

Appendix B
Air Emissions Calculations

TABLE B1: Emission Summary

Summary of Construction Emissions - Maximum Daily Emissions (2016)

	VOC	CO	NOx	SOx	PM ₁₀ Fugitive	PM ₁₀ Exhaust	PM _{2.5} Fugitive Dust	PM _{2.5} Exhaust
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
New WWTP Project-1	3.650	36.330	37.166	0.062	2.210	1.858	0.502	1.711
New WWTP Project-2	3.650	36.330	37.166	0.062	2.210	1.858	0.502	1.711
Large Pipeline Project-1	2.432	21.628	24.903	0.034	1.201	1.376	0.234	1.266
Large Pipeline Project-2	2.432	21.628	24.903	0.034	1.201	1.376	0.234	1.266
Average Pipeline Project-1	2.443	21.842	24.870	0.034	1.189	1.375	0.232	1.265
Average Pipeline Project-2	2.443	21.842	24.870	0.034	1.728	1.375	0.364	1.265
Average Pipeline Project-3	2.443	21.842	24.870	0.034	1.189	1.375	0.232	1.265
Large Pump Station-1	1.771	15.863	17.710	0.025	0.947	1.023	0.167	0.942
Large Pump Station-2	1.771	15.863	17.710	0.025	0.947	1.023	0.167	0.942
In-system Storage Bin	1.364	16.212	13.791	0.027	1.355	0.542	0.274	0.499
Total for Full Conveyance Alternative	23.036	213.168	234.167	0.344	12.821	12.639	2.633	11.633
Total for In-system Storage Alternative	22.628	213.517	230.249	0.346	13.230	12.158	2.740	11.189

Note:

Construction emissions were modeled using CalEEMod. Assumed all construction activities would occur simultaneously during a worst-case day.

Full Conveyance Alternative would not include the In-system Storage Basin

In-System Storage

- 2 large pipelines
- 3 average pipelines
- 1 pump station wet well
- 1 in-system storage basin

Full Conveyance

- 2 large pipelines
- 3 average pipelines
- 2 pump station wet wells

TABLE B2: Emission Summary

Summary of Construction Emissions - Annual Emissions (2016)

	VOC	CO	NOx	SOx	PM ₁₀ Fugitive	PM ₁₀ Exhaust	PM _{2.5} Fugitive Dust	PM _{2.5} Exhaust
	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day
Total for Full Conveyance Alternative	23.04	213.17	234.17	0.34	12.82	12.64	2.63	11.63
Total for In-system Storage Alterantive	22.63	213.52	230.25	0.35	13.23	12.16	2.74	11.19
WWTP project	3.65	36.33	37.17	0.06	2.21	1.86	0.50	1.71
	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
Total for Full Conveyance Alternative	2.99	27.71	30.44	0.04	1.67	1.64	0.34	1.51
Total for In-system Storage Alterantive	2.94	27.76	29.93	0.04	1.72	1.58	0.36	1.45
WWTP project	0.47	4.72	4.83	0.01	0.29	0.24	0.07	0.22

Note:

Construction emissions were modeled using CalEEMod. Assumed all construction activities would occur simultaneously during a worst-case day.

Assumed 5 days per week, 52 week per year of construction.

TABLE B3: GHG Emission Summary

Summary of Construction Emissions - Maximum Daily Emissions (2016)

	CH4	N2O	CO2	CO2e	CO2e
	lb/day	lb/day	lb/day	lb/day	metric ton/year
New WWTP -1	0.943	0.000	6076.72	6096.53	719.0
New WWTP -2	0.943	0.000	6076.72	6096.53	719.0
Pipe Line -1 (Large Pipes)	0.690	0.000	3419.04	3433.52	404.9
Pipe Line -2 (Large Pipes)	0.690	0.000	3419.04	3433.52	404.9
Pipe Line -3 (Average Pipes)	0.690	0.000	3406.42	3420.89	403.4
Pipe Line -4 (Average Pipes)	0.690	0.000	3406.42	3420.89	403.4
Pipe Line -5 (Average Pipes)	0.690	0.000	3406.42	3420.89	403.4
Large Pump Station-1	0.481	0.000	2504.66	2514.75	296.6
Large Pump Station-2	0.481	0.000	2504.66	2514.75	296.6
In-system Storage Bin	0.296	0.000	2680.71	2686.93	316.9
Total for Full Conveyance Alternative	6.295	0.000	34,220.07	34,352.26	4,051.4
Total for In-system Storage Alternative	6.110	0.000	34,396.13	34,524.45	4,071.7

Note:

Construction emissions were modeled using CalEEMod. Assumed all construction activities would occur simultaneously during a worst-case day.

Summary of Operational Emissions - GHG from WWTP and Pump Station Electricity Use

GHG Emission Factors

	Emission Factor	
	CO2	CO2e
	lb/MWH	lb/MWH
	610.82	
Global Warming Potential	1	613.33

Note:

GHG emission factors were EPA eGRID 9th edition Version 1.0 Year 2010 GHG Annual Output Emission Rates, February, 2014.

Indirect GHG Emissions from Program Electricity Use

	Energy Usage	CO2e Emissions	CO2e Emission Increase
	MWH/yr	metric ton/year	metric ton/year
Existing Condition	6753.618	1,879	NA
Program Operation (maximum)	14382.49	4,001	2,122
Program Operation (minimum)	10558.18	2,937	1,058

Note:

1. Energy usage of existing condition was based on the historical data record of the WWTP and pump station operation.
2. Energy usage of Program operation were estimated using CH2M HILL's Emissions Inventory Calculator (EIC) tool. The tool is linked to the Facilities sizing and cost estimating tools CPES and CPES Lifecycle (LC).