CERF COASTAL ENVIRONMENTAL RIGHTS FOUNDATION

SAN DIEGO COASTKEEPER

February 28, 2022

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Via Email
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Re: COTTONWOOD SAND MINING PROJECT (PDS2018-MUP-18-023), (PDS2018-RP-18-001); LOG NO. PDS2018-ER-18-19-007; SCH# 2019100513

D-O1-1

Please accept these comments on the Cottonwood Sand Mining Project (Project) Draft Environmental Impact Report (DEIR) on behalf of the Coastal Environmental Rights Foundation (CERF) and San Diego Coastkeeper (Coastkeeper). CERF is a nonprofit environmental organization founded by surfers in 2008 for the protection and enhancement of California's coastal resources. The purposes of CERF are to aid the enforcement of environmental laws, raise public awareness about coastal environmental issues, encourage environmental and political activism, and generally act to defend natural resources in coastal areas. Coastkeeper is likewise a nonprofit environmental organization dedicated to the preservation, protection, and defense of the environment, wildlife, and natural resources of San Diego County watersheds. To further these goals, Coastkeeper and CERF actively seek federal and state agency implementation of the Clean Water Act, and, where necessary, directly initiate enforcement actions on behalf of themselves and their members.

As reflected below, CERF and Coastkeeper have grave concerns regarding the Project's undisclosed water quality and greenhouse gas impacts.

D-O1-2

A. The Project Will Result in Water Quality Impacts

In September 2020, CERF and Coastkeeper sent a 60-day notice to the County alleging numerous violations of the Clean Water Act and the Regional Municipal Separate Storm Sewer Systems (MS4) National Pollutant Discharge Elimination System (NPDES) Permit. Since that time, CERF, Coastkeeper, and the County have been working collaboratively toward achievement of both Clean Water Act and MS4 Permit goals, culminating in the execution of a Memorandum of Agreement (MOA) late last year. Most recently, the parties identified an area in the Sweetwater watershed for further study and potential development of long-term best management practices (BMPs) to achieve water quality standards. The focus area is directly adjacent to and downstream of the Project. Because sand mining within a sensitive, impaired water body (the Sweetwater River) will result in significant biological, water quality, and hydrological impacts to receiving and downstream waters, CERF and Coastkeeper have serious concerns regarding the viability of any collaborative efforts within the Spring Valley focus area under the MOA should the Project be approved.

Because of their prior enforcement efforts, in particular those aimed at aggregate facilities operating under the California's General Permit for Storm Water Discharges Associated with Industrial Activities (Industrial General Permit), CERF and Coastkeeper are intimately familiar with aggregate facility water quality impacts. Notably, virtually all such facilities are unable to achieve compliance with the Industrial

<u>D-O1 – Coastal Environmental Rights Foundation and Attorneys for San Diego Coastkeeper</u>

D-O1-1 The County acknowledges these introductory comments; however, they do not raise an issue concerning the environmental analysis or adequacy of the DEIR. Please see the responses below to specific comments.

D-O1-2 The County acknowledges the Coastal Environmental Rights Foundation's (CERF's) concerns regarding the ability of other aggregate facilities "to achieve compliance with the Industrial General Permit and attain water quality standards." The County also agrees that a collaborative working relationship has been established regarding a Memorandum of Understanding (MOU) to attain CWA and MS4 Permit goals, and that an area in the Sweetwater watershed has been identified for further study and potential development of long-term BMPs relative to clean water standards.

The statement that lack of conformance by others should constitute a part of the Project EIR, however, is inaccurate. The purpose of the EIR is to analyze and drawing conclusions based on the Project description for this Project, specifics of the Project site and resources, Hand mandated actions related to design, implementation of that design, and performance monitoring. Please see Response to Comment D-A6-11. Based on Project-specific elements, as well as the mandated legal standards required by governmental agencies in state and local laws and regulations, the County finds that *this particular project* would have less than significant impacts under CEQA.

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D-O1-2 cont.

General Permit[1] and attain water quality standards – especially without enforcement action on behalf of nongovernmental organizations such as CERF and Coastkeeper.

"The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data."[2] The DEIR's failure assess such available data undermines the water quality analysis. As reflected in the enclosed discharge monitoring data from facilities with the SIC Code 1442 (Construction Sand and Gravel) applicable to the Project, most facilities in San Diego County enrolled under the Industrial General Permit do not meet the applicable water quality objective for phosphorus (exceedances in over 75% of samples) and more than 1/5th of samples exceed the nitrogen water quality objective.[3]

Though commonplace, this lack of conformance with applicable laws and regulations and failure to implement appropriate BMPs is completely ignored in the DEIR. The Project's compliance with such laws is not only presumed but forms the basis for the finding of no significant impact to water quality and hydrology. The DEIR concludes the Project's impacts related to water quality would be less than significant based on purported future compliance with applicable laws, including the Industrial General Permit.

> In summary, compliance with applicable federal, State, and local water quality related regulations would minimize impacts to the water quality of surrounding receiving waters during the Project's site development, mining, and reclamation activities.[4]

On its face, this omission and lack of enforceable mitigation measures will result in significant environmental impacts. For example, though the Project involves over 200 acres of mining and would be subject to the Industrial General Permit, the Stormwater Quality Management Plan (SWQMP) states the Project does not qualify as a Priority Development Project (PDP) and is exempt from PDP requirements.[5] This is false. The Project clearly results in the disturbance of more than one acre and is expected to generate pollutants post construction.[6] Therefore, it is a PDP subject to the MS4 Permit and County PDP requirements.[7] The DEIR's failure to acknowledge and enforce the PDP requirements further evidences the lack of factual support for any finding of insignificance based on purported compliance with applicable laws.

[1] For example, the East County Sand Mine, enrolled under the Industrial General Permit under WDID 9 37I027726 since 2018, failed to submit and certify any required annual reports until 2021 and has never conducted any rain event monitoring. The East County Sand Mine was reviewed and approved by the County in 2015. (https://www.sandiegocounty.gov/content/dam/sdc/pds/PC/170714-Supporting-Documents/East%20County%20Sand%20Mine%20Major%20Use%20Permit/Project-Description.pdf). The County did not make Industrial General Permit enrollment or compliance an enforceable mitigation measure or project feature. As a result, the East County Sand Mine remains out of compliance today and continues to impact downstream receiving waters.
In addition, Hanson Aggregates has been the subject of Clean Water Act enforcement by CERF and Coastkeeper for its repeated failure to monitor its discharges as required and meet water quality standards under the Industrial General Permit. See, Civil Case No. 3:19-cv-00565-BEN-WVG (California Southern District Court). As reflected in the enclosed water monitoring data, Hanson and similar mining operations continue to negatively impact impaired and downstream receiving waters despite enrollment under the Industrial General Permit.
[2] 14 Cal. Code Regs. §15064(b)(1).
[3] See Enclosure.
[4] Id. At p. 3.1.5-13.
[5] SWQMP, Appendix P, p. 2.
[6] MS4 Permit, Section E.3.b.(1)(f)). Other PDP definitions may also apply
[7] See enclosed email correspondence with Regional Water Quality Control Board staff.

D-O1-2 (cont.) The County agrees that the Project is characterized as a PDP. A PDP SWQMP is included as Appendix P to the RDEIR and was prepared using the County's standard form to describe how the Project would comply with the applicable requirements of the County BMP Design Manual and the County Watershed Protection Ordinance. The PDP SWQMP includes construction stormwater BMPs and structural and site design BMPs that would be implemented to satisfy County requirements for managing urban runoff, including stormwater, from land development activities. The PDP SWQMP was circulated for public review and comment with the RDEIR.

Due to the analyzed design and mandatory legal requirements, the assertion that BMPs would address potential impacts of this Project is reasonable. No additional analysis of speculative assertions that mandatory legal obligations may not be met in the future is required.

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D-O1-3

The Project will also result in substantial alteration of the Sweetwater River floodplain, with mining up to 40 feet bgs.[8] However, the DEIR does not explain how the Project will remove water from the open mining pits after rain events. There is no analysis of percolation, evaporation, or the like. If mining operations are to commence shortly after rain events, the Project will likely resort to pumping to remove standing water. This will not only require an additional NPDES and Waste Discharge permit, but also result in further discharges of concentrated sediment and pollutant-laden water downstream. Likewise, when groundwater is encountered (which is likely given the depth of groundwater onsite), the DEIR does not explain how such water will be removed and where it will be pumped. Again, discharge of such pumped groundwater will require additional permits and BMPs.

