Salton Sea Long-Range Plan

Appendix I: Public Comments and Responses

March 2024

SALTON SEA MANAGEMENT PROGRAM

CALIFORNIA NATURAL RESOURCES AGENCY

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA ·

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

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Acronyms

AF	acre-feet
AFY	acre-feet per year
BTU	British thermal unit
Cu-Ni	Copper-Nickel
ft	feet
gpd	gallons per day
gpm	gallons per minute
HDPE	High-density polyethylene
kgallon	kilogallon
kW	kilowatts
kWh	kilowatts per hour
lb	pound
lb/h	pound per hour
LRP	Long-Range Plan
MED	multi-effect distillation
MGD	million gallons per day
NaCl	sodium chloride
NDP	net driving pressure
NF	nanofiltration
ppb	parts per billion
ppm	parts per million
Psi	pounds per square inch
RO	Reverse Osmosis
SHC	Saline Habitat Complex
TDS	total dissolved solids
TVC	thermal vacuum compressor
UF	ultrafiltration
VTE-MED	vertical tube evaporators – multi-effect distillation
ZLD	zero liquid discharge

Appendix I: Public Comments and Responses

The SSMP program received comments from 28 reviewers on the Draft Long-Range Plan that was released for review on December 15, 2022.

1.1. Public Comments and Responses

The comments and responses are provided on the following pages. Comments are organized in alphabetical order by last name of the commentor. The responses note those cases where a comment led to updates to the Final Long-Range Plan. All comments and responses presented here have been made available for consideration in the next phase of feasibility analysis.

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Name	Organization	Section or Page	Comment	Response
Craig King	Desert Survivors	Section 8.1, Pages 185-187: Findings	The LRP analysis evaluates inflow projections of high, medium and low probability with varying amounts of exposed shoreline caused by shrinking inflows. We do not accept the inevitability of a shrinking lake, with deleterious environmental consequences. The level of the Salton Sea must be reliably maintained through fallowing of farmlands and importation of desalinated seawater.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Craig King	Desert Survivors	Section 8.2.1, Pages 187-188: Concepts Recommended for Further Evaluation	Desert-Survivors.org endorses Restoration Concepts 11 and 13 and components of Concepts 6,8, 9 and 10. Restoration Concept 11 provides for importation of desalinated seawater from the Sea of Cortez, and additional desalination of water in the Salton Sea. These combined strategies would yield reliable freshwater flows into the Salton Sea to maintain its elevation, while also removing excess salinity already present in the Salton Sea. Restoration Concept 13 provides for fallowing of farmland. We strongly disagree with the finding that the cost is "too expensive for the benefits provided…". This strategy reduces agricultural demand on shrinking flows of Colorado River water and lessens the flow of toxic runoff into the Sea. Moreover, fallowing of agricultural lands must be defined to include reduction of concentrated animal feeding operations (CAFOs). CAFOs make an intensive contribution to air and water pollution, and consume vast amounts of Colorado River water. CAFOs rely on cattle feed crops of alfalfa and hay that utilize an average of 6 acre-feet of water annually. Strategies to reduce CAFOs will reduce flows of toxic runoff, and promote fallowing of farmland used to grow feed crops of water-thirsty alfalfa and hay. Restoration Concepts 6, 8, 9 and 10. We agree with CNRA that these concepts merit future consideration. We endorse components that enhance and maintain healthy vegetation and wetland habitat for fish, birds and other wildlife along the seashore.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
John Marksbury	Desert Interfaith Council		Salton Sea Long Range Plan does not give proper weight to our communities' needs or concerns, such as the long-term sustainability of water resources or the employment opportunities associated with lithium production and tourism •Identify the water source for each concept; this is not done consistently in the report. It should be made clear to the reader that the Imperial Irrigation District (IID) relies solely on the Colorado River and any concept that refers to water supply from IID should cite the Colorado River as the original source. "Water Source" should be added to the Captions in the Draft Concepts Fact Sheet. •Include a stronger statement about the linkage of lithium development to restoration of the Salton Sea. This could help convince public officials that a healthy environment for the community is crucial to the success of this industry. As one local stakeholder said, "You can't have the industry in the area if you don't fix the health situation; we can't bring thousands of people here and give them all asthma." •Include a proactive statement that any lithium development "ensure that water use by all processes at the extraction site can be accommodated without causing a drop in the water table that would impact species or habitats dependent on groundwater. Water use for lithium extraction must be considered in light of all other uses of water within the region to evaluate if it is likely to have a detrimental impact on other existing uses of water by people and nature." (see The Nature Conservancy report issued August 2022 Potential Lithium Extraction in the Unites States: Environmental, Economic, and Policy Implications) https://www.scienceforconservation.org/assets/downloads/Lithium_Report_FINAL.pdf •Identify the Federal land holdings in the area and responsibility for sharing in solutions to the environmental problems and their cost, as well as for assisting in developing future economic opportunities, such as lithium production and associated industries. •Make the Long Range Plan more reader friendly. To be sure you are producing a document that provides a thorough and cogent analysis for use by the U.S. Army Corps of Engineers for its three-year study, you must also engage the public at the same time. The Plan is far too complex and even the fact sheet on the 13 concepts is indigestible for the average person. We urge you to produce a "Cliff Notes" version for simplifying both the text and maps.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Water sources to the Salton Sea are indentified in the Long-Range Plan as well as in Appendix B on hydrology. The future estimate of flow does consider potential water use for lithium production based on potential lithium production (40,000 tons per year or more than 10 times current US use), and rates of water use for lithium processing. This value is estimated at 50,000 AFY and used in the future hydrology calculations.
Tom Sephton	EcoMedia Compas	Page 113 Table 5-20 Brine-Management Salton Sea	The R9 Concept's brine management solutions are in bold, yet the IRP did not use these brine management options, they instead substituted their own concept for 22,000 acres of evaporation ponds not using salt for sale nor salt gradient solar ponds. Table 5-20 is wrongly highlighted.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Highlighting in this table is updated.
Tom Sephton	EcoMedia Compas	Page 114 "INTAKE – While tidal sand-filtered and subsurface intakes may be appropriate … additional studies would be required to verify suitability for the project."	The tidal sand-filtered and the subsurface (beach well) intakes, proposed respectively by R9 and by R10, both would have minimal impact on marine life. The submerged intake chosen by the IRP is a type of desalination plant intake that can have significant impacts on marine life and has been discouraged by the Coastal Commission in California. Possibly it could be permitted in Mexico, but the Sea of Cortez is a highly sensitive marine environment and this method of intake is likely to be challenged there. The excuse given by the IRP for failing to do what they were paid $2.5 million dollars to do amounts to academic laziness. They refused to evaluate the two options with minimal environmental impact on marine life, intentionally choosing the more damaging option. This choice was later used in their finding on water import feasibility to claim that water import would be environmentally damaging. This is a fraudulent approach to evaluating water import. We find the action of the IRP to be reprehensible on the choice of intake.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 114 “DESALINATION AT THE SEA OF CORTEZ – To reduce the amount of salt imported into the Salton Sea basin along with the imported water, …, while R4 and R10 did not define a specific location for the facility.”	It should be noted that Proposal R9A that identified this location for a Sea of Cortez desalination plant did not propose any brine outfall. It proposed instead to use purified salt recovery for sale and salinity gradient solar ponds at the plant location to accept unpurified salt and provide supplementary power to eliminate all brine discharge.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Tom Sephton	EcoMedia Compas	Page 114 “BRINE MANAGEMENT AT THE SEA OF CORTEZ – Seawater RO facilities typically operate at a 50% recovery rate, ... the IRP Water Import Concept includes an outfall to dispose of RO brine.”	The IRP’s refusal to explore options for brine management and salt recovery explained in Proposal R9A is based on a stunning level of ignorance among the IRP on how a sea salt operation works. Sea salt operations often store salt on site for years before shipment to customers. Storage can be as brine in evaporation ponds, a process that takes years to complete, or as harvested dry salt. For example the nearest large scale sea salt operation to the Salton Sea is at Guererro Negro on the Pacific Coast of Baja. There millions of tons of salt, collected from evaporation ponds and washed, is currently stored in a huge pile of salt before loading thousands of tons on barges for shipment to an offshore seaport for delivery to customers around the world. A desalination facility there would never have a need for an ocean brine outfall because the brine could go to large evaporation ponds, nor would a desalination facility north of San Felipe where similar but smaller, sea salt operations are running now. The brine output from desalination can be stored in solar evaporation ponds, or used in salinity gradient solar ponds, or simply evaporated into crystallized salt and stored. The IRP invented a completely false excuse to choose brine outfall to the Sea of Cortez as the only option for the huge amounts of brine from an RO plant at the Sea of Cortez. This invention by the IRP does have a motive. A brine outfall into the environmentally sensitive Sea of Cortez is the most environmentally damaging option for brine management there. This type of desalination plant outfall can have significant impacts on marine life and has been refused by the Coastal Commission at Huntington Beach in California. This damaging choice by the IRP was later used in the IRP’s finding on water import feasibility to claim that water import would be environmentally damaging and that it would not be acceptable in California and therefore, according to the IRP, not acceptable in Mexico. Additionally, by inventing the false excuse of a temporary interruption in salt recovery causing shutdown of the desalination plant as a reason to replace salt recovery and salt gradient solar ponds in Proposal R9A with a brine outfall to the Sea of Cortez, the IRP eliminated the major project operating cost offset and economic benefit to Mexico of salt sales and renewable power. This invention by the IRP shows either deep ignorance or malicious intent to reach a predetermined and false conclusion about the environmental impact, benefit to Mexico, and net cost of ocean water import.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Had evaporation ponds been included, the volume of brine coming from large desalting operations would require ponds greater in size than any conventional salt farms and massive areas for salt storage. It is likely that even if salt ponds were included, an ocean outfall would still be needed.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 114 CONVEYANCE – Responses R4, R9, and R10 convey desalinated water from the Sea of Cortez to the Salton Sea ... due to easier access for construction, operations, and maintenance.	Canals are the most widely accepted conveyance infrastructure to move large amounts of water over long distances where elevation changes are gradual, as with the great majority of any route from San Felipe in Mexico to the Salton Sea. Yet the IRP chose pipelines claiming the choice was made to reduce evaporation loss. Water loss in an open canal from San Felipe to the Salton Sea was estimated in R9A to be 8.5% of total flow given a normal canal flow rate of 660 CFS. The cost of the canal was estimated in R9A at $4,651,200 per mile based on the cost to build the similarly sized lined replacement Coachella Canal in similar terrain and conditions in 2006 and adjusted to 2021 dollars based on the CPI. The total estimated canal cost for 213 miles from San Felipe to the Salton Sea was $892,751,328. In contrast the IRP estimated a cost of $26,219,635,000 for the same run using two deeply buried 108" steel pipelines coated with polyurethane. The IRP estimate in the Feasibility Report 9/30/2022 Final in Table 4-11 was for 2,006,400 linear feet (190 miles doubled) at a unit cost of $13,068 per linear foot. That comes to a capital cost of $137,998,079 per mile for the dual pipeline compared to $4,651,200 per mile for a canal, almost 30 times the cost to use an IRP estimated pipeline. The actual cost estimation calculations used by the IRP are secret. Ostensibly in order to conserve 8.5% of water lost to evaporation, the IRP chose to inflate the capital cost of conveyance from less than one billion to over twenty six billion dollars. Or perhaps there was another reason, to make the cost of ocean water import appear too expensive to consider. The IRP Sea of Cortez import proposal's Elevation and Hydraulic Grade chart (Feasibility Report 9/30/2022 Final, Figure 4-2) shows the 190 miles of dual pipeline rising to an elevation of over 600 feet one hundred miles into the route, which would route the pipeline up into the Cucapah mountains somewhere near Mexicali. The IRP does not explain the reason to route the pipeline to such a high elevation. The most cost effective route through the Mexicali has a high point of only 40 feet above mean sea level (msl). Even when assiduously avoiding any of the many RAMSAR wetland areas in the Mexicali Valley (many of them now dry) that were identified by the IRP as a "fatal flaw" if touched, there is no need to route a pipeline to an elevation higher than 230 feet above msl. This choice by the IRP adds unnecessarily to pumping costs and ignores the more cost effective route options proposed by R4, R9, and R10.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Some reduction in cost could be achieved by replacing some sections of pipelines with open channels, but this realtively modest change in cost would not change the score received by this concept as it is a relative comparison.
Tom Sephton	EcoMedia Compas	Page 114 DELIVERY TO THE SALTON SEA – Responses R4, R9A, and R10 convey desalinated water from the Sea of Cortez directly to the Salton Sea ... The IRP Water Import Concept assumes 100% of the water delivery would be at the Salton Sea.	The IRP clearly admits that proposals R9B and R10 (also R9C not stated) provide clear benefits to Mexico in the form of new drought proof desalinated potable water supply. Proposals R9B and R9C propose conveyance infrastructure sufficient to supply up to 400,000 AFY to Mexicali should the region need it. The IRP uses the excuse that R10 does not define the amount of water for Mexico as a lazy out to avoid calculating the cost of additional desalination capacity to benefit Mexico in their alternative ocean water import proposal. By applying this nonsensical rationale, the IRP eliminate an important benefit to Mexico from their alternative, then use their choice to claim that ocean water import provides no significant benefits to Mexico and therefore should be found infeasible.	The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.
Tom Sephton	EcoMedia Compas	Page 114 SALINITY REDUCTION AT THE SALTON SEA – Even with the desalination of imported water prior to delivery … A constant recovery of 50% was assumed.	According to salinity modelling in the Feasibility Report 9/30/2022 Final, Figure 4-7, the 13.5 MGD RO remediation desalination facility meets the IRP fatal flaw salinity target of below 70 PPT TDS in 2056, but never brings the Salton Sea salinity below 59 PPT TDS, which fails to meet the 40 PPT target maximum of the SSMP LRP. There does not seem to be a compelling reason to include that option in the LRP. The 100 MGD RO remediation desalination facility (similar to that proposed in R9A, B, & C) meets the IRP salinity target in 2045 and the LRP's 40 PPT TDS one year later in 2046 and is therefore relevant to LRP salinity reduction goals. The assumption of RO as a technology for a remediation desalination facility when the Salton Sea is still hypersaline is not a wise technology choice as the osmotic pressure of a hypersaline Salton Sea will cause any RO system to operate at a very low recovery rate with very high energy consumption per acre foot of water desalinated. For the same reason, the IRP's assumption of a 50% recovery rate is invalid while the Salton Sea is still hypersaline. The project would have to wait for desalinated, or raw, ocean water inflow to substantially dilute the Salton Sea before a 50% recovery rate would be possible.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. It is likely that at higher salinities, inflow to the remediation desalting plant would need to be blended with lower salinity river water for the RO process to work. Or, during feasibility analysis, a distillation process would need to be substituted for RO.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 114-115 BRINE MANAGEMENT AT THE SALTON SEA – Both R4 and R9 include evaporation ponds as a part of the brine management strategy … therefore only investigated evaporation ponds as a brine disposal method.	In stating that both R4 and R9 include evaporations ponds, the IRP mischaracterize the type and use of evaporation ponds by R9. The evaporation ponds in R9 take a concentrated brine from the desalination process that has been pretreated by several filtration steps to remove particles, organic materials, and most ions other than sodium and chloride. The brine going into the R9 ponds will contain 99% sodium and chloride by dry weight and will crystallize pure salt for sale. This is backed up by peer reviewed Salton Sea test data cited in R9, but ignored by the IRP. Most of the salt produced in the R9 proposal will be further refined to food grade for use in industry as well as in food processing. R9 does not use concentration and storage ponds for waste salt as proposed by the IRP for as much as 22,000 acres. The R9 salt crystallization ponds will need only a few hundred acres and be reused to crystallize and harvest salt over and over again. The IRP claim that most salt is only used in the geographic region in which it is produced is a false and misleading statement. Any consumer buying salt in the grocery store will note that food grade salt comes from all over the world, for example the popular pink Himalayan salt from Pakistan. The nearest salt works of a capacity similar to what would be needed to remediate salinity at the Salton Sea is at Guerrero Negro, Mexico halfway down the Baja coast. The facility produces five to eight million tons of salt annually by evaporating and crystallizing salt from the Pacific Ocean. Very little of that salt is used in the mid Baja Peninsula geographic region. Guerrero Negro ships nearly all of its salt production by sea to customers all over the world, including the US and Canada and to other continents. Most of Guerrero Negro's customers are industrial salt users. The Salton Sea has rail access to deep water ports like Long Beach as well as dozens of rail destinations in the United States. To claim that purified Salton Sea salt could only be used locally is a false argument designed to justify the IRP's wasteful and destructive use of 22,000 acres of waste salt evaporation ponds and the IRP's irresponsible and very costly plan to ship millions of tons of waste salt by rail to unspecified landfills. The line "Future work could evaluate the proposed salt recovery facilities at a demonstration scale…" may be valid by itself until it's noted that the argument is used to eliminate the sale of purified salt as a way to offset the cost of Salton Sea restoration from consideration in the IRP's Feasibility and Summary Reports. If the IRP findings prevail, this assures that public funding for such work will never be available because sale of purified salt was not taken seriously by the IRP.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Referenced salt farm in Mexico where salt can be transported economically by boat is producing 5 to 8 million tons of salt per year. For the lower inflow scenarios investigated in the LRP, 300 to 400 million tons of salt would need to be removed from the Sea to lower the salinity to the target of about 40 PPT.
Tom Sephton	EcoMedia Compas	Page 115 "INTAKE AND DESALINATION – A 960 MGD ocean water intake would be located on the west side of the Sea of Cortez near San Felipe, Baja California… The proposed pipeline material would be steel with polyurethane lining."	The submerged intake structure 1.9 miles offshore and 40 feet below the Sea of Cortez surface is unlike any of the three proposals that passed the IRP's "fatal flaw analysis". Proposal R4 offered a multiple screened direct canal intake with a sediment trap, or alternatively beach wells. Proposal R10 used beach wells exclusively, and R9 proposed a unique tidal driven engineered gravity flow sand filtration system. Both the beach wells offered by R4 and R10, and the R9 tidal sand-filtered system would eliminate intake of any macroscopic marine life to the desalination plant. The only reason given by the IRP for why they did not consider either of those environmentally benign ocean intake options is that the IRP was too lazy to undertake analysis of those options, or as they say it "While tidal sand-filtered and subsurface intakes may be appropriate for the project, verifying the design criteria and suitability for the project would require additional geotechnical studies and infiltration evaluations. The feasibility analysis therefore used a submerged intake as no additional studies would be required to verify suitability for the project." There may be an unstated reason, however. By choosing a subsurface intake the IRP replaced two options with minimal impact on marine life with an option that is well known in the desalination industry to have significant problems with impingement of fish on screens and entrainment of smaller marine life on pipes and other surfaces. The IRP later used their choice of intake, unlike anything proposed by respondents to the 2018 and 2021 request for information, to claim that their ocean water import alternative (LRP Restoration Concept 11) is damaging to the environment and should not be considered. This enabled the IRP to promote their preferred non-import alternative (LRP Restoration Concept 13) as superior to ocean water import on environmental impact grounds. The IRP played a similar game with their choice of concentrated desalination brine outfall by selecting a 144-inch pipeline 3.4 miles in length to deliver 480 MGD of brine a short distance off the shore of the Sea of Cortez. With no mention of measures to diffuse that brine into the ocean water, the IRP's choice of outfall would appear to be an open pipe dumping brine directly into a highly sensitive marine environment and productive fishery. In comparison, Proposal R10 called for a brine outfall 25 miles offshore to strategic "deep mid-water outfall areas" to blend with ocean water in "active educator arrays and related systems that bring the discharge to a salinity and aeration similar to surrounding waters", then use currents to disperse the diluted brine. Proposal R9 was designed to require no brine discharge at all by converting all salts to beneficial use either purified and sold or used for solar heat absorption and storage. Again the IRP used their environmentally damaging choice of outfall to discredit ocean water import in their LRP Concept 11 alternative as environmentally damaging while promoting their LRP Concept 13 no import alternative as environmentally superior.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Various elements of each concept could change during the feasibility study to improve their effectiveness and reduce their impacts.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 115 "CONVEYANCE FACILITIES – Conveyance facilities would consist of a 480 MGD conveyance pump station, … The water conveyance pipeline is assumed to be installed via trenching."	Conveyance pumping alone, is 96,000 BHP, equivalent to 76.1 MW. Combining the IRP's cost estimate for ocean water intake pumping power and power to run the RO desalination plant, with the conveyance pumping, and converting the $533,309,000 annual total to kWh based on the IRP cost estimate for CFE grid power in Mexico of $0.162/kWh, the power demand totals to 1,766,407,407 kWh annually or 375.8 MW in 24/7 power generation. That's equivalent to the full output of a power plant supplying a city of half a million people. San Felipe is a small town (population 17,143 in 2020). To assume that San Felipe has over 375 MW of power to spare to support the IRP's proposed project is ridiculous. The Baja region experiences frequent CFE grid power shortages. There is little doubt that a dedicated power plant would have to be built in San Felipe to support the desalination plant and conveyance pumping needs of the project. R9 proposed did just that, with a dedicated solar power plant north of San Felipe backed up by local pumped storage hydro power in the adjacent mountains to supply the 24/7 needs of that project. Proposal R10 included geothermal power sourced in Baja. The Baja peninsula has abundant and only moderately developed solar and geothermal power resources. Yet the IRP chose to purchase non-existent grid power from CFE in San Felipe at a price four times higher than the $0.037/kWh cost of dedicated 24/7 solar power in R9 and also chose to count the major greenhouse gas emissions of the CFE grid power (which is mostly fossil fuel sourced) against the impacts of the IRP's ocean water import project (LRP Concept 11). The IRP could have chosen to use the lower cost 100% renewable power options offered by R9 or R10, but instead chose high cost, high climate impact power. Why? Is it because the IRP wanted to discredit ocean water import as too costly to operate and damaging to climate change? Page 116 Figure 5-33 fails to show the most important component, the water import pipeline.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Various elements of each concept could change during the feasibility study to improve their effectiveness and reduce their impacts.
Tom Sephton	EcoMedia Compas	Page 117 "FACILITIES AND OPERATIONS WITHIN THE SALTON BASIN – Energy recovery turbines, expected to be parallel Francis turbines, would be located near the discharge at the Salton Sea ... located on the west side of the Salton Sea outside of sensitive ecological areas."	Siting of the remediation desalination plant on the West side of the Salton Sea is likely an outcome of the need to limit the distance to pump millions of gallons of brine daily to the 22,000 acres of waste salt evaporations ponds that the IRP chose to site in the desert west of Salton City. Siting the waste salt evaporation ponds there will place the West Shores communities downwind during seasonal high westerly winds common in that location. The people of Salton City will be the unwilling receptors of dry waste salt particles and dust blowing off the dried ponds and raised during truck or rail loading of dry waste salt. To claim this is outside of sensitive ecological areas assumes that people are not part of the ecosystem. The IRP intends to ship millions of tons of waste salt out of the area by rail from the evaporation ponds west of the Salton Sea. However the rail service is on the east side of the Salton Sea. The IRP did not discuss a new rail extension to the waste salt evaporation ponds. That would leave shipment by truck of millions of tons of waste salt from the west side of the Salton Sea to existing rail facilities on the east side. The IRP estimates salt removal operations as high as 59 million tons in one year maximum. That's equivalent to 6,735 double dump truck loads per day or more than four double dump trucks every minute 24/7. California Highway 86 and the other area roads would be negatively impacted by that high volume of new truck traffic.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Various elements of each concept could change during the feasibility study to improve their effectiveness and reduce their impacts. Your comments are noted.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 117-118 5.13.2 "Performance, Expected Benefits, and Recreational Opportunities The IRP Water Importation concept would return the Sea to a lower salinity in the range of 20 to 40 PPT ... The calculations shown in are for steady state conditions after the salinity in the water has reached target salinity."	The statement written by the author of this Draft Long Range Plan that "information provided by the IRP suggests that it would take about 37 years, or until 2059, to achieve 40 PPT" is not supported by the actual text of the IRP's Feasibility nor Summary Reports. Both IRP Reports describe a 22 year timeline from permitting to completion of construction, for example in Figures 4-3 and 4-4 (Feasibility Report 9/30/2022 Final). 13 years is shown for agreements and permitting followed by 9 years for construction. The time to reach 40 PPT in Figure 4-3 (Feasibility Report 9/30/2022 Final) shows the restored Salton Sea reaching 40 PPT in 2046, that's 13 years earlier than the claim written by the author of the Draft Long Range Plan and the salinity predictions in this same Plan Page 119 Figure 5-34 show a similar time frame of 2046. The author even got the time to reach 40 PPT TDS for the "High" and "Low Probability Inflow Scenarios" reversed. Why the author of the Draft Long Range Plan found it necessary to add an unsupported 13 years to the date for achieving whole Salton Sea restoration seems incomprehensible, unless there was some uncited private communication between the author and the not so "Independent" Review Panel or the author simply wanted to pile on criticism of ocean water import due to author bias. While ocean water import from the Sea of Cortez requires an International agreement and extensive environmental documentation and permitting in two nations, assuming 22 years for implementation of the concept after another 3 years of Feasibility Study taking completion out to 2046 is unnecessarily pessimistic. At the 2022 Salton Sea Summit, the director of the International Boundary and Water Commission (IBWC) in the U.S. and her counterpart at CILA in Mexico laid out the procedure to get approval for a cooperative cross border project based on existing protocols to do the same for past cross border projects. Other permits with the State Governments of California and Baja and with local authorities would use established procedures used on other water conveyance and desalination infrastructure in both countries. None of this easy, but other large projects, like the 50 MGD desalination plant at Carlsbad (start of permit process 2006 to operational in 2015), have been designed, permitted, and built in less than 10 years. In commenting on the Salton Sea after restoration, the statement "The communities around the Sea could build out toward the new shorelines" should take into account the rise in the level of the Sea caused by two tropical storms in the 1970's. Since the IRP ocean water import proposal does not manage elevation, any such build out to a lower shoreline should be on solidly compacted elevated fill to a higher base elevation. The quantity of ocean water import could be managed to sustain a target elevation by directing all desalinated ocean water flow to the Salton Sea when needed and using more of it in Mexico when not needed. If Mexico does not need the potable water, then it could contribute to management of the Colorado River through an exchange or be used to supply ecologically beneficial pulse flows to the former Colorado River channel in Mexico as was last done in 2021 with 35,000 acre feet, and previously in 2014 with 105,000 acre feet.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. The calculation of time to achieve target salinity was based on: (1) Information from the Independent Review Panel's report on how long it would take to make the full system operational; and (2) A consistent modeling approach for salinity and elevation in the Sea used to evaluate the performance of all concepts for three inflow scenarios.
Tom Sephton	EcoMedia Compas	Page 118 "5.13.3 Status and Cost Estimate STATUS COST ESTIMATE – The IRP estimated capital costs, planning and permitting costs, and land acquisition costs. ... which will be discussed in the next two sections of this Plan."	It was shown above that the IRP's choice to use two deeply buried 108" steel pipelines coated with polyurethane in place of the much less expensive and commonly accepted practice of using concrete lined canals to move water over long distances increased the IRP's capital cost estimate by tens of billions of dollars. The cost difference between large capacity pipelines versus canals is generally on the order of three to four times more cost per mile for a pipeline versus a canal. The difference between an IRP pipeline and a canal is larger than that. In the next section it will be shown that the IRP's method of estimating the cost of a pipeline raises the per mile cost of an IRP pipeline by a factor of ten over a normal pipeline. The reason for this is hidden by the secrecy of all of the IRP's cost estimating. Nevertheless it can be shown that at least some IRP capital cost estimates are grossly excessive. For OMER costs as well it was shown above that the IRP chose much more expensive and much more environmentally damaging power supply options than it could have chosen. None of the IRP based cost estimates in Table 5-22 are realistic for several reasons that have and/or will be shown.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Some reduction in cost could be achieved by replacing some sections of pipelines with open channels, but this realtively modest change in cost would not change the score recieved by this concept as it is a relative comparison.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 120 “5.14 Restoration Concept 12: IRP Water Exchange In the Sea of Cortez Water … further decrease the salinity of the Salton Sea.”	There is no City of Jaquey in Baja California, nor is there a city by that name in Sonora State on the eastern shore of the Sea of Cortez where the desalination plant would actually be located. The next section on page 120 locates the plant somewhere along the 55 miles of coastline between Bahia de San Jorge and Puerto Lobos in Sonora State. This section appears to be in error by locating the plant 11 miles south of a non-existent city (the location El Jagüey in Sonora State had a population of only one inhabitant in the 2020 census down from two in 2010, perhaps it’s a city of ghosts, no doubt the self-described “experts” of the IRP would know). As admitted in the introduction quoted, Restoration Concept 12 begins on shaky legal ground. The Federal 1998 Salton Sea Restoration Act states in Title 1 Section 101(b)(2)(c) regarding options for Salton Sea restoration that may be considered “shall not include any option that – (i) relies on any new or additional importation of water from the Colorado River…”. The law applied to a feasibility study to be undertaken by the Secretary of the Interior, but it states a Federal policy in opposition to direct delivery of Colorado River water to the Salton Sea. All Colorado River water sustaining the Salton Sea at this time is waste water from agricultural drainage plus some treated municipal and industrial wastewater. The only exception to this 1998 law and policy against direct delivery of Colorado River water to the Salton Sea was the temporary delivery of mitigation water during the first 17 years of the QSA. There is no other basis in the existing ‘Law of the River’ for the direct delivery of Colorado River water to the Salton Sea described in Concept 12.	The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. The conceptual locations of conveyance facilities and other features evaluated by the Independent Review Panel are identified on maps presented in their report.
Tom Sephton	EcoMedia Compas	Page 120 “INTAKE AND DESALINATION – The ocean ... extending 3.4 miles offshore.”	As noted with respect to Restoration Concept 11 above, in choosing a subsurface intake the IRP chose an option that is well known to have significant problems with impingement of fish on screens and entrainment of smaller marine life on pipes. The IRP later used this choice of intake to claim that this ocean water import alternative is also damaging to the environment and should not be considered in spite of the fact that R4 had proposed a much less damaging beach well intake as an option for an East Sea of Cortez desalination facility. Similarly an unnecessarily close to shore (3.4 miles) brine outfall to the Sea of Cortez was chosen by the IRP, then used to claim the environmental damage from it is reason to reject this proposal. This is a glaringly obvious design to fail approach that the IRP used on both of their water import proposals in order to reject them in favor of the IRP’s preferred in basin proposal (Restoration Concept 13).	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Various elements of each concept could change during the feasibility study to improve their effectiveness and reduce their impacts.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 120-122 CONVEYANCE FACILITIES – Approximately 230 miles of 70-inch steel pipe with cement mortar lining would convey up to 100 MGD product water ... National Transmission Network Electrical Service 230 KV transmission line would be required.	IRP Restoration Concept 12 is taken from a 2020 study of options to supply water to Arizona and Sonora States by building one or two 100 MGD desalination plants on the Sea of Cortez eastern coast in Sonora State. The 2020 study, BINATIONAL STUDY OF WATER DESALINATION OPPORTUNITIES IN THE SEA OF CORTEZ, was prepared for the "Minute 323 Desalination Work Group", a working group of the IBWC, by the well respected and deeply experienced engineering firm Black & Veatch. Table 1 below shows the cost estimates for Opportunities 1, 2 (with two conveyance options), and 5. Opportunities 3 and 4 were dropped for different reasons. The capital cost of conveyance infrastructure is highlighted. Black & Veatch analyzed the cost to build a pipeline carrying 100 MGD of desalinated Sea of Cortez water from the East shore north along the coast with an upsize about 1/3 of the way along the route at a second desalination plant to convey 200 MGD to Morelos Dam. The IRP chose a very similar route, with some changes, to carry only 100 MGD from a single desalination plant on the East shore of the Sea of Cortez to Morelos Dam. The table labelled 5-5 is from the IRP's Feasibility Report 9/30/2022 Final and shows the IRP's estimated capital cost to build the IRP's Sea of Cortez Exchange Concept. The cost of the pipeline conveyance is also highlighted. It can be seen from the Black & Veatch study that the cost to build the conveyance pipeline alone varies between $993,065,591 for Opportunity 1 to $1,303,385,871 for Opportunity 2 (upsized at to 200 MGD at Puerto Libertad). The average is roughly $1.2 billion to pipe 200 MGD from the east coast of the Sea of Cortez to Morelos Dam. In contrast, the IRP concept in Table 5-5 estimates a capital cost for their pipeline of $12,705,000,000. In essence the IRP has estimated a capital cost of $12.7 billion for a very similar desalinated water pipeline route with half the capacity. The IRP has estimated ten times the cost to move half the water, virtually the same route. How the IRP managed to inflate the cost of their pipeline by 1,000 % two years after the Black & Veatch estimate is truly a mystery because the IRP cost estimating calculations are secret. [Two attached tables can be found in email attachment files] The Francis turbines selected by the IRP are the most common type of turbine used for hydro power production however the optimal efficiency range is within 330 to 980 feet of head (Paul Breeze, Power Generation Technologies (Third Edition), 2019). Taking any reasonable route from the coast between Bahia de San Jorge and Puerto Lobos to Morelos dam, the maximum conveyance elevation is about 250 feet above msl. If the delivery point is at the Alimentador Central canal above the Morelos dam at 150 feet above msl that's a 100 foot difference, well under the minimum 330 feet of head needed for efficient Francis turbine operation. That head would be even less when factoring in pipe friction in the pipeline. The IRP chose the wrong type of turbine for efficient hydro power recovery. If the IRP chose a route with higher elevation than required, then that is energy inefficient to pump up, then try to recover on delivery with losses at both pumps and turbines. Why the IRP chose a hydro turbine incapable of operating at high efficiency in the range of head available is a mystery and the IRP's calculations are secret, but the claim of 87% efficiency is highly suspect. Similarly to IRP Restoration Concept 11, the choice is made by the IRP to use 105 miles of connection to the existing National electrical grid in Sonora State, which is mostly supplied with fossil fuel generated power. This choice is unnecessary and adds to both the cost of IRP Restoration Concept 12, but also adds hugely to the carbon footprint of the project. In fact Sonora State, with US support, just announced what will be largest solar power facility in Mexico at Puerto Peñasco on the east shore of the Sea of Cortez just north of the proposed desalination plant site. Yet the IRP proposed going 105 miles for grid power rather than use nearby renewable power, why?	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 122 “FACILITIES AND OPERATIONS WITHIN THE SALTON BASIN – The remediation desalination facility would be located near the southwest corner of the Salton Sea. … thereby decreasing the acreage of lakebed needing restoration.”	The timeline of construction proposed by the IRP for the 100 MGD reverse osmosis remediation desalination facility they propose would have it completed 12 years after project start, which could be roughly 2038. LRP Figure 5-36 shows Salton Sea salinity reaching 150 PPT TDS by that year under the optimistic “High Probability Inflow” scenario and over 220 PPT TDS under the less optimistic “Low Probability Inflow” scenario. 150 PPT TDS is above the maximum salinity for even the newly available ultra-high pressure reverse osmosis technology to work. The 100 MGD reverse osmosis remediation desalination facility proposed by the IRP would fail to operate. This was pointed out to the IRP representative, Principal Investigator, Dr. Brent Haddad, at their final public meeting on September 30, 2022. His answer was “That’s for someone else to figure out.” For the Sea of Cortez Import Concept (LRP Restoration Concept 11), the import of roughly half a million acre feet per year of desalinated ocean water could dilute the Salton Sea enough to bring salinity down to a range where reverse osmosis could work if the IRP were to substantially modify their timeline and build the Sea of Cortez desalination and import infrastructure before the 100 MGD reverse osmosis remediation desalination facility. Proposal R9C was similar to the IRP’s Sea of Cortez Exchange Concept in several ways, but it recognized the need to dilute Salton Sea water with a large amount of imported water before attempting to use reverse osmosis technology at the Salton Sea. For the Sea of Cortez Exchange Concept (LRP Restoration Concept 12) the 100,000 AFY of Colorado River water exchanged for desalinated Sea of Cortez water at Morelos Dam would not be available until several years after building the 100 MGD reverse osmosis remediation desalination facility according to the IRP timeline. The amount will not be enough to dilute the Salton Sea to less than 130 PPT TDS. The 100,000 AFY of imported water would be too little and too late to dilute the Salton Sea enough to make the reverse osmosis remediation desalination facility actually work. The IRP’s Restoration Concept 12 fails their own “fatal flaw” criterion stated as: “1. the submission is technically sound and utilizes established, non-speculative technologies.” Even the IRP’s Dr. Haddad admitted in the final public meeting that the IRP had discussed among themselves the fact that reverse osmosis would not work at such high salinity as 150 PPT TDS or more. Yet the IRP decided to ignore the fact that their Sea of Cortez Exchange Concept is fatally flawed in their Feasibility Report 9/30/2022 Final. Perhaps the IRP decided this fatal flaw did not matter as they had no intention from the time they began their feasibility study of recommending the Sea of Cortez Exchange Concept (LRP Restoration Concept 12) nor the Sea of Cortez Import Concept (LRP Restoration Concept 11). Both IRP importation concepts were designed from day one to fail leaving only the IRP’s preferred in-basin Colorado River Voluntary Transfer Concept standing (LRP Restoration Concept 13). Such a scheme fails the public trust put in the IRP, but is consistent with the facts in the record. The use of evaporation ponds for brine remediation without fully utilizing the salt is a missed opportunity and the result of slack judgment or sheer laziness on the part of the IRP. Instead of investing in purification measures that could allow for sale of salt to boost the struggling Imperial Valley economy, the IRP incurs extra cost and GHG emissions to ship out waste salt to an unspecified and likely out of state disposal site. R9 on the other hand, takes full advantage of the economic and eco-friendly course of action to pre-treat the brine to 99% purity, then crystallize salt to higher purity, making the product available for sale on the global salt market.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. The calculation of time to achieve target salinity was based on: (1) Information from the Independent Review Panel's report on how long it would take to make the full system operational; and (2) A consistent modeling approach for salinity and elevation in the Sea used to evaluate the performance of all concepts for three inflow scenarios. It is likely that at higher salinities, inflow to the remediation desalting plant would need to be blended with lower salinity river water for the RO process to work. Or, during feasibility analysis, a distillation process would need to be substituted for RO. The LRP has noted that a market analysis for the sale of salt would be needed before it can be determined if the sales could offset any restoration costs. The costs of packaging and transporting the salt would need to be evaluated. The commenter has noted that a salt farm in Mexico where salt can be transported economically by boat is producing 5 to 8 million tons of salt per year. To accommodate the desalting operations in the valley in conjunction with the remediation desalting operation, at lower inflow scenarios, 300 to 400 million tons of salt would need to be processed.
Tom Sephton	EcoMedia Compas	Page 122 “5.14.2 Performance, Expected Benefits, and Recreational Opportunities The IRP Water Exchange Concept would return the Sea to a lower salinity in the range of 20 to 40 PPT.... could be added to take advantage of the restored fish and bird habitat.”	The author of this Draft Long Range Plan has again distorted the time to completion of a water importation concept. The “information provided by the IRP” in their Feasibility Report 9/30/2022 Final does NOT suggest “that it would take about 36 years, or until 2058, to achieve 40 PPT.” On the contrary, the actual text of the IRP’s Feasibility Report describes an 18 year timeline from permitting to completion of construction, for example in Figures 5-2 and 5-3 where 13 years is shown for agreements and permitting, and for construction at the Salton Sea, followed by 5 years for construction in Mexico. IRP Figure 5-5 shows the Salton Sea reaching 40 PPT in 2048, that’s 10 years earlier than the claim written by the author of the Draft Long Range Plan and in this same Plan Page 124 the salinity predictions in Figure 5-36 show a similar time frame. Why the author of the Draft Long Range Plan chose to add 10 years to the date for achieving 40 PPT TDS with no justification and in conflict with the projections in the Draft Long Range Plan seems to show consistent author bias against ocean water import. The statement that “The communities around the Sea could build out toward the new shorelines…” is unrealistic since the new shorelines under Restoration Concept 12 will be one to two miles away from the communities and nearly all shoreline property will be owned by either the Torres Martinez Cahuilla Indians or a handful of public agencies that have not allowed buildout onto their shoreline parcels to date. If there were a build out one to two miles to the new shoreline, these properties would be at risk of flooding as the elevation of the residual Salton Sea is unmanaged in this Concept.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. The calculation of time to achieve target salinity was based on: (1) Information from the Independent Review Panel's report on how long it would take to make the full system operational; and (2) A consistent modeling approach for salinity and elevation in the Sea used to evaluate the performance of all concepts for three inflow scenarios.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 125 “5.14.3 Status and Cost Estimate STATUS COST ESTIMATE – The IRP estimated capital costs, planning and permitting costs, and land acquisition costs… 10-Year Plan projects for all three concepts proposed by the IRP.”	As illustrated above the IRP found a way to inflate the cost of the conveyance pipeline from the Sea of Cortez to Morelos Dam by a factor of ten without explanation. None of the cost estimates provided by the IRP can be relied upon for that reason alone. On top of that, the Capital and OMER cost estimates provided by the IRP fail to take into account the problem that the reverse osmosis remediation desalination plant will not be able to operate at the 150 PPT TDS of the Salton Sea when construction is completed. Some other strategy will be needed to bring the Salton Sea TDS to the point where reverse osmosis desalination at the Salton Sea might be able to operate. Cost figures from the IRP do not take this reality into account and therefore cannot be relied upon for this reason as well.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. It is likely that at higher salinities, inflow to the remediation desalting plant would need to be blended with lower salinity river water for the RO process to work. Or, during feasibility analysis, a distillation process would need to be substituted for RO.
Tom Sephton	EcoMedia Compas	Page 125 “5.15 Restoration Concept 13: IRP Colorado River Water Transfer In the Colorado River Voluntary Transfer Concept, ... the Salton Sea salinity levels would be reduced.”	The IRP incorrectly assumes that 100,000 AFY of Colorado River water will be able to offset the wrongly assumed 50% loss to brine of the nominal 100 MGD remedial reverse osmosis desalination facility proposed for the IRP’s preferred Colorado River Voluntary Transfer Concept (LRP Restoration Concept 13). However the IRP’s own optimistic salinity modelling in Figure 6-3 (Feasibility Report 9/30/2022 Final) based on a sustained Salton Sea inflow of 717,000 AFY shows the Salton Sea reaching 130 PPT TDS by the year the plant could be completed in 2034. This is at the limit of what currently available commercial reverse osmosis (RO) technology can operate with, but the recovery rate will be very low, so all of the 100,000 AFY of Colorado River water will be insufficient to stabilize the elevation as wrongly stated in the excerpt from this Draft Long Range Plan: “Water from voluntary transfers could stabilize the sea’s elevation…”. Salt removal will proceed, but most of the 200 MGD taken from the Salton will go to the brine ponds, which will have to be up-sized, and very little desalinated water will be returned to the Salton Sea until the salinity can be greatly reduced. Therefore the elevation modelling in Figure 6-5 is wrong and the playa exposure will be much larger in the early years of operation. All of the estimates in the description of the Colorado River Voluntary Transfer Concept are a fantasy based on a wrong assumption about the recovery rate of RO desalination technology proposed. An assumption that the IRP knew to be wrong. What a fairytale the IRP has spun to declare the infeasibility of ocean water import, an promote their own non-import proposal. The IRP fairytale even includes a fantasy city called “Jaquey, Baja California” elusively located 11 miles north of the Western side of the Eastern Shore of the magical Sea of Cortez.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 125 “5.15.1 Components of the Restoration Concept In contrast to other IRP concepts, the IRP Colorado River Water Transfer concept only involves facilities within the Salton Basin.”	The IRP was ostensibly contracted to evaluate the feasibility of water import concepts for restoration of the Salton Sea, but that is not what the IRP did. The choice by the State Natural Resources Agency of Dr. Brent Haddad to lead the evaluation was questionable from the Start. In his July 14, 2002 editorial published in the LA Times and entitled “Drop Bid to Revive the Dying Salton Sea”, Dr. Haddad opposed any restoration of the Salton Sea, stating instead: “The correct approach should be remediation: protecting human health, bird populations and the local economy as the Salton Sea inevitably dries up. This would shift the focus of policymakers from the sea itself to the exposed lake bed--something they can do something about.” Clearly in 2002 Dr. Haddad publicly opposed any water import restoration that could reverse an ‘inevitable’ drying up of the Salton Sea. He went on to state: “We must also help recreation and vacation businesses plan for a future without the Salton Sea. Attempting to restore the Salton Sea would mean spending too much money on a wish.” The Salton Sea Management Program leadership was well aware that Dr. Brent Haddad was an outspoken opponent of using water import to restore the Salton Sea, or using any method that could genuinely restore the Salton Sea. In a 2021 conference call including former Assistant Secretary for Salton Sea Policy, Mr. Arturo Delgado, Salton Sea Coalition leader Mr. Chuck Parker (who found Dr. Haddad’s 2002 LA Times editorial), and two members of the EcoMedia Compass locally based non-profit Board, Mr. Kerry Morrison, and Tom Sephton, the issue of the deep bias held by Dr. Brent Haddad against Salton Sea restoration by ocean water import, or by any other means, was raised. Mr. Delgado successfully prevaricated in assuring the local public representatives on the call that Dr. Brent Haddad had fundamentally changed his attitude toward Salton Sea restoration, would be able to carry out an unbiased feasibility analysis of the water import concepts brought forward by, at that time 12 respondents to a 2016 and a 2018 Request for Information (RFI), and that Dr. Haddad would not lead the IRP, but would instead be replaced in the lead position by a different, yet to be named Panel Chairperson. Later in 2021, Dr. Rominder Suri was named as Chair of the IRP, but in every other respect none of Mr. Delgado’s assurances were true. Dr. Brent Haddad was in the IRP Principal Investigator position from which he led every aspect of the IRP process through 2021 and through September 30, 2022. Looking at the IRP budget expenditures, the IRP Panel members were only compensated $50,000 each with an extra $20,000 for Dr. Suri. However payments to Dr. Brent Haddad and his graduate students ($569,571 direct salary plus $353,022 indirect costs) plus the sub-recipient contract with Dr. Haddad’s friends at Kennedy Jenks ($964,114) were a much higher portion of the $2.5 million contract. Clearly the vast majority of the work was performed by Kennedy Jenks employees, and by Dr. Haddad and his graduate students, all directly under Dr. Brent Haddad’s control. The IRP Panel members were only paid enough to serve in an advisory role, a total of $380,000 or 14.9% split between the seven Panel members out of the contract total of $2,563,488. Dr. Brent Haddad was in charge of the IRP project from start to finish and he was the sole IRP representative speaking to the public at the Fatal Flaw public meeting and the Final public meeting on September 30th 2022.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.
Tom Sephton	EcoMedia Compas	Page 125 “FACILITIES AND OPERATIONS WITHIN THE SALTON BASIN – The remediation desalination facility would be located near the southwest corner of the Salton Sea… thereby decreasing the acreage of lakebed needing restoration.”	As noted above and in Figure 5-38 in this Draft LRP the Salton Sea will have reached 130 PPT TDS by the earliest time this Colorado River Voluntary Transfer Concept could be implemented in 2037 (adding 3 years for the Army Corps of Engineers Feasibility Study per Figure 5-38). This is for the most optimistic “High Probability Inflow” scenario. Newly available ultra-high pressure reverse osmosis membranes have a maximum concentrate TDS of about 130 PPT, the source water needs to be less saline to operate, so initially all of the capacity of the 200 MGD Salton Sea pump station would have to move Salton Sea water to the brine ponds until the salinity of the Salton Sea is reduced enough for the proposed reverse osmosis desalination to operate. No desalination would be possible initially, so there would be no freshwater return to dilute the Salton Sea. Wherever located, the capacity of the brine ponds would therefore need to be doubled to 44,000 acres to accept full 200 MGD of Salton Sea water instead of 100 MGD of remediation reverse osmosis desalination facility reject brine. If the less optimistic “Low Probability Inflow” scenario were to play out, then the Salton Sea would reach close to 180 PPT TDS making operation of the proposed remediation reverse osmosis desalination facility impossible for many years. In the case where Colorado River water availability cause the pessimistic “Very Low Probability Inflow” scenario to come into effect, the proposed remediation reverse osmosis desalination facility may never work. Clearly this is a very high technology risk since the proposed technology is known not to work under the initial Salton Sea TDS conditions expected. Even Dr. Brent Haddad admitted in the Final public meeting on September 30th 2022 that the IRP knew the proposed technology would not work at high TDS. However the persons evaluating that technology risk in scoring this Concept for this Draft LRP failed to recognize this fact.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. It is likely that at higher salinities, inflow to the remediation desalting plant would need to be blended with lower salinity river water for the RO process to work. Or, during feasibility analysis, a distillation process would need to be substituted for RO.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	EcoMedia Compas	Page 127 “5.15.2 Performance, Expected Benefits, and Recreational Opportunities The IRP Colorado River Water Transfer Concept would be very much like what was described for Concept 12: IRP Water Exchange Concept. Once ... This area would have shallow and some mid-depth habitat.”	As with the Draft LRP Restoration Concept 12, the statement that “The communities around the Sea could build out toward the new shorelines…” is unrealistic since the new shorelines under Restoration Concept 13 will be at least one to two miles away from the communities under the most optimistic inflow scenario. If there were a build out to the new shoreline, these properties would be at risk of flooding as the elevation of the residual Salton Sea is unmanaged. A smaller Sea with a shoreline one to two miles away from communities does not miraculously offer availability of recreational activities. Ownership of the exposed playa and the need for mitigation measures to prevent fugitive dust would restrict access as it does with recently exposed playa. The second paragraph is completely nonsensical and irrelevant for the IRP’s Concept 13. There are no "Pump Out concepts", "Figure 5-38", or "Phase 2 Marine Sea for Concept 12" that are in any way relevant here. This appears to be a poorly edited cut and paste mash-up of LRP Restoration Concepts 4A-4D and 12. It is truly astonishing that a state agency with paid professionals can overlook such glaring errors in a report that is supposedly considered to be a key document for determining the future outcome for the Salton Sea. The third paragraph refers to Table 5-24, however the content of Table 5-24 does not provide “the estimated water available for the IRP Water Import Concept in comparison to the Very Low Probability Inflow Scenario…”. Instead Table 5-24 is a direct copy of Table 5-23 with none of the editing that should have been done. Table 5-24 includes a line for Coastal Desalination of 112,000 AFY that does not exist for Concept 13. The water proposed to be purchased by indefinitely fallowing Imperial Valley farms is not noted on Table 5-24. The Remediation Desalination of 112,000 AFY in Table 5-24 will not work for reasons explained above. Whatever calculations are shown in Table 5-24 are not relevant to Concept 13.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. It is likely that at higher salinities, inflow to the remediation desalting plant would need to be blended with lower salinity river water for the RO process to work. Or, during feasibility analysis, a distillation process would need to be substituted for RO.
Tom Sephton	EcoMedia Compas	Page 129 “5.15.3 Status and Cost Estimate STATUS – The IRP Colorado River Water Transfer Concept has been retained for analysis and comparison to other alternatives considered feasible in this document. COST ESTIMATE – The IRP estimated capital costs, planning and permitting costs, and land acquisition costs ... from the IRP Feasibility Report [University of California Santa Cruz, 2022]).”	The Capital and OMER cost estimates provided by the IRP fail to take into account the problem that the “remediation desalination plant” will not be able to operate at the completion of the construction and that the brine ponds will therefore need double capacity to take the 200 MGD of Salton Sea water pumped out to remove salt, or else the pump rate must be cut in half and it will take much longer to reduce the TDS of the Salton Sea to the point where reverse osmosis desalination might be able to operate. Cost figures from the IRP therefore cannot be relied upon and should be recalculated from scratch.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. It is likely that at higher salinities, inflow to the remediation desalting plant would need to be blended with lower salinity river water for the RO process to work. Or, during feasibility analysis, a distillation process would need to be substituted for RO.
Tom Sephton	Sephton Water Technology, Inc.		There are deep flaws in the analysis done by State SSMP staff and their contractors, Tetra Tech, and UCSC executed by Dr. Brent Haddad and his friends at Kennedy Jenks company. It is clear from the contract record that Dr. Haddad and friends were funded from the beginning to invent their own alternative to a water import plan to replace actual engineering and feasibility analysis of any of the 18 water import proposals submitted to them.	The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	Sephton Water Technology, Inc.	Page 1 "The goal of the LRP is to protect or improve … fish and wildlife that depend on the Salton Sea."	The anticipated recession of the Sea does not allow for restoration of lake level. This is not in keeping with the Salton Sea legislation passed and is therefore of questionable legality. The second goal is vague as to what bodies of water should be protected and assumes there must be negative environmental consequences ignoring the option for full restoration. There are federally designated beneficial uses for the Sea. This goal should address all of those beneficial uses. Pupfish connectivity needs to be integrated with this goal. Beneficial uses: 1.Preservation of rare, endangered or threatened species 2.Wildlife habitat 3.Warm water habitat 4.Water contact recreation 5.Non water contact recreation 6.Aquaculture 7.Freshwater replenishment of the Salton Sea The third goal is vague as to what historic levels would be restored, does it apply to Salton Sea elevation, or population levels and/or diversity of fish and wildlife? Page 12 of the Evaluation Criteria for Shallow Habitat measures habitat restoration against area of habitat at -230 ft msl, a Sea elevation several years into the QSA water transfers. The -230 ft msl is a baseline is applied to Medium-Depth and Deep Water Habitat on page 13. Metrics comparing habitat area at -230 ft msl to actual wildlife population have not been established, but are critical. This statement of goals essentially assumes the Salton Sea must recede and precludes any whole Sea restoration such as Ocean Water Import. We object to this statement and everything that flows, or does not flow from it. The salinity evaluation criterion on Page 13 sets a target of 20 PPT to 40 PPT to score a 5 with no target set for lower scoring. We recommend that salinity under 50 PPT should score a 4 because the Salton Sea still supported millions of fish and benthic organisms like pile worms in that salinity range. We also recommend that salinity under 60 PPT should score a 3 because the Salton Sea supported a robust if slightly diminished fish population in that salinity range. We further recommend that salinity under 70 PPT should score a 2 because desert pupfish can survive in that salinity range and have connectivity between drains that connect to habitat under 70 PPT. Projects that achieve these target salinities in either the residual Salton Sea or in smaller habitat areas should get evaluation credit on a sliding scale of time and area based on when each of these intermediate salinity targets is reached and the area of habitat that reaches each target.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The goals and evaluation criteria were developed through a multi-step process that included input from the Long-Range Plan Committee and the public.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	Sephton Water Technology, Inc.	Page 156 “7 Evaluation of Restoration Concepts This chapter evaluates the … and a Colorado River Transfer concept based on land fallowing).”	There is a math error in the line: “The 18 Phase 2 concepts being evaluated include 16 concepts that were proposed by the SSMP team, the LRPC, or the public”. There are actually 13 concepts drafted by Tetra Tech for the SSMP (four basic concepts with a total of 13 variations) plus two from LRPC members, totaling 15 instead of 16, plus 3 concepts drafted by the IRP for a grand total of 18 concepts evaluated. There is no “combined water importation concept” from the IRP process. There is a singular “Sea of Cortez Import Concept” that was drafted by the IRP in order to avoid having to evaluate any of the three responses to the 2021 RFI that got through the “fatal flaw” rejection process (R4, R9, and R10) for their individual, or even collective, feasibility. By the time the IRP concluded their “fatal flaw” process in July 2022, there were only two and a half months left to contract completion, so the IRP apparently had planned not to need to evaluate any RFI proposals for feasibility. Instead, the IRP created their own fantasy “Sea of Cortez Import Concept” that was designed to eliminate all of the substantial benefits to Mexico in each of R4, R9, and R10 so that the IRP could claim that their alternative “Sea of Cortez Import Concept” had no significant benefits for Mexico and therefore would not be acceptable to Mexico and therefore would be infeasible. The IRP also used their fantasy “Sea of Cortez Import Concept” to eliminate ocean water intake and brine management options proposed in R4, R9, and R10 designed to minimize environmental damage to the highly sensitive Sea of Cortez ecosystem. The IRP chose the most environmentally damaging options for ocean water intake and brine management that are available to the desalination industry and then used those options to declare that their alternative “Sea of Cortez Import Concept” would cause excessive damage to the Sea of Cortez ecosystem and could not pass a permitting process if applied on the coast of California (yes California USA not Baja California) and therefore the IRP’s “Sea of Cortez Import Concept” was declared infeasible by the IRP on the grounds of excessive environmental impact. The IRP also chose mostly fossil fuel based grid power in Mexico to greatly increase both the carbon footprint of the IRP’s “Sea of Cortez Import Concept” and the cost of power compared to dedicated renewable power proposed by R9 and R10. Unbeknownst to the IRP, sufficient grid power is unavailable in the specified location on the Sea of Cortez shore near San Felipe, Finally, the IRP chose to cost out their fantasy “Sea of Cortez Import Concept” to more than ten times the cost of R4, R9, or R10 by choosing pipelines that cost tens times the price of normal pipelines and various other means to massively inflate the cost of their proposal and therefore claim that ocean water import to the Salton Sea in infeasible due to the exorbitant cost claimed by the IRP based on their secret cost calculations. The IRP carefully designed their fantasy “Sea of Cortez Import Concept” to fail their feasibility analysis, likewise their fairy tale “Sea of Cortez Exchange Concept”, leaving the IRP’s preferred “Colorado River Voluntary Transfer Concept”, actually an in-basin concept, as the only option standing. Since the IRP process concluded in Fall 2022, Dr. Brent M. Haddad and Robert Glennon have gone on to speak out publicly against ocean water import and promote their “Colorado River Voluntary Transfer Concept” in the LA Times, the Desert Sun, and other widely read publications. These are not the actions of impartial evaluators of project feasibility, these are the actions of champions of a cause, agricultural to urban water transfers.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Text in the document has been revised based on the first paragraph. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.
Tom Sephton	Sephton Water Technology, Inc.	Page 160	How much habitat do pupfish need? Audubon calculated the acreage for birds that use the Sea require about 38,000 acres. What about the endangered aquatic wildlife? What happens if drain flow becomes insufficient due to reduced water deliveries in the future? How is the pupfish connectivity habitat designed to be drought-resilient? Where will the pupfish be relocated to if their drain and pond habitat becomes unsustainable at the Salton Sea?	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The level of detail requested regarding species impacts will be developed as part of next level of feasibility analysis.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 1 "As part of the Long-Range Plan (LRP), … working under contract to the California Department of Water Resources."	It should be noted that four Restoration Concepts included in this Draft Long Range Plan (LRP) include large scale desalination at the Salton Sea, Concepts 7, 11, 12, and 13. The first section on "Conventional Reverse Osmosis (RO) or other similar processes" applies directly to Concepts 11, 12, and 13 submitted under the UC Santa Cruz contract with the California Department of Water Resources and referred to in the Draft LRP as the IRP process. The three IRP Concepts were completed through the IRP process by the end of September 2022 and each propose to use conventional seawater reverse osmosis at the Salton Sea to reduce and manage salinity, yet this Appendix G makes no mention of any of them. The second part of this Appendix G is designed by Tetra Tech engineers as an attack on Restoration Concept 7 alone. The discussion and recommendations by Tetra Tech engineers should be applied to the reverse osmosis remediation desalination at the Salton Sea proposed in each of the IRP Restoration Concepts 11, 12, and 13. Concept 11 could avoid the issues raised by Tetra Tech by diluting the Salton Sea with desalinated ocean water before starting desalination of Salton Sea water, but the timeline proposed by the IRP for their Concept 11 does not consider this. IRP Concepts 12 and 13 would be directly impacted by the problems with reverse osmosis technology at the Salton Sea raised by Tetra Tech: Appendix G, Page 2 "The recovery rate of the desalination process strongly affects the economics of water production. A lower recovery rate would result in a proportionally higher flow rate of feed water pumped from the Sea, which would increase the size of the pretreatment system, the power consumption, usage of water treatment chemicals, and the size of the system required to treat the process wastewater. The seawater RO desalination plant at Carlsbad, CA, which operates at a 50% recovery rate, treats seawater at a salinity of about 35,000 PPM total dissolved solids (TDS), produces potable water at a price of about $2,000/(acre-feet) AF. The product water from an RO system that would treat Salton Sea water of salinity of 75,000 – 100,000 PPM at a recovery rate of ~30% would be significantly more expensive than the one produced by the Carlsbad desalination plant. Therefore, the application of RO technology to desalinate the Salton Sea saline water does not appear to be economically feasible. Furthermore, with the possibility of inflows to the Sea being reduced further by droughts and climate change, the feed water salinity could exceed 110,000 PPM, which would exceed the accepted technical limit of the RO process. It is therefore not recommended that RO desalination of Salton Sea water as a restoration concept be considered further unless there are technology improvements in the RO process that would make treating very high salinity water feasible." The rest of Appendix G is focused on attacking Restoration Concept 7 as submitted to the Salton Sea Management Program on April 2nd 2022 by Sephton Water Technology, Inc. Appendix G finds a series of excuses to replace Restoration Concept 7 as submitted with a less efficient and much more costly alternative Concept 7 created by Tetra Tech engineers using related but significantly different technology options. It should be noted that there is some history between the original proposer of Restoration Concept 7 (Sephton Water Technology, Inc.) and the company that wrote this Appendix G for the Salton Sea Management Program attacking the proposal. Tetra Tech is a large desalination company, among many other things, has worked on studies and mitigation projects at the Salton Sea for roughly 25 years, and has been the original designer of several restoration concepts for the Salton Sea, including Draft LRP Restoration Concepts 3A, 3B, 4A, 4B, 4C, and 4D, originally designed under a multi-year State funded contract with the Salton Sea Authority. Sephton Water Technology is a small desalination research and development company and has worked at the Salton Sea for 18 years adapting its thermal desalination technology to the unique conditions and opportunities at the Sea, partly supported by Federal and State grants. Several years ago Sephton Water Technology owner, Tom Sephton, made a general comment about desalination of Salton Sea water at a public meeting of the Salton Sea Authority Board held in the Imperial Irrigation District boardroom. Tetra Tech Vice President and Salton Sea project lead Dr. Bill Brownlie looked directly at Tom Sephton and stated: "If anyone is going to do desalination at the Salton Sea, it will be us." That set the precedent for subsequent relations between Tetra Tech and Sephton Water Technology. Early in the proposal review process conducted by Tetra Tech under contract with the California Department of Water Resources, Tetra Tech offered a very short description of two alternatives (then labelled 7B and 7C) that proposed to replace the thermal desalination technology developed at the Salton Sea by Sephton Water Technology with reverse osmosis desalination. Concept 7B would do reverse osmosis at the Salton Sea, and 7C on the Pacific Ocean with an exchange for Colorado River water. Tetra Tech has experience only with reverse osmosis, and other membrane technologies, so these Concepts were obvious for Tetra Tech to offer as alternatives they could profit from. Tetra Tech has no experience at all with the type of thermal distillation that Sephton Water Technology proposed as the primary Salton Sea treatment process for the original Concept 7. However, when Tetra Tech employee Dr. Mark Wilf (an expert in membrane desalination, but not in thermal desalination) recommended that reverse osmosis was not going to be feasible to treat hypersaline Salton Sea water, Concepts 7B and 7C were dropped.	Appendix G was intended to provide an independent technology and cost evaluation of the distillation desalting process proposed by the commenter. It is likely that at higher salinities, inflow to the remediation desalting plant would need to be blended with lower salinity river water for the RO process to work. Or, during feasibility analysis, a distillation process would need to be substituted for RO. The commenter has asserted that restoration costs could be offset by the sale of salt. While this strategy provides a promising alternative to disposal of salt by other means, whether the market could accommodate the mass of salt generated is unclear. A market study would need to be conducted to determine if the cost of processing, packaging, and transporting the salt would be offset by the value of salt sales. While this topic was already addressed on Page 114 of the LRP under Brine Management for Concept 11, the above discussion is added to Page 105 for Concept 9. The commenter's conflict of interest claims are meritless. Tetra Tech is prohibited from bidding on or being awarded any contract by the Department as it relates to the design or construction of desalination projects, or any other proposed project under consideration by the Long-Range Plan Committee. Tetra Tech is aware of this prohibition and understands its contractual conflict of interest obligations to the Department.

