

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION**

**RESOLUTION R6-2022-0020**

**ADOPTION OF CALIFORNIA ENVIRONMENTAL QUALITY ACT  
NEGATIVE DECLARATION FOR  
GENERAL WASTE DISCHARGE REQUIREMENTS FOR IN-SITU AND EX-SITU  
GROUNDWATER REMEDIATION PROJECTS**

**WHEREAS:**

1. The Lahontan Regional Water Quality Control Board (Lahontan Water Board) proposes to adopt General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation Projects (Groundwater Remediation General Order). The Groundwater Remediation General Order would provide coverage for the discharges of waste associated with groundwater remediation projects including: 1) direct injection of amendments to the vadose zone and groundwater basin; 2) injection of treated groundwater to the groundwater basin; and 3) discharge of treated groundwater to land surfaces including ephemeral drainages (that are not Waters of the United States) and for use as crop irrigation.
2. The Lahontan Water Board is the lead agency for the project in accordance with the California Environmental Quality Act (CEQA).
3. Consistent with Public Resources Code section 21080.3, the Lahontan Water Board consulted with responsible and trustee agencies regarding the project before determining the type of CEQA document to prepare. The list of agencies consulted was developed with assistance from the California Office of Planning and Research.
4. Consistent with Public Resources Code section 21080.3.1, the Lahontan Water Board provided California Native American tribes traditionally and culturally affiliated with the geographic area of the proposed project with an opportunity for consultation in July 2018. The San Manuel Band of Mission Indians requested formal consultation with the Lahontan Water Board in August 2018. Conclusion of tribal consultation was confirmed by the San Manuel Band of Mission Indians in April 2022.
5. The Lahontan Water Board considered the environmental impacts associated with the adoption of the Groundwater Remediation General Order and prepared an Initial Study in accordance with California Code of Regulations, title 14, section 15063. Analysis in the Initial Study and early consultation with responsible and trustee agencies did not identify any significant impacts on the environment.
6. A Notice of Intent to adopt the Negative Declaration and Groundwater Remediation General Order was transmitted electronically to 13 county clerks,

located in the Lahontan Region, including Plumas County; published in four newspapers (the Daily Press, Desert Dispatch, Tahoe Daily Tribune and Lassen County Times); submitted to the State Clearinghouse (SCH #: 2022030276); transmitted to the State Water Resources Control Board Lyris List Serve email distribution list; and emailed to other potentially interested parties. A 30-day public comment period was provided to all responsible agencies and interested parties. No comments were received during the public comment period.

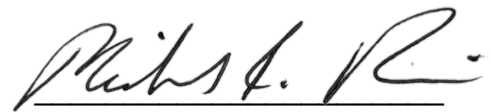
7. The Lahontan Water Board conducted a public meeting on June 8-9, 2022, in Barstow and via video and teleconference (for public commenters) to consider adoption of the Negative Declaration and Groundwater Remediation General Order.
8. The documents and other materials that constitute the record of proceedings on which the Lahontan Water Board findings are based, are available at the Lahontan Water Board office located at 2501 Lake Tahoe Boulevard in South Lake Tahoe.
9. The Lahontan Water Board will file a Notice of Determination for this project with the Governor's Office of Planning and Research within five days after deciding to adopt the Groundwater Remediation General Order in accordance with California Code of Regulations, title 14, section 15075.

THEREFORE, BE IT RESOLVED THAT:

1. The Lahontan Water Board finds that on the basis of the whole record before it, that there is no substantial evidence that the project will have a significant effect on the environment and the attached Negative Declaration reflects the Lahontan Water Board's independent judgment and analysis.
2. The Lahontan Water Board hereby adopts the Negative Declaration for the Groundwater Remediation General Order.

#### **CERTIFICATION**

The Executive Officer hereby does certify that the foregoing is a full, true, and correct copy of the resolution duly and regularly adopted at a meeting of the Lahontan Regional Water Quality Control Board held on June 8, 2022.



