

Appendix C
Air Quality Data

Appendix C Air Quality Data

Table C-1. Air Quality Monitoring Data at the Bethel Island Monitoring Station (2006–2008)

Pollutant	Monitoring Data by Year		
	2006	2007	2008
O₃			
Highest 1-hour average, ppm	0.116	0.093	0.109
Highest 8-hour average, ppm	0.090	0.078	0.090
Days > state 1-hour standard	9	0	4
Days > federal 8-hour standard	13	1	4
Percent of year covered	99	99	93
PM₁₀			
Highest 24-hour average, µg/m ³	84.3	49.4	77.0
Days > state standard	4	4	0
Days > federal standard	0	0	0
Percent of year covered	93	75	86
CO			
Highest 8-hour average, µg/m ³	1.04	0.84	0.83
Days > federal standard	0	0	0
Percent of year covered	98	96	47

Source: California Air Resources Board 2009.

Note: **Bolded** values represent those in excess of the applicable California ambient air quality standards.

ppm = parts per million by volume.

µg/m³ = micrograms per cubic meter.

Table C-2. Air Quality Monitoring Data at the Pittsburg Monitoring Station (2006–2008)

Pollutant	Monitoring Data by Year		
	2006	2007	2008
O₃			
Highest 1-hour average, ppm	0.105	0.100	0.106
Highest 8-hour average, ppm	0.093	0.074	0.083
Days > state 1-hour standard	3	1	1
Days > federal 8-hour standard	6	0	1
Percent of year covered	98	98	93
PM₁₀			
Highest 24-hour average, $\mu\text{g}/\text{m}^3$	57.8	55.6	73.6
Days > state standard	2	4	2
Days > federal standard	0	0	0
Percent of year covered	93	75	86
CO			
Highest 24-hour average, $\mu\text{g}/\text{m}^3$	1.92	1.5	1.44
Days > federal standard	0	0	0
Percent of year covered	98	97	53

Source: California Air Resources Board 2009.

Note: **Bolded** values represent those in excess of the applicable California ambient air quality standards.

ppm = parts per million by volume.

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter.

Table C-3. Existing Conditions Assumptions

Data Type	Bacon Island	Webb Tract	Bouldin Island	Holland Tract
Recreation				
Number vehicles traveling to recreation area (trips/day)	6	8	5	2
Number vehicles traveling to recreation area (trips/year)	1,610	365	285	76
Number of recreational boats (boats/day)	–	–	–	–
Number of recreational boats (boats/year)	–	–	–	–
Agriculture				
Acres farmed	4859	4064	4933	2884
Number of harvest vehicles (trips/day)	20	10	15	3
Number of harvest vehicles (trips/year)	714	500	975	50
Gas used for ag activities (gallons/day)	17	33	67	0
Gas used for ag activities (gallons/year)	4,280	8,275	16,801	0
Diesel used for ag activities (gallons/day)	600	490	995	5
Diesel used for ag activities (gallons/year)	60,000	48,987	99,459	500
Acres disturbed by farming (acres/day)	243	203	247	144
Assumes 100 working days per year of farming. Also assumes that an acre of farmland is disturbed an average of 5 times per year, so the acres disturbed per day is total number of acres times 5, divided by 100.				

Table C-4. Future No Project Assumptions

Data Type	Bacon Island	Webb Tract	Bouldin Island	Holland Tract
Recreation				
Number vehicles traveling to recreation area (trips/day)	43	38	42	29
Number vehicles traveling to recreation area (trips/year)	3,262	1,731	1,946	1,323
Number of recreational boats (boats/day)	–	–	–	–
Number of recreational boats (boats/year)	–	–	–	–
Agriculture				
Acres farmed	4,960	4,880	5,200	3,680
Number of harvest vehicles (trips/day)	61	4	13	3
Number of harvest vehicles (trips/year)	15,368	890	3,175	763
Gas used for ag activities (gallons/day)	433	245	276	136
Gas used for ag activities (gallons/year)	108,205	61,308	69,018	34,033
Diesel used for ag activities (gallons/day)	1,392	2,220	2,499	1,232
Diesel used for ag activities (gallons/year)	139,193	221,978	249,893	123,228
Acres disturbed by farming (acres/day)	248	244	260	184
Assumes 100 working days per year of farming. Also assumes that an acre of farmland is disturbed an average of 5 times per year, so the acres disturbed per day is total number of acres times 5, divided by 100.				

