 546,820**	**$ 562,677**	**$ 578,995**	**$ 595,786**	**$ 1,634,837**	**$ 630,843**	**$ 649,137**
136																	
137	E/F	*Otay Mesa Alternative*															
138			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
139																	
140	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
141	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (334,683,589)**	**$ (344,389,413)**	**$ -**	**$ -**
143																	
144																	
145	4	Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5	***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147																	
148	G	*LNG Storage (Peak-Shaver)*															
149			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
150																	
151	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
152	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (334,683,589)**	**$ (344,389,413)**	**$ -**	**$ -**
154																	
155																	
156	4	Annual O&M Cost	$ 15,283,747	$ 1,790,591	$ 1,842,519	$ 1,895,952	$ 1,950,934	$ 2,007,511	$ 2,065,729	$ 2,125,635	$ 2,187,279	$ 2,250,710	$ 2,315,980	$ 2,383,144	$ 2,452,255	$ 2,523,370	$ 2,596,548
157	5	***Total O&M Costs***	**$ 15,283,747**	**$ 1,790,591**	**$ 1,842,519**	**$ 1,895,952**	**$ 1,950,934**	**$ 2,007,511**	**$ 2,065,729**	**$ 2,125,635**	**$ 2,187,279**	**$ 2,250,710**	**$ 2,315,980**	**$ 2,383,144**	**$ 2,452,255**	**$ 2,523,370**	**$ 2,596,548**
158																	
159	H1	*Alternative Energy (Grid-Scale Battery)*															
160			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
161																	
162	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
163	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (334,683,589)**	**$ (344,389,413)**	**$ -**	**$ -**
165																	
166																	
167	4	Annual O&M Cost	$ 15,283,747	$ 1,790,591	$ 1,842,519	$ 1,895,952	$ 1,950,934	$ 2,007,511	$ 2,065,729	$ 2,125,635	$ 2,187,279	$ 2,250,710	$ 2,315,980	$ 2,383,144	$ 2,452,255	$ 2,523,370	$ 2,596,548
168	5	***Total O&M Costs***	**$ 15,283,747**	**$ 1,790,591**	**$ 1,842,519**	**$ 1,895,952**	**$ 1,950,934**	**$ 2,007,511**	**$ 2,065,729**	**$ 2,125,635**	**$ 2,187,279**	**$ 2,250,710**	**$ 2,315,980**	**$ 2,383,144**	**$ 2,452,255**	**$ 2,523,370**	**$ 2,596,548**
169																	
170	H2	*Alternative Energy (Smaller-Scale Battery)*															
171			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
172																	
173	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
174	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (334,683,589)**	**$ (344,389,413)**	**$ -**	**$ -**
176																	
177																	
178	4	Annual O&M Cost	$ 15,283,747	$ 1,790,591	$ 1,842,519	$ 1,895,952	$ 1,950,934	$ 2,007,511	$ 2,065,729	$ 2,125,635	$ 2,187,279	$ 2,250,710	$ 2,315,980	$ 2,383,144	$ 2,452,255	$ 2,523,370	$ 2,596,548
179	5	***Total O&M Costs***	**$ 15,283,747**	**$ 1,790,591**	**$ 1,842,519**	**$ 1,895,952**	**$ 1,950,934**	**$ 2,007,511**	**$ 2,065,729**	**$ 2,125,635**	**$ 2,187,279**	**$ 2,250,710**	**$ 2,315,980**	**$ 2,383,144**	**$ 2,452,255**	**$ 2,523,370**	**$ 2,596,548**
180																	
181	I	*Off-shore Route*															
182			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
183					Operational Year												
184	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
185	2	MCS O&M and Emissions Cost	$ (59,240,789)	$ -	$ (9,007,792)	$ (9,269,018)	$ (9,537,820)	$ (9,814,416)	$ (10,099,035)	$ (10,391,907)	$ (10,693,272)	$ (11,003,377)	$ (11,322,475)	$ (11,650,826)	$ (11,988,700)	$ (12,336,373)	$ (12,694,127)
186	3	***Total Avoided Costs***	**$ (159,526,272)**	**$ -**	**$ (9,007,792)**	**$ (9,269,018)**	**$ (9,537,820)**	**$ (9,814,416)**	**$ (10,099,035)**	**$ (10,391,907)**	**$ (10,693,272)**	**$ (11,003,377)**	**$ (11,322,475)**	**$ (346,334,415)**	**$ (356,378,113)**	**$ (12,336,373)**	**$ (12,694,127)**
187																	
188																	
189	4	Annual O&M Cost	$ 4,544,076	$ -	$ 690,944	$ 710,982	$ 731,600	$ 752,817	$ 774,648	$ 797,113	$ 820,229	$ 844,016	$ 868,493	$ 893,679	$ 919,596	$ 946,264	$ 973,706
190	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
191	6	TIMP Cost	$ 595,634	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 937,796	$ -	$ -	$ -	$ -	$ -
192	7	***Total O&M Costs***	**$ 5,139,710**	**$ -**	**$ 690,944**	**$ 710,982**	**$ 731,600**	**$ 752,817**	**$ 774,648**	**$ 797,113**	**$ 820,229**	**$ 1,781,812**	**$ 868,493**	**$ 893,679**	**$ 919,596**	**$ 946,264**	**$ 973,706**
193																	
194	J1	*Blythe to Santee Alternative 1*															
195			PV	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
196																	
197	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
198	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (8,753,928)	$ (9,007,792)	$ (9,269,018)	$ (9,537,820)	$ (9,814,416)	$ (10,099,035)	$ (10,391,907)	$ (10,693,272)	$ (11,003,377)	$ (11,322,475)	$ (11,650,826)	$ (11,988,700)	$ (12,336,373)	$ (12,694,127)
199	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (8,753,928)**	**$ (9,007,792)**	**$ (9,269,018)**	**$ (9,537,820)**	**$ (9,814,416)**	**$ (10,099,035)**	**$ (10,391,907)**	**$ (10,693,272)**	**$ (11,003,377)**	**$ (11,322,475)**	**$ (346,334,415)**	**$ (356,378,113)**	**$ (12,336,373)**	**$ (12,694,127)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	28	29	30	31	32	33	34	35	36	37	38	39	40
1																
2			100													
98	C6	***Alternative Diameter Pipeline (30")***														
99			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
100																
101	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
102	2	MCS O&M and Emissions Cost	$ (62,977,694)	$ (9,143,580)	$ (9,408,744)	$ (9,681,597)	$ (9,962,364)	$ (10,251,272)	$ (10,548,559)	$ (10,854,467)	$ (11,169,247)	$ (11,493,155)	$ (11,826,457)	$ (12,169,424)	$ (12,522,337)	$ (12,885,485)
103	3	***Total Avoided Costs***	**$ (163,263,177)**	**$ (9,143,580)**	**$ (9,408,744)**	**$ (9,681,597)**	**$ (9,962,364)**	**$ (10,251,272)**	**$ (10,548,559)**	**$ (10,854,467)**	**$ (11,169,247)**	**$ (11,493,155)**	**$ (11,826,457)**	**$ (12,169,424)**	**$ (12,522,337)**	**$ (12,885,485)**
104																
105																
106	4	Annual O&M Cost	$ 3,680,546	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
107	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
108	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,321,578	$ -	$ -	$ -	$ -	$ -	$ -
109	7	***Total O&M Costs***	**$ 4,585,126**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 616,479**	**$ 1,955,935**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 753,054**
110																
111	C7	***Alternative Diameter Pipeline (42")***														
112			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
113																
114	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
115	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (13,062,257)	$ (13,441,063)	$ (13,830,853)	$ (14,231,948)	$ (14,644,675)	$ (15,069,370)	$ (15,506,382)	$ (15,956,067)	$ (16,418,793)	$ (16,894,938)	$ (17,384,891)	$ (17,889,053)	$ (18,407,836)
116	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (13,062,257)**	**$ (13,441,063)**	**$ (13,830,853)**	**$ (14,231,948)**	**$ (14,644,675)**	**$ (15,069,370)**	**$ (15,506,382)**	**$ (15,956,067)**	**$ (16,418,793)**	**$ (16,894,938)**	**$ (17,384,891)**	**$ (17,889,053)**	**$ (18,407,836)**
117																
118																
119	4	Annual O&M Cost	$ 3,680,546	$ 534,370	$ 549,866	$ 565,812	$ 582,221	$ 599,105	$ 616,479	$ 634,357	$ 652,754	$ 671,684	$ 691,162	$ 711,206	$ 731,831	$ 753,054
120	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
121	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,321,578	$ -	$ -	$ -	$ -	$ -	$ -
122	7	***Total O&M Costs***	**$ 4,585,126**	**$ 534,370**	**$ 549,866**	**$ 565,812**	**$ 582,221**	**$ 599,105**	**$ 616,479**	**$ 1,955,935**	**$ 652,754**	**$ 671,684**	**$ 691,162**	**$ 711,206**	**$ 731,831**	**$ 753,054**
123																
124	D	***Replace Line 1600 In-Place***														
125			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
126																
127	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130																
131																
132	4	Annual O&M Cost	$ 3,647,596	$ 667,962	$ 687,333	$ 707,266	$ 727,776	$ 748,882	$ 770,599	$ 792,947	$ 815,942	$ 839,604	$ 863,953	$ 889,008	$ 914,789	$ 941,318
133	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
134	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ 1,248,136	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,524,648	$ -
135	7	***Total O&M Costs***	**$ 4,364,782**	**$ 667,962**	**$ 687,333**	**$ 707,266**	**$ 727,776**	**$ 1,997,018**	**$ 770,599**	**$ 792,947**	**$ 815,942**	**$ 839,604**	**$ 863,953**	**$ 889,008**	**$ 2,439,437**	**$ 941,318**
136																
137	E/F	***Otay Mesa Alternative***														
138			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
139																
140	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
141	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
143																
144																
145	4	Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5	***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147																
148	G	***LNG Storage (Peak-Shaver)***														
149			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
150																
151	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
152	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
154																
155																
156	4	Annual O&M Cost	$ 15,283,747	$ 2,671,848	$ 2,749,332	$ 2,829,062	$ 2,911,105	$ 2,995,527	$ 3,082,397	$ 3,171,787	$ 3,263,769	$ 3,358,418	$ 3,455,812	$ 3,556,031	$ 3,659,155	$ 3,765,271
157	5	***Total O&M Costs***	**$ 15,283,747**	**$ 2,671,848**	**$ 2,749,332**	**$ 2,829,062**	**$ 2,911,105**	**$ 2,995,527**	**$ 3,082,397**	**$ 3,171,787**	**$ 3,263,769**	**$ 3,358,418**	**$ 3,455,812**	**$ 3,556,031**	**$ 3,659,155**	**$ 3,765,271**
158																
159	H1	***Alternative Energy (Grid-Scale Battery)***														
160			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
161																
162	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
163	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
165																
166																
167	4	Annual O&M Cost	$ 15,283,747	$ 2,671,848	$ 2,749,332	$ 2,829,062	$ 2,911,105	$ 2,995,527	$ 3,082,397	$ 3,171,787	$ 3,263,769	$ 3,358,418	$ 3,455,812	$ 3,556,031	$ 3,659,155	$ 3,765,271
168	5	***Total O&M Costs***	**$ 15,283,747**	**$ 2,671,848**	**$ 2,749,332**	**$ 2,829,062**	**$ 2,911,105**	**$ 2,995,527**	**$ 3,082,397**	**$ 3,171,787**	**$ 3,263,769**	**$ 3,358,418**	**$ 3,455,812**	**$ 3,556,031**	**$ 3,659,155**	**$ 3,765,271**
169																
170	H2	***Alternative Energy (Smaller-Scale Battery)***														
171			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
172																
173	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
174	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
176																
177																
178	4	Annual O&M Cost	$ 15,283,747	$ 2,671,848	$ 2,749,332	$ 2,829,062	$ 2,911,105	$ 2,995,527	$ 3,082,397	$ 3,171,787	$ 3,263,769	$ 3,358,418	$ 3,455,812	$ 3,556,031	$ 3,659,155	$ 3,765,271
179	5	***Total O&M Costs***	**$ 15,283,747**	**$ 2,671,848**	**$ 2,749,332**	**$ 2,829,062**	**$ 2,911,105**	**$ 2,995,527**	**$ 3,082,397**	**$ 3,171,787**	**$ 3,263,769**	**$ 3,358,418**	**$ 3,455,812**	**$ 3,556,031**	**$ 3,659,155**	**$ 3,765,271**
180																
181	I	***Off-shore Route***														
182			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
183																
184	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
185	2	MCS O&M and Emissions Cost	$ (59,240,789)	$ (13,062,257)	$ (13,441,063)	$ (13,830,853)	$ (14,231,948)	$ (14,644,675)	$ (15,069,370)	$ (15,506,382)	$ (15,956,067)	$ (16,418,793)	$ (16,894,938)	$ (17,384,891)	$ (17,889,053)	$ (18,407,836)
186	3	***Total Avoided Costs***	**$ (159,526,272)**	**$ (13,062,257)**	**$ (13,441,063)**	**$ (13,830,853)**	**$ (14,231,948)**	**$ (14,644,675)**	**$ (15,069,370)**	**$ (15,506,382)**	**$ (15,956,067)**	**$ (16,418,793)**	**$ (16,894,938)**	**$ (17,384,891)**	**$ (17,889,053)**	**$ (18,407,836)**
187																
188																
189	4	Annual O&M Cost	$ 4,544,076	$ 1,001,943	$ 1,030,999	$ 1,060,898	$ 1,091,664	$ 1,123,323	$ 1,155,899	$ 1,189,420	$ 1,223,913	$ 1,259,407	$ 1,295,930	$ 1,333,511	$ 1,372,183	$ 1,411,977
190	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
191	6	TIMP Cost	$ 595,634	$ -	$ 1,145,555	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,399,341	$ -	$ -	$ -	$ -
192	7	***Total O&M Costs***	**$ 5,139,710**	**$ 1,001,943**	**$ 2,176,554**	**$ 1,060,898**	**$ 1,091,664**	**$ 1,123,323**	**$ 1,155,899**	**$ 1,189,420**	**$ 1,223,913**	**$ 2,658,748**	**$ 1,295,930**	**$ 1,333,511**	**$ 1,372,183**	**$ 1,411,977**
193																
194	J1	***Blythe to Santee Alternative 1***														
195			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
196																
197	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
198	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (13,062,257)	$ (13,441,063)	$ (13,830,853)	$ (14,231,948)	$ (14,644,675)	$ (15,069,370)	$ (15,506,382)	$ (15,956,067)	$ (16,418,793)	$ (16,894,938)	$ (17,384,891)	$ (17,889,053)	$ (18,407,836)
199	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (13,062,257)**	**$ (13,441,063)**	**$ (13,830,853)**	**$ (14,231,948)**	**$ (14,644,675)**	**$ (15,069,370)**	**$ (15,506,382)**	**$ (15,956,067)**	**$ (16,418,793)**	**$ (16,894,938)**	**$ (17,384,891)**	**$ (17,889,053)**	**$ (18,407,836)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	41	42	43	44	45	46	47	48	49	50	51	52	53
1																
2			100													
98	C6	***Alternative Diameter Pipeline (30")***														
99			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
100																
101	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
102	2	MCS O&M and Emissions Cost	$ (62,977,694)	$ (13,259,164)	$ (13,643,680)	$ (14,039,346)	$ (14,446,487)	$ (14,865,436)	$ (15,296,533)	$ (15,740,133)	$ (16,196,597)	$ (16,666,298)	$ (17,149,621)	$ (17,646,960)	$ (18,158,721)	$ (18,685,324)