MICHAEL R. PLAZIAK, PG  
EXECUTIVE OFFICER

Attachment: Initial Study, Environmental Checklist and Negative Declaration – General Order for In-situ and Ex-situ Groundwater Remediation Projects





# INITIAL STUDY, ENVIRONMENTAL CHECKLIST, & NEGATIVE DECLARATION

**FOR LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD  
GENERAL WASTE DISCHARGE REQUIREMENTS FOR IN-SITU AND EX-SITU  
GROUNDWATER REMEDIATION PROJECTS**

MARCH 2022

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## I. PROJECT DESCRIPTION

Numerous unauthorized releases of man-made organic constituents, inorganic compounds and heavy metals have occurred throughout the Lahontan Region from activities such as landfilling, mining, composting, dry cleaning, wastewater treatment, sewer/septic systems, dairy operations, agriculture, firefighting, retail gasoline/diesel fueling operations, and automobile/aircraft maintenance. Cleanup of polluted sites (remediation) are designed to improve water quality conditions.

The Lahontan Regional Water Quality Control Board (Lahontan Water Board) has the authority to issue waste discharge requirements (WDRs) to restore, protect and enhance water quality resources to ensure public health, environmental quality, and economic vitality throughout the Lahontan region.

Pursuant to Division 7 of the California Water Code (CWC), the Lahontan Water Board is proposing to adopt General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation Projects (General Order) to regulate the discharges of waste associated with remediation activities. The remediation projects eligible for coverage under the proposed General Order include the extraction and treatment of groundwater above ground including the use of amendments (ex-situ remediation), and the discharge of amendments directly to the vadose zone or groundwater basin to remediate groundwater (in-situ remediation). "Amendments" include biological, chemical, and organic compounds that help to advance/mediate degradation of groundwater pollutants.

The General Order does not establish requirements for groundwater cleanup. Final groundwater remediation levels and groundwater monitoring are separately established through the regulatory programs requiring cleanup and may vary on a site-specific basis. Groundwater cleanup levels are established through submittal of a Remedial Action Plan (RAP), required under the General Order, and are approved by the Lahontan Water Board Executive Officer (Executive Officer) as specified in a Notice of Applicability (NOA).

The objective of the General Order is to streamline the permitting process to regulate the discharge of waste, including the use of amendments, in a manner that is protective of beneficial uses identified in the *Water Quality Control Plan for the Lahontan Region (Basin Plan)*. Coverage eligibility under the General Order is at the discretion of the Executive Officer and the Executive Officer may decide that the Lahontan Water Board will issue individual WDRs if the remediation project does not meet the eligibility requirements outlined in the General Order. The Executive Officer is also delegated the authority to revise and update the list of amendments and authorize the use of other

amendments not listed if the materials are proven to meet specific criteria. The amendments must be proven to effectively remediate targeted constituents and be protective of human health and the environment. All remediation activities must be proven to be effective and protective of water quality and the environment.

### **In-situ Remediation of Groundwater Pollution<sup>1</sup>**

In-situ remediation of groundwater pollution at most sites includes the use and application of biological, chemical, and/or physical treatment processes. These processes may include addition of oxygen, chemical oxidation/reduction, and the addition of nutrients, organic carbon and/or bacteria to enhance biodegradation. The method of delivery is generally direct injection to soil or the groundwater basin. The remediation processes can result in exceedances of water quality objectives that are generally limited in duration and/or in a relatively small portion of the aquifer. The General Order allows exceedances of water quality objectives to occur while oxidation/reduction processes are taking place, but only within the defined treatment zone.

Oxidation/reduction reactions take place when an electron is transferred from one compound to another. The electron donor becomes oxidized, and the electron receptor becomes reduced. These are always coupled reactions. If a compound is reduced, another must necessarily be oxidized to provide the electron. Reducing environments are typified by the absence of oxygen and can be referred to as anaerobic environments. Oxidative environments contain oxygen and are also referred to as aerobic environments.

