# Appendix F
## Energy: Fuel Use Calculations

## SEIR Fuel Use Summary Tables

**2012 EIR**

| Scenario | Diesel | Gasoline |
|---|---|---|
| Baseline Fuel Use | 822,554 | 12,615 |
| Reclamation Plan Amendment Phase 1 Fuel Use | 2,327,866 | 7,933 |
| Maximum Annual Incremental Change | 1,505,312 | -4,682 |
| Percent Incremental Change | 183% | -37% |

**PCRP Fuel Use**

| Scenario | Diesel | Gasoline |
|---|---|---|
| Reclamation Plan Amendment Incremental Change Disclosed in 2012 EIR[a] | 1,505,312 | -4,682 |
| PCRP Fuel Use not Evaluated in the 2012 EIR | 38,077 | 898 |
| Net Fuel Use | 1,543,389 | -3,784 |
| Percent Incremental Change | 2.5% | 19.2% |

## PCRP Construction Fuel Use Estimates

**Total Fuel Use During Contruction**

| Fuel Type | Fuel Consumed (gal/proj) | Fuel Consumed (av. gal/yr) | Gallons Sold in Santa Clara County in 2020 | % Project gallons comp. to Co. gallons |
|---|---|---|---|---|
| Gasoline | 5,388 | 898 | 511,000,000 | 0.00018% |
| Diesel | 228,462 | 38,077 | 71,000,000 | 0.054% |