103	3	***Total Avoided Costs***	**$ (163,263,177)**	**$ (13,259,164)**	**$ (13,643,680)**	**$ (14,039,346)**	**$ (14,446,487)**	**$ (14,865,436)**	**$ (15,296,533)**	**$ (15,740,133)**	**$ (16,196,597)**	**$ (16,666,298)**	**$ (17,149,621)**	**$ (17,646,960)**	**$ (18,158,721)**	**$ (18,685,324)**
104																
105																
106	4	Annual O&M Cost	$ 3,680,546	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
107	5	Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
108	6	TIMP Cost	$ 904,581	$ 1,614,360	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,972,005	$ -	$ -	$ -	$ -	$ -
109	7	***Total O&M Costs***	**$ 4,585,126**	**$ 2,389,253**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 919,886**	**$ 2,918,567**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
110																
111	C7	***Alternative Diameter Pipeline (42")***														
112			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
113																
114	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
115	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (18,941,663)	$ (19,490,971)	$ (20,056,209)	$ (20,637,839)	$ (21,236,337)	$ (21,852,190)	$ (22,485,904)	$ (23,137,995)	$ (23,808,997)	$ (24,499,458)	$ (25,209,942)	$ (25,941,030)	$ (26,693,320)
116	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (18,941,663)**	**$ (19,490,971)**	**$ (20,056,209)**	**$ (20,637,839)**	**$ (21,236,337)**	**$ (21,852,190)**	**$ (22,485,904)**	**$ (23,137,995)**	**$ (23,808,997)**	**$ (24,499,458)**	**$ (25,209,942)**	**$ (25,941,030)**	**$ (26,693,320)**
117																
118																
119	4	Annual O&M Cost	$ 3,680,546	$ 774,893	$ 797,365	$ 820,488	$ 844,282	$ 868,767	$ 893,961	$ 919,886	$ 946,562	$ 974,013	$ 1,002,259	$ 1,031,325	$ 1,061,233	$ 1,092,009
120	5	Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
121	6	TIMP Cost	$ 904,581	$ 1,614,360	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,972,005	$ -	$ -	$ -	$ -	$ -
122	7	***Total O&M Costs***	**$ 4,585,126**	**$ 2,389,253**	**$ 797,365**	**$ 820,488**	**$ 844,282**	**$ 868,767**	**$ 893,961**	**$ 919,886**	**$ 2,918,567**	**$ 974,013**	**$ 1,002,259**	**$ 1,031,325**	**$ 1,061,233**	**$ 1,092,009**
123																
124	D	***Replace Line 1600 In-Place***														
125			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
126																
127	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130																
131																
132	4	Annual O&M Cost	$ 3,647,596	$ 968,616	$ 996,706	$ 1,025,610	$ 1,055,353	$ 1,085,958	$ 1,117,451	$ 1,149,857	$ 1,183,203	$ 1,217,516	$ 1,252,824	$ 1,289,156	$ 1,326,541	$ 1,365,011
133	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
134	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ -	$ 1,862,418	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,275,018
135	7	***Total O&M Costs***	**$ 4,364,782**	**$ 968,616**	**$ 996,706**	**$ 1,025,610**	**$ 1,055,353**	**$ 1,085,958**	**$ 2,979,869**	**$ 1,149,857**	**$ 1,183,203**	**$ 1,217,516**	**$ 1,252,824**	**$ 1,289,156**	**$ 1,326,541**	**$ 3,640,029**
136																
137	E/F	***Otay Mesa Alternative***														
138			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
139																
140	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
141	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
143																
144																
145	4	Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5	***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147																
148	G	***LNG Storage (Peak-Shaver)***														
149			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
150																
151	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
152	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
154																
155																
156	4	Annual O&M Cost	$ 15,283,747	$ 3,874,464	$ 3,986,823	$ 4,102,441	$ 4,221,412	$ 4,343,833	$ 4,469,804	$ 4,599,428	$ 4,732,812	$ 4,870,063	$ 5,011,295	$ 5,156,623	$ 5,306,165	$ 5,460,044
157	5	***Total O&M Costs***	**$ 15,283,747**	**$ 3,874,464**	**$ 3,986,823**	**$ 4,102,441**	**$ 4,221,412**	**$ 4,343,833**	**$ 4,469,804**	**$ 4,599,428**	**$ 4,732,812**	**$ 4,870,063**	**$ 5,011,295**	**$ 5,156,623**	**$ 5,306,165**	**$ 5,460,044**
158																
159	H1	***Alternative Energy (Grid-Scale Battery)***														
160			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
161																
162	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
163	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
165																
166																
167	4	Annual O&M Cost	$ 15,283,747	$ 3,874,464	$ 3,986,823	$ 4,102,441	$ 4,221,412	$ 4,343,833	$ 4,469,804	$ 4,599,428	$ 4,732,812	$ 4,870,063	$ 5,011,295	$ 5,156,623	$ 5,306,165	$ 5,460,044
168	5	***Total O&M Costs***	**$ 15,283,747**	**$ 3,874,464**	**$ 3,986,823**	**$ 4,102,441**	**$ 4,221,412**	**$ 4,343,833**	**$ 4,469,804**	**$ 4,599,428**	**$ 4,732,812**	**$ 4,870,063**	**$ 5,011,295**	**$ 5,156,623**	**$ 5,306,165**	**$ 5,460,044**
169																
170	H2	***Alternative Energy (Smaller-Scale Battery)***														
171			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
172																
173	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
174	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
176																
177																
178	4	Annual O&M Cost	$ 15,283,747	$ 3,874,464	$ 3,986,823	$ 4,102,441	$ 4,221,412	$ 4,343,833	$ 4,469,804	$ 4,599,428	$ 4,732,812	$ 4,870,063	$ 5,011,295	$ 5,156,623	$ 5,306,165	$ 5,460,044
179	5	***Total O&M Costs***	**$ 15,283,747**	**$ 3,874,464**	**$ 3,986,823**	**$ 4,102,441**	**$ 4,221,412**	**$ 4,343,833**	**$ 4,469,804**	**$ 4,599,428**	**$ 4,732,812**	**$ 4,870,063**	**$ 5,011,295**	**$ 5,156,623**	**$ 5,306,165**	**$ 5,460,044**
180																
181	I	***Off-shore Route***														
182			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
183																
184	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
185	2	MCS O&M and Emissions Cost	$ (59,240,789)	$ (18,941,663)	$ (19,490,971)	$ (20,056,209)	$ (20,637,839)	$ (21,236,337)	$ (21,852,190)	$ (22,485,904)	$ (23,137,995)	$ (23,808,997)	$ (24,499,458)	$ (25,209,942)	$ (25,941,030)	$ (26,693,320)
186	3	***Total Avoided Costs***	**$ (159,526,272)**	**$ (18,941,663)**	**$ (19,490,971)**	**$ (20,056,209)**	**$ (20,637,839)**	**$ (21,236,337)**	**$ (21,852,190)**	**$ (22,485,904)**	**$ (23,137,995)**	**$ (23,808,997)**	**$ (24,499,458)**	**$ (25,209,942)**	**$ (25,941,030)**	**$ (26,693,320)**
187																
188																
189	4	Annual O&M Cost	$ 4,544,076	$ 1,452,924	$ 1,495,059	$ 1,538,415	$ 1,583,029	$ 1,628,937	$ 1,676,177	$ 1,724,786	$ 1,774,804	$ 1,826,274	$ 1,879,236	$ 1,933,734	$ 1,989,812	$ 2,047,516
190	5	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
191	6	TIMP Cost	$ 595,634	$ -	$ -	$ 1,709,350	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,088,040	$ -	$ -	$ -
192	7	***Total O&M Costs***	**$ 5,139,710**	**$ 1,452,924**	**$ 1,495,059**	**$ 3,247,766**	**$ 1,583,029**	**$ 1,628,937**	**$ 1,676,177**	**$ 1,724,786**	**$ 1,774,804**	**$ 1,826,274**	**$ 3,967,275**	**$ 1,933,734**	**$ 1,989,812**	**$ 2,047,516**
193																
194	J1	***Blythe to Santee Alternative 1***														
195			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
196																
197	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
198	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (18,941,663)	$ (19,490,971)	$ (20,056,209)	$ (20,637,839)	$ (21,236,337)	$ (21,852,190)	$ (22,485,904)	$ (23,137,995)	$ (23,808,997)	$ (24,499,458)	$ (25,209,942)	$ (25,941,030)	$ (26,693,320)
199	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (18,941,663)**	**$ (19,490,971)**	**$ (20,056,209)**	**$ (20,637,839)**	**$ (21,236,337)**	**$ (21,852,190)**	**$ (22,485,904)**	**$ (23,137,995)**	**$ (23,808,997)**	**$ (24,499,458)**	**$ (25,209,942)**	**$ (25,941,030)**	**$ (26,693,320)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	54	55	56	57	58	59	60	61	62	63	64	65	66
1																
2			100													
98	C6	*Alternative Diameter Pipeline (30")*														
99			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
100																
101	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
102	2	MCS O&M and Emissions Cost	$ (62,977,694)	$ (19,227,199)	$ (19,784,787)	$ (20,358,546)	$ (20,948,944)	$ (21,556,463)	$ (22,181,601)	$ (22,824,867)	$ (23,486,788)	$ (24,167,905)	$ (24,868,775)	$ (25,589,969)	$ (26,332,078)	$ (27,095,708)
103	3	***Total Avoided Costs***	**$ (163,263,177)**	**$ (19,227,199)**	**$ (19,784,787)**	**$ (20,358,546)**	**$ (20,948,944)**	**$ (21,556,463)**	**$ (22,181,601)**	**$ (22,824,867)**	**$ (23,486,788)**	**$ (24,167,905)**	**$ (24,868,775)**	**$ (25,589,969)**	**$ (26,332,078)**	**$ (27,095,708)**
104																
105																
106	4	Annual O&M Cost	$ 3,680,546	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
107	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
108	6	TIMP Cost	$ 904,581	$ -	$ 2,408,882	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942,546	$ -	$ -	$ -	$ -
109	7	***Total O&M Costs***	**$ 4,585,126**	**$ 1,123,677**	**$ 3,565,146**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 1,372,616**	**$ 4,354,968**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
110																
111	C7	*Alternative Diameter Pipeline (42")*														
112			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
113																
114	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
115	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (27,467,427)	$ (28,263,982)	$ (29,083,638)	$ (29,927,063)	$ (30,794,948)	$ (31,688,001)	$ (32,606,953)	$ (33,552,555)	$ (34,525,579)	$ (35,526,821)	$ (36,557,099)	$ (37,617,255)	$ (38,708,155)
116	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (27,467,427)**	**$ (28,263,982)**	**$ (29,083,638)**	**$ (29,927,063)**	**$ (30,794,948)**	**$ (31,688,001)**	**$ (32,606,953)**	**$ (33,552,555)**	**$ (34,525,579)**	**$ (35,526,821)**	**$ (36,557,099)**	**$ (37,617,255)**	**$ (38,708,155)**
117																
118																
119	4	Annual O&M Cost	$ 3,680,546	$ 1,123,677	$ 1,156,264	$ 1,189,795	$ 1,224,299	$ 1,259,804	$ 1,296,338	$ 1,333,932	$ 1,372,616	$ 1,412,422	$ 1,453,382	$ 1,495,530	$ 1,538,901	$ 1,583,529
120	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
121	6	TIMP Cost	$ 904,581	$ -	$ 2,408,882	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,942,546	$ -	$ -	$ -	$ -
122	7	***Total O&M Costs***	**$ 4,585,126**	**$ 1,123,677**	**$ 3,565,146**	**$ 1,189,795**	**$ 1,224,299**	**$ 1,259,804**	**$ 1,296,338**	**$ 1,333,932**	**$ 1,372,616**	**$ 4,354,968**	**$ 1,453,382**	**$ 1,495,530**	**$ 1,538,901**	**$ 1,583,529**
123																
124	D	*Replace Line 1600 In-Place*														
125			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
126																
127	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130																
131																
132	4	Annual O&M Cost	$ 3,647,596	$ 1,404,596	$ 1,445,329	$ 1,487,244	$ 1,530,374	$ 1,574,755	$ 1,620,423	$ 1,667,415	$ 1,715,770	$ 1,765,528	$ 1,816,728	$ 1,869,413	$ 1,923,626	$ 1,979,411
133	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
134	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,779,025	$ -	$ -	$ -	$ -	$ -	$ -
135	7	***Total O&M Costs***	**$ 4,364,782**	**$ 1,404,596**	**$ 1,445,329**	**$ 1,487,244**	**$ 1,530,374**	**$ 1,574,755**	**$ 1,620,423**	**$ 4,446,440**	**$ 1,715,770**	**$ 1,765,528**	**$ 1,816,728**	**$ 1,869,413**	**$ 1,923,626**	**$ 1,979,411**
136																
137	E/F	*Otay Mesa Alternative*														
138			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
139																
140	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
141	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
143																
144																
145	4	Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5	***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147																
148	G	*LNG Storage (Peak-Shaver)*														
149			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
150																
151	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
152	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
154																
155																
156	4	Annual O&M Cost	$ 15,283,747	$ 5,618,385	$ 5,781,318	$ 5,948,976	$ 6,121,497	$ 6,299,020	$ 6,481,692	$ 6,669,661	$ 6,863,081	$ 7,062,110	$ 7,266,911	$ 7,477,652	$ 7,694,504	$ 7,917,644
157	5	***Total O&M Costs***	**$ 15,283,747**	**$ 5,618,385**	**$ 5,781,318**	**$ 5,948,976**	**$ 6,121,497**	**$ 6,299,020**	**$ 6,481,692**	**$ 6,669,661**	**$ 6,863,081**	**$ 7,062,110**	**$ 7,266,911**	**$ 7,477,652**	**$ 7,694,504**	**$ 7,917,644**
158																
159	H1	*Alternative Energy (Grid-Scale Battery)*														
160			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
161																
162	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
163	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
165																
166																
167	4	Annual O&M Cost	$ 15,283,747	$ 5,618,385	$ 5,781,318	$ 5,948,976	$ 6,121,497	$ 6,299,020	$ 6,481,692	$ 6,669,661	$ 6,863,081	$ 7,062,110	$ 7,266,911	$ 7,477,652	$ 7,694,504	$ 7,917,644
168	5	***Total O&M Costs***	**$ 15,283,747**	**$ 5,618,385**	**$ 5,781,318**	**$ 5,948,976**	**$ 6,121,497**	**$ 6,299,020**	**$ 6,481,692**	**$ 6,669,661**	**$ 6,863,081**	**$ 7,062,110**	**$ 7,266,911**	**$ 7,477,652**	**$ 7,694,504**	**$ 7,917,644**
169																
170	H2	*Alternative Energy (Smaller-Scale Battery)*														
171			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
172																
173	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
174	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
176																
177																
178	4	Annual O&M Cost	$ 15,283,747	$ 5,618,385	$ 5,781,318	$ 5,948,976	$ 6,121,497	$ 6,299,020	$ 6,481,692	$ 6,669,661	$ 6,863,081	$ 7,062,110	$ 7,266,911	$ 7,477,652	$ 7,694,504	$ 7,917,644
179	5	***Total O&M Costs***	**$ 15,283,747**	**$ 5,618,385**	**$ 5,781,318**	**$ 5,948,976**	**$ 6,121,497**	**$ 6,299,020**	**$ 6,481,692**	**$ 6,669,661**	**$ 6,863,081**	**$ 7,062,110**	**$ 7,266,911**	**$ 7,477,652**	**$ 7,694,504**	**$ 7,917,644**