Table C-5. Alternatives 1 and 2 Construction, Operational, Recreational, and Agricultural Unmitigated Assumptions

	Bacon Island	Webb Tract	Bouldin Island	Holland Tract
Construction				
Number worker vehicle trips per day to islands	67	53	30	14
Number worker vehicle trips per day to boat	3	31	1	1
Number of employee boat trips to islands per day	3	12	2	2
Number of material delivery truck trips to island per day	2	2	0	0
Number of barge trips to island per day	1	1	1	0
Number of hours of rock placement per day	5	4	2	2
Quantity of borrow (cubic yards/day)	6,634	5270	3,300	520
Operations				
Amount of diesel used to pump water (gallons/day)	1,355	1,178	–	–
Amount of diesel used to pump water (gallons/year)	81,300	70,700	–	–
Recreation				
Number of vehicles to recreation areas (trips/day)	521	521	474	284
Number of vehicles to recreation areas (trips/year)	87,585	87,585	79,684	47,743
Hours of recreational boats per day	320	320	291	174
Hours of recreational boats per year	116,773	116,773	106,289	63,629
Agriculture				
Number of harvest vehicles (trips/day)	–	–	1	1
Number of harvest vehicles (trips/year)	–	–	335	168
Gas used for operations(gallons/day)	–	–	60	30
Gas used for operations (gallons/year)	–	–	14,970	7,485
Diesel used for ag activities (gallons/day)	–	–	217	108
Diesel used for ag activities (gallons/year)	–	–	54,200	27,100
Acres disturbed by farming (acres/day)	0	0	44	22

Table C-6. Alternative 3 Construction, Operational, Recreational, and Agricultural Unmitigated Assumptions

	Bacon Island	Webb Tract	Bouldin Island	Holland Tract
Construction				
Number worker vehicle trips per day to islands	67	53	151	103
Number worker vehicle trips per day to boat	3	31	7	4
Number of employee boat trips to islands per day	3	12	12	16
Number of material delivery truck trips to island per day	2	2	1	1
Number of barge trips to island per day	1	1	1	1
Number of hours of rock placement per day	5	4	2	4
Quantity of borrow (cubic yards/day)	2,613	5,387	35,616	2,400
Operations				
Amount of diesel used to pump water (gallons/day)	228	228	228	228
Amount of diesel used to pump water (gallons/year)	57,000	57,000	57,000	57,000
Recreation				
Number of vehicles to recreation areas (trips/day)	521	521	474	379
Number of vehicles to recreation areas (trips/year)	87,480	87,480	79,588	63,637
Hours of recreational boats per day	320	320	291	232
Hours of recreational boats per year	116,623	116,623	106,152	84,850
Agriculture				
Number of harvest vehicles (trips/day)	0	0	0	0
Gas used for ag activities (gallons/day)	0	0	0	0
Diesel used for ag activities (gallons/day)	0	0	0	0
Acres disturbed by farming (acres/day)	0	0	0	0

Table C-7. Comparison of Unmitigated Criteria Pollutant Emissions for Existing, Future No-Project, and Build Alternatives with Diesel Used for Pumping (Pounds per Day)

Pounds per Day	ROG	NO _x	CO	PM10	PM2.5
Existing Emissions	94	500	624	8,401	2,040
Future No-Project	220	975	3,976	9,428	2,313
Construction of Alternatives 1 & 2	188	1,538	876	746	315
Operation of Alternatives 1 & 2	631	2,016	10,642	917	398
Construction of Alternative 3	514	4,302	2,220	993	506
Operation of Alternative 3	565	1,018	10,649	194	174
Net Increase: Operation 1&2 vs. Future No-Project	410	1,042	6,666	(8,511)	(1,914)
Net Increase: Operation 3 vs. Future No-Project	344	44	6,673	(9,234)	(2,139)

Notes: Assumes diesel engines used to pump water.