D-O1-4

The discharge of polluted storm water and pumped ground water is of great consequence to the downstream receiving waters. Sweetwater River, Sweetwater Reservoir, and downstream San Diego Bay are all impaired water bodies. The most recent draft 303(d) list of impaired water bodies only adds pollutants to the existing list, making any discharge of such pollutants from the Project that much more detrimental. The DEIR surface water monitoring confirms upstream and midstream monitoring locations did not meet phosphorus or nitrogen water quality objectives.[9]

Water Body	Estimated Size Affected	Unit	Pollutant	Pollutant Category	Final Listing Decision	Decision Status
Long Canyon Creek (Lower Sweetwater Watershed)	1.45	miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	Original
Mexican Canyon Creek (eastern tributary to Sweetwater River, Upper)	4.85	miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	Original
Mexican Canyon Creek (western tributary to Sweetwater River, Upper)	3.55	miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	Original
Sweetwater Reservoir	924.93	acres	Mercury	Metals	List on 303(d) list (TMDL required list)	Revised
Sweetwater Reservoir	924.93	acres	Oxygen, Dissolved	Nutrients	List on 303(d) list (TMDL required list)	Original
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Benthic Community Effects	Other Cause	Do Not Delist from 303(d) list (TMDL required list)	Revised
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Bifenthrin	Pesticides	List on 303(d) list (TMDL required list)	Revised
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Chlorpyrifos	Pesticides	Do Not Delist from 303(d) list (TMDL required list)	Revised

[8] DEIR, p. 3.1.2-18.
[9] DEIR, p. 3.1.5-3 to 4.

D-O1-3 Please see Response to Comment D-A3-4 regarding excavation and groundwater. Over-excavation pits would be limited to five acres in size and an excavator would be utilized for extraction when groundwater is encountered in the pits or in the event of pooling during rain events. Additionally, mining activities occurring during the rainy season (generally November through March) would be located away from the river channel to reduce the potential for overflow into active mining areas during a large storm event.

D-O1-4 Please see Responses to Comments D-A6-11 and D-O1-2. During and following Project implementation, construction and operational BMPs would guard against Project-related pollutants entering the drainage. The Project is not required to mitigate for indicator bacteria/pollutants associated with non-Project sources. Please refer to discussion of 303(d) pollutants in the assessment titled "Surface Water Quality" in EIR Section 3.1.5, *Hydrology and Water Quality,* as well as the Section 3.1.5.3 under the heading "Water Quality," regarding the controls and BMPs planned to control potential pollutants. Based on the Project-specific controls and analysis, potential impacts are identified as less than significant.

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D-O1-4 cont.

Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Indicator Bacteria	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	Revised
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Nitrogen	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	Revised
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Oxygen, Dissolved	Nutrients	List on 303(d) list (TMDL required list)	Revised
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Phosphorus	Nutrients	Do Not Delist from 303(d) list (TMDL required list)	Revised
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Pyrethroids	Pesticides	List on 303(d) list (TMDL required list)	Revised
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Total Dissolved Solids	Salinity/ Total Dissolved Solids/ Chlorides/Sulfates	Do Not Delist from 303(d) list (TMDL required list)	Revised
Sweetwater River, Lower (below Sweetwater Reservoir)	8.52	miles	Toxicity	Total Toxics	Do Not Delist from 303(d) list (TMDL required list)	Revised
Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Aluminum	Metals	Do Not Delist from 303(d) list (TMDL required list)	Original
Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Benthic Community Effects	Other Cause	Do Not Delist from 303(d) list (TMDL required list)	Revised
Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Indicator Bacteria	Pathogens	Do Not Delist from 303(d) list (TMDL required list)	Original
Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Nitrogen	Nutrients	List on 303(d) list (TMDL required list)	Revised
Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Phosphorus	Nutrients	List on 303(d) list (TMDL required list)	Revised
Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Selenium	Metals	Do Not Delist from 303(d) list (TMDL required list)	Revised
Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Total Dissolved Solids	Salinity/Total Dissolved Solids/ Chlorides/ Sulfates	List on 303(d) list (TMDL required list)	Revised
Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Toxicity	Total Toxics	List on 303(d) list (TMDL required list)	Revised

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Sweetwater River, Middle (between Sweetwater and Loveland Reservoirs)	17.45	miles	Turbidity	Sediment	List on 303(d) list (TMDL required list)	Revised
Sweetwater River, North Fork, unnamed tributary at Tavern Road	1.74	miles	Indicator Bacteria	Pathogens	List on 303(d) list (TMDL required list)	Original
Sweetwater River, North Fork, unnamed tributary at Tavern Road	1.74	miles	Manganese	Metals	List on 303(d) list (TMDL required list)	Original

D-O1-5

In addition, the DEIR makes no mention of the process to remove the eight existing golf course ponds, including any efforts to minimize resuspension and discharge of nutrients, bacteria, metals, sediments, and pesticides therein– all of which are a problem for downstream receiving waters.[10]

D-O1-6

Lastly, the DEIR fails to account for the sediment and pollutants associated with the conveyer belt and stockpiles, which would be located within the floodplain of the Sweetwater River. The DEIR claims stockpiles would not impede storm water/river flows but fails to assess their impact on water quality.[11] Stockpiles of concrete sand and gravel up to 25 feet in height and additional uncharacterized stockpiles of process materials up to 15 feet in height would cause a significant water quality impact if such materials were suspended during rain events or reservoir transfers.[12]

D-O1-7

In summary, because the DEIR dispenses with water quality impact analysis by presuming adherence to some (but not all) applicable Clean Water Act and Water Code permits, it fails to disclose the Project' significant environmental impacts. As a result, the DEIR must be revised and recirculated to include the omitted water quality analysis and appropriate, enforceable mitigation measures.

D-O1-8

B. The Project Will Result in Greenhouse Gas Impacts

A determination that an environmental impact complies with a threshold of significance does not relieve a lead agency of its obligation to consider evidence that indicates the impact may be significant despite compliance with the threshold.[13] If evidence is submitted tending to show that the environmental impact might be significant despite the significance standard used in the EIR, the agency must address it.[14]

The Project DEIR adopts one significance threshold for analysis of greenhouse gas (GHG) emissions (10,000 MTCO2e per year), borrowed from the SCAQD.[15] As noted in the DEIR, however, not only is this threshold a poor substitute for a true analysis of the Project's real GHG impact, but it was adopted in 2008, before the state and local agencies adopted much more aggressive GHG reduction targets.[16] Notably, the DEIR makes no mention of the County's 2021 commitment – by unanimous vote – to

[10] See, Vector Management Plan, Appendix U, p. 5.
[11] DEIR, p. 3.1.5-20 to 21.
[12] DEIR, p. 1-8.
[13] 14 Cal Code Regs §15064(b)(2).
[14] *Protect the Historic Amador Waterways v Amador Water Agency* (2004) 116 Cal. App. 4th 1099, 1111.
[15] DEIR, p. 3.1.3-12.
[16] Id.

D-O1-5 The existing golf course ponds were artificially constructed and fed. Since the cessation of golf course activities on the Lakes Course, some of the ponds are already dry. The remaining golf course ponds would be allowed to dry and soil would be managed on site. Topsoil, including the soil in the dry pond areas, would be salvaged and stabilized against wind and water erosion. Further BMPs to minimize potential downstream effects would be addressed by the SWPPP. Please see Response to Comment D-A6-14 for a description of the BMPs that would be employed to address potential water quality issues. Additionally, please see Response to Comment D-A6-17 relative to pollutant and site management controls.

D-O1-6 Please see Responses to Comments D-A6-11 and D-A6-30 regarding sediment and pollutant controls. Stockpiles would be stabilized to ensure that sedimentation would not occur and fugitive dust control measures would include watering, use of wind barriers as necessary, and coverage with polyethylene tarps. Further BMPs to minimize potential downstream effects would be addressed by the SWPPP.

D-O1-7 This comment is a summary statement reiterating CERF's comments on the EIR's water quality impact analysis. Please see Responses to Comments D-O1-2 and D-O1-4, as well as DA6-11, specifically addressing these comments. Additionally, please see Topical Response 1, *Reason for the Recirculation of the DEIR and the Recirculated DEIR Process*, which describes why only portions of the DEIR were recirculated for public review; and Topical Response 3*, EIR Errata and Updated Technical Reports*, for discussions, as appropriate, of the revisions to Appendix S, *Sediment Load Analysis*, and Appendix T, *Water Quality Evaluation Report*. The Project analysis and compliance with applicable regulatory controls supports a finding of less than significant impact. Additional revisions to the EIR and further recirculation are not required.