180																
181	I	*Off-shore Route*														
182			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
183																
184	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
185	2	MCS O&M and Emissions Cost	$ (59,240,789)	$ (27,467,427)	$ (28,263,982)	$ (29,083,638)	$ (29,927,063)	$ (30,794,948)	$ (31,688,001)	$ (32,606,953)	$ (33,552,555)	$ (34,525,579)	$ (35,526,821)	$ (36,557,099)	$ (37,617,255)	$ (38,708,155)
186	3	***Total Avoided Costs***	**$ (159,526,272)**	**$ (27,467,427)**	**$ (28,263,982)**	**$ (29,083,638)**	**$ (29,927,063)**	**$ (30,794,948)**	**$ (31,688,001)**	**$ (32,606,953)**	**$ (33,552,555)**	**$ (34,525,579)**	**$ (35,526,821)**	**$ (36,557,099)**	**$ (37,617,255)**	**$ (38,708,155)**
187																
188																
189	4	Annual O&M Cost	$ 4,544,076	$ 2,106,894	$ 2,167,994	$ 2,230,866	$ 2,295,561	$ 2,362,132	$ 2,430,634	$ 2,501,123	$ 2,573,655	$ 2,648,291	$ 2,725,092	$ 2,804,119	$ 2,885,439	$ 2,969,117
190	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
191	6	TIMP Cost	$ 595,634	$ -	$ -	$ -	$ 2,550,624	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,115,688	$ -	$ -
192	7	***Total O&M Costs***	**$ 5,139,710**	**$ 2,106,894**	**$ 2,167,994**	**$ 2,230,866**	**$ 4,846,185**	**$ 2,362,132**	**$ 2,430,634**	**$ 2,501,123**	**$ 2,573,655**	**$ 2,648,291**	**$ 2,725,092**	**$ 5,919,808**	**$ 2,885,439**	**$ 2,969,117**
193																
194	J1	*Blythe to Santee Alternative 1*														
195			PV	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081
196																
197	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
198	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (27,467,427)	$ (28,263,982)	$ (29,083,638)	$ (29,927,063)	$ (30,794,948)	$ (31,688,001)	$ (32,606,953)	$ (33,552,555)	$ (34,525,579)	$ (35,526,821)	$ (36,557,099)	$ (37,617,255)	$ (38,708,155)
199	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (27,467,427)**	**$ (28,263,982)**	**$ (29,083,638)**	**$ (29,927,063)**	**$ (30,794,948)**	**$ (31,688,001)**	**$ (32,606,953)**	**$ (33,552,555)**	**$ (34,525,579)**	**$ (35,526,821)**	**$ (36,557,099)**	**$ (37,617,255)**	**$ (38,708,155)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	67	68	69	70	71	72	73	74	75	76	77	78	79
1																
2			100													
98	C6	*Alternative Diameter Pipeline (30")*														
99			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
100																
101	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
102	2	MCS O&M and Emissions Cost	$ (62,977,694)	$ (27,881,484)	$ (28,690,047)	$ (29,522,058)	$ (30,378,198)	$ (31,259,166)	$ (32,165,682)	$ (33,098,486)	$ (34,058,343)	$ (35,046,034)	$ (36,062,369)	$ (37,108,178)	$ (38,184,315)	$ (39,291,660)
103	3	***Total Avoided Costs***	**$ (163,263,177)**	**$ (27,881,484)**	**$ (28,690,047)**	**$ (29,522,058)**	**$ (30,378,198)**	**$ (31,259,166)**	**$ (32,165,682)**	**$ (33,098,486)**	**$ (34,058,343)**	**$ (35,046,034)**	**$ (36,062,369)**	**$ (37,108,178)**	**$ (38,184,315)**	**$ (39,291,660)**
104																
105																
106	4	Annual O&M Cost	$ 3,680,546	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
107	5	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
108	6	TIMP Cost	$ 904,581	$ -	$ -	$ 3,594,437	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,390,748	$ -	$ -	$ -
109	7	***Total O&M Costs***	**$ 4,585,126**	**$ 1,629,451**	**$ 1,676,705**	**$ 5,319,767**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 2,048,162**	**$ 6,498,307**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
110																
111	C7	*Alternative Diameter Pipeline (42")*														
112			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
113																
114	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
115	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (39,830,691)	$ (40,985,781)	$ (42,174,369)	$ (43,397,426)	$ (44,655,951)	$ (45,950,974)	$ (47,283,552)	$ (48,654,775)	$ (50,065,764)	$ (51,517,671)	$ (53,011,683)	$ (54,549,022)	$ (56,130,944)
116	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (39,830,691)**	**$ (40,985,781)**	**$ (42,174,369)**	**$ (43,397,426)**	**$ (44,655,951)**	**$ (45,950,974)**	**$ (47,283,552)**	**$ (48,654,775)**	**$ (50,065,764)**	**$ (51,517,671)**	**$ (53,011,683)**	**$ (54,549,022)**	**$ (56,130,944)**
117																
118																
119	4	Annual O&M Cost	$ 3,680,546	$ 1,629,451	$ 1,676,705	$ 1,725,330	$ 1,775,364	$ 1,826,850	$ 1,879,828	$ 1,934,344	$ 1,990,439	$ 2,048,162	$ 2,107,559	$ 2,168,678	$ 2,231,570	$ 2,296,285
120	5	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
121	6	TIMP Cost	$ 904,581	$ -	$ -	$ 3,594,437	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,390,748	$ -	$ -	$ -
122	7	***Total O&M Costs***	**$ 4,585,126**	**$ 1,629,451**	**$ 1,676,705**	**$ 5,319,767**	**$ 1,775,364**	**$ 1,826,850**	**$ 1,879,828**	**$ 1,934,344**	**$ 1,990,439**	**$ 2,048,162**	**$ 6,498,307**	**$ 2,168,678**	**$ 2,231,570**	**$ 2,296,285**
123																
124	D	*Replace Line 1600 In-Place*														
125			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
126																
127	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130																
131																
132	4	Annual O&M Cost	$ 3,647,596	$ 2,036,814	$ 2,095,882	$ 2,156,662	$ 2,219,205	$ 2,283,562	$ 2,349,786	$ 2,417,929	$ 2,488,049	$ 2,560,203	$ 2,634,449	$ 2,710,848	$ 2,789,462	$ 2,870,357
133	5	Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
134	6	TIMP Cost	$ 717,186	$ 3,394,690	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,146,749	$ -	$ -	$ -	$ -	$ -
135	7	***Total O&M Costs***	**$ 4,364,782**	**$ 5,431,504**	**$ 2,095,882**	**$ 2,156,662**	**$ 2,219,205**	**$ 2,283,562**	**$ 2,349,786**	**$ 2,417,929**	**$ 6,634,798**	**$ 2,560,203**	**$ 2,634,449**	**$ 2,710,848**	**$ 2,789,462**	**$ 2,870,357**
136																
137	E/F	*Otay Mesa Alternative*														
138			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
139																
140	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
141	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
143																
144																
145	4	Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5	***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147																
148	G	*LNG Storage (Peak-Shaver)*														
149			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
150																
151	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
152	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
154																
155																
156	4	Annual O&M Cost	$ 15,283,747	$ 8,147,256	$ 8,383,526	$ 8,626,649	$ 8,876,821	$ 9,134,249	$ 9,399,142	$ 9,671,718	$ 9,952,197	$ 10,240,811	$ 10,537,795	$ 10,843,391	$ 11,157,849	$ 11,481,427
157	5	***Total O&M Costs***	**$ 15,283,747**	**$ 8,147,256**	**$ 8,383,526**	**$ 8,626,649**	**$ 8,876,821**	**$ 9,134,249**	**$ 9,399,142**	**$ 9,671,718**	**$ 9,952,197**	**$ 10,240,811**	**$ 10,537,795**	**$ 10,843,391**	**$ 11,157,849**	**$ 11,481,427**
158																
159	H1	*Alternative Energy (Grid-Scale Battery)*														
160			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
161																
162	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
163	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
165																
166																
167	4	Annual O&M Cost	$ 15,283,747	$ 8,147,256	$ 8,383,526	$ 8,626,649	$ 8,876,821	$ 9,134,249	$ 9,399,142	$ 9,671,718	$ 9,952,197	$ 10,240,811	$ 10,537,795	$ 10,843,391	$ 11,157,849	$ 11,481,427
168	5	***Total O&M Costs***	**$ 15,283,747**	**$ 8,147,256**	**$ 8,383,526**	**$ 8,626,649**	**$ 8,876,821**	**$ 9,134,249**	**$ 9,399,142**	**$ 9,671,718**	**$ 9,952,197**	**$ 10,240,811**	**$ 10,537,795**	**$ 10,843,391**	**$ 11,157,849**	**$ 11,481,427**
169																
170	H2	*Alternative Energy (Smaller-Scale Battery)*														
171			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
172																
173	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
174	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
176																
177																
178	4	Annual O&M Cost	$ 15,283,747	$ 8,147,256	$ 8,383,526	$ 8,626,649	$ 8,876,821	$ 9,134,249	$ 9,399,142	$ 9,671,718	$ 9,952,197	$ 10,240,811	$ 10,537,795	$ 10,843,391	$ 11,157,849	$ 11,481,427
179	5	***Total O&M Costs***	**$ 15,283,747**	**$ 8,147,256**	**$ 8,383,526**	**$ 8,626,649**	**$ 8,876,821**	**$ 9,134,249**	**$ 9,399,142**	**$ 9,671,718**	**$ 9,952,197**	**$ 10,240,811**	**$ 10,537,795**	**$ 10,843,391**	**$ 11,157,849**	**$ 11,481,427**
180																
181	I	*Off-shore Route*														
182			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
183																
184	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
185	2	MCS O&M and Emissions Cost	$ (59,240,789)	$ (39,830,691)	$ (40,985,781)	$ (42,174,369)	$ (43,397,426)	$ (44,655,951)	$ (45,950,974)	$ (47,283,552)	$ (48,654,775)	$ (50,065,764)	$ (51,517,671)	$ (53,011,683)	$ (54,549,022)	$ (56,130,944)
186	3	***Total Avoided Costs***	**$ (159,526,272)**	**$ (39,830,691)**	**$ (40,985,781)**	**$ (42,174,369)**	**$ (43,397,426)**	**$ (44,655,951)**	**$ (45,950,974)**	**$ (47,283,552)**	**$ (48,654,775)**	**$ (50,065,764)**	**$ (51,517,671)**	**$ (53,011,683)**	**$ (54,549,022)**	**$ (56,130,944)**
187																
188																
189	4	Annual O&M Cost	$ 4,544,076	$ 3,055,221	$ 3,143,822	$ 3,234,993	$ 3,328,808	$ 3,425,343	$ 3,524,678	$ 3,626,894	$ 3,732,074	$ 3,840,304	$ 3,951,673	$ 4,066,271	$ 4,184,193	$ 4,305,535
190	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
191	6	TIMP Cost	$ 595,634	$ -	$ -	$ -	$ -	$ 3,805,937	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,649,104	$ -
192	7	***Total O&M Costs***	**$ 5,139,710**	**$ 3,055,221**	**$ 3,143,822**	**$ 3,234,993**	**$ 3,328,808**	**$ 7,231,281**	**$ 3,524,678**	**$ 3,626,894**	**$ 3,732,074**	**$ 3,840,304**	**$ 3,951,673**	**$ 4,066,271**	**$ 8,833,297**	**$ 4,305,535**
193																
194	J1	*Blythe to Santee Alternative 1*														
195			PV	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094
196																
197	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
198	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (39,830,691)	$ (40,985,781)	$ (42,174,369)	$ (43,397,426)	$ (44,655,951)	$ (45,950,974)	$ (47,283,552)	$ (48,654,775)	$ (50,065,764)	$ (51,517,671)	$ (53,011,683)	$ (54,549,022)	$ (56,130,944)
199	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (39,830,691)**	**$ (40,985,781)**	**$ (42,174,369)**	**$ (43,397,426)**	**$ (44,655,951)**	**$ (45,950,974)**	**$ (47,283,552)**	**$ (48,654,775)**	**$ (50,065,764)**	**$ (51,517,671)**	**$ (53,011,683)**	**$ (54,549,022)**	**$ (56,130,944)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	80	81	82	83	84	85	86	87	88	89	90	91	92
1																
2			100													
98	C6	***Alternative Diameter Pipeline (30")***														
99			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
100																
101	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
102	2	MCS O&M and Emissions Cost	$ (62,977,694)	$ (40,431,119)	$ (41,603,621)	$ (42,810,126)	$ (44,051,620)	$ (45,329,117)	$ (46,643,661)	$ (47,996,327)	$ (49,388,221)	$ (50,820,479)	$ (52,294,273)	$ (53,810,807)	$ (55,371,320)	$ (56,977,089)
103	3	***Total Avoided Costs***	**$ (163,263,177)**	**$ (40,431,119)**	**$ (41,603,621)**	**$ (42,810,126)**	**$ (44,051,620)**	**$ (45,329,117)**	**$ (46,643,661)**	**$ (47,996,327)**	**$ (49,388,221)**	**$ (50,820,479)**	**$ (52,294,273)**	**$ (53,810,807)**	**$ (55,371,320)**	**$ (56,977,089)**
104																
105																
106	4	Annual O&M Cost	$ 3,680,546	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
107	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
108	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ 5,363,473	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,551,696	$ -	$ -
109	7	***Total O&M Costs***	**$ 4,585,126**	**$ 2,362,878**	**$ 2,431,401**	**$ 2,501,912**	**$ 7,937,940**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 3,056,185**	**$ 9,696,510**	**$ 3,236,014**	**$ 3,329,858**
110																
111	C7	***Alternative Diameter Pipeline (42")***														
112			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
113																
114	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
115	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (57,758,741)	$ (59,433,744)	$ (61,157,323)	$ (62,930,885)	$ (64,755,881)	$ (66,633,802)	$ (68,566,182)	$ (70,554,601)	$ (72,600,685)	$ (74,706,104)	$ (76,872,581)	$ (79,101,886)	$ (81,395,841)
116	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (57,758,741)**	**$ (59,433,744)**	**$ (61,157,323)**	**$ (62,930,885)**	**$ (64,755,881)**	**$ (66,633,802)**	**$ (68,566,182)**	**$ (70,554,601)**	**$ (72,600,685)**	**$ (74,706,104)**	**$ (76,872,581)**	**$ (79,101,886)**	**$ (81,395,841)**
117																
118																
119	4	Annual O&M Cost	$ 3,680,546	$ 2,362,878	$ 2,431,401	$ 2,501,912	$ 2,574,467	$ 2,649,127	$ 2,725,951	$ 2,805,004	$ 2,886,349	$ 2,970,053	$ 3,056,185	$ 3,144,814	$ 3,236,014	$ 3,329,858
120	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
121	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ 5,363,473	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,551,696	$ -	$ -
122	7	***Total O&M Costs***	**$ 4,585,126**	**$ 2,362,878**	**$ 2,431,401**	**$ 2,501,912**	**$ 7,937,940**	**$ 2,649,127**	**$ 2,725,951**	**$ 2,805,004**	**$ 2,886,349**	**$ 2,970,053**	**$ 3,056,185**	**$ 9,696,510**	**$ 3,236,014**	**$ 3,329,858**
123																
124	D	***Replace Line 1600 In-Place***														
125			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
126																
127	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130																
131																
132	4	Annual O&M Cost	$ 3,647,596	$ 2,953,597	$ 3,039,251	$ 3,127,390	$ 3,218,084	$ 3,311,408	$ 3,407,439	$ 3,506,255	$ 3,607,936	$ 3,712,566	$ 3,820,231	$ 3,931,018	$ 4,045,017	$ 4,162,323
133	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