Based on assumptions in Tables C-1 through C-5.

Alternatives 1 and 2 assume 3 million kilowatt-hours per year required to pump water. Alternative 3 assumes 6 million kilowatt-hours per year required for pumping.

On-road vehicle trip emissions estimated with URBEMIS2007.

Table C-8. Comparison of Unmitigated Criteria Pollutant Emissions for Existing, Future No-Project, and Build Alternatives with Diesel Used for Pumping (Tons per Year)

Tons per Year	ROG	NO _x	CO	PM10	PM2.5
Existing Emissions	5.8	26.3	58.9	22.7	6.8
Future No-Project	18.6	55.0	440.2	28.8	11.0
Construction of Alternatives 1 & 2	23.5	192.3	109.5	93.2	39.4
Operation of Alternatives 1 & 2	95.3	132.6	1,867.5	30.0	27.2
Construction of Alternative 3	64.3	537.7	277.5	124.2	63.2
Operation of Alternative 3	100.0	153.8	1,928.8	30.7	29.1
Net Increase: Operation 1&2 vs. Future No-Project	77	78	1,427	1	16
Net Increase: Operation 3 vs. Future No-Project	81	99	1,489	2	18

Notes: Assumes diesel engines used to pump water.

Based on assumptions in Tables C-1 through C-5.

Alternatives 1 and 2 assume 3 million kilowatt-hours per year required to pump water. Alternative 3 assumes 6 million kilowatt-hours per year required for pumping.

On-road vehicle trip emissions estimated with URBEMIS2007.

Agricultural emissions estimated with OFFROAD2007.

Table C-9. Comparison of Mitigated Criteria Pollutant Emissions for Existing, Future No-Project and Build Alternatives (Pounds per Day)

Pounds per Day	ROG	NO _x	CO	PM10	PM2.5
Existing Emissions	94	500	624	8,401	2,040
Future No-Project	220	975	3,976	9,428	2,313
Construction of Alternatives 1 and 2	188	1,538	876	746	315
Operation of Alternatives 1 and 2	79	105	1,617	681	179
Construction of Alternative 3	514	4,302	2,220	993	506
Operation of Alternative 3	74	67	1,493	22	19
Net Increase: Operation 1 and 2 vs. Future No-Project	(142)	(869)	(2,359)	(8,747)	(2,134)
Net Increase: Operation 3 vs. Future No-Project	(147)	(908)	(2,483)	(9,406)	(2,294)

Notes: Assumes electricity used to pump water.

Based on assumptions in Tables C-1 through C-5.

Alternatives 1 and 2 assume 3 million kilowatt-hours per year required to pump water. Alternative 3 assumes 6 million kilowatt-hours per year required for pumping.

On-road vehicle trip emissions estimated with URBEMIS2007.

Agricultural emissions estimated with OFFROAD2007.

Table C-10. Comparison of Mitigated Criteria Pollutant Emissions for Existing, Future No-Project and Build Alternatives (Tons per Year)

Tons per Year	ROG	NO _x	CO	PM10	PM2.5
Existing Emissions	5.8	26.3	58.9	22.7	6.8
Future No-Project	18.6	55.0	440.2	28.8	11.0
Construction of Alternatives 1 and 2	23.5	192.3	109.5	93.2	39.4
Operation of Alternatives 1 and 2	13.5	16.5	276.9	5.4	3.9
Construction of Alternative 3	64.3	537.7	277.5	124.2	63.2
Operation of Alternative 3	13.4	12.1	271.3	3.7	3.4
Net Increase: Operation 1 and 2 vs. Future No-Project	(5)	(39)	(163)	(23)	(7)
Net Increase: Operation 3 vs. Future No-Project	(5)	(43)	(169)	(25)	(8)

Notes: Assumes electricity used to pump water.

Based on assumptions in Tables C-1 through C-5.

Alternatives 1 and 2 assume 3 million kilowatt-hours per year required to pump water. Alternative 3 assumes 6 million kilowatt-hours per year required for pumping.

On-road vehicle trip emissions estimated with URBEMIS2007.

Agricultural emissions estimated with OFFROAD2007.