**Diesel Fuel Use for Off-road Construction Equipment**

| Phase Name | Equipment Type | HP | Units | Hours/day | Days | Total Hours | Use Factor (Gal/hr) | Total Gallons | Applicability Factors | Gallons Covered in SEIR |
|---|---|---|---|---|---|---|---|---|---|---|
| | Concrete/Industrial Saws | 81 | 1 | 0.2 | 132 | 26.4 | 1.75 | 46 | 100% | 46 |
| Concrete Channel | | | | | | | | | | |
| | Excavators | 286 | 1 | 2.9 | 132 | 382.8 | 6.45 | 2,470 | | |
| | Excavators | 108 | 1 | 1.4 | 132 | 184.8 | 1.60 | 295 | | |
| | Off-Highway Trucks | 402 | 1 | 0.3 | 132 | 39.6 | 7.40 | 293 | | |
| | Off-Highway Trucks | 452 | 1 | 5.4 | 132 | 712.8 | 7.40 | 5,274 | | |
| | Off-Highway Trucks | 402 | 1 | 0.1 | 132 | 13.2 | 7.40 | 98 | | |
| | Off-Highway Trucks | 402 | 1 | 1.8 | 132 | 237.6 | 7.40 | 1,758 | | |
| | Rubber Tired Dozers | 347 | 1 | 0.6 | 132 | 79.2 | 7.34 | 582 | | |
| | Rubber Tired Loaders | 393 | 1 | 0.2 | 132 | 26.4 | 5.93 | 157 | | |
| Channel Widening | Rubber Tired Loaders | 110 | 1 | 2.9 | 132 | 382.8 | 1.59 | 610 | | |
| (Phase 1) | Total | | | | | 2,059 | | 11,536 | 89% | 10,267 |
| | Excavators | 286 | 1 | 8.7 | 132 | 1148.4 | 6.46 | 7,420 | | |
| | Excavators | 108 | 1 | 4.3 | 132 | 567.6 | 1.60 | 906 | | |
| | Off-Highway Trucks | 402 | 1 | 0.4 | 132 | 52.8 | 7.39 | 390 | | |
| | Off-Highway Trucks | 452 | 1 | 23 | 132 | 3036 | 7.39 | 22,450 | | |
| | Off-Highway Trucks | 402 | 1 | 0.1 | 132 | 13.2 | 7.39 | 98 | | |
| | Off-Highway Trucks | 402 | 1 | 1.8 | 132 | 237.6 | 7.39 | 1,757 | | |
| | Rollers | 156 | 1 | 0.4 | 132 | 52.8 | 2.79 | 147 | | |
| | Rubber Tired Dozers | 347 | 1 | 0.9 | 132 | 118.8 | 7.34 | 872 | | |
| | Rubber Tired Loaders | 393 | 1 | 0.4 | 132 | 52.8 | 5.94 | 314 | | |
| Rock Pile Area (Phase | Rubber Tired Loaders | 110 | 1 | 1.4 | 132 | 184.8 | 1.59 | 294 | | |
| 1) | Total | | | | | 5,465 | | 34,647 | 89% | 30,836 |
| | Excavators | 286 | 1 | 8.7 | 132 | 1148.4 | 6.46 | 7,422 | | |
| | Excavators | 108 | 1 | 4.3 | 132 | 567.6 | 1.60 | 906 | | |
| | Off-Highway Trucks | 402 | 1 | 0.4 | 132 | 52.8 | 7.40 | 391 | | |
| | Off-Highway Trucks | 452 | 1 | 23 | 132 | 3036 | 7.40 | 22,467 | | |
| | Off-Highway Trucks | 402 | 1 | 0.1 | 132 | 13.2 | 7.40 | 98 | | |
| | Off-Highway Trucks | 402 | 1 | 1.8 | 132 | 237.6 | 7.40 | 1,758 | | |
| | Rollers | 156 | 1 | 0.4 | 132 | 52.8 | 2.79 | 147 | | |
| | Rubber Tired Dozers | 347 | 1 | 0.9 | 132 | 118.8 | 7.33 | 870 | | |
| | Rubber Tired Loaders | 393 | 1 | 0.4 | 132 | 52.8 | 5.94 | 314 | | |
| Rock Pile Area (Phase | Rubber Tired Loaders | 110 | 1 | 1.4 | 132 | 184.8 | 1.59 | 295 | | |
| 2) | Total | | | | | 5,465 | | 34,667 | 89% | 30,854 |
| | Excavators | 286 | 1 | 2.9 | 132 | 382.8 | 6.46 | 2,475 | | |
| | Excavators | 108 | 1 | 1.4 | 132 | 184.8 | 1.60 | 295 | | |
| | Off-Highway Trucks | 402 | 1 | 0.3 | 132 | 39.6 | 7.40 | 293 | | |
| | Off-Highway Trucks | 452 | 1 | 5.4 | 132 | 712.8 | 7.40 | 5,272 | | |
| | Off-Highway Trucks | 402 | 1 | 0.1 | 132 | 13.2 | 7.40 | 98 | | |
| | Off-Highway Trucks | 402 | 1 | 1.8 | 132 | 237.6 | 7.40 | 1,757 | | |
| | Rubber Tired Dozers | 347 | 1 | 0.6 | 132 | 79.2 | 7.33 | 580 | | |
| | Rubber Tired Loaders | 393 | 1 | 0.2 | 132 | 26.4 | 5.94 | 157 | | |
| Channel Widening | Rubber Tired Loaders | 110 | 1 | 2.9 | 132 | 382.8 | 1.59 | 610 | | |
| (Phase 2) | Total | | | | | 2,059 | | 11,537 | 89% | 10,268 |
| Old Crusher | Generator Sets | 84 | 1 | 0.3 | 130 | 39 | 1.75 | 68 | | |
| Foundation | Total | | | | | 39 | | 68 | 0% | 0 |
| | Excavators | 286 | 1 | 7.5 | 130 | 975 | 6.46 | 6,299 | | |
| | Excavators | 108 | 1 | 3.7 | 130 | 481 | 1.60 | 769 | | |
| | Off-Highway Trucks | 402 | 1 | 0.3 | 130 | 39 | 7.39 | 288 | | |
| | Off-Highway Trucks | 452 | 1 | 20.2 | 130 | 2626 | 7.39 | 19,416 | | |
| | Off-Highway Trucks | 402 | 1 | 0.2 | 130 | 26 | 7.39 | 192 | | |
| | Off-Highway Trucks | 402 | 1 | 1.8 | 130 | 234 | 7.39 | 1,730 | | |
| | Rubber Tired Dozers | 347 | 1 | 0.9 | 130 | 117 | 7.32 | 857 | | |
| | Rubber Tired Loaders | 393 | 1 | 0.4 | 130 | 52 | 5.93 | 308 | | |
| Material Removal | Rubber Tired Loaders | 110 | 1 | 1.1 | 130 | 143 | 1.59 | 228 | | |
| Area (Phase 1) | Total | | | | | 4,693 | | 30,087 | 20% | 6,017 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Excavators | 286 | 1 | 7.5 | 131 | 982.5 | 6.46 | 6,348 | | |
| | Excavators | 108 | 1 | 3.7 | 131 | 484.7 | 1.60 | 774 | | |
| | Off-Highway Trucks | 402 | 1 | 0.3 | 131 | 39.3 | 7.40 | 291 | | |
| | Off-Highway Trucks | 452 | 1 | 20 | 131 | 2620 | 7.40 | 19,378 | | |
| | Off-Highway Trucks | 402 | 1 | 0.2 | 131 | 26.2 | 7.40 | 194 | | |
| | Off-Highway Trucks | 402 | 1 | 1.8 | 131 | 235.8 | 7.40 | 1,744 | | |
| | Rubber Tired Dozers | 347 | 1 | 0.9 | 131 | 117.9 | 7.32 | 863 | | |
| | Rubber Tired Loaders | 393 | 1 | 0.4 | 131 | 52.4 | 5.93 | 310 | | |
| Material Removal | Rubber Tired Loaders | 110 | 1 | 1.1 | 131 | 144.1 | 1.60 | 230 | | |
| Area (Phase 2) | Total | | | | | 4,703 | | 30,132 | 20% | 6,026 |
| | | | | | Total Hours | 24,509 | Total | 152,721 | Total | 94,315 |
| fuel use rates derived from the Off-road 2011 model. | | | | | Ave. Gal/hr | 6.23 | Ave. Gal./yr. | 25,453 | Ave. Gal./yr. | 15,719 |