134	6	TIMP Cost	$ 717,186	$ -	$ 5,065,419	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,187,611	$ -	$ -	$ -	$ -
135	7	***Total O&M Costs***	**$ 4,364,782**	**$ 2,953,597**	**$ 8,104,670**	**$ 3,127,390**	**$ 3,218,084**	**$ 3,311,408**	**$ 3,407,439**	**$ 3,506,255**	**$ 3,607,936**	**$ 9,900,177**	**$ 3,820,231**	**$ 3,931,018**	**$ 4,045,017**	**$ 4,162,323**
136																
137	E/F	***Otay Mesa Alternative***														
138			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
139																
140	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
141	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
143																
144																
145	4	Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5	***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147																
148	G	***LNG Storage (Peak-Shaver)***														
149			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
150																
151	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
152	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
154																
155																
156	4	Annual O&M Cost	$ 15,283,747	$ 11,814,388	$ 12,157,005	$ 12,509,558	$ 12,872,336	$ 13,245,633	$ 13,629,757	$ 14,025,020	$ 14,431,745	$ 14,850,266	$ 15,280,923	$ 15,724,070	$ 16,180,068	$ 16,649,290
157	5	***Total O&M Costs***	**$ 15,283,747**	**$ 11,814,388**	**$ 12,157,005**	**$ 12,509,558**	**$ 12,872,336**	**$ 13,245,633**	**$ 13,629,757**	**$ 14,025,020**	**$ 14,431,745**	**$ 14,850,266**	**$ 15,280,923**	**$ 15,724,070**	**$ 16,180,068**	**$ 16,649,290**
158																
159	H1	***Alternative Energy (Grid-Scale Battery)***														
160			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
161																
162	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
163	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
165																
166																
167	4	Annual O&M Cost	$ 15,283,747	$ 11,814,388	$ 12,157,005	$ 12,509,558	$ 12,872,336	$ 13,245,633	$ 13,629,757	$ 14,025,020	$ 14,431,745	$ 14,850,266	$ 15,280,923	$ 15,724,070	$ 16,180,068	$ 16,649,290
168	5	***Total O&M Costs***	**$ 15,283,747**	**$ 11,814,388**	**$ 12,157,005**	**$ 12,509,558**	**$ 12,872,336**	**$ 13,245,633**	**$ 13,629,757**	**$ 14,025,020**	**$ 14,431,745**	**$ 14,850,266**	**$ 15,280,923**	**$ 15,724,070**	**$ 16,180,068**	**$ 16,649,290**
169																
170	H2	***Alternative Energy (Smaller-Scale Battery)***														
171			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
172																
173	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
174	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
176																
177																
178	4	Annual O&M Cost	$ 15,283,747	$ 11,814,388	$ 12,157,005	$ 12,509,558	$ 12,872,336	$ 13,245,633	$ 13,629,757	$ 14,025,020	$ 14,431,745	$ 14,850,266	$ 15,280,923	$ 15,724,070	$ 16,180,068	$ 16,649,290
179	5	***Total O&M Costs***	**$ 15,283,747**	**$ 11,814,388**	**$ 12,157,005**	**$ 12,509,558**	**$ 12,872,336**	**$ 13,245,633**	**$ 13,629,757**	**$ 14,025,020**	**$ 14,431,745**	**$ 14,850,266**	**$ 15,280,923**	**$ 15,724,070**	**$ 16,180,068**	**$ 16,649,290**
180																
181	I	***Off-shore Route***														
182			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
183																
184	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
185	2	MCS O&M and Emissions Cost	$ (59,240,789)	$ (57,758,741)	$ (59,433,744)	$ (61,157,323)	$ (62,930,885)	$ (64,755,881)	$ (66,633,802)	$ (68,566,182)	$ (70,554,601)	$ (72,600,685)	$ (74,706,104)	$ (76,872,581)	$ (79,101,886)	$ (81,395,841)
186	3	***Total Avoided Costs***	**$ (159,526,272)**	**$ (57,758,741)**	**$ (59,433,744)**	**$ (61,157,323)**	**$ (62,930,885)**	**$ (64,755,881)**	**$ (66,633,802)**	**$ (68,566,182)**	**$ (70,554,601)**	**$ (72,600,685)**	**$ (74,706,104)**	**$ (76,872,581)**	**$ (79,101,886)**	**$ (81,395,841)**
187																
188																
189	4	Annual O&M Cost	$ 4,544,076	$ 4,430,395	$ 4,558,877	$ 4,691,084	$ 4,827,126	$ 4,967,112	$ 5,111,159	$ 5,259,382	$ 5,411,904	$ 5,568,850	$ 5,730,346	$ 5,896,526	$ 6,067,526	$ 6,243,484
190	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
191	6	TIMP Cost	$ 595,634	$ -	$ -	$ -	$ -	$ -	$ 5,679,065	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,937,204
192	7	***Total O&M Costs***	**$ 5,139,710**	**$ 4,430,395**	**$ 4,558,877**	**$ 4,691,084**	**$ 4,827,126**	**$ 4,967,112**	**$ 10,790,224**	**$ 5,259,382**	**$ 5,411,904**	**$ 5,568,850**	**$ 5,730,346**	**$ 5,896,526**	**$ 6,067,526**	**$ 13,180,688**
193																
194	J1	***Blythe to Santee Alternative 1***														
195			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
196																
197	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
198	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (57,758,741)	$ (59,433,744)	$ (61,157,323)	$ (62,930,885)	$ (64,755,881)	$ (66,633,802)	$ (68,566,182)	$ (70,554,601)	$ (72,600,685)	$ (74,706,104)	$ (76,872,581)	$ (79,101,886)	$ (81,395,841)
199	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (57,758,741)**	**$ (59,433,744)**	**$ (61,157,323)**	**$ (62,930,885)**	**$ (64,755,881)**	**$ (66,633,802)**	**$ (68,566,182)**	**$ (70,554,601)**	**$ (72,600,685)**	**$ (74,706,104)**	**$ (76,872,581)**	**$ (79,101,886)**	**$ (81,395,841)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	93	94	95	96	97	98	99	100	101	102	103	104	105
1																
2			100													
98	C6	*Alternative Diameter Pipeline (30")*														
99			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
100																
101	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
102	2	MCS O&M and Emissions Cost	$ (62,977,694)	$ (58,629,424)	$ (60,329,678)	$ (62,079,238)	$ (63,879,536)	$ (65,732,043)	$ (67,638,272)	$ (69,599,782)	$ (71,618,175)	$ (73,695,103)	$ (75,832,261)	$ (78,031,396)	$ (80,294,307)	$ (82,622,841)
103	3	***Total Avoided Costs***	**$ (163,263,177)**	**$ (58,629,424)**	**$ (60,329,678)**	**$ (62,079,238)**	**$ (63,879,536)**	**$ (65,732,043)**	**$ (67,638,272)**	**$ (69,599,782)**	**$ (71,618,175)**	**$ (73,695,103)**	**$ (75,832,261)**	**$ (78,031,396)**	**$ (80,294,307)**	**$ (82,622,841)**
104																
105																
106	4	Annual O&M Cost	$ 3,680,546	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
107	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
108	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ 8,003,157	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,776,175	$ -
109	7	***Total O&M Costs***	**$ 4,585,126**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 3,733,251**	**$ 11,844,673**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 4,560,315**	**$ 14,468,739**	**$ 4,828,648**
110																
111	C7	*Alternative Diameter Pipeline (42")*														
112			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
113																
114	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
115	2	MCS O&M and Emissions Cost	$ (89,968,134)	$ (83,756,320)	$ (86,185,254)	$ (88,684,626)	$ (91,256,480)	$ (93,902,918)	$ (96,626,103)	$ (99,428,260)	$ (102,311,679)	$ (105,278,718)	$ (108,331,801)	$ (111,473,423)	$ (114,706,152)	$ (118,032,631)
116	3	***Total Avoided Costs***	**$ (190,253,617)**	**$ (83,756,320)**	**$ (86,185,254)**	**$ (88,684,626)**	**$ (91,256,480)**	**$ (93,902,918)**	**$ (96,626,103)**	**$ (99,428,260)**	**$ (102,311,679)**	**$ (105,278,718)**	**$ (108,331,801)**	**$ (111,473,423)**	**$ (114,706,152)**	**$ (118,032,631)**
117																
118																
119	4	Annual O&M Cost	$ 3,680,546	$ 3,426,424	$ 3,525,790	$ 3,628,038	$ 3,733,251	$ 3,841,516	$ 3,952,919	$ 4,067,554	$ 4,185,513	$ 4,306,893	$ 4,431,793	$ 4,560,315	$ 4,692,564	$ 4,828,648
120	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
121	6	TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ 8,003,157	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,776,175	$ -
122	7	***Total O&M Costs***	**$ 4,585,126**	**$ 3,426,424**	**$ 3,525,790**	**$ 3,628,038**	**$ 3,733,251**	**$ 11,844,673**	**$ 3,952,919**	**$ 4,067,554**	**$ 4,185,513**	**$ 4,306,893**	**$ 4,431,793**	**$ 4,560,315**	**$ 14,468,739**	**$ 4,828,648**
123																
124	D	*Replace Line 1600 In-Place*														
125			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
126																
127	1	Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3	***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130																
131																
132	4	Annual O&M Cost	$ 3,647,596	$ 4,283,030	$ 4,407,238	$ 4,535,048	$ 4,666,564	$ 4,801,894	$ 4,941,149	$ 5,084,443	$ 5,231,892	$ 5,383,616	$ 5,539,741	$ 5,700,394	$ 5,865,705	$ 6,035,811
133	5	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
134	6	TIMP Cost	$ 717,186	$ -	$ -	$ 7,558,413	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,232,902	$ -	$ -	$ -
135	7	***Total O&M Costs***	**$ 4,364,782**	**$ 4,283,030**	**$ 4,407,238**	**$ 12,093,460**	**$ 4,666,564**	**$ 4,801,894**	**$ 4,941,149**	**$ 5,084,443**	**$ 5,231,892**	**$ 5,383,616**	**$ 14,772,643**	**$ 5,700,394**	**$ 5,865,705**	**$ 6,035,811**
136																
137	E/F	*Otay Mesa Alternative*														
138			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
139																
140	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
141	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
143																
144																
145	4	Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5	***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147																
148	G	*LNG Storage (Peak-Shaver)*														
149			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
150																
151	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
152	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
154																
155																
156	4	Annual O&M Cost	$ 15,283,747	$ 17,132,120	$ 17,628,951	$ 18,140,191	$ 18,666,256	$ 19,207,578	$ 19,764,597	$ 20,337,771	$ 20,927,566	$ 21,534,466	$ 22,158,965	$ 22,801,575	$ 23,462,821	$ 24,143,242
157	5	***Total O&M Costs***	**$ 15,283,747**	**$ 17,132,120**	**$ 17,628,951**	**$ 18,140,191**	**$ 18,666,256**	**$ 19,207,578**	**$ 19,764,597**	**$ 20,337,771**	**$ 20,927,566**	**$ 21,534,466**	**$ 22,158,965**	**$ 22,801,575**	**$ 23,462,821**	**$ 24,143,242**
158																
159	H1	*Alternative Energy (Grid-Scale Battery)*														
160			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
161																
162	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
163	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
165																
166																
167	4	Annual O&M Cost	$ 15,283,747	$ 17,132,120	$ 17,628,951	$ 18,140,191	$ 18,666,256	$ 19,207,578	$ 19,764,597	$ 20,337,771	$ 20,927,566	$ 21,534,466	$ 22,158,965	$ 22,801,575	$ 23,462,821	$ 24,143,242
168	5	***Total O&M Costs***	**$ 15,283,747**	**$ 17,132,120**	**$ 17,628,951**	**$ 18,140,191**	**$ 18,666,256**	**$ 19,207,578**	**$ 19,764,597**	**$ 20,337,771**	**$ 20,927,566**	**$ 21,534,466**	**$ 22,158,965**	**$ 22,801,575**	**$ 23,462,821**	**$ 24,143,242**
169																
170	H2	*Alternative Energy (Smaller-Scale Battery)*														
171			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
172																
173	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
174	2	MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3	***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
176																
177																
178	4	Annual O&M Cost	$ 15,283,747	$ 17,132,120	$ 17,628,951	$ 18,140,191	$ 18,666,256	$ 19,207,578	$ 19,764,597	$ 20,337,771	$ 20,927,566	$ 21,534,466	$ 22,158,965	$ 22,801,575	$ 23,462,821	$ 24,143,242
179	5	***Total O&M Costs***	**$ 15,283,747**	**$ 17,132,120**	**$ 17,628,951**	**$ 18,140,191**	**$ 18,666,256**	**$ 19,207,578**	**$ 19,764,597**	**$ 20,337,771**	**$ 20,927,566**	**$ 21,534,466**	**$ 22,158,965**	**$ 22,801,575**	**$ 23,462,821**	**$ 24,143,242**
180																
181	I	*Off-shore Route*														
182			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
183																
184	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
185	2	MCS O&M and Emissions Cost	$ (59,240,789)	$ (83,756,320)	$ (86,185,254)	$ (88,684,626)	$ (91,256,480)	$ (93,902,918)	$ (96,626,103)	$ (99,428,260)	$ (102,311,679)	$ (105,278,718)	$ (108,331,801)	$ (111,473,423)	$ (114,706,152)	$ (118,032,631)
186	3	***Total Avoided Costs***	**$ (159,526,272)**	**$ (83,756,320)**	**$ (86,185,254)**	**$ (88,684,626)**	**$ (91,256,480)**	**$ (93,902,918)**	**$ (96,626,103)**	**$ (99,428,260)**	**$ (102,311,679)**	**$ (105,278,718)**	**$ (108,331,801)**	**$ (111,473,423)**	**$ (114,706,152)**	**$ (118,032,631)**
187																
188																
189	4	Annual O&M Cost	$ 4,544,076	$ 6,424,545	$ 6,610,857	$ 6,802,572	$ 6,999,846	$ 7,202,842	$ 7,411,724	$ 7,626,664	$ 7,847,837	$ 8,075,425	$ 8,309,612	$ 8,550,591	$ 8,798,558	$ 9,053,716
190	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
191	6	TIMP Cost	$ 595,634	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,474,071	$ -	$ -	$ -	$ -	$ -	$ -
192	7	***Total O&M Costs***	**$ 5,139,710**	**$ 6,424,545**	**$ 6,610,857**	**$ 6,802,572**	**$ 6,999,846**	**$ 7,202,842**	**$ 7,411,724**	**$ 16,100,735**	**$ 7,847,837**	**$ 8,075,425**	**$ 8,309,612**	**$ 8,550,591**	**$ 8,798,558**	**$ 9,053,716**
193																
194	J1	*Blythe to Santee Alternative 1*														
195			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
196																
197	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
198	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (83,756,320)	$ (86,185,254)	$ (88,684,626)	$ (91,256,480)	$ (93,902,918)	$ (96,626,103)	$ (99,428,260)	$ (102,311,679)	$ (105,278,718)	$ (108,331,801)	$ (111,473,423)	$ (114,706,152)	$ (118,032,631)
199	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (83,756,320)**	**$ (86,185,254)**	**$ (88,684,626)**	**$ (91,256,480)**	**$ (93,902,918)**	**$ (96,626,103)**	**$ (99,428,260)**	**$ (102,311,679)**	**$ (105,278,718)**	**$ (108,331,801)**	**$ (111,473,423)**	**$ (114,706,152)**	**$ (118,032,631)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.