### ***Reducing Environment Processes***

The primary reduction processes that are effective for remediating perchlorate, nitrate, sulfate and volatile organic compounds (VOCs) pollution are anaerobic in nature; aerobic processes are generally not effective on most highly chlorinated VOCs. Aerobic dechlorination or aerobic cometabolism of perchloroethene (PCE) and trichloroethene (TCE) has not been successful at most sites. Therefore, reductive dechlorination of VOCs requires development of anaerobic conditions within the groundwater contaminant plume. PCE can be sequentially reduced to TCE, thence to cis-1,2-dichloroethylene (Cis-1,2-DCE), vinyl chloride and finally to ethane. Along the way the rate of reduction, consortium of bacteria involved in the process, and groundwater conditions may change. Reduction of VOCs may even stall at a stage if the correct conditions and bacteria are not present. Perchlorate reduction appears to occur more

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<sup>1</sup> United States Environmental Protection Agency (US EPA), 2000; Interstate Technology & Regulatory Council (ITRC), 2005; ITRC, 2007; US EPA, 2013

readily than VOCs and stalling at a particular stage in the dechlorination process does not occur.

In order to develop a reducing environment to achieve reduction of chlorinated hydrocarbons and perchlorate, concentrations of oxygen and nitrate need to be significantly depleted. Oxygen and nitrate are more easily reduced than the chlorinated compounds and will utilize the electrons preferentially over the chlorinated compounds. Elevated concentrations of dissolved iron and manganese may also inhibit reduction of the chlorinated hydrocarbons by being electron acceptors. There are three types of anaerobic reduction that may be occurring.

**Direct Anaerobic Reductive Dechlorination.** Direct anaerobic reductive dechlorination is a biological reaction in which bacteria gain energy and grow as one or more chlorine atoms on the chlorinated hydrocarbon molecule are replaced with hydrogen. In this reaction, the chlorinated compound serves as the electron acceptor, and the hydrogen serves directly as the electron donor.

**Cometabolic Anaerobic Reductive Dechlorination.** Cometabolic anaerobic reductive dechlorination is a reaction in which a chlorinated compound is reduced by a non-specific enzyme or cofactor produced during microbial metabolism of another compound (i.e., the primary substrate) in an anaerobic environment. For the cometabolic process to be sustained, sufficient primary substrate is required to support growth of the transforming microorganisms.

**Abiotic Reductive Dechlorination.** Abiotic reductive dechlorination is a chemical degradation reaction, not associated with biological activity in which a chlorinated hydrocarbon is reduced by a reactive compound. Addition of an organic substrate and creation of an anaerobic environment may create reactive compounds, such as metal sulfides, that can degrade chlorinated aromatic hydrocarbons.

Of those three, direct anaerobic reductive dechlorination is the primary process for biological reduction of VOCs. In order to accomplish the complete reduction to ethane, the appropriate species of bacteria must be present. Lacking the complete consortium of bacteria could cause the process to stall at cis-1,2-DCE and vinyl chloride. If this condition occurs, adding bacteria that are known to effectively reduce cis-1,2-DCE and vinyl chloride is an option to correct the problem.

Hydrogen has a lead role as a direct electron donor in the anaerobic dechlorination of chlorinated aromatic hydrocarbons. Hydrogen is generated by fermentation of non-chlorinated organic substrates, including naturally occurring organic carbon, accidental releases of anthropogenic carbon (fuel), or introduced substrates such as carbohydrates (sugars), alcohols, and low-molecular-weight fatty acids (lactates,

acetates, etc.). As hydrogen is produced by fermentative organisms, it is rapidly consumed by other bacteria, including denitrifiers, iron reducers, sulfate-reducers, methanogens, and dechlorinating microorganisms.

For anaerobic reductive dechlorination to occur, dechlorinators must successfully compete against other microorganisms that also utilize hydrogen. Generally, there are not sufficient numbers of bacteria naturally present to conduct an effective anaerobic dehalogenation process. To increase the concentration of bacteria biostimulation is implemented by injecting a carbon source or substrate into the groundwater. For the degradation of chlorinated ethenes, the injected carbon source provides for cell growth and ferments to produce products like hydrogen, providing an electron donor for the reductive dechlorination process. By adding electron donors, methanogenic and/or sulfate-reducing conditions can be achieved at a site, which can be used to dechlorinate cis-1,2-DCE and vinyl chloride. Complete reductive dechlorination to ethene without the accumulation of cis-1,2-DCE and vinyl chloride is most likely to occur under these strongly reducing conditions.