Name	Organization	Section or Page	Comment	Response
			Dr. Mark Wilf prepared an alternative proposal loosely based on the combined ultrafiltration and nanofiltration membrane pre-treatment followed by high efficiency thermal distillation process proposed on April 2nd 2022 by Sephton Water Technology but making assumptions about process steps and the type of distillation system to be used that led to lower net efficiency and much higher cost. The most critical change was an assumption by Dr. Wilf that the amount of nitrates from fertilizer runoff in the Salton Sea would contaminate the purified salt produced by the nanofiltration pre-treatment and distillation process developed by Sephton Water Technology making it unmarketable. Sale of purified salt was critical to making the original Restoration Concept 7 profitable and therefore highly economically competitive. It was also critical to the need to cost effectively remove millions of tons of salt out of the Salton Sea's aquatic ecosystem in order to restore it. Dr. Wilf's denial by assumption of the marketability of the salt destroyed the economic basis of Sephton Water Technology's proposal. These changes were first made known to Tom Sephton, a participant in the Long Range Planning Committee as a board member of a local non-profit, in a September 7th 2022 public meeting of the Long Range Planning Committee. The findings were announced in the meeting by Dr. Bill Brownlie, who stated in the meeting, without explanation, that the cost to refine the sodium chloride in the brine produced by the process developed by Sephton Water Technology would be too high to be considered economically viable. Sephton Water Technology objected to the damaging technology and economic choices announced and asked to see the document justifying those choices in this correspondence sent on September 7th 2022 following the meeting at which the choices by Tetra Tech were publicly announced: "Dear Dr. Brownlee and Mr. Newcomb, I was stunned to learn today of the finding by Tetra Tech that the cost to refine the near saturation sodium chloride brine from the process I proposed is thought to be so high that it would be uneconomic to sell the refined salt. Considering that the purified brine could simply be crystallized and dried in the sun, scooped up, flushed with saturated brine, re-dried, packaged and sold as a commercial product like any salt evaporation pond operation without refining makes the Tetra Tech finding even more surprising. Salt is refined and sold in several places in the United States, and in many places around the world. To claim that it's too expensive to refine concentrated sodium chloride brine I have produced at the Salton Sea implies that a salt refining process in the Imperial or Coachella Valleys is somehow much more costly than the same process in any other part of the Country. I am asking for a copy of the analysis that led to the Tetra Tech conclusion, announced publicly today, that it is too expensive to refine salt from the sodium chloride brine from my process to justify selling the refined salt. I am also asking for a copy of the analysis you publicly promised to share that led to the inflated Tetra Tech estimate of capital and operation & maintenance cost of the project that I proposed. Both analyses should include all engineering and cost assumptions, all quotations, all cost bases, all engineering and cost analyses, all calculations, all conclusions reached, and the author(s) of the analysis. Best Regards, Tom Sephton" Eventually the Tetra Tech document was shared. Sephton Water Technology wrote and submitted a rebuttal to the assumption by Tetra Tech that the purified salt would have too much nitrate to be marketable by pointing out nitrate concentration data in the original proposal from pilot testing at the Salton Sea that proved most nitrate was removed and the residual levels were well within safe limits for human consumption, even without further salt refining. Having no prior knowledge of thermal desalination technology, Dr. Mark Wilf had escalated the capital cost of the thermal desalination system pilot tested at the Salton Sea five-fold by choosing a cost estimate from a Federal Government publication for a very different small scale thermal desalination technology and multiplying it up to large scale. Sephton Water Technology also provided a written objection to this unwarranted capital cost escalation. Several months after the original proposal, and long after dropping their reverse osmosis alternatives, Tetra Tech engineers requested more information from Sephton Water Technology on the original technology proposed. Extensive documentation was collected and provided by Sephton Water Technology including peer reviewed scientific papers, reports to Federal grant funding authorities, and extensive pilot testing data. However, in the end Tetra Tech chose to ignore the information provided and instead stuck with the substitution of their own September 2022 technology choices and cost estimates and invented new excuses to zero out the revenue from selling purified salt so vital to the original Concept 7 proposal. It was the Tetra Tech alternative Concept 7 that was evaluated for Effectiveness, Acceptability, Completeness, and Efficiency in the Draft LRP and scored poorly on several criteria by Tetra Tech's design and intent. Indeed Tetra Tech wrote many of the scoring criteria, conducted the technical scoring, and drafted 13 of their own competing proposals to meet the criteria that Tetra Tech had drafted.	

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 2 "1.2. Salton Sea Water Recycling Proposal (Sephton Water Technology) Sephton Water Technology developed a complete proposal… was described conceptually in the proposal (1)."	The process for treating highly saline water from the Salton Sea to produce very low salinity water has been developed through pilot testing at the Salton Sea by Sephton water technology. It is a Multi-Effect Distillation (MED) process using Vertical Tube Evaporators (VTE) in each effect. The process developed includes application of fluted vertical evaporator tubes, a vertical tube foam evaporation method (U.S. Pat. No. 3,846,254), and a dispersed seeded slurry evaporation method (U.S. Pat. No. 5,156,706) from prior decades of work combined with an ultrafiltration and nanofiltration membrane pre-treatment process developed at the Salton Sea that provides the dual benefit of enabling much higher thermal efficiency by operating at a higher top brine temperature enabling energy and capital cost savings and also yielding a brine concentrate that can be dried and sold as commercial solar salt, or further refined by vacuum crystallization to yield a very high grade salt product. The description of these processes in the April 2nd 2022 Restoration Concept 7 submittal was not highly detailed and technical, because the invitation for submissions was for "ideas or concepts" and therefore technical material was intentionally simplified to be "described conceptually in the proposal". Tetra Tech has used the simplified conceptual diagrams and description as a basis to attack Restoration Concept 7 as submitted on the grounds that some process steps and parameters were omitted, thus implying that the process pilot tested by Sephton Water Technology is flawed.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Text in the document has been revised based on the first paragraph.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 2-3 "• Some process steps, necessary for plant operation were omitted from the process description, as are some process parameters. ... includes other components related to the management of the Salton Sea."	Tetra Tech used the false claim of a flawed water treatment process as an excuse to replace the process submitted by Sephton Water Technology with an alternative, but never fully explained nor diagrammed, secret process devised by Tetra Tech employee Dr. Mark Wilf that claimed to add "in process steps that would be considered essential for a reasonably complete desalination system." Dr. Wilf ignored the detailed cost estimates and estimates of process performance provided by Sephton Water Technology in the original Restoration Concept 7 based on several years of pilot test data. Instead, Dr. Wilf's unexplained alternative process was used as the basis for performance and cost estimates rewritten by Tetra Tech. When Sephton Water Technology requested an opportunity to submit a revised Restoration Concept 7 to address the attacks by Tetra Tech and the changing technical evaluation criteria being drafted by Tetra Tech, the State's Long Range Planning process lead, Mr. James Newcomb absolutely refused to allow it. While Tetra Tech was free to revise the 4 Restoration Concepts it originally drafted for the State and expand them over several months into 13 variations, Sephton Water Technology was not allowed to make any revisions or clarifications to the Restoration Concept 7 description beyond the April 2nd 2022 submission. This facilitated Tetra Tech's replacement of the original Restoration Concept 7 from Sephton Water Technology with Tetra Tech's alternative, underperforming and vastly overpriced, alternative Concept 7 that was designed by Tetra Tech to fail the technical evaluation of Efficiency criteria written by Tetra Tech and evaluated by Tetra Tech's deeply flawed cost, performance, and hydrology modelling.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 3 "• The desalination equipment cost estimate presented here was prepared based on prices from recently received equipment quotes ... were significantly lower than this estimation."	The cost estimates prepared by Tetra Tech are for the alternative process substituted by Tetra Tech, not the process developed by Sephton Water Technology. Many of the costs listed by Tetra Tech simply do not apply to the process developed by Sephton Water Technology. Most significantly the "economic information published by the US Bureau of Reclamation for similar processes." is in fact estimated for a very different process, which is the basis of a completely unjustified five-fold escalation in desalination plant system capital cost imposed by Tetra Tech.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 3 "• The overall cost estimate provided by Sephton Water technology ..., as summarized in this appendix."	Tetra Tech's statement "but no cost or other detail information was provided for this source of water" is completely false. The cost estimating spreadsheet submitted on April 2nd 2022 with the original Restoration Concept 7 proposal was: Appendix_D_SSWRP_ProjectRevenueCostCalculation_2022_v06 On the second tab, lines 69 through 75 describe the costs for a wellfield delivering 50,000 AFY of brackish groundwater sourced from East Mesa into the Salton Sea using mostly existing brackish water conveyance infrastructure and rights of way. The basis for that wellfield cost was derived from a 2009 Imperial Integrated Regional Water Management Plan released by the Imperial Irrigation District (IID) and labelled as tab "IID Cost Basis 2013" in the same spreadsheet. If Tetra Tech failed to take note of certain lines of this essential spreadsheet, while selecting other lines for attack, it is Tetra Tech's failing.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 3 "• A cost item was also added to account for the construction of the brine evaporation ponds that would be needed to manage the outflow from the desalination system."	Tetra Tech did not need to add this cost item because lines 85 through 94 provide construction and operating cost estimates for an ongoing build out of mixed salt crust in shallow evaporation ponds to cover playa dust. The tab labelled "Salt Evaporation Pond Costs" detailed the evaporation pond configuration, the projected capital and operating costs, and defined the extent of playa coverage possible per quantity of salt produced. Over time, the build out would cover as much as 150 square miles of playa (96,000 acres) if needed, with several inches of salt crust concentrated close to saturation from the reject stream of the Sephton Water Technology developed Salton Sea desalination process and dried in the sun. One of two functions of the $240 million "water distribution pipeline" was to distribute the salt around Sea to flow down to emissive areas of playa as needed. This would eliminate PM10 dust from a vast area of exposed playa. Tetra Tech instead replaced this concept with higher cost per acre and less effective deep waste brine ponds in the South end of the Salton Sea basin. This was an effective strategy by Tetra Tech to make the Sephton Water Technology Concept appear ineffective for dust mitigation and overpriced compared to Tetra Tech's 13 competing Concepts.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 3 "The Salton Sea Water Recycling Proposal by Sephton Water Technology … to create low-salinity areas in this body of water."	The distillate return "to the Salton Sea to create low-salinity areas in this body of water." is in fact 15,000 acres of mid-term salinity and dissolved oxygen managed habitat for fish and birds placed in the Salton Sea to retain as much elevation as possible, plus smaller recreational lakes at the shoreline communities. These features were described and mapped in some detail in the Salton Sea Water Recycling Project Narrative and the costs were estimated in the appendices attached. These significant near to mid-term benefits of the original Restoration Concept 7 were not only ignored in this Tetra Tech Appendix G critique, they were ignored in the benefits analysis of Concept 7 in the Draft Long Range Plan. Perhaps because Tetra Tech so grossly inflated the cost of distilled water in the Tetra Tech version of Concept 7, the benefits were regarded as moot.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 3 "The process consists of a combination of different commercial water treatment technologies… Chemical storage and dosing systems were also omitted."	Restoration Concept 7, as submitted by Sephton Water Technology on April 2nd 2022, was a Concept level narrative as requested by the Salton Sea Management Program, with supporting documents. Where well know processes like pumping water and filtration system backwash were involved, detailed descriptions would not normally be expected in a Concept submission, therefore "other plant equipment and treatment processes are described in broad terms" in keeping with normal practice for a Concept level submission. The VTE-MED system does include some innovations, so more detail was used. However, all components were part of the Concept cost estimate, as noted above, Tetra Tech simply failed to note several key components and misunderstood others.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 3 "All the equipment prices, listed in the Sephton Water Technology proposal in Reference (1), are significantly lower than the equipment prices derived from recent and historical quotes or what would generally be considered as acceptable in the commercial desalination field."	Equipment prices listed in the Restoration Concept 7 project narrative (Reference 1) and the cost estimate spreadsheet (Appendix_D_SSWRP_ProjectRevenueCostCalculation_2022_v06) are based on quotations and/or cost data from published sources. In several cases prices are lower because Tetra Tech chose to inappropriately substitute more expensive equipment, sometimes four times more expensive to do the same job. [attached figure can be found in email attachment files] Figure 1. Salt Separation Process Proposed by Sephton Water Technology (Source: Reference 1)	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 4 "1.2.1. Process recovery rate ... the process recovery rate will be about 42%, 8,417/20,000 = 0.42085."	The interpretation and calculation above is a gross misrepresentation of the process in Figure 1 perpetrated by Tetra Tech to justify replacing the process in Figure 1 with an alternative process having a much lower actual recovery rate. Here is a definition of the recovery ratio for a desalination system (https://blog.harnrosystems.com/how-to-calculate-percent-recovery-and-what-affects-it-in-a-membrane-treatment-system): "Membrane systems operating at 82% recovery will convert 82% of the total raw water input into treated permeate, with the remaining 18% being sent to waste as concentrate (or reject)" [attached equation can be found in email attachment files] The upper left of Figure 1 shows that of 20,000 AFY pre-filtered ahead of the nanofiltration membrane systems, 10,000 AFY is returned to the Salton Sea. Dissolved solids are not concentrated in this 10,000 AFY stream, it is Salton Sea water at the same TDS as when drawn in and therefore not a desalination process concentrate. It does not need to go to waste. It can be returned to the Salton Sea to sustain elevation. The other 10,000 AFY is permeate from the ultrafiltration step, which is feed to the nanofiltration steps. The feed flow for the actual desalination process is 10,000 AFY and the correct calculation of the recovery ratio is: (10,000 AFY – (10,000 – (6,992 AFY + 1,425 AFY)) / (10,000 AFY) = 0.8417 or 84.2%	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 4 "Therefore, based Figure 1, ... proposed by Sephton Water Technology would be significantly higher per unit of water produced."	Sephton Water Technology is well aware that ultrafiltration can return less than 50% of the Salton Sea intake water to the Sea, we have received an analysis and quotation for ultrafiltration equipment with a 17% return but the pilot testing work completed used a very conservative 50% return so the water quality returned would not put an excess of small particles back in the Salton Sea adding more turbidity. Tetra Tech replaced the return of 10,000 AFY to the Salton Sea shown in Figure 1 with a reduced draw from the Salton Sea, but a greater share of non-concentrated Salton Sea water sent to brine ponds, claiming an improvement, but actually reducing the net recovery ratio, or conversion of seawater to distillate from 84% to 65%. This choice by Tetra Tech had negative consequences for overall process cost and was used by Tetra Tech to predict a net negative impact on Salton Sea elevation when the Sephton Water Technology version of Restoration Concept 7 would have a modest net positive impact.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 4 "More recent correspondence from Sephton Water Technology,… This would assume that the VTE-MED treats Salton Sea water without any pretreatment."	The overall desalination system recovery ratio of nanofiltration followed by distillation of both nanofiltration permeate and reject based on pilot testing of the combined process happens to be very similar to the measured 86% recovery ratio of the VTE-MED process on raw Salton Sea water. That's not an assumption, it's just a circumstantial outcome of measured recovery ratio from pilot testing of two alternative desalination processes, the process recovery ratio happens to be close. The statement above: "This would assume that the VTE-MED treats Salton Sea water without any pretreatment." may be a failure to carefully read and understand what was said in the "More recent correspondence from Sephton Water Technology…", The relevant excerpt from the October 11th 2022 document is: "Additionally Dr. Wilf assumed a much lower 60% total recovery rate than what has been achieved in VTE test data at the Salton Sea. Pilot testing with the VTE on UF/NF permeate yielded a 92% recovery of distillate. For a 20 MGD distillate capacity that gives about 22 MGD of UF/NF permeate feed with just under 2 MGD of purified salt brine for evaporation in salt ponds or refinement by vacuum crystallization. Optimization of the two pass NF process gave 95% recovery of purified sodium chloride brine by volume. That would give 1.2 MGD of mixed salt brine per 22 MGD of NF permeate. The total brine from both process steps would be just under 3.2 MGD giving a net 86% recovery of distilled water compared to the 13 MGD brine 60% recovery process that Dr. Wilf assumed without explanation. The same 86% recovery of distillate from Salton Sea water has been achieved in extensive VTE-MED pilot testing without the UF/NF pre-treatment, but yielding only impure brine." The question of how words were interpreted may not be an important point, but in his document entitled "7A. Water Recycling (VTE Desalination) Preliminary Cost Estimate, Draft 9/16/2022", Dr. Wilf stated: "The water recycling concept is based on the construction and operation of five desalting plants that each intake 33 MGD of water and produce 20 MGD of pure fresh water and 13 MGD of brine. Multiplying by five results in 100 MGD (112,000 AFY) of pure fresh water and 65 MGD (72,800 AFY) of brine to be evaporated." That calculates out to a recovery ratio of (33 MGD – 13 MGD) / (33 MGD) = 0.6061 or 60.6% which would require a much larger groundwater makeup volume than a net desalination system recovery ratio of 84.2% in order to offset negative elevation impacts on the Salton Sea.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.