			PV (X years after operational)	106	107	108	109	110	111	112	113	114	115	116
1														
2			100											
98		C6	***Alternative Diameter Pipeline (30")***											
99			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
100														
101	1		Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
102	2		MCS O&M and Emissions Cost	$ (62,977,694)	$ (85,018,904)	$ (87,484,452)	$ (90,021,501)	$ (92,632,125)	$ (95,318,456)	$ (98,082,692)	$ (100,927,090)	$ (103,853,975)	$ (106,865,740)	$ (109,964,847)	$ (113,153,828)
103	3		***Total Avoided Costs***	**$ (163,263,177)**	**$ (85,018,904)**	**$ (87,484,452)**	**$ (90,021,501)**	**$ (92,632,125)**	**$ (95,318,456)**	**$ (98,082,692)**	**$ (100,927,090)**	**$ (103,853,975)**	**$ (106,865,740)**	**$ (109,964,847)**	**$ (113,153,828)**
104														
105														
106	4		Annual O&M Cost	$ 3,680,546	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
107	5		Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
108	6		TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
109	7		***Total O&M Costs***	**$ 4,585,126**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 5,570,606**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
110														
111		C7	***Alternative Diameter Pipeline (42")***											
112			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
113														
114	1		Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
115	2		MCS O&M and Emissions Cost	$ (89,968,134)	$ (121,455,577)	$ (124,977,789)	$ (128,602,145)	$ (132,331,607)	$ (136,169,223)	$ (140,118,131)	$ (144,181,557)	$ (148,362,822)	$ (152,665,344)	$ (157,092,638)	$ (161,648,325)
116	3		***Total Avoided Costs***	**$ (190,253,617)**	**$ (121,455,577)**	**$ (124,977,789)**	**$ (128,602,145)**	**$ (132,331,607)**	**$ (136,169,223)**	**$ (140,118,131)**	**$ (144,181,557)**	**$ (148,362,822)**	**$ (152,665,344)**	**$ (157,092,638)**	**$ (161,648,325)**
117														
118														
119	4		Annual O&M Cost	$ 3,680,546	$ 4,968,679	$ 5,112,771	$ 5,261,041	$ 5,413,612	$ 5,570,606	$ 5,732,154	$ 5,898,386	$ 6,069,440	$ 6,245,453	$ 6,426,571	$ 6,612,942
120	5		Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
121	6		TIMP Cost	$ 904,581	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
122	7		***Total O&M Costs***	**$ 4,585,126**	**$ 4,968,679**	**$ 5,112,771**	**$ 5,261,041**	**$ 5,413,612**	**$ 5,570,606**	**$ 5,732,154**	**$ 5,898,386**	**$ 6,069,440**	**$ 6,245,453**	**$ 6,426,571**	**$ 6,612,942**
123														
124		D	***Replace Line 1600 In-Place***											
125			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
126														
127	1		Future L1600 Replacement Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
128	2		MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
129	3		***Total Avoided Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
130														
131														
132	4		Annual O&M Cost	$ 3,647,596	$ 6,210,849	$ 6,390,964	$ 6,576,302	$ 6,767,014	$ 6,963,258	$ 7,165,192	$ 7,372,983	$ 7,586,799	$ 7,806,817	$ 8,033,214	$ 8,266,178
133	5		Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
134	6		TIMP Cost	$ 717,186	$ -	$ -	$ -	$ 11,278,357	$ -	$ -	$ -	$ -	$ -	$ -	$ -
135	7		***Total O&M Costs***	**$ 4,364,782**	**$ 6,210,849**	**$ 6,390,964**	**$ 6,576,302**	**$ 18,045,372**	**$ 6,963,258**	**$ 7,165,192**	**$ 7,372,983**	**$ 7,586,799**	**$ 7,806,817**	**$ 8,033,214**	**$ 8,266,178**
136														
137		E/F	***Otay Mesa Alternative***											
138			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
139														
140	1		Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
141	2		MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
142	3		***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
143														
144														
145	4		Annual O&M Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
146	5		***Total O&M Costs***	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
147														
148		G	***LNG Storage (Peak-Shaver)***											
149			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
150														
151	1		Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
152	2		MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
153	3		***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
154														
155														
156	4		Annual O&M Cost	$ 15,283,747	$ 24,843,397	$ 25,563,855	$ 26,305,207	$ 27,068,058	$ 27,853,031	$ 28,660,769	$ 29,491,932	$ 30,347,198	$ 31,227,266	$ 32,132,857	$ 33,064,710
157	5		***Total O&M Costs***	**$ 15,283,747**	**$ 24,843,397**	**$ 25,563,855**	**$ 26,305,207**	**$ 27,068,058**	**$ 27,853,031**	**$ 28,660,769**	**$ 29,491,932**	**$ 30,347,198**	**$ 31,227,266**	**$ 32,132,857**	**$ 33,064,710**
158														
159		H1	***Alternative Energy (Grid-Scale Battery)***											
160			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
161														
162	1		Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
163	2		MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
164	3		***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
165														
166														
167	4		Annual O&M Cost	$ 15,283,747	$ 24,843,397	$ 25,563,855	$ 26,305,207	$ 27,068,058	$ 27,853,031	$ 28,660,769	$ 29,491,932	$ 30,347,198	$ 31,227,266	$ 32,132,857	$ 33,064,710
168	5		***Total O&M Costs***	**$ 15,283,747**	**$ 24,843,397**	**$ 25,563,855**	**$ 26,305,207**	**$ 27,068,058**	**$ 27,853,031**	**$ 28,660,769**	**$ 29,491,932**	**$ 30,347,198**	**$ 31,227,266**	**$ 32,132,857**	**$ 33,064,710**
169														
170		H2	***Alternative Energy (Smaller-Scale Battery)***											
171			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
172														
173	1		Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
174	2		MCS O&M and Emissions Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
175	3		***Total Avoided Costs***	**$ (100,285,483)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
176														
177														
178	4		Annual O&M Cost	$ 15,283,747	$ 24,843,397	$ 25,563,855	$ 26,305,207	$ 27,068,058	$ 27,853,031	$ 28,660,769	$ 29,491,932	$ 30,347,198	$ 31,227,266	$ 32,132,857	$ 33,064,710
179	5		***Total O&M Costs***	**$ 15,283,747**	**$ 24,843,397**	**$ 25,563,855**	**$ 26,305,207**	**$ 27,068,058**	**$ 27,853,031**	**$ 28,660,769**	**$ 29,491,932**	**$ 30,347,198**	**$ 31,227,266**	**$ 32,132,857**	**$ 33,064,710**
180														
181		I	***Off-shore Route***											
182			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
183														
184	1		Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
185	2		MCS O&M and Emissions Cost	$ (59,240,789)	$ (121,455,577)	$ (124,977,789)	$ (128,602,145)	$ (132,331,607)	$ (136,169,223)	$ (140,118,131)	$ (144,181,557)	$ (148,362,822)	$ (152,665,344)	$ (157,092,638)	$ (161,648,325)
186	3		***Total Avoided Costs***	**$ (159,526,272)**	**$ (121,455,577)**	**$ (124,977,789)**	**$ (128,602,145)**	**$ (132,331,607)**	**$ (136,169,223)**	**$ (140,118,131)**	**$ (144,181,557)**	**$ (148,362,822)**	**$ (152,665,344)**	**$ (157,092,638)**	**$ (161,648,325)**
187														
188														
189	4		Annual O&M Cost	$ 4,544,076	$ 9,316,274	$ 9,586,446	$ 9,864,453	$ 10,150,522	$ 10,444,887	$ 10,747,789	$ 11,059,474	$ 11,380,199	$ 11,710,225	$ 12,049,821	$ 12,399,266
190	5		Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
191	6		TIMP Cost	$ 595,634	$ 10,351,415	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,644,666	$ -	$ -	$ -
192	7		***Total O&M Costs***	**$ 5,139,710**	**$ 19,667,689**	**$ 9,586,446**	**$ 9,864,453**	**$ 10,150,522**	**$ 10,444,887**	**$ 10,747,789**	**$ 11,059,474**	**$ 24,024,865**	**$ 11,710,225**	**$ 12,049,821**	**$ 12,399,266**
193														
194		J1	***Blythe to Santee Alternative 1***											
195			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
196														
197	1		Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
198	2		MCS O&M and Emissions Cost	$ (74,719,907)	$ (121,455,577)	$ (124,977,789)	$ (128,602,145)	$ (132,331,607)	$ (136,169,223)	$ (140,118,131)	$ (144,181,557)	$ (148,362,822)	$ (152,665,344)	$ (157,092,638)	$ (161,648,325)
199	3		***Total Avoided Costs***	**$ (175,005,390)**	**$ (121,455,577)**	**$ (124,977,789)**	**$ (128,602,145)**	**$ (132,331,607)**	**$ (136,169,223)**	**$ (140,118,131)**	**$ (144,181,557)**	**$ (148,362,822)**	**$ (152,665,344)**	**$ (157,092,638)**	**$ (161,648,325)**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	0	1	2	3	4	5	6	7	8	9	10	11	12	13
1			100														
2																	
200																	
201																	
202	4	Annual O&M Cost	$ 14,495,118	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,514,701	$ 1,558,627	$ 1,603,828	$ 1,650,339
203	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
204	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,514,701**	**$ 1,558,627**	**$ 1,603,828**	**$ 1,650,339**
206																	
207	J2	***Blythe to Santee Alternative 2***															
208			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
209														Operational Year			
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (7,808,030)	$ (8,034,463)	$ (8,267,462)	$ (8,507,219)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (7,808,030)**	**$ (8,034,463)**	**$ (8,267,462)**	**$ (8,507,219)**
213																	
214																	
215	4	Annual O&M Cost	$ 14,508,148	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,516,063	$ 1,560,028	$ 1,605,269	$ 1,651,822
216	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
217	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,516,063**	**$ 1,560,028**	**$ 1,605,269**	**$ 1,651,822**
219																	
220	J3	***Cactus City to San Diego Alternative***															
221			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
222														Operational Year			
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (7,808,030)	$ (8,034,463)	$ (8,267,462)	$ (8,507,219)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (7,808,030)**	**$ (8,034,463)**	**$ (8,267,462)**	**$ (8,507,219)**
226																	
227																	
228	4	Annual O&M Cost	$ 10,434,660	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,090,394	$ 1,122,015	$ 1,154,554	$ 1,188,036
229	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
230	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,090,394**	**$ 1,122,015**	**$ 1,154,554**	**$ 1,188,036**
232																	
233	K	***Second Pipeline Along Line 3010***															
234			**PV**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
235															Operational Year		
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (8,034,463)	$ (8,267,462)	$ (8,507,219)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ (8,034,463)**	**$ (8,267,462)**	**$ (8,507,219)**
239																	
240																	
241	4	Annual O&M Cost	$ 2,799,858	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 315,369	$ 324,515	$ 333,926
242	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
243	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 315,369**	**$ 324,515**	**$ 333,926**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1			100														
200																	
201																	
202	4	Annual O&M Cost	$ 14,495,118	$ 1,698,198	$ 1,747,446	$ 1,798,122	$ 1,850,268	$ 1,903,925	$ 1,959,139	$ 2,015,954	$ 2,074,417	$ 2,134,575	$ 2,196,478	$ 2,260,176	$ 2,325,721	$ 2,393,167	$ 2,462,568
203	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
204	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ 2,438,668	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,978,930	$ -	$ -	$ -
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ 1,698,198**	**$ 1,747,446**	**$ 1,798,122**	**$ 4,288,935**	**$ 1,903,925**	**$ 1,959,139**	**$ 2,015,954**	**$ 2,074,417**	**$ 2,134,575**	**$ 2,196,478**	**$ 5,239,105**	**$ 2,325,721**	**$ 2,393,167**	**$ 2,462,568**
206																	
207	**J2**	***Blythe to Santee Alternative 2***															
208			**PV**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
209																	
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (8,753,928)	$ (9,007,792)	$ (9,269,018)	$ (9,537,820)	$ (9,814,416)	$ (10,099,035)	$ (10,391,907)	$ (10,693,272)	$ (11,003,377)	$ (11,322,475)	$ (11,650,826)	$ (11,988,700)	$ (12,336,373)	$ (12,694,127)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (8,753,928)**	**$ (9,007,792)**	**$ (9,269,018)**	**$ (9,537,820)**	**$ (9,814,416)**	**$ (10,099,035)**	**$ (10,391,907)**	**$ (10,693,272)**	**$ (11,003,377)**	**$ (11,322,475)**	**$ (346,334,415)**	**$ (356,378,113)**	**$ (12,336,373)**	**$ (12,694,127)**
213																	
214																	
215	4	Annual O&M Cost	$ 14,508,148	$ 1,699,725	$ 1,749,017	$ 1,799,738	$ 1,851,931	$ 1,905,637	$ 1,960,900	$ 2,017,766	$ 2,076,282	$ 2,136,494	$ 2,198,452	$ 2,262,207	$ 2,327,811	$ 2,395,318	$ 2,464,782
216	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
217	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ 2,438,668	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,978,930	$ -	$ -	$ -
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ 1,699,725**	**$ 1,749,017**	**$ 1,799,738**	**$ 4,290,598**	**$ 1,905,637**	**$ 1,960,900**	**$ 2,017,766**	**$ 2,076,282**	**$ 2,136,494**	**$ 2,198,452**	**$ 5,241,137**	**$ 2,327,811**	**$ 2,395,318**	**$ 2,464,782**
219																	
220	**J3**	***Cactus City to San Diego Alternative***															