Biostimulation also may include injecting limiting nutrients, such as phosphorus or nitrogen. The advantage of biostimulation is that native populations present in the subsurface are already acclimated to the site, so enhancements such as the addition of nutrients will increase their biodegradation capacity. The disadvantage is that subsurface geology of a site may interfere with the introduction of nutrients, including the formation of preferential flow patterns due to fractures and impermeable lithology affecting the distribution of additives. Important subsurface characteristics to consider for biostimulation include velocity of the groundwater, and hydraulic conductivity of the soil. Pilot studies are usually conducted to provide additional site-specific information before full-scale implementation.

Substrates added to promote reductive dechlorination come in many forms and may be soluble, low viscosity, high viscosity or solid. Soluble substrates, such as sugars, citric acid and lactic acid, may be applied in an aqueous phase offering uniform distribution throughout the aquifer. These dissolved substrates travel with advective groundwater flow and are typically applied continuously or periodically. The soluble substrates are consumed rather quickly and must be frequently replenished.

Substrates that are viscous are less mobile than soluble substrates, but they tend to last longer in the subsurface. Slow-release materials such as vegetable oil or hydrogen-releasing compounds (HRC™) which are intended to be long lasting, may require a single or limited number of injections. The low mobility of viscous substrates may lead to nonuniform distribution and require different application mechanisms to achieve the desired distributions. These substrates are relatively immobile and rely on advective



and dispersive qualities of soluble compounds (lactic acid for the HRC and metabolic acids for the oil) to deliver them throughout the subsurface.

Moderate viscosity fluids such as emulsions of vegetable oil have a relatively high mobility as compared to solid or highly viscous materials that allows more uniform distribution within the aquifer. Emulsified oils slowly release hydrogen through fermentation of fatty acids. Other moderate viscosity substrates that could be used include, chitin, whey and oleate.

### ***Oxidative Environment Processes<sup>2</sup>***

As with reductive processes, oxidation processes can be either chemically or biologically induced. A chemical oxidant removes electrons from constituents in the vicinity of the oxidant and the oxidant becomes reduced. In a biological oxidation process, one compound is the electron donor, and another compound is the electron acceptor. An example of biological oxidation happens with fuel contaminants in groundwater. In an aerobic environment, fuel can provide the carbon and the electrons for microbial metabolism, and the oxidizing agent is oxygen, which is the electron acceptor. In the absence of oxygen, nitrate also serves as an electron acceptor. The fuel becomes degraded as it is oxidized.

Remediation of groundwater pollution, including VOCs, benzene, toluene, ethylbenzene, xylenes, organic pesticides, munitions (i.e., HMX, RDX), petroleum hydrocarbons or methyl-tertiary-butyl ether (MTBE) can potentially be achieved using chemical or biological oxidation processes. This involves injecting oxidants directly into the source and the downgradient plume or delivering oxidants by means of a groundwater recirculation system. The oxidant reacts with the pollutants, producing innocuous substances such as carbon dioxide, water, and chloride. The four main chemical oxidants used are permanganate, peroxide, persulfate, and ozone.

The ability of the oxidant to react with a certain contaminant in the field depends on kinetics, stoichiometry, thermodynamics, and delivery of the oxidant. On a microscale, kinetics or reaction rates are the most important. The rates of oxidation reactions are dependent on many variables, such as, pH, temperature, concentration of the reactants, catalysts, reaction by-products, and impurities (oxidant scavengers, organic matter, etc.) that all must be taken into consideration.

The oxidant needs to be delivered in such a manner that the oxidant comes into the contact with the pollutant to be oxidized. The delivery goal is to ensure that the oxidant is dispersed evenly throughout the groundwater needing to be remediated. The

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<sup>2</sup> US EPA, 2000; ITRC, 2005

solubility and rate of reaction of the oxidant need to be considered when developing the method of delivery of the oxidant.

### **Ex-situ Remediation of Groundwater Pollution<sup>3</sup>**

Ex-situ remediation of polluted groundwater involves the physical extraction of the polluted groundwater and moving it to another location for treatment above ground. The ex-situ remediation technologies eligible for enrollment under the General Order include pump-and-treat methods with discharge of treated groundwater to the same groundwater basin from which it was extracted. Pump-and-treat methods may include, but are not limited to, adsorption, air stripping, bioreactors, filtration, ion-exchange, oxidation, and metals precipitation. Ex-situ remediation of contaminated soils is not covered under the General Order.