**Fuel Use for Vehicles During Construction**

| Trip Type | Total Miles | Vehicle Type | Fuel Type | miles /gallon | Gallon /project | Ave. Gal. Year |
|---|---|---|---|---|---|---|
| Worker Trips | 91,599 | light-duty vehicles | gasoline | 17 | 5,388 | 898 |
| Vendor Trips | 767,193 | heavy-duty trucks | diesel | 6 | 127,866 | 21,311 |
| Haul Trips | 37,694 | heavy-duty trucks | diesel | 6 | 6,282 | 1,047 |
| Total | 804,887 | | | | 134,148 | 22,358 |

Fuel economy obtained from U.S. Energy Information Administration, 2021.

**Total Worker, Vendor, and Haul Trip Mileage**

| Phases | # of Worker Trips | Worker Trip Distance (mi) | Total Worker Trip Miles | Total # of Vendor Trips | Vendor Trip Distance (mi) | Total Vendor Trip Miles | Total # of Haul Trips | Haul Trip Distance (mi) | Total Haul Trip Miles |
|---|---|---|---|---|---|---|---|---|---|
| Concrete Channel | 1,056 | 10.8 | 11,405 | 3,300 | 6.6 | 21,780 | 2 | 20 | 40 |
| Channel Widening (Phase 1) | 1,584 | 10.8 | 17,107 | 28,512 | 6.6 | 188,179 | 172 | 20 | 3,440 |
| Rock Pile Area (Phase 1) | 2,112 | 10.8 | 22,810 | 28,512 | 6.6 | 188,179 | 740 | 20 | 14,800 |
| Rock Pile Area (Phase 2) | 2,112 | 10.8 | 22,810 | 28,512 | 6.6 | 188,179 | 741 | 20 | 14,820 |
| Channel Widening (Phase 2) | 1,584 | 10.8 | 17,107 | 28,512 | 6.6 | 188,179 | 172 | 20 | 3,440 |
| Old Crusher Foundation | 1,040 | 10.8 | 11,232 | 3,250 | 6.6 | 21,450 | 2 | 20 | 40 |
| Material Removal Area (Phase 1) | 2,080 | 10.8 | 22,464 | 28,080 | 6.6 | 185,328 | 638 | 20 | 12,760 |
| Material Removal Area (Phase 2) | 2,096 | 10.8 | 22,637 | 28,296 | 6.6 | 186,754 | 638 | 20 | 12,760 |
| | | Total | 147,571 | | Total | 1,168,028 | | Total | 62,100 |