221			**PV**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
222																	
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (8,753,928)	$ (9,007,792)	$ (9,269,018)	$ (9,537,820)	$ (9,814,416)	$ (10,099,035)	$ (10,391,907)	$ (10,693,272)	$ (11,003,377)	$ (11,322,475)	$ (11,650,826)	$ (11,988,700)	$ (12,336,373)	$ (12,694,127)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (8,753,928)**	**$ (9,007,792)**	**$ (9,269,018)**	**$ (9,537,820)**	**$ (9,814,416)**	**$ (10,099,035)**	**$ (10,391,907)**	**$ (10,693,272)**	**$ (11,003,377)**	**$ (11,322,475)**	**$ (346,334,415)**	**$ (356,378,113)**	**$ (12,336,373)**	**$ (12,694,127)**
226																	
227																	
228	4	Annual O&M Cost	$ 10,434,660	$ 1,222,489	$ 1,257,941	$ 1,294,421	$ 1,331,960	$ 1,370,586	$ 1,410,334	$ 1,451,233	$ 1,493,319	$ 1,536,625	$ 1,581,187	$ 1,627,042	$ 1,674,226	$ 1,722,779	$ 1,772,739
229	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
230	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ 2,438,668	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,978,930	$ -	$ -	$ -
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ 1,222,489**	**$ 1,257,941**	**$ 1,294,421**	**$ 3,770,627**	**$ 1,370,586**	**$ 1,410,334**	**$ 1,451,233**	**$ 1,493,319**	**$ 1,536,625**	**$ 1,581,187**	**$ 4,605,971**	**$ 1,674,226**	**$ 1,722,779**	**$ 1,772,739**
232																	
233	**K**	***Second Pipeline Along Line 3010***															
234			**PV**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**
235																	
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (334,683,589)	$ (344,389,413)	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ (8,753,928)	$ (9,007,792)	$ (9,269,018)	$ (9,537,820)	$ (9,814,416)	$ (10,099,035)	$ (10,391,907)	$ (10,693,272)	$ (11,003,377)	$ (11,322,475)	$ (11,650,826)	$ (11,988,700)	$ (12,336,373)	$ (12,694,127)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ (8,753,928)**	**$ (9,007,792)**	**$ (9,269,018)**	**$ (9,537,820)**	**$ (9,814,416)**	**$ (10,099,035)**	**$ (10,391,907)**	**$ (10,693,272)**	**$ (11,003,377)**	**$ (11,322,475)**	**$ (346,334,415)**	**$ (356,378,113)**	**$ (12,336,373)**	**$ (12,694,127)**
239																	
240																	
241	4	Annual O&M Cost	$ 2,799,858	$ 343,610	$ 353,575	$ 363,828	$ 374,379	$ 385,236	$ 396,408	$ 407,904	$ 419,733	$ 431,906	$ 444,431	$ 457,319	$ 470,582	$ 484,228	$ 498,271
242	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
243	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ 836,463	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,021,773	$ -	$ -
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ 343,610**	**$ 353,575**	**$ 363,828**	**$ 374,379**	**$ 1,221,699**	**$ 396,408**	**$ 407,904**	**$ 419,733**	**$ 431,906**	**$ 444,431**	**$ 457,319**	**$ 1,492,354**	**$ 484,228**	**$ 498,271**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	28	29	30	31	32	33	34	35	36	37	38	39	40
1			100													
2																
200																
201																
202	4	Annual O&M Cost	$ 14,495,118	$ 2,533,983	$ 2,607,468	$ 2,683,085	$ 2,760,894	$ 2,840,960	$ 2,923,348	$ 3,008,125	$ 3,095,361	$ 3,185,126	$ 3,277,495	$ 3,372,542	$ 3,470,346	$ 3,570,986
203	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
204	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ 3,638,881	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,445,038	$ -	$ -
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ 2,533,983**	**$ 2,607,468**	**$ 2,683,085**	**$ 6,399,776**	**$ 2,840,960**	**$ 2,923,348**	**$ 3,008,125**	**$ 3,095,361**	**$ 3,185,126**	**$ 3,277,495**	**$ 7,817,581**	**$ 3,470,346**	**$ 3,570,986**
206																
207		***J2 Blythe to Santee Alternative 2***														
208			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
209																
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (13,062,257)	$ (13,441,063)	$ (13,830,853)	$ (14,231,948)	$ (14,644,675)	$ (15,069,370)	$ (15,506,382)	$ (15,956,067)	$ (16,418,793)	$ (16,894,938)	$ (17,384,891)	$ (17,889,053)	$ (18,407,836)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (13,062,257)**	**$ (13,441,063)**	**$ (13,830,853)**	**$ (14,231,948)**	**$ (14,644,675)**	**$ (15,069,370)**	**$ (15,506,382)**	**$ (15,956,067)**	**$ (16,418,793)**	**$ (16,894,938)**	**$ (17,384,891)**	**$ (17,889,053)**	**$ (18,407,836)**
213																
214																
215	4	Annual O&M Cost	$ 14,508,148	$ 2,536,261	$ 2,609,812	$ 2,685,497	$ 2,763,376	$ 2,843,514	$ 2,925,976	$ 3,010,829	$ 3,098,143	$ 3,187,989	$ 3,280,441	$ 3,375,574	$ 3,473,466	$ 3,574,196
216	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
217	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ 3,638,881	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,445,038	$ -	$ -
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ 2,536,261**	**$ 2,609,812**	**$ 2,685,497**	**$ 6,402,257**	**$ 2,843,514**	**$ 2,925,976**	**$ 3,010,829**	**$ 3,098,143**	**$ 3,187,989**	**$ 3,280,441**	**$ 7,820,612**	**$ 3,473,466**	**$ 3,574,196**
219																
220		***J3 Cactus City to San Diego Alternative***														
221			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
222																
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (13,062,257)	$ (13,441,063)	$ (13,830,853)	$ (14,231,948)	$ (14,644,675)	$ (15,069,370)	$ (15,506,382)	$ (15,956,067)	$ (16,418,793)	$ (16,894,938)	$ (17,384,891)	$ (17,889,053)	$ (18,407,836)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (13,062,257)**	**$ (13,441,063)**	**$ (13,830,853)**	**$ (14,231,948)**	**$ (14,644,675)**	**$ (15,069,370)**	**$ (15,506,382)**	**$ (15,956,067)**	**$ (16,418,793)**	**$ (16,894,938)**	**$ (17,384,891)**	**$ (17,889,053)**	**$ (18,407,836)**
226																
227																
228	4	Annual O&M Cost	$ 10,434,660	$ 1,824,149	$ 1,877,049	$ 1,931,483	$ 1,987,496	$ 2,045,134	$ 2,104,443	$ 2,165,471	$ 2,228,270	$ 2,292,890	$ 2,359,384	$ 2,427,806	$ 2,498,212	$ 2,570,660
229	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE
230	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ 3,638,881	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,445,038	$ -	$ -
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ 1,824,149**	**$ 1,877,049**	**$ 1,931,483**	**$ 5,626,377**	**$ 2,045,134**	**$ 2,104,443**	**$ 2,165,471**	**$ 2,228,270**	**$ 2,292,890**	**$ 2,359,384**	**$ 6,872,844**	**$ 2,498,212**	**$ 2,570,660**
232																
233		***K Second Pipeline Along Line 3010***														
234			**PV**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**
235																
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ (13,062,257)	$ (13,441,063)	$ (13,830,853)	$ (14,231,948)	$ (14,644,675)	$ (15,069,370)	$ (15,506,382)	$ (15,956,067)	$ (16,418,793)	$ (16,894,938)	$ (17,384,891)	$ (17,889,053)	$ (18,407,836)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ (13,062,257)**	**$ (13,441,063)**	**$ (13,830,853)**	**$ (14,231,948)**	**$ (14,644,675)**	**$ (15,069,370)**	**$ (15,506,382)**	**$ (15,956,067)**	**$ (16,418,793)**	**$ (16,894,938)**	**$ (17,384,891)**	**$ (17,889,053)**	**$ (18,407,836)**
239																
240																
241	4	Annual O&M Cost	$ 2,799,858	$ 512,721	$ 527,590	$ 542,890	$ 558,634	$ 574,834	$ 591,504	$ 608,658	$ 626,309	$ 644,472	$ 663,162	$ 682,393	$ 702,183	$ 722,546
242	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
243	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ 1,248,136	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,524,648	$ -
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ 512,721**	**$ 527,590**	**$ 542,890**	**$ 558,634**	**$ 1,822,970**	**$ 591,504**	**$ 608,658**	**$ 626,309**	**$ 644,472**	**$ 663,162**	**$ 682,393**	**$ 2,226,831**	**$ 722,546**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	41	42	43	44	45	46	47	48	49	50	51	52	53
1			100													
2																
200																
201																
202	4	Annual O&M Cost	$ 14,495,118	$ 3,674,545	$ 3,781,107	$ 3,890,759	$ 4,003,591	$ 4,119,695	$ 4,239,166	$ 4,362,102	$ 4,488,603	$ 4,618,772	$ 4,752,717	$ 4,890,545	$ 5,032,371	$ 5,178,310
203	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
204	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ 5,429,791	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,632,706	$ -
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ 3,674,545**	**$ 3,781,107**	**$ 3,890,759**	**$ 4,003,591**	**$ 9,549,486**	**$ 4,239,166**	**$ 4,362,102**	**$ 4,488,603**	**$ 4,618,772**	**$ 4,752,717**	**$ 4,890,545**	**$ 11,665,077**	**$ 5,178,310**
206																
207	**J2**	***Blythe to Santee Alternative 2***														
208			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
209																
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (18,941,663)	$ (19,490,971)	$ (20,056,209)	$ (20,637,839)	$ (21,236,337)	$ (21,852,190)	$ (22,485,904)	$ (23,137,995)	$ (23,808,997)	$ (24,499,458)	$ (25,209,942)	$ (25,941,030)	$ (26,693,320)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (18,941,663)**	**$ (19,490,971)**	**$ (20,056,209)**	**$ (20,637,839)**	**$ (21,236,337)**	**$ (21,852,190)**	**$ (22,485,904)**	**$ (23,137,995)**	**$ (23,808,997)**	**$ (24,499,458)**	**$ (25,209,942)**	**$ (25,941,030)**	**$ (26,693,320)**
213																
214																
215	4	Annual O&M Cost	$ 14,508,148	$ 3,677,848	$ 3,784,505	$ 3,894,256	$ 4,007,189	$ 4,123,398	$ 4,242,976	$ 4,366,023	$ 4,492,637	$ 4,622,924	$ 4,756,989	$ 4,894,941	$ 5,036,895	$ 5,182,965
216	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
217	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ 5,429,791	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,632,706	$ -
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ 3,677,848**	**$ 3,784,505**	**$ 3,894,256**	**$ 4,007,189**	**$ 9,553,189**	**$ 4,242,976**	**$ 4,366,023**	**$ 4,492,637**	**$ 4,622,924**	**$ 4,756,989**	**$ 4,894,941**	**$ 11,669,601**	**$ 5,182,965**
219																
220	**J3**	***Cactus City to San Diego Alternative***														
221			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
222																
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (18,941,663)	$ (19,490,971)	$ (20,056,209)	$ (20,637,839)	$ (21,236,337)	$ (21,852,190)	$ (22,485,904)	$ (23,137,995)	$ (23,808,997)	$ (24,499,458)	$ (25,209,942)	$ (25,941,030)	$ (26,693,320)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (18,941,663)**	**$ (19,490,971)**	**$ (20,056,209)**	**$ (20,637,839)**	**$ (21,236,337)**	**$ (21,852,190)**	**$ (22,485,904)**	**$ (23,137,995)**	**$ (23,808,997)**	**$ (24,499,458)**	**$ (25,209,942)**	**$ (25,941,030)**	**$ (26,693,320)**
226																
227																
228	4	Annual O&M Cost	$ 10,434,660	$ 2,645,209	$ 2,721,921	$ 2,800,856	$ 2,882,081	$ 2,965,661	$ 3,051,666	$ 3,140,164	$ 3,231,229	$ 3,324,934	$ 3,421,357	$ 3,520,577	$ 3,622,673	$ 3,727,731
229	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE
230	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ 5,429,791	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,632,706	$ -
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ 2,645,209**	**$ 2,721,921**	**$ 2,800,856**	**$ 2,882,081**	**$ 8,395,453**	**$ 3,051,666**	**$ 3,140,164**	**$ 3,231,229**	**$ 3,324,934**	**$ 3,421,357**	**$ 3,520,577**	**$ 10,255,379**	**$ 3,727,731**
232																
233	**K**	***Second Pipeline Along Line 3010***														
234			**PV**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**	**2065**	**2066**	**2067**	**2068**
235																
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ (18,941,663)	$ (19,490,971)	$ (20,056,209)	$ (20,637,839)	$ (21,236,337)	$ (21,852,190)	$ (22,485,904)	$ (23,137,995)	$ (23,808,997)	$ (24,499,458)	$ (25,209,942)	$ (25,941,030)	$ (26,693,320)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ (18,941,663)**	**$ (19,490,971)**	**$ (20,056,209)**	**$ (20,637,839)**	**$ (21,236,337)**	**$ (21,852,190)**	**$ (22,485,904)**	**$ (23,137,995)**	**$ (23,808,997)**	**$ (24,499,458)**	**$ (25,209,942)**	**$ (25,941,030)**	**$ (26,693,320)**
239																
240																
241	4	Annual O&M Cost	$ 2,799,858	$ 743,500	$ 765,061	$ 787,248	$ 810,078	$ 833,571	$ 857,744	$ 882,619	$ 908,215	$ 934,553	$ 961,655	$ 989,543	$ 1,018,240	$ 1,047,769
242	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
243	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ -	$ 1,862,418	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,275,018
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ 743,500**	**$ 765,061**	**$ 787,248**	**$ 810,078**	**$ 833,571**	**$ 2,720,163**	**$ 882,619**	**$ 908,215**	**$ 934,553**	**$ 961,655**	**$ 989,543**	**$ 1,018,240**	**$ 3,322,787**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	54	55	56	57	58	59	60	61	62	63	64	65	66
1			100													
2																
200																
201																
202	4	Annual O&M Cost	$ 14,495,118	$ 5,328,481	$ 5,483,007	$ 5,642,014	$ 5,805,632	$ 5,973,996	$ 6,147,242	$ 6,325,512	$ 6,508,951	$ 6,697,711	$ 6,891,945	$ 7,091,811	$ 7,297,474	$ 7,509,100
203	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
204	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ 8,102,114	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,897,055