Certain ex-situ remedial technologies have a waste stream that includes salts, sulfides, and spent media which requires off-site disposal at an authorized disposal facility.

#### ***Pump-and-Treat***

Groundwater that contains dissolved inorganic and organic chemicals can be physically removed from the groundwater basin so that the polluted water can be treated at the surface to remove the constituents of concern. If there are non-aqueous phase liquids (NAPLs) present in the groundwater basin, the situation is much more complex than if all pollutants are in a dissolved form. As long as an NAPL is present, the NAPL pollutant will partition between the NAPL phase and the dissolved phase. Light aqueous phase liquids (LNAPL) tend to float on the water table and are relatively easy to remove by pumping. However, dense non-aqueous phase liquids (DNAPL) sink to the bottom of the aquifer and are very difficult to locate and remove. As the polluted groundwater is withdrawn from the groundwater basin for treatment, the clean water that recharges the basin eventually becomes polluted with material partitioning from the remaining NAPL. Because considerable amounts of residual NAPL may remain in the groundwater basin even if the mobile LNAPL is removed, several years may be required for a pump-and-treat system to remove all the residual NAPL by partitioning into the dissolved phase, which can be recovered. In the case of contamination by DNAPLs, especially in fractured rock aquifers, it may be impossible to fully remediate a polluted aquifer to background conditions.

If the dissolved phase of a pollutant sorbs (attaches) onto the mineral matter of the soil, the dissolved phase of the pollutant may desorb (release) as the polluted water is flushed from the pores. Many pore volumes of unpolluted groundwater may be needed

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<sup>3</sup> Fetter C. W., 1993; US EPA, et al., 1993; US EPA, 2020

to completely remove the sorbed phase of both organic and inorganic pollutants.

Contaminants that have been in the groundwater basin for a long period of time may diffuse into the less permeable zones (e.g., clays and silts) of porous media aquifers (coarse sand layers with interbedded clays and silts) and into the bedrock matrix of fractured rock aquifers. Pump-and-treat systems are efficient at removing pollutants from the coarse sands and there will be a rapid decline in the concentration of pollutants. Fine grained sediment has a larger surface area per unit volume of the aquifer than the coarse sediment and will sorb more pollution. Polluted water occupying the pores of the fine sand and silt layers will be removed very slowly. If remediation is halted before the sorbed phase is completely removed from the finer grained sands, the dissolved concentration will eventually rise above the level detected at the end of the remedial period as additional contamination desorbs to come to equilibrium with the dissolved phase.

**Adsorption.** Adsorption is a chemical process. Groundwater is pumped through a series of canisters containing activated carbon (or similar media) to which dissolved organic pollutants sorb to the surface of the treatment media and are removed from the groundwater. Activated carbon may be liquid, coal, wood, nut shells or other carbon-rich materials. Periodic replacement or regeneration of the saturated carbon is required. Granulated activated carbon (GAC) can remediate pollutants such as volatile organic compounds, semi-volatile organic compounds, petroleum hydrocarbon fuel, radon and other radioactive materials, and some types of metals.

**Air Stripping.** Air stripping is a physical process. Air is moved through the polluted groundwater in an above ground treatment system. Volatile organics are partitioned from groundwater to a vapor phase by increasing the surface area of the contaminated water exposed to air. Aeration methods include packed towers, diffused aeration, tray aeration, and spray aeration.

**Bioreactors.** Bioreactors utilize a biological process. Contaminants in extracted groundwater are put into contact with microorganisms through attached or suspended biological systems. In suspended systems, such as activated sludge, contaminated groundwater is circulated in an aeration basin where the microbial population aerobically degrades organic matter and produces new cells. In attached systems, such as rotating biological contactors and trickling filters, microorganisms are established on an inert support matrix to aerobically degrade groundwater pollutants.