D-O1-8 Consistent with CEQA Guidelines Section 15064.4, the GHG analysis for the Project appropriately relies upon a threshold that is appropriate in the context of this particular Project. As detailed in DEIR Section 3.1.3, the County does not currently have an approved quantitative threshold related to GHG emissions. The South Coast Air Quality Management District (SCAQMD) adopted threshold was relied upon due to the similar climate and land use patterns between the two jurisdictions. Additionally, the SCAQMD's GHG thresholds have been relied upon by several lead agencies throughout the state. The Project's consistency with the County's General Plan goals and policies, SANDAG's Regional Plan, and California Air Resources Board (CARB)'s Scoping Plan are also addressed in Section 3.1.3 of the DEIR. The GHG analysis acknowledges the potential for reduction in GHG emissions from reduced regional VMT attributed to the Project, but conservatively does not rely on this reduction in the quantification of GHG emissions.

The Commenter references a goal of carbon neutrality by 2035 and the County Board of Supervisors' January 27, 2021 recommendation for the development of a framework for a regional zero carbon sustainability plan as outlined in a Board of Supervisors Minute Order. Neither represent an enforceable threshold or adopted plan that the Project must be in compliance with, and therefore, they were not referenced in the DEIR.

With regard to potential GHG emissions impacts due to reduction in carbon sequestration, GHG modeling conducted for the Project has been revised as disclosed in this FEIR to account for the one-time loss of sequestered carbon dioxide by removing existing trees on site. These updated estimates do not alter the conclusion in the previously circulated DEIR that impacts related to GHG emissions would be less than significant.

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D-O1-8 cont.

zero carbon emissions by 2035.[17] Building a new sand mining operation which emits over 2,000 MTCO2e per year with no mitigation frustrates the County's ability to achieve this goal.[18] Likewise, the DEIR does not analyze the Project's GHG emissions relative to the statewide SB-32 goal of reducing emissions 40 percent from 1990 levels by 2030.[19] By all accounts, any increase in annual emissions and reduction in carbon sequestration will hinder the County's ability to reduce its GHG emissions by 2030 and achieve carbon neutrality by 2035. Accordingly, the Project will result in a significant environmental impact.

D-O1-9

The Project's GHG analysis is further flawed because it fails to account for the loss of carbon sinks. As noted in the Technical Report:

> Development under the project would also result in changes in CO2 sequestration from the atmosphere. By removing existing vegetation (golf course grass), the project would also result in a carbon exchange. While typically accounted for in a project's construction period analysis, this release of sequestered carbon is not analyzed here because it would only be temporary. Upon completion of mining activities, the site would be reclaimed as open space with native vegetation, resulting in additional carbon sequestration.[20]

Not only is such an assumption and omission unsupported by substantial evidence, but it also undermines the DEIR's fundamental goal of disclosing the Project's significant environmental impacts. For over 10 years, the County will lose the CO_2 sequestration capability of the existing vegetation, including the golf course and impacted riparian habitat. Moreover, once the reclamation is complete, the vegetation will need time to mature. The Project has completely failed to account for this considerable temporal impact.

D-O1-10

The GHG analysis also relies on a faulty Local Mobility Analysis (LMA) for calculation of vehicle-related GHG emissions. For example, the LMA acknowledges the 18-hole golf course will be closed during Phase 2 and Phase 3 of the Project, but "conservatively" takes credit for traffic related to a 9-hole golf course.[21] Similarly, Project VMT and associated GHG emissions are presumed to take place only in San Diego County, but trucks transporting aggregate material will likely travel beyond the County's jurisdictional borders. A recent Port of San Diego feasibility study found long-haul heavy duty trucks (similar to those transporting aggregate from the Project site) operations are designed to minimize miles travelled without transporting cargo or with empty trailers (known as "deadheading").[22] The study found the new source of imported cement would be transported by the primary customer based out of Rialto, California in San Bernardino, California. The trucks would travel between the new cargo destination at the Port of San Diego and Rialto each day with multiple deliveries that would result in over 100 miles of travel each way from the fleet warehouse.[23] The Project's VMT analysis and associated "San Diego County Construction Aggregate Market Study – With an Emphasis on Sand Imports," which form the basis of the auto-related GHG emissions, do not take this travel patterns of operational goals into account. Rather, they assume all truck traffic to and from the Project will remain within San Diego County and would displace longer-distance travel. Based on the aforementioned study, these assumptions are unsupported. As a result, the Project VMT cannot be presumed to result in a reduction from existing VMT and truck traffic related GHG emissions have been underestimated. To account for these omissions, the DEIR must be revised.

[17] https://bosagenda.sandiegocounty.gov/cob/cosd/cob/doc?id=0901127e80cb1fb8
[18] DEIR, p. 3.1.3-14.
[19] See Greenhouse Gas Emissions Technical Report, Appendix K, pp. 9-10.
[20] Id. at p. 15.
[21] LMA, Appendix W, Table 7-2, footnote f.
[22] See Enclosure, Zero Emission Truck Feasibility Study for Mitsubishi Cement Corporation, p. 16.
[23] Id.

D-O1-9 As detailed in Section 3.1.3 of the DEIR, the loss of sequestered carbon would be temporary. A full quantitative analysis of the sequestered carbon lost due to construction plus the sequestered carbon gained over the lifetime of the Project would effectively result in no net change because the carbon released by the vegetation removed would be sequestered in the newly planted vegetation once mature. It is true that the vegetation would take time to mature, however it is standard practice that analyses of change in vegetated land uses include this time. That is, for most large trees, a 20-year growing period is accounted for in the calculations of carbon sequestered by newly planted trees.

D-O1-10 Please see Topical Response 3, *EIR Errata and Updated Technical Reports*, for details related to the updated LMA, VMT, and GHG analyses. While the LMA does include a net reduction in average daily traffic associated with the closure of a 9-hole golf course during Phases 2 and 3, the GHG analysis does not. Emissions associated with heavy vehicles (trucks), light vehicles (employees), and vendors are included in the inventories presented in the addendum to the GHG technical report provided in Appendix K to the FEIR with no net reduction taken for trips associated with the closure of the golf course.

Regarding footnote 23, the commentor simplifies and misrepresents the conclusions made in the *Zero Emissions Truck Feasibility Study for Mitsubishi Cement Corporation*. As detailed on page 16 of that study:

For MCC customer operations, these trucks would travel between the new cargo destination at the Port of San Diego and Rialto each day with multiple deliveries that may or may not be associated with cementitious materials stored at the [Tenth Avenue Marine Terminal (TAMT)]. As an example, a truck from the fleet would pick up a load in the Rialto area and travel to its drop-off destination, then be dispatched to another pick-up/drop-off destination, and so on until reaching the San Diego region and then ending at the TAMT. The same scenario of pick-up/drop-off would repeat for the truck on its way back to Rialto from the San Diego region... Conservatively, these trucks would travel over 100 miles before reaching the Port and travel over 100 miles back to Rialto.

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C. Conclusion

D-O1-11 As detailed above, CERF and Coastkeeper have serious concerns regarding the water quality, greenhouse gas, and VMT impacts of the proposed Project. The lack of thoughtful consideration of such environmental impacts, supported by facts and reasonable assumptions thereon, renders the DEIR inadequate. Further, the Project's anticipated negative impacts on water quality jeopardizes CERF and Coastkeeper's efforts to work collaboratively with the County pursuant to their MOA. For the foregoing reasons, the DEIR must be substantially revised.

Thank you for your consideration.

Sincerely,

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Matt O'Malley
Patrick McDonough
Attorneys for San Diego Coastkeeper

D-O1-10 **(cont.)** As detailed in the excerpt from the referenced study, a given truck would make multiple trips along its overall route from Rialto to the Port and back again. Each pick-up/drop-off would be only a portion of the total 100 miles. Stacking the pick-up/drop-off trips in this manner helps reduce deadhead miles and maximize efficiency. Each pick-up/drop-off can also be viewed as an individual trip with an independent purpose. Therefore, each individual trip would be only a fraction of the 100 total miles traveled.