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ 5,328,481**	**$ 5,483,007**	**$ 5,642,014**	**$ 5,805,632**	**$ 5,973,996**	**$ 14,249,356**	**$ 6,325,512**	**$ 6,508,951**	**$ 6,697,711**	**$ 6,891,945**	**$ 7,091,811**	**$ 7,297,474**	**$ 17,406,156**
206																
207		***J2 Blythe to Santee Alternative 2***														
208			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
209																
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (27,467,427)	$ (28,263,982)	$ (29,083,638)	$ (29,927,063)	$ (30,794,948)	$ (31,688,001)	$ (32,606,953)	$ (33,552,555)	$ (34,525,579)	$ (35,526,821)	$ (36,557,099)	$ (37,617,255)	$ (38,708,155)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (27,467,427)**	**$ (28,263,982)**	**$ (29,083,638)**	**$ (29,927,063)**	**$ (30,794,948)**	**$ (31,688,001)**	**$ (32,606,953)**	**$ (33,552,555)**	**$ (34,525,579)**	**$ (35,526,821)**	**$ (36,557,099)**	**$ (37,617,255)**	**$ (38,708,155)**
213																
214																
215	4	Annual O&M Cost	$ 14,508,148	$ 5,333,271	$ 5,487,935	$ 5,647,086	$ 5,810,851	$ 5,979,366	$ 6,152,767	$ 6,331,198	$ 6,514,802	$ 6,703,732	$ 6,898,140	$ 7,098,186	$ 7,304,033	$ 7,515,850
216	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
217	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ 8,102,114	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,897,055
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ 5,333,271**	**$ 5,487,935**	**$ 5,647,086**	**$ 5,810,851**	**$ 5,979,366**	**$ 14,254,882**	**$ 6,331,198**	**$ 6,514,802**	**$ 6,703,732**	**$ 6,898,140**	**$ 7,098,186**	**$ 7,304,033**	**$ 17,412,905**
219																
220		***J3 Cactus City to San Diego Alternative***														
221			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
222																
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (27,467,427)	$ (28,263,982)	$ (29,083,638)	$ (29,927,063)	$ (30,794,948)	$ (31,688,001)	$ (32,606,953)	$ (33,552,555)	$ (34,525,579)	$ (35,526,821)	$ (36,557,099)	$ (37,617,255)	$ (38,708,155)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (27,467,427)**	**$ (28,263,982)**	**$ (29,083,638)**	**$ (29,927,063)**	**$ (30,794,948)**	**$ (31,688,001)**	**$ (32,606,953)**	**$ (33,552,555)**	**$ (34,525,579)**	**$ (35,526,821)**	**$ (36,557,099)**	**$ (37,617,255)**	**$ (38,708,155)**
226																
227																
228	4	Annual O&M Cost	$ 10,434,660	$ 3,835,835	$ 3,947,074	$ 4,061,540	$ 4,179,324	$ 4,300,525	$ 4,425,240	$ 4,553,572	$ 4,685,625	$ 4,821,509	$ 4,961,332	$ 5,105,211	$ 5,253,262	$ 5,405,607
229	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE
230	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ 8,102,114	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,897,055
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ 3,835,835**	**$ 3,947,074**	**$ 4,061,540**	**$ 4,179,324**	**$ 4,300,525**	**$ 12,527,354**	**$ 4,553,572**	**$ 4,685,625**	**$ 4,821,509**	**$ 4,961,332**	**$ 5,105,211**	**$ 5,253,262**	**$ 15,302,662**
232																
233		***K Second Pipeline Along Line 3010***														
234			**PV**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**	**2075**	**2076**	**2077**	**2078**	**2079**	**2080**	**2081**
235																
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ (27,467,427)	$ (28,263,982)	$ (29,083,638)	$ (29,927,063)	$ (30,794,948)	$ (31,688,001)	$ (32,606,953)	$ (33,552,555)	$ (34,525,579)	$ (35,526,821)	$ (36,557,099)	$ (37,617,255)	$ (38,708,155)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ (27,467,427)**	**$ (28,263,982)**	**$ (29,083,638)**	**$ (29,927,063)**	**$ (30,794,948)**	**$ (31,688,001)**	**$ (32,606,953)**	**$ (33,552,555)**	**$ (34,525,579)**	**$ (35,526,821)**	**$ (36,557,099)**	**$ (37,617,255)**	**$ (38,708,155)**
239																
240																
241	4	Annual O&M Cost	$ 2,799,858	$ 1,078,154	$ 1,109,420	$ 1,141,594	$ 1,174,700	$ 1,208,766	$ 1,243,820	$ 1,279,891	$ 1,317,008	$ 1,355,201	$ 1,394,502	$ 1,434,943	$ 1,476,556	$ 1,519,376
242	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
243	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,779,025	$ -	$ -	$ -	$ -	$ -	$ -
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ 1,078,154**	**$ 1,109,420**	**$ 1,141,594**	**$ 1,174,700**	**$ 1,208,766**	**$ 1,243,820**	**$ 4,058,916**	**$ 1,317,008**	**$ 1,355,201**	**$ 1,394,502**	**$ 1,434,943**	**$ 1,476,556**	**$ 1,519,376**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	67	68	69	70	71	72	73	74	75	76	77	78	79
1																
2			100													
200																
201																
202	4	Annual O&M Cost	$ 14,495,118	$ 7,726,864	$ 7,950,943	$ 8,181,521	$ 8,418,785	$ 8,662,930	$ 8,914,154	$ 9,172,665	$ 9,438,672	$ 9,712,394	$ 9,994,053	$ 10,283,881	$ 10,582,113	$ 10,888,995
203	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
204	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,089,647	$ -	$ -	$ -	$ -	$ -	$ -
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ 7,726,864**	**$ 7,950,943**	**$ 8,181,521**	**$ 8,418,785**	**$ 8,662,930**	**$ 8,914,154**	**$ 21,262,312**	**$ 9,438,672**	**$ 9,712,394**	**$ 9,994,053**	**$ 10,283,881**	**$ 10,582,113**	**$ 10,888,995**
206																
207		***J2 Blythe to Santee Alternative 2***														
208			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
209																
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (39,830,691)	$ (40,985,781)	$ (42,174,369)	$ (43,397,426)	$ (44,655,951)	$ (45,950,974)	$ (47,283,552)	$ (48,654,775)	$ (50,065,764)	$ (51,517,671)	$ (53,011,683)	$ (54,549,022)	$ (56,130,944)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (39,830,691)**	**$ (40,985,781)**	**$ (42,174,369)**	**$ (43,397,426)**	**$ (44,655,951)**	**$ (45,950,974)**	**$ (47,283,552)**	**$ (48,654,775)**	**$ (50,065,764)**	**$ (51,517,671)**	**$ (53,011,683)**	**$ (54,549,022)**	**$ (56,130,944)**
213																
214																
215	4	Annual O&M Cost	$ 14,508,148	$ 7,733,810	$ 7,958,090	$ 8,188,875	$ 8,426,352	$ 8,670,716	$ 8,922,167	$ 9,180,910	$ 9,447,156	$ 9,721,124	$ 10,003,037	$ 10,293,125	$ 10,591,625	$ 10,898,782
216	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
217	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,089,647	$ -	$ -	$ -	$ -	$ -	$ -
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ 7,733,810**	**$ 7,958,090**	**$ 8,188,875**	**$ 8,426,352**	**$ 8,670,716**	**$ 8,922,167**	**$ 21,270,557**	**$ 9,447,156**	**$ 9,721,124**	**$ 10,003,037**	**$ 10,293,125**	**$ 10,591,625**	**$ 10,898,782**
219																
220		***J3 Cactus City to San Diego Alternative***														
221			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
222																
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (39,830,691)	$ (40,985,781)	$ (42,174,369)	$ (43,397,426)	$ (44,655,951)	$ (45,950,974)	$ (47,283,552)	$ (48,654,775)	$ (50,065,764)	$ (51,517,671)	$ (53,011,683)	$ (54,549,022)	$ (56,130,944)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (39,830,691)**	**$ (40,985,781)**	**$ (42,174,369)**	**$ (43,397,426)**	**$ (44,655,951)**	**$ (45,950,974)**	**$ (47,283,552)**	**$ (48,654,775)**	**$ (50,065,764)**	**$ (51,517,671)**	**$ (53,011,683)**	**$ (54,549,022)**	**$ (56,130,944)**
226																
227																
228	4	Annual O&M Cost	$ 10,434,660	$ 5,562,369	$ 5,723,678	$ 5,889,665	$ 6,060,465	$ 6,236,218	$ 6,417,069	$ 6,603,164	$ 6,794,655	$ 6,991,700	$ 7,194,460	$ 7,403,099	$ 7,617,789	$ 7,838,705
229	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
230	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,089,647	$ -	$ -	$ -	$ -	$ -	$ -
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ 5,562,369**	**$ 5,723,678**	**$ 5,889,665**	**$ 6,060,465**	**$ 6,236,218**	**$ 6,417,069**	**$ 18,692,811**	**$ 6,794,655**	**$ 6,991,700**	**$ 7,194,460**	**$ 7,403,099**	**$ 7,617,789**	**$ 7,838,705**
232																
233		***K Second Pipeline Along Line 3010***														
234			**PV**	**2082**	**2083**	**2084**	**2085**	**2086**	**2087**	**2088**	**2089**	**2090**	**2091**	**2092**	**2093**	**2094**
235																
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ (39,830,691)	$ (40,985,781)	$ (42,174,369)	$ (43,397,426)	$ (44,655,951)	$ (45,950,974)	$ (47,283,552)	$ (48,654,775)	$ (50,065,764)	$ (51,517,671)	$ (53,011,683)	$ (54,549,022)	$ (56,130,944)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ (39,830,691)**	**$ (40,985,781)**	**$ (42,174,369)**	**$ (43,397,426)**	**$ (44,655,951)**	**$ (45,950,974)**	**$ (47,283,552)**	**$ (48,654,775)**	**$ (50,065,764)**	**$ (51,517,671)**	**$ (53,011,683)**	**$ (54,549,022)**	**$ (56,130,944)**
239																
240																
241	4	Annual O&M Cost	$ 2,799,858	$ 1,563,438	$ 1,608,778	$ 1,655,432	$ 1,703,440	$ 1,752,840	$ 1,803,672	$ 1,855,978	$ 1,909,802	$ 1,965,186	$ 2,022,176	$ 2,080,820	$ 2,141,163	$ 2,203,257
242	5	Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
243	6	TIMP Cost	$ 717,186	$ 3,394,690	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,146,749	$ -	$ -	$ -	$ -	$ -
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ 4,958,128**	**$ 1,608,778**	**$ 1,655,432**	**$ 1,703,440**	**$ 1,752,840**	**$ 1,803,672**	**$ 1,855,978**	**$ 6,056,551**	**$ 1,965,186**	**$ 2,022,176**	**$ 2,080,820**	**$ 2,141,163**	**$ 2,203,257**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	80	81	82	83	84	85	86	87	88	89	90	91	92
1			100													
2																
200																
201																
202	4	Annual O&M Cost	$ 14,495,118	$ 11,204,775	$ 11,529,714	$ 11,864,076	$ 12,208,134	$ 12,562,170	$ 12,926,473	$ 13,301,340	$ 13,687,079	$ 14,084,004	$ 14,492,441	$ 14,912,721	$ 15,345,190	$ 15,790,201
203	5	Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
204	6	TIMP Cost	$ 2,253,804	$ 14,767,985	$ -	$ -	$ -	$ -	$ -	$ -	$ 18,039,681	$ -	$ -	$ -	$ -	$ -
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ 25,972,760**	**$ 11,529,714**	**$ 11,864,076**	**$ 12,208,134**	**$ 12,562,170**	**$ 12,926,473**	**$ 13,301,340**	**$ 31,726,761**	**$ 14,084,004**	**$ 14,492,441**	**$ 14,912,721**	**$ 15,345,190**	**$ 15,790,201**
206																
207	**J2**	***Blythe to Santee Alternative 2***														
208			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
209																
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (57,758,741)	$ (59,433,744)	$ (61,157,323)	$ (62,930,885)	$ (64,755,881)	$ (66,633,802)	$ (68,566,182)	$ (70,554,601)	$ (72,600,685)	$ (74,706,104)	$ (76,872,581)	$ (79,101,886)	$ (81,395,841)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (57,758,741)**	**$ (59,433,744)**	**$ (61,157,323)**	**$ (62,930,885)**	**$ (64,755,881)**	**$ (66,633,802)**	**$ (68,566,182)**	**$ (70,554,601)**	**$ (72,600,685)**	**$ (74,706,104)**	**$ (76,872,581)**	**$ (79,101,886)**	**$ (81,395,841)**
213																
214																
215	4	Annual O&M Cost	$ 14,508,148	$ 11,214,847	$ 11,540,078	$ 11,874,740	$ 12,219,107	$ 12,573,462	$ 12,938,092	$ 13,313,297	$ 13,699,382	$ 14,096,664	$ 14,505,468	$ 14,926,126	$ 15,358,984	$ 15,804,394
216	5	Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
217	6	TIMP Cost	$ 2,253,804	$ 14,767,985	$ -	$ -	$ -	$ -	$ -	$ -	$ 18,039,681	$ -	$ -	$ -	$ -	$ -
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ 25,982,832**	**$ 11,540,078**	**$ 11,874,740**	**$ 12,219,107**	**$ 12,573,462**	**$ 12,938,092**	**$ 13,313,297**	**$ 31,739,064**	**$ 14,096,664**	**$ 14,505,468**	**$ 14,926,126**	**$ 15,358,984**	**$ 15,804,394**
219																
220	**J3**	***Cactus City to San Diego Alternative***														
221			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
222																
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (57,758,741)	$ (59,433,744)	$ (61,157,323)	$ (62,930,885)	$ (64,755,881)	$ (66,633,802)	$ (68,566,182)	$ (70,554,601)	$ (72,600,685)	$ (74,706,104)	$ (76,872,581)	$ (79,101,886)	$ (81,395,841)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (57,758,741)**	**$ (59,433,744)**	**$ (61,157,323)**	**$ (62,930,885)**	**$ (64,755,881)**	**$ (66,633,802)**	**$ (68,566,182)**	**$ (70,554,601)**	**$ (72,600,685)**	**$ (74,706,104)**	**$ (76,872,581)**	**$ (79,101,886)**	**$ (81,395,841)**
226																
227																
228	4	Annual O&M Cost	$ 10,434,660	$ 8,066,027	$ 8,299,942	$ 8,540,640	$ 8,788,319	$ 9,043,180	$ 9,305,432	$ 9,575,290	$ 9,852,973	$ 10,138,710	$ 10,432,732	$ 10,735,281	$ 11,046,605	$ 11,366,956
229	5	Pigging to Occur	N/A	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
230	6	TIMP Cost	$ 2,253,804	$ 14,767,985	$ -	$ -	$ -	$ -	$ -	$ -	$ 18,039,681	$ -	$ -	$ -	$ -	$ -
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ 22,834,012**	**$ 8,299,942**	**$ 8,540,640**	**$ 8,788,319**	**$ 9,043,180**	**$ 9,305,432**	**$ 9,575,290**	**$ 27,892,655**	**$ 10,138,710**	**$ 10,432,732**	**$ 10,735,281**	**$ 11,046,605**	**$ 11,366,956**
232																
233	**K**	***Second Pipeline Along Line 3010***														
234			**PV**	**2095**	**2096**	**2097**	**2098**	**2099**	**2100**	**2101**	**2102**	**2103**	**2104**	**2105**	**2106**	**2107**
235																
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ (57,758,741)	$ (59,433,744)	$ (61,157,323)	$ (62,930,885)	$ (64,755,881)	$ (66,633,802)	$ (68,566,182)	$ (70,554,601)	$ (72,600,685)	$ (74,706,104)	$ (76,872,581)	$ (79,101,886)	$ (81,395,841)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ (57,758,741)**	**$ (59,433,744)**	**$ (61,157,323)**	**$ (62,930,885)**	**$ (64,755,881)**	**$ (66,633,802)**	**$ (68,566,182)**	**$ (70,554,601)**	**$ (72,600,685)**	**$ (74,706,104)**	**$ (76,872,581)**	**$ (79,101,886)**	**$ (81,395,841)**