Name	Organization	Section or Page	Comment	Response
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 5 "However, the process flow diagram provided by Sephton Water Technology, reproduced in Figure 1, ... The combined raw water losses would be close to 35%."	Tetra Tech does not explain how they calculate or what is really meant by: "The combined raw water losses would be close to 35%.". If Tetra Tech really means that 35% of the raw Salton Sea water intake to the system would be lost to filter backwash and membrane cleaning plus calcium sulfate precipitation, then 35% losses plus 65% recovery ratio equals 100% of the raw Salton Sea water intake meaning 0% brine. That makes no sense whatsoever. Something is very wrong with the 35% combined raw water losses claim by Tetra Tech. Tetra Tech engineers may not have read much of the papers, reports, and data submitted at their request on October 7th 2022, but if they had, they would have realized that the calcium sulfate precipitated is recycled in the DSSE process used in the secondary VTE-MED process to recover distilled water from the nanofiltration reject brine while concentrating the remaining 25% for use in shallow dust mitigation ponds. That water ends up there along with gypsum and is part of the overall recovery ratio already calculated.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 5 "Another component of water use, essential in evaporation desalination systems, … would reduce the value of the calculated process recovery rate."	As explained in a phone call with a Tetra Tech engineer, Dr. Sujoy Roy, the cooling water source for the lowest temperature effect of the proposed 60 effect VTE-MED is the filtered Salton Sea water feed to the nanofiltration process (ultrafiltration permeate), which would be heated in the condenser that cools the lowest temperature effect. The nanofiltration process runs more efficiently over 100°F so combining VTE-MED cooling with pre-heating feed to the nanofiltration unit is beneficial to the nanofiltration process efficiency. The mass flow of filtered Salton Sea feed water to a 60 effect VTE-MED will exceed the mass flow needed to cool the lowest temperature effect, so there is not a need for additional seawater to serve cooling alone. Therefore the Tetra Tech statement: "Including seawater usage in the cooling loop would reduce the value of the calculated process recovery rate." is not true. The heat exchangers required and flow paths through them are not included in Figure 1. Neither are the periodic filter and membrane backwash and cleaning cycles because inclusion of all of those process details would make the simplified one page conceptual diagram unreadable. Figure 1 is barely readable as it is.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 5 "1.2.2. Sizing of the equipment components, …, or only 95% of the designed daily flow capacity of the low salinity product water."	It's not clear how Tetra Tech derives the 22.7 MGD UF system filtrate flow. That number was not in the updated cost estimates provided to Tetra Tech on November 2nd 2022. The UF system filtrate flow would need to be 23.8 MGD to yield 20 MGD of distillate.	This flow was derived from the Sephton design for the UF system, and is related to the $49,849,315 cost estimate provided by Sephton Technologies. Tetra Tech developed an independent design for a 20 MGD system with similar components and came up with a cost of $213,091,023 (Section 1.2.5 in Appendix G). The 22.7 MGD number was not used by Tetra Tech in any calculations.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 5 "1.2.3. Calculation of the electric power requirement and geothermal steam requirement for the proposed process …, proposed by Sephton Water Technology would increase by about $300/AF."	The price of $0.0045 per pound of steam was a price quote from a geothermal power company operating on the Salton Sea Known Geothermal Resource area. The price was based on what that geothermal company could get to convert that steam to power and sell it at a market rate. The price quoted therefore much more real than Tetra Tech's guesswork on what the rate might be. Tetra Tech assumes an "electric rate price of $0.12/kWhr". Tetra Tech's assumed electric rate is almost double the typical rates that geothermal power generators actually sell power for. The price of $0.12/kWh is closer to a retail rate for electric power than the wholesale rates that geothermal power companies actually get. Tetra Tech's rate assumption also ignores that fact that, by selling geothermal energy as heat (direct sale of steam) rather than as electricity, the geothermal company saves the cost of buying, maintaining, and operating, turbines, generators, and high voltage electrical equipment. They also save the cost of fees paid to utilities to accept power onto the grid and to transmit the power to buyers. Tetra Tech's proposed near doubling of the cost of steam to a $0.12/kWh electrical equivalent is unjustified and defies logic.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 5-6 "Another issue is the very high thermal performance efficiency assumed by Sephton Water Technology for the proposed VTE–MED system, …. which will concentrate a very high salinity Salton Sea feed."	The high thermal performance is not an assumption, it's an estimate based on scaling pilot test data from VTE units desalinating highly saline Salton Sea water to high concentration. The data was collected by operating a pilot scale VTE-MED over a range of 15 effect conditions based on available non-commercial geothermal steam sources at the Salton Sea. The data was published in a peer reviewed paper (Comment reference 1) and yielded a performance ratio of 14 pounds of distillate per 1,000 BTU, which reasonable for 15 effects in an MED system. The innovation is to increase that performance ratio to 56 by going from 15 effects to 60 effects. Several factors make this possible: 1.The non-commercial geothermal steam from the atmospheric flash step of the triple flash geothermal process used at the Salton Sea geothermal plants limits a VTE-MED process to 15 or 16 effects between the 212°F temperature of the steam and the 95°F summer afternoon temperature of both local cooling towers and the Salton Sea surface, but by buying high pressure geothermal steam at up to 403°F from new geothermal plants that have been designed, and in some cases permitted, but not yet built the available geothermal steam temperature range can support 60 effects. 2.The geothermal steam comes at a significant cost, although less than Tetra Tech might think, so making the most efficient use of steam that's technically and economically feasible makes sense. The thermal performance of an MED plant increases linearly with the number of effects rising very close to one pound of distillate per pound of steam in gain output ratio and also one pound of distillate per 1,000 BTU for each effect added provided there is a at least of few degrees of temperature difference between each MED effect and provided thermal losses are minimized. Of course capital cost of the core evaporator units also increases linearly with the number of effects. 3.The usual limit to the number of effects in a seawater MED system is not the steam temperature available, but the top brine temperature that is feasible to operate at and the concentration ratio that can be achieved without problematic scaling of the evaporator surfaces. The nanofiltration pre-treatment process developed at the Salton Sea by Sephton Water Technology and a few expert advisors is highly effective at removing the ions that cause mineral scaling thus enabling a much higher top brine temperature than when operating with raw seawater. The DSSE process has also been highly effective with raw untreated Salton Sea water. This makes it possible to use many more effects than typical seawater MED systems can consider. 4.Newly developed thermoplastic evaporator tubes have high thermal conductivity and high resistance to scaling and fouling. They can replace metal evaporator tubes with similar thermal performance and much superior resistance to scaling and corrosion. New thermoplastic materials are also available for other system components like evaporator tube sheets. Newly developed high temperature epoxy coatings have been shown to protect standard metals like stainless steel pipes and vessels from corrosion by very high salinity brine concentrate at high temperatures. This avoids the need for very high cost materials like titanium. The new materials and process innovations listed make it possible to achieve much higher thermal performance than is typical in the industry to date and the local geothermal resource can provide the 24/7 renewable heat to make that possibility a reality. The statement by Tetra Tech: "By comparison, the energy provided by the geothermal steam listed by Sephton Water Technology as a sufficient energy source for production of 20 MGD of distillate (2) is equivalent to a Performance Ratio of 69.4 lb distillate/1,000 BTU" is a miscalculation by Tetra Tech in apparently using a wrong enthalpy value. The steam input to the 60 effect VTE-MED is 120,000 lbs/hr of geothermal steam obtained from the plant at up to 403°F, then de-superheated to a first effect steam inlet temperature of 392°F. Coolant enthalpy is from the worst case top summer Sea surface temperature of 95°F. That will provide a heat input to the VTE-MED system of (120,000 lb/hr)(1,201.8 BTU/lb – 63.05 BTU/lb) = 136,651,200 BTU/hr. The minimum performance ratio to get 20 MGD is 51 pounds of distillate per 1,000 BTU. Calculating distillate production in MGD: (136,651,200 BTU/hr) (51 lbs/1,000 BTU)(24 hr/day)/(1,000 lbs)/(8.3333 lbs/gal)/(1,000,000) = 20.1 MGD. For a 60 effect VTE-MED, a performance ratio of 51 pounds of distillate per 1,000 BTU is reasonable to achieve compared to Shoaiba 2 "with 10 thermal effects and the Performance Ratio of 14.6 lb distillate/1,000 BTU".	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 6 "Clearly, there is a significant gap between the thermal efficiencies of the modern commercial thermal desalination units and the VTE–MED system proposed by Sephton Water Technology."	Clearly there is a gap between the performance of other units and what is needed at the Salton Sea. At the Salton Sea the price Government agencies are willing to pay for environmental restoration water is $0 per acre foot. The gap in thermal efficiencies proposed for VTE-MED at the Salton Sea versus existing commercial seawater MED units is no mistake, it's the point, to dramatically reduce the cost and environmental impact of thermal desalination with more efficient technology.	The analysis presented in Appendix G of the Long-Range Plan is an independent cost and technology evaluation. The disagreement from Sephton Water Technology is noted, and included for review during the next phase of feasibility analysis.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 6 “1.2.4. System Cost Provided by Sephton Water Technology, ... this amount will cover equipment and plant construction.”	Tetra Tech misinterprets what total plant cost means when claiming that the $49.85 million on Page 37 of the April 2nd 2022 Restoration Concept 7 Narrative covers everything needed to produce 20 MGD of distillate. The cost breakdown on Page 37 only covers one 60 effect 20 MGD VTE-MED thermal desalination plant. The cost of the pre-treatment nanofiltration systems on Page 38 are also part of the plant cost, as is the Salton Sea water intake cost in Appendix O. One $49.85 million 20 MGD VTE-MED plant is supplied with nanofiltration permeate by four 6 MGD nanofiltration plants at $16.5 million each or $66 million total plus a floating intake system on a barge in the Salton Sea at $792,024 each. That comes to $116.64 million to produce 20 MGD of distillate. Additionally one 5 MGD 15 effect VTE-MED driven by non-commercial steam and recovering distilled water from the nanofiltration reject is part of the complete water treatment process at a capital cost of $25,369,589 with a cost breakdown shown in Appendix D of the April 2nd 2022 Restoration Concept 7 submission.	The equipment cost listed in the proposal submitted by Sephton Water Technology was lower than the same commercially available equipment quoted from reputable suppliers. The independent cost estimation in Appendix G was based on: (a) recent quotes; (b) quotes for similar equipment from past projects, adjusted for the equipment price index increase; and (c) cost estimation based on a similar equipment, using the “cost-to-capacity” calculation method. The independent cost estimation in Appendix G followed the process proposed by Mr. Sephton and applied plant cost calculations and operation and maintenance calculations following a typical process used for other water treatment projects in the past. A 20% cost contingency was applied to the final estimation of the plant cost because of the uncertainty related to this new technology. Mr. Sephton claims that the cost of a 20 MGD VTE-MED system will be about $50M, whereas the cost developed through the independent estimate is about $213M. The independent estimate of the system was derived from the quote for a brine concentrator provided by GE Water to the US Bureau of Reclamation and a recent survey of brine concentrator equipment costs, conducted by Dr. Mike Mickley. The VTE-MED, proposed by Mr. Sephton, and brine concentrators operate in a similar feed salinity range, and both operate as a thermal distillation process. The major cost components of commercial equipment of this technology consists of cost of material of construction (metal alloys), manufacturing labor and cost of installation equipment on site. Compared to the brine concentrator, which could have 1 – 4 heat exchange effects, the VTE-MED, proposed by Mr. Sephton will have 60 heat exchange effects. Larger number of heat exchange effects will require a significantly larger area of heat exchange surfaces, therefore more than proportional larger weight of metal tubes in the heat exchange effects. The experts of US Bureau of Reclamation, estimated cost of a single brine concentrator unit of a capacity of 5 MGD, updated to today’s price, as about $85M. As previously mentioned, the cost of a 20 MGD VTE-MED, listed in the Mr. Sephton proposal is about $50M compared to about $213M, using the same calculation approach as included in the US Bureau Reclamation report. Considering the large number of heat exchange effects (compared to brine concentrator), it is possible that the actual cost of the proposed VTE-MED, will be even higher than estimated.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 6-7 "1.2.5. Revised VTE–MED System Cost Prepared by Tetra Tech The cost estimation for the desalination system. …, about 22% of the cost of the system derived from the Reclamation report data."	Rather than correctly analyze the detailed costing presented in the Restoration Concept 7 submission, Tetra Tech is trying to justify their decision to replace the high efficiency and high capacity VTE-MED technology with an alternate technology, small scale thermal brine concentrators. There is one technology similarity in that brine concentrators commonly use Vertical Tube Evaporators (VTE) because these are better able handle very high TDS brines than other types of evaporators. However, there is a major difference in scale, method of operation, and thermal efficiency between VTE-MED technology and thermal brine concentrators. The thermal brine concentrators are generally designed for small scale applications with a typical maximum design capacity of 1.5 MGD and more commonly 1 MGD or less. Brine concentrators typically use only one effect, and sometimes up to four effects. Therefore they typically operate at lower thermal efficiency than a large scale MED plant. Brine concentrators typically use Mechanical Vapor Recompression (MVR) or Mechanical Vapor Compression (MVC) powered by electricity to compress part of the exhaust vapor, thereby heating it and reintroduce it the evaporator to improve efficiency and drive the process without a continuous need for hot steam. This is useful if the only steam source is a fuel fired on-site boiler. MED plants in contrast are typically installed as part of a cogeneration operation in series with a thermal power plant that can provide a continuous source of hot steam at a low to moderate cost. The next three pages are copied from the relevant section of Appendix G Reference 4 entitled: "Brine-Concentrate Treatment and Disposal Options Report, Southern California Regional Brine-Concentrate Management, Study – Phase I, Lower Colorado Region, US Bureau of Reclamation (October 2009)" [the attached pages can be found in email attachment files] Tetra Tech used this reference to replace the detailed cost estimates developed by Sephton Water Technology for a 60 effect 20 MGD VTE-MED with a one line cost estimate for single effect 1 MGD VTE mechanical vapor recompression brine concentrators. This cost estimate was scaled by Tetra Tech by extending a scaling formula suggested in the reference. The first page of the next three shows a process schematic of the single effect brine concentrator using a vertical tube evaporator (labels 2 and 3) and a mechanical vapor compressor to recycle vapor (label 4). The primary energy input to this type of brine concentrator is electrical energy to run the vapor compressor. Some steam is needed at startup. The feed (label 1) is identified as membrane reject because these brine concentrators are normally used to reduce in volume or eliminate brine discharge from RO systems. Unlike MED, brine concentrators like this are not normally used directly on seawater or other natural source water because they are expensive to purchase and operate. The second copied page below continues the process explanation. The third page below explains a few disadvantages and shows in table 2.9 the capital cost estimates that Tetra Tech used to replace the VTE-MED cost estimates with brine concentrator cost estimates. What Tetra Tech has done with this substitution a small scale high unit cost technology for a large scale lower unit cost technology, is to grossly inflate the cost of a 20 MGD 60 effect VTE-MED system from $49,849,315 per 20 MGD unit (excluding the intake and nanofiltration pre-treatment systems) to $213,091,023 per 20 MGD system, or the $51,196,000 figure above for a 5 MGD scale up of the 1 MGD cost, which is a 5 fold scale up of the 0.2 MGD base unit cost, multiplied again by four to get to 20 MGD scale, then adding inflation cost from 2009. To illustrate what's being done by multiplying up all these costs from a small scale technology to take the place of direct costing of a large scale technology, please consider a transportation analogy. Imagine if you owned or managed a sports team. You might need for your team to travel around the country to different cities for games. You could purchase a new tour bus to carry 20 players and coaches from city to city, then hire a driver, and pay to fuel up the bus. Your team would arrive in time for each game and hopefully be somewhat rested and ready to play. Alternatively you could choose to buy 20 new limousines, hire a driver for each, and pay to fuel each limo to get your players and coaches from city to city. The players might enjoy the special treatment of a private limo, but the franchise's budget could be quite strained from buying and maintaining a fleet of limos and drivers. Tetra Tech has chosen the 20 limousine option by costing based on typical 1 MGD brine concentrators and applied that choice to revise the cost of a single 20 MGD VTE-MED plant, the equivalent of the tour bus option. Both are capable of doing the job, but one option is much more costly than the other. Sephton water technology did explain the inappropriate substitution of brine concentrator technology in a written rebuttal to Tetra Tech's cost analysis on November 2nd 2022. Tetra Tech did not respond directly, but Tetra Tech has used Appendix G Pages 6-7 to double down on their choice to replace the single plant 20 MGD VTE-MED costing with a cost based on multiple brine concentrators.	The equipment cost listed in the proposal submitted by Sephton Water Technology was lower than the same commercially available equipment quoted from reputable suppliers. The independent cost estimation in Appendix G was based on: (a) recent quotes; (b) quotes for similar equipment from past projects, adjusted for the equipment price index increase; and (c) cost estimation based on a similar equipment, using the "cost-to-capacity" calculation method. The independent cost estimation in Appendix G followed the process proposed by Mr. Sephton and applied plant cost calculations and operation and maintenance calculations following a typical process used for other water treatment projects in the past. A 20% cost contingency was applied to the final estimation of the plant cost because of the uncertainty related to this new technology. Mr. Sephton claims that the cost of a 20 MGD VTE-MED system will be about $50M, whereas the cost developed through the independent estimate is about $213M. The independent estimate of the system was derived from the quote for a brine concentrator provided by GE Water to the US Bureau of Reclamation and a recent survey of brine concentrator equipment costs, conducted by Dr. Mike Mickley. The VTE-MED, proposed by Mr. Sephton, and brine concentrators operate in a similar feed salinity range, and both operate as a thermal distillation process. The major cost components of commercial equipment of this technology consists of cost of material of construction (metal alloys), manufacturing labor and cost of installation equipment on site. Compared to the brine concentrator, which could have 1 – 4 heat exchange effects, the VTE-MED, proposed by Mr. Sephton will have 60 heat exchange effects. Larger number of heat exchange effects will require a significantly larger area of heat exchange surfaces, therefore more than proportional larger weight of metal tubes in the heat exchange effects. The experts of US Bureau of Reclamation, estimated cost of a single brine concentrator unit of a capacity of 5 MGD, updated to today's price, as about $85M. As previously mentioned, the cost of a 20 MGD VTE-MED, listed in the Mr. Sephton proposal is about $50M compared to about $213M, using the same calculation approach as included in the US Bureau Reclamation report. Considering the large number of heat exchange effects (compared to brine concentrator), it is possible that the actual cost of the proposed VTE-MED, will be even higher than estimated.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 7 "Another reference point could be the cost of regular MED systems used for desalination of seawater. … No commercial MED unit with more than 15 thermal effects has been built and is operational (9)."	Tetra Tech does admit above that the costs of a large scale commercial MED system for seawater is on the order of $120 million for a 20 MGD MED plant. That is not far apart from the total intake, nanofiltration, and 20 MGD 60 effect VTE-MED desalination system cost estimated by Sephton Water Technology at $116.6 million. In spite of that admission, Tetra Tech is still insisting on using brine concentrators as the basis for costing the VTE-MED plant, insisting on limos instead of the tour bus option so as to keep the capital cost as high as Tetra Tech think they can get away with. The reasons for going to 60 effects were explained earlier, in short they are: much more efficient use of geothermal steam, take advantage of higher temperature geothermal steam sources that will become available as lithium is developed, and eliminate the need for an outside source of cooling water. The nanofiltration pre-treatment process coupled with the use of newly available thermoplastic materials and high temperature anti-corrosion epoxy coatings break through old MED limitations of 10-15 effects by controlling high temperature mineral scaling much more effectively than in the past. Tetra Tech could have simply clearly stated that they were choosing to eliminate the VTE-MED technology developed by Sephton Water Technology at the Salton Sea and replace it another technology of their choice, brine concentrators. That would be technically feasible, but there would be a very high electrical demand as well as very high capital and operating costs. Brine concentrators would be capable of evaporating and concentrating Salton Sea water even as it becomes increasingly hypersaline. But Tetra Tech did not choose to explicitly replace VTE-MED with brine concentrators. Instead they chose a more devious path, to replace the cost estimates that Sephton Water Technology provided for 20 MGD VTE-MED systems with cost estimates for as many as twenty 1 MGD brine concentrators at much greater total cost thereby making it appear that Sephton Water Technology had grossly underestimated the cost of VTE-MED systems. This strategy serves Tetra Tech's commercial interest. Initially Tetra Tech had come up with alternative Concepts 7B and 7C, both using the Reverse Osmosis (RO) technology that Tetra Tech has expertise in designing and implementing. The original Sephton Water Technology alternative became, for a month or two, Concept 7A.When Tetra Tech's own analysis showed that RO would not work at the hypersaline Salton Sea, Concepts 7B and 7C were retracted. Tetra Tech has no experience or expertise in designing or installing brine concentrators and therefore would not be well placed to win a contract to implement that technology. Therefore Tetra Tech has no commercial incentive to openly promote replacement of VTE-MED technology with brine concentrators. However Tetra Tech does a commercial incentive to discredit Sephton Water Technology and the VTE-MED process so that it cannot compete with the berms and earthworks and pumping projects that Tetra Tech does have experience with including six variations on two Concepts that Tetra Tech originally designed and Tetra Tech's more recent conceptual level design work on at least two other Concepts with seven variations. Therefore it is in Tetra Tech's commercial advantage to inflate the cost of Restoration Concept 7 in order to eliminate it from consideration. Tetra Tech VP Dr. Bill Brownlie's public statement years ago is playing out. Since Tetra Tech dropped its proposals (7B and 7C) to do desalination at the Salton Sea, Tetra Tech is working to see to it that Sephton Water Technology will not be allowed to do desalination at anything more than a pilot scale at the Salton Sea by finding every excuse available to discredit Restoration Concept 7.	Concepts 7B and 7C were investigated to evaluate a wide spectrum of concepts, but were eliminated from further consideration because distillation technologies are expected to be the most viable application at the Salton Sea. At the next stage of feasibility analysis, the VTE-MED technology could be considered among other distillation technologies.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 7-8 "Yet another issue related both to system cost and durability is the selection of construction materials. ... These components include evaporators and heat exchangers (10, 11)."	Sephton Water Technology has been working with Salton Sea water over a 15 year period often concentrating it to saturation in stainless steel vessels and pipes using both titanium alloy and copper nickel evaporator tubes. Corrosion is an issue that needs to be controlled. A thin layer of high temperature epoxy coating has been effective in protecting saltwater wetted surfaces of stainless steel vessels from corrosion for many years. Titanium evaporator tubes have been very effective in the most challenging locations, specifically direct exposure to geothermal steam on one side and concentrated brine on the other. Recent testing of heat conductive thermoplastic tube material has been resistant to geothermal steam corrosion and is rated to perform very well with high brine concentration. Copper nickel has been effective and durable in contact with clean steam and concentrated Salton Sea water. Tetra Tech engineers can make phone calls, but years of actual experience with Salton Sea water and geothermal steam has value as well.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 8 "Additional supporting information regarding proper construction materials for the proposed application was received from the Nickel Institute (12). ... The process proposed by Sephton Water Technology does not include a deaeration step."	Tetra Tech's claim that "The process proposed by Sephton Water Technology does not include a deaeration step." is completely false. If Tetra Tech engineers had gone to the trouble to actually read some of the detailed reports, papers, and information they asked for, they would have noticed the deaerator in the upper left of the VTE Pilot Plant process diagram below (Figure 2) which is in both reports and a 2017 conference paper (Reference 1). Or if they had ever taken the long drive from their offices in Pasadena they could have seen the tall grey vessel right in the middle of the VTE Pilot Plant photo below (Figure 3) and maybe asked what it's for. They would have heard that it's the deaerator used to fully de-aerate Salton Sea water before it flows into the rest of the system. Or the intrepid Tetra Tech engineers could have used their phone or e-mail skills and asked me if we use a de-aeration step. Maybe they didn't want to know. [attached figures can be found in email attachment files]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 8 "Based on the multiple factors above, the higher cost estimate for the VTE-MED system developed by Tetra Tech, as compared to the original Sephton Water Technology estimate (1), is considered justified. The results of calculation of the plant cost are summarized in Table 1"	For all of the multiple reasons explained above, particularly the substitution of a multiplicity of inappropriate and overly costly brine concentrators in place of the 20 MGD 60 effect VTE-MED systems, "…the higher cost estimate for the VTE-MED system developed by Tetra Tech, as compared to the original Sephton Water Technology estimate (1), is…" completely unjustified.	The equipment cost listed in the proposal submitted by Sephton Water Technology was lower than the same commercially available equipment quoted from reputable suppliers. The independent cost estimation in Appendix G was based on: (a) recent quotes; (b) quotes for similar equipment from past projects, adjusted for the equipment price index increase; and (c) cost estimation based on a similar equipment, using the "cost-to-capacity" calculation method. The independent cost estimation in Appendix G followed the process proposed by Mr. Sephton and applied plant cost calculations and operation and maintenance calculations following a typical process used for other water treatment projects in the past. A 20% cost contingency was applied to the final estimation of the plant cost because of the uncertainty related to this new technology. Mr. Sephton claims that the cost of a 20 MGD VTE-MED system will be about $50M, whereas the cost developed through the independent estimate is about $213M. The independent estimate of the system was derived from the quote for a brine concentrator provided by GE Water to the US Bureau of Reclamation and a recent survey of brine concentrator equipment costs, conducted by Dr. Mike Mickley. The VTE-MED, proposed by Mr. Sephton, and brine concentrators operate in a similar feed salinity range, and both operate as a thermal distillation process. The major cost components of commercial equipment of this technology consists of cost of material of construction (metal alloys), manufacturing labor and cost of installation equipment on site. Compared to the brine concentrator, which could have 1 – 4 heat exchange effects, the VTE-MED, proposed by Mr. Sephton will have 60 heat exchange effects. Larger number of heat exchange effects will require a significantly larger area of heat exchange surfaces, therefore more than proportional larger weight of metal tubes in the heat exchange effects. The experts of US Bureau of Reclamation, estimated cost of a single brine concentrator unit of a capacity of 5 MGD, updated to today's price, as about $85M. As previously mentioned, the cost of a 20 MGD VTE-MED, listed in the Mr. Sephton proposal is about $50M compared to about $213M, using the same calculation approach as included in the US Bureau Reclamation report. Considering the large number of heat exchange effects (compared to brine concentrator), it is possible that the actual cost of the proposed VTE-MED, will be even higher than estimated.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 11 "1.2.6. Operating Costs and Derived Water Cost Appendix G, Page 13 "1.2.7. Purity of water harvested from the Salton Sea Page 3: "The locations where Salton Sea water will be recycled will also produce a stream of concentrated Salton Sea brine containing a mixture of salts and small organic molecules."	This excerpt from the Restoration Concept 7 original submission is an example of cherry picking to mislead the reader. The full quote shows that the mixture of salts and organic molecules are not going to wind up in the salt for sale, they are instead destined for use as a base layer in shallow lined evaporation ponds to eliminate PM 10 dust: Restoration Concept 7 Submittal 4/2/2022 Page 3: "The locations where Salton Sea water will recycled will also produce a stream of concentrated Salton Sea brine containing a mixture of salts and small organic molecules not removed by coarse filtration. This mixed brine stream will be 5% to 10% by volume of the hypersaline Salton Sea water drawn in by the water recycling systems. It will need to be delivered to high emissivity areas of Salton Sea playa as those areas become exposed. The mixed salt brine will fill salt crust evaporation ponds to eliminate PM10 dust from those sections of exposed playa. Since the mixed salt brine will contain organic matter and low concentrations of some contaminants present in Salton Sea water, some pure salt brine may be used over a dried, mixed salt crust to dry and cap the crust with pure crystallized salt."	The commenter has asserted that restoration costs could be offset by the sale of salt. While this strategy provides a promising alternative to disposal of salt by other means, whether the market could accommodate the mass of salt generated is unclear. A market study would need to be conducted to determine if the cost of processing, packaging, and transporting the salt would be offset by the value of salt sales. While this topic was already addressed on Page 114 of the LRP under Brine Management for Concept 11, the above discussion is added to Page 105 for Concept 9.
Tom Sephton	Sephton Water Technology, Inc.	Page 4: "In the last century the quality of the salt dissolved in the Salton Sea has been degraded by agricultural drainage and some industrial waste. ... Fertilizer runoff stimulates a massive growth of microorganisms that decay to release a wide range of organic molecules."	This excerpt is also an example of strategic cherry picking by Tetra Tech. The more complete text is much more positive: Restoration Concept 7 Submittal 4/2/2022 Page 4: "In the last century the quality of the salt dissolved in the Salton Sea has been degraded by agricultural drainage and some industrial waste. The sodium chloride in the Salton Sea is now mixed with a substantial portion of sulfate from agricultural drainage, significant amounts of magnesium, and a modest amount of calcium, potassium, and bicarbonate, plus trace amounts of a wide range of elements. Fertilizer runoff stimulates a massive growth of microorganisms that decay to release a wide range of organic molecules. Fortunately, in the last couple of decades new filtration technologies like microfiltration and ultrafiltration have proven methods to separate micro-particles and microorganisms from saltwater and nanofiltration technology can separate ions of various sizes and charges. These technologies combined with distillation make it feasible to recover purified sodium chloride of commercial quality similar to what was harvested from the dry lakebed in the late 1800's. New more energy efficient distillation technology makes recovery of high purity water also feasible in a combined pure water recycling and pure salt recovery process. The market value of the purified salt at $220 per metric ton (USGS bulk FOB 2021 data) is sufficient to fully offset the cost of recycling the water from the Salton Sea. In this combined process, the hypersaline nature of the current Salton Sea is actually a benefit because more pure salt can be recovered and sold per volume of Seawater recycled."	The commenter has asserted that restoration costs could be offset by the sale of salt. While this strategy provides a promising alternative to disposal of salt by other means, whether the market could accommodate the mass of salt generated is unclear. A market study would need to be conducted to determine if the cost of processing, packaging, and transporting the salt would be offset by the value of salt sales. While this topic was already addressed on Page 114 of the LRP under Brine Management for Concept 11, the above discussion is added to Page 105 for Concept 9.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 13 "Notably, fertilizers and pesticides in agricultural runoff could have resulted in the contamination of the seawater. ... At this time, potential presence of these impurities is considered to be an uncertainty for evaluating the future economic value of this salt."	This argument is a somewhat modified rehash of an illogical excuse written by Dr. Mark Wilf dated September 2nd 2022 in an attempt to justify ignoring sale of purified salt from the Salton Sea as a way to provide revenue that could fully offset the cost of the process. This pay for itself economic model was at the center of Restoration Concept 7 as submitted by Sephton Water Technology on April 2nd 2022. Tetra Tech employees have aggressively attacked this aspect of Concept 7 from the first discussion up to today. Any Salton Sea restoration concept that has the potential to fully pay for itself might be seen as a threat to Tetra Tech's 25 year business model at the Salton Sea of extracting millions of tax dollars from the public while building nothing that actually works. Tetra Tech should rethink that business model and find a way to profit from something that can work. Dr. Wilf's September 2nd 2022 document was a previous version of Appendix G entitled: "Investigation of Desalination Methods for Restoration of the Salton Sea, Prepared by Mark Wilf, Ph.D. " For identification of quotations it will be referred to as Wilf Investigation 9/2/2022 In his critique of the Salton Sea Water Recycling Proposal (aka. Restoration Concept 7), Dr. Mark Wilf makes a critically mistaken assumption that the proposed filtration pre-treatment process that will feed purified sodium chloride to the VTE-MED system will fail to remove significant amounts of nitrates and low molecular weight organic compounds. The following is how Dr. Wilf states that case: Wilf Investigation 9/2/2022 "The Salton Sea is of high salinity, greater than 60,000 mg/l. The major dissolved ionic components are sodium and chloride ions. However, due to agricultural runoff inflow, the Salton Sea water also contains very high concentrations of sulfate, about 11,000 mg/l. The agricultural runoff results in additional contamination of water by fertilizers and organic matter. The proposed process of salt production includes steps of water filtration, using media filtration and ultrafiltration. The filtration process will remove practically all suspended and colloidal particles from the treated water. The filtration step will be followed by processing water with two pass nanofiltration (NF) systems. Processing of Salton Sea seawater with NF membranes will reduce concentration of sulfates and most of other divalent ions. The majority of sodium and chloride ions will pass through the NF membranes. The NF membranes used for separation of sodium and chloride ions from the sulfate ions are open type membranes. These types of membranes have very low rates of rejection of nitrates and of small molecular weight organics." Data from the bench and pilot testing of the proposed UF/NF process on Salton Sea water clearly demonstrates that this assumption of very low rejection rates is mistaken for the actual process as developed at the Salton Sea by Sephton Water Technology. The chemical analysis of a pilot test run of Ultra-Filtered (UF) Salton Sea feed water to the Nano-Filtration (NF) process, permeate from the first and second passes of NF treatment, and subsequent concentration of the NF permeate in a Vertical Tube Evaporator (VTE) to high concentration that yielded 92% recovery of distilled water from the 99% sodium chloride permeate brine. This data includes analysis for nitrate in the brine. Figure 4 shows nitrate in UF treated Salton Sea fed to the two pass NF process at 503 mg/kg of brine with a calculated TDS of 46,400 mg/kg at the time several years ago that the pilot test was run. Figure 5 shows nitrate in the permeate brine after 2 passes of NF treatment at 2.38 mg/kg of brine, a nitrate rejection of 99.5%. That's less than the sulfate rejection of 99.97%, but still a very substantial rejection in spite of the nitrate ion being a monovalent anion. The nitrate contribution to dissolved solids in the second pass NF permeate is 0.012% in a TDS of 19,400 99% of which is sodium chloride.	The commenter has asserted that restoration costs could be offset by the sale of salt. While this strategy provides a promising alternative to disposal of salt by other means, whether the market could accommodate the mass of salt generated is unclear. A market study would need to be conducted to determine if the cost of processing, packaging, and transporting the salt would be offset by the value of salt sales. While this topic was already addressed on Page 114 of the LRP under Brine Management for Concept 11, the above discussion is added to Page 105 for Concept 9.

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			Dr. Mark Wilf goes on to state that: Wilf Investigation 9/2/2022 “The process of water evaporation in the VTE equipment and the evaporation ponds will not remove nitrates or organic contaminants, present in the NF permeate. Therefore, there will be a need for an extensive purification of the dried salt, to remove all contaminants, in order to produce a refined grade salt. The cost of construction and operation of the salt purification system could be quite significant.” [attached figures can be found in email attachment files] Figure 4. Nitrate in Salton Sea feed water to NF process Figure 5. Nitrate in permeate after two passes of NF on Salton Sea water Figure 6. Nitrate in permeate after two passes of NF and brine concentration in VTE The first sentence is mostly true. Figure 6 shows that, after concentration in the VTE to 92% recovery of distilled water from the brine, the concentration of nitrate rises to 15.4 mg/kg in a TDS of 159,000 mg/kg. However, that is only a 0.0097% nitrate contribution to dissolved solids in the concentrated second pass NF permeate. Concentrated brine from this same pilot test run of Salton Sea water UF/NF permeate was allowed to dry gradually at ambient temperature exposed to sunlight. The crystallized salt was sampled and shipped to a lab for both chemical analysis by mass spectrometry and X-ray Diffraction analysis. The X-ray Diffraction analysis identified minerals in the salt sample as halite (99.3 weight %), sylvite (0.4 weight %) and quartz (0.3 weight %). The chemical analysis showed higher nitrate in the crystalized halite, and a little sylvite, at 0.226% of total mass. This is still a low content of nitrate in the solar evaporated salt product from the process proposed. The nitrate figures given are for solar evaporation pond salt known in the industry as “solar salt” and sold to consumers in bulk for use in water softeners and swimming pools. The domestic commodity price for solar salt is $120 per metric ton in the most recently available report from USGS. If that salt were to be sold as table salt, which it would not, the amount of nitrate in an average daily intake of sodium for an adult in the USA (3,400 mg) would come to 7.7 mg of nitrate in the solar salt. That would be far less than the 24 to 387 mg of nitrate in a single 100 g serving of spinach. With respect to nitrate, there would be no need for refinement whatsoever. However, if table salt were refined from Salton Sea sourced salt using the typical vacuum pan, or other vacuum crystallization method on the brine concentrate from the UF/NF followed by VTE-MED process, the nitrate content would be even lower. Refined salt fetches the higher price of $220 per metric ton FOB according to the most recently available USGS data, which is enough increment to pay for the refining process in a region where heat is available at a reasonable price.	

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			The other possible issue with the quality of the solar salt raised by Dr, Mark Wilf on 9/2/2022 is low molecular weight carbon compounds in the Salton Sea water. These compounds are present in untreated Salton Sea water. When Salton Sea water is concentrated in a VTE-MED process absent the pre-treatment by the proposed UF/NF process, then the brine develops a yellow color due to these low molecular weight carbon compounds. Literature data supporting this can be found in a Department of Energy publication on Salt gradient solar ponds at the Salton Sea (M. L. Peelgren, January 15, 1982, JPL Publication 81-108, DOE/JPL - 1060 – 44). This color, and hence the organic compounds, can be removed by filtration with activated charcoal. Low molecular weight removal by activated charcoal filtration from highly concentrated Salton Sea brine without UF/NF pre-treatment has been verified by pilot testing. The concentrated brine, and crystallized salt, from VTE concentration of Salton Sea permeate after pre-treatment by the UF/NF process pilot tested was completely clear with no sign of the yellow color that would have indicated the presence of low molecular weight carbon compounds. There is no evidence to show that these low molecular weight carbon compounds are a problem in the salt produced by the proposed process. However, samples from prior testing can be analyzed to prove that. Dr. Mark Wilf's assertion that "…there will be a need for an extensive purification of the dried salt, to remove all contaminants, in order to produce a refined grade salt." Is not supported by the data. Dr. Mark Wilf uses an erroneous assumption about high nitrates and possibly high levels of low molecular weight carbon compounds in the salt. The word nitrates has been struck from the current version of Appendix G and replaced by nebulous terminology "Some residual ionic components of the fertilizers and small molecular size organics are not well rejected by the open-type NF membranes" Maybe this was done to make it harder to show with chemical analysis data that this is a false argument. Nitrates can be measured. A nebulous term like "Some residual ionic components of the fertilizers" will not appear on a lab report, but nitrates in the salt was and still is the issue that Tetra Tech is trying to raise. The other difference is that now Tetra Tech has thrown pesticides into the mix to try to make up excuses to ignore sale of purified salt to offset project costs. If it's still Dr. Mark Wilf writing the latest version of Appendix G, as a membrane expert, he should know that nanofiltration membranes are used to remove a wide range of pesticides from natural water sources. Due to biodegradation of modern pesticides, the concentration of pesticides in the water column of the Salton Sea is low in most places, other than where the New and Alamo Rivers carry agricultural drainage into the Sea. Pesticides reported in the Salton Sea's tributary Rivers include: Cyhalothrin, Chlorpyrifos,Removal by NF process >99% Diazinon,Removal by NF process 99.52% Disulfoton, Malathion,Removal by NF process 99.64% Mirex. Pesticides reported detected in the Salton Sea itself include:	

Name	Organization	Section or Page	Comment	Response
			Atrazine (maximum 0.234 µg/L in 2008), Removal by NF process 93%-97.5% Desethyl-Atrazine (maximum 0.018 µg/L in 2008), Desisopropyl-Atrazine (maximum 0.013 µg/L in 2008), Hydroxyatrazine (maximum 0.3 µg/L in 2011), Cyfluthrin (maximum 0.004 µg/L in 2007), Diazinon (maximum 0.027 µg/L in 2006), Removal by NF process 99.52% Dioxathion (maximum 0.039 µg/L in 2009), Disufoton (maximum 0.053 µg/L in 2006), Dimethoate (maximum 0.067 µg/L in 2002), Hexachlorohexane (maximum 0.0015 µg/L in 2002), Endosulfan (maximum 0.001 µg/L in 2003), Removal by NF process 100% Heptachlor Epoxide (maximum 0.001 µg/L in 2003), Dieldrin / Aldrin (maximum 0.001 µg/L in 2003),Removal by NF process 89.69% DDE(p,p') (maximum 0.001 µg/L in 2002)Removal by NF process 95.07% All of these pesticide levels in the Salton Sea itself are below EPA standards for water bodies. Even if the erroneous assumptions by Tetra Tech were true, it would not provide a logical basis to ignore the very substantial reduction in net operating cost that can be obtained by selling the millions of tons of commercial quality purified salt that would be produced by the process rather than just dumping it in evaporation ponds indefinitely. Figure 7 shows the logical basis that Dr. Wilf uses to dismiss the sale of salt produced by the UF/NF VTE-MED process proposed in the Salton Sea Water Recycling Project (Restoration Concept 7). Figure 7. Logic Dr. Mark Wilf uses to Dismiss Selling the Salt Product [attached figure can be found in email attachment files] Dr. Mark Wilf's use of this flawed line of reasoning to eliminate sale of salt by the Salton Sea Water Recycling Project from consideration is devastating to the economics of the Project. Due to the errors in the analysis, sale of salt to offset costs should be reinstated in Restoration Concept 7 and used to offset OMER costs. The offset will be dramatic.	
Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 14 "CAPITAL COST ESTIMATE We have assumed that a total of 20 wells would be required to produce the total flow of 31,000 GPM. ... The average depth of the pipeline would be assumed to be 4 feet below ground surface."	The wellfield capital costs at $44,068,000 are lower than was estimated by Sephton Water Technology at $45,963,605.16 per well field for two well fields so no objection other than the false statement that no wellfield costs were included in the original Restoration Concept 7 submission.	The original report provided by the commenter did not identify the well field cost as a line item. However, a spreadsheet was provided that did include the referenced costs and the text has been revised to delete the statement noted by commentor. The estimated costs from both approaches are similar enough for the planning level analysis performed for the LRP.

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Tom Sephton	Sephton Water Technology, Inc.	Appendix G, Page 14 "1.2.9. Summary of System Costs for the Sephton Water Technology Concept The total system costs show in Table 7 were estimated based on the need for five desalination plants, each with a water production of 20 MGD, brine evaporation ponds, treated water distribution pipeline, and a groundwater well system to provide an additional 50,000 AFY of water to the Salton Sea."	The following tables and descriptions include several revisions to Dr. Mark Wilf's cost estimates based on some of the key issues of profound disagreement raised in these comments. These revisions do not account for near all the differences, just some of those described in these Comments. A more accurate cost and revenue estimate is included in greater detail in the original Restoration Concept 7 submission on April 2nd 2022. [attached tables were can be found in email attachment files] 7A. Water Recycling (VTE Desalination) Preliminary Cost Estimate Draft 9/16/2022 Revision 11/1/2022 TS Desalting System. The water recycling concept is based on the construction and operation of five desalting plants that each intake 23.8 MGD of water and produce 20 MGD of pure fresh water and 3.3 MGD of brine. Multiplying by five results in 100 MGD (112,000 AFY) of pure fresh water and 16.5 MGD (18,482 AFY) of brine to be evaporated. The cost of an individual plant is estimated at $301 million. Assuming a 10% economy of scale, the cost of five plants is estimated at 5 X 0.9 X $588 million, which equals $1.35 billion. These costs do not include any allowance for site development or land acquisition, which would need to be added. The cost of conveyance infrastructure from plants to projects is not included. A Perimeter Pipeline would cost roughly $240 million to construct under road right of ways. The operating costs for five plants are estimated as follows: [attached table can be found in email attachment files] This concept requires steam to operate the distilling process, which is assumed to be purchased at power equivalent market price from nearby geothermal power stations. This assumption is based on a previous price estimate from a local geothermal developer reached at the scale for this concept. Importantly for consideration, energy cost is typically a major cost factor for operating a desalting plant. Evaporation Ponds. The evaporation ponds for Concept 7A would be used to evaporate brine from the desalting process and would provide dust control within the footprint of the ponds. Costs for evaporating pond systems for this and other concepts are based on estimates for the Saline Habitat Complex (SHC) that is part of the North/South Marine Sea Concept 1A. The base cost per acre is based on the original estimate for SHC presented in the CNRA Preferred Alternative Report and Funding Plan (May 2007) updated to 2022 dollars. The escalation factor was derived from the California Construction Cost Index, https://www.dgs.ca.gov. The original estimate for the SHC from 2007 was approximately $30,000/acre. The escalation factor from 2007 to 2022 is 1.9, resulting in a current estimate of $59,000/acre. In developing a conceptual level cost estimate for this concept, consideration was given to the recent experience of constructing vegetation projects on the soft sediments of the exposed lakebed. Working on these soft sediments is costly and requires the use of mats for standard construction equipment or specialized equipment like mudcats. Based on these combined factors, the original cost estimate for SHC is expected to be a reasonable starting point for Concept 7A. However, because the system would not require pumping of Salton Sea water into the upper reaches as some habitat projects would, the unit cost was discounted by 20%, which reduced the unit cost to about $47,000/acre or roughly double the cost of normal salt evaporation ponds. Approximately 72,800 AFY of brine would need to be evaporated. Evaporation rates at the Sea would be slowest in the winter. The winter rate for evaluation plus some seepage was estimated at ½ foot per month. Dividing the total brine production of 18,482 AFY by 12 months results in a little over 1,540 ac-ft per month, divided by 0.5 ft, results in a total pond area of just over 3,080 (close to the near term rate playa exposure) acres multiplied by the unit cost of $47,000/acre yields $145 million for evaporation ponds. The annual operating cost for the SHC in 2007 was estimated at approximately 5% of the capital cost. Using this same factor, the annual operating cost for the evaporation ponds is $2,350/acre/year. The annual unit cost times 3,080 acres yields an operating cost of $7.2 million/year. Total Cost. The combined capital and operating cost for the plants and pond system is estimated as follows, including revenue from the sale of 1.4 million tons of solar salt plus $1.8 million tons of refined salt annually using 2030 purified salt production as a basis. Revenue offsets all operating costs and can make payments against amortized capital costs sufficient to pay off the coat of capital over the life of the project. [attached tables can be found in email attachment files]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.

Name	Organization	Section or Page	Comment	Response
William Patterson	Coachella Valley Water District	General Comment 1: Whitewater River	Throughout the document, a distinction is lacking between the Whitewater River and the Coachella Valley Stormwater Channel (CVSC). The Whitewater River empties from the Whitewater River canyon into the Coachella Valley near Interstate 10 and soon thereafter becomes ephemeral flow and joins the Whitewater River Stormwater Channel (WRSC) infrastructure. The WRSC terminates and the CVSC begins just east of Point Happy near Washington Boulevard in La Quinta. The CVSC is an upland constructed conveyance that captures and conveys stormwater, drainage, agricultural return flows, and treated wastewater. Downstream of Valley Sanitation District in Indio, the CVSC is a perennial reach, continuing 17 miles to the confluence with the Salton Sea. Identifying the CVSC as the Whitewater River results in inaccurate findings and assumptions and will incorrectly attribute CVSC impairments, beneficial uses, and water quality objectives, respectively, to the Whitewater River. While this has been addressed in some sections, the lack of adequate differentiation remains in parts of the Plan and Appendices.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We will clarify with USACE where Whitewater River becomes the Coachella Valley Stormwater Channel in future steps of the Feasibility Study. We understand the distinction being made, but also note that many public maps refer to the channel as "Whitewater River," and thus have retained this usage in most maps in the document.
William Patterson	Coachella Valley Water District	General Comment 2: Land Access Ownership	CVWD is concerned the project may lack the coordinated review and approvals needed to allow continued operations and maintenance of irrigation pipelines and agricultural drains which supply return flow to the Salton Sea. CVWD operates and maintains US Bureau of Reclamation (BOR) Irrigation Pipelines along the northern banks in Riverside County. In addition, CVWD owns, operates, and maintains numerous agricultural drains, both underground pipes and open channels, along the north banks in Riverside County. The approximate limits are along Ave 86 on the west boundary of the Salton Sea, proceeding clockwise along the banks of the Salton Sea to approximately Hot Springs Road and Highway 111 near the border of Riverside and Imperial Counties. These drains and pipelines are within easements or fee owned land. These easements may not appear on title reports. Each easement may have different restrictions on what activities can be done within the easement. Project proponent should request from CVWD through public records request the location of easements, drains, and pipelines by providing specific APNs. If a conflict exists between the Project and CVWD/BOR facilities, the Project Proponent shall contact CVWD to coordinate and if necessary, obtain necessary permits/permissions to work within the easements and right of ways. Although the SSMP plans to coordinate with landowners for programmatic land access, consideration should also be made for easement holders on those parcels.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We acknowledge that any Federal or State project on CVWD land should be developed in close coordination with CVWD, and that such coordination will be a part of future project development and feasibility analysis.
William Patterson	Coachella Valley Water District	General Comment 3: Sustainability for Agriculture	The document should contain perspective on the certainty of agricultural drain flows in consideration of long-term reliance for project implementation. The Salton Sea has been designated as an agricultural sump and return flows to the Salton Sea depend upon sustainable agricultural practices and continued existing land uses. Threats to the sustainable nature of agriculture include reduced Colorado River water supplies, conversion to urbanized areas, habitat and recreation features adjacent to the Salton Sea, and other land use changes. The SSMP must take into consideration the sustainability of agricultural return flows which is not fully analyzed in the document. The SSMP project water quality objectives, such as those for lakes and ponds that support aquatic species and habitat, could result in increased regulatory requirements on the agriculture community and irrigation agencies, which could impact continued agricultural land use and related inflows to the Salton Sea. The SSMP should put forth plans that do not conflict with agriculture and provide certainty in achieving project water quality objectives by analyzing water quality, volumes, future projections, to in turn develop a successful and sustainable project.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We acknowledge that uncertainty relating to future hydrology as it relates to land-use and policy should be further investigated as part of the next phase of planning during the Feasibility Study.

Name	Organization	Section or Page	Comment	Response
William Patterson	Coachella Valley Water District	General Comment 4: Baseline Conditions	CVWD has concern that the baseline conditions and assumptions in the 10-Year Plan may be serving as an inaccurate baseline for the evaluation of LRP concepts. The SSMP recently drafted an Environmental Assessment for the SSMP Phase 1 :10-Year Plan, and released the document for public review. CVWD commented on this document along with others, and the Corps nor SSMP has yet to respond and finalize the document. Further the 10-Year Plan projects have only partially been implemented, and specifically limited progress has been made on the North Lake Project or North Lake Demonstration Project. Implementation of these projects may lead to better informed planning efforts of the LRP concepts and future feasibility analysis. Although CVWD recognizes and appreciates the actions the SSMP has taken in 2021 and 2022, including planning progress for the North Lake Demonstration Project, CVWD feels complete environmental review and project implementation at the north end of the Salton Sea are necessary prior to moving forward with LRP concept evaluation and recommendations. In evaluation of project LRP concepts the SSMP has not reflected the playa conditions accurately. The SALSA2 model and/or exposed playa models used to depict and calculate exposed playa coverage do not account for wetland and ponded habitats that have formed naturally on the playa since the Salton Sea shoreline has begun to recede. Contrary to the modeled expectation these modeled wetland complexes, which often form at drain confluences and spread in parallel to the shoreline playa depressions, provide resilience to emissivity and dust sources on the playa while also providing unique and functional habitat. These wetland habitats represent a new transmission feature at the interface between agriculture land and open water areas of the Salton Sea, not realized in the former Salton Sea elevation. These habitats have proven functional for various shorebirds as well as Desert Pupfish. Although the SSMP may have a preference to build on existing analysis', reliance on outdated conclusions may lead to the exclusion of important information in the project design and evaluation criteria. Although this topic was brought up in the LRP committee meetings, it does not appear to have been addressed. SSMP should recognize this important step and need for accurate baseline conditions in evaluation of LRP alternatives. Further, impacts to these existing habitats should also be a consideration for the LRP alternative selection process and feasibility analysis, as it remains unclear how impacts to existing jurisdictional resources could affect permitting processes with regulatory agencies. Considerations include costs associated with the with implementation for each of the alternatives, project siting and size, avoidance, minimization, compensatory mitigation, and unanalyzed environmental impacts.	Thank you for your review of the Draft Long-Range Plan. The hydrology in the EA for the Phase 1 10-Year Plan has been updated and is aligned to be consistent with the Long Range Plan. We acknowledge the formation of smaller scale features such as wetlands near discharge locations, and these will be incorporated in the designs on individual projects. The Long Range Plan is intended to provide high-level concepts, with further refinement expected based on actual measurements of ground conditions, and consideration of existing functional habitats.
William Patterson	Coachella Valley Water District	Section 1.4, Page 8: Feasibility Analysis and Environmental Review	The LRP states: "2. Feasibility and Environmental Review and Analysis. The following step is starting the feasibility analysis and environmental documentation in compliance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). This phase is expected to take three years, beginning in January 2023, and concluding with a recommended action." The relationship between a feasibility study and environmental review document should be more clearly described. It appears these are two independent phases to be undertaken in sequence. Granted the LRP will put forth project alternatives to be further analyzed for feasibility, it's unclear if and how the feasibility study may be used to identify alternatives for environmental review under NEPA and CEQA. CVWD recommends the context and use of the LRP and comments received be clarified as it relates to environmental review. Furthermore, while the Independent Review Panel (IRP) is in the process of completing an updated Feasibility Study for the recommended water importation proposals that were selected (UC Santa Cruz, 2022), environmental review does not appear to be identified for this IRP task. CVWD recommends the SSMP describe their approach with considerations for consistency in environmental review for the Imperial Streams Salton Sea Tributaries Feasibility Study and the IRP Water Importation Long Team Feasibility Study, context for both, and clarification on the integration in a single final document, if planned.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Feasibilty Study will adhere to NEPA and CEQA, and ultimately culminate with an environmental document
William Patterson	Coachella Valley Water District	Section 3.1, Page 22-27: Salton Sea Inflow Projections	The LRP states, "Projected Hydrology analysis is described in Appendix B, uncertainty remains regarding Colorado River water allocation and project Salton Sea inflows.". Along with the LRP, Appendix B should be provided to reviewers and available for revision as an outcome of public review. Changes to the Hydrology Appendix could lead to a change in the results of the alternatives analysis. It's unclear if the appendices are closed for further review or editing when incorporated into the USACE's future Feasibility Study and or Environmental Review. Granted the changing conditions and uncertainty with Colorado River water allocations into the future, the SSMP should consider this flexible approach option into the future, and adapt as needed. A statement regarding the status of the Hydrology Appendix as complete or in-progress should be included. Figure 3-1 depicts stabilized inflow at year 2035, and a model limit at year 2060. The document should describe the basic interpretations of the model timeline and assumptions depicted for these years. For example, Coachella Valley inflows maintain under all 3 scenarios (Table 3-3) yet each scenario model has substantially different inflow volumes. Please refer to the comments below on the hydrology appendix, and update in the LRP as necessary, as clarity may aid the readers in understanding the values provided.	Thank you for your review of the Draft Long-Range Plan. Appendix B provides this additional detail on the hydrology development.

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William Patterson	Coachella Valley Water District	Section 3.4, Page 29: Air Quality Evaluation	Dust emission data is collected by IID (2020) and utilized to analyze project success measure for air quality. A map showing the emissivity results produced by IID should be included. The California Department of Water Resources (DWR) is currently collecting its own Air Quality data, including that on the Coachella Playa, to verify through an independent process the emissivity results observed by IID. The LRP should outline how DWR and the SSMP integrates newly gained information, such as data potentially indicating new emissive areas are identified, in contrary to data from IID. The LRP describes that CALMET/CALPUFF modeling is still underway and results will be used to update PM10 fraction and emissivity analysis for each LRP project alternatives. The time frame to completion of the CALMET/CALPUFF monitoring should be included. It remains unclear if the LRP Air Quality analysis can be relied upon until this data collection and analysis is completed. Please address the adaptability of this information and how it relates to completed LRP evaluations.	Thank you for your review of the Draft Long-Range Plan. Air quality modeling information is updated in the Final Long Range Plan as Appendix E. This Appendix was not complete when the Long Range Plan was first posted online in December 2022., but was posted in February, which initiated the final public review period.
William Patterson	Coachella Valley Water District	Section 3.4, Table 3-4, Page 32: Greenhouse Gas Emissions	Table 3-4 summarizes GHGs through 2050. Context for the year 2050 timeframe should be included, as opposed to 2060 used in Hydrology modeling. Table -3-7 also uses a 50 year project time frame to calculate annual emissions. An additional column should be included in table 3-4 which would help in defining the relative difference between each alternative. For example, the table could include a column for the exceedance of a given air quality threshold, or a metric to evaluate the significance of differences in metric tons of CO2 for each alternative over the given time frame. A statement regarding the conclusion of the analysis is unclear, but it appears that the lowest GHG emitting proposal is given priority regardless of whether the modeled GHG's emission consistent with the Air Quality Basin Plan and if differences between each of the alternative's GHG emissions are significant.	Thank you for your review of the Draft Long-Range Plan. Table 3-4 shows a single year in the middle of the century as an example. The appendix with added calculations contains data for the 21st century (Appendix F). The comment about the scoring of the GHG emissions is noted for further analysis in the Feasibility Study.
William Patterson	Coachella Valley Water District	Section 4.1.1, Page 37-39: Uncertainty in Future inflow	The LRP text states that, "95 percent of the inflow to the Salton Sea comes indirectly from the Colorado River, through discharges from IID and CVWD lands, and from Mexico." However, agricultural return water is the primary source of inflow to the Salton Sea. These flows are from coalescing agricultural return created by individual agricultural producers in the watershed as the LRP describes. These inflows should not be confused with wastewater discharges permitted through NPDES permits, or from lands owned by CVWD. To avoid any confusion, CVWD recommends clarifying the use of this terminology regarding "discharges from CVWD lands." The LRP states, "By examining these three hydrologic scenarios (probabilistic inflows), we can identify the extent to which concepts are resilient to future water policy changes." Uncertainty in Salton Sea inflows can be exacerbated by changes in land use around the Salton Sea. An example of this land use change is from agricultural production to urban development in response to population increase and or urbanization. Land use planning that supports the viability of agriculture practices, also support the hydrologic inflows to the Salton Sea. Further, well thought out water quality objectives for SSMP Habitat projects that do not place burdensome requirements on agricultural inflows, can avoid a hindrance to agricultural activities, and support continued inflow to the Salton Sea and SSMP projects. CVWD requests changes to land use be identified in the discussion regarding uncertainty to Salton Sea inflows.	Long-Range Plan sections updated as noted by commenter.
William Patterson	Coachella Valley Water District	Section 5, Page 44-46: Restoration Concepts	The LRP states, "The SSMP Phase 1: 10-Year Plan serves as a foundation for the concepts that are part of Phase 2. The Phase 1: 10-Year Plan includes four large habitat projects, multiple smaller habitat projects, and several revegetation projects designed to mitigate dust emissions." CVWD previously submitted comments to the USACE and SSMP regarding the 10-Year Plan Environmental Assessment NEPA document. These comments have not been addressed, some of which expressed concerns for information included in the 10 Year Plan. CVWD has concern the LRP concepts are based conclusions form the draft 10-Year Plan, which could change as projects are implemented and lessons learned. In descriptions of restoration concepts the basis mentions previous conceptualization rather than the 10-Year Plan EA. For example, restoration concept one is described to have been built upon the 2006 Ecosystem Restoration PEIR. CVWD recommends the plan include steps for the inclusion of information gained in the 10-Year Plan Final Environmental Assessment, and implementation of those projects. The LRP states the 10-Year plan described in the Draft EA serves as a reasonably foreseeable baseline condition for evaluating concepts that are part of the LRP. As a starting point, it was assumed that all components of the 10-Year Plan would be incorporated in all LRP restoration concepts. CVWD does not agree that a baseline should be driven by an unfinalized, yet to be implemented 10-year plan outlined in a draft environmental review. The long-term approach appears to rushed and could be better informed with a solid baseline of projects implemented in the 10 year plan EA and developed based on proven concepts.	Thank you for your review of the Draft Long-Range Plan. The comments on the NEPA document are being addressed for public release of the Phase1: 10-Year Plan EA, and key features of the hydrology analysis are consistent. The Long-Range Plan restoration concepts build upon the best current representation of Phase 1:10-Year Plan projects. While uncertainty still exists regarding specific projects witihin the 10-Year Plan, this approach gave us the most confidence to predict how concepts would interact with Phase 1 projects.

Name	Organization	Section or Page	Comment	Response
William Patterson	Coachella Valley Water District	Section 5.2.1, Page 49: Components of Phase 1:10-Year Plan, North Lake Projects	The LRP implies the North Lake Project (NLP) can be expanded from the North Lake Demonstration Project (NLDP). The LRP states "the NLP would include a proposed area of up to 3,862 ac and be designed to be compatible with the NLDP." To truly be a demonstration project the NLDP and NLP should have similar water quality objectives and utilize similar sources of water. Specific water quality targets for salinity should be identified as salinity levels will directly affect environmental conditions, including, but not limited to, invasive species, pupfish predation, and selenium sequestration, which represent limiting factors in project success for aquatic habitat. The LRP identifies three sources of water may be available to sustain the NLP ponds: (1) the Whitewater River/CVSWC; (2) local agricultural drains; and (3) the Salton Sea. For the 3,862-ac lake area, the estimated inflow required is about 50,000 AFY, of which 20 percent, or 10,000 AFY, would need to be from saline water pumped from the Salton Sea, and the remaining 40,000 AFY would need to be supplied by local surface water flows. Limited details are provided on how this water is to be provided in a sustainable manner while meeting water quality objectives for the NLP, considering that some of the water supplies identified for the NLDP, namely pumped groundwater from wells, are different from those in the NLP. In the 10-Year Plan EA pumped groundwater is fully allocated for existing uses identified in approved water management plans. These concerns can be rectified by providing pumped groundwater from an adjacent groundwater basin, as discussed with CVWD. CVWD recommends the SSMP include specific water details when building LRP projects from the 10 Year Plan projects. detailed water quality objectives for the NLP and NLDP.	Thank you for your review of the Draft Long-Range Plan. Comment noted, and specific comments related to water sources and water quality will be addressed in further development of the North Lake Project. This will be distinct from the high-level analysis described in the Long-Range Plan.
William Patterson	Coachella Valley Water District	Section 7, page 155: Evaluation of Restoration Concepts	CVWD made the recommendation during LRP meetings that concept individual scores should be shared by the SSMP that help derive the final score, and can be reviewed by the LRP committee. CVWD also followed up on several occasions via written email to request that individual concept scoring sheets be provided. Although final scores for each criteria rating are provided, it is not possible with the information provided to comment on how the scores were determined. CVWD recommends that individual criteria scoring be organized by each individual concept with detailed explanations for each final scoring breakdown. This would more readily help to identify a concept's strong suits and areas in need of refinement towards the LRP objectives, and provide commenters opportunity for meaningful input into the end results of the LRP findings. A more suitable approach to cumulative concept tables would be to show how each of the criteria and scenarios were compiled, such as a final ranking table, to define how the LRP recommendations were determined.	Thank you for your review of the Draft Long-Range Plan. Comment noted and SSMP agrees that the LRP process could have benefited from additional iteration of scoring with LRPC. We spent more time than expected to develop the criteria with the LRPC and the public, which did not leave enough time for a very iterative scoring process. In the draft plan, we provide a summary of each concept with the draft scores for public review.
William Patterson	Coachella Valley Water District	Section 8.2, page 187: Recommendations	As stated above, a lack of information regarding individual concept scores for each criteria makes this section a challenge to comment on with meaningful input for the authors. It appears this section is incomplete as the cumulative scores for each concept have not been presented, nor is there a minimum score threshold for when a concept is not recommended for further evaluation. Given the entire LRP has been a quantitative exercise in scoring specific concept criteria, a final table would be a visual aid that helps to validate and summarize the qualitive explanations for the recommendations provided. Assuming each criteria evaluated and presented in section 7 holds a similar weighted factor in the overall findings, the final table would serve as an unbiassed presentation of information developed in coordination with the LRP committee, and ideally would support the recommendations or assist to identify caveats. CVWD recommends individual scoring sheets be shared and explained, organized by concept type, and cumulative criteria scores combined in a final ranking table representing the different inflow scenarios. Further, the recommendations do very little to recommend a combined concept taking into consideration the limitations and benefits from the concepts analyzed, a potentially valuable outcome of the process.	We agree that a summary table should be incorporated for reviewers. This table has been added to the Final LRP.
William Patterson	Coachella Valley Water District	Hydrology Appendix B, Section 4.2 page 24	The information regarding projected Coachella Valley Stormwater Channel and Agricultural Drains included in this section was derived from the 2010 Coachella Valley Water Management Plan Update which was updated in 2021. The latest version is the 2022 Indio Subbasin Water Management Plan Update: Sustainable Groundwater Management Act (SGMA) Alternative Plan. The current Water Management Plan does not include desalination of drain water by CVWD, focusing instead on maximizing development of recycled water for irrigation to reduce groundwater withdrawals and meet the water needs for projected population growth, housing needs, and development that will result in increased municipal demands. CVWD recommends that this section be updated to reflect the current planning assumptions.	Thank you for your review of the Draft Long-Range Plan. The section in question is in a chapter entitled 'Previous Modeling of Inflows to the Salton Sea with SALSA2' and describes work done in 2018. A footnote was added to this section to state that updated assumptions from the 2022 Indio Subbasin Water Management Plan Update are included in Section 6 of Appendix B, and used for LRP hydrologic modeling.
William Patterson	Coachella Valley Water District	Hydrology Appendix B, Section 6.2, Table 16, Page 58	The combined Coachella Valley flows for the High, Low, and Very Low Probability Scenarios, which is 70,000 acre-feet per year for all three scenarios, were derived from the 2022 Indio Subbasin Water Management Plan Update (Figure 7-37 Simulated Drain Flow for Future Scenarios) utilizing the projected flows for the Future Projects with Climate Change scenario (orange line). This figure is replicated in this Appendix B - Hydrology and Climate Change as Figure 41. As discussed with the project team, this graphic includes only subsurface flows from the farm tile drainage systems that intercept return flows from applied irrigation water and rising groundwater. As presented in Table 16 of Appendix B, it appears that Coachella Valley flows to the Salton Sea are decreasing from Scenario 1 Baseline Flow. However, this is only because point discharges (e.g., from POWTSs) to the Coachella Valley Stormwater Channel are not included in the subsurface flows projected in Figure 41. CVWD recommends that the value of 70,000 acre-feet per year be footnoted to clarify this point.	Thank you for your review of the Draft Long-Range Plan. The Long-Range Plan was updated as suggested by the commenter at the first discussion of the 70,000 AFY value, in the text describing Figure 41.
William Patterson	Coachella Valley Water District	Hydrology Appendix B, Section 6.2.2, Page 60	This section states that the scenario of 70,000 acre-feet per year selected as most appropriate for Coachella Valley from Figure 41 (Future Projects with Climate Change scenario, orange line) "represents the total inflow to the Sea from the Coachella Valley, including the gaged CVSC." As explained in the prior comment, this graphic includes only subsurface flows from the farm tile drainage systems and not the point discharges to the Coachella Valley Stormwater Channel. CVWD requests that this sentence be corrected to "This represents the total inflow from the tile drainage system to the Sea from the Coachella Valley, including from the gaged CVSC."	Thank you for your review of the Draft Long-Range Plan. The Long-Range Plan was updated as suggested by the commenter.

Name	Organization	Section or Page	Comment	Response
Carole Rubinstein-Mendel			It is my belief that the Draft Long Range Plan fails to achieve the goals set by the 2003 Salton Sea Restoration Act. That Act included not only improved air & water quality but the restoration of a long-term stable aquatic & shoreline habitat. The Draft Long Range Plan also did not give Ocean Water Imports a fair hearing. It is via Ocean Water Imports that all the goals could be achieved: affordable & feasibly.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.
Jasmyn Phillips			I recommend ocean water importation as the long-range plan and preferred alternative to carry out Salton Sea restoration as defined in the Ca. Fish and Game Code § 2931: (1) Restoration of long-term stable aquatic and shoreline habitat for the historic levels and diversity of fish and wildlife that depend on the Salton Sea. (2) Elimination of air quality impacts from the restoration projects. (3) Protection of water quality. (d) For the purpose of the restoration plan, the Salton Sea ecosystem shall include, but is not limited to, the Salton Sea, the agricultural lands surrounding the Salton Sea, and the tributaries and drains within the Imperial and Coachella Valleys that deliver water to the Salton Sea. Ca. Fish and Game Code § 2940: (1) Protect and provide long-term conservation of fish and wildlife that are dependent on the Salton Sea ecosystem. (2) Restore the long-term stable aquatic and shoreline habitat for fish and wildlife that depend on the Salton Sea. (3) Mitigate air quality impacts from restoration projects using the best available technology or best available control measures, as determined by the South Coast Air Quality Management District and the Imperial County Air Pollution Control District. (4) Protect water quality. (5) Maintain the Salton Sea as a vital link along the Pacific Flyway. (6) Preserve local tribal heritage and cultural values associated with the Salton Sea. (7) Minimize noxious odors and other water and air quality problems. (8) Coordinate with local, state, and federal agencies that are responsible for air quality, endangered species, and other environmental mitigation implementation requirements of the Quantification Settlement Agreement. (9) Enhance economic development opportunities that will provide sustainable financial improvements benefiting the local environment and the economic quality of life for communities around the Salton Sea. Water importation is the only logical long-range plan to allow the Legislature to fulfill its obligation for a genuine, whole-Sea restoration and supports the LRPC goals of equity, social and environmental justice. I strongly recommend the 2021 RFI Water Importation Project Proposals be properly and fairly evaluated in an unbiased and legitimate study, and the Independent Review Panel's findings on ocean water importation and recommendations be rejected due to a flawed, improper and legally questionable evaluation process.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
Rebecca T. Zaragoza	Leadership Counsel for Justice and Accountability		1. The Draft LRP must develop an actionable pathway to achieve the successful integration and implementation of community amenities and multi-beneficial infrastructure alongside SSMP dust suppression and habitat projects. Leadership Counsel has long supported residents in advocating for the integration of community amenities and multi-beneficial infrastructure (MBI) in SSMP projects. Over the past year, we have appreciated the effort that CNRA, Better World Group (BWG), and other organizations have made in building out a specific Salton Sea Community Amenities Strategy (the Strategy) for these project components. However, the Draft LRP does not present a pathway for implementing this strategy alongside identified SSMP projects. Community residents, as voiced in several of CNRA's public SSMP meetings, have requested to see detailed action plans with strategies that the state will use to implement their priorities. While we await the release of the Strategy, CNRA and partnering agencies must continue identifying actionable policy and programmatic ways of supporting the long-term implementation and sustainability of community amenities and MBI in conjunction with SSMP dust suppression and habitat conservation projects. Actions that can support this include: ● CNRA-led advocacy to target funding for community amenities and MBI from state budget and/or legislative opportunities, including funding for continued public engagement and participatory budgeting. In the last several years, LCJA has submitted specific budget recommendations annually that can be used as examples that CNRA and other advocates can collectively support. ● Identifying additional funding sources that support community and climate resiliency and actively pursuing these resources in partnership with other agencies/organizations. ● Stronger coordination with public health entities to facilitate funding and implementation of community amenities. ● Updating the project acceptability criteria to include stronger parameters around centering community involvement. Our advocacy on community amenities and MBI does not intend to place responsibility of the broader infrastructure needs of the Salton Sea region on CNRA, rather to encourage and expand the state's efforts to restore the Salton Sea and protect public health holistically, while simultaneously advancing the state's environmental justice and climate goals in a highly disadvantaged region. The Bombay Beach Wetland Project is a good example of how community engagement informed the development of the project which now integrates habitat conservation, dust suppression, and public access. Overall, we recognize and appreciate CNRA's efforts to address the need for community amenities and MBI in connection with the Salton Sea restoration efforts, but strongly urge the state to support this with a clear and enforceable pathway for implementation.	Thank-you for your review of the Draft Long-Range Plan. Significant work was done to evaluate how community ammenities could be incorporated for each concept. More specific actions would be identified through the feasibility study as higher level details are completed. The SSMP continues to evaluate opportunities to incorporate recommendations received for multi-benefit infrastrucuture as part of current and future SSMP projects. The SSMP commissioned a consultant to gather public input from past public comments, working group sessions, public meetings, and a community survey to help identify broad needs in the Salton Sea Region. The Salton Sea Management Program and Community Needs Report identifies specific actions that the SSMP is currently doing to incorporate community needs and what potential actions may be taken as future projects of the program are funded and staffed.

Name	Organization	Section or Page	Comment	Response
Rebecca T. Zaragoza	Leadership Counsel for Justice and Accountability		2. The Draft LRP must include additional considerations in the proposed projects. Upon reviewing the projects proposed in the Draft LRP, we have multiple concerns about thelong-term success and sustainability of the projects. To begin, the projects presented in the DraftLRP have a holistic goal of the long term sustainability of the Salton Sea. Based on theinformation provided, it is unclear what the state envisions as a "sustainable" Salton Sea. A working definition of what a sustainable Salton Sea will be is important as this has ramifications on what the state estimates will be the future size of the Salton Sea. This is also important when considering the ramifications of a potentially smaller Salton Sea. While multiple water level scenarios were utilized to propose projects, none include public health considerations for the lower water level scenarios. Given residents are already dealing with adverse health impacts because of the receding Salton Sea, it is critical the state include steps for addressing and mitigating the health impacts of a smaller Salton Sea. In addition to a working definition of sustainability, the state must also include a water budget for the Salton Sea in order to be able to assess the viability of the proposed projects as recommended by members of the Salton Se aPartnership (SSP) in their letter dated February 22, 2023. We would also like to raise concerns about a lack of proposals to address salinity issues at thesource of water distribution. The high salinity levels in the Salton Sea are directly related to thelong-standing salinity issues in the Imperial Valley that come from agricultural production. It is concerning that the state is not, at a minimum, exploring options to establish a comprehensive agricultural drainage water quality improvement project or program to assist with addressing thesalinity in the runoff that makes its way to the Salton Sea. Investing in projects around the SaltonSea to address salinity issues will be futile if the state and Imperial Valley do not also commit to a comprehensive agricultural drainage water quality improvement project or program. Similarly,we are concerned about the overall success of the Draft LRP given how long it is taking the state to implement projects from the 10-Year Plan. 10-Year Plan projects need to be implemented immediately in order to support a successful implementation of LRP projects. Furthermore, we would like to note that the projects presented in the Draft LRP are based on current cost estimates. Realistically, we will not see the implementation of a project for at least 5-10 years. Given the likelihood that the costs for these projects will increase during this time, itis imperative for the state to critically evaluate the actual cost estimates for implementing LRP projects and prepare to be able to fund them when costs inevitably rise.	Thank you for your review of the Draft Long-Range Plan. The goals of the LRP are defined in terms of three objectives: Protect or improve air quality to reduce public health consequences; Protect or improve water quality to provide opportunities for beneficial uses and reduce environmental consequences; and Restore long-term stable aquatic and shoreline habitat to historic levels and diversity of fish and wildlife that depend on the Salton Sea. Multiple criteria were used to evaluate restoration concepts, and these criteria were applied using different inflow levels which indicates the performance of concepts against different hydrologic scenarios. This approach was used to test if concepts could sustain themselves against varying water futures. The criteria also consider the air quality impacts due to the emission of dust from exposed lakebed under different inflow scenarios. Regarding agricultural drain water salinity, that is not a direct focus of the LRP because salinity naturally increases in drain water due to evapotranspirative water loss. This phenomenon is common in agricultural systems in arid climates. If the inflow salinity could somehow be addressed, salinity would continue to increase in the Salton Sea because it is a terminal water body. The problem of high salinity in the Sea would be minimally affected by lowering the inflow salinity, and still need to be adressed to acheive goals and objectives. Costs for engineering projects are typically reported in current dollars, because the future cost escalations caused by inflation are unknown. Usually, the cost estimates in a report such as the LRP will be updated with escalation factors at a time closer to project implementation. Comment noted and documented in this appendix to the Final Long-Range Plan.

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Rebecca T. Zaragoza	Leadership Counsel for Justice and Accountability		3. The Draft LRP must refrain from incentivizing the development of lithium extraction related projects or any other project that is counterproductive to the goalof the SSMP without a full environmental review and public engagement process. As part of the SSMP's focus to improve the conditions of the Salton Sea, the Draft LRP must notallow processes or development projects that will cause further harm to the Sea or the surrounding region. Residents across the region have continuously raised concerns about the lackof existing data related to the potential impacts of Direct Lithium Extraction and the minimalcommunity engagement process to date.12 Irresponsibly, the Draft LRP does not capture localconcerns related to lithium extraction activities and their potential impacts to the Sea, rather itgives projects that will not preclude such activities a higher score.3 The Draft LRP's Appendix C must effectively reflect the concerns and priorities of communitiesaround the Salton Sea related to lithium activities. As it stands, it is not clear how the stateconcluded that geothermal development and lithium production in the Salton Sea region willpose few adverse impacts on the environment.4 The Draft LRP must remain committed to theSSMP's purpose and refrain from accommodating projects that include lithium-related activitiesgiven the continued uncertainty of their potential impacts by requiring a full environmental andpublic health analysis of any and all proposals. Accommodations should not be made at theexpense of impacts to communities and wildlife.5 Similarly, we support the comments made bymembers of the SSP regarding the misleading assumptions made in the Draft LRP on thepotential impacts of the lithium industry. 1 Leadership Counsel for Justice and Accountability, and Residents of Salton Sea region. Letter to Chair Silvia Paz,and Lithium Valley Commission Members. "RE: Public Engagement and Outreach Related to the Lithium ValleyCommission," October 8, 2021. 2 Armenta , Cecilia Dora, and Elizabeth Jaime. "We Are More than an Experiment for Lithium in the Desert." DesertSun, August 24, 2022. 3 California Natural Resources Agency, Department of Water Resources, State of California, and CaliforniaDepartment of Fish and Wildlife, Salton Sea Long-Range Plan Public Draft § (2022). Pg 174. 4 California Natural Resources Agency, Department of Water Resources, State of California, and CaliforniaDepartment of Fish and Wildlife, Salton Sea Long-Range Plan Public Draft Appendix C § (2022). Pg 4. 5 California Natural Resources Agency, Department of Water Resources, State of California, and CaliforniaDepartment of Fish and Wildlife, Salton Sea Long-Range Plan Public Draft § (2022). Pg 42.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The LRP does not intend to incentivize the production of lithium at the Salton Sea, however the LRP does examine if mutual water supply and habitat benefits could occur, and takes into account potential water demands of this industry.
Rebecca T. Zaragoza	Leadership Counsel for Justice and Accountability		4. CNRA must release an updated version of the Draft LRP that reflects the mostrecent round of public input before submitting to the Army Corps of Engineers. The state's overall community engagement and outreach tactics have significantly improved inthe last year, including collaborative efforts via the Outreach Working Team, diversification ofoutreach tactics, and meeting facilitation styles. The state's partnership with BWG has alsogreatly supported the state's understanding of community amenities as it relates to the SSMP, butwe believe it has also helped the state in understanding the broader social and environmentalissues that local communities face which is highly important. Despite these improvements, thedevelopment process of the Draft LRP did not adequately consider input from the Long RangePlanning Committee (LRPC), nor has it followed a traditional revision process that reflects themost recent round of public comments before its submission to the US Army Corps of Engineers(Army Corps). As members of the LRPC, we do not believe that the committee's input for the Draft LRP wasmeaningfully considered by the state. One example is our comments regarding the proposedacceptability criteria which were disregarded entirely. In addition, the development process hasbeen quite unclear and fails to provide an updated version of the LRP that reflects public inputreceived by March 17th. CNRA's planning efforts could be improved by ensuring an adequatepublic input and revision period and submitting a more accurate Draft LRP to the Army Corps,and not just as an appendix. Such actions are a clear breach of CNRA's duty to meaningfullyconsider input from the public. As a reminder, California law defines "Environmental justice" as the fair treatment andmeaningful involvement of people of all races, cultures, incomes, and national origins, withrespect to the development, adoption, implementation, and enforcement of environmental laws,regulations, and policies. (Gov. Code, § 65040.12 et. seq.) Environmental justice includes "at aminimum, the meaningful consideration of recommendations from communities most impactedby pollution into environmental and land use decisions." Gov. Code § 65040.12(e)(2). Further,state law defines "environmental justice" to include "[g]overnmental entities engaging andproviding technical assistance to populations and communities most impacted by pollution topromote their meaningful participation in all phases of the environmental and land use decisionmaking process." (Gov. Code, § 65040.12).	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Public comments are included in an appendix of the Final Long-Range Plan to ensure they are available to the Army Corps of Engineers and the public during the development of the Feasibility Study. The SSMP strives to continue serving the environmental justice communities in the Salton Sea Region and appreciates the expertise from community members and from the LRP Committee. SSMP will continue to meaninfully consider received recommenations into future projects, actions, and processes.

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Rebecca T. Zaragoza	Leadership Counsel for Justice and Accountability		5. The state must abide by the Public Trust Doctrine and consider public interest in itsefforts to restore the Salton Sea. In 1983, the California Supreme Court in National Audubon Society v. Superior Court of AlpineCounty, 33 Cal.3d 419 (1983) confirmed the well-established rule that, under California's PublicTrust Doctrine, the state "owns all of its navigable waterways and the lands lying beneath themas trustee of a public trust for the benefit of the people." The Public Trust Doctrine is not a meredeclaration of the state's right to use public property for public purposes: "it is an affirmation ofthe duty of the state to protect the people's common heritage of streams, lakes, marshlands andtidelands, surrendering that right of protection only in rare cases when the abandonment of thatright is consistent with the purposes of the trust." In resolving the inherent conflicts between California's constitutional and statutory water rights system and the state's Public Trust Doctrine trustee responsibilities, the National Audubon Courtestablished the following principles to guide its decision: The state has an affirmative duty to take the public trust into account in theplanning and allocation of water resources, and to protect public trust useswhenever feasible. . . . As a matter of practical necessity the state may have toapprove appropriations despite foreseeable harm to public trust uses. In so doing, however, the state must bear in mind its duty as trustee to consider the effect ofthe taking on the public trust, and to preserve, so far as consistent with the publicinterest, the uses protected by the [Public Trust Doctrine]. National Audubon, supra, 33 Cal.3d at p. 445-446. The Salton Sea, as a natural terminus of the Colorado River, which held navigablewaters before, after, and at times contemporaneous with California's statehood, qualifies undertraditional standards as a Public Trust Doctrine resource.6 Past statements that the Salton Sea isnot a Public Trust Doctrine resource have mischaracterized the Sea's history and geomorphology.But in addition to meeting the traditional "equal footing" standard for Public Trust Doctrinestatus, the Salton Sea enjoys Public Trust Doctrine status as an incident of Mexican law, andMexico's cession of California to the United States under the 1848 Treaty of Guadalupe Hidalgo. Therefore the state has a continuing duty to manage public trust resources for the benefit of thepeople of the state, by balancing interests related to: fishing, commerce, navigation, wildlife, andrecreation. Given the current state of the Sea, there is no question that the state is failing this dutyto manage the Sea for the benefit of the people. As such, CNRA must (1) identify and analyzepotential adverse impacts of the Draft LRP on the public; (2) identify and analyze potentialadverse impacts of groundwater extractions on the Sea; and (3) determine the feasibility ofprotecting public trust uses and protect such uses whenever feasible. Lastly, CNRA must alsoseriously implement the 10-year plan and Long Range Plan to restore the Sea for the benefit andenjoyment of the people. Failure to do so is a breach of the affirmative duty to maintain a publictrust resource: the Salton Sea.	Thank you for your review of the Draft Long-Range Plan. The Long Range Plan considers the State's public trust responsibilities. The Feasibility Study will provide further detail on the items requested.

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Nikola Lakic	Geothermal Worldwide, Inc.		In response to the “Salton Sea Long Range Plan Public Draft" (SSLRP) prepared by the California Natural Resources Agency - SSMP Long-Range Plan (LRP) published on December 15, 2022, I respectfully urge everyone involved to read my response - rebuttal (62 pages) - to the Report of the UCSC Panel of independent reviewers which I submitted to the Secretary of CNRA on December 31, 2022. Document is attached. Here is the link too: Response to the Report of Panel of independent reviewers.pdf [the hyperlink can be found in email attachment files]. As I commented during numerous meetings, I am writing this comment for the record. The “current course of action” for the restoration of the Salton Sea is a “drive in the wrong direction”. Also, it is a part of an obvious scam that is in process for some time. Such illegal conduct (scamming), on which I elaborated in detail in my response to the Report of the UCSC Panel, that lead to destruction of the Lake with serious consequences, needs to be stopped if we are to follow the State’s policy toward saving and restoring the Salton Sea, our environment, the health of the nearby population, and the economy in general. I respectfully urge everyone involved in the “current course of action” for so-called the “restoration” of the Salton Sea which is the “Perimeter/Brine Lake” recently renamed to “In-Basin Solution” or “In-Land Solution”, which is a part of the 10-Year Plan, that is outlined in the “Salton Sea Long Range Plan Public Draft" - to stop pretending to do something that is in the interest of the Salton Sea, the environment, the health of the nearby population, and the economy of the State knowing very well that the truth is just the opposite. In my response to the report of the UCSC Panel, I respectfully urge the top State officials to open an investigation into this case, for which I provided more than enough verifiable evidence. Those involved in scam needs to be held accountable. If they are not held accountable, will be very difficult to move forward in saving and restoring the Salton Sea and we would end up losing the Lake with tremendous consequences and liabilities. I am suggesting radical changes in logistical (operational) and administrative aspect of moving forward toward the restoration of the Salton Sea and abolishment of some or all those agencies that will not be necessary during the implementation of the well-designed plan for the restoration of the Salton Sea project. I suggest, after a thorough investigation of this case, and subsequent consultation with several potential contractors about their cost estimate for the implementation of my proposal (See page 55, Segment 5.4 of my response to the Report of the UCSC Panel of independent reviewers), to be established an office with appropriate staff (team) to manage money (the budget of the project), oversee necessary permits and permissions, and to communicate with all contractors and stakeholders involved in the project including the “International Boundary And Water Commission” with their counterparts in Mexico, and report frequently to the Secretary of CNRA. The facts are: 1. The Report of the Panel of independent reviewers is a travesty. Please read my response to the Report of the UCSC Panel of independent reviewers (62 pages) with verifiable evidence (copy is included above). The “Salton Sea Long Range Plan Public Draft" (LRP) uses the UCSC Panel of independent reviewers Report as reference and a path to follow. Therefore, the LRP is a travesty too. NOTE: Exactly for that reason, in my response to the Report of the UCSC Panel, I requested for abolishment of the UCSC Panel of independent reviewers Report (Report) based on multiple violations committed during the Panel’s lousy work, and for stoppage of all relevant projects that use or will use the Panel’s Report as reference for their existence (See page 3, Segment 1.0 Introduction in my response to the Report – included above).	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
			2. The “current course of action” in the region of the Salton Sea consists of two main projects that are in serious conflict - they are not coexistent (synchronized) a) Extraction of lithium from geothermal brine that is based on a smaller Lake that has an exposed lakebed (playa) and requires related expensive dust suppression projects; and b) Restoration of the Salton Sea that is based on the importation of seawater. 3. Those two concepts (a and b) are in conflict because there is no logical explanation for continuing with a smaller Lake that would have soon about 200 square miles of exposed lakebed (playa) that require related expensive dust suppression projects that are doomed to fail because there is no water to support effectively such dust suppression projects, and at the same time talking about importing seawater that would flood those dust suppression projects. Also, there is no logical explanation for continuing with a smaller Lake and related dust suppression projects and having a pipeline for the importation of seawater with which we could and should fill up the central section of the Lake to the water level of the 1950s and 60s which was about -220 feet, that would flood those dust suppression projects, rightfully so. I elaborated on it in my response to the UCSC Panel Report (62 pages) included. 4. Recently mentioned - the so-called hybrid solution that supposedly will merge the Perimeter/Brine Lake” concept - recently suggested by the UCSC Panel and recently renamed to “In-Basin Solution” or “In-Land Solution”- with the possible importation of seawater concept in the future – does not make sense. It is an attempt to scam people “smoke and mirror tactics” in believing that future is bright and that the “designing team” need to continue working on finding the solution in next 4-5 years. It is an obvious scam and is not worth discussing. I elaborated on it in my response to the UCSC Panel Report (62 pages) included. 5. Further fact – just for 1,000 Tons of produced Lithium it needs 1,500 acre-feet of water. Just for 20,000 Tons of lithium, it needs 30,000 acre-feet of water. That is a substantial amount of water that we do not have. Everyone knows that we are lacking water, and in the future, because of Quantification Settlement Agreement (QSA) and drought we will have even less water from the Colorado river and that the Salton Sea is disappearing. 6. The local organization/agencies - Salton Sea Authority (SSA), which is under the strong influence of the Imperial Irrigation District (IID) and a few others made a fundamental breach of trust and their task which was/is to follow State’s policy and work in the interest of restoration of the Salton Sea, our environment, the health of the nearby population. They openly support projects that lead to the final product – the smaller, saltier, smellier, and more polluted Lake. That is undisputable fact. 7. Came to my attention two very good, and in-depth comments (studies) on the Salton Sea situation by Jenny Ross, Research Affiliate of the Stout Research Center. One is to the Army Corps of Engineers and the Salton Sea Management Plan about the recent environmental impact report on the projects of the Ten-Year Plan, and the other is to the U.S. Bureau of Reclamation about how future planning for water management of the Colorado River must include the importation of ocean water to refill the Salton Sea, thus ending its dependence on the Colorado River, and relieving the shortage of water for users of the river in the seven states and Mexico. Please make time to read them. Here are the links: Jenny Ross 10 Yr Plan Public Comment.pdf and Jenny Ross on Colorado River Mgt. stategy.pdf. [the hyperlinks can be found in email attachment files]	

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			8. Further fact is that there is a feasible architectural plan for the restoration of the Salton Sea, that has been systematically ignored since 2013, that fulfills all necessary requirements such as: a. Solution must be viable and technically sound for the importation of seawater whether from the Sea of Cortez or the Pacific Ocean or both. b. Solution must be viable in stopping pollution of the Salton Sea. c. Solution must be viable in respecting the Quantification Settlement Agreement (QSA) because of the limited inflow from the Colorado River. d. Solution must be viable in providing wildlife sanctuaries. e. Solution must be viable in reducing the salinity of the Salton Sea. f. Solution must be viable in providing conditions for tourism and other activities to benefit the local population, employment, and economy. g. Solution must be viable in harmonizing existing projects for the extraction of lithium from the geothermal brine and the restoration of the Salton Sea which includes the importation of seawater. h. Solution must be economically viable having a positive ratio of cost expense for the project and revenue generated from the project. i. If there are several proposals having similar but different parts or technologies, then, they should be evaluated by comparison on each difference including cost, feasibility, efficiency, and revenue generated. 9. There are really two options for the State to choose about the fate of the Salton Sea with two completely different outcomes: Option I – To proceed with the current project already in motion a “Smaller, Sustainable Lake” – “10-year plan” – “Perimeter/Brane Lake” - The projects that will be constantly asking the State and Federal Governments for help (for more money) for fixing never-ending problems - and at the end losing the Lake with tremendous liabilities in billions of dollars (environmental disaster – toxic dust storms, health issues, and economic fold). NOTE: In the process would benefit a few “friendly” companies on the expenses of the environment and communities; and Option II – Based on new revealing critical information, redirecting efforts (logistic and administrative) and allocating money toward implementation of the long-term solution (my proposal) which would restore the Salton Sea to the water level of the 1950s and 60s; provide the condition for tourism, wildlife sanctuary, clean environment, and generate revenue in 100s Billion Dollars in several decades and would continue so in the future costing only about $15,000,000,000. NOTE: A few companies that would benefit from Option I, would benefit even more with Option II, – possibly they just do not understand it yet (See Segment 4.1 in my response - rebuttal (62 pages) to the Report of the UCSC Panel). People with honor and conscience do not find it satisfactory to work on projects doomed to fail just to keep their job position and receive a monthly paycheck. I would like to point out that will be thousands of jobs during the implementation of my proposal and thousands of new jobs for nearby communities after implementation is finished. Also, I am pointing out that every year of delaying the implementation of my proposal we (the community, stakeholders, and the State) are losing between $500,000,000 and $1,000,000,000 per year just from clean renewable energy “out of blue” – literally. That is in addition to other activities, tourism that will not exist if my proposal is not implemented.	

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Chuck Parker	Salton Sea Coalition		I am very concerned that the Draft Long Range Plan has produced a plan which is so out of touch with the changed and changing world that we live in. With the Colorado River reduced by the worst drought in 1200 years, and with the entire Southwest region undergoing a warming and drying trend due to Climate Change (known as aridification,) the long range plan produced by the Natural Resources Agency and the UC Santa Cruz Panel is recommending continued reliance on the Colorado River to sustain the Salton Sea! As a friend and former member of our coalition, Mark Johnson, summarized it recently, "The UC Santa Cruz folks are not living reality. The Tortolita Alliance letter to USBR sums it up. There must be a permanent cut to Colorado River water users of 20% across the Board or 3.5 million acre-feet per year because the water does not exist." (attached.) Mark Johnson is the retired former chief engineer of the Coachella Valley Water District. He used the established facts of historical Colorado River flow and use to arrive at his recommended 20% cuts. "We offer the following observations: •Period 1 (1953-1974)1- Average Colorado River flow = 13.1 mafy. •Period 2 (2000-2021)1 - Average Colorado River flow = 12.3 mafy. •Average Colorado River flow for Periods 1 & 2 = 12.7 mafy. •Colorado River Full Allocation = 16.5 mafy •Historic Allocation Imbalance = 16.5 – 12.7 = 3.8 mafy. •Experts2 predict Average Colorado River flows to be even lower than 12.7 mafy in the future due to aridification. •In 2012 USBR3 predicted a future 3.2 mafy imbalance. •Average Historic and Projected Imbalance = 3.5 mafy [(3.2 + 3.8)/2] " Sadly, the history of overallocation of water from the reservoirs at Lake Mead and Lake Powell have led to the reservoirs falling near to "dead pool" levels where no more water can flow out. Water managers who should have known better, have continued to release more water from the reservoirs than was flowing in for the last twenty years! That has led to the current crisis. We cannot fall victim to the wishful thinking that "maybe it will rain more next year" even though this has been an unusually wet winter. The second, and related concern that I have with the Draft Long Range Plan and the UC Santa Cruz Panel Report is that they combined to deny the feasibility of importing ocean water to restore the Salton Sea. This is the only way to decouple the future of the Salton Sea from the Colorado River. How could these agencies reach such wildly unrealistic, unscientific, head-in-the-sand conclusions? I will devote quite a few words to describing the secrecy, bias, lying, and fraud that both of these state sponsored bodies engaged in to sabotage the restoration of the Salton Sea that is mandated by California and United States law. My third overriding concern is that the Draft Long Range Plan and the UC Santa Cruz Panel chose to overlook the major quantities of of carbon Dioxide, methane, and nitrous oxide which the former Salton Sea will emit if those plans are followed, if the panel's recommendations are adopted, the sea will become a dry, dead source of pollution instead of a living ecosystem healthy to birds, fish and humans, as it once was. Following these plans contradicts California's stated goals to fight climate change and achieve carbon neutrality. I will talk more about this later as well. In summary, the Draft Long Range Plan and the UC Santa Cruz reports fail to satisfy the requirements of the 2003 Salton Sea Restoration Act because none of the recommended projects can protect the long term stable aquatic and shoreline habitat, or the air and water quality. If the water supply from the Colorado declines as predicted the results of the expensive plans recommended by the Draft Long Range Plan and the UC Santa Cruz Panel reports embedded within it, will have the same results as doing nothing. You can't do any worse than that! So the only hope for the Salton Sea, and all of us to live near it, is that the U.S. Army Corps of Engineers will set aside these disastrous and inadequate reports and do a serious, objective study of oceanwater importation. I would like to quote from researcher Jenny Ross who wrote the book on the US Santa Cruz Panel and singlehandedly showed up all the Brent Haddad's, Jean Debroux's, & their Tetra Tech and Kennedy Jenks highly paid partners in crime: " All of the UCSC Panel's work must be set aside, and a full and objective feasibility study of water importation options must be performed. We suggest that the CNRA should immediately request that the U.S. Army Corps of Engineers, in consultation or collaboration with appropriate agencies of the U.S. Department of the Interior, to conduct a comprehensive, detailed, and objective feasibility-level study of proposals for water importation to achieve long-term restoration of the Salton Sea." Jenny Ross, Comments on the UCSC Panel's Evaluation of Water Importation proposals to Restore the Salton Sea.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

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Mark McCumsey	California Department of Transportation	Environmental	Caltrans appreciates the opportunity to comment on the Draft Salton Sea Long-Range Plan. The analysis of potential future projects presented may impact on Caltrans Right-of-Way (R/W) in the future. Should future projects based upon the changes enacted from this Long-Range Plan document have elements and/or mitigation measures that change or effect Caltrans R/W, Caltrans would be a Responsible Agency under the California Environmental Quality Act (CEQA) and would use your environmental assessment in your environmental documentation for Caltrans subsequent environmental compliance. These projects may be applicable for the Caltrans encroachment permit process, which would naturally evolve from our continued coordination.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Mark McCumsey	California Department of Transportation	Right-of-Way	Any work performed within Caltrans' R/W will require discretionary review and approval by Caltrans and an encroachment permit will be required for any work within the Caltrans' R/W prior to construction. As part of the encroachment permit process, the applicant must provide an approved final environmental document including the California Environmental Quality Act (CEQA) determination addressing any environmental impacts within the Caltrans' R/W, and any corresponding technical studies.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Mark McCumsey	California Department of Transportation	Driveway Design	Please refer to the design guidelines (Appendix J of the Caltrans Encroachment Permit Manual) for typical rural driveway in Caltrans' R/W. Also, refer to the latest Highway Design Manual (HDM) for the most up to date guidelines. The HDM indexes (Chapter 200 – Topic 205) referenced in the guidelines can be accessed online from the following link: https://dot.ca.gov/programs/design/manual-highway-design-manual-hdm SR-86 and SR-111 is on the California Freeway and Expressway System and is access controlled. Any new proposed access points within SR-86 and SR-111 R/W will require an Encroachment Policy Exception per Project Development Procedures Manual (PDPM) Chapter 17. Any gateway monuments must comply with the PDPM Chapter 29 and are considered discretionary fixed objects and must comply with the Highway Design Manual (HDM) Topic 309. When designing the drainage (or anything else that requires grading) keep in mind PDPM Chapter 17, Section 2 Article 2 Earthwork: Grading, placement, or removal of material by others in the State RW is prohibited. An encroachment policy exception may be approved to perform earthwork within the State R/W if the State benefits from one or more of the following: • Improved sight distance • Increased clear recovery zone • Improved drainage • Reduced maintenance Also, please refer to the Caltrans PDPM for grading that encroaches into the State R/W (per PDPM Chapter 17, Section 2, article 2) regarding Encroachments Prohibited by State Constitution: Private use of the [state] highway R/W without compensation is considered a gift of public funds and is prohibited by the California Constitution, Article XVI, Section 6. Caltrans has no authority to allow the use of highway R/W by a private party without compensation or benefits. Also, Caltrans has no authority to allow use of highway R/W that would be a betterment to adjacent parcels or entity or for a proposed development to be viable without equal or comparable benefit or compensation. This policy applies to all freeways, expressways, conventional highways, rest stops, vista points, maintenance facilities, and park and ride lots.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. These detailed points will be considered in future stages of project development.

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Mark McCumsey	California Department of Transportation	Traffic Management Plan/Hauling	Caltrans has discretionary authority with respect to highways under its jurisdiction and may, upon application and if good cause appears, issue a special permit to operate or move a vehicle or combination of vehicles or special mobile equipment of a size or weight of vehicle or load exceeding the maximum limitations specified in the California Vehicle Code. The Caltrans Transportation Permits Issuance Branch is responsible for the issuance of these special transportation permits for oversize/overweight vehicles on the State Highway network. Additional information is provided online at: http://www.dot.ca.gov/trafficops/permits/index.html A Traffic Management Plan is to be submitted to Caltrans District 11, including the encroachments of SR- 111 and SR-86, at least 30 days prior to the start of any construction. Traffic shall not be unreasonably delayed. The plan shall also outline suggested detours to use, including routes and signage. Potential impacts to the highway facilities (SR-111 and SR-86) and traveling public from the detour, demolition and other construction activities should be discussed and addressed before work begins. Please see the following chapters in the Caltrans' manuals: • Chapter 600 of the Encroachment Permits Manual for requirements regarding utilities and state R/W: https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/encroachment-permits/chapter-6-ada.pdf. • Chapter 17 of the Project Development Procedures Manual https://dot.ca.gov/-/media/dot-media/programs/design/documents/pdpm-chapter17-a11y.pdf.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. These detailed points will be considered in future stages of project development.
Susan T. Skora			I oppose the Salton Sea Long Range Plan, as stated in the December 2022 Public Draft. Ocean water import from the Sea of Cortez to the Salton Sea is the most viable and sustainable long range plan. The health and wellbeing of the Sea, the fish, the birds, and most importantly the humans living around the Sea will be addressed in a natural and curative way, returning it to a viable fishing and recreational area for Southern California.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Michael Cohen	Pacific Insitute	Hydrology	The inflow assumptions remain very aspirational, distorting the projections of future water availability.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We propose three inflow trajectories to the Salton Sea for consideration in the Long Range Plan, comprising individual flows from different sources (Appendix B, Section 6). In all three trajectories we assume climate change will lead to higher evapotranspiration and lower drainage flows, Mexico flows will decrease to 0, and water use for Lithium extraction will increase to 50,000 AF annually. The higher of these flow trajectories assume deliveries from Lake Mead to IID will remain at current policy (2,535,000 AF), the low probability flow assumed flow would be at the 90% level (2,330,000 AF) , and the very low probability flow assumed flow at the 5% level (2,090,000 AF). These result in a range of future flows to the Salton Sea, from 889,000 AF to 444,000 AF, all of which are considerably lower that the current flow of 1,090,000 AF. The inflows to the Sea decrease more than the water deliveries because we assume that IID's irrigated area remains the same in all cases--also a conservative assumption. Given our current understanding of the system, we believe this is a reasonable representation of the range of future inflow conditions to the Sea, and includes consideration of dramatic inflow reductions from current inflow levels.
Michael Cohen	Pacific Insitute	p. 24 – "resampling hydrology from 2000-2018"	this is an unconventional baseline, since it includes three distinct periods: 2000-02 (pre-QSA), 2003-17 (with mitigation flows), and 2018 (post-mitigation flow).	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Please note that the use of 2000-2018 hydrology is for the Colorado River basin, with water deliveries to Imperial and Coachella Valleys calculated through the current operating rules in the CRSS model. We are not mixing the policies--the same policy driver is being used, but the natural hydrologic range being used is for the years 2000-2018.

Name	Organization	Section or Page	Comment	Response
Michael Cohen	Pacific Insitute	p. 26 – Inflow summary.	There are three major problems with this analysis: 1. It's mislabeled: "high" probability here actually refers to "average" probability that such an inflow will occur. 2. The value itself is too high, because the period 2000-2018 includes three distinct policy periods, two of which no longer pertain: (1) pre-QSA (2000-2002), (2) mitigation water delivery (2003-17), and (3) post-mitigation water delivery (2018-present). Using inflows driven by outdated policies is misleading. 3. Applying an average inflow as a performance criterion for the alternatives inflates the expected success of that alternative, since this analysis suggests that inflows will be less than that value one out of every two years.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Please note that the use of 2000-2018 hydrology is for the Colorado River basin, with water deliveries to Imperial and Coachella Valleys calculated through the current operating rules in the CRSS model. We are not mixing the policies--the same policy driver is being used, but the natural hydrologic range being used is for the years 2000-2018. For the long-term condition of the Sea, a terminal water body that carries a signal of the historical inflows received, the use of a long-term average flow is appropriate. Thus, unlike a flow-through water body, the Sea retains a memory of all the flows and salts received. Changes in any single year are diminished by the long-term flow signal.
Michael Cohen	Pacific Insitute	p. 38. – Inflow summary.	“The most likely outcome for inflow any given year is one that would occur 50% of the time.” This is an unusual statement. A different way to frame this would be, “The most dependable inflow isone that would be exceeded 99% of the time.” Planning projects with the assumption that there will notbe sufficient water supply 50% of the time would be reckless and a waste of public money. The 2007preferred alternative used a design flow calculated as occurring only 20% of the time, which still meantthat there would not be sufficient water supply one year out of five. The LRP should clearly state whatthe SSMP determines is an acceptable level of risk of insufficient water supply and how proposedprojects would perform under such circumstances.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The 50% exceedance flow is a good marker because it's an expected averge inflow. The Salton Sea is a terminal lake, which means that inflows (less evaporation) from previous years remain and therefore it is approprriate to use average annual inflow for investigating long-term trends. The inflow distribution to IID that is modeled is shown in Appendix B. Because this is a human-controlled flow, driven by current policy, even with the 2000-2018 hydrology reflecting a dry period, it is actually met over a large fraction of the time (nearly 90% of the time), with lower flows than allocated only 10% of the time. To allow for future change and lower flows, we consider scenarios where these reduced flows at the 90% level and 5% level occur every year over the entire period of the analysis. We also assume other inflows decrease, such as Mexico flows into the New River, and IID flows on account of higher evapotranspiration. We also assume an additional 50,000 AF of water is consumptively used for lithium production. Taken together, these are major cumulative reductions in inflows over the following decades. The performance of the restoration concepts is evaluated under each of these three inflow scenarios--all of which are considerably lower than recent inflows.
Michael Cohen	Pacific Insitute	Water Budget	The draft LRP should include a water budget. The current draft includes a mix of water supply and waterdemand estimates but does not compile these in a clear and understandable table, leading to significantinconsistencies. For example, p. 50 states “For the 3,862-ac [North] lake area, the estimated inflowrequired is about 50,000 AFY….” Yet Table 5-6 on p. 70 shows the water requirements of a 4,182 acNorth Lake (presumably including the ~160-acre North Lake pilot demonstration project as well as someother unknown feature) as 25,092 AFY. It appears that the water requirements in Table 5-6 only reflectevaporative losses, and not the additional seepage and flow-through requirements presumablyincorporated in the 50,000 AFY requirement stated on p. 50, but it is not clear why the authors assumethat all seepage will be recaptured downstream or why the two values are so inconsistent. Similarly, “Figure 5-9. Concept 2A: Divided Sea/Marine Sea South” (p.67) shows a total surface area ofthe divided Sea at about 110,000 acres under the “low probability inflow.” The other divided Sea concepts have a greater surface area. Assuming losses at the Marine Sea South would be analogous tothe six feet listed for the similarly saline North Lake as shown in Table 5-6 yields a total waterrequirement of 660,000 AFY for Concept 2A. The low probability inflow is only 684,000 AFY, leaving only24,000 AFY for Phase I projects, less than 20% of the 139,000 AFY water requirement shown in Table 5-6and less than 10% of the water required once Concept 2A would be constructed. It is not clear why thedraft LRP does not include a table showing water requirements under low/high probability inflows, butin any case, the surface area shown for the various divided Sea concepts are not consistent with theevaporative water requirements shown in Table 5-6, much less the total water requirements of suchprojects. Nor is it clear why Table 5-6 lists water losses of 6 feet per year for the North Lake but only 5feet per year for the Marine Sea South “habitat,” even though the salinity of the two water bodieswould be similar. Simply put, the surface areas shown for the divided Seas under low probability inflowsare at least 50% too large.	Thank you for your review of the Draft Long-Range Plan. The text related to the water budget has been updated. The water budgets for the Phase 1: 10-Year Plan are consistent in the LRP and in the EA.

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Michael Cohen	Pacific Insitute	Lithium p. 26	“The three inflow scenarios include 50,000 AFY inflow reduction due to lithium allocation.”What’s the basis for this assumption? Table 1 in Appendix C (“Estimated annual freshwater use for Liproduction in the Salton Sea Geothermal Field”) lists several potential ranges of freshwater use but doesnot identify 50,000 AFY as a probable future volume, or reference that volume at all.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The 50,000 AF lithium water estimate is a mid-range level derived from Appendix C: Water Use and Availability for Lithium Extraction, for 40,000 tons of lithium production annually, which ranges from 32,796-81,351 AF. Additional text has been added to the main LRP as part of the text of Table 3-3. 40,000 tons corresponds to more than 10 times the current level of use in the United States.
Michael Cohen	Pacific Insitute	Appendix C, p. 4	“In general, the integrated geothermal development and Li production in the SSGFwill pose very few adverse impacts on the environment. All effluent brines and wastewater fromproduction cycles will be reinjected back into the deep reservoir, therefore the risk of water pollution islow.” This assertion is misleading and premature: potential water pollution is but one of many potentialadverse environmental impacts associated with lithium mining and production. The impacts have yet tobe assessed fully. And while brines and effluent (though perhaps not all) are reinjected, the facilities alsoproduce solid waste. Per Ch. 3 of the DEIR cited below, four CalEnergy plants produced about 300 tonsof solid "filter cake" waste per day - about 110,000 tons/yr. "Impact 5.6-1: Significant public hazard from the routine transport, use, or disposal ofhazardous materials.The existing DVCM is a Class II solid waste management facility that is permitted to acceptnon-hazardous waste streams and byproducts generated by CalEnergy’s geothermal powerplant operations in Imperial County. The waste stream includes geothermal filter cake,geothermal drilling mud materials, soils containing geothermal materials and incidentalplastic sheeting used as truckbed liners of the geothermal waste transport trucks. "Source: Imperial County Planning & Development Services, July 2021, Desert ValleyCompany Monofill Expansion Project, Cell 4 DEIR, at https://www.icpds.com/assets/5.6-Hazards-and-Hazards-Materials.pdf, p. 5.16-17.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. This section has been modified in Appendix C as follows: "In general, the integrated geothermal development and Li production in the SSGF will have limited direct discharges. All effluent brines and wastewater from production cycles will be reinjected back into the deep reservoir, therefore the risk of water pollution is low. The plant operations emit little GHG and pose a negligible impact on air quality. After the construction of the plants, the increased land coverage by buildings and paved ground surface could help reduce dust emissions. Potential environmental impacts of specific geothermal and lithium projects will be evaluated in individual environmental compliance documents, and are not part of the scope of this Long-Range Plan."
Michael Cohen	Pacific Insitute	Habitat p. xiii	The draft LRP includes the following objective: “Restore long-term stable aquatic and shorelinehabitat to historic levels and diversity of fish and wildlife that depend on the Salton Sea.” The draftreduces this robust objective to three water depths, targeted at different bird species, within a salinityrange of 20-40 ppt TDS. The LRP committee identified the need to expand this analysis in March 2022.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. For the high-level planning in the LRP, the three depth ranges and the salinity range together constitute a reasonable range of conditions to evaluate across multiple restoration concepts. At a future stage more refined development of habitats can be conceived.
Michael Cohen	Pacific Insitute	p. 28	“Many of these characteristics are expected to be defined at a future date.” Habitat/ecosystemfunction is a key driver of authorizing legislation and one of three project objectives, yet it only receives1/2 page of description.● Why doesn’t the draft LRP reference and use the extensive work done in 2006 for the PEIR?● Why wasn't the science committee tasked with this?● By when will these characteristics be defined?● By when will “Habitat population dynamics, characterizing the large-scale needs of key avianspecies,” (p. 37) be developed? Without a robust habitat analysis, the draft LRP’s evaluation criteria are inadequate.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Additional ecological models will be developed during the feasibility study process, which will provide the level of detail identified in the comment.
Michael Cohen	Pacific Insitute	p. 40	“Habitat areas that providing [sic] water in this range of salinity [20-40 ppt TDS] at a variety ofwater depths would be the most able to support the abundance and diversity of fish and wildlife thathave depended on the Salton Sea in the past.” What is the basis for this assertion? This salinity rangewas targeted to minimize vegetation and selenium exposure and to maximize fish production forpiscivorous birds. Overall abundance and diversity require a broader range of habitat types andsalinities. For example, many birds fed and roosted at the Sea’s estuaries, with salinity well below 20 pptTDS.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We agree with comment that the idetified salinity range has the benefit of minimizing concerns related to vegetation recruitment and selenium levels. The target salinty range was also selected because it is associated with positive historic trends in abundance and diversity of fish and wildlife.
Michael Cohen	Pacific Insitute	p. 40	“Finally, the objective in itself carries uncertainty due to the ambiguous phrasing. Furtherspecificity is required to identify desired fish and wildlife composition.” Please refer to Appendix H-1,“Habitat Components of the Salton Sea Ecosystem Restoration,” of the 2006 draft PEIR (attached foryour reference), for the Natural Resources Agency’s previous approach to addressing this objective.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.

Name	Organization	Section or Page	Comment	Response
Michael Cohen	Pacific Insitute	p. 41 Reservoir	“One provision that is clear is the demand for an added water source. In this plan we haveincorporated a component of a 100,000 Acre-feet reservoir to be located on exposed lakebed. Thisreservoir would provide habitat, recreation, and water supply for industries, including lithium.” This project element raises many questions: ● Why is the proposed reservoir described in Section 4.1.4 “Uncertainty in Sustainable EconomicDevelopment specifically related to Lithium Production”? ● Who is the primary beneficiary of the reservoir? ● Would the reservoir be filled with raw Colorado River water? ● Presumably, 10,000 surface acres would evaporate on the order of 60,000 acre-feet annually –60% of the reservoir’s total storage capacity, more than doubling the salinity of the remainingwater. Was a cost/benefit analysis completed for this potential water supply loss and waterquality degradation, especially in the face of rapidly declining Colorado River system storageoverall?● How much additional water would be lost to seepage annually? Preliminary water budgets forthe SCH project suggest a seepage loss of about 20%.● Would these evaporative and seepage losses be accounted for as part of IID’s annualconsumptive use?● Has IID endorsed the inclusion of this project element?● How was the cost of the 10,000 acre, average 10-foot depth reservoir estimated at $365 millionwhen the much shallower 4,100-acre SCH project cost more than $200 million?	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The concept of a freshwater reservoir was added to explore the possibility of having a new facility available to IID for storing Colorado River water. The commenter points out a number challenges that would have to be addressed during detailed design. The preliminary cost estimate was developed using factors that were similar to those used for other enlosures and do not inlcude the cost of conveying water to the facility. The costs are not comparable to SCH because SCH involves may internal berms, islands and other habitat features that would not be included in a storage reservoir.
Michael Cohen	Pacific Insitute	p. 41 Selenium	“Based on the history of selenate reduction over the past 100+ years, it is expected that maintaining large water bodies at 20 to 40 PPT would preserve the ability of the Sea to sequester selenium and maintain selenium levels below the EPA criteria.” Expected by whom? Has this expectationbeen corroborated by the science committee? How might higher concentrations of dissolved oxygen in smaller water bodies affect selenate reduction and sequestration? How does disturbing sediments (with earthmoving and wave action) affect selenium remobilization?	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. This paragraph has been edited as follows: "While selenium concentrations in the waters that flow into the Sea have often been in the range of 5 to 10 micrograms per liter or greater, selenium concentrations in the Sea have typically been measured at around 1 microgram per liter. In 2016, USEPA adopted chronic water-column criteria of 3.1 micrograms per liter in flowing freshwater bodies and 1.6 micrograms per liter in freshwater lakes, with additional targets for tissue concentrations in fish eggs, ovaries, and muscle tissue (USEPA, 2016). Saltwater selenium criteria are much higher (71 micrograms per liter) and have not been recently updated. Based on the history of selenate reduction in the Sea over the past 100+ years, it is anticipated that maintaining large water bodies at 20 to 40 PPT salinity and with similar general water quality would preserve the ability of the Sea to sequester selenium and maintain selenium levels below the EPA criteria. However, this will need to be managed through continued monitoring of water column and tissue concentrations in the larger and smaller water bodies envisioned as part of the different restoration concepts."
Michael Cohen	Pacific Insitute	p. 41 Selenium	“Despite this wave activity, selenium levels in the Sea remain low.” Please share the waterquality data, including monitoring locations, supporting this assertion.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. These data are generally available as part of long-term sampling efforts by USBR and CEDEN. A citation to the Salton Sea Authority Benchmark 2 report has been added.
Michael Cohen	Pacific Insitute	p. 42 Other Water Quality Parameters	Has the Science Committee corroborated the assertion that “it is reasonable to conclude that[water quality] benefits will occur”? The statement that “Flow through pond systems like SCH that will filter nutrients” suggests that SCH and other pond systems will become sinks for nutrients and subject to eutrophication. Since SCH is a key element of the 10-Year Plan, how is water quality degradation within that project consistent with water quality benefits? Isn't there a significant risk that disturbing sediments could degrade water quality?	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The SCH has been designed to minimize the risks identified, and consists of a settling basin to remove particulates and particulate-associated pollutants.
Michael Cohen	Pacific Insitute	p. 55 Cost Estimates	“The costs for other habitat projects estimated by per-acre costs from SCH and scaling by acreage of the other projects.” This suggests that costs are simply estimated based on surface area and do not account for water depth or the size of the berms required. Since the amount of material required for berms increases geometrically as a function of berm height, this cost assumption dramaticallyincreases cost estimates for shallow habitat projects with small berms.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. You are correct that costs are rough estimates for the purposes of comparing concepts and are subject to change as higher level detail information is developed as part of the feasibility study process. For the LRP, we wanted to be able to evaluate a broad array of concepts, which required us to make assumptions about cost.

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Michael Cohen	Pacific Insitute	p. 55 Cost Estimates	As we commented previously, the LRP's cost estimate for the Audubon Bombay Beach Wetlandis almost an order of magnitude too high. DWR staff assured us that that inflated value would becorrected. This significant error suggests that other cost estimates are not credible, either.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. This value has been updated with the most recent information available.
Michael Cohen	Pacific Insitute	p. 69 Restoration Concepts	"Upon completion of the causeway, the water in the south marine sea area, would return to alower salinity in the range of 20 to 40 PPT." ● How was this salinity estimate calculated?● How would different inflow volumes affect salinity?● What would be the rate of exchange of water and salts with the north marine sea area?● How will that vary with elevation?	Thank you for your review of the Draft Long-Range Plan. Comment noted and made publicly available as part of the Final Long Range Plan. The modified SSAM was used to estimate the time to achieve the target salinity. Once the target salinity is achieved, steady state conditions can be evaluated through mass balance calculations. The amount of time to achieve target salinity would vary with future inflows. The salinity in the south basin could be controlled by having a movable weir between the south and north basin that would regulate the flow between the basins.
Michael Cohen	Pacific Insitute	p. 180 Restoration Concepts	We specifically designed the Water Optimization concept to minimize water supply risk.Instead, this analysis arbitrarily assigns a size of 35,000 acres to the concept and then penalizes theconcept for being too large for certain low inflows. This is also inconsistent with the habitat waterdemands shown on p. 50.The scoring described on p. 187 - "Concept 5 generally performs well except for lacking sufficient deepwaterhabitat, and for lesser recreational opportunities. A variation of Concept 5 should receive furtherconsideration with a focus on adding recreational opportunities" is not consistent with the conceptdescription on p. 99 – "Multiple amenities could be added in coordination with local communities. Thesecould include selected deeper areas identified for kayaking and fishing access, as well as birding andhiking paths, nature trails, picnic areas, shade areas, and educational and other features that wouldbenefit the community and be attractive to visitors."	Thank you for your review of the Draft Long-Range Plan. Comment noted and made publicly available as part of the Final Long Range Plan. We agree that some deep-water habitat could be created for Concept 5, however when compared against historical conditions and other concepts, Concepts 5 provides falls into the bottom tier for providing deep water habitat.
Michael Cohen	Pacific Insitute	Concept Evaluation	The Draft Long Range Plan fails to objectively vet the various concepts. For example, how can Concept#2 "Divided Sea" score well for environmental justice, outdoor access, etc., when it would result inabout a two-mile wide playa around the shoreline, even under the state's "high probability inflowscenario"? This could extend more than four miles wide if future inflows decline significantly, as the LRPCommittee projected, degrading outdoor access.	Thank you for your review of the Draft Long-Range Plan. Comment noted and made publicly available as part of the Final Long Range Plan. We agree that more public input is needed. This evaluation was based on input derived through multiple public meetings.
Michael Cohen	Pacific Insitute	Independent Review Panel	The inclusion of recommendations from the deeply flawed Independent Review Panel (IRP) report diminishes the credibility of the LRP. For example, the IRP report's assumptions regarding import methods inflated the projected costs of such proposals while its assumed costs for fallowing are lessthan a quarter of existing payments to Imperial Irrigation District for conservation and efficiency-based water transfers. Similarly, the IRP report's proposal for direct desalination of Salton Sea water – with a salinity currently more than double that of ocean water – is not a proven technology.	Thank you for your review of the Draft Long-Range Plan. Comment noted and made publicly available as part of the Final Long Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.
Michael Cohen	Pacific Insitute	Errata	p. xiii – "Revised Order WR 2002-0013" can be found more quickly by the reader as "Order WR 2017-0134." p. 23 – "IID will transfer nearly 415,000 AF annually" should be 492,000 annually, per exhibit B of theQSA (includes AAC lining and miscellaneous PPRs). p. 24 – "This assumes that the current dry conditions in the 21st century will continue over the followingfour decades." The 2003-2018 Salton Sea inflows reflect QSA conditions. To date, neither IID nor anyother California water user has had their water orders reduced due to the declaration of shortageconditions on the Colorado River. p. 25 – "Western Basin United States"p. 38 – "Colorado River water is diverted at Morales [sic] Dam and flows through the All-American Canal…." Actually, this water is diverted at Imperial, not Morelos, Dam. p. 40 – "The area in each depth category was calculated for a historic Sea elevation of about -230 ft msl,which existed in 1999 and earlier." In fact, in 1999, the Sea's elevation was -225.5' (NAVD88), more thanfour feet higher than claimed here.	Thank you for your review of the Draft Long-Range Plan. Comment noted and made publicly available as part of the Final Long Range Plan. These edits have been noted and updated in the Final Long Range Plan.
Earl Withycombe		pp. 91, 105, 116, 121, 126, 144, 146, 147, 148, 149	For options that result in shorelines below -230 ft msl, the Plan states that "communities around the Sea could build out toward the new shorelines". Given the low load-bearing capacity of exposed playa, I think this statement is misleading. The structural costs of new facilities, including roads, would be significantly higher than development costs on non-playa shoreline lands. I don't think it is reasonable to suggest that residential and commercial growth onto exposed playa is efficient or affordable.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.

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Joan Speer			I am a resident of the Coachella Valley, and I have serious concerns about the Salton Sea. The Draft Long Range Plan fails to achieve the goals set by the 2003 Salton Sea Restoration Act. Air quality is a grave concern! People living on the East side of the Coachella Valley, which includes Polo Fields, Tennis Garden, and concerts, will have drastic problems with air quality. Hay/straw and furrows will NOT work for the long haul. The value of homes and property will fall as the pollution creeps into the area. Water quality and restoring long-term stable aquatic and shoreline habitat are given only band-aid solutions! Instead of spending the money which can fix these problems, piecemeal projects are absorbing money that could go for LONG TERM solutions. Also the committee did not give Ocean Water Imports a fair hearing. Ocean Water Imports would achieve all the goals. It is affordable AND feasible. With our water instability, I believe we will more and more have to depend on ocean water. PLEASE LOOK AT THE LONG RANGE AND GIVE OCEAN WATER IMPORTS A FAIR HEARING.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Restoration concepts, including in-basin and water importation concepts, will be considered at the next stage of feasibility analysis.
Pat Leach			The SSLRP draft has already failed in the most basic way - it has not fairly considered ocean water import to solve the multitude of problems at the Salton Sea. In the face of growing demand for Colorado Riverwater, we cannot depend on increasing water levels at the Salton Sea unless we import water fromelsewhere. Only one of the proposed restoration concepts included in the study actually contains the element of ocean water import, and that plan is a mish-mosh of ideas created by the IRP instead of aholistic and orderly design. The published draft of the SSLRP falls short in the following ways: It will not improve air quality in terms of PM10 pollution or sulfuric odors coming from the Salton Sea,nor will it reduce GHG emissions. The plans for shallow ponds and perimeter lakes will increase methaneemissions compared to a basin restored to pre-QSA levels. It will not improve the quality of the water, which will continue to get more saline and polluted withoutan infusion of new water. This in turn will mean the further deterioration of the natural habitat at the Salton Sea. When the fish are eradicated, the birds will also be gone. The many competing demands on the Colorado River water make future deals to garnish more of it for the Salton Sea very improbable. We have to find a new source for water to keep our region healthy andeconomically viable. Basing a plan on getting more Colorado River water will certainly fail, and the money spent inimplementing that plan will be wasted. Toxic pollution and dust storms will continue to severely impact public health. The plans selected in the SSLRP draft as most highly rated for further evaluation rely on outdated studies,instead of more recent updates, and technical advice from Tetra Tech, a contractor sued for fraud by the US Navy for falsifying records relating to their work at a SuperFund cleanup site. None of these plans guarantees any increase in available water for the Salton Sea. Please consider again the earlier vendor proposals for ocean water import. Yes, water importation will cost a lot. Yes, it will take time to build. But it is the only way to stave off the ecological, economic and public health nightmare that is building at the Salton Sea.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Restoration concepts, including in-basin and water importation concepts, will be considered at the next stage of feasibility analysis.
Kristen Nelson; Donna Griffith	City of Indian Wells		On November 7, 2019, our city passed Resolution 2019-40 (attached) which read: "A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF INDIAN WELLS, CALIFORNIA, DECLARING ITS SUPPORT FOR A COMPREHENSIVE ANALYSIS OF ALL WATER IMPORT ALTERNATIVES AS PART OF THE LONG-TERM SOLUTION FOR THE SALTON SEA." In 2021, the UC Santa Cruz Panel that was hired to conduct such a feasibility study of the 13 water importation proposals. They failed to conduct such a study of any of those plans. The City of Indian Wells therefore respectfully requests that all of the UCSC Panel's work be set aside, and a full and objective feasibility study of water importation options be performed. We suggest that the CNRA should immediately request that the U.S. Army Corps of Engineers, in consultation or collaboration with appropriate agencies of the U.S. Department of the Interior, conduct a comprehensive, detailed, and objective feasibility-level study of proposals for water importation to achieve long-term restoration of the Salton Sea. We are very concerned about the deterioration of the Salton Sea, and we fear that your Draft Long Range Plan will not protect the air and water quality or restore the wildlife habitat as required by the Salton Sea Restoration Act of 2002. We appreciate you taking our request into consideration.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Restoration concepts, including in-basin and water importation concepts, will be considered at the next stage of feasibility analysis.

Name	Organization	Section or Page	Comment	Response
Kay Wolff			Like many of my friends and neighbors in the Coachella Valley, I have long been concerned about the degradation of the Salton Sea. My concern relates to the loss of habitat for fish and fowl, the effect on our health due to chemicals becoming airborne and the economic effect on local tourism and the value of my home (within range of major hazards). The only real solution to the Salton Sea dilemma is to refill it. Small projects around the edges will not resolve the health problems, as the remaining water will continue to evaporate, leaving ever more exposed toxic playa. All reports and data point to the inadequacy of the Colorado River as a source to restore or diminish the degradation of the Sea, let alone supply a major source of water to over 40 million thirsty dwellers in the Southwest. Importing water from the Sea of Cortez is fraught with political obstacles in the long term. Agreements with a foreign government, private property owners, tribes and cartels are risks to any sustainable solution. The importation of water from the Pacific Ocean is the logical solution. •No foreign entities involved •The Pacific Ocean needs some drainage (rising sea levels) •Underground tunnels require less invasion of private property •Huge tunnels have been used for decades to transport water, for example the Delaware tunnel to NYC built during the depression •Abandoned tunnels might be utilized •Desalination plants can convert the sea water into useful water for drinking or for industry (lithium) •One project proposes running a tunnel along the US/Mexico border, below the right of way already owned by the US. •One private project envisions selling excess water along the tunnel route to offset expenses and even make a profit. Surely a country that built the Panama Canal over 100 years ago can figure out how to get the Salton Sea refilled and save the wild life and human life in Southern California. Decades of wasted time and money (millions and millions) are behind us. No more studies. No more delays. Get busy an fix this blight in our midst.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.

Name	Organization	Section or Page	Comment	Response
Susan St Louis			I would like to register my objection to the Salton Sea Long Range Plan Draft: Citizens of the Coachella and Imperial valleys know that drought, climate change and growing demands on the Colorado River are leading to a critical breaking point for our region. There is not enough water to satisfy all agricultural, commercial, residential and wildlife conservation uses. The West is going dry. In 2021, the state appointed Professor Brent Haddad of UC Santa Cruz to select members and serve as the Chair for an “Independent Panel” of experts to review ocean water import proposals for the Salton Sea. Citizens of the Coachella and Imperial valleys were disappointed by this, as Dr. Haddad was already on record for publicly opposing ocean water import for the Sea, in his 2002 LA Times op-ed entitled, “Drop Bid to Revive the Salton Sea.” When public opposition was raised to his selection, Dr. Haddad moved from Chair to Principal Investigator, but continued to lead the process. Dr. Haddad’s panel (the IRP) reopened the request for proposals and several more were submitted. Out of 18 submitted proposals, some were eliminated because they didn’t actually include water importation, and most of the others were eliminated for supposed fatal flaws. The fatal flaw criteria seem to have been created to deliberately eliminate proposals, as many of the criteria were based on untested assumptions, scientific errors, and flawed calculations. Only 3 proposals made it through the process. The IRP then refused to consider each plan’s merits, and cherry-picked elements from each of the proposals and added other elements of their own, to create a stitched-together plan, lacking a coherent, viable structure. Consistently, the panel picked the most expensive, least beneficial, and most environmentally harmful of the elements to put into their Frankenstein creation. The panel also inflated the cost of many of the items, by a factor of 10 or more times as much as the earlier proposals had indicated, without providing any quotes or calculations to back up their inflated estimates. After all this, the “independent” UCSC panel did not recommend their combined plan, which at least included importing some ocean water. Between hugely inflating the cost of importing water from the estimates, to wrongly stating that water import wouldn’t provide enough benefits to Mexico, to declaring the elements they chose for their proposal environmentally unsound, they then eliminated their combined water import plan. They deliberately created a plan that would fail their own criteria. One must wonder whether their criteria were ever in earnest, or whether they were designed to make all proposals fail? The IRP also concocted a second water import concept based on a study done by the engineering firm Black and Veatch for the State of Arizona for import of desalinated Sea of Cortez water from Sonora State with an exchange for Colorado River water. This second water import concept proposed that 100,000 acre feet of water be imported annually to offset loss of brine from a proposed Seawater Reverse Osmosis (SWRO) desalination plant at the Salton Sea, not near enough to offset to the loss to the Imperial Valley of almost 500,000 acre feet per year to QSA and prior water transfers. The IRP inflated the Black and Veatch estimate for the cost of a pipeline from Sonora to the border by a factor of 10, then eliminated this escalated $45 billion capital cost water import proposal as well. Instead, the IRP recommended a different proposal, which involves an in-basin solution rather than water import, requiring a reallocation of CO River water to the Salton Sea, plus building a SWRO desalination plant at the Salton Sea to gradually reduce the salt content. Why did their recommended plan ignore ocean water import to focus only on an in-basin solution? We understand by this that the state was not interested in an independent, unbiased review process, but simply wanted to take ocean water import off the table.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
			The recommended proposals in the Long Range Plan Draft contain problematic elements as a result of the poorly implemented analysis by the IRP. These include: 1) The planned use of SWRO desalination technology, which will not work on the hyper-saline water of the future Salton Sea, if no water is imported to cut the initial salinity; 2) The proposal to return 100,000 acre-feet of fresh water per year to the inflow to the Sea to offset the SWRO brine waste, by persuading farmers to voluntarily reduce their water use by fallowing their fields, is no solution: if 28,000 acres of fields are left dry, not only does it reduce food supplies, but the reduction in agricultural runoff to the Sea will require an additional 145,000 acre-feet of water per year simply to keep the water level stable; 3) The plan is predicated on the federal government being willing to pay the farmers to stop production, then purchase the necessary river water at the rate of $157/acre-foot, when IID is already selling Colorado River water to San Diego for $641/acre-foot; 4) The IRP's plan also calls for huge quantities of the dried salts removed from the Salton Sea to be loaded onto railcars and shipped to landfills. No landfills exist which are likely to accept 40 million tons of salt initially, and then 3-4 million per shipment in perpetuity; 5) The currently employed dust suppression methods the Long Range Plan supports, furrowing and hay bales, will cost many millions of dollars over the coming years, but won't stop carbon and methane emissions from growing dangerously, nor fully control the PM10 dust. (The cost of furrowing and spreading gravel at Owens Lake is nearing $2.5B and has not solved the problem, nor saved the wildlife and critical habitat of the now defunct lake); and 6) The proposals being most seriously considered consist of a variety of arrangements of small, shallow ponds and skinny perimeter lakes, which will emit greatly elevated levels of methane in comparison to the deeper water of a refilled basin, and which will also leave thousands of acres of dry lakebed exposed to the air to create both PM10 pollution and GHG emissions. We need a deeper Salton Sea to become an important carbon sink, and to help reduce GHG emissions. The entire proposal review process has systematically avoided the central question here – where will the fresh water come from? Water we need for agriculture, water for residential use, water for important industrial uses like extracting lithium, water for species preservation, water for recreational uses, water to keep life livable in the seven US states that draw from the CO River, and Mexico as well. Despite the recent winter rains, our reservoirs and rivers in the Southwest are all dangerously low. Climate change is drying out vegetation, leading to extensive wildfires, and increasing the evaporation of our water sources. We must find alternative water sources, and ocean water import is the only answer. The technology exists. Canals carry water across California right now. This can be done. Does California want to ignore the reality that water import is the only way to gain access to new water supplies, in favor of building small-scale projects around a drying, hyper-saline brine pool which will become a growing source for both PM10 dust and hugely elevated CO2 and methane emissions? The SSLRP wants to select a plan because it is less expensive and can be built more quickly, but what is the rationale for building an infrastructure that doesn't solve the basic problem? It only kicks the can down the road. The West needs fresh water, and we need to get on with the process of sourcing it from the vast reaches of the ocean as soon as possible.	

Name	Organization	Section or Page	Comment	Response
Edward Armendarez			The Draft of the Salton Sea Long Range Plan is more wasted time and money and only ensures continuing suffering. Children can't breathe. You should meet them. I am a member of several community groups that have been following the ongoing impending ecological disaster that is the Salton Sea. Its deadly pace is quickening. I have been in so many meetings with the Salton Sea Authority, (which has NO authority), local and state representatives, UC Riversides symposiums, the presentations of the water import plans, etc., and what is happening? Multi-million dollar projects, (Red Hill), being removed by IID in a day. Hay bales expected to mitigate dust. The water import options nullified by a woefully inept UCSC independent review team. (Which is particularly embarrassing because I'm an alumni of that fine institution.) It was headed by a guy who'd opposed the idea of water import. They kicked out plans, years in the making, because they didn't meet certain criteria, yet they never disclosed what that criteria was. They never gave the proponents a chance to answer their questions. We launched an immediate campaign with our local leaders to pressure them to reconsider, and they did, but ultimately came up with their own plan, which they were not asked to do. They then condemned their own plan, saying it was too expensive and didn't benefit Mexico. As you know, decades have passed and millions of dollars spent on trying to remedy the impending disaster that the Salton Sea is. The populations near the sea are suffering from respiratory diseases. A lot of these people are low income people of color. They do not have the resources to fight for their own health. You must help them, and all of us in Southern California, for the toxic dust from that Sea reaches the LA basin, and it will get worse. It's my suspicion, for many reasons, that lithium mining must have something to do with the delays. It always seems to be commerce over community. The Long Range Planning committee meetings violated the Bagley Keene meetings act. They were purposely opaque. We all know that lithium is a critical resource for the United States. I understand, besides requiring fresh water for processing, which is problematic enough, that it's a strategic resource. But I don't know why addressing the quickly shrinking shores of the Sea, and the resulting increasingly toxic dust that escapes, still wouldn't be the highest priority. The workers and plants at the sea would be better off with cleaner air, wouldn't they? Relying on Colorado River water to mediate is absurd. Our historic droughts are forever. That water has already been over-promised and will fall short. If the Sea keeps shrinking at its current rate, the more toxic elements, which have settled at its bottom, will be exposed and destroy the air quality of Imperial County, the Coachella Valley and beyond. I have seen the birds disappear in what seemed like a season. The entire tourist economy, the real estate market and the population will collapse. Will it affect our agriculture industry there too? Of course it will. Isn't that a critical resource too? Hay bales will not stop the dust. It didn't work at Owen's Lake. We had 80 mph winds Tuesday. We had sustained winds between 50-70 mph that night too. We have a weather station. I can send you a screenshot. The desert has wind. Sea water import seems like a reasonable solution. Don't waste any more time nor money. There is enough research and study that has been done. There are too many parties involved and this has to be consolidated into one program, one that can be held accountable. The Long Term Plan is just more wasted money and time, and everyone responsible in this decision needs to visit the communities along the Sea's shore and speak to the actual inhabitants. YOU can explain to those whose health is being damaged permanently, right now, why you are making the decisions that you are. Please do the right thing. If it's sea import, (we built the Panama Canal, and we have major water tunnels in great cities in the east - the Delaware tunnel), or, something else; immediate, permanent solutions must be forthcoming.	Comment noted and documented in this appendix to the Final Long-Range Plan. Public health is a foundational concern in our work. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
Carole Rogers; Tracey T; Bruce Flamenbaum			The Draft Long Range Plan fails to achieve the goals set by the 2003 Salton Sea Restoration Act: 1) Fails to improve air quality 2) Fails to improve water quality 3) Fails to restore long-term stable aquatic and shoreline habitat.The Long Range Planning committee violated the Bagley Keene public meetings act. Their methods and procedures were not transparent or inclusive. 4) Documents were not made available to committee members in advance, meetings were not recorded, nor public comments addressed. 5) Reliance on outdated studies which cost millions but failed to produce plans that would improve air, water, and environment. 6) Estimates of future water flows, plus technical advice were provided by Tetra Tech, a contractor sued for fraud by the US Navy. 7) Lack of clarity on how the final public comments will be handled.The UC Santa Cruz Independent Review Panel was hired to study and report on the feasibility of ocean water importation proposals accepted by the state in 2018. (IRP report attached.) 8) Professor Brent Haddad opposed water importation in 2002. He was appointed as Principal Investigator of the IRP panel. 9)The IRP review panel undermined and mocked the water import proposals accepted by the state. 10) The IRP fabricated their own water import project. 11) The IRP, after designing their fabricated project, then deemed it to be infeasible because it was exceedingly expensive, damaging to the environment, and did not benefit Mexico - it was designed to fail. 12) Then the IRP rejected water importation, instead relied on depleted Colorado river water.Fourth, the Long Range Plan undermines the impact of climate change and drought. 13) Water flows will continue to be drastically reduced. 14) Plans cannot rely on local water. 15) Money will be wasted on such plans. 16) Destruction of the local environment will continue. 17) Damage to human health will accelerate. The LRP ignored the warnings of a groundbreaking report by Jenny Ross titled: "Potential Major Greenhouse Gas Emissions from Proposed Salton Sea Long-Range Plans." By undermining this report, LRP is also undermining the state's overall goal to reduce greenhouse gas emissions. (see link below) https://www.researchgate.net/publication/360029978_Potential_Major_Greenhouse_Gas_Emissions_From_Proposed_Salton_Sea_Long-Range_Plans	Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.
Mary Lou Rosczyk			I comment as an interested party who is both a birder and one that deeply cares about environmental justice. With this in mind the two top priorities for the Long-Term Restoration of the Salton Sea should be: 1) That a significant portion of the Salton Sea be restored such that the sea's fish population is returned to productive levels. This would enable the sea's function as an integral part of the Pacific Flyway for migrating birds to be restored. 2) That the dust problem be reduced to a level such that the communities surrounding the Salton Sea are no longer breathing the very small particulate-laden dust which so impacts the health and air quality of these mostly low-income people. With these two problems solved or reduced to a great extent, everything else will begin to fall into place. Thank you for the opportunity to comment.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Your priorities are closely aligned with our objectives.

Name	Organization	Section or Page	Comment	Response
Nikola Lakic			I'm writing during this Public Comment period regarding the Long Range Plan (LRP) for the Salton Sea because we need a completely "objective" view for this issue. For 20 years I've been part of the residents of the Salton Sea area, environmental organizations, and neghboring cities' efforts to get the attention of our policy makers to address the drying up of the Salton Sea. Money has been allocated during these 20 years but the sea keeps drying up, the air quality continues to be more difficult to breathe, and promises keep being made. Now with the Lithium industry looking good in this area, Lithium is being addressed with little attention being directed to the sea drying up and the ability to access Colorado water decreasing by the day. On my first trip to Sacramento, I was on a bus with around 8 people from various universities hoping to present feasability studies and remedies that could've resulted in a solution earlier and at less expense. Governor Schwarzenegger, Brown and now Newsom all promised to fix the problem but as you can see nothing was done. Now we have studies that were made from 20 years ago to the present day. So much money has been spent on these studies and all the people heading these task forces start all over again as if nothing was done before. I'm no scientist or environmentalist but I do know that Owens Lake suffered from delayed and incompetent action so I can predict that what is being proposed is ignoring the reality that the air and water quality will suffer if we don't accept the necessity for water import. Below is a very comprehensive proposal that I think covers all possible scenarios. None of the research groups looked at this proposal which was submitted in 2013. The person who submitted it never received any kind of constructive criticism or reason for being dismissed. I'm sending it to you for consideration as I feel it will transform the Salton Sea into a revenue stream while improving the environmental quality of the air and water. As a consequence, the neighboring counties in Riverside, Imperial, LA and San Bernardino will continue to develop into thriving communities with new revenue streams growing the wealth in California unseen in decades. Below was presented at Stanford sending you three papers from Stanford Geothermal Workshop 2023. [Attachements removed] Segment (I) - Harnessing Energy and Water in the Salton Sea. Segment (II) - Harnessing Geothermal Energy in the Salton Sea Area. Segment (III) - System for Drilling Deeper and Wider Wellbores. Just to summarize (that is mentioned in Segment I) - the implementation of my proposal for the restoration of the Salton Sea would cost about $15,000,000,000. It can be completed in about 5-6 years and would generate at least $500,000,000 in revenue per year out of the blue – literally. The revenue numbers in my papers are conservative. A more realistic revenue estimate would be about $1,000,000,000 per year. That is in addition to a clean environment, a substantial amount of potable water, lithium, tourism, and other activities that generate revenue. I am including in the attachment three files (so-called Papers). PowerPoint files are too big therefore I will not include them this time. I am consulting with someone to include it on my website. Also, I am including my public comment (7 pages) that I sent on January 25, 2023, to Salton Sea Long-Range Plan Review - California Natural Resources Agency. [repeated comments removed]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Andrea Jones	Audubon California	p55. Table 5-1. Phase 1: 10-Year Plan Cost Estimate	Could you explain where the $37,500,000 number came from for Audubon Bombay Beach project? We are right now estimating somewhere between $3-5 million for the project (Phase I and possibly part of Phase 2), but are working with our contractor Formation on coming up with more exact numbers shortly - our design is only in the conceptual phase right now. We are planning to apply for a WCB grant very soon for around $5 million so if they saw this number it might cause some confusion. Even if $5 million doesn't complete the cost, we would expect this project be well under $37 million. We are not involved in the San Felipe Wash project but are familiar with it and wondered it that number was also too high?	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Estimated project costs have been updated with the most recent information available.
Johnathan McDannell	Salton Sea Authority	Page vi. Figure 5-8	Comparison of Concept 1: Water Requirements with Inflow Scenarios (there should be a colon after the 1 like the next Content' topic).	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page vii. Figure 5-20	Comparison of Concept 3: Water Requirements with Inflow Scenarios (there should be a colon after the 3 like in most topics in the Contents).	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page ix. Table 5-3	There are two spaces between Requirements and for where should only be one	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page x. Table 5-23	there are two spaces between Concept Compared where should only be one	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page xii.	LRP Long-Range Plan or Plan	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.

Name	Organization	Section or Page	Comment	Response
Johnathan McDannell	Salton Sea Authority	Page xv.	Need a colon after Restoration Concept 9	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page xviii.	Effectiveness measures how will a concept accomplished an individual vs. induvial objective for the key objective areas	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page xxii.	I do not believe that in the second paragraph that lake-surface needs to be hyphenated	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page 9	after the fourth bullet, there should be a space between Chapter and 5	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page 10	first paragraph for 2.1 Core Commitments for the Development of Evaluation Criteria: I would recommend a ; after and before (3).	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The punctuation appears as we intended.
Johnathan McDannell	Salton Sea Authority	Page 48	Under Key Features you may want to add a cumulative total of acres of 37,139	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The content appears as we intended.
Johnathan McDannell	Salton Sea Authority	Page 63	Please see scan for figures [scanned page can be found in email attachment files; minor numerical corrections commented]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The total appears as we intended. Because of rounding in individual elements, totals don't always match sum of components.
Johnathan McDannell	Salton Sea Authority	Page 65	Please see scan for figures and would mid-Sea be capitalized? [scanned pages can be found in email attachment files; minor numerical corrections commented]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have capitlized "Mid-Sea" trhoughout document. The total appears as we intended. Because of rounding in individual elements, totals don't always match sum of components.
Johnathan McDannell	Salton Sea Authority	Page 66	Per the first paragraph, last sentence: As additional salts enter the north basin over time, they would crystalize on the bottom or form crusts around the perimeter; and thus, the salinity would be expected to stabilize at a concentration of about 280 PPT	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The content appears as we intended.
Johnathan McDannell	Salton Sea Authority	Page 68 & 69	Last paragraph under SEDIMENTATION BASINS – Inflows from the New and Alamo Rivers would be captured in two sedimentation basins to flow into the south marine lake. Contaminants attached to fine sediment particles would be removed in these basins. The sedimentation basins would be excavated at the mouths of the New and Alamo Rivers. (Rivers should be capitalized)	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The content appears as we intended.
Johnathan McDannell	Salton Sea Authority	Page 75	Please see scan for figures [scanned pages can be found in email attachment files; minor numerical corrections commented]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The total appears as we intended. Because of rounding in individual elements, totals don't always match sum of components.
Johnathan McDannell	Salton Sea Authority	Page 84	There should be periods after ft in line 1 of paragraph 2 and after sq. mi. in the last sentence in the same paragraph	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The content appears as we intended.
Johnathan McDannell	Salton Sea Authority	Page 85	Please see scan for figures [scanned pages can be found in email attachment files; minor numerical corrections commented]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The total appears as we intended. Because of rounding in individual elements, totals don't always match sum of components.
Johnathan McDannell	Salton Sea Authority	Page 87	Please see scan for figure [scanned pages can be found in email attachment files; minor numerical corrections commented]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The total appears as we intended. Because of rounding in individual elements, totals don't always match sum of components.
Johnathan McDannell	Salton Sea Authority	Page 88	Under BRINE PONDS AND SMALL PUMP FACILITIES: remove the ? between the words be and spread	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page 91	Under 5.6.2 Performance, Expected Benefits, and Recreational Opportunities: the last sentence: should it be restored fish and bird habitat versus habitat?	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The content appears as we intended.

Name	Organization	Section or Page	Comment	Response
Johnathan McDannell	Salton Sea Authority	Page 91	Under the paragraph that begins with Table 5-12 in the next to last sentence. I would recommend to take out the word in and have the sentence read: The calculations shown are for steady state conditions. . .	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Johnathan McDannell	Salton Sea Authority	Page 96, 98, 99, 107, 109, 117, 122, and 126	Please see scan for figures [scanned pages can be found in email attachment files; minor numerical corrections commented]	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The total appears as we intended. Because of rounding in individual elements, totals don't always match sum of components.
Johnathan McDannell	Salton Sea Authority	Page 136. Under 6.4 Opportunities to Implement Multi-Benefit Solutions Within the LRP	Take out the “d” in the first line between needs of and community	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We have made this correction in the final version.
Nathan G. White	Agess, Inc.	Executive Summary - Introduction "The goal of the LRP is to protect or improve air quality, water quality, and wildlife habitat to prevent or reduce health and environmental consequences anticipated from the long-term recession of the Salton Sea."	This doesn't seem to be achievable as these review processes aren't able to adjust to water cuts and changes on the Colorado River Basin in real time. The only criteria should be can the project succeed with current and future water projection as of today and moving foward. If a project can be adjusted to that criteria as this is updated then it should still be a viable project and continue with project development. Our Water Import Project in 2018 received 3 comments which we have resolved. Our 2021 proposal at the "Fatal Flaw" review has 1 remaining comment which we were given two weeks to resolve. The judging criteria also fall short of real time data related to climate change, water cuts, conserve and transfer and upper elevation impacts. We have advocated that the two attachments for regional climate modeling be performed to show what happens related to all non import and water import scenarios to know what effect all of these strategies will have on the whole Colorado River Basin because the Salton Sea is part of the entire Colorado River network. As shown in both programs water cuts have drastically reduced feasibility of all proposals except for our projects which adjust to the changing water inflow without increasing the prices substantially. Third party regional climate modeling are scientific studies that would show if projects could not only help locally but also regionally and internationally. They can be done frequently and be updated regularly with any new input and projections. We have a real concerns of conserve and transfer policies that fallow fields as the also reduce evaporation into the region. As the Salton Sea recedes we should also know what effects that will have on the upper elevation water bank. If the Salton Sea recedes what will happen to the geological substructure which is the San Andres Fault Line. The weight of water is massive and if any more is lost it might cause catastrophic earthquakes and the only mitigation strategy is to =keep it at current levels or refill to its historic level. I have to be honest. My day job is a Development Project Manager with the City of San Diego Development Services Department and I managed complex developments. We have 1 comment on our Tres Mares / Three Seas project for binational restoration with a cost of $1-1.25 billion that builds a lake nearly the size of Salton Sea in Mexico with no Desalination required. The added benefit is that it can provide more water for Geothermal Facilities with an additional 500k acre feet of ocean water at a fractional cost increase. It can also provide additional water to supplement additional water conservation measures with minimal modifications and fractional costs. Unfortunately the door was closed to move to feasibility stage with UC Sant Cruz and LRPC. I would like to provide specific comments and recommendations below in hopes that we still have an opportunity to fund these efforts our selves and have an audience with CNRA and LRPC as the projects progress. It has caused great financial hardships to our small business team to prepare this work for CNRA and the fact that we are being eliminated from the conversation with frivolous reasons is cause for concern.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.
Nathan G. White	Agess, Inc.	Executive Summary p xxi. Concepts Recommended for Further Evaluation	After a public meeting on June 7th, 2022 when I presented this project on behalf of Agess Inc., alongside James Newcomb of CNRA LRPC and other LRPC board members Tom Sephton or Septhon Water Tech, Bill Brownlie of Tetra Tech and Michael Cohen of the Pacific Institute, I received no further communications from the LRPC as to a determination, results or next steps. In the following public meeting on July 6th 2022 it was shared by LRPC that our project Concept no. 6 was not going to continue with review and that beneficial elements can be pulled out of our project and utilized in other projects and future developments. Why was it not reviewed? Please provide documentation. The results and ability for me to contest the findings that our project was similar or identical to other perimeter lake concepts was not provided. To this date I have received no information even after requesting this several times. This is not the case, our Southlake Demonstration is not similar to a portion of the perimeter lake concept in part or whole. Our project can be built and restore 17,000 acres for 16 million as phase one using incoming freshwater inflow. This can be the final project or it can be added onto later when or if water is imported to create a salt sink or a much cheaper, smaller, easier and effective Perimeter lake. We were not invited to these discussions or purview to the results. It is a stand alone development and adaptable to changing conditions as well as additional water cuts. If CNRA LRPC determination is that it is identical we request this determination documents and supporting communications and information and the ability for us to formally contest the determination and start the review process be granted. The public should have access to this information and the why behind it. Our project is very different from any other concepts part of the Salton Sea Management LRPC. Please provide additional information as our project can be permitted quickly, a very low cost, restore vast areas of water quality, quickly get salinity to decrease in +/- 17,000 acres quickly.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.