D-O1-11 This comment does not raise an issue concerning the environmental analysis or adequacy of the DEIR. Please see the responses above to specific comments raised in this letter.

DRAFT Zero Emission Truck Feasibility Study for Mitsubishi Cement Corporation

November 2020

Submitted to:
Port of San Diego

Submitted by:
ICF and CALSTART

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Introduction

Deployment of battery electric, heavy-duty Class 8 trucks (gross vehicle weight rating [GVWR] > 26,000) is expected to increase throughout the next decade. Technological improvements are increasing the energy density of batteries and market forces are decreasing the costs for electric drivetrains. Meanwhile, the regulatory environment in California is shifting with the adoption of the Advanced Clean Truck Regulation, requiring manufacturers of medium- and heavy-duty trucks to begin selling zero emission vehicles by 2024, and the development of a new zero emission fleet regulation that likely will require use of zero emission vehicles in the foreseeable future. Other state policies are supporting the deployment of infrastructure to support transportation electrification—particularly in the freight sector.

Although production and use of battery-electric Class 8 trucks is rather nascent, short-range (less than 150 miles) and predictable route applications may be well suited for battery electric trucks. However, longer range freight transportation with less predictable routes may be difficult to service with battery electric trucks at this time.

Mitsubishi Cement Corporation (MCC) is seeking a lease and Coastal Development Permit for construction and operation at the Port of San Diego's (Port) Tenth Avenue Marine Terminal (TAMT). The transport of cement from TAMT to offsite locations and construction sites will be conducted by MCC's customers, the producers of cement ready-mix products. Freight transport is conducted with Class-8 vehicles utilizing pneumatic bottom dump trailers. The Mitsubishi project CEQA analysis assumed each truck to travel an average round trip distance of 124 miles and relates to the attainment status of air quality standards within San Diego County; therefore, haul truck trip emissions were confined to those occurring within the County. Additionally, the proposed Project is designed to service the San Diego area. Customers outside of San Diego County are expected to be more efficiently supplied by other sources of cement and cementitious materials. However, MCC's preferred customer transports and delivers cement throughout Southern California and its fleet does not include dedicated trucks to specific geographic locations. These trucks operate long distances (on average between 300-400 miles on a daily basis, with heavy weight (approximately 80,000 pounds including the truck, trailer, and cargo). As a result, the current duty cycles of MCC's customers make it difficult to implement battery electric trucks.

The purpose of this study is twofold: (1) develop metrics to determine feasibility for zero emission, battery electric Class 8 trucks given MCC's customers duty cycles and logistics, and (2) guide decision-making for a transition to zero emission trucks that may service MCC's proposed project site at the Port's TAMT.

This study is broken out into five separate tasks: (1) Fleet and Infrastructure Analysis, (2) Operational Analysis, (3) Economic Analysis, (4) Feasibility Metrics, and (5) Recommendations.

I. Fleet and Infrastructure Analysis

1. Purpose

The purpose of this section is to provide background information on the current state of electric truck and charging technology, MCC's primary customers' vehicle characteristics, and regulations and grant programs affecting trucks.

2. Current State of Technology

Heavy-duty electric vehicles have been slower to evolve and implement compared to light- and medium-duty vehicles, but a specific emphasis and focus has been placed on drayage trucks. Traditionally, electric drive trains are most effective for short, regular duty cycles in urban areas with stop-and-go traffic. This would include transit buses, school buses, yard tractors, and drayage trucks. Drayage trucks are cargo vehicles with predictable routes that transport goods between ports and freight facilities and warehouses. Conventional port drayage trucks are considered to have less than 100 daily vehicle miles traveled (VMT), with multiple stops at the Port, and overnighting at their home fleet base, making them prime candidates for electrification with currently available Class 8 electric trucks. As transload and freight facilities are being located farther from the ports, the typical daily VMT may be higher.

CALSTART's Drive to Zero Beachhead Strategy[1] identifies the commercial vehicle market segments where zero- and near-zero technologies are most likely to succeed first. They are typically urban applications where vehicles operate along known routes and over relatively shorter distances and can recharge overnight at depots. The flow of innovation follows the transition from first-success beachhead applications, expanding to larger-volume, longer-distance, and more demanding applications that can make use of core zero-emission commercial vehicle (ZECV) powertrain components and supply chains, as shown in Figure I-1. The beachhead model's projections for zero-emission freight vehicles (ZEFV) start with smaller vehicles, such as cargo vans and yard tractors, as first-success applications in receptive markets around the world. The components and supply chains for these vehicles can be transferred and fashioned into new applications that will meet more rigorous duty cycles in heavier vehicles. The progression from lighter to heavier freight vehicles in an expanding market is shown in Figure I-1, with the progress from port yard hostlers to medium-duty freight and eventually heavy-duty regional freight.

[1] CALSTART: 2020. The Beachhead Model: Catalyzing Mass-Market Opportunities for Zero-Emission Commercial Vehicles. Available online at https://globaldrivetozero.org/public/The_Beachhead_Model.docx.

Zero Emission Truck Feasibility Study for Mitsubishi Cement Corporation

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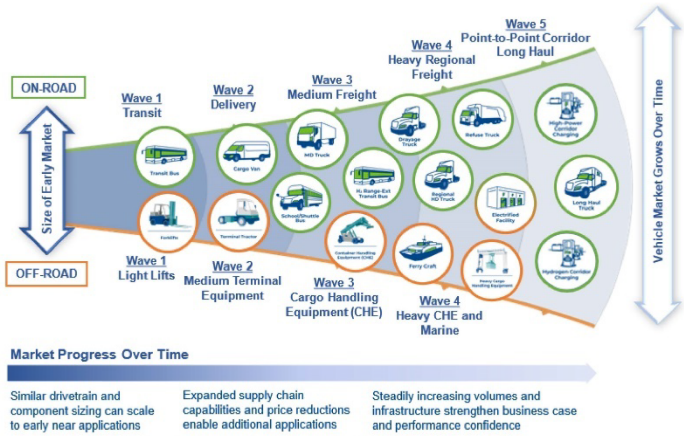
Figure I-1. "Beachhead Pathways" for Zero-Emission Vehicle Commercialization[2]



Based on the current market, the zero-emission vehicle market is approaching the end of Wave 2 in the beachhead model. It is projected that Wave 4 technologies will be commercialized in 2023 as supported by data in the Zero Emission Technology Inventory (ZETI) and discussed below.

2.1 Vehicles

Traditional truck and engine manufacturers, including Daimler, Volvo, and Cummins, have all developed zero-emission freight vehicles or technologies that have at least entered demonstration phases. Tesla, which has rapidly grown to become a leading global automaker, expects to bring its all-electric Semi truck to market by 2022. Nikola, a startup hydrogen fuel cell truck manufacturer, has secured commitments from major fleets such as InBev and was valued at more than $12 billion after its Initial Public Offering, though its first production model has not yet been manufactured.[3]

[2] CALSTART: 2020. The Beachhead Model: Catalyzing Mass-Market Opportunities for Zero-Emission Commercial Vehicles. Available online at https://globaldrivetozero.org/public/The_Beachhead_Model.docx.
[3] *Nikola's $12 Billion Nasdaq Debut Is A Boost For Hydrogen Trucks–And Founder Trevor Milton's Fortune*. Available online at https://www.forbes.com/sites/alanohnsman/2020/06/04/nikolas-12-billion-nasdaq-debut-is-a-boost-for-hydrogen-trucksand-founder-trevor-miltons-fortune/.

ZETI[4] is a shared knowledgebase of commercially available offerings for zero-emission medium- and heavy-duty vehicles and was used to identify 17 Class 8 electric trucks that can perform the required drayage truck duty cycle. Commercial availability is defined as "ready for immediate production based on placed orders." Of these trucks 13 are expected to be commercially available by the end of 2020, while another 4 should become available over the next 4 years. Each has a range of over 100 miles, which is enough to complete the average drayage truck duty cycle of less than 100 miles on a single charge. Table 1 shows the currently available and future available trucks for Class 8 applications. The availability dates listed in Table 1 are the current or projected dates based on manufacturer announcements, and the vehicles may potentially be offered in limited quantities or actual availability date may change.