**Worker, Vendor, and Haul Trip Mileage Covered In SEIR**

| Phases | Applicability Factors | Worker Trip Miles | Total Vendor Trip Miles | Total Haul Trip Miles |
|---|---|---|---|---|
| Concrete Channel | 100% | 11,405 | 21,780 | 40 |
| Channel Widening (Phase 1) | 89% | 15,253 | 167,781 | 3,067 |
| Rock Pile Area (Phase 1) | 89% | 20,337 | 167,781 | 13,196 |
| Rock Pile Area (Phase 2) | 89% | 20,337 | 167,781 | 13,214 |
| Channel Widening (Phase 2) | 89% | 15,225 | 167,479 | 3,062 |
| Old Crusher Foundation | 0% | 0 | 0 | 0 |
| Material Removal Area (Phase 1) | 20% | 4,493 | 37,066 | 2,552 |
| Material Removal Area (Phase 2) | 20% | 4,549 | 37,526 | 2,564 |
| | Total | 91,599 | 767,193 | 37,694 |
| | Average/year | 15,266 | 127,866 | 6,282 |

## Offroad 2011 Fuel Consumption Factors

| Calendar Year | Equipment Type | HP Bin | BSFC (lbs/yr) | Activity (hrs/yr) | BSFC (gal/hr)* |
|---|---|---|---|---|---|
| 2024 | Excavators | 120 | 2382474.55 | 209941.9666 | 1.60 |
| 2024 | Excavators | 175 | 5017341.45 | 244930.297 | 2.88 |
| 2024 | Excavators | 500 | 10563913.4 | 230487.3669 | 6.45 |
| 2024 | Off-Highway Trucks | 120 | 89020.1088 | 7399.999991 | 1.69 |
| 2024 | Off-Highway Trucks | 175 | 1723353.38 | 77681.16287 | 3.12 |
| 2024 | Off-Highway Trucks | 500 | 14993283.4 | 285330.4598 | 7.40 |
| 2024 | Other Construction Equipment | 120 | 1287076.57 | 103494.6561 | 1.75 |
| 2024 | Other Construction Equipment | 175 | 699023.789 | 30229.63231 | 3.26 |
| 2024 | Other Construction Equipment | 500 | 3069645.17 | 55898.36967 | 7.73 |
| 2024 | Rollers | 120 | 1612454.27 | 134256.9613 | 1.69 |
| 2024 | Rollers | 175 | 1667105.86 | 84212.72837 | 2.79 |
| 2024 | Rollers | 500 | 166075.702 | 3557.537695 | 6.57 |
| 2024 | Rubber Tired Dozers | 120 | 216765.534 | 18085.6323 | 1.69 |
| 2024 | Rubber Tired Dozers | 175 | 180777.608 | 8299.258826 | 3.07 |
| 2024 | Rubber Tired Dozers | 500 | 2159941.65 | 41407.77582 | 7.34 |
| 2024 | Rubber Tired Loaders | 120 | 3493355.99 | 308830.4764 | 1.59 |
| 2024 | Rubber Tired Loaders | 175 | 8266086.66 | 416531.0278 | 2.79 |
| 2024 | Rubber Tired Loaders | 500 | 14894333.4 | 353531.5345 | 5.93 |
| 2025 | Excavators | 120 | 2483473.15 | 219145.1416 | 1.60 |
| 2025 | Excavators | 175 | 5238044.58 | 255667.2469 | 2.88 |
| 2025 | Excavators | 500 | 11040631.7 | 240591.1855 | 6.46 |
| 2025 | Off-Highway Trucks | 120 | 92947.0812 | 7724.391991 | 1.69 |
| 2025 | Off-Highway Trucks | 175 | 1797903.89 | 81086.45311 | 3.12 |
| 2025 | Off-Highway Trucks | 500 | 15642289.3 | 297838.4218 | 7.39 |
| 2025 | Other Construction Equipment | 120 | 1345270.34 | 108031.5262 | 1.75 |
| 2025 | Other Construction Equipment | 175 | 730130.585 | 31554.80135 | 3.26 |
| 2025 | Other Construction Equipment | 500 | 3202945.07 | 58348.77291 | 7.73 |
| 2025 | Rollers | 120 | 1682584.19 | 140142.351 | 1.69 |
| 2025 | Rollers | 175 | 1740030.36 | 87904.34127 | 2.79 |
| 2025 | Rollers | 500 | 173237.338 | 3713.48861 | 6.57 |
| 2025 | Rubber Tired Dozers | 120 | 226276.696 | 18878.44776 | 1.69 |
| 2025 | Rubber Tired Dozers | 175 | 188936.716 | 8663.071417 | 3.07 |
| 2025 | Rubber Tired Dozers | 500 | 2253205.11 | 43222.95842 | 7.34 |
| 2025 | Rubber Tired Loaders | 120 | 3647194.69 | 322368.6029 | 1.59 |
| 2025 | Rubber Tired Loaders | 175 | 8630329.36 | 434790.3972 | 2.79 |
| 2025 | Rubber Tired Loaders | 500 | 15568162.8 | 369029.2104 | 5.94 |
| 2026 | Excavators | 120 | 2591442.01 | 228504.9154 | 1.60 |
| 2026 | Excavators | 175 | 5462016.15 | 266586.8939 | 2.88 |