Name	Organization	Section or Page	Comment	Response
Jenny E. Ross	Stout Research Center	General issues 1. The Draft Long-Range Plan is inadequate and does not satisfy the CNRA's legal obligations	The requirement that the CNRA must "complete a long-term plan" for Salton Sea restoration "by no later than December 31, 2022" is set forth in State Water Resources Control Board (SWRCB) Order WR 2017- 0134, Exhibit A, paragraph 26. This directive was also incorporated into State Water Resources Control Board Order WRO 2002-0013 as a condition of the 2003 Quantification Settlement Agreement's ongoing water transfers from Imperial County to Southern California urban areas. In that way, continuation of the QSA water transfers was made contingent upon CNRA compliance with the legal mandate that a long-term restoration plan must be completed no later than the end of December 2022. The SWRCB also retained continuing jurisdiction over Revised Order WRO 2002-0013 as amended, and over WR 2017-0134. Fifteen years passed between enactment in 2002 of a statutory mandate that the State of California restore the Salton Sea and the subsequent issuance of SWRCB Order WR 2017-0134 in 2017 again requiring the State to move forward to comply with that crucial legal obligation. Five more years passed between issuance of WR 2017-0134 and the CNRA's deadline to complete a long-term restoration plan for the Salton Sea by December 31, 2022. Yet, at the end of all those years, the substance of the agency's December 2022 Draft Long-Range Plan ("Draft LRP") is seriously insufficient and fails to constitute an actual restoration plan. The CNRA did not "complete a long-term plan" for Salton Sea restoration "by no later than December 31, 2022" as required by SWRCB Orders WR 2017-0134 and WRO 2002-0013, and still has not done so. The Draft LRP issued on December 15, 2022 is incomplete, inadequate, and flawed. It is not even an actual restoration plan. Instead, the Draft LRP is simply a preliminary—and unsound—assessment of various possible restoration concepts, which have been retained for further consideration during a future evaluation process. The Draft LRP is a deficient and flawed rehashing of decades-old proposals for in-basin restoration concepts that rely unsustainably on very large quantities of Colorado River water and have many significant inherent defects that undermine their suitability and viability. Similar concepts for long-term restoration have been proposed repeatedly for many years, and have never been approved at either the state or the federal level. None of the fundamental problems affecting such plans have been addressed, yet they have now been revived, repackaged, and suggested again. Additional years and dollars have been expended doing the same thing once more and expecting a different result. Pursuant to the federal Water Supply Reliability and Environmental Improvement Act of 2004, the Bureau of Reclamation previously conducted a "Salton Sea Study Program" to assess various proposed in-basin restoration options for the Salton Sea that were similar to ones now being suggested by the SSMP and its consultant Tetra Tech in the Draft LRP. Reclamation performed an appraisal-level evaluation and evaluation, the Bureau of Reclamation determined that it could not recommend any of the in-basin plans. In a concluding section entitled "Recommendations for the Future," the 2007 report stated: "All five action alternatives considered in this report entail extreme costs; and there are substantial uncertainties and risks associated with engineering, physical, and biological elements of the alternatives. While lack of data and the time and funding required to analyze these data did not allow a full feasibility level study, a more detailed evaluation would not resolve the hydrologic and biologic uncertainties. Therefore, Reclamation does not have a basis for recommending implementation of any of the action alternatives evaluated in this report." Following Reclamation's evaluation of possible in-basin plans in 2007 and the agency's determination that none could be recommended for implementation, the reasons for concluding that such in-basin plans cannot be recommended have grown even more significant: •The costs for such plans have greatly increased; •the "substantial uncertainties and risks associated with engineering, physical, and biological elements of the alternatives" previously noted by Reclamation continue to exist; •wastewater containing potentially harmful pollutants will be relied upon as the sole water source for impoundments to be used for wildlife habitat and human recreation; •sediments contaminated with potentially hazardous substances, such as heavy metals and residues of banned pesticides (including DDT), will be used to create impoundments, islands for wildlife to nest and loaf, and embankments to be used by people (e.g. for hiking and fishing); •large quantities of toxic dust will be blown from vast areas of lakebed that will be left exposed, and greenhouse gases will be emitted in significant amounts from both exposed lakebed and other features of in-basin plans; and •the hydrologic situation across the Colorado River Basin has worsened to the point that all in-basin plans for the Salton Sea that depend on availability in perpetuity of large quantities of Colorado River water (i.e., all of the in-basin plans being considered by the SSMP in the Draft LRP) face a very substantial risk of failure because the water supply essential for their long-term operation is highly unlikely to exist, and cannot reasonably be assumed to exist. Nonetheless, the SSMP has consumed large amounts of time and resources resurrecting essentially the same in-basin plans that have been rejected multiple times previously, apparently hoping that the Army Corps of Engineers will somehow make a different determination than has been made repeatedly in the past concerning the same issues.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Salton Sea Management Program (SSMP) prepared the Draft Long-Range Plan to comply with State Water Board Revised Order WR 2002-0013. The State also prepared a Programmatic EIR and submitted a Preferred Ecosystem Restoration Alternative to the Legislature in 2008, consistent with Quantification Settlement Agreement legislation. The restoration concepts presented in the Long-Range Plan build on previous work that involved a great deal of prior analysis and outreach. In addition, all information was updated with current conditions in and around the Sea, and evaluated based on the three hydrologic scenarios developed. Furthermore, Appendix A of the report contains a summary of all previous concepts that have been proposed at the Sea. Together, this is a strong foundation for additional feasibilty analysis by the Army Corps of Engineers. The retrospective analysis of this large body of prior work was essential to captialize on past study and minumize duplication of effort as we move forward with the feasibility study. The SSMP led a public process over a year to prepare the Long-Range Plan. Key portions of the plan, such as the evaluation criteria used, were reviewed by the Science Committee. Members of other federal and state agencies were part of the LRP Committee with an opportunity to participate in the plan development process. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

Name	Organization	Section or Page	Comment	Response
			After many years of inaction, during 2022 the CNRA rushed to complete a long-term plan for the Salton Sea in order to comply with the legally mandated deadline to do so that was imposed by the SWRCB in 2017. But because of the relatively short time remaining when the SSMP's attempt to develop a long-term plan finally proceeded in earnest, it appears that scientifically sound assumptions, methodologies, and conclusions became less important than scrambling to pull together some sort of document resembling a plan, regardless of its inadequacies and defects. By proceeding in this manner, the CNRA: •failed to understand, disregarded, or misinterpreted important facts and relevant science; •used misguided assumptions to make unwarranted and flawed findings; •did not take proper advantage of an available and objective Science Committee that the CNRA itself had established to assist the SSMP; •failed to obtain assistance from additional specialized experts in academia and federal agencies of the Department of the Interior concerning particular issues of great importance for developing an appropriate long-term plan; •discounted or ignored input by knowledgeable members of the public; •instead apparently relied almost exclusively on the SSMP's consultant, Tetra Tech, a private engineering company that has been designing and advocating for particular in-basin plans for many years; and •incorporated into the Draft LRP the clearly improper, biased, and fundamentally defective work of the UC Santa Cruz review panel, including its fatally flawed conclusions and recommendations, and its straw-man concepts for water importation that were designed to fail a feasibility analysis. Consequently, the CNRA did not fulfill its legal obligation to complete a viable long-term plan for the Salton Sea no later than December 31, 2022. The inadequate analysis in the Draft LRP cannot form a solid foundation for moving forward with an appropriate, feasible, and sustainable plan for long-term Salton Sea restoration. In the Draft LRP the SSMP has retained deficient and deeply faulty "restoration" concepts "for analysis and comparison to other alternatives considered feasible in this document," despite the fact that such proposed plans: (a) cannot genuinely accomplish long-term restoration of the Salton Sea to support the numbers and diversity of wildlife originally reliant on the lake, including threatened and endangered species; (b) will violate the requirements of the Salton Sea Restoration Act; (c) will not protect public health, and in fact will seriously jeopardize it throughout a large populated area; and (d) will fail to revitalize, and will very likely worsen, the economy across a region encompassing numerous chronically disadvantaged and marginalized communities. Proceeding with any of the in-basin "restoration" concepts in the SSMP's current Draft LRP is an approach very likely to ensure that the Salton Sea region remains the sacrifice zone it has been for decades, with dire consequences for both wildlife and people.	
Jenny E. Ross	Stout Research Center	General issues 2. Recent procedural problems	On December 15, 2022 the CNRA released a draft of the agency's "Long-Range Plan" that was said to be a"living document" that would be amended and updated on an ongoing basis. In addition to containing errorsand faulty information, the document was incomplete; most of the crucial appendices on which the Draft LRPrelied heavily were not released to the public along with the "plan." Moreover, the Spanish-language version of the Draft LRP—essential for some largely Spanish-speaking Salton Sea communities—was not publicly available until the end of January, six weeks later. It was clear there was a rush to push out a public version of the Draft LRP, regardless of its inadequacy and flaws, in advance of a signing ceremony held on December 16, 2022 for the launch of the Imperial Streams Salton Sea and Tributaries Feasibility Study ("Imperial Streams" study) to be led by the Army Corps of Engineers beginning in 2023, with the Department of Water Resources (DWR) and the Salton Sea Authority as non-federal co-sponsors. In the SSMP email newsletter on December 30, 2022, the public was informed that the Imperial Streams study "will investigate and recommend projects and/or actions to contribute to improved public health and potential environmental restoration opportunities for communities around the Salton Sea" and that the "study will build on the Salton Sea Management Program's Long-Range Plandocument, released as a draft for public comment on December 15." In a subsequent SSMP email newsletter on January 31, 2023, the public was informed that following the public comment deadline on March 17 "the long-range planning effort will become part of a feasibility study led by the U.S. Army Corps of Engineers." This appears to mean that submitted public comments, and the Draft LRP itself, will simply be handed off to the Army Corps of Engineers following the March 17 deadline, and that the SSMP will not amend the Draft LRP in accordance with any of the comments before giving everything to the Corps. During a public Zoom meeting on March 1, 2023—the only public meeting the SSMP has held or plans to hold regarding the December 15, 2022 Draft Long-Range Plan—the SSMP representative present to answer questions was asked to provide clarification regarding the issue of whether or not the Draft LRP would be amended in accordancewith public comments before being transmitted to the Army Corps of Engineers. The SSMP representative, who had been assigned at the last minute to handle the meeting on behalf of the agency, did not know the answer to that question. In fact, she said she had asked the same question herself internally within the SSMP, but she had not received an answer. Following the meeting I asked the question again via email to the SSMP, but no answer has been forthcoming.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. All comments on the Draft Long-Range Plan were provided to the US Army Corps of Engineers.

Name	Organization	Section or Page	Comment	Response
			Between December 15, 2022 and the end of February 2023, the Draft LRP and its essential appendices were repeatedly revised by the SSMP; however, no notice of the release of revised versions was provided to the public. Instead, each revised version was simply uploaded to the SSMP website in place of the previous version, and the documents were still labeled as the “December 2022 Draft Long-Range Plan” and “December 2022” appendices. It was impossible for members of the public to know when revised versions of the DraftLRP were uploaded, when the missing appendices became available, when the appendices were revised, or what the specific revisions to the Draft LRP and appendices actually were. In addition, beginning on December 15 and continuing for at least 6 weeks thereafter, the appendices were uploaded by the CNRA as a single document named “Appendix A,” with a cover entitled Appendix A and a Table of Contents relevant only to Appendix A, even though some additional appendices were included in the same document behind Appendix A. This made it necessary to search through the entire document in order to identify all the actual contents andto discover that some additional appendices were hidden behind Appendix A. Many weeks passed before someof the most important appendices were included. Eventually the single document containing appendices was renamed from “Appendix A” to “Appendices,” but it continued to lack a comprehensive Table of Contents specifying which appendices were included, so it remained necessary to search the entire document to determine what information was included and to identify any appendices that remained missing. The“December 2022” document containing the appendices continued to be incomplete until the important appendix related to air quality issues was finally released at the end of February, with less than 3 weeks remaining in the 45-day public comment period. From mid-December through the end of February it was necessary to keep checking the SSMP website, repeatedly download the report and the appendices, and reexamine the documents over and over in an attempt to obtain the most recent version of each document and determine what was included and what contents had changed. All of the appendices that purport to provide essential foundational support for the Draft LRP are still labeled “Working Draft” in mid-March 2023. In an email to the SSMP on December 17, 2022, less than 48 hours after initial release of the Draft LRP “living document” and “Appendix A,” I notified the CNRA that the agency’s approach to these issues would be untenable and inappropriately burdensome for members of the public, and I made suggestions regarding how to avert the otherwise inevitable and significant problems.8 That email stated in relevant part (emphasis in the original): "You’ve indicated that the SSMP Draft LRP is a “living document” and that you intend to continue amending it during the comment period. You’ve also indicated in the Table of Contents that some appendices are still being prepared (and in fact nearly all appendices – not just the ones that are labeled as “in progress”— are not yet available on the SSMP website). Because of those issues, I’m writing to suggest the following procedural steps for the public comment period: 1.That you do not start the “clock” for the 45-day comment period until all of the appendices for the Draft Long-Range Plan are available to the public online. Unfortunately it is not possible to evaluate the draft plan adequately without access to the appendices that are currently missing.	

Name	Organization	Section or Page	Comment	Response
			2.That you send an email notification (with appropriate links) to everyone who subscribes to SSMP emails each time a new or revised document related to the Draft LRP is posted to the SSMP website. 3.That you date each version of the Draft LRP (and each Appendix) in the file name and in the link for each document (and preferably on the face of the document itself as well), retain all versions online, and highlight all changes made to each version in some manner so that the public can track the changes. If you simply replace the older version of a document with a newer version online rather than naming each one with its date, highlighting changes, and retaining all versions online, it will be exceedingly difficult or impossible for members of the public to figure out whether they are commenting on the latest version. The text of the draft plan may change in important ways during the period when one is preparing comments, and it will be impossible to know whether the version that one is commenting on is current before submitting one's comments, unless one compares – word-by-word – the version that's online immediately prior to submitting comments with the version previously downloaded, in order to search for any changes relevant to one's comments. Needless to say, that would be incredibly burdensome." I received no response to this email, and the SSMP proceeded to disregard my suggestions. As a result, members of the public were confronted with an exceedingly burdensome and unworkable situation that thwarted attempts to comment in a fully informed manner on the actions of the SSMP. Even at this late date, and notwithstanding my own efforts to repeatedly download version after version of the appendices and check the Draft LRP for updates, it is impossible to know whether I am commenting on the latest iterations of those documents. If the CNRA had wanted members of the public to become so frustrated and confused by the agency's actions that they would simply give up trying to comment in any detail, then the agency could not have designed a better way to accomplish that improper goal. This chaotic process has been extremely problematic and inappropriate. It also appears, as noted above, that the SSMP does not intend to respond to public comments, or revise the Draft LRP in accordance with any of them, before simply handing everything off to the Army Corps of Engineers immediately following expiration of the public comment period on March 17, 2023. The January 31, 2023 and February 23, 2023 subscriber-only email newsletter from the SSMP stated: "Following the receipt of comments on March 17, the long-range planning effort will become part of a feasibility study led by the U.S. Army Corps of Engineers. SSMP will partner with the U.S. Army Corps of Engineers and Salton Sea Authority to undertake this feasibility study. The official title of the feasibility study is: Imperial Streams Salton Sea and Tributaries Feasibility Study. Additional public input opportunities will be available during this process to shape and enhance the plan for future actions at the Sea."	

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Jenny E. Ross	Stout Research Center		This is an inadequate public explanation regarding the intentions of the SSMP and the public process to be utilized by the CNRA for completing a long-term restoration plan for the Salton Sea pursuant to the agency's legal obligations. While the information provided during the March 1, 2023 SSMP Zoom meeting was more helpful, it remains unclear whether comments the SSMP receives from the public during the comment period concerning the December 2022 Draft LRP will be seriously considered in any manner by the SSMP. But it seems that proper consideration of public comments will not occur following the end of the current public comment process, that public comments will simply be given by the SSMP to the Army Corps of Engineers along with the December 15, 2022 Draft LRP, and that the Draft LRP will not be amended in any manner in accordance with public comments before becoming part of the feasibility analysis to be conducted by the Army Corps of Engineers. That is an improper approach. As I pointed out in written comments submitted to the SSMP on February 20, 2023, and in oral comments during the March 1, 2023 Zoom meeting, there are extremely serious flaws and deficiencies in the Draft LRP. That document and its appendices should not simply be transmitted to the Army Corps of Engineers as is, with no effort made to address the very significant and fundamental defects it contains. My comments below are limited to a relatively small number of crucial issues concerning the Draft LRP. The currently available versions of the Draft LRP and appendices appear to remain in an active state of flux more than two months after the CNRA's deadline to "complete a long-term plan," which means that any comments submitted now are directed at an unclear moving target. Moreover, as indicated above, it appears that the SSMP does not intend to take public comments into consideration before forwarding some unidentified versions of the Draft LRP and appendices to the Army Corps of Engineers. Therefore I will wait to submit detailed comments on additional issues of concern until it is clear which version of the Draft LRP and appendices I should be commenting on, and until it is also clear that all comments submitted will actually be taken into proper consideration. I anticipate that such clarity will occur during the federal process to be led in a professional manner by the Army Corps of Engineers, and I will therefore submit further comments then. I urge the SSMP to make available to the public the specific version of the Draft LRP and its accompanying appendices that are submitted to the Army Corps of Engineers for the Imperial Streams study, as soon as that submission actually occurs. The documents should be clearly identified on the SSMP website as the materials submitted to the Army Corps of Engineers, and they should be available at properly labeled hyperlinks. In addition, there should be a detailed description on the website concerning the process to be used moving forward for developing and implementing a long-term restoration plan for the Salton Sea. Email notification of the availability of the documents and information should be sent to members of the public who subscribe to SSMP notices as soon as the Draft LRP and its appendices have been transmitted to the Army Corps of Engineers. Updated contact information for both the SSMP and the Corps should also be provided.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.
Jenny E. Ross	Stout Research Center	Hydrologic issues affecting the viability of proposed in-basin long-term plans	The analysis of hydrologic issues in the Draft LRP is an improvement over earlier preliminary drafts, because it incorporates a very low inflow scenario in accordance with previous public comments and utilizes some improved modeling techniques. However, the consideration of hydrologic issues in the Draft LRP is still insufficient, and the evaluation of hydrologic impacts on proposed in-basin restoration plans is seriously deficient. My comments here focus primarily on a crucial overarching problem: The Draft LRP does not adequately consider the significant future constraints on the availability of Colorado River water that are very likely to cause large decreases in future inflows to the central Salton Basin, and will thereby undermine the operability, effectiveness, and sustainability of all proposed in-basin restoration concepts.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long Range Plan considered the impacts of each of the three hydrologic scenarios on all of the proposed restoration concepts.

Name	Organization	Section or Page	Comment	Response
Jenny E. Ross	Stout Research Center	Hydrologic issues affecting the viability of proposed in-basin long-term plans 1. Impacts of Colorado River water constraints on proposed long-term restoration plans	The Colorado River Basin states ("Basin States") are confronting unprecedented water supply challenges that will profoundly affect the entire Southwest throughout the 21st century. The Colorado River's water has been over-allocated and overused for many years, and now the chronic and massive imbalance between supply and demand has become an acute emergency as climate warming also takes an increasing toll on the Colorado River Basin's hydrology. Stored supplies in the river's two largest reservoirs, Lakes Mead and Powell, have already plummeted to the lowest levels since they were originally filled, and the combined storage of both reservoirs is hovering near just 25% of total capacity. If appropriate corrective actions are not undertaken quickly, in the foreseeable future the water shortage could imperil the ability of the Colorado River's engineered system to move any water downstream to the many millions of people in California, Arizona, Nevada, and northwest Mexico who depend on that supply. Consequently, it is clear there is an urgent need for everyone reliant on the Colorado River to reduce their use of the river's water significantly, both in the short term and in the future. 1.1 The severe imbalance between Colorado River water supply and demands If the Basin States fail to reach an agreement soon on the apportionment of 2-4 million acre-feet of water use reductions, the federal government will step in and make the cuts for them in whatever manner is deemed necessary to protect the system that stores and delivers the river's water to more than 40 million people and nearly 6 million acres of farmland. In an attempt to avoid potentially disastrous outcomes from worsening depletion of limited available supply, the Department of the Interior (the "Interior Department" or "Interior"), through its Bureau of Reclamation ("Reclamation" or "USBR"), may slash water deliveries to Lower Basin water users (California, Arizona, Nevada, and northwest Mexico) by as much as one-third beginning in mid-to-late 2023. While Interior and USBR continue to urge all the Basin States to reach an appropriate agreement to accomplish sufficient voluntary reductions in their water use, the federal agencies have already initiated the necessary federal administrative process pursuant to the National Environmental Policy Act (NEPA) to make changes in river management and to implement unilateral reductions in water deliveries of as much as 4 million acre-feet if necessary. Moreover, utilizing the regulatory structure already in place, Reclamation has begun retaining some water in Lake Powell that would have flowed downstream to Lake Mead and the Lower Basin states if not for the ongoing crisis. In May 2022, deliveries through Glen Canyon Dam to the Lower Basin were reduced for the first time when USBR held back 430,000 acre-feet of water in order to prop up Lake Powell's plummeting level. In addition, on December 2, 2022 the agency announced that 530,000 acre-feet more would be retained in that reservoir. But reduced deliveries from Lake Powell increase the downstream risk that Lake Mead will drop below a critical elevation—unless there are huge reductions in water use by Lower Basin stakeholders. Tribal water rights will also play an important role in the future allocation of a shrinking supply of Colorado River water. There are 30 federally recognized Tribes in the Colorado River Basin, and they have senior water rights; however, many of those water rights have never been quantified. It is estimated that the Tribes may be entitled to about 25% of the river's water, much of which they have never actually received.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The uncertainties related to future water deliveries have been acknowledged in the Draft Long-Range Plan and additional discussions on future policies were added in Appendix B.

Name	Organization	Section or Page	Comment	Response
			Historically Tribes have been excluded from decision-making concerning allocation of the river's water, and they've also had inadequate funds to develop the infrastructure necessary for using the water to which they're entitled. Therefore, much of the Tribes' water has remained in the river and has been used by others. Now, as a consequence of the Colorado River's depletion from overuse and the impacts of climate change, any additional water to which the Tribes are legally entitled that is to be distributed to them in the coming years must be deducted from the amounts that other Colorado River stakeholders are currently using. This issue will create major challenges for management of the river's water, the potential for significant conflicts among stakeholders, and a realistic possibility that future reductions in water allocations to many Colorado River water users will be larger than previously anticipated. On October 5, 2022 the Colorado River Board of California—in partnership with representatives of the primary Southern California water agencies utilizing Colorado River water—submitted a letter to the Interior Department and USBR responding to Reclamation Commissioner Touton's June 14, 2022 call to reduce use of Colorado River water by 2 to 4 million acre-feet annually through 2026 (after which new operating guidelines currently under development will go into effect). Pursuant to the October 2022 proposal, California water districts would reduce their use of Colorado River water by a total of 1,600,000 AF from 2023 to 2026, or approximately 400,000 AF per year, to prop up the elevation of Lake Mead. The Imperial Irrigation District (IID), the agency with the largest allotment of Colorado River water, has proposed to be responsible for 1,000,000 AF of the total conserved amount over the four-year period, or an average of 250,000 AF per year. The balance of the reductions would be undertaken by the other California water districts. Subsequently, on November 28, 2022 the Department of the Interior, the CNRA, and IID announced a multi- agency Memorandum of Understanding including a conditional provision for payment of $250 million from federal Inflation Reduction Act (IRA) monies to cover costs largely associated with short-term mitigation and habitat creation measures in the SSMP's 10-Year Plan. That payment amount is contingent on the voluntary reductions in Colorado River water use previously proposed by California water agencies on October 5, 2022 totaling 400,000 AFY from 2023 through 2026, including a reduction of 250,000 AFY by IID for each of those 4 years. The IID Board of Directors approved the MOU on November 29, 2022 on a 3-2 vote, which locked in the federal government's commitment to pay the IRA monies if—and only if—the necessary water-use cutbacks occur. Further negotiations, and an additional vote by the IID Board, will be necessary to solidify the details regarding how IID will achieve the required 250,000 AFY reductions. On January 30, 2023 six of the seven U.S. states reliant on the Colorado River, excluding California, jointly submitted a proposal (the "six-state proposal") to Interior and Reclamation suggesting a methodology for accomplishing the cuts in water allocations necessary to protect Colorado River infrastructure and prevent the river's largest reservoirs from crashing to dead pool. The six-state proposal, which was framed as a "Consensus- Based Modeling Alternative" (CBMA), would reduce the water allocations of Lower Basin water users to account for so-called "system losses" (including evaporation, seepage, and spillage), and would also impose additional cuts to each state's allotment. (The six-state proposal is appended here as Attachment 1. [attachment can be found in email attachment files]) Like previous drought-related Colorado River agreements in the past two decades, the CBMA dictates that water users must sustain increasingly large cuts to their allocations as Lake Mead's elevation drops. But the CBMA assesses larger reductions more rapidly than past agreements, allocates the cuts among water users in new ways, and adds additional categories of reductions. California did not support the six-state proposal, and has asserted that the manner in which the proposal accomplishes usage reductions would violate legal principles, statutes, contracts, treaties, and case law central to the Law of the River, and would contravene well-established legal rights. The water agencies in California collectively submitted their own proposal to USBR on January 31, 2023, the terms of which accomplish large reductions in Lower Basin use of Colorado River water but are consistent with existing law and established rights. It is possible that neither of the recently proposed plans by the Basin States can achieve the water usage reductions that will actually be necessary in a changing climate to address the severe imbalance between supply and demand that has developed over decades and is currently threatening to cause the collapse of the entire Colorado River system. It is now up to the Interior Department, pursuant to the Supplemental EIS process under NEPA that is currently underway, to devise a plan for stabilizing the Colorado River system and preventing calamitous consequences from now through 2026, when new longer-term rules for management of the river and its water—rules that also have not been developed yet—will be put into place. A draft of the SEIS plan is anticipated to be released sometime this spring, and a final plan is expected in August 2023.	

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Jenny E. Ross	Stout Research Center	Hydrologic issues affecting the viability of proposed in-basin long-term plans 1. Impacts of Colorado River water constraints on proposed long-term restoration plans	For those who closely follow the details of Colorado River hydrology, climate science relating to the Colorado River Basin, and Colorado River law and policy, the current crisis for the river and for the people and wildlife reliant on it has long been foreseeable. Although the crisis exploded into the news during 2022, the problems involved are not ones that developed in the past year. But for other people who have not followed the relevant issues closely, apparently including the SSMP and the agency's contractor Tetra Tech, it seems to have been surprising when the Commissioner of the Bureau of Reclamation announced in June 2022 that the Basin States must collectively cut a staggering total of two million to four million acre- feet (MAF) of water from the amounts they currently use annually, beginning in 2023. It appears that the SSMP's efforts to develop a long-range plan for the Salton Sea were chronically predicated on unrealistic assumptions regarding future water availability in the central Salton Basin, and that the agency was unprepared for the Commissioner's June 2022 announcement. It seems that the SSMP has been scrambling since then to understand the implications of the looming water cutbacks, and attempting to adjust the formulation of the Draft LRP to account for availability of much less water than previously anticipated.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The uncertainties related to future water deliveries have been acknowledged in the Draft Long-Range Plan and additional discussions on future policies were added in Appendix B. Consideration of water policy and future operational planning on the Colorado River will be used to inform future hydrology modeling undertaken as part of the feasibility study.
		1.2 Implications of the Colorado River crisis for Salton Sea long-term planning	While the SSMP acknowledges the current Colorado River situation in the Draft LRP, and mentions the likely 250,000 AFY reduction in IID's use of the river's water, the SSMP places too much emphasis on previously-established Colorado River policies, and on IID's senior water rights, when discussing both near-term and future hydrologic issues pertinent to restoration of the Salton Sea. The entire discussion in the Draft LRP relating to future hydrologic conditions and their effects on the operability of proposed restoration concepts is inappropriately based on the assumption that there will be no significant policy changes in the future relating to Colorado River management and allocation of the river's water, and on the assumption that IID will avoid additional substantial cuts in its water usage beyond the 250,000 AFY reduction it has already tentatively agreed to implement in the near future. I suggest that those assumptions are misguided for purposes of planning long-term restoration of the Salton Sea, and for evaluating the feasibility of proposed restoration projects that are very costly and are intended to be operational for the rest of the 21st century. 'In order to be viable, a long-term plan for restoration of the Salton Sea must properly account for the severity and permanence of the water supply crisis on the Colorado River, the enormous ongoing reductions in water usage by the Lower Basin states that will be required, and the major adverse impacts on inflow to the central Salton Basin that will result. Specifically, any proposed long-term plan must properly account for the following facts:	

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			•The aridification of the Colorado River Basin caused by climate change will worsen in the coming decades; therefore, the amount of Colorado River water available for consumptive use is projected to continue shrinking. Two recent studies found that additional decreases in Colorado River streamflow—beyond the ~20% flow reduction that has already occurred in the past two decades—could be greater than 30% and potentially as much as 40% by mid-century, with possible declines as large as 55% later in the century (during the operational life of a long-term restoration project for the Salton Sea). The states reliant on the Colorado River must therefore plan for huge additional reductions in their use of the river's water. •Because of chronic overuse and the effects of climate change, the supply-demand imbalance on the Colorado River has reached a critical juncture. Unless total reductions of as much as 4 million acre- feet in use of Colorado River water occur beginning in 2023 and are sustained or increased annually thereafter, one or both of the river's largest reservoirs will soon decline below minimum power pool (a potentially disastrous situation for the structural integrity of Glen Canyon Dam), and they will continue to shrink toward dead pool. Enormous, unprecedented decreases in consumptive use of the river's water, both in the near future and longer term, will be necessary to avert catastrophically low reservoir levels as climate warming continues to worsen aridification across the region. •The required cutbacks must occur primarily or exclusively in the Lower Basin, and California water agencies—including IID—will likely be forced to bear a large portion of the reductions. The math problem on the river simply cannot be solved otherwise. •While voluntary decreases in use of Colorado River water will play an important role in the effort to achieve stability of the river system, they may not be sufficient. In that case the federal government will be obliged to implement mandatory cuts in water deliveries. In fact, as noted above, Reclamation has already begun taking such actions, and held back nearly 1 million acre-feet of water in Lake Powell during 2022 that would otherwise have been released downstream. Furthermore, Reclamation has initiated the administrative process to significantly alter the way it manages the reservoirs and dams moving forward, in order to make major, ongoing reductions in the quantities of water the agency delivers to the Lower Basin states. Reclamation has made clear that such measures are required to prevent the reservoirs from crashing to dead pool. •It is inevitable that future inflows to the central Salton Basin will decrease by huge amounts—not temporarily, but permanently—because of necessary cutbacks in Colorado River water use that will affect all of the river's stakeholders. Substantial declines in Salton Basin inflows will occur in the near term, and additional major decreases will happen in the longer term. While it is not currently possible to determine precisely what the future inflow reductions will be, there is no reasonable doubt that those amounts will be very large during the multidecadal life of a long-term Salton Sea restoration project.	
Jenny E. Ross	Stout Research Center	Hydrologic issues affecting the viability of proposed in-basin long-term plans 2. The Draft LRP's estimation of future inflows to the central Salton Basin 2.1 Assistance of a "technical and policy team"	The Draft LRP appropriately acknowledges that the Colorado River water crisis is a centrally important concern affecting long-term planning for the Salton Sea, and correctly notes the existence of large uncertainties regarding the amounts of potential future reductions in Colorado River water allocations that will occur as a result of both climate change and federal policy decisions. The SSMP also properly makes the following recommendation: "To reduce uncertainty in future analysis, SSMP recommends that a technical and policy team be formed to select a hydrologic scenario, or a range of scenarios, as a foundation for other analysis. This team should be comprised of hydrologists, climatologists, and policy experts. This team should be used to inform evaluations performed as part of environmental review." I suggest that the recommended "technical and policy team" should not be composed of individuals whose work focuses specifically on California hydrology, climate, and water policy. Instead, it is essential that the individuals engaged to provide advice and assistance as part of this "technical and policy team": (a) are experienced, independent, and objective experts on the hydrology and climate (past, present, and projected future conditions) of the Colorado River Basin in particular (including the Salton Trough), and (b) are experienced and objective experts on legal and policy issues pertaining specifically to the Colorado River (including but not limited to issues affecting Colorado River water contractors in California), and who are not affiliated with any local or state government agencies in the seven Colorado River Basin states, or any water agencies reliant on Colorado River water. The specific expertise and abilities of the people chosen for this crucial team, and their complete objectivity, will matter enormously.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan.

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Jenny E. Ross	Stout Research Center	Hydrologic issues affecting the viability of proposed in-basin long-term plans 2. The Draft LRP's estimation of future inflows to the central Salton Basin 2.2 Inflow scenarios in the Draft Long-Range Plan	Although the SSMP recommended using an expert panel during the next phase of long-term planning to evaluate future water availability, for purposes of the Draft LRP and its Appendix B, the SSMP relied on the agency's consultant Tetra Tech to develop and apply inflow scenarios for assessing the hydrologic feasibility of proposed long-range plans. The inflow scenarios used were: "High Probability Inflow," "Low Probability Inflow," and "Very Low Probability Inflow." Concerning the "High Probability Inflow" scenario, the Draft LRP states: "First, we evaluate concepts based on an expected average annual inflow. The most likely outcome for inflow any given year is one that would occur 50% of the time. This inflow is described as the High Probability Inflow. We estimate this inflow at 889,000 AFY. For added clarity, in the future we expect inflow will surpass 889,000 AFY every 1 out of 2 years. This flow estimate incorporates projected climate change, but it does not incorporate future speculative policy changes. This inflow is then used to determine how concepts would perform over a long-term average condition." Later in the Draft LRP, the SSMP notes regarding the High Probability Inflow scenario: "…the most reasonably foreseeable average annual inflow, barring any significant future policy changes, is estimated at 889,000 AFY. This estimate is approximately 201,000 AFY less than the current 7-year average (1,090,000)." Regarding the "Low Probability Inflow" and "Very Low Probability Inflow" scenarios, the Draft LRP states: "Common feedback received during LRPC meetings was that the High Probability Inflow value was too optimistic, primarily because of concerns related to unknown future policy changes. In response to this concern, SSMP added two additional hydrologic scenarios: a Low Probability Inflow, and a Very Low Probability Inflow. If no future major policy changes took effect, we would expect an inflow of 684,000 AFY to be surpassed in 90% of years. Likewise, we would expect an inflow of 444,000 AFY to be exceeded in 95% of years. To replicate a potential stressful future condition, we assume that every year looking forward receives these relatively rare-expected occurrences in inflow. Note, absent an effect of policy change, it is exceedingly unlikely Salton Sea average inflow would drop to 684,000 AFY, and even more unlikely it would drop to 444,000 AFY. However, we have represented these hydrologic conditions to test concept performance against stressful conditions, should extreme policy changes impact future inflow to that degree." To derive the "High Probability Inflow," "Low Probability Inflow," and "Very Low Probability Inflow" scenarios, the SSMP relied in part on the modeling technique employed by Wheeler et al. (2022). While use of that approach appears overall to have been appropriate, it is not clear which of various other factors and methods discussed in the Draft LRP's Appendix B were also utilized by the SSMP in developing the three inflow scenarios, or in precisely what ways they were used. That lack of clarity thwarts proper and full evaluation of the inflow scenarios. In addition, there are other significant problems, even if one assumes the factors and methods used to derive the three inflow scenarios were appropriate. First, the High Probability Inflow scenario cannot reasonably be relied upon for implementation of a very costly long-range restoration project, because the High Probability Inflow amount of 889,000 AFY is estimated to be available in only 50% of future years. It would be reckless to construct a restoration project that requires the High Probability Inflow amount but may not actually receive the necessary water half of the time. Moreover, I suggest that because of the severe supply-demand imbalance on the Colorado River, in combination with ongoing and worsening aridification of the Colorado River Basin (including the Salton Trough), it is not reasonable to assume that 889,000 AFY will be available in the central Salton Basin even 50% of the time in the future. In fact, it is conceivable actual inflows may be less than that soon, because of potential mandatory reductions in allocation of Colorado River water. Over the longer term, during the life of a long-range restoration project for the Salton Sea, similar difficulties affect the Low Probability Inflow scenario, and potentially the Very Low Probability Inflow scenario as well. I suggest that the Very Low Probability Inflow scenario is the only one presented in the Draft LRP that comes close to being appropriate for evaluating the long-term viability of proposed restoration plans. However, even that scenario may be too optimistic concerning inflow to the central Salton Basin during the entire life of a long-range plan. It is realistic to think that in the coming decades, and certainly during the second half of this century, there may be considerably less water available for operation of a restoration project than is projected even in the Very Low Probability Inflow scenario. In fact, as explained in part II.D and Attachment 2 [attachment can be found in email attachment files], if allocation reductions in the future for IID are ultimately similar to those that would result from implementation of the recent six-state proposal for cuts in Colorado River water use by the Lower Basin states, then inflow to the central Salton Basin could indeed be decreased to an amount smaller than the Very Low Probability Inflow that the Draft LRP states "has a relatively very low probability of establishing itself as the average annual inflow."	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The uncertainty of future policies was acknowledged in Appendix B Section 5.2.2. The hydrology is a key driver of future conditions, and it will continue to be evaluated by other experts and agencies as noted in the Long-Range Plan. It should be noted that the current and likely future annual water supplies are contingent on Lake Mead elevation, which is largely affected by annual flow conditions and is subject to climate and hydrology variability. It is possible that flows are higher or lower than this period. The inflow probabilities were therefore based on simulations using the Colorado River Simulation System (CRSS) model and using resampled post-2000 natural flow sequence, a period with a considerably dry hydrology (among the lowest long-term flows in the paleo record). The resampled post-2000 historical natural flow series provided an assessment on water deliveries to the lower basin given with annual hydrologic variability and with the recently observed drought condition. From this resampling, we considered lower flow deliveries at the 90th and 95th percentile level, and applied these lower flows every year, following a transition period from the present to the mid-2030s.

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Jenny E. Ross	Stout Research Center	Hydrologic issues affecting the viability of proposed in-basin long-term plans 2. The Draft LRP's estimation of future inflows to the central Salton Basin 2.3 Examples of problems with the hydrologic analysis in the Draft Long-Range Plan	There are various problems with the SSMP's hydrologic analysis presented in Appendix B to the Draft LRP, and in several sections of the Draft LRP itself. Here are some examples: •In Appendix B and related sections of the Draft LRP, the SSMP assumes that current Colorado River management and water allocation policies will remain in place for the indefinite future, and that those existing policies—in combination with the fact that IID holds senior water rights—will primarily govern how much Colorado River water is available in the central Salton Basin throughout the entire life of a long-term plan for Salton Sea restoration. That is a problematic approach. The SSMP may not fully appreciate that the dire situation on the Colorado River will inevitably result in policy changes and significant allocation reductions for all Colorado River water users, including IID, in both the near future and the longer term. The problem of water scarcity in the Colorado River Basin is not temporary; the pertinent scientific literature indicates it is extremely likely to worsen very substantially in the future. Both climate change and over-allocation of the Colorado River's water will necessitate major reductions in consumptive use to stabilize the river system for the long term. Because of the enormous deficits in the Colorado River water supply, IID's allotment will not be immune to cutbacks. Consequently, future allocation reductions for Colorado River water users in the Salton Trough (IID, CVWD, and Mexico) will necessarily cause large decreases in inflow to the central Salton Basin. Yet the "High Probability Inflow," "Low Probability Inflow," and "Very Low Probability Inflow" modeling scenarios used by the SSMP for evaluating proposed long-range restoration plans do not take into account any policy changes that will reduce future water allocations. I suggest that approach renders the SSMP's evaluation of the hydrologic feasibility of proposed restoration plans nearly useless for understanding their actual real-world viability in the coming decades. Future policy changes concerning allocation of Colorado River water must be properly considered when estimating future inflows to the central Salton Basin, and when analyzing the effects of reduced inflows on the operability, effectiveness, and sustainability of proposed long-term plans for the Salton Sea. I discuss this issue further in part II.D and Attachment 2 [attachment can be found in email attachment files]. •Climate change will cause worsening aridification in the Salton Trough. That situation will also affect inflows to the central Salton Basin and the water requirements of proposed in-basin long-range plan features, including impoundments and wetlands, as well as the water level of the residual Salton Sea. I suggest that the SSMP has not adequately anticipated and accounted for the occurrence of such challenges throughout the life of a long-term restoration plan. •Substantial increases in temperature and atmospheric evaporative demand will certainly occur in the coming decades. Those increases may be greater than is currently anticipated based on the modeling employed by the SSMP, in part because major climate feedback effects with global ramifications are likely to be triggered in the relatively near future, by mid-century or sooner, because climate tipping points may be passed. Those factors will cause greatly increased water needs by plants, higher rates of evapotranspiration, enhanced absorption of available moisture by drier soils, and greater evaporation from water surfaces including tributary streams, canals, agricultural drains, wetlands, impoundments, and the residual Salton Sea. These hydrologic effects of climate change within the Salton Trough have already begun. I suggest that the assumptions and modeling utilized by the SSMP in the Draft LRP may not adequately account for future climate realities during the multidecadal life of a long-term restoration project. •Although the SSMP did consider future changes in crop evapotranspiration as well as direct evaporation from the surfaces of waterbodies, the analysis may not have been sufficient to account for all relevant factors. Moreover, there are additional issues involved. For example, when reduced quantities of inflow from tributaries and direct agricultural drains meander and spread across vast areas of exposed lakebed for many miles, it is highly likely that significant amounts of water will be absorbed by parched lakebed sediments and/or will evaporate before reaching the residual Salton Sea. Also, it appears that the SSMP's evaporation assumptions underestimated future rates of evaporative loss from impoundments, wetlands (which were assumed, without explanation, to have a significantly lower evaporation rate than impoundments), and the residual Salton Sea or central brine sink. In addition, the SSMP may not have adequately considered future increases in direct evaporation from tributaries and agricultural drains. •A 2022 study found that the drought in the Colorado River Basin from 2000 through 2022, which reduced Colorado River streamflow by about 20%, was the worst in at least 1200 years. But another 2022 study found that an even more extreme drought occurred during the second century and reduced Colorado River streamflow by 32%. If a drought of a severity similar to the 2nd-century event were to occur during the 21st century in a climate already adversely affected by anthropogenic climate change, the consequences for water availability would be catastrophic.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The uncertainty of future hydrology and future policies has been acknowledged in the Draft Long-Range Plan and additional discussions were added in Appendix B Section 5.2.2. Given such uncertainty, the calculation of inflow probabilities was based on Colorado River Simulation System (CRSS) model that used different traces of flow sequences considering natural variability to simulate water deliveries for each year and calculate overall probabilities for long-term projections. The CRSS model was developed and is maintained by U.S. Bureau of Reclamation to simulate and study long-term (beyond 5 years) operations and water deliveries. The future climate and hydrology conditions of Colorado River Basin have been assessed with the information and future projections obtained from an integration of global climate models and a hydrologic model. The modeling results using global climate models incorporate different trajectories of future greenhouse gas concentrations, including a scenario with significantly increasing greenhouse concentrations. The climate model projections were further processed with Variable Infiltration Capacity model to calculate and simulate future hydrologic conditions that were the basis of the simulations. Future projected temperature and precipitation changes from the BCSD downscaled climate model projections were assessed in Appendix B Section 5.2.1.3. The projected future changes (i.e., temperature anomaly and precipitation changes from a 1895-1924 average level) represent the climate change signal presented in climate models. The calculation of relative changes also help reduce potential model bias or bias from downscaling. The use of BCSD results from different phases of Coupled Model Intercomparison Project (CMIP) is consistent with the available projected future flow sequences in the current CRSS model. In addition to the use of global model projections, the traces from resampled post-2000 flow conditions were used in the CRSS model. Appendix B Section 5.2.1.1 aims to provide general background on historical climate of Colorado River Basin and historical natural flow at Lees Ferry. The effects of temperature and precipitation on annual historical natural flow were assessed. The effect of temperature increase on reducing future natural flow has been acknowledged and further assessed in Section 5.2.1.3. Additional comparisons with the results from Udall and Overpeck (2017) were provided, which showed that the estimated temperature sensitivity of natural flow in Section 5.2.1.1 is higher than the values used in Udall and Overpeck (2017). We worked with published climate scenarios, processed for input to the CRSS model, that were availalbe for analysis at the time the Long-Range Plan was developed. It is certainly conceivable that in future iterations of this analysis, additional climate change scenarios will be utilized. The lithium water use is based on water use per ton of lithium carbonate, ranging from 0.154 acre-feet per ton to 0.382 acre-feet per ton. For water use calculations, this must be corrected for the ratio between lithium and lithium carbonate (pure lithium is multiplied by 5.324 to get the corresponding mass of lithium carbonate). Also, we assume production of 40,000 tons per year of lithium which is approximately 10 times the current use of lithium in the United States. The basis for the 300,000 metric tons annual production at the Salton Sea is not available to

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			•It appears that the analysis of climate change impacts in the Colorado River Basin presented in section 5.2.1.3 of Appendix B may not have properly considered some directly pertinent studies. Section 5.2.1.3 states that BCSD downscaling of coarse-resolution GCMs was utilized for the SSMP's modeling of future Colorado River streamflow. BCSD downscaling is known to have a "very wet bias." Udall and Overpeck (2017) found that half of CMIP5 models and one-fourth of CMIP3 models used with BCSD downscaling could not reproduce the 2000-2014 drought-affected Colorado River flows at any point in the 21st century. A recent repeat of that analysis by the original authors showed that two-thirds of the CMIP5 and half of the CMIP3 BCSD runs similarly could not reproduce the Colorado River flows that occurred during 2000-2022. This problem seems to be partly the result of the very wet bias of BCSD downscaling, but likely also extends to the GCMs themselves. In the SSMP's modeling, resampled natural flows of the Colorado River during the drought years of 2000-2018 have been incorporated in the manner employed by Wheeler et al. (2022), and doing so may have addressed the problem noted above to some extent; nonetheless, it is not clear whether the problem of a wet bias has been eliminated for either near-future projections or the longer term. In addition, the findings in Udall and Overpeck (2017), Xiao et al. (2018), and Milly and Dunne (2020) also imply that the SSMP's discussion in section 5.2.1.1 of Appendix B to the Draft LRP significantly underestimates the major role that temperature increases will play (and have already played) in causing decreases in Colorado River streamflow, and will also play within the Salton Trough in reducing inflows to the central Salton Basin. •The SSMP discussed Reclamation's CRMMS 5-Year Studies and Colorado River 24-Month Studies in Appendix B. Although it's unclear exactly how the SSMP may have used those studies in the hydrologic modeling and/or analysis for the Draft LRP, it appears that too much emphasis may have been placed on them. Those studies are not intended to be used for long-term planning of the type being undertaken by the SSMP in evaluating and making decisions about a possible restoration project for the Salton Sea that is expected to be operational through the end of the 21st century. The results of Reclamation's modeling studies often change very significantly within just a few months (e.g., between the May and August studies in a given year), and from one year to the next. In addition, Reclamation's modeling may project higher reservoir levels than actually occur, and that can affect policy-related water allocations. •The SSMP's hydrologic modeling does not appear to take into consideration the extent to which future curtailment of irrigated agriculture in the Imperial, Coachella, and Mexicali Valleys and major shrinkage of the Salton Sea are factors that themselves will negatively affect Salton Trough climate and hydrology, and possibly Colorado River Basin climate and hydrology as well. There is reason to think a detrimental positive feedback effect could result, yielding even hotter and drier climate conditions, further decreases in water availability and inflows to the central Salton Basin, and additional shrinkage of the Salton Sea. Conceivably, such changes may already be underway to some extent because of reductions in water usage for irrigated agriculture and decline of the Salton Sea that have already occurred during the past two decades. •Worsening constraints on future water availability will enhance the desirability of increased wastewater recycling and reuse by Salton Trough water agencies. This issue does not appear to have been adequately incorporated into the SSMP's analysis concerning future inflows attributable to Colorado River water use by IID and CVWD. (However, Appendix B to the Draft LRP does appropriately reduce inflows from Mexico based on the assumption that country will recycle and reuse most or all of its wastewater in the future.) •The SSMP relied on a 2018 report produced by PPIC (e.g., in section 5.1 of the Draft LRP's Appendix B) in order to understand Colorado River issues related to California, including policy and legal matters. Not only is that 2018 PPIC report significantly out of date in its understanding of important Colorado River issues, it also includes inaccurate information about the Salton Sea and the State of California's related legal obligations. •Commercial-scale lithium extraction in the Salton Sea Geothermal Field (SSGF) is very likely to use large quantities of IID's Colorado River water allocation in the future. I suggest that the SSMP has underestimated the total amount of this future water use, which will be fully consumptive and will not yield wastewater that flows into the central Salton Basin. The SSMP assumed in the Draft LRP, for purposes of hydrologic modeling in Appendix B, that lithium extraction will only consume 50,000 AFY throughout the life of a long-term restoration plan. Although specific details regarding the amount of water necessary for commercial-scale lithium extraction in the SSGF are not publicly available, Appendix C to the Draft LRP indicates the amount of water that Controlled Thermal Resources (CTR), one of the companies working on developing commercial-scale lithium extraction, is currently using in its small field project is 0.382 acre-feet per ton of Li2CO3. Based on news reports, CTR anticipates producing as much as 300,000 metric tons of lithium annually when that company ultimately operates at full capacity. Thus, it appears that just one of the companies that will eventually perform commercial-scale lithium extraction may consume more than 110,000 acre-feet of IID's Colorado River water allotment annually during the operational life of a Salton Sea long-term restoration project. I suggest it should also be assumed that at least two other lithium- extraction facilities in the SSGF that are currently developing their capacities will have similar water requirements in the future. This means that roughly 330,000 acre-feet per year of IID's allocation of Colorado River water should be assumed to be unavailable for any other use in the central Salton Basin.	us, and it is acknowledged that the water use will be proportional to the tonnage of lithium produced. As cited in Appendix C, the maximum estimated geothermal capacity of the Salton Sea basin corresponds to a lithium carbonate production of 600,000 tons or about 113,000 tons of lithium. The news estimate of 300,000 cited may be higher than the maximum estimate or may refer to lithium carbonate, or about 57,000 tons of lithium.

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Jenny E. Ross	Stout Research Center	Hydrologic issues affecting the viability of proposed in-basin long-term plans 3. Inadequate analysis of effects on proposed in-basin plans if very low inflows occur	The Draft LRP includes a number of tables and figures presenting the water requirements of various proposed restoration plans and comparing them to water availability pursuant to the three inflow scenarios. But the information presented is insufficient, and some important underlying details are vague or absent. The lack of adequate clarity impedes attempts to evaluate properly how the viability of each proposed plan will be affected by the challenging future hydrologic conditions that are likely to occur. In particular, the Draft LRP does not include an explanation regarding: (1) the specific details of the "10- Year Plan" being referred to as the "baseline condition" for evaluating proposed restoration concepts; (2) whether each of the specific 10-Year Plan components utilized for particular proposed in-basin restoration concepts in the Draft LRP is being used in a modified or an unmodified manner; (3) the particular ways in which 10-Year Plan components (and the SCH) are being modified, and why they are being modified, when included as part of a specific proposed long-range restoration concept; and (4) why the water requirements for 10-Year Plan components (and the SCH) included in particular restoration concepts in the Draft LRP have been greatly reduced to just a fraction (e.g., less than half, or just one-third) of the original water requirements specified in the 2022 Draft Environmental Assessment for the 10-Year Plan; and (5) what the impacts of the huge water reductions for 10-Year Plan components (and the SCH) will be for the operability and effectiveness of those features and for each proposed restoration concept that includes them. The Draft LRP includes only a very general description of "the 10-Year Plan" that is to be used as a "baseline" and that will also be included, in whole or in part, in some proposed long-range restoration concepts. Relevant to this issue, the Draft LRP states: "The plan described in the Draft EA serves as a reasonably foreseeable baseline condition for evaluating concepts that are part of the LRP. As a starting point, it was assumed that all components of the 10-Year Plan would be incorporated in all LRP restoration concepts. However, for the purpose of evaluating the widest range of possible outcomes, variations of some concepts have been developed where some components of the 10-Year Plan have been modified or eliminated to achieve specific strategies." There are significant problems with each of the three sentences in the above statement. For example: •There is not just a single "10-Year Plan" that is "described in the Draft EA" as the first sentence above implies; rather, there are multiple dissimilar plans, each with different components, water requirements, and costs. It currently remains unclear (at least to members of the public) which of the several "10-Year Plan" alternatives presented in the 2022 Draft Environmental Assessment for the 10-Year Plan (Draft EA) will actually be implemented—assuming that any of them will be. •For that reason, it is not true—and does not even make sense—to say that "The plan described in the Draft EA serves as a reasonably foreseeable baseline condition…" There is no "reasonably foreseeable baseline condition" when it is not actually known what the specific features and water requirements of the unidentified "10-Year Plan" will be. •Because it is unclear which of the proposed alternatives for the 10-Year Plan presented in the Draft EA is the "10-Year Plan" the SSMP is talking about in the first quoted sentence above, the meaning of the second quoted sentence is also unclear. What does it mean to say "As a starting point, it was assumed that all components of the 10-Year Plan would be incorporated in all LRP restoration concepts" when it has not been made clear what the components of "the 10-Year Plan" will actually be? •The meaning and specific implications of the third quoted sentence above are also unclear. Given that it has not been explained what particular "10-Year Plan" is being used as the "baseline," it cannot be understood what is meant by the assertion that "variations of some concepts have been developed where some components of the 10-Year Plan have been modified or eliminated to achieve specific strategies." Furthermore, nowhere is it specifically explained: (1) what specific modifications are being made to the particular "10-Year Plan" components that have not been eliminated; (2) why such modifications are appropriate in each instance (what "specific strategies" is the SSMP trying "to achieve" by modifying or eliminating certain components?); (3) what the consequences of modifying some "10-Year Plan" components will be for the viability and sustainability of those components, as well as for the operability and effectiveness of the relevant proposed restoration concepts; (4) why some other "10-Year Plan" components have been eliminated from specific long-range plan concepts; and (5) what the consequences of eliminating some "10-Year Plan" components will be for the overall efficacy of the relevant proposed restoration concepts.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Related discussions about the 10-year plan have been revised and updated in the Long-Range Plan. A common set of assumptions for the 10-Year Plan projects was used, except where a particular feature of the 10-Year Plan was not possible to be constructed because of an overlapping feature of a Long-Range Plan restoration concept. These are noted specifically in the revisions to the Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria.

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			•One of the modifications of 10-Year Plan components "to achieve specific strategies," but done without explanation, appears to be the reduction of the water requirements for such components to a fraction of the amounts they originally required as specified in the Draft EA. (The same is true for the SCH project, which is included—with its water requirement slashed by more than half—as a component in most proposed in-basin long-range plans.) For example, in the Draft LRP the water requirement for the "Alamo Project," a component of some 10-Year Plan alternatives that is to be included in most of the proposed in-basin restoration concepts, is specified as 43,542 AFY in the tables presenting the water needs of the various features in proposed plans; however, that is just 36% of the water requirement for the "Alamo River Project" in the Draft EA, which was stated to be 120,546 AFY (104,193 AFY river water, and 16,343 AFY Salton Sea water). Some water used in the Draft LRP's "Alamo Project" will presumably run off into another component of each proposed in- basin long-range plan that includes the "Alamo Project," and it is important not to count that water twice in the relevant tables. But that fact does not appear to explain the huge discrepancy between the stated water requirements in the Draft LRP and those specified in the Draft EA. •Overall, it seems that the water requirements for 10-Year Plan components (and the SCH) that are being used in proposed in-basin long-range restoration concepts are being reduced immensely so that the total amount of water required by those in-basin plans is within the modeled amount of water available pursuant to the SSMP's "Low Probability Inflow" and "Very Low Probability Inflow" scenarios. If that is indeed what has been done, the Draft LRP must be revised to make that fact explicit. Moreover, it must be explained how the functioning of the 10-Year Plan components involved, and each proposed long-range plan that includes them, will be affected by having far less water available for their operation than the SSMP stated in the Draft EA they actually require. The above discussion concerns just one important category of the problems in the Draft LRP concerning potential impacts of low or very low inflow conditions, and relating to the difficulties involved in attempting to understand the viability of proposed restoration concepts if such conditions occur. Because of the inadequacy and lack of clarity in the Draft LRP's explanations of these issues, it is not possible to fully and appropriately evaluate many aspects of the various proposed in-basin long-range restoration concepts, and especially their operability and efficacy in the low or very low inflow conditions that can reasonably be expected to occur in the future. There is a particular lack of clarity concerning the proposed restoration concepts that incorporate unmodified or modified components of the undefined "10-Year Plan" but assign them quantities of water that appear to be insufficient. In summary: The suggested restoration concepts cannot be properly evaluated in relation to the "baseline condition" of the "10-Year Plan," because the specific details of the "10-Year Plan" that will actually be implemented remain uncertain. The proposed in-basin long-range plans also cannot be evaluated on their own merits rather than in relation to undefined "baseline conditions," because it is not clear exactly what their features will be, which components of the "10-Year Plan" they will include, what particular modifications of such components are being proposed, why modifications need to be made, why the water requirements for the "10-Year Plan" components included in proposed long-range restoration concepts have been hugely reduced, and what the impacts of those water reductions will be for the operability, efficacy, and sustainability of proposed restoration concepts.	
Jenny E. Ross	Stout Research Center	Hydrologic issues affecting the viability of proposed in-basin long-term plans 4. Effects of reduced Colorado River water allocations on future Salton Basin inflows	Despite the ongoing Colorado River crisis, the inflow scenarios in the Draft LRP do not account for any reductions in Colorado River water allocations related to near-term or future changes in federal policy regarding management of the river and distribution of its water. Yet it is clear there will be federal policy changes. In addition, the SSMP's modeled inflow scenarios may underestimate future impacts of climate change that will affect the quantities of water that reach the central Salton Basin during the life of a long- term restoration plan. In light of the large cuts in apportionments of Colorado River water that may be imposed in both the near future and longer term, as well as the worsening effects of climate change on the hydrology of both the Colorado River and the Salton Trough that are anticipated to occur in the coming decades, I suggest it is useful to consider the ramifications for inflow to the central Salton Basin that would result from a realistic but hypothetical federal "policy reduction" in water allocations. Attachment 2 [attachment can be found in email attachment files]presents two hypothetical examples, both of which are based on: (a) the recent six-state proposal for allocation cuts to Lower Basin states; and (b) the hydrologic assumptions and modeling methodologies used by the SSMP in Appendix B to the Draft LRP and presented in Section 3.1 of the Draft LRP. To be clear, I am not indicating it is likely that federal agencies will adopt the six-state proposal during the pending Supplemental EIS process, and I am not implying that I endorse the approach taken in that proposal. Rather, I provide the hypothetical examples in Attachment 2 [attachment can be found in email attachment files] solely in order to explain the degree of pessimism regarding future inflows—realistic pessimism—that I suggest must be employed when evaluating the future water supply for proposed Salton Sea long-term restoration projects that are very expensive and should be operational through the end of the 21st century.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The uncertainty of future policies was acknowledged and discussed in Appendix B Section 5.2.2. It is important to note that potential future annual water cuts are contingent on Lake Mead elevation, which is largely affected by annual flow conditions and is subject to climate and hydrology variability. While additional water shortages in the lower basin are expected in the near term, longer term flows are more uncertain. The overall probabilities of water deliveries to the lower basin were therefore computed by using the simulations from the Colorado River Simulation System (CRSS) model, using the 2000-2018 hydrology, a period of major drought in the Colorado River Basin and using current policy. From this input we estimated the 90th and 95th percentile of flow deliveries and assumed that these flows occur every year beginning in the mid-2030's, following a period of transition from the mid-2020s. The CRSS model suggests that such flows will occur at a low probability, i.e., 1 year in 10 or 20 years, but in our framework, we have assumed that one of these two low flows occurs every year over three decades. Thus, although we are not changing policy, we are imposing a stressful condition for

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			Attachment 2 [attachment can be found in email attachment files] presents additional explanation of the details and calculations that are summarized below: •If we assume the six-state proposal is implemented and Lake Mead's elevation falls to 1020 feet amsl or lower, IID would sustain cuts in its allocation of Colorado River water totaling approximately 671,250 acre-feet per year. That amount represents a reduction of about 26.5% in the quantity of Colorado River water currently used in Imperial County (assuming total current use is 2.535 MAF, which is the amount that the SSMP utilizes for the High Probability Inflow scenario in Appendix B). This estimated amount by which IID's allocation of Colorado River water would be reduced pursuant to the six-state proposal is in addition to IID's substantial water usage reductions that are already ongoing pursuant to the QSA. (It is an estimate, because the six-state proposal presents only the state-level reductions; the specific reductions that would be sustained by each water agency in California if the six-state proposal were implemented are not publicly available.) CVWD would also sustain reductions pursuant to the six-state proposal, and Mexico would as well if an agreement to do so were reached through the International Boundary and Water Commission; those additional cuts would also affect inflows to the central Salton Basin. •To calculate an estimate for the reduced amount of inflow to the central Salton Basin that would result from both a "policy reduction" and the future impacts of climate change, I employed the following approach in Attachment 2 [attachment can be found in email attachment files]: (a) I reduced IID's allocation of Colorado River water in a manner consistent with the six-state proposal; (b) I did not include any reduction for CVWD or Mexico that would result from implementation of the six-state proposal; and (c) I adopted the assumptions and the methodologies used by the SSMP for Scenarios 2, 3, and 4 in Appendix B to the Draft LRP, relating to the amounts of inflow to the central Salton Basin from various sources other than IID, as well as relating to other factors affecting inflow, including climate change. For the first hypothetical example I also employed the SSMP's assumption concerning the amount of future consumptive water use for lithium extraction, and for the second example I increased the amount of that future consumptive use. (See Attachment 2 [attachment can be found in email attachment files] for further details.) •Based on the first hypothetical scenario, future inflows to the central Salton Basin would shrink to a total of approximately 218,189 acre-feet per year. Potentially this could be an overestimate, as explained in Attachment 2 [attachment can be found in email attachment files]. Based on the second hypothetical example, there would be no inflows to the central Salton Basin in the future. Implementation of allocation reductions similar to those in the six-state proposal, in combination with the effects of climate change, would cause such a major decrease in future inflows to the central Salton Basin that the proposed in-basin long-term plans for Salton Sea restoration presented in the Draft LRP would not be viable. The amount of water necessary for their operation would not exist. In fact, even apart from long-term restoration measures, none of the versions of the 10-Year Plan proposed in the 2022 Draft EA would be viable either, with the possible exception of Alternative 4. There is realistic potential for extremely low inflow to the central Salton Basin to occur in the future because of climate change and associated policy reductions in Colorado River water allocations. It is not yet clear how the Interior Department will accomplish the cuts that are necessary to stabilize the Colorado River system. But the six-state proposal provides one example of a pessimistic scenario that might actually materialize. It has been proposed by six of the seven Basin States because those states think it should be implemented soon to address the ongoing Colorado River crisis and stabilize the crucial river system relied upon by more than 40 million people. Even if near-term policy reductions implemented by the Interior Department do not affect IID as severely as implementation of the six-state proposal would, it is certainly possible that draconian cutbacks will occur in the coming decades as the effects of climate change worsen. It is also realistically possible that extremely low inflow to the central Salton Basin will become the future reality for other reasons (e.g., due to a combination of decreased Colorado River allocations, climate change impacts, and water recycling and reuse by IID, CVWD, and Mexico). I suggest that a bleak allocation-reduction scenario similar to the ones I present in Attachment 2 [attachment can be found in email attachment files] should be used to evaluate the viability of proposed long-term plans for the Salton Sea. If any such scenario does occur in the future, and if an in-basin Salton Sea long-term plan that is reliant on Colorado River water has been implemented based on optimistic hydrologic assumptions, the outcome would be tantamount to the impacts of a no-action plan. There would be devastating consequences for wildlife and for large numbers of people all across the surrounding region (and potentially as far away as Los Angeles, Yuma, and Mexicali). It would be exceedingly irresponsible to select an in-basin long-range plan for implementation based on any degree of optimism concerning available inflows to the central Salton Basin. To justify investing billions of dollars to construct and operate an in-basin plan that will require very large quantities of Colorado River water for the rest of the 21st century, there must be no reasonable doubt that the necessary water will actually be available throughout the long operational life of such a project. I suggest that in fact there is a lot of reasonable doubt concerning the future availability of the necessary water.	Imperial Valley inflows from the Colorado River, and thus a stressful long-term flow on the Salton Sea to evaluate the proposed restoration concepts. The commenter's calculations on flows to the Salton Sea for lower water deliveries to IID from Lake Mead are noted. If irrigation demands are based on current areas irrigated, it follows that for lower IID water deliveries, a smaller water flow to Salton Sea will result.

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Jenny E. Ross	Stout Research Center	The UCSC Panel's fatally flawed work must be removed from the CNRA's Draft LRP, and an objective feasibility study of water importation must be done	On February 20, 2023 I submitted an initial set of detailed written comments related to the Draft LRP that were specifically focused on: (a) the unjustifiable failure of the UCSC review panel ("UCSC Panel") to conduct a comprehensive, independent, and objective feasibility study of proposals to use water importation to accomplish long-term restoration of the Salton Sea; and (b) the remaining urgent need for the study that the UCSC Panel failed to perform. In those comments to the CNRA and SSMP ("my February 20 comments") I explained in detail that the UCSC Panel's contract was formulated and performed in violation of applicable California law and policy, and that the panel's work was biased, its methodologies were improper and deficient, it did not conduct a full feasibility study of submitted proposals for water importation as it was contractually required to do, and its conclusions and recommendations are fatally flawed. I stated that the UCSC Panel's faulty conduct was so egregious that all of its findings should be ignored by the CNRA, and no information related to the panel or its work should be included in the long-term plan for Salton Sea restoration that the CNRA is legally required to complete. I incorporate here by reference the entirety of my February 20 comments about the UCSC Panel and its grossly improper, deficient, and fundamentally unsound work. (My February 20 comments are appended as Attachment 3 [attachment can be found in email attachment files], without the voluminous attachments to those comments that originally accompanied them.) Unfortunately the SSMP did include information about the UCSC Panel and its deeply defective work in the December 15, 2022 Draft LRP. The SSMP did so without adequately scrutinizing that work, and improperly "retained for analysis and comparison to other alternatives considered feasible" all three of the fundamentally flawed "restoration" concepts concocted by the UCSC Panel, including the panel's inoperable water transfer plan and the panel's two straw-man concepts for ocean water importation—the so-called "Sea of Cortez Water Import Concept" and the "Sea of Cortez Water Exchange Concept"—which, indefensibly, are the only water importation plans the SSMP is considering. Therefore, as I did in my February 20 comments, I again urge the CNRA to eliminate all mention of the UCSC Panel and all references to its fatally flawed findings and conclusions from the State of California's Draft Long-Range Plan for the Salton Sea. There is no justification whatsoever for expending a single additional taxpayer dollar on further consideration of the UCSC Panel's improper and untenable analysis, findings, and recommendations. In addition, I again urge the CNRA to request the Army Corps of Engineers, in consultation or collaboration with appropriate agencies of the Department of the Interior, to conduct a comprehensive, detailed, and objective feasibility-level study of proposals for water importation to achieve long-term restoration of the Salton Sea. A full, objective, and scientifically sound feasibility-level study of water importation has never been conducted at either the federal or the state level. For all the reasons I explained in my February 20 comments, and for the additional reasons explained in these comments (particularly in part II above), it is essential for such a study to be done now, and to be incorporated into the important Imperial Streams Salton Sea and Tributaries Feasibility Study and the related NEPA/CEQA process that the Army Corps of Engineers is starting in 2023, with DWR and the Salton Sea Authority as non-federal co-sponsors. If the Imperial Streams feasibility study focuses exclusively on in-basin concepts for the Salton Sea that are reliant on Colorado River water and are inherently problematic in other ways, or if that study includes the UCSC Panel's seriously flawed "Sea of Cortez Water Import Concept" and "Sea of Cortez Water Exchange Concept" as the token ocean water importation options, that study will be profoundly deficient. It would be an abuse of the CNRA's discretion to proceed in that manner.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The Long-Range Plan provides high-level analysis to conduct a relative comparison across the broadest array of restoration concepts. The level of detail and accuracy provided by the Independent Review Panel in their evaluation of water importation concepts was appropriate for application of the Long-Range Plan Criteria. Restoration concepts, including in-basin and water importation concepts, will be considered at the next stage of feasibility analysis.

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Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans	Appendix F to the Draft LRP purports to evaluate specific types of greenhouse gas (GHG) emissions from the Salton Sea and its exposed lakebed beginning in 1905 and continuing through the end of the 21st century. Based on that analysis, Appendix F makes specific findings concerning the quantification of past, present, and future GHG emissions from, and carbon sequestration by, the lake, its lakebed, and the "Phase 1:10-Year Plan." Section 3.5.1 of the Draft LRP then uses the analysis and findings in Appendix F to draw conclusions regarding the net GHG emissions from each of the proposed long-range plans. Appendix F was apparently prepared by a Tetra Tech engineer. Based on the metadata in a non-public draft that I obtained in November, and which is nearly identical to the version of Appendix F posted publicly online to accompany the Draft LRP, a Tetra Tech engineer named Katherine Heidel was responsible for writing the text. It also appears that Ms. Heidel and/or one or more other Tetra Tech employees prepared section 3.5.1 of the Draft LRP. Therefore I will refer to the author of both Appendix F and section 3.5.1 as "Tetra Tech." Tetra Tech's analysis and findings in Appendix F and section 3.5.1 are fundamentally defective. They are unwarranted by—and even contradicted by—the relevant scientific literature; they are inconsistent with important facts; and they are improperly speculative, yet are utilized as if they were proven. The analysis and findings in Appendix F and section 3.5.1 are so deeply flawed that no scientifically justified conclusions can be drawn from them concerning the GHG emissions associated with landscape components of any proposed long-range plan, or with a no-action scenario. The discussion related to greenhouse gas emissions from landscape components of proposed long-range plans in Appendix F, section 3.5.1, and other portions of the Draft LRP is scientifically improper, misguided, and invalid. Consequently, the ratings of the various proposed restoration concepts that are presented in the Draft LRP, and were developed in reliance on Appendix F and section 3.5.1, are therefore also invalid. Appendix F, section 3.5.1, and all other related discussion of GHG issues must be eliminated from the Draft LRP, and must not be relied upon in any manner by either the SSMP or the Army Corps of Engineers when evaluating proposed long-range plans for the Salton Sea. I suggest instead that the Army Corps of Engineers should engage appropriate and objective experts in academia and/or USGS who are specialists in the directly relevant scientific fields to analyze the GHG issues properly.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The uncertainty of GHG estimates in Appendix F of the Draft Long-Range Plan has been acknowledged and discussed in Section 1.3. Due to the limited observations available in Salton Sea such as sediment organic carbon concentrations and atmospheric fluxes of GHG, Appendix F used several estimated values from the literature to quantify the processes related GHG sequestration and emissions. As described in Appendix F, these are not limited to CO2 emissions, but also include methane (CH4) and nitrous oxide (N2O). The values for the associated fluxes were based on the published literature and considering factors such as climate, eutrophication, and salinity of Salton Sea. It is acknowledged that there are limited studies that are based on lake that are very similar to the Salton Sea, but wherever possible, we considered saline lake studies as a source. For some flux terms other types of lake data were used, but only where no saline-lake-specific data were available. The goal was to develop a meaningful estimate of GHG emissions considering all the pathways that are possible. We stand by the flux estimates and underlying data sources for the purpose of this analysis, and believe there is no basis to reject these estimates in their entirety unless site specific data are obtained at the Salton Sea in future. Most importantly, we find that the GHG flux estimates are orders of magnitude lower than asserted by the commenter in a previous letter to the State Water Board in April 2022. This is further described below. In response to these comments, we have clarified the conceptual framework used to evaluate the GHG emissions from the Salton Sea. In particular, we assume the initial condition is a dry basin prior to 1905 with background emissions; we account for emissions that would result from the accumulation of additional carbon from 1905 to the present time, and into the future, as the Salton Sea loses area.

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Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans 1. General problems with Appendix F and section 3.5.1 of the Draft LRP	The analysis in Appendix F and section 3.5.1 of the Draft LRP, and the conclusions reached in the Draft LRP that are based upon them, are scientifically unsound. Multiple unjustified and unscientific assumptions are utilized, and even stacked on top of one another, to make unsupportable findings concerning GHG emissions from the Salton Sea, its exposed lakebed, and landscape components of proposed long-term plans. The discussion in Appendix F and section 3.5.1 reflects almost no understanding of various crucial matters relating specifically to the Salton Sea. It also reveals a disturbing willingness to misuse the relevant scientific literature to reach unfounded conclusions. In evaluating issues concerning greenhouse gas emissions from lakes and lakebeds, and in devising seriously flawed approaches for quantifying particular types of GHG emissions from the Salton Sea and its lakebed, Tetra Tech ignored key characteristics unique to the Salton Sea, its ecosystem, its climate, its lakebed, its tributaries and other hydrologic features, and relevant geologic and biogeochemical issues. Instead, Tetra Tech inappropriately and arbitrarily cherry-picked numbers out of the scientific literature relating to averaged emission rates for collections of reservoirs and lakes that are obviously dissimilar to the Salton Sea, and that are located in ecoregions and climate zones bearing no resemblance to the Salton Basin and its arid desert environment. In addition, Tetra Tech misinterpreted scientific studies; cited studies for conclusions they did not reach and do not support; applied study findings in inappropriate and unjustifiable ways; ignored studies that presented information contrary to the claims being made by Tetra Tech; and improperly selected inapplicable emission rates in order to use them to draw the unfounded conclusions that the Salton Sea has had and will have a low carbon sequestration rate and a high lake-surface GHG emission rate, and that its exposed lakebed has had and will have a low GHG emission rate. Tetra Tech then used those unsound, unwarranted, and unscientific conclusions to buttress unjustified high ratings for in-basin restoration concepts, including ones designed by Tetra Tech. The analysis in Appendix F is also untenable for numerous other reasons. For example, it is never explicitly made clear in Appendix F that the future Salton Sea and the future exposed lakebed being characterized in the document with regard to their GHG emissions represent the lake and lakebed under a scenario in which some version of the 10-Year Plan is constructed and operated throughout the 21st century, but there is no long-term restoration plan implemented. However, that seems to be the scenario involved in the analysis. But the details of the specific components of the particular version of the “10-Year Plan” being used as a baseline are not described. And, since such a plan has not been finalized and is far from being implemented, it cannot actually be used as a baseline because its physical and biological features, biogeochemical functioning, and future net emissions are unknown. In addition, the particular hydrologic assumptions (e.g., future inflow) being utilized to make projections about the future Salton Sea and its exposed lakebed are also not described and may be unsound. Moreover, the hydrologic model employed is not publicly available, does not appear to have been peer reviewed, and may not have been validated for the particular purposes it is being used to accomplish. These crucial problems and omissions make it impossible to evaluate key details in Appendix F, and raise serious doubts about the validity of the analysis presented there. The misguided and faulty analysis in Appendix F cannot reasonably be relied upon to draw any conclusions about greenhouse gas emissions from either a no-action scenario or from potential long-term restoration concepts, yet the Draft LRP does in fact draw such conclusions. Section 3.5.1, within the Draft LRP section entitled “Greenhouse Gas Analysis,” focuses on GHG emissions from Salton Basin “landscape processes.” For that subsection, the analysis and findings presented in Appendix F were applied to each of the proposed Salton Sea long-term restoration concepts—applied using a methodology that is not explained—in order to derive conclusions about net GHG emissions from “Wetted Area” and “Exposed Lakebed” in each proposed concept, and to compute total landscape-related GHG emissions from each such concept. Section 3.5.1 should have included a detailed explanation regarding specifically how the analysis and findings in Appendix F were utilized to derive conclusions regarding landscape-related GHG emissions associated with each element of each proposed restoration plan; however, no such explanation is presented. That alone is a major and unacceptable omission. Regardless, however, because the findings in Appendix F are not scientifically valid, the conclusions presented in section 3.5.1 of the Draft LRP that rely on those findings are necessarily also not valid—regardless of the specific methodology employed to apply the findings of Appendix F to proposed plans and derive numbers for net GHG emissions from each plan. The conclusions in section 3.5.1 are also fundamentally unsound because of various other problems, some of which are discussed further below.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We disagree with these assertions by the commenter. To provide context to the analysis in Appendix F, the commenter in a letter to the State Water Board in April 2022, stated the following: "The attached calculations indicate that approximately 26 million metric tons of CO2 emissions per year may be released as a result of implementation of a Salton Sea long-range plan that leaves vast areas of dry lakebed exposed, and that includes additional highly-emissive features such as large expanses of significantly disturbed lakebed (e.g., regions where furrowing is utilized for dust control), areas of exposed lakebed that are periodically rewetted, fresh or low-salinity water impoundments constructed on portions of the exposed lakebed, and an extremely hypersaline brine sink. To put the amount of 26 million metric tons of CO2 emissions per year in perspective, it is more than 160% of the annual CO2-equivalent emissions of all the petroleum refineries currently operating in California, and 7.3% of all energy-related CO2 emissions in California annually. " Our analysis found no support for such a large magnitude of carbon emissions from the Salton Sea, i.e., 26 million tons of CO2 each year. For this much carbon to be emitted, it needs first to have accumulated. This rate would imply that over 15 years 390 million tons of CO2 would be emitted--more than the annual California statewide emissions of GHG. For comparision, the following numbers may be considered. The inflow concentration of organic carbon to the Sea is approximately 10 mg/l. Assuming a 1.2 million acre-feet of inflow over 120 years, the cumlative amount over all these years is 1.8 million tons of carbon, or about 0.015 tons inflow of carbon each year. In the analysis we assume a deposition of carbon (mostly from internal production) that is based on California water bodies is slightly higher or about 0.06 tons per year. While it is true that the internal production number is an estimate, what is clear is that the carbon potentially accumulating in the system is expected to be orders of magnitude lower than what the commenter has asserted in feedback to the Long-Range Plan.

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Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans 2. Examples of defects in the GHG analysis and conclusions	There are so many serious problems throughout Appendix F and section 3.5.1 that it would be exceedingly time-consuming and burdensome to attempt to describe and explain all of them. It would also be pointless, since the analysis, findings, and conclusions are so scientifically flawed and untenable that the only reasonable remedy is to reject them entirely, and instead to rely on a new evaluation conducted by scientists who are actually experts regarding the specific issues involved. Some of the categories of problems with the analysis, findings, and conclusions in Appendix F and section 3.5.1 are the following: •It was misguided for Tetra Tech to use averaged data for GHG emissions from a large and varied collection of freshwater reservoirs, lakes, and ponds within forested, heavily vegetated, and marshy watersheds located in cold and temperate climates, and to apply those data to the hypersaline Salton Sea in the hot and arid Colorado Desert. •It was unsound for Tetra Tech to assume that the mean CO2 flux calculated or modeled for a collection of freshwater reservoirs and lakes unlike the Salton Sea, located in ecoregions, watersheds, and climates that are dissimilar to the Salton Basin, can be directly used as the net CO2 flux from the past, current, and future Salton Sea. •It was inappropriate for Tetra Tech to assume that data from a study pertaining to nitrous oxide dynamics involving atmospheric deposition of nitrogen in alpine and subalpine freshwater reservoirs and lakes of the Colorado Rocky Mountains within a cold, forested ecoregion are directly applicable to the Salton Sea, a hypersaline lake in a desert ecoregion that receives nitrogen via a different route with distinct biogeochemical factors involved. •It was not valid for Tetra Tech to group all features of all proposed long-range plans into two undefined and improperly broad categories—“wetted areas” and “exposed lakebed”—for purposes of evaluating net GHG emissions. The relevant components and features in the various proposed long- range plans cannot properly be categorized in that manner, nor can the relevant scientific literature. The details of the specific characteristics of each component and feature in proposed plans, as well as the changes in those characteristics over time, will determine the actual net GHG emissions involved; yet those specific characteristics and changes were ignored by Tetra Tech. For example: •In evaluating potential GHG emissions from waterbodies, it was unsound for Tetra Tech to assume that relatively small and shallow freshwater or brackish impoundments with high edge-to-volume and sediment-to-water ratios will function like an extremely large, saline, and ecologically restored Salton Sea with regard to net fluxes of CO2, CH4, and N2O. •It was untenable for Tetra Tech to assume that a large, relatively shallow, and extremely hypersaline brine sink incapable of supporting any organisms other than halophilic bacteria, archaea, and viruses will have the same net fluxes of CO2, CH4, and N2O as either an extremely large and moderately saline lake containing desalinated ocean water and supporting a robustly functioning ecosystem, or a relatively small freshwater or brackish impoundment. •In evaluating potential GHG emissions from exposed lakebed, it was not valid for Tetra Tech to ignore the significant and directly relevant differences between fully desiccated lakebed and intermittently rewetted lakebed, or between undisturbed lakebed and highly disturbed and/or reworked lakebed (e.g. lakebed repeatedly subjected to deep furrowing for dust control). •Many features in proposed long-range plans are not properly categorized as either ”wetted areas” or “exposed lakebed,” and placing such features in either category for purposes of claiming to quantify their net GHG emissions is not scientifically sound. For example, areas that are seasonally flooded to a shallow depth and then allowed to dry until being re-flooded again (e.g., see page 52 of the Draft LRP) are not properly put into either: (a) the “wetted area” category (which also apparently includes an inappropriate assortment of other, very dissimilar waterbodies, including an extremely large and permanent saline lake, a freshwater reservoir, small brackish impoundments, and a large brine sink); or (b) the “exposed lakebed” category (which apparently includes fully desiccated and undisturbed lakebed, highly disturbed and reworked lakebed, rewetted lakebed, and other dissimilar lakebed variants). The scientific literature makes clear that shallow, low-salinity impoundments rapidly cycle carbon, and that the drying and rewetting processes themselves are associated with very high GHG emissions. These factors make clear that a shallow impoundment subjected to seasonal flooding and drying does not properly belong in either the “wetted area” category or the “exposed lakebed” category. Drawing conclusions about the GHGs emitted from that type of impoundment by inappropriately categorizing it in an overbroad manner as either “wetted” or “exposed” is not valid.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The methodology and uncertainty of GHG estimates, and the underlying conceptual model, in Appendix F have been clarified. Additional discussions in Section 1.3 were added noting that future local measurements for the different processes of GHG sequestration and emissions in Salton Sea are necessary and critical to improve estimation accuracy. For the individual processes assessed and estimated in Appendix F, further discussions on other related studies and their results (e.g., N2O emission rates in Section 1.3.3) were included as additional background information. Section 1.2.4 was additionally included to provide further background information related to the carbon concentrations from inflow and measured in Salton Sea. These measured organic and inorganic carbon concentrations provided additional context related to the high carbon content within and transported to Salton Sea. As discussed in Section 1.2.4, with the high carbon concentrations, the emissions of CO2 are expected to be in a higher end, which led to the use of relatively higher values for different flux rates. Given the currently limited observations of GHG fluxes in Salton Sea, the estimation of GHG sequestration and emissions in Appendix F used the results from several studies, including studies that were carried out on a global scale and included a relatively large number of regions and lakes/reservoirs. The use of a larger number of studied regions and locations allow the predictive models for GHG estimates to be used as reasonable first order estimates, as done in this work. Where the regression equation allowed it, the values selected and used in Appendix F are also based on additional consideration of the unique conditions in Salton Sea (clarified in corresponding sections of Appendix F). To estimate the long-term CO2 emissions from the permanently dried area in Salton Sea, effective exposed lakebed area was calculated to consider the possible rewetting of the exposed sediment. Additionally, the mass balance of sediment carbon content was used to ensure the amount of carbon released from exposed sediment is below the total carbon content in the sediment. Relevant discussions in Appendix F Section 1.3.2.2 were revised to clarify the methodology applied.

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			•It was not scientifically sound for Tetra Tech to assume that the eutrophic status of the Salton Sea in recent decades necessarily means it has been a large net emitter of GHGs, and a large emitter of methane in particular. Published studies indicate the opposite conclusion may be warranted. •It was improper to claim, as Tetra Tech did, that the values it selected for GHG emission rates were "conservative" when in fact they were selectively and unjustifiably gleaned from studies on waterbodies dissimilar to the Salton Sea in order to support unscientific allegations that the Salton Sea has a low carbon burial rate, a high lake-surface GHG emissions rate, and a low lakebed GHG emissions rate. It seems that this scientifically invalid strategy may have been utilized specifically in order to conclude unwarrantedly that proposed in-basin long-term restoration concepts with relatively small impoundments and vast areas of exposed lakebed will have lower total net emissions than a fully restored Salton Sea. It is impractical to elucidate comprehensively the many ways in which Tetra Tech's analysis, findings, and conclusions in Appendix F and section 3.5.1 are riddled with defects and are indefensible and invalid. It will suffice to present several examples of the problems in greater detail in parts IV.C through IV.G below.	
Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans 3. Flawed evaluation of CO2 emissions from the lake surface	To establish a rate of CO2 flux from the surface of the Salton Sea in Appendix F, Tetra Tech utilized studies of reservoirs and lakes that are not analogous to the Salton Sea in their characteristics, and that are located in climates, watersheds, and ecoregions that bear no resemblance to the Salton Basin in various important ways. In addition, Tetra Tech misinterpreted and misapplied the scientific literature, cited particular studies for conclusions they did not reach and do not support, and failed to properly consider a variety of key factors that may affect net greenhouse gas emissions from the Salton Sea. Concerning CO2 emissions, Appendix F states: "CO2 flux computed for 15 shallow, eutrophic lakes in Iowa ranged from –0.01 to 0.05 mol C/m2/day (-10 to 50 mmol C/m2/day) (Morales-Williams et al., 2021), while a study of 196 globally distributed saline lakes shows that CO2 flux averaged 81 mmol C/m2/day (Duarte et al., 2008). McDonald et al. (2013) specifically studies mean CO2 flux in the Mediterranean California ecoregion and suggests an estimate of 0.29 g C/m2/day or 24.2 mmol C/m2/day with a 95% confidence interval of 5.8 to 58 mmol C/m2/day, which is largely encompassed by the ranges established by Morales-Williams et al., 2021. These studies show that the Salton Sea, a eutrophic and saline inland water body in Mediterranean California, is most likely a CO2 net emitter. A flux rate of 58 mmol C/m2/day is used, which is the upper rate of the study by McDonald et al. (2013). Note that this is much higher than the 11.8 mmol C/m2/day suggested by Clow et al. (2015); however, we assume that the effect of eutrophication and salinity on the diffusive flux of CO2 are masked in such a global study and would most likely be represented by the upper bound for a California-specific study."	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Some related discussions on the methodology of estimating CO2 flux in Appendix F Section 1.3.2.1 have been revised and clarified. A higher value for CO2 flux was used to reflect the higher temperature and salinity in Salton Sea compared to the other locations in the region. Evaluation on the selected CO2 flux rate with the results from other studies was additionally provided in Section 1.3.2.1. Discussions related to identifying Salton Sea as a "net emitter" and the use of term "Mediterranean California" was clarified and revised in Section 1.3.2.1. Instead of the phrase "show that the Salton Sea," we use "suggest that the Salton Sea." Related studies were added to provide additional information on the CO2 flux, including one study (Yan et al., 2018) conducted for 14 saline (out of a total 17) lakes in Tibetan Plateau which suggests a higher average CO2 flux rate than the selected 58 mmol C/m2/day and positive correlation between CO2 flux rate and

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			There are numerous fundamental problems with this analysis. •Contrary to Tetra Tech's claim, the cited studies do not "show that the Salton Sea… is most likely a CO2 net emitter." That assertion is scientifically unfounded. Tetra Tech ignored the specific characteristics of the Salton Sea, and disregarded relevant studies that indicate the opposite conclusion may be appropriate. Tetra Tech decided based on no evidence (and in disregard of contrary evidence) that the Salton Sea emits CO2 at the highest rate found in a study of freshwater reservoirs and lakes in high-elevation, cold or temperate, forested regions. Nothing in that study, or the others cited, justifies the use of that emissions rate or supports the conclusion drawn by Tetra Tech that the Salton Sea has had net emissions of CO2 since 1905 and will continue to be a net emitter throughout the 21st century. •The Salton Sea is obviously not located in "Mediterranean California." That statement is bizarre. It appears that the Tetra Tech employee who wrote Appendix F either knew little-to-nothing about the Salton Sea, or made a significant error through carelessness. •Referring to a study of 15 small, shallow, freshwater, eutrophic lakes in Iowa (Morales-Williams et al., 2020)—13 of which were reservoirs and all of which were ice-covered for 5 months of the year—Tetra Tech noted that the authors found a range of carbon fluxes from –10 mmol C/m2/day to +50 mmol C/m2/day. (A negative flux number reflects net carbon influx into the lake, whereas a positive flux number reflects net carbon efflux (emission) by the lake.) Five of the lakes studied had significant net influx; the rest of the studied lakes were net carbon emitters. But Tetra Tech disregarded the details in Morales-Williams et al. (2020), including the study's extensive discussion regarding the limits of the data and qualifications regarding the findings, and ignored the study's text concerning the characteristics of the lakes with net influx. •Based on Duarte et al. (2008), Tetra Tech claimed that "saline lakes support higher CO2 exchange rates with the atmosphere due to the chemistry of the environment." But that study has been widely criticized by limnologists with expertise related to GHG emissions from lentic water bodies and dry inland waters, because the authors of Duarte et al. (2008) did not conduct appropriate fieldwork in order to determine CO2 emission rates from the lakes involved, and because the study's conclusions were derived based on indirect calculations of GHG emissions using other types of published data gathered in inconsistent ways for other, unrelated purposes. Moreover, that study did not differentiate among different types of lakes based on their specific characteristics, and it did not evaluate the extent to which particular characteristics either enhanced or limited emissions from individual lakes. Tetra Tech ignored the fact that other studies utilizing more appropriate methodologies indicate that saline lakes have significantly lower carbon emissions than freshwater lakes, and may have net negative emissions because of high carbon sequestration rates.	organic carbon concentrations, salinity, and water temperature. Given with high organic concentrations within and transported to Salton Sea as additionally discussed in Section 1.2.4, identifying Salton Sea as most likely a CO2 net emitter is a valid statement. The "Mediterranean California" term was used to be consistent with a label used in a region in a map in McDonald et al. (2013) that included the Salton Sea. This has been revised in the new version. As discussed in Section 1.3.2.1, the value selected and used is based on the estimates conducted for the ecoregion Salton Sea is located in and an upper bound was used because of the high carbon concentrations, warmer water temperature, and salinity of Salton Sea. Some related discussions in Section 1.3.2.1 have been revised for further clarification. Specifically, the CO2 flux rate of 58 mmol C/m2/day was selected for the ecoregion Salton Sea is located as presented in McDonald et al. (2013). Because Salton Sea is a eutrophic, saline, and warm inland lake and thus is subject to a greater CO2 flux rate (as discussed in Section 1.3.2.1), the upper bound of 58 mmol C/m2/day in McDonald et al. (2013) was used. CO2 emissions were calculated as a product of a constant CO2 flux rate (mass per surface area) and annual surface area of Salton Sea. The future shrinkage of Salton Sea with a decreasing surface area leads to a reduction of annual CO2 emissions as presented in the bottom of Figure 9 (Figure 11 in the current version).