Table 1 Current Available and Future Available Trucks for Class 8 Applications

Manufacturer	Model	Battery Size (kWh)	Torque (ft-lb)	Range (miles)	Availability or Expected Availability
Emoss	EMS 16 Serie (U.S.)	120–200	1,550–2,500	78–130	2019
Emoss	EMS 18 Serie (U.S.)	120–240	2,500	52–155	2019
BYD	8TT	435	1,770	150	2020
Peterbilt	579EV	396	NA	150	2020
XOS	ET-One	NA	4,700	300	2020
Volvo	VNR Electric	300/560	NA	75–175	2020
Lion	Lion8T	588	5,300	210	2021
Kenworth	T680E	396	NA	150	2021
Mercedes-Benz	EActros (U.S.)	240	715	124	2021
Navistar	Navistar Class 8	107–321	NA	250	2021
Nikola	Tre EV (U.S.)	720	NA	250	2021
Tesla	Semi	NA	NA	300/500	2021/2023
Freightliner/ Daimler	eCascadia	550	NA	250	2022

kWh = kilowatt hours; ft-lb = foot pound

To support the growth of the market, the California Air Resources Board (CARB) created a program that provides significant incentives at the point of purchase for electric trucks and buses: the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP).[5] Currently no vouchers have been redeemed for on-road heavy-duty trucks under the HVIP

[4] Drive to Zero's Zero-emission Technology Inventory (ZETI) Tool Version 5.5. Available online at https://globaldrivetozero.org/tools/zero-emission-technology-inventory/.
[5] California Air Resource Board. 2020. *HVIP Eligible Vehicle Catalog*. Available online at https://www.californiahvip.org/how-to-participate/#Eligible-Vehicle-Catalog.

program, suggesting there remains high uncertainty in the performance of these vehicles.[6] However, many of the Class 7-8 electric trucks in California have been deployed in demonstration and pilot programs and separate from HVIP (see Section 2.3 for more details). For fleet and truck owners to purchase electric trucks through HVIP outside of demonstration and pilot program, they need to confident the technology will work for their specific application and use case and that has not occurred yet.

For Class 8 long-distance trucks, vehicle ranges are expected to increase as manufacturers develop longer-range batteries and configurations for trucks, with the Tesla semi planned to exceed 500 miles near the 2023 timeframe. It is important to emphasize that these are planned releases from manufacturer announcements, and actual availability may change. Fuel cell electric vehicles (FCEVs) will also compete for long-distance truck market share, with several FCEV models emerging within the next few years.

2.2 Charging Infrastructure

Pilot projects involving electric Class 8 trucks use charging stations at power levels of 150 kW DC, or 50 kW DC in some cases. A vehicle with a battery pack of 250 kilowatt hours (kWh) can charge up to 80% in approximately 90 minutes at 150 kW or in 4–5 hour at 50 kW. Figure I-2 and Figure I-3 show examples of MD and HD vehicle chargers. The ABB HVC has a power range of 100–150 kW with a voltage range from 150–850 V DC and sequential charging with up to three outlets with 100 kW and 150 kW per vehicle. The ChargePoint Express Plus has a modular and scalable architecture that allows for up to four Power Blocks to serve each station and send up to 500 kW to a single vehicle.

Figure I-2. ABB HVC 150 kW

[6] California HVIP. 2020. *Deployed Vehicle Mapping Tool.* Available online at https://www.californiahvip.org/tools-results/#deployed-vehicle-mapping-tool. Accessed September 2020.

Figure I-3. ChargePoint Express Plus

In 2018, SAE International released the standard SAE J3068 for medium-duty (MD) and heavy-duty (HD) vehicles, which is similar to the European IEC 62196 (aka Type 2 or CCS Combo). In fact, it is the European charging derivative adopted by SAE for MD and HD electric vehicles (EVs). SAE J3068 was needed because SAE J1772 or its combo version (SAE J1772 Combo) does not support three-phase charging, and single-phase charging was limited to 19.2 kilowatts (kW). Many commercial and industrial locations in the U.S. and Canada are equipped with three-phase power, and SAE J3068 enables the use of three-phase 480 volts (V) (up to 133 kW at 160 amperes [amps]), as well as 600 V alternating current (AC) (up to 166 kW at 160A). In addition, SAE J3105 applies to overhead charging and SAE J2954/2 to HD wireless charging. Both overhead and wireless have been used for electric buses but not for electric trucks, at least not to date.

Connectors CCS1 are expected to be used widely in North America. However, in some electric truck pilot projects CCS2 type connectors have been in use. The need for higher power charging has created a shift toward direct current (DC) charging as well. It also shifts some costs away from vehicles toward infrastructure because higher charging power rates are typically more expensive, and vehicles charging solely by DC fast charging will not bear the added costs of on-board AC/DC inverters.

Table 2 lists the most common types of charging stations, with details such as connectors and power levels. Proprietary stations and connector types, such as those for Tesla, are not included.

Table 2 Examples of Different Chargers and Charging Stations[7]

Charging Station Level (Electric Current Type)	U.S. Connector Type	Power	Fill Time for a 100kWh Battery (80% Fill)	Voltage	Best Commercial Use Case Example
Level 2 (Alternative Current (AC) 1-phase)	SAE J1772	> 3.7 kW ≤ 22kW	7 kW = 12.5 hours 22kW = 4 hours	208/240V	Medium- and heavy-duty vehicles that sit parked for 5+ hours at a time
Level 3 (Direct Current (DC) Fast Charging)	CHAdeMO	> 22 kW ≤ 43.5 kW	2+ hours	277/480V	Medium- and heavy-duty vehicles with shorter routes/smaller battery packs that have a natural pause in their duty cycle of around 2 hour or more; medium- and heavy-duty vehicles with a longer route / larger battery packs that can charge over several hours
Level 3 Combo (AC, DC Fast Charging) Note: Combined Charging System (CCS1) Combo 1 Connector is currently used in North America, but the CCS2 combo 2 may be used in North American MD/HD applications.	J1772 CCS1 J3068 CCS2	Today, <450 kW, projected up to 1 MW	15+ minutes (future) 40+ minutes (today)	Industrial voltage levels (speak with your utility)	Medium- and heavy-duty vehicles that have a natural pause in their duty cycles (e.g. while waiting at a loading dock) that is less than 2 hours
Inductive Charging (DC)		Inductive charging equipment uses an electromagnetic field to transfer electricity to a plug-in electric vehicle without a cord. In HD applications, inductive charging is often used for in-route charging on bus routes with 150-300 kW charging capability.			

There is currently no standardized system that could service the various sizes, types, and models of various EV Trucks, but there are several options that look promising.

Because the energy capacity of electric truck batteries is expected to increase, a concurrent need for higher levels of charging can be expected. Current standards allow for charging up to 350 kW, with research being conducted around very high-power charging (at 1 megawatt [MW]

[7] CALSTART. 2020. *Chicago Commercial Electric Vehicle Readiness Guidelines*. Available online at https://www.chicago.gov/content/dam/city/progs/env/MDHDCommercialEVReadiness.pdf

and higher).[8] Tesla trucks, expected in pilot projects in 2021, are expected to charge at 500 kW with a proprietary charging system.

Charging infrastructure for HD electric trucks will primarily be located at a fleet's domicile (depot charging) as fleets are expected to charge at the end of their workday. Fleet sites with a few vehicles may be able to manage using existing utility interconnections, while larger projects may require facility upgrades to accommodate the power requirements of multiple electric trucks charging concurrently.

To help with transitioning to electric trucks and buses the state of California and utility companies have implemented incentives and programs to encourage electrification of commercial vehicles. The HVIP program, mentioned earlier, provides funding for electric trucks and buses. Similarly, the California Energy Commission (CEC) is preparing a program that will provide incentive funding to support installations of MD and HD charging infrastructure throughout the state.

California utilities have programs and/or special rates designed to support and install make-ready charging infrastructure at host sites.

- **Southern California Edison (SCE):** *Charge Ready Transport Program* proposed the installation of at least 870 commercial charging stations over the next 5 years.
- **Pacific Gas and Electric (PG&E):** *EV Fleet Program* aims to support 6,500+ electric vehicles being deployed across numerous MD and HD fleet applications.
- **San Diego Gas & Electric (SDG&E):** *High-Power Electric Vehicle Rate (EV-HP)* is a proposed pricing plan for electric commercial trucks and buses.