| | | | | | |
|---|---|---|---|---|---|
| 2026 | Excavators | 500 | 11515501.6 | 250866.9282 | 6.46 |
| 2026 | Off-Highway Trucks | 120 | 96944.7147 | 8054.303763 | 1.69 |
| 2026 | Off-Highway Trucks | 175 | 1875190.78 | 84549.68691 | 3.12 |
| 2026 | Off-Highway Trucks | 500 | 16322595.4 | 310559.2161 | 7.40 |
| 2026 | Other Construction Equipment | 120 | 1401498 | 112645.5945 | 1.75 |
| 2026 | Other Construction Equipment | 175 | 761842.783 | 32902.51913 | 3.26 |
| 2026 | Other Construction Equipment | 500 | 3336321.85 | 60840.87158 | 7.72 |
| 2026 | Rollers | 120 | 1755255.54 | 146127.8851 | 1.69 |
| 2026 | Rollers | 175 | 1814559.92 | 91658.7697 | 2.79 |
| 2026 | Rollers | 500 | 180853.245 | 3872.093145 | 6.58 |
| 2026 | Rubber Tired Dozers | 120 | 236020.086 | 19684.75357 | 1.69 |
| 2026 | Rubber Tired Dozers | 175 | 197018.768 | 9033.07455 | 3.07 |
| 2026 | Rubber Tired Dozers | 500 | 2344815.64 | 45069.0277 | 7.33 |
| 2026 | Rubber Tired Loaders | 120 | 3806308.06 | 336137.0907 | 1.59 |
| 2026 | Rubber Tired Loaders | 175 | 9000129.28 | 453360.4633 | 2.80 |
| 2026 | Rubber Tired Loaders | 500 | 16232006.7 | 384790.5908 | 5.94 |
| 2027 | Excavators | 120 | 2700174.9 | 238021.2881 | 1.60 |
| 2027 | Excavators | 175 | 5688373.9 | 277689.2382 | 2.88 |
| 2027 | Excavators | 500 | 11998108.3 | 261314.5948 | 6.46 |
| 2027 | Off-Highway Trucks | 120 | 101013.629 | 8389.735306 | 1.70 |
| 2027 | Off-Highway Trucks | 175 | 1952548.15 | 88070.86426 | 3.12 |
| 2027 | Off-Highway Trucks | 500 | 16993233.6 | 323492.8426 | 7.40 |
| 2027 | Other Construction Equipment | 120 | 1460007.22 | 117336.861 | 1.75 |
| 2027 | Other Construction Equipment | 175 | 793759.437 | 34272.78565 | 3.26 |
| 2027 | Other Construction Equipment | 500 | 3478075.38 | 63374.66569 | 7.73 |
| 2027 | Rollers | 120 | 1828246.75 | 152213.5634 | 1.69 |
| 2027 | Rollers | 175 | 1890065.25 | 95476.01368 | 2.79 |
| 2027 | Rollers | 500 | 188258.554 | 4033.351302 | 6.57 |
| 2027 | Rubber Tired Dozers | 120 | 245776.451 | 20504.54973 | 1.69 |
| 2027 | Rubber Tired Dozers | 175 | 205230.287 | 9409.268225 | 3.07 |
| 2027 | Rubber Tired Dozers | 500 | 2443145.2 | 46945.98367 | 7.33 |
| 2027 | Rubber Tired Loaders | 120 | 3963886.37 | 350135.9398 | 1.59 |
| 2027 | Rubber Tired Loaders | 175 | 9378124.74 | 472241.2262 | 2.80 |
| 2027 | Rubber Tired Loaders | 500 | 16908164.9 | 400815.6757 | 5.94 |
| 2028 | Excavators | 120 | 2811028.33 | 247694.2596 | 1.60 |
| 2028 | Excavators | 175 | 5917846.56 | 288974.2796 | 2.88 |
| 2028 | Excavators | 500 | 12477354.8 | 271934.1854 | 6.46 |
| 2028 | Off-Highway Trucks | 120 | 105633.348 | 8730.68662 | 1.70 |
| 2028 | Off-Highway Trucks | 175 | 2031019.67 | 91649.98515 | 3.12 |
| 2028 | Off-Highway Trucks | 500 | 17677794.3 | 336639.3015 | 7.39 |