**Filtration.** Filtration is a physical process. Polluted groundwater is forced through a porous media. The suspended particles in the polluted groundwater are trapped on the surface or within the filter media. Ultrafiltration/nanofiltration occurs when particles in

the polluted groundwater are forced through a semipermeable membrane. Only particles that are smaller than the membrane pass through. Other filtration methods include nanofiltration and reverse osmosis which use similar filtration methods.

**Ion Exchange.** Ion exchange is a physical and chemical process. Ions from the aqueous phase are removed by exchange of cations or anions between the pollutants and the exchange media. Ion exchange materials may consist of resins made from synthetic organic materials that contain ionic functional groups to which exchangeable ions are attached. They may also be inorganic and natural polymeric materials. Resins can be regenerated after the resin capacity has been exhausted.

**Oxidation.** Oxidation can be a physical or chemical process. Ultraviolet radiation, ozone, and/or hydrogen peroxide are used to destroy organic pollutants as water flows into a treatment tank. An ozone destruction unit is used to treat off-gases from the treatment tank.

**Metals Precipitation.** Metal precipitation is a chemical process where soluble heavy metal salts are converted to insoluble salts that will precipitate. The precipitate produced during the process can be removed from the polluted groundwater by physical methods such as filtration. pH adjusters, addition of chemical precipitant and flocculation are used to complete the process. The metals typically precipitate from the solution as hydroxides, sulfides, or carbonates.

## **Remediation Project Category Details**

The remediation activities planned for coverage under the proposed General Order include full-scale and pilot testing in-situ remediation, large-scale ex-situ remediation, and small-scale/pilot testing ex-situ remediation. The proposed General Order establishes the threat to water quality (TTWQ) and complexity ratings (CPLX) for each remediation project type as outlined below. Annual permit fees are assessed based on the TTWQ and CPLX. Details of the Annual Fee Schedule for each TTWQ/CR can be found on the State Water Resources Control Board website.

### ***Full Scale and/or Pilot Test In-Situ Remediation***

In-situ groundwater remediation activities apply the amendments directly to the vadose zone and/or groundwater basin to achieve regulatory compliance with specified cleanup levels. Amendments react chemically or biologically with the pollutants to reduce contaminant mass and concentration. The full list of amendments that are proposed for use are included in Appendix A. In-situ remediation activities have the greatest potential to alter water quality and are subject to a TTWQ Category 2 and CPLX Category A (TTWQ/CPLX 2A).

TTWQ Category 2 discharges are those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance.

CPLX Category A includes any discharge of toxic wastes, any small volume discharge containing toxic waste, any facility having numerous discharge points and groundwater monitoring, or any Class 1 waste management unit.

### ***Large Scale Ex-Situ Remediation***

Large-scale ex-situ groundwater remediation activities extract groundwater for treatment above ground and may use specific amendments included in Appendix A. Ex-situ remediation may include chemical, biological, or physical treatment of targeted contaminants. For example, air stripping removes organic waste without additive amendments. The waste is either reinjected to the groundwater basin or discharged to land when numerical criteria are met. The discharge of treated groundwater from large scale ex-situ remediation projects are defined as having discharges that exceed 10,000 gallons per day. These remediation activities present a moderate threat to water quality and are subject to a TTWQ Category 3 and CPLX Category B (TTWQ/CPLX 3B).

TTWQ Category 3 discharges are those discharges of waste that could degrade water quality without violating water quality objectives or could cause a minor impairment of designated beneficial uses as compared to Category 1 or 2.

CPLX Category B includes any discharge not subject to Category A that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class 2 or Class 3 waste management units.

### ***Small Scale and/or Pilot Test Ex-Situ Remediation***

Small scale ex-situ remediation activities are similar in nature to the large-scale remediation projects except less than 10,000 gallons of waste is discharged per day. These projects that are expected to have no or low threat to water quality, human health and the environment are subject to TTWQ Category 3 and CPLX Category C (TTWQ/CPLX 3C).

TTWQ Category 3 discharges are those discharges that could degrade water quality without violating water quality objectives or could cause a minor impairment of designated beneficial uses as compared with Category 1 and Category 2.

CPLX Category C includes dischargers having no waste treatment systems or that must

comply with best management practices, dischargers having passive treatment and disposal systems, or dischargers having waste storage systems with land disposal.