239																
240																
241	4	Annual O&M Cost	$ 2,799,858	$ 2,267,152	$ 2,332,899	$ 2,400,553	$ 2,470,169	$ 2,541,804	$ 2,615,516	$ 2,691,366	$ 2,769,416	$ 2,849,729	$ 2,932,371	$ 3,017,410	$ 3,104,915	$ 3,194,957
242	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
243	6	TIMP Cost	$ 717,186	$ -	$ 5,065,419	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,187,611	$ -	$ -	$ -	$ -
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ 2,267,152**	**$ 7,398,318**	**$ 2,400,553**	**$ 2,470,169**	**$ 2,541,804**	**$ 2,615,516**	**$ 2,691,366**	**$ 2,769,416**	**$ 9,037,340**	**$ 2,932,371**	**$ 3,017,410**	**$ 3,104,915**	**$ 3,194,957**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	93	94	95	96	97	98	99	100	101	102	103	104	105
1			100													
2																
200																
201																
202	4	Annual O&M Cost	$ 14,495,118	$ 16,248,117	$ 16,719,312	$ 17,204,172	$ 17,703,093	$ 18,216,483	$ 18,744,761	$ 19,288,359	$ 19,847,721	$ 20,423,305	$ 21,015,581	$ 21,625,033	$ 22,252,159	$ 22,897,471
203	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
204	6	TIMP Cost	$ 2,253,804	$ -	$ 22,036,189	$ -	$ -	$ -	$ -	$ -	$ -	$ 26,918,082	$ -	$ -	$ -	$ -
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ 16,248,117**	**$ 38,755,501**	**$ 17,204,172**	**$ 17,703,093**	**$ 18,216,483**	**$ 18,744,761**	**$ 19,288,359**	**$ 19,847,721**	**$ 47,341,387**	**$ 21,015,581**	**$ 21,625,033**	**$ 22,252,159**	**$ 22,897,471**
206																
207		***J2 Blythe to Santee Alternative 2***														
208			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
209																
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (83,756,320)	$ (86,185,254)	$ (88,684,626)	$ (91,256,480)	$ (93,902,918)	$ (96,626,103)	$ (99,428,260)	$ (102,311,679)	$ (105,278,718)	$ (108,331,801)	$ (111,473,423)	$ (114,706,152)	$ (118,032,631)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (83,756,320)**	**$ (86,185,254)**	**$ (88,684,626)**	**$ (91,256,480)**	**$ (93,902,918)**	**$ (96,626,103)**	**$ (99,428,260)**	**$ (102,311,679)**	**$ (105,278,718)**	**$ (108,331,801)**	**$ (111,473,423)**	**$ (114,706,152)**	**$ (118,032,631)**
213																
214																
215	4	Annual O&M Cost	$ 14,508,148	$ 16,262,722	$ 16,734,341	$ 17,219,636	$ 17,719,006	$ 18,232,857	$ 18,761,610	$ 19,305,697	$ 19,865,562	$ 20,441,663	$ 21,034,471	$ 21,644,471	$ 22,272,161	$ 22,918,053
216	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
217	6	TIMP Cost	$ 2,253,804	$ -	$ 22,036,189	$ -	$ -	$ -	$ -	$ -	$ -	$ 26,918,082	$ -	$ -	$ -	$ -
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ 16,262,722**	**$ 38,770,530**	**$ 17,219,636**	**$ 17,719,006**	**$ 18,232,857**	**$ 18,761,610**	**$ 19,305,697**	**$ 19,865,562**	**$ 47,359,745**	**$ 21,034,471**	**$ 21,644,471**	**$ 22,272,161**	**$ 22,918,053**
219																
220		***J3 Cactus City to San Diego Alternative***														
221			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
222																
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (83,756,320)	$ (86,185,254)	$ (88,684,626)	$ (91,256,480)	$ (93,902,918)	$ (96,626,103)	$ (99,428,260)	$ (102,311,679)	$ (105,278,718)	$ (108,331,801)	$ (111,473,423)	$ (114,706,152)	$ (118,032,631)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (83,756,320)**	**$ (86,185,254)**	**$ (88,684,626)**	**$ (91,256,480)**	**$ (93,902,918)**	**$ (96,626,103)**	**$ (99,428,260)**	**$ (102,311,679)**	**$ (105,278,718)**	**$ (108,331,801)**	**$ (111,473,423)**	**$ (114,706,152)**	**$ (118,032,631)**
226																
227																
228	4	Annual O&M Cost	$ 10,434,660	$ 11,696,598	$ 12,035,799	$ 12,384,837	$ 12,743,998	$ 13,113,573	$ 13,493,867	$ 13,885,189	$ 14,287,860	$ 14,702,208	$ 15,128,572	$ 15,567,300	$ 16,018,752	$ 16,483,296
229	5	Pigging to Occur	N/A	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE
230	6	TIMP Cost	$ 2,253,804	$ -	$ 22,036,189	$ -	$ -	$ -	$ -	$ -	$ -	$ 26,918,082	$ -	$ -	$ -	$ -
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ 11,696,598**	**$ 34,071,988**	**$ 12,384,837**	**$ 12,743,998**	**$ 13,113,573**	**$ 13,493,867**	**$ 13,885,189**	**$ 14,287,860**	**$ 41,620,290**	**$ 15,128,572**	**$ 15,567,300**	**$ 16,018,752**	**$ 16,483,296**
232																
233		***K Second Pipeline Along Line 3010***														
234			**PV**	**2108**	**2109**	**2110**	**2111**	**2112**	**2113**	**2114**	**2115**	**2116**	**2117**	**2118**	**2119**	**2120**
235																
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ (83,756,320)	$ (86,185,254)	$ (88,684,626)	$ (91,256,480)	$ (93,902,918)	$ (96,626,103)	$ (99,428,260)	$ (102,311,679)	$ (105,278,718)	$ (108,331,801)	$ (111,473,423)	$ (114,706,152)	$ (118,032,631)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ (83,756,320)**	**$ (86,185,254)**	**$ (88,684,626)**	**$ (91,256,480)**	**$ (93,902,918)**	**$ (96,626,103)**	**$ (99,428,260)**	**$ (102,311,679)**	**$ (105,278,718)**	**$ (108,331,801)**	**$ (111,473,423)**	**$ (114,706,152)**	**$ (118,032,631)**
239																
240																
241	4	Annual O&M Cost	$ 2,799,858	$ 3,287,611	$ 3,382,952	$ 3,481,057	$ 3,582,008	$ 3,685,886	$ 3,792,777	$ 3,902,767	$ 4,015,948	$ 4,132,410	$ 4,252,250	$ 4,375,565	$ 4,502,457	$ 4,633,028
242	5	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE
243	6	TIMP Cost	$ 717,186	$ -	$ -	$ 7,558,413	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,232,902	$ -	$ -	$ -
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ 3,287,611**	**$ 3,382,952**	**$ 11,039,470**	**$ 3,582,008**	**$ 3,685,886**	**$ 3,792,777**	**$ 3,902,767**	**$ 4,015,948**	**$ 4,132,410**	**$ 13,485,152**	**$ 4,375,565**	**$ 4,502,457**	**$ 4,633,028**

WORK PAPER TABLE - AVOIDED COST MODEL - COSTS OVER 100 YEARS (AC 1.2)
ANNUAL COSTS BY PROJECT ALTERNATE, FOR AVOIDED COSTS AND O&M COSTS
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			PV (X years after operational)	106	107	108	109	110	111	112	113	114	115	116
1			100											
2														
200														
201														
202	4	Annual O&M Cost	$ 14,495,118	$ 23,561,498	$ 24,244,781	$ 24,947,880	$ 25,671,369	$ 26,415,838	$ 27,181,898	$ 27,970,173	$ 28,781,308	$ 29,615,966	$ 30,474,829	$ 31,358,599
203	5	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
204	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ 32,881,509	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
205	7	***Total O&M Costs***	**$ 16,748,922**	**$ 23,561,498**	**$ 24,244,781**	**$ 57,829,389**	**$ 25,671,369**	**$ 26,415,838**	**$ 27,181,898**	**$ 27,970,173**	**$ 28,781,308**	**$ 29,615,966**	**$ 30,474,829**	**$ 31,358,599**
206														
207	J2	***Blythe to Santee Alternative 2***												
208			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
209														
210	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
211	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (121,455,577)	$ (124,977,789)	$ (128,602,145)	$ (132,331,607)	$ (136,169,223)	$ (140,118,131)	$ (144,181,557)	$ (148,362,822)	$ (152,665,344)	$ (157,092,638)	$ (161,648,325)
212	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (121,455,577)**	**$ (124,977,789)**	**$ (128,602,145)**	**$ (132,331,607)**	**$ (136,169,223)**	**$ (140,118,131)**	**$ (144,181,557)**	**$ (148,362,822)**	**$ (152,665,344)**	**$ (157,092,638)**	**$ (161,648,325)**
213														
214														
215	4	Annual O&M Cost	$ 14,508,148	$ 23,582,677	$ 24,266,575	$ 24,970,305	$ 25,694,444	$ 26,439,583	$ 27,206,331	$ 27,995,314	$ 28,807,179	$ 29,642,587	$ 30,502,222	$ 31,386,786
216	5	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
217	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ 32,881,509	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
218	7	***Total O&M Costs***	**$ 16,761,952**	**$ 23,582,677**	**$ 24,266,575**	**$ 57,851,814**	**$ 25,694,444**	**$ 26,439,583**	**$ 27,206,331**	**$ 27,995,314**	**$ 28,807,179**	**$ 29,642,587**	**$ 30,502,222**	**$ 31,386,786**
219														
220	J3	***Cactus City to San Diego Alternative***												
221			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
222														
223	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
224	2	MCS O&M and Emissions Cost	$ (74,719,907)	$ (121,455,577)	$ (124,977,789)	$ (128,602,145)	$ (132,331,607)	$ (136,169,223)	$ (140,118,131)	$ (144,181,557)	$ (148,362,822)	$ (152,665,344)	$ (157,092,638)	$ (161,648,325)
225	3	***Total Avoided Costs***	**$ (175,005,390)**	**$ (121,455,577)**	**$ (124,977,789)**	**$ (128,602,145)**	**$ (132,331,607)**	**$ (136,169,223)**	**$ (140,118,131)**	**$ (144,181,557)**	**$ (148,362,822)**	**$ (152,665,344)**	**$ (157,092,638)**	**$ (161,648,325)**
226														
227														
228	4	Annual O&M Cost	$ 10,434,660	$ 16,961,311	$ 17,453,189	$ 17,959,332	$ 18,480,153	$ 19,016,077	$ 19,567,543	$ 20,135,002	$ 20,718,917	$ 21,319,766	$ 21,938,039	$ 22,574,242
229	5	Pigging to Occur	N/A	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
230	6	TIMP Cost	$ 2,253,804	$ -	$ -	$ 32,881,509	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
231	7	***Total O&M Costs***	**$ 12,688,464**	**$ 16,961,311**	**$ 17,453,189**	**$ 50,840,840**	**$ 18,480,153**	**$ 19,016,077**	**$ 19,567,543**	**$ 20,135,002**	**$ 20,718,917**	**$ 21,319,766**	**$ 21,938,039**	**$ 22,574,242**
232														
233	K	***Second Pipeline Along Line 3010***												
234			**PV**	**2121**	**2122**	**2123**	**2124**	**2125**	**2126**	**2127**	**2128**	**2129**	**2130**	**2131**
235														
236	1	Future L1600 Replacement Cost	$ (100,285,483)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
237	2	MCS O&M and Emissions Cost	$ (71,330,165)	$ (121,455,577)	$ (124,977,789)	$ (128,602,145)	$ (132,331,607)	$ (136,169,223)	$ (140,118,131)	$ (144,181,557)	$ (148,362,822)	$ (152,665,344)	$ (157,092,638)	$ (161,648,325)
238	3	***Total Avoided Costs***	**$ (171,615,648)**	**$ (121,455,577)**	**$ (124,977,789)**	**$ (128,602,145)**	**$ (132,331,607)**	**$ (136,169,223)**	**$ (140,118,131)**	**$ (144,181,557)**	**$ (148,362,822)**	**$ (152,665,344)**	**$ (157,092,638)**	**$ (161,648,325)**
239														
240														
241	4	Annual O&M Cost	$ 2,799,858	$ 4,767,386	$ 4,905,640	$ 5,047,903	$ 5,194,293	$ 5,344,927	$ 5,499,930	$ 5,659,428	$ 5,823,551	$ 5,992,434	$ 6,166,215	$ 6,345,035
242	5	Pigging to Occur	N/A	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
243	6	TIMP Cost	$ 717,186	$ -	$ -	$ -	$ 11,278,357	$ -	$ -	$ -	$ -	$ -	$ -	$ -
244	7	***Total O&M Costs***	**$ 3,517,044**	**$ 4,767,386**	**$ 4,905,640**	**$ 5,047,903**	**$ 16,472,650**	**$ 5,344,927**	**$ 5,499,930**	**$ 5,659,428**	**$ 5,823,551**	**$ 5,992,434**	**$ 6,166,215**	**$ 6,345,035**

WORK PAPER TABLE - AVOIDED COST MODEL OUTPUTS (AC 1.3)
TOTAL O&M COSTS, TOTAL AVOIDED COSTS, AND NET COSTS BY PROJECT ALTERNATE
APPLICATION 15-09-013 VOLUME III – COST-EFFECTIVENESS ANALYSIS

Line No.			A	B	C	D	E = (B+C+D)	F	G	H = (F+G)	I = (A+E+H)
3				Total O&M ($M)				Avoided Cost ($M)			
4	Alt No.	Project Name	Fixed Cost ($M)[1]	Gas Import	O&M	TIMP	Total O&M Cost ($M)	L1600 Replacement	MCS O&M and Emissions	Total Avoided Cost ($M)	Net Cost ($M)
5	A	Proposed Project (Line 3602)	$441.9	$0.0	$3.7	$0.9	$4.6	($100.3)	($90.0)	($190.3)	$256.2
6	B	Hydrotest Alternative (Line 1600)	$112.9	$0.0	$4.2	$1.6	$5.8	$0.0	$0.0	$0.0	$118.7
7	C1	Alt Diameter Pipeline 10"	$297.6	$100.8	$3.7	$0.9	$105.3	($100.3)	$0.0	($100.3)	$302.7
8	C2	Alt Diameter Pipeline 12"	$320.1	$67.2	$3.7	$0.9	$71.8	($100.3)	$0.0	($100.3)	$291.6
9	C3	Alt Diameter Pipeline 16"	$337.1	$0.0	$3.7	$0.9	$4.6	($100.3)	$0.0	($100.3)	$241.4
10	C4	Alt Diameter Pipeline 20"	$352.9	$0.0	$3.7	$0.9	$4.6	($100.3)	($18.0)	($118.3)	$239.2
11	C5	Alt Diameter Pipeline 24"	$361.2	$0.0	$3.7	$0.9	$4.6	($100.3)	($36.0)	($136.3)	$229.6
12	C6	Alt Diameter Pipeline 30"	$392.2	$0.0	$3.7	$0.9	$4.6	($100.3)	($63.0)	($163.3)	$233.5
13	C7	Alt Diameter Pipeline 42"	$527.5	$0.0	$3.7	$0.9	$4.6	($100.3)	($90.0)	($190.3)	$341.9
14	D	Replace Line 1600 In-Place	$556.1	$0.0	$3.6	$0.7	$4.4	$0.0	$0.0	$0.0	$560.4
15	E/F	Otay Mesa Alternative	$977.1	$0.0	$0.0	$0.0	$0.0	($100.3)	$0.0	($100.3)	$876.8
16	G	LNG Storage (Peak-Shaver) Alternative	$2,669.7	$0.0	$15.3	$0.0	$15.3	($100.3)	$0.0	($100.3)	$2,584.7
17	H1	Alternate Energy Alternative: Grid-Scale Batteries	$8,415.1	$0.0	$15.3	$0.0	$15.3	($100.3)	$0.0	($100.3)	$8,330.1
18	H2	Alternate Energy Alternative: Small-Scale Batteries	$10,095.1	$0.0	$15.3	$0.0	$15.3	($100.3)	$0.0	($100.3)	$10,010.1
19	I	Offshore Route Alternative	$1,449.9	$0.0	$4.5	$0.6	$5.1	($100.3)	($59.2)	($159.5)	$1,295.5
20	J1	Blythe to Santee Alternative 1	$1,377.5	$0.0	$14.5	$2.3	$16.7	($100.3)	($74.7)	($175.0)	$1,219.3
21	J2	Blythe to Santee Alternative 2	$1,315.5	$0.0	$14.5	$2.3	$16.8	($100.3)	($74.7)	($175.0)	$1,157.3
22	J3	Cactus City to San Diego Alternative	$1,143.4	$0.0	$10.4	$2.3	$12.7	($100.3)	($74.7)	($175.0)	$981.1
23	K	Second Pipeline Along Line 3010 Alternative	$595.2	$0.0	$2.8	$0.7	$3.5	($100.3)	($71.3)	($171.6)	$427.1

Footnotes

1. See Prepared Direct Testimony of Neil Navin (March 21, 2016), page 31, workpaper Estimated Fixed and Operating Costs for Proposed Project and Alternatives