| | | | | | |
|---|---|---|---|---|---|
| 2028 | Other Construction Equipment | 120 | 1517051.96 | 122105.3257 | 1.75 |
| 2028 | Other Construction Equipment | 175 | 825898.143 | 35665.6009 | 3.26 |
| 2028 | Other Construction Equipment | 500 | 3621617.41 | 65950.15523 | 7.73 |
| 2028 | Rollers | 120 | 1902839.13 | 158399.3861 | 1.69 |
| 2028 | Rollers | 175 | 1966997.16 | 99356.0732 | 2.79 |
| 2028 | Rollers | 500 | 196008.887 | 4197.26308 | 6.58 |
| 2028 | Rubber Tired Dozers | 120 | 255771.37 | 21337.83623 | 1.69 |
| 2028 | Rubber Tired Dozers | 175 | 213735.32 | 9791.652443 | 3.07 |
| 2028 | Rubber Tired Dozers | 500 | 2541630.05 | 48853.82632 | 7.32 |
| 2028 | Rubber Tired Loaders | 120 | 4126961.76 | 364365.1502 | 1.59 |
| 2028 | Rubber Tired Loaders | 175 | 9759645.79 | 491432.6859 | 2.80 |
| 2028 | Rubber Tired Loaders | 500 | 17575291.8 | 417104.4651 | 5.93 |
| 2029 | Excavators | 120 | 2920609.77 | 257523.8301 | 1.60 |
| 2029 | Excavators | 175 | 6152024.37 | 300442.0183 | 2.88 |
| 2029 | Excavators | 500 | 12974157.2 | 282725.7001 | 6.46 |
| 2029 | Off-Highway Trucks | 120 | 109475.078 | 9077.157706 | 1.70 |
| 2029 | Off-Highway Trucks | 175 | 2112104.61 | 95287.04959 | 3.12 |
| 2029 | Off-Highway Trucks | 500 | 18386173.7 | 349998.5926 | 7.40 |
| 2029 | Other Construction Equipment | 120 | 1577470.61 | 126950.9887 | 1.75 |
| 2029 | Other Construction Equipment | 175 | 858435.117 | 37080.96489 | 3.26 |
| 2029 | Other Construction Equipment | 500 | 3766804.22 | 68567.34022 | 7.73 |
| 2029 | Rollers | 120 | 1978544.96 | 164685.353 | 1.69 |
| 2029 | Rollers | 175 | 2044749.97 | 103298.9483 | 2.79 |
| 2029 | Rollers | 500 | 203736.564 | 4363.828478 | 6.57 |
| 2029 | Rubber Tired Dozers | 120 | 265928.995 | 22184.61308 | 1.69 |
| 2029 | Rubber Tired Dozers | 175 | 221958.579 | 10180.2272 | 3.07 |
| 2029 | Rubber Tired Dozers | 500 | 2639588.94 | 50792.55566 | 7.32 |
| 2029 | Rubber Tired Loaders | 120 | 4293373.85 | 378824.7219 | 1.60 |
| 2029 | Rubber Tired Loaders | 175 | 10154157.7 | 510934.8423 | 2.80 |
| 2029 | Rubber Tired Loaders | 500 | 18249807.6 | 433656.959 | 5.93 |

*There is 1.874 pounds/liter of diesel, and 3.79 liters/gallon.

Fuel use factors for San Francisco Bay Area Air Basin; BSFC = brake specific fuel consumption