### **Authorized Remediation Amendments**

The General Order identifies a variety of amendments proposed for potential use during in-situ and ex-situ remediation activities. For purposes of this General Order, "amendments" include biological, chemical, and organic compounds that help to advance/mediate degradation of groundwater pollutants and may be applied directly to the groundwater basin in a defined treatment zone or utilized for treatment of polluted groundwater above ground. The list of proposed amendments authorized for use are included in Appendix A of the General Order. The list of amendments includes chemical oxidants, chemical oxidant activators, aerobic bioremediation enhancement compounds, anaerobic degradation enhancement compounds, reduction degradation enhancement compounds, metals precipitation/stabilization compounds, sorption/biodegradation biomatrices, surfactants/co-solvents, bioaugmentation organisms, tracer study compounds, buffer solutions, pH adjusters, biofouling control agents, and adsorption injectants.

The amendments listed do not represent all chemicals that might be used in remediation. The General Order requires that the proposed amendments to be used for remediation be analyzed to determine the suitability of the materials to remediate the target pollutants and be protective of public health and the environment. Approval for use of the listed amendments, or any other chemical, organic, or biological compound that is not listed in Appendix A may only be used under the proposed General Order with approval by the Executive Officer.

Past analyses of various amendments, including corn syrup, molasses, HRC™, and edible oils have shown elevated concentrations of sodium and other salts, and trace metals in some of them. An applicant that proposes using a salt-containing amendment is required to demonstrate that there is no cost-effective, salt-free amendment that can be utilized to achieve adequate remediation of the pollution before allowing the salt-containing amendment to be used. In addition, amendments containing other pollutants such as metals could contribute to exceedances of water quality objectives and/or degradation of the groundwater. By-products produced by the proposed amendment are required to be reported in the RAP.

### **Treatment Zone**

The "treatment zone" means a three-dimensional area being targeted to receive authorized amendments to achieve water quality objectives and protect beneficial uses. Within the treatment zone, a spatial zone of impact exists in which water quality and

beneficial uses are temporarily degraded. The treatment zone must be defined in a RAP required to apply for coverage under the General Order. Degradation of water quality outside the defined treatment zone is prohibited.

The treatment zone is the area where proposed oxidation/reduction processes would take place. During oxidation, several changes in water quality parameters can occur. The oxidation process can cause trivalent chromium present in formation materials and dissolved in the aquifer to be converted to hexavalent chromium, a much more toxic form of chromium. In addition, chlorides will be liberated if the pollutants being oxidized are chlorinated compounds. Increases in salts can occur if the oxidant being used has a salt component such as sodium or potassium.

Reduction processes have similar concerns with chlorides and salts. Reducing conditions will remove dissolved oxygen from the water and can liberate excess concentrations of dissolved iron and manganese from formation materials, and generate methane, causing secondary water quality problems. These WDRs recognize that water quality objectives for some parameters may be exceeded within the treatment zone. However, water quality objectives are not allowed to be exceeded outside of the treatment zone. Monitoring wells must be established downgradient of the treatment zone for use as compliance wells. The monitoring wells will be used to measure compliance with water quality objectives and groundwater limitations.

The size of the treatment zone should be made as small as feasible, but in most cases will be driven by the plume configuration and design of the treatment system. The treatment zone could include a transition zone where ambient groundwater mixes with the treatment zone, reestablishing ambient oxidative conditions. In contact with the oxygen of ambient groundwater, the elevated concentrations of ferrous iron and dissolved manganese are oxidized, removing them from solution. Methane concentrations return to ambient concentrations much more slowly and travel further than other reduced species. Therefore, the formation of methane should be avoided to the extent practicable by minimizing the degree of reducing conditions generated by the project. It is not appropriate to significantly increase the size of the treatment zone to simply allow for methane concentrations to reduce back to ambient levels.