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			•It seems that Tetra Tech proceeded to peruse the scientific literature looking for other, higher CO2 emission rates to use for the Salton Sea. Tetra Tech selected the highest CO2 flux rate at the top of the 95% confidence interval presented in McDonald et al. (2013) as the Salton Sea's CO2 flux rate. An examination of the details in McDonald et al. (2013) shows that this was completely unjustified: •McDonald et al. (2013) was not a "California-specific study" as Tetra Tech claims. To arrive at a range of conclusions regarding CO2 fluxes from lakes, McDonald et al. (2013) used averaged data from the 2007 National Lake Assessment (NLA) for a variety of freshwater reservoirs and lakes that are not analogous to the Salton Sea in their characteristics, and are located in ecoregions that are dissimilar to the Salton Sea's location with regard to crucial factors including, but not limited to, elevation, topography, vegetation, temperature, precipitation, sources of inflow, and salinity. Only a comparatively small number of the lakes included in the NLA and selected by McDonald et al. (2013) were in California, nearly all of those were freshwater reservoirs in forested areas with cold seasonal temperatures, and none of them was located in the hot, arid ecoregion where the Salton Sea is situated. The reservoirs and lakes that yielded the range of emissions plucked out by Tetra Tech do not share any important characteristics with the Salton Sea. •McDonald et al. (2013) did partition NLA data into ecoregions with similar characteristics; however, I conducted a detailed evaluation of the original NLA data that McDonald et al. (2013) utilized, and I determined that none of the California lakes analyzed in that study was located in the Salton Sea's ecoregion. Moreover, none was a saline lake, and nearly all were man-made reservoirs. Had the Salton Sea been included in the 2007 NLA database, it would have been within the "Xeric West" category. The only two natural lakes in California that are in the NLA's Xeric West category are both in Mono County and are categorized as "high elevation, cold, deep" waterbodies, and are freshwater lakes that share no important characteristics with the Salton Sea. The rest of the Xeric West lakes in California are man-made, and therefore are fundamentally dissimilar to the Salton Sea for that reason alone. Furthermore, all of the Arizona and New Mexico lakes in the 2007 NLA's Xeric West category are man-made reservoirs, so they cannot properly be used as analogues for the Salton Sea either. The relevant literature makes clear that the characteristics of reservoirs that are important for understanding their GHG emissions are different in crucial ways from the characteristics of non-reservoir lentic waterbodies. Salinity is a very important factor, as are various other considerations. It was inappropriate for Tetra Tech to draw conclusions about CO2 flux from the Salton Sea based on data for freshwater reservoirs with dissimilar characteristics. Moreover, the other California waterbodies in the NLA database used by McDonald et al. (2013) that are not in the Xeric West category are in climate zones that are very different from the Colorado Desert, most are in heavily forested watersheds in mountainous regions, all but one are man-made, and the single natural California lake in the collection is in Lassen County and is categorized as a "high elevation, cold, deep" waterbody. •Thus, for Tetra Tech to draw conclusions about the Salton Sea's CO2 flux based on McDonald et al. (2013) was misguided. To select the highest emission rate in the 95% confidence interval for lakes in the McDonald et al. (2013) collection that bear no resemblance to the Salton Sea was even more inappropriate. Tetra Tech's approach, and its decision to use a CO2 emission rate of 58 mmol C/m2/day, are scientifically unsound. Tetra Tech's finding that the Salton Sea emitted 880,000 metric tons of CO2 annually from 1905 to 2004 is not valid. It is a speculative and unwarranted assumption based on the arbitrary selection of 58 mmol C/m2/day from the top of the 95% confidence interval in McDonald et al. (2013) as the Salton Sea's emission rate for a 100-year period, chosen in complete disregard of the Salton Sea's unique characteristics that are dissimilar to those of the lakes in the selected study. In addition, Tetra Tech's assumption that total CO2 emissions from the Salton Sea remained constant at the same unjustified amount after 2004, notwithstanding shrinkage of the lake and its rising salinity, was also inappropriate. Furthermore, Tetra Tech's assumption that the lake will reach "an equilibrium" after 2050, and will then have the same improperly applied emission rate but across a smaller surface area (an area derived using hydrologic assumptions of questionable validity)—for a total of 610,000 metric tons of CO2 annually—was once again scientifically unfounded.	

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Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans 4. Invalid quantification of CH4 and N2O emissions from the lake surface	For purposes of evaluating methane (CH4) emissions from the Salton Sea, Tetra Tech used one chlorophyll-a measurement from 1999 and unjustifiably assumed the lake contained that chlorophyll-a level all the time beginning in 1905 and continuing through the late 21st century. Tetra Tech then improperly utilized that single measurement to quantify methane emissions from the Salton Sea on a daily basis across a span of nearly 200 years by employing a formula that was developed for a different purpose. There are many reasons why this approach employed by Tetra Tech is scientifically unsound, and the results obtained through its use are scientifically invalid. Just a few of the problems involved are the following: •The Salton Sea was not eutrophic for a large portion of the 20th century beginning in 1905, yet Tetra Tech assumed that the lake was eutrophic from 1905 through the end of the 21st century. Tetra Tech inappropriately called this a “conservative” approach. •Once the Salton Sea became eutrophic, its degree of eutrophication was highly variable over time. But Tetra Tech assumed the lake had the specific chlorophyll-a level measured in 1999 at all times from 1905 through 2100. •In purportedly quantifying CH4 emissions from the Salton Sea during a period of nearly 200 years, Tetra Tech ignored the lake’s salinity. Yet peer-reviewed studies show saline lakes emit significantly smaller quantities of methane—as much as an order of magnitude smaller—than freshwater lakes, and hypersaline lakes like the Salton Sea emit the smallest quantities. •To quantify the Salton Sea’s CH4 emissions, Tetra Tech utilized a formula that was developed for a different purpose, and assumed without justification that it could be directly applied to quantify the Salton Sea’s emissions of CH4 from 1905 through the end of the 21st century. Tetra Tech obtained the formula from DelSontro et al. (2018), a study that was focused on using a number of upscaling methods to derive a first-order indirect approximation of global CH4 emissions from a widely varying collection of primarily freshwater waterbodies in various biomes and climate zones around the world. It was not scientifically valid for Tetra Tech to utilize a formula developed for producing an upscaled ballpark estimate of global CH4 emissions and apply it to quantify the daily CH4 emissions from a particular lake with unique characteristics, and to do so for a period spanning nearly 200 years and encompassing both the past and the future. Regarding nitrous oxide (N2O) emissions, Tetra Tech stated: "N2O is an immediate product of denitrification (reduction of NO3 - to N2) and by-product of nitrification (oxidation of NH4 + to NO3 -) (Woszczyk and Schubert, 2021). Thus, flux of N2O is correlated with availability of oxygen and nitrates, and with temperature of the water column. N2O flux from lakes is not well studied. A study of lakes in the Colorado Rocky Mountains shows that N2O flux from high-deposition lakes (i.e. receiving 5 – 8 kg N/ha/year) varied from 0.8 to 6.4 µmol N/m2/hour (0.308 to 2.47 g N2O/m2/year) (McCrackin and Elser, 2011). Therefore for a eutrophic lake such as the Salton Sea that is influenced by agricultural drainage, the upper limit of 2.47 g N2O/m2/year can be used. For comparison, in the south Baltic coastal lakes, N2O flux is estimated at 0.269 g N2O/m2/year (Woszczyk and Schubert, 2021). This is lower than the lower limit cited above. There is little data on N2O flux from warmer lakes, so we use 2.47 g N2O/m2/year as a conservative estimate for the Salton Sea. Figure 12 shows the cumulative and annual emission of N O from the lake surface."	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Related discussions on the methodology of estimating CH4 and N2O flux in Appendix F Sections 1.3.2.1 and 1.3.3 have been revised. The uncertainty of estimating CH4 and N2O emission rates (and other related processes) was acknowledged in Appendix F Section 1.3. Higher values of CH4 and N2O emission rates were used given with the high eutrophication and temperature in Salton Sea. For CH4 emission, the chlorophyll a concentration used is based on the annual average concentration level with the measurements from 1997 to 1999. Evaluation on the estimated CH4 emission rate with the results from another study was additionally provided in Section 1.3.2.1. Additional evaluation on the estimated N2O emission rate with the results from other studies (including the estimates for Saline lakes) was provided in Section 1.3.3.

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			Essentially what Tetra Tech said here was: "N2O flux from lakes is not well studied, and there are no data relevant to the Salton Sea; therefore we will use the highest emission rate for N2O emissions that we've found in the literature, despite the fact that it comes from an extremely dissimilar lake in a very different ecoregion and climate, and is receiving N in a very different manner from what is occurring at the Salton Sea. We'll apply that emissions rate to the Salton Sea, and we'll call this a 'conservative' estimate." This was improper, unscientific, and unsupportable. Also indefensible is the fact that Tetra Tech blatantly disregarded various important statements in McCrackin and Elser (2011)—the study from which Tetra Tech selectively plucked a high N2O emissions rate—that made clear the significant limits of the applicability of that study's findings. In particular, McCrackin and Elser (2011) explicitly stated, "The lakes we sampled… may not be representative of other regions or land uses": "It is important to note that studies of N2O dynamics in aquatic ecosystems have largely been conducted in the Northern Hemisphere in temperate and boreal climates… The lakes we sampled are located in the same region with similar elevations and climate. Thus, while they are comparable to those reported in the literature, they may not be representative of other regions or land uses, such as those in urban or agricultural areas." McCrackin and Elser (2011) studied freshwater lakes in cold, subalpine and alpine regions that are ice- covered for more than half the year. Those water bodies are utterly different from the Salton Sea, and it is obviously inappropriate and indefensible to assume that study's findings apply directly to the Salton Sea. In fact, McCrackin and Elser (2011) make clear it is problematic to apply that study's findings even to lakes that are similar to the ones they studied and are located in similar ecoregions. The authors stated: "It is difficult to make generalizations of our data based on summer measurements, because we do not know how concentrations of dissolved CO2, CH4, and N2O in the sampled lakes vary seasonally. The alpine and subalpine lakes that we sampled are ice-covered for more than half of the year… Gases that accumulate under ice during winter could be released during periods of thaw and mixing. Hence, concentrations of dissolved gases that we measured in summer months may be greater than average annual concentrations." For all the foregoing reasons, and many others, Tetra Tech's "estimates" of CH4 and N2O emissions from the Salton Sea are not scientifically valid.	
Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans 5. Faulty estimation of carbon sequestration in lake sediments	To derive a rate of carbon sequestration in the Salton Sea lakebed, Tetra Tech misused Clow et al. (2015). That study evaluated organic carbon burial in reservoirs and lakes in the conterminous U.S. (CONUS) that are part of the 2007 NLA database (discussed above with regard to McDonald et al., 2013). Clow et al. (2015) estimated total carbon sequestration by waterbodies of the CONUS in the NLA (freshwater reservoirs, lakes, and ponds in a variety of climates and ecoregions); also considered the types of factors that may affect carbon burial rates; and compared the estimated total, collective amount of carbon burial by CONUS waterbodies with the total, collective carbon emissions from CONUS waterbodies estimated in a different study. Tetra Tech grabbed a number presented in one of the Clow et al. (2015) figures, which was the mean of the estimated modern carbon burial rates for NLA lakes and ponds in California and Arizona—72 g C/m2/year— and unjustifiably applied that rate to the Salton Sea. As noted above in the discussion of Tetra Tech's misuse of McDonald et al. (2013), the NLA includes no waterbodies that have characteristics that are similar to those of the Salton Sea. Most of the California and Arizona waterbodies in the NLA are man-made reservoirs (and were therefore not included in the Clow et al. (2015) figure pertaining to "lakes/ponds" from which Tetra Tech selected the burial rate of 72 g C/m2/year). In addition, the very small number of California and Arizona non-reservoir lakes that are in the NLA database do not share any important characteristics with the Salton Sea, and are therefore not appropriate analogues for understanding carbon sequestration by the Salton Sea. Yet Tetra Tech nonetheless decided the Salton Sea should be assumed to have a carbon burial rate identical to the mean estimated rate for those very dissimilar waterbodies. Moreover, Tetra Tech disregarded the discussion in Clow et al. (2015) indicating that various factors relevant to the Salton Sea may increase carbon sequestration. Notably, Clow et al. (2015) stated, "Annual OC [organic carbon] burial is greatest in areas that are relatively warm, intensively used for agriculture, and have large total water body surface areas…" (Emphasis added.) Importantly, Tetra Tech also disregarded the findings of other studies mentioned in Clow et al (2015) that concluded higher sequestration rates may occur in eutrophic waterbodies in agricultural settings. Documented sequestration rates for eutrophic waterbodies in agricultural settings were as high as 17,000 g C/m2/year, yet Tetra Tech dismissed that fact and selected a carbon burial rate for the Salton Sea that is just 0.4% of that amount. Tetra Tech also disregarded the finding of Clow et al. (2015) that their studied CONUS waterbodies collectively sequestered nearly 30% more carbon than CONUS waterbodies in a previous study were found collectively to have emitted. Instead, with no justification, Tetra Tech decided that the opposite is true for the Salton Sea—i.e., that the lake has always emitted and will continue to emit much more carbon than it sequesters.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. The multiple factors affecting CO2 burial rate and the uncertainty of estimating CO2 burial rate in Salton Sea were acknowledged and discussed in Appendix F Section 1.3.1. As the local measurements are limited in Salton Sea, the CO2 burial rate was obtained using the result for the region Salton Sea is located from Clow et al. (2015), which used a prediction model (constructed based on a larger number of studied regions and locations) to estimate CO2 burial and sedimentation rates. The CO2 burial rate used was selected also considering several conditions of Salton Sea including the size and slope of Salton Sea, average temperature, and land cover of the region. Additional discussions were added in Section 1.3.1, e.g., Mendonça et al., (2017) suggests that the burial rate is lower for larger lakes (greater surface area).

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Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans 6. Defective analysis of GHG emissions from exposed lakebed	While Tetra Tech acknowledges that exposed Salton Sea lakebed will emit greenhouse gases, Appendix F and section 3.5.1 claim that all the carbon in exposed sediments will be fully oxidized in as little as 5 years, or in 20 years at the most, and that by 2050 there will be no GHG emissions of any kind from exposed lakebed. Appendix F asserts, “The lakebed has completed its drying process and is no longer emitting GHGs by 2050 because the carbon in the lakebed has been fully oxidized.” In reliance on Appendix F, the Draft LRP states, “Note that where the lakebed emissions are zero (in 2050), the lakebed has completed its drying process and is no longer emitting GHGs by 2050 because the carbon in the lakebed has been fully oxidized.” But no justification is provided for this assumption. It is inconsistent with the facts and ongoing processes at the Salton Sea, and it is not scientifically sound. Tetra Tech’s unfounded assertion that GHG emissions from exposed lakebed will completely cease in 5-20 years demonstrates a failure to understand the relevant physical, biogeochemical, and hydrologic processes involved at the Salton Sea, as well as an improper willingness to make highly consequential claims without any appropriate scientific foundation for doing so. Total oxidation of lakebed sediments—assuming hypothetically that is even possible—would require permanent, deep desiccation of undisturbed and fully exposed lakebed, as well as very specific steady-state conditions that do not exist in the central Salton Basin. The basin is not a static system from either a hydrologic standpoint or a biogeochemical one. Water heavily laden with carbon and nutrients reaches the central Salton Basin constantly. It arrives via tributaries containing agricultural drainwater and wastewater (including untreated wastewater) from various sources; it enters through numerous direct agricultural drains; and it is delivered as runoff from rain and flash flooding events that transport large quantities of easily eroded sediments from the surrounding watershed. Microorganisms are delivered along with the carbon-loaded, nutrient-enriched water. Those flows meander and spread across the exposed lakebed, and will continue to do so for the foreseeable future, wetting the sediments and depositing a fresh supply of sustenance for microbes to feast upon. These processes will result in ongoing GHG emissions from the exposed lakebed. There are also additional processes that will do so. For example, during wind events—which are frequent and often very powerful—Salton Sea water can be blown across the nearly-flat exposed lakebed for 2-3 miles or more. Such events cause wetting of large areas of exposed lakebed, and add carbon, nutrients, and microorganisms onto the sediment surface, initiating large pulses of GHG emissions. There is also extensive shallow groundwater that is pulled up through carbon-rich sediments to the uppermost lakebed on an ongoing basis by capillary action; that process also rewets the sediments, and introduces fresh carbon and microbes, and likely additional nutrients as well. Furthermore, groundwater and carbon are delivered upward because of the numerous faults that crisscross the area beneath the lakebed and provide widespread connections between an extensive subterranean hydrothermal system and surface sediments. Beneath the Salton Sea’s footprint there are moist and warm lacustrine, deltaic, estuarine, and marine sediments extending to a depth of several kilometers. Linkage between the underlying hydrothermal system and the upper lakebed, through those carbon-rich sediments via faults, serves to bring moisture and fresh carbon to the surface and supports GHG-emitting microbial communities. There is no justification for assuming any of the foregoing processes will cease at any time. In addition, the SSMP intends to use repeated deep furrowing of the lakebed for dust mitigation across vast areas; that process will cause renewed pulses of GHG emissions from the newly oxygenated sediments. The agency is also planning to utilize Colorado River wastewater, loaded with carbon and containing elevated concentrations of nutrients, to accomplish additional dust control by intentionally spreading that water across the lakebed surface. Those activities will also result in large quantities of GHG emissions from the lakebed. All of these facts yield the conclusion that carbon oxidation in surficial lakebed sediments will not be “completed” in 5-20 years as Appendix F and section 3.5.1 assume, and GHG emissions from the exposed lakebed will not therefore cease as Tetra Tech claims. Rather, it is highly likely that there will be major GHG emissions from exposed lakebed on an ongoing basis for the foreseeable future.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Discussion on the methodology of estimating CO2 emissions from permanently dried lakebed area have been clarfied in Appendix F Section 1.3.2.2, including the discussions related to the 5-year and 20-year oxidation. Effective exposed lakebed area was calculated to consider the possible rewetting of the exposed sediment and to estimate CO2 emissions from permanent drying. The CO2 emissions from the exposed lakebed area were estimated based on a relatively high emission rate and constrained by the amount of carbon available in the sediment (accumulated from long-term CO2 burial). As discussed and further clarified in Appendix F Section 1.3.2.2, the CO2 emissions from exposed sediment are constrained by the amount of carbon accumulated historically via carbon burial (which was estimated in the previous section). At the end of the 5-year or 20-year oxidation period, the amount of accumulated carbon in the exposed sediment has been fully oxidized and calculated as CO2 emissions.

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Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans 7. Key findings in the relevant scientific literature were discounted or ignored	Tetra Tech disregarded data from previous studies that are highly relevant to understanding potential net GHG emissions at the shrinking Salton Sea and from landscape components of proposed long-term plans. The following findings from peer-reviewed studies are especially important for considering potential GHG emissions, as well as possible carbon sequestration, resulting from the implementation of proposed long-range plans at the Salton Sea, and from failure to implement an appropriate plan: •Elevated GHG emissions are an intrinsic characteristic of exposed lake sediments. (Paranaíba et al., 2022; Keller et al., 2020; Marcé et al., 2019.) Multiple studies have measured high CO2 emission rates from drying and desiccated sediments of various types of shrinking lentic inland waters, including exposed sediments of lakes, ponds, and reservoirs. (See, e.g., Kosten et al., 2018; Obrador et al., 2018; Jin et al., 2016; Catalan et al., 2014; Fromin et al., 2010.) A recent study has also found that all types of dry inland waters—including dry sediments of lakes, ponds, and reservoirs in all climate zones—have high CH4 emission rates. (Paranaíba et al., 2022.) •A study that evaluated 196 dry inland waters globally across diverse ecosystem types and climate zones (Keller et al., 2020) concluded that CO2 emissions from exposed lakebeds were significantly higher than from the lakes themselves: "All studied lentic ecosystem types (i.e. reservoirs, lakes and ponds) showed higher CO2 emissions from dry sediments than globally estimated for their inundated stages." Specifically, the study found that "[m]easured CO2 emissions from dry inland waters to the atmosphere were an order of magnitude higher than average water surface emissions (water-to-atmosphere) previously reported for lentic waters…" •"CO2 emissions from dry inland waters share fundamental drivers across diverse ecosystem types and climate zones…" (Keller et al., 2020.) This comprehensive study found the strongest individual predictors of very high CO2 fluxes from dry inland waters were: (1) high organic matter content, (2) presence of some moisture, and (3) elevated temperatures. Moreover, the researchers determined that the combination of high organic matter content and the presence of some moisture constituted the strongest predictor of very large CO2 fluxes from dry inland waters, which they attributed to greater microbial activity in the presence of those factors. •Portions of inland waters that have become dry and then are rewetted as the result of a variety of natural and human-caused processes have been documented to be major emitters of GHGs to the atmosphere during both rewetting and drying periods, because of changes in microbial processes. (Paranaiba et al., 2020; Marcé et al., 2019; Kosten et al., 2018; Camacho et al., 2017; Jin et al., 2016; Catalán et al., 2014; Fenner and Freeman, 2011; Fromin et al., 2010.) •Significant disturbance of exposed dry lakebed increases GHG emissions by increasing the sediment-atmosphere interface and oxygenating the sediments. Oxygenation of carbon-rich sediments through recurrent disturbance tends to cause renewed microbial activity and significant associated pulses of elevated gaseous carbon fluxes. (See, e.g., Fenner and Freeman, 2011.) •Smaller and shallower lakes, ponds, and impoundments are considered potential hotspots of carbon cycling, and have been documented to emit GHGs to the atmosphere at a much higher rate than large lakes. (See, e.g., Obrador et al., 2018; Holgerson and Raymond, 2016; Downing, 2010.) "Small ponds tend to have higher concentrations of both CO2 and CH4 than larger lakes… Very small ponds can have exceptionally high CO2 and CH4 concentrations." (Holgerson and Raymond, 2016, and references cited therein.) Larger lakes tend to have much lower CH4 emissions than smaller lakes (Bastviken et al., 2004), and "the smallest lakes are responsible for the largest emission" (Rosentreter et al., 2021). High carbon emissions from small lentic systems "probably result from shallow waters, high sediment and edge-to-water volume ratios, and frequent mixing. These attributes increase CO2 and CH4 supersaturation in the water and limit efficient methane oxidation." (Holgerson and Raymond, 2016.) Ebullition (bubbling) is a primary pathway by which CH4 is released directly to the atmosphere from shallow ponds and lakes, and as the result of either natural or man-made drawdown in the volume of initially larger waterbodies, in part because of low hydrostatic pressure on shallow sediments. (Beaulieu et al., 2018; Bastviken et al., 2008; Bastviken et al., 2004.) In addition, CH4 produced in shallow sediments largely avoids oxidation by methanotrophic bacteria and escapes to the atmosphere. (Bastviken et al., 2008.) In bigger and deeper lakes, particularly ones that tend to be persistently stratified, gaseous carbon is more likely to be broken down by biological and biogeochemical processes in the water column and sediments before it can reach the lake surface and be emitted to the atmosphere. (Zimmerman et al., 2021; Holgerson and Raymond, 2016; Bastviken et al., 2004; Joye et al., 1999; Segers, 1998.) •Production and emission of GHGs tend to be lower in lakes that are more saline. For example, in comparison to freshwater lakes and lentic waterbodies of low-to-medium salinity, hypersaline lakes (ones that are saltier than the ocean) release methane at significantly lower rates. (Camacho et al., 2017; Segers, 1998.) Hypersaline lakes have been determined to have methane emission rates that were an order of magnitude less than the average CH4 emission rates from freshwater and low- salinity lakes. (Camacho et al., 2017.) This phenomenon may result from greater carbon sequestration in lakebed sediments as salinity rises. (See, e.g., Jellison et al., 1996.) However, a limit for emission reduction is eventually reached at some point after a lake becomes hypersaline, so that additional increases in salinity do not result in further decreases in GHG emissions. (Camacho et al., 2017.)	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Discussions and estimation of GHG emissions in the literature were reviewed and examined for Appendix F. Some of the existing studies were used to obtain the estimates of GHG emission and sequestration rates in Appendix F, while some studies were used to provide additional background information. The estimation of the different processes of GHG emissions and sequestration and the corresponding rates used are based on multiple factors such as climate, eutrophication, and salinity of Salton Sea. The CO2 emissions from exposed sediment are also restrained by the amount of sediment carbon accumulated historically via carbon burial. The estimation of CH4 flux and emissions is based on DelSontro et al. (2018) and using recorded chlorophyll a concentration in Salton Sea as discussed in Section 1.3.2.1. While smaller lakes may contribute to a large portion of CO2 and CH4 emissions in a global scale, the results of DelSontro et al. (2018) suggests that no lake size effect can be found for the CH4 flux rate (mass per surface area) of a particular lake. The conclusion that "production and emission of GHGs tend to be lower in lakes that are more saline" cannot be made based solely on the findings related to CH4 emissions. Yan et al., (2018), for example, showed a positive correlation between CO2 flux rate and salinity. For the organic carbon burial rate, the predictive model used in Mendonça et al., (2017) suggested a negative correlation between burial rate and lake size (and slope) for example. While Salton Sea is subject to substantial eutrophication, the size of Salton Sea can also lead to a lower burial rate (mass per surface area). The use of an average burial rate estimated for the region is therefore reasonable.

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			•Extreme hypersalinity in brine sinks is associated with high methane emissions. In extraordinarily hypersaline waterbodies such as brine sinks and industrial salt-production ponds, the activities of halophilic methanogenic (i.e., CH4-producing) archaea and other salt-loving microbes, and the occurrence of various biogeochemical processes that result in methanogenesis, are associated with significantly heightened methane production and high rates of CH4 emission to the atmosphere. (Zhou et al., 2022; Obrador et al., 2018.) •Highly productive eutrophic lakes have been documented to have elevated carbon sequestration rates that are nearly an order of magnitude greater than oligotrophic lakes (waterbodies that have relatively low productivity because of low nutrient content and low biological activity). (Downing, 2010; see also Anderson et al., 2014; Anderson et al., 2013; Heathcote and Downing, 2012; Einsele et al., 2001.) High carbon burial rates are strongly correlated with extensive agricultural land cover in the lake's catchment area, indicating that high nutrient input is associated with elevated carbon sequestration in lakebed sediments. (Anderson et al., 2013.) Primary production by algae and carbon storage in both biota and sediments are especially great in nutrient-enriched eutrophic lakes. In such lakes the water tends to be depleted in CO2, atmospheric carbon therefore diffuses readily into surface waters, and biological and biogeochemical processes in the water and sediments enable such waterbodies to function as net carbon sinks. (See, e.g., Heathcote and Downing, 2012; Schindler et al., 1997.) Nutrient-rich saline lakes tend to be extremely productive (Hammer, 1981); and hypersaline, highly productive, endorheic lakes may be particularly effective at accumulating carbon in their sediments. (See, e.g., Jellison et al., 1996.) Higher temperatures and drier climate are also factors associated with greater carbon burial rates in lakes. (Mendonça et al., 2017; Clow et al., 2015.)	
Jenny E. Ross	Stout Research Center	GHG emissions from landscape components of proposed long-term restoration plans 8. The flawed discussion of GHG emissions from landscape features must be eliminated from the Draft LRP, and an expert scientific analysis must be performed instead	The analysis and conclusions in the Draft LRP concerning landscape-related GHG issues are scientifically unsound and unsupportable. It was seriously inappropriate for the SSMP to rely on Tetra Tech to devise Appendix F and section 3.5.1, rather than engaging the assistance of scientific experts who are specialists concerning the particular complex and esoteric subjects involved. Furthermore, it was an abuse of the CNRA's discretion to incorporate Tetra Tech's misguided and clearly faulty analysis into the Draft LRP, and to reach consequential conclusions based on Tetra Tech's invalid findings. Appendix F and section 3.5.1, and all related discussion and conclusions, must be removed from the Draft LRP. The SSMP and the Army Corps of Engineers should not utilize the deeply flawed evaluation of landscape- related greenhouse gas issues in Appendix F and section 3.5.1 to reach any conclusions about the GHG emissions from, or carbon sequestration by, the Salton Sea, its lakebed, or the components of any proposed long-term restoration concepts. Instead, a new scientific analysis must be performed by appropriate experts. Specifically, I suggest: 1.The Army Corps of Engineers and/or the Department of the Interior should immediately support a study by pertinent subject-matter experts of: (a) the actual net GHG emissions within the central Salton Basin associated with relevant landscape-related sources; and (b) the actual carbon sequestration that has occurred within lakebed sediments in the central Salton Basin during recent decades. 2.The necessary research should be conducted by a group of independent and objective academic and/or USGS scientists with directly relevant expertise and experience, including but not limited to: a limnologist and a biogeochemist with specific expertise in evaluating GHG emissions from and carbon sequestration in lakes—particularly saline lakes—and their lakebeds, as well as a geologist, a hydrologist, and a biologist with specific expertise concerning the unique geologic, hydrologic, and biologic history and current characteristics of the northern Salton Trough and the Salton Sea. 3.The data from those field investigations should then be utilized by the same expert team to estimate the net GHG emissions in the future from each proposed long-term plan for the Salton Sea that is being evaluated by the Army Corps of Engineers, based on the particular components and features of each such plan. 4.Alternatively, if the Army Corps of Engineers and the Department of the Interior determine it is not feasible for the necessary field research in the Salton Basin to be conducted, I suggest that the same group of independent and objective academic and/or USGS scientists, with the specific expertise described above, should be enlisted to evaluate whether—and, if so, in what particular manner—the existing scientific literature can be applied to develop reasonable, scientifically valid estimates of net GHG emissions from the various types of landscape-related sources in the Salton Basin that are part of each proposed long-term restoration plan.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. We calculate that the inflow of organic carbon into the Salton Sea is approximately 0.015 M tons/year (averaging concentations of total organic carbon in inflows) and 0.072 M tons per year of inorganic cardon. We estimated that the carbon storage using a study from other California reservoirs is 0.06 tons/year. While the storage number is an estimate, it is nonetheless orders of magnitude lower than the value that has been frequently proposed by the commenter. In our review of GHG fluxes of different gases and from different sources, we found no evidence to support the large change in emissions that the commenter asserts.

Name	Organization	Section or Page	Comment	Response
Jenny E. Ross	Stout Research Center	Risks posed by contaminants in the water and sediments to be used for components of proposed in-basin restoration plans	Proposed in-basin restoration plans will direct the flow of primary tributaries (the New, Alamo, and Whitewater Rivers) into impoundments to be used for habitat and recreation. That water contains a variety of concerning pollutants that may pose significant risks of harm to both wildlife and people. The pollutants present in the water, suspended sediments, and bottom sediments of tributaries, as well as in lakebed sediments to be used for construction of impoundments, include but are not limited to: pesticide residues (from both banned legacy pesticides and ones in current use), components of untreated wastewater crossing the international border (potentially including pathogens), industrial chemicals from Mexican factories, heavy metals (including arsenic), PCBs, and naturally occurring selenium at elevated levels. In the Salton Sea itself, those pollutants are diluted and largely become sequestered within the lakebed. In impoundments, however, the contaminants will likely be present in higher concentrations, both because there will be direct, undiluted inflow from polluted tributaries into the impoundments, and because contaminated subsurface lakebed sediments will be excavated to form the embankments enclosing the impoundments. The Draft LRP does not discuss potential risks of harm to wildlife and people that could be posed by direct contact with polluted water and contaminated sediments used for key components of proposed in-basin restoration plans. Polluted water will be contained in impoundments to be used as wildlife habitat and for recreational activities; sediments containing contaminants will be utilized to create the impoundments and to construct embankments from which people will fish and launch boats, and on which they will hike; and contaminated sediments will also be used to make islands within impoundments for bird nesting and loafing. The potential risks involved for both wildlife and people are significant, and must be carefully considered. But the Draft LRP does not do so. To illustrate the potential problems and risks involved, below I discuss the harmful legacy pesticide DDT, and its metabolite DDE, which are both known to be present in significant concentrations within subsurface Salton Sea sediments that will be excavated and used to construct impoundments, embankments, and other features in proposed in-basin long-range plans. Salton Sea subsurface sediments are contaminated with dichlorodiphenyltrichloroethane (DDT) and its metabolite dichlorodiphenyldichloroethylene (DDE) because of major historical use of DDT as a pesticide across the lake's watershed in both the U.S. and Mexico. Use of DDT in the United States was banned in 1972, but its use continued in Mexico for domestic food production until the 1990s and for malaria control until 2000. DDE is a chemically-similar breakdown product of DDT that forms as a result of microbial activity after the pesticide enters the environment. The SSMP's 2022 Draft Environmental Assessment for the 10-Year plan stated, "Dichlorodiphenyltrichloroethane (DDT) and its metabolites were detected in all sediment samples [sampled within the 10-Year Plan project area], and dichlorodiphenyldichloroethylene (DDE) was the predominant pesticide residue."	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Additional ecological models will be incorporated during the feasibility study process, which will provide the level of detail and analysis identified in the comment.

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			Maximum concentrations of DDE in subsurface sediments exceeded the Probable Effects Concentration (the concentration above which harmful effects are likely to be observed) at all but one location where sediment was sampled at and near the New and Alamo Rivers. Although the Coachella Valley Stormwater Channel (Whitewater River) is impaired with contaminants including DDT, the Draft EA did not include data concerning the concentrations of DDT or DDE in that river's sediments, delta, or nearby areas. The elevated levels of DDT and DDE present in subsurface Salton Sea sediments raise significant environmental and public health concerns, because those sediments may be excavated and used for components of in-basin restoration plans, and both wildlife and people may be exposed to harmful substances. The following issues, and others, must be carefully considered: •The threats that DDT and DDE contamination poses to wildlife, especially birds, are serious and have been well-known for many decades. In addition, there are potentially significant risks for people. The possible threats to human health from consuming Salton Sea fish and birds contaminated with DDE were discussed in the Draft EA, but not in the Draft LRP. Neither document discussed additional potential human risks related to DDT and/or DDE exposure through dermal contact or as the result of inhalation or ingestion of contaminated particulates. Recent animal and epidemiologic studies indicate that DDT is a human neurodevelopmental toxicant. Moreover, the U.S. Environmental Protection Agency's Integrated Risk Information System has classified DDE as a probable human carcinogen. •Subsurface Salton Sea sediments that are highly contaminated with DDE have become buried over time beneath younger sediments that are much less contaminated or contain no contamination. But the subsurface sediments of concern are located within areas where proposed in-basin restoration plan components would be built, and therefore the hazardous older sediments will probably be excavated during construction and maintenance of those components. The contaminated excavated sediments will likely be used for berms, embankments, the mid-sea barrier required in some plans, and potentially for access roads and other purposes. This situation could pose serious risks for wildlife, since high levels of DDE in the newly-exposed sediments could enter the food web and bioaccumulate. Excavated sediments containing elevated levels of DDE may also be used to construct islands for bird nesting and loafing, thereby potentially increasing birds' exposure to this well-understood hazard. •The use of previously sequestered contaminated sediments for in-basin restoration project components could also expose people to potentially significant health risks. DDE adheres strongly to soil particles and may therefore contaminate fugitive dust in the region and pose an inhalation hazard to both project workers and the public. In addition, because components of in-basin plans will be used for recreation, human exposure to contaminated sediments is likely to occur through inhalation, dermal contact, and ingestion. The excavation and use of currently-buried sediments that are highly contaminated with DDE could therefore add to the serious pollution and public health burdens already unjustly borne by the people in the Salton Sea region.	

Name	Organization	Section or Page	Comment	Response
Jenny E. Ross	Stout Research Center	Seismic issues associated with proposed in-basin plans	The Salton Trough is one of the most seismically active regions in the world, so there are necessarily some significant seismic risks that cannot be avoided if an in-basin plan reliant on impoundments on top of the lakebed is to be utilized for long-term Salton Sea restoration. However, seismic risks that are specifically related to the nature and locations of the particular components of the various proposed in-basin restoration concepts should be very carefully considered and addressed by the Army Corps of Engineers. I suggest those risks are not adequately discussed in the Draft LRP, and the scoring method used in section 7.4.7 of the Draft LRP does not properly account for the variety and potential severity of the risks involved. •The Draft LRP does not include either a map or a discussion of the known faults and fault zones located within or adjacent to the Salton Sea footprint that are specified in the USGS Quaternary Fault and Fold Database of the United States and described in the relevant scientific literature. In addition, there is no depiction or discussion of the subset of faults and fault zones that are located beneath the lakebed directly under the proposed sites for components of in-basin restoration concepts. I suggest these omissions in the Draft LRP must be remedied. Features of proposed in-basin restoration plans that are located on top of or immediately adjacent to faults, or within fault zones containing multiple faults, will have the greatest potential for damage, and even complete destruction, in the event of a significant earthquake. Many key features of the proposed in-basin plans to be constructed on the Salton Sea lakebed would be built on top of or adjacent to the Brawley Seismic Zone, and/or the eastern extension of the Elmore Ranch Fault, and/or the Extra Fault Zone, and/or the Salton Trough Fault, and/or other unnamed but identified faults. (See Attachments 4, 5, and 6. [attachments can be found in email attachment files]) In addition, other major faults capable of producing very large earthquakes, including but not limited to the southern San Andreas Fault and the Imperial Fault, are nearby. •Shaking in the event of a major earthquake caused by rupture of a fault, or multiple faults, beneath the Salton Sea lakebed or nearby would likely cause very significant damage to components of the proposed in-basin restoration plans that are to be constructed on top of the lakebed. But shaking is not the only seismic or fault-related mechanism that could pose substantial threats. The following potential processes, and the associated damage they could cause, must also be considered: liquefaction, co-seismic slip, subsidence, aseismic creep, and the generation of potentially dangerous and destructive seiche waves.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. An analysis of seismic risks is expected as restoration concepts are developed in higher detail.

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			•The SSMP should anticipate the possibility that damage from shaking, co-seismic slip, and liquefaction could be so severe in the event of a major earthquake as to incapacitate or destroy large portions—or even the entirety—of berms, embankments, impoundments, canals, pipes, pumping equipment, and other essential project components on or adjacent to the lakebed. For example, a recent modeling study evaluated potential dynamic interactions involving the southern San Andreas Fault, the Imperial Fault, and the Brawley Seismic Zone. One modeled scenario involved propagation of rupture and slip from the San Andreas Fault southward through the Brawley Seismic Zone to the Imperial Fault; a second scenario involved propagation of rupture and slip from the Imperial Fault northward through the Brawley Seismic Zone to the San Andreas Fault; and a third scenario entailed propagation of rupture and slip from cross-faults in the Brawly Seismic Zone to the San Andreas Fault in the north and to the Imperial Fault in the south. In all these cases, the authors found that co-seismic slip would be as much as 6 meters in large regions of the Salton Sea footprint where proposed in-basin plans would build key infrastructure on top of the lakebed. (See Attachment 7.) That large amount of co-seismic slip and the associated shaking would also cause widespread liquefaction and would likely result in shearing and/or collapse of impoundment dikes, the mid-sea barrier (which would cross directly through the area of greatest co-seismic slip), and other crucial project components. Complete loss of impounded fresh and low-salinity water from containment structures, and blending of that previously impounded water with the extremely hypersaline water located in the central portion of the Salton Basin should be considered a realistic possibility. If a major earthquake occurs, rebuilding of the entire project could be necessary. Potentially, such rebuilding might not be feasible. •It appears that the possible ramifications for public safety related to collapse of in-basin plan components in the event of a major earthquake have not been thoroughly considered in detail by the SSMP, because they are not adequately discussed in the Draft LRP. (Notably, however, the Draft LRP does include appropriate discussion of seismic issues related to the North/South Marine concepts.) Unless the earthquake happens overnight, when the ground motion abruptly commences there are likely to be many boaters recreating on the proposed impounded waterbodies, as well as people fishing from or hiking on embankments and levees, or driving across the proposed mid-sea barrier. If the containment structures for impoundments located at the perimeter of the Salton Sea footprint (pursuant to some plans) were to collapse due to major shaking, co-seismic slip, and/or liquefaction, boaters will likely be spilled toward the central basin along with the previously-impounded water, and hikers and vehicles may also end up in the water. For the North/South marine concepts, as properly noted in the Draft LRP, failure of the mid- sea barrier could result in a significant loss of water and danger to boaters on the upstream side of the spilling lake. There would also be significant risks for people walking or driving along the mid-sea barrier, and those risks are not only relevant to the North/South marine concepts but also to the other concepts that rely on a mid-sea barrier (concept numbers 2A-D). Even in the absence of a large water release, failure of the embankment would leave hikers and drivers stranded, potentially in hazardous circumstances. People and vehicles could be dumped into the water or marooned far from shore on liquefied mud in which they could sink deeply and become trapped. In addition, a major seiche with large waves could also cause hikers and drivers on embankments to be washed into the water. There are numerous potentially serious hazards involved that must be evaluated. •Damage to project components constructed on the lakebed, particularly earthen structures, may also occur as a consequence of the small earthquakes that occur frequently, and the moderate earthquakes that occur occasionally, in the Salton Basin. Such damage may also be caused by swarms of small-to-moderate earthquakes like those that have happened repeatedly during the past two decades in the Brawley Seismic Zone. Damage to project components could also result from significant subsidence of the lakebed that may occur in some locations, particularly in the southern half of the Salton Sea footprint, as a result of co-seismic and post-seismic deformation along normal faults. Moreover, some faults beneath the lakebed where project components will be constructed may be subject to aseismic creep. All of the foregoing processes could increase the maintenance requirements for, and the risk of failure of, key structures to be built on the lakebed such as impoundment levees and a mid-sea barrier. •In addition to the likelihood of naturally occurring seismicity and other natural fault-related hazards, it should be anticipated that seismicity and subsidence could be induced because of expanding geothermal development and the anticipated initiation of commercial-scale lithium extraction. The SSMP and Army Corps of Engineers should also consider the potential risk of induced seismicity from hydrologic unloading of faults as the Salton Sea shrinks, as well as from possible subsidence because of large-scale sediment compaction as vast areas that were previously submerged beneath the lake become desiccated and the groundwater level drops.	

Name	Organization	Section or Page	Comment	Response
Jenny E. Ross	Stout Research Center	Summary and Conclusions for previous comments	Current state and federal actions—including the development of the 10-Year Plan and the November 28, 2022 multi-party MOU pledging federal monies and federal assistance in implementing the 10-Year Plan—are crucial but are not sufficient to address the ongoing and worsening Salton Sea crisis. The lake's shrinking water supply, rising salinity, and ecological collapse, and the resulting emissions of hazardous dust and greenhouse gases from increasingly vast expanses of exposed lakebed sediments, are extremely serious problems that must be remedied with a feasible, effective, and sustainable long-term restoration plan. The 10- Year Plan, even if fully implemented, will not be adequate to restore crucial habitat necessary for supporting the numbers and variety of wildlife species, including threatened and endangered ones, originally reliant on the Salton Sea ecosystem. The 10-Year Plan will also not be sufficient to prevent serious injury to human health across a large region as the Salton Sea continues to shrivel, and it will not be adequate to avert further economic damage to marginalized communities in the Salton Sea area that are already bearing significant burdens of environmental injustice. If the 10-Year Plan (whatever its final components turn out to be) is the only Salton Sea plan implemented and operated as the deteriorating lake becomes ecologically useless and its increasingly exposed lakebed becomes a toxic dustbowl, both wildlife and people will suffer severe and irreparable harm. It is essential that state and federal agencies devise an appropriate long-term plan for Salton Sea restoration, and that such a plan is implemented as expeditiously as possible in order to avoid worsening consequences. Unfortunately the SSMP's Draft LRP does not constitute such a plan, nor is it an adequate blueprint for developing such a plan. The inherent and serious flaws in the proposed restoration concepts presented in the Draft LRP—most fundamentally, the untenable dependence of the in-basin plans on extremely large quantities of Colorado River wastewater flowing into the central Salton Basin throughout the 21st century— must be subjected to much more rigorous scrutiny than has occurred so far. I suggest that a variety of crucial considerations collectively indicate it is not reasonable to assume proposed in-basin plans will be sustainable over the long term, because the water supply necessary for their operation may not exist. Viewed objectively, many factors point toward the likelihood of future water scarcity within the central Salton Basin: the ongoing impacts of climate change, which will cause worsening aridification across the Colorado River Basin and the Salton Trough in the coming decades; the major reductions in use of Colorado River water that must occur in both the near term and the future, affecting all who rely on the river; likely implementation of commercial-scale lithium extraction in the Salton Basin that will consumptively use large amounts of water; and increasing deployment of water recycling and reuse that will shrink the inflow needed to sustain proposed in-basin plans. It would be grossly irresponsible to spend billions of dollars to construct an in-basin restoration project based on a speculative, and likely unwarranted, assumption that there will be long-term availability of the huge water supply required for operation of such a project.	Thank you for your review of the Draft Long-Range Plan. Comment noted and documented in this appendix to the Final Long-Range Plan. Restoration concepts, including in-basin and water importation concepts, will be considered at the next stage of feasibility analysis.

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			In addition, proposed in-basin long-range plans suffer from other inherent limitations and defects that render them inadvisable, and even potentially dangerous: (a) the unavoidable inclusion in such plans of vast areas of exposed lakebed, which I suggest will be larger than anticipated because water-supply constraints have not been properly accounted for, and which will emit huge amounts of toxic dust and greenhouse gases; (b) the use of sediments and wastewater containing pesticide residues, elevated selenium levels, heavy metals, and other hazardous contaminants to construct and fill impoundments that will be utilized for habitat and recreation—a situation that will pose risks of serious harm to both wildlife and people; and (c) construction of essential in-basin plan components on the lakebed on top of or adjacent to significant active faults that will produce dangerous ground motion and liquefaction in the event of a major earthquake, jeopardizing public safety and threatening destruction of project infrastructure. On the other hand, importation of desalinated ocean water to refill the Salton Sea and reestablish its crucial ecosystem would safeguard both wildlife and people from the foregoing threats, while also decoupling the fate of the Salton Sea ecosystem from an uncertain and shrinking supply of Colorado River water. Pursuant to such a plan, the restored lake would have an enduring source of water independent of the Colorado River that will be immune to the future vagaries of climate change and to increasing aridification across the Colorado River Basin. An ocean water importation plan would also be unaffected by future policy decisions to decrease allocations of Colorado River water, and it would suffer no adverse effects as the result of potential recycling and reuse of the river's water by IID, CVWD, and Mexico, or because of other reasonably foreseeable factors—such as the development of commercial-scale lithium extraction—that will substantially decrease the amount of water flowing into the central Salton Basin. In addition, the use of desalinated ocean water to fully restore the Salton Sea would: reestablish essential habitat to conserve hundreds of species that will otherwise face grave threats to their survival; prevent emission of hazardous dust by permanently covering the lakebed with water; sustain a robustly functioning saltwater ecosystem that is likely to have net-zero or net-negative greenhouse gas emissions; enhance the health and well-being of people throughout the surrounding area rather than dangerously threatening them; and support a vigorous regional economy. Therefore I suggest it is essential for the Army Corps of Engineers not only to fully and carefully scrutinize the appropriateness, viability, and sustainability of the proposed in-basin plans presented in the Draft LRP, but also to conduct a comprehensive, scientifically sound, and objective feasibility-level study of proposals for ocean water importation as a method for achieving effective and sustainable long-term restoration of the Salton Sea and protection of both wildlife and people. There has never been such a study at either the state or the federal level, and it is more important than ever that it be done immediately.	

SALTON SEA MANAGEMENT PROGRAM

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