These utility programs provide special rates that eliminate demand charges (or provide a 5-year moratorium on demand charges), provide incentives for each electric vehicle at the site, and/or entirely cover the cost of the utility side of the meter to the stub-out for the charging hardware. Some municipal utilities, such as the Sacramento Municipal Utility District and Los Angeles Department of Water and Power, also have special programs for transportation electrification. Public charging for electric trucks is currently not available. However, individual stations and corridor electrification for MD and HD electric trucks are in the planning stage. One public charging station for electric trucks is planned at a Loves station in Southern California as part of the Volvo LIGHTS project and should be installed in 2021. Other locations are being planned along and around important corridors. US West Coast utilities recently completed a study to map out charging infrastructure locations along the Interstate (I-) 5 corridor.[9] The proposed first phase would install charging infrastructure at 27 sites to serve both MD and HD trucks. In the second phase (by 2030) about half of these sites would be expanded to accommodate higher power charging for HD electric trucks.

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[8] CharIN (CharIN, 2019). *CharIN Steering Committee paves the way for the development of a CCS compliant plug for commercial vehicles with >2MW.* Available online at: https://www.charinev.org/news/news-detail-2018/news/charin-steering-committee-paves-the-way-for-the-development-of-a-ccs-compliant-plug-for-commercial-v/.

[9] *West Coast Clean Transit Corridor Initiative, 2020.* Available online at: https://www.westcoastcleantransit.com/.

2.3 Current Truck Demonstration Projects

In 2019, Californians consumed approximately 114 million gasoline gallon equivalents of electricity for transportation, accounting for approximately 5% of the total alternative fuel demand in the state.[10] While vehicle electrification for HD vehicles has been slower to evolve than light- and medium-duty applications, several technology demonstrations for Class 7-8 trucks have been deployed across the country, and at ports within the state specifically. Table 3 summarizes the Class 8 truck demonstration projects currently ongoing statewide. Project funding in many cases also includes matching funds.

Table 3 Examples of Current Class 8 Demonstration or Pilot Projects

Demonstration Program	Year and Cost	Location	Trucks	Types of Cargo
California Collaborative Advanced Technology Drayage Truck Demonstration	2018 $40M	Ports of Stockton, Oakland, Los Angeles, Long Beach, and San Diego	44 HD pre-commercial Class 8; 37 battery electric trucks 25 BYD trucks with 100-124 mile range; 12 Peterbilt/Transpower trucks with 110–150 mile range	Containerized cargo
Daimler Trucks North America (also known as Freightliner)	April 2019 $16M	Throughout Southern California	20 battery-electric trucks	Containerized cargo
CARB Zero and Near Zero-emissions Freight Facilities	Late 2018 $205 million	Throughout California	10 projects: zero emission HD truck and off-road equipment	Containerized cargo/ Food & Beverage
Volvo Low Impact Green Heavy Transports Solutions ("LIGHTS") Project	March 2019 $90.7 million	Ports of Long Beach and Los Angeles	23 HD battery electric trucks; up to 175 mile range with charging	Containerized cargo
Sustainable Terminals Accelerating Regional Transformation ("START") Project	January 2019 Unknown	5 at the Port of Long Beach; 10 at the Port of Oakland	Peterbilt and Transpower battery electric Class 8 drayage	Containerized cargo
Frito Lay Transformative Zero and Near-Zero Emission Freight Facility Project	March 2019 $30.8 million	Modesto, California	15 HD Tesla battery-electric tractors along with 38 Low NO_x trucks and 8 Peterbilt e220 battery-electric trucks.	Food & Beverage

[10] CARB. 2019. *Data Dashboard: 2011-2019 Performance of the Low Carbon Fuel Standard.* Available online at: https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm. Accessed August 2020.

Demonstration Program	Year and Cost	Location	Trucks	Types of Cargo
Zero-Emission Beverage Handling and Distribution at Scale	March 2018 $11.3 million	Four Anheuser-Busch facilities: Pomona, CA, Riverside, CA, Carson CA	21 battery-electric Class 8 BYD trucks 40 kW BYD chargers	Food & Beverage
San Diego Port Tenants Association Sustainable Freight Demonstration	August 2016 $8.2 million	Port of San Diego	4 Class 8 BYD Trucks	Autos; Break-bulk products

NO_X = oxides of nitrogen

3. Regulations and Grant Programs Effecting Trucks

3.1 On-Road Heavy-Duty Diesel Vehicles (In-Use) Truck and Bus Regulation

The On-Road Heavy Duty Diesel Vehicle Truck and Bus Regulation requires existing HD trucks to be replaced with trucks meeting the latest oxides of nitrogen (NO_X) and particulate matter Best Available Control Technology (BACT) levels, or be retrofitted to meet these levels. Trucks with a GVWR less than 26,000 pounds (most construction trucks) are required to replace older engines with 2010 or newer engines, or equivalent, by January 2023. Trucks with a GVWR greater than 26,000 pounds (most drayage trucks) must meet particulate matter BACT standards, and upgrade to a 2010 or newer model year emissions equivalent engine pursuant to the compliance schedule set forth by the rule. By January 1, 2023, all model year 2007 Class 8 drayage trucks are required to meet NO_X and particulate matter BACT (i.e., EPA 2010 and newer) standards.

3.2 Advanced Clean Trucks

CARB's Advanced Clean Trucks (ACT) regulation was adopted earlier this year and aims to accelerate the sales of heavy-duty electric vehicles. It consists of two parts, a manufacturer component and a fleet reporting component. Manufacturers are required to sell an increasing percentage of zero-emission vehicles between 2024 and 2035. By 2035, 40% of Class 8 truck purchases will be required to be zero emission. Fleets with 50 or more vehicles will be required to report on their fleet's composition and activities in order to help CARB craft new strategies to hasten the adoption of zero-emission vehicles. Table 4 shows the projection of annual Class 7 and 8 tractor truck sales under the ACT.[11] There are approximately 180,000 Class 7-8 tractors in California.[12]

Table 4 Projection of Zero-Emission Class 7 and 8 Tractor Truck Sales Under the ACT

Model Year	Percentage of Zero-Emission Trucks Sold
2024	5%
2025	7%
2026	10%
2027	15%
2028	20%
2029	25%
2030	30%
2031	35%
2032	40%
2033	40%
2034	40%
2035	40%

3.3 Upcoming Advanced Clean Fleets

The Advanced Clean Fleets rule is an upcoming regulation that has the goal of reaching a zero-emission truck and bus California fleet everywhere by 2045. CARB has stated its intent to require specific market segments, such as port drayage, to transition to zero emission trucks by 2035. The specific details of this regulation have not yet been made publicly available, but fleets should be aware of it and plan accordingly. Governor Newsom's recent Executive Order (N-79-20) reinforces California's push toward zero emission requirements for drayage trucks by 2035.

3.4 Heavy-Duty Engine and Vehicle Omnibus Regulation

The Low NO_X Omnibus Rule is a recent rule that requires all HD vehicles built in 2024 and thereafter to emit far fewer nitrogen oxide particles and particulate matter. The regulation will require NO_X emissions to be reduced by 90% and particulate matter emissions by 50%. This rule is intended to keep NO_X requirements for diesel vehicles low as CARB transitions fully to a zero-emissions vehicle program.

[11] https://www.nrdc.org/experts/patricio-portillo/california-makes-history-clean-trucks-rule#:~:text=In%20a%20groundbreaking%20win%2C%20the,the%20Advanced%20Clean%20Trucks%20rule.&text=Beginning%20in%202024%2C%20manufacturers%20must,40%2D75%20percent%20by%202035.

[12] https://ww3.arb.ca.gov/regact/2019/act2019/30dayattd.pdf

II. Operational Analysis

1. Purpose

The purpose of this section is to document the truck operations of MCC's primary customer.

2. Typical MCC Customer Vehicle Characteristics and Charging Requirements

Typical MCC customers will be driving Class 8 heavy duty trucks requiring the highest end of power and torque rating. MCC's primary customer currently drives Mack Pinnacle CXU612 model trucks outfitted with the Mack MP8 diesel engine. **Error! Reference source not found.** s hows the main characteristics of the primary customer vehicle. Values for toque and displacement were not directly supplied and come from manufacturer specification sheets for the Mack MP8 engine.[13]

Table 5 MCC Primary Customer Vehicle Characteristics

Vehicle Characteristics	Value
Engine	MP8
Horsepower	450
Torque	1,460–1,860 foot pounds
Displacement	13 liters
Wheel Base	209 inches

Error! Reference source not found. shows a Mack Pinnacle CXU612 model truck and a bulk t railer with pneumatic power take off (PTO) that is used to transport cement and/or cementitious materials. PTO is where power and energy requirements for the trailer are supplied by the engine of the truck.

Figure II-1. Example of MCC Primary customer Trucks and Trailers

[13] https://www.macktrucks.com/powertrain-and-suspensions/engines/mp8/

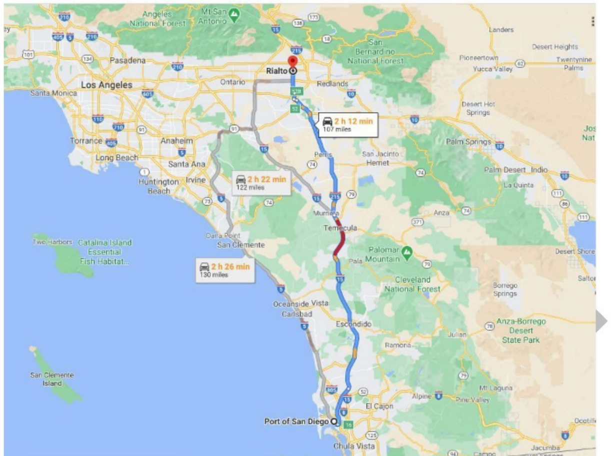
As discussed in Section I.2.2, overnight or depot charging of Class 8 trucks are expected to use DC fast charging at 150 kW. Opportunity charging is expected to use higher rates, at least 350 kW in the 5-year timeframe, and potentially 1 and 2 MW in the long term. Currently, charging rates are limited to 120-150 kW for battery safety and reliability. MCC's primary customer trucks cover longer ranges than are possible for current models of electric trucks and would require both opportunity charging during the day and overnight charging to meet their daily duty-cycle requirements.

3. MCC Primary customer Truck Operations

MCC does not own or operate a truck fleet to distribute their cement and material throughout the region. Rather, MCC sells cement and material to customers who must pick up the material at TAMT.

MCC's primary customer is based out of Rialto, California in San Bernardino County, and currently performs work throughout Southern California, including San Diego County. These types of operations do not use a dedicated service route. The goal for long-haul heavy-duty truck fleet operations is to minimize miles travelled without transporting cargo or with empty trailers (also known as "deadheading"), for this reason trucks are dispatched live form their current location to their next pick-up, again attempting to maximize efficiency and minimize miles traveled without empty trailers. For MCC customer operations, these trucks would travel between the new cargo destination at the Port of San Diego and Rialto each day with multiple deliveries that may or may not be associated with cementitious materials stored at the TAMT. As an example, a truck from the fleet would pick-up a load in the Rialto area and travel to its drop-off destination, then be dispatched to another pick-up/drop-off destination, and so on until reaching the San Diego region and then ending at the TAMT. The same scenario of pick-up/drop-off would repeat for the truck on its way back to Rialto from the San Diego region. This live-dispatching occurs over two 10-hour work shifts, leaving only 4 hours a day during the work week where the truck is not actively used for cargo transport. Additionally, it is not certain that a specific truck leaving the Rialto yard will end up in San Diego; depending upon that day's book of business, it may or may not be known what a particular truck hauling route may be for the day. Conservatively, these trucks would travel over 100 miles before reaching the Port and travel over 100 miles back to Rialto. Figure II-2 shows the mapped transportation distance between Rialto and the Port.

Figure II-2. Map of Various Truck Routes from Rialto to the Port of San Diego



Expected operations for the trucks once they arrive in San Diego County are to deliver their initial load and then visit TAMT two to three times each day before picking up a final load for drop-off on the way back to Rialto. The expected mileage per day is 300–400 miles, and potentially much less within the area that includes the Port Tidelands and adjacent neighborhoods. The Draft EIR for the proposed Mitsubishi project assumed each truck to travel an average round trip distance of 124 miles, consistent with the TAMT Final PEIR (Draft EIR Appendix C, Page C-11). The CEQA significance thresholds used in the impact analysis are regional and relate to the attainment status of air quality standards within San Diego County, haul truck trip emissions were confined to those occurring within the County. Additionally, the proposed Project is designed to service the San Diego area. The exact locations served would be dependent on customer needs, but for purposes of analysis, trucks are expected to travel between the Project site and the Riverside County line. Customers beyond the Riverside County line are expected to be more efficiently supplied by other sources of cement. Serving areas further away from TAMT by other source locations is consistent with the operational characteristics of Mitsubishi's primary customers' on-demand dispatching as described above.

The expected operating day for a truck in MCC's primary customer is 20 hours over two 10-hour shifts. A total fleet of approximately 50 trucks is expected to meet the maximum number of 176 truck trips on a peak day, but it is estimated that only 60–75% of these truck trips would be performed by the primary customer. The fleet operator has roughly 80 trucks for dry bulk freight transport in their Rialto-based fleet and does not currently dedicate trucks specifically to Port of San Diego or other San Diego area cargo movements. The Rialto fleet is changed over every 5 years, partially based on mitigation measures imposed by project approval conditions and partly because of the high use nature of operating heavy-duty fleets, so all trucks operated by the fleet are 5 years old or newer.

When the trucks visit the Port or any cement loading facility, it is estimated that each fill takes less than 10 minutes and then takes 45 minutes to an hour to unload at the batch plant. In addition, there is an onboard PTO requirement of 50 horsepower (hp) or 37 kW, for the entirety of each unloading event. Each truck transports approximately 27.5 short tons[14] (55,000 pounds) of cement or cementitious material per load. The baseline range of energy consumption for a Class 8 electric truck is 2.0–2.5 kWh/mile. Assuming 5 loads for 300 miles/day operation and 6 loads for a 400 miles/day operation, when including the PTO demand, the average energy consumption increases to 2.5–3.0 kWh/mile.

It is not anticipated that the trucks will idle or wait long enough to opportunity charge at the Port without materially increasing the turnaround time. Increasing turnaround times to allow for charging would reduce efficiency in the trucking operations.[15] With battery packs that can last for 150–200 miles, trucks may need to charge up to 3 or more hours throughout the day to complete the current 300–400 mile daily duty cycle. Higher load charging, on the order of 250 kW, could reduce this time to 2 hours or less. Table 6 provides an example of a 400-mile route between Rialto, San Diego County, and back.

Table 6 Example of a Rialto and Port Daily Route

Route Segment	Estimated Miles	Diesel Consumption (6 miles/ gallon)	Electricity Consumption (Remaining kWh Charge)*		Charging Requirements to Complete Segment (hours)	
			Low – 2.5 kWh/mile	High – 3.0 kWh/mile	150 kW Charging	250 kW Charging
Rialto to Local Pick-ups in San Bernardino	70	8.3 gallons	175 kWh (275 kWh)	210 kWh (240 kWh)	0	0
San Bernardino To TAMT	100	16.7 gallons	250 kWh (25 kWh)	300 kWh (-60 kWh)	0–0.4	0–0.4
TAMT to Local Batch Plants (average)	130	25 gallons	325 kWh (-300 kWh)	390 kWh (-390 kWh)	2–2.5	1.2–1.5
TAMT to Rialto	100	16.7 gallons	250 kWh (-250 kWh)	300 kWh (-300 kWh)	1.7–2	1–1.2
TOTAL	400	66.7 gallons	1000 kWh (-550 kWh)	1200 kWh (-750 kWh)	3.7–5	2.2–3

[14] 27.5 short tons equals 25 metric tons
[15] It should be noted that other zero emission truck technologies, such as hydrogen fuel cells, would not require this additional time to charge/refill.

* Notes – Assumes 500 kWh battery with 90% available SOC (450 kWh available); kWh/mile inclusive of PTO events, not solely onroad fuel economy.

4. Potential Charging Locations

There are three potential locations where battery electric trucks could potentially charge: a fleet's home base yard, such as in Rialto; at or nearby the Port's marine terminal; and at batch plants operated by MCC's customers. Charging infrastructure would be required at each location, with chargers capable of at least 120–150 kW each. Any successful implementation of electric trucks will require overnight charging at the fleet's yard. With the maximum charge time to full capacity being up to 4 hours (based on 150 kW charging), one charger with two ports for two trucks could be installed.

For opportunity charging throughout the day to extend the vehicle range from 150–200 miles (per single charge) for existing Class 8 electric trucks to 300–400 miles to complete the typical duty cycle, the electric trucks will need to charge 3–4 hours during the duty-cycle with a 120–150 kW charger. Locations for opportunity charging could take place at logical points of rest, such as at or near the Port's marine terminal or at the batch plants. The Port and MCC could install infrastructure for charging at the terminal or at adjacent or nearby properties where trucks would likely need to charge for an hour or more at a time. However, charging requirements would cause increased operational costs for MCC's customers as their efficiency decreases (and costs increase) as trucks stop operating during charging times. It should also be noted that Ports typically do not encourage charging stations within marine terminals, as space is at a premium for cargo loading, unloading and storage operations (the same logic as not putting gas stations in marine terminals).

It is important to note that the necessary charging infrastructure may require upgrades to the electricity service at specific locations. Each location may differ based on current electricity requirements. Permanent batch plants where cement is delivered may represent good locations for charging infrastructure. However, existing batch plants require less than 50 kW of electric service, which would require significant electricity service upgrades at each facility, with the actual upgrades per location dependent on capacity in the area.

5. Weight and Payload Implications

A concern with alternative fueled trucks is that increased weight from batteries (electric trucks) or compressed gas tanks (compressed natural gas trucks) will decrease the payload for each truck, reducing the efficiency and increasing the cost of moving goods. In 2018, California adopted Assembly Bill (AB) 2061, which increased the upper weight limit of zero- or near-zero emission vehicles by 2,000 pounds (1 short ton) from 80,000 to 82,000 pounds.

Current batteries have an energy density of 140 to 170 watt-hours per kilogram (Wh/kg). The specific energy of the resulting battery pack is typically 30–40% lower, or 80–120 Wh/kg.[16] Table 7 shows the battery size, weight, and estimated displaced cargo a Class 8 electric truck battery. The displaced cargo amount also takes into account both AB 2061 and that electric

[16] https://mkt-bcg-com-public-images.s3.amazonaws.com/public-pdfs/legacy-documents/file36615.pdf.

trucks, especially the engine, are lighter than diesel trucks and reduces the displaced cargo from the battery weight by a combined 2 tons.

Table 7 Battery Density and Weight

Battery Size (kWh)	Energy Density (Wh/kg)	Weight (tons)	Displaced Cargo Weight (tons)
435	80–120	4.0–6.0	2.0–4.0

Because the current fleet transports 27.5 tons per load, approximately an additional 7-14% more vehicle trips would be required to transport the same tons of cargo.[17] The additional truck trips may increase operating expenses unless there are cost savings by using electric trucks.

III. Economic Analysis

1. Purpose

The purpose of this section is to perform a total cost of ownership (TCO) analysis which compares the costs to procure and operate a diesel truck and an electric truck for a set period of time. This analysis is based on a first owner/operator basis by MCC's primary customer.

2. TCO Methodology

The main cost categories of the TCO are grouped into five categories: vehicle cost, infrastructure cost (i.e., capital and operations and maintenance [O&M]), fuel cost, vehicle operations and maintenance, and incentives.

2.1 Vehicle Cost

Table 8 presents the vehicle costs for diesel and electric trucks.

Table 8 Summary of Inputs

Input Category	Diesel	Electric	Source
Vehicle Cost	$110,000	$350,000 – 2020 $275,000 – 2023	CalETC report; conversations with OEMs

The values were selected by the project team from previous research and conversations with truck manufacturers. Two vehicle cost scenarios were run for electric trucks with the expected decreases in prices, increased production volumes, and decreasing battery prices. Bloomberg New Energy Finance and other organizations have predicted significant battery cost reductions

[17] 27.5 tons – 2 tons = 25.5 tons. 1 – 25.5/27.5 = 7%.

over the next decade. These price reductions are consistent with analysis performed by ICF in their report for CalETC.[18]

Residual value can also be an important factor to the TCO. The analysis presented here is based on a first owner-operator basis, which would traditionally include the resale or residual value of the truck. The decision was made to exclude the residual value of the trucks from this analysis for multiple reasons. The significant amount of miles driven by MCC's primary customer is in excess of 500,000 miles over 5 years, which reduces the potential resale value.

There are also significant uncertainties in the residual value of electric trucks. The resale value of trucks is dependent on both the initial value of the truck and the cost of a new vehicle at the time of resale. The projected decreasing cost of new batteries and electric trucks combined with the limited data and information on the total battery life, in years and cycles, for the battery pack, will significantly limit the resale value of early adoption electric trucks. The other component costs, such as electric motors, heating, and cooling systems, and other control systems, are expected to decrease over the same time frame as manufacturing processes improve and components are transferred between models and segments.

2.2 Infrastructure Cost

There are two contributing elements to the infrastructure cost: capital costs and ongoing operations and maintenance. For diesel trucks, diesel stations have already been built and there are no additional capital costs. The Argonne National Laboratory AFLEET model[19] includes operations and maintenance of approximately $5,000 per station per year, for a station servicing 20 trucks, with an electricity demand of 0.1 kWh per diesel gallon.

For charging station costs, the infrastructure costs will vary based on site characteristics. For this analysis, the assumption of $40,000 for the charger and $48,000 to the fleet owner for installation are based on the ICF CalETC report[20] and assume a 150 kW charger. The AFLEET model estimates an operations and maintenance cost of $4,000 per station for overall electrical maintenance and networking costs. The assumption is that there will be one charger for two trucks in Rialto and one charger for two trucks in San Diego County, resulting in a one charger per truck overall ratio.

2.3 Fuel Cost

The costs associated with fueling include the cost of the fuel, the amount of fuel consumed, and electricity, when the fueling or charging takes place. When the charging takes place and how much charging occurs are necessary inputs to determine the weighted electricity rate.

2.3.1 Fuel Consumption

The TCO analysis was run for three different driving operations: 130, 300, and 400 miles per day. The 300 and 400 miles per day operations best represent the current range of operations for MCC's primary customer. The 130 miles per day scenario represents the estimated mileage

[18] https://caletc.com/assets/files/ICF-Truck-Report_Final_December-2019.pdf
[19] https://greet.es.anl.gov/afleet_tool
[20] https://caletc.com/assets/files/ICF-Truck-Report_Final_December-2019.pdf

which will be needed to transport MCC's products from TAMT throughout San Diego County as presented in Section II.2. In all scenarios it is assumed that the trucks operate 300 days per year, which results in 45,000, 90,000 and 120,000 miles per year.

The fuel economy, based on conversations with MCC's primary customer and the CalETC report, for the existing diesel trucks is 6 miles per gallon of diesel. The TCO analysis utilizes the 2.5 kWh/mile aggregate fuel economy when including the PTO during unloading, as discussed in Section II.2.

2.3.2 Diesel Prices

Diesel fuel prices are based on the trajectory of the CEC Revised Transportation Energy Demand Forecast,[21] current diesel prices, and an estimated 15% reduction in price due to bulk fuel purchasing compared to retail. The resulting diesel prices start at $2.84 per gallon and increase to $3.03 in the fifth year.

2.3.3 Electricity Prices

For MCC's primary customer, charging would occur at the home base facility in Rialto, which is in SCE's service territory and utilize opportunity charging while in the area of the Port in SDG&E's service territory. Because of this, the rates for each service territory needed to be analyzed.

SCE and SDG&E Commercial Rates

SCE has an approved rate structure for MD and HD trucks: Time-of-Use (TOU) -EV-8. This rate structure includes a 5-year phase-in period from 2019–2023 where there are no monthly demand charges and only energy charges. From 2024–2028 the demand charges are phased back in with the full rate in 2029.[22]

SDG&E is currently waiting for approval of their MD and HD electric vehicle rate structure: EV-HP. The EV-HP rate structure includes two parts: (1) TOU based energy charges and (2) a monthly subscription charge for demand costs. Figure III-1 and Figure III-2 present SDG&E's EV-HP rate structure's energy and subscription charges.

Figure III-1. SDG&E EV-HP TOU Energy Charges

Proposed EV-HP Energy Charges for bundled customers		
	Summer	Winter
On-peak	$0.39	$0.37
Off-peak	$0.16	$0.16
Super Off-peak	$0.11	$0.11

[21] California Energy Commission (CEC), *Revised Transportation Energy Demand Forecast, 2018-2030*, Staff Report, February 2018, CEC-200-2018-003.https://efiling.energy.ca.gov/GetDocument.aspx?tn=223241.

[22] Southern California Edison (SCE), *Schedule TOU-EV-8*, 2019. https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_TOU-EV-8.pdf