### **Authorized Disposal Methods of Treated Groundwater**

Treated groundwater from ex-situ remediation activities, that meets cleanup goals may be disposed to the same groundwater basin from which it was withdrawn by means of subsurface infiltration, re-injection directly to the groundwater basin, surface infiltration, percolation trenches or basins, evaporation ponds, land spreading, spray disposal, irrigation, and discharged to ephemeral drainages. Ephemeral drainages are known to

be areas that maximize groundwater recharge in arid environments and therefore this is an allowable method for disposal of treated groundwater. Prior to authorization of discharge to an ephemeral drainage by the Executive Officer, the Discharger is required to provide evidence of consultation with the US Army Corp of Engineers to determine that the ephemeral drainage is not a water of the US and will not require a Federal Clean Water Act section 404 permit. The discharge of treated groundwater to perennial waters, wetlands and waters of the US are prohibited under the General Order.

In-situ groundwater remediation activities treat groundwater directly in the subsurface, therefore; disposal of treated groundwater will not occur.

### **Waste Discharge Requirements**

The proposed General Order regulates discharges of waste, as defined in the CWC section 13050(g), from remediation projects at polluted sites affected by man-made organic constituents, heavy metals, and inorganics. The in-situ and ex-situ remediation projects covered under the General Order are authorized to utilize amendments within a defined treatment zone to eliminate pollutants from groundwater.

The WDRs included in the General Order outline the requirements for injection of amendments, injection of treated groundwater, discharge of treated groundwater, disposal of investigation derived waste (including soil and groundwater) and receiving water limitations. All WDRs are designed to be protective of beneficial uses and water quality objectives of the receiving waters and the environment.

Injection and disposal of treated groundwater is limited to the same groundwater basin undergoing remediation. The discharges must not alter the hydrogeologic and geochemical characteristics of the basin outside the treatment zone. The injection of amendments, injection of treated groundwater, and disposal of treated groundwater must not increase the lateral or vertical extent of pollution or create a condition of pollution outside the treatment zone. The discharges must not exceed water quality objectives, both narrative and numeric, outside the defined treatment zone unless background concentrations of naturally occurring inorganic constituents and heavy metals are above the Basin Plan water quality objectives. Disposal of treated groundwater must be in a manner that controls runoff, does not cause erosion, scouring or flooding, and prevents offsite sediment deposition.

Dischargers must ensure the assimilative capacity of the groundwater basin is not unduly exhausted by the discharge and the discharge must be in compliance with any salt and nutrient management plan adopted for the groundwater basin. "Assimilative capacity" of a surface water or a groundwater is the ability of the water body to receive and accommodate natural and anthropogenic sources of pollutants (from point and



nonpoint sources), while maintaining water quality standards that are protective of beneficial uses of the water resource. Factors that affect the assimilative capacity of a groundwater basin depend on the pollutant, soil type, the groundwater chemistry, and hydraulic parameters.

The investigation derived waste, including soil and groundwater, must be containerized, properly labeled, characterized, removed from the site within 90 days of waste generation, and disposed of at an authorized disposal facility.

### **Monitoring and Reporting Program**

Pursuant to CWC section 13267, each enrollee is required to establish an MRP that includes the basic MRP requirements outlined under the Provisions of the Monitoring and Reporting Program and the specific requirements for each remediation type outlined in Attachment B of the proposed General Order and must be submitted as part of the RAP. The requirements are developed to monitor progress toward remedial objectives (cleanup goals) and includes post-treatment and closure monitoring requirements for both in-situ and ex-situ remediation. The specific MRP requirements outlined in the General Order address monitoring parameters for in-situ bioremediation, in-situ chemical oxidation, and ex-situ pump-and-treat remedial alternatives. The MRP will be approved and then issued with the NOA by the Executive Officer providing coverage under the General Order.

The technical reports required under the General Order that involve planning, investigation, evaluation, design, or other work requiring interpretation or application of engineering or geologic sciences, must be prepared by, or under the direction of, persons qualified to conduct this work and registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835 and 7835.1. To demonstrate compliance with CCR, title 16, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) such that all work can be clearly attributed to the professional(s) responsible for the work.

The Executive Officer is delegated the authority to amend the MRP that is required under the General Order.

### **Waste Discharge Prohibitions**

The prohibitions included in the General Order are designed to be protective of public health, water resources, aquatic life, and wildlife. Dischargers enrolled under the General Order are prohibited to cause degradation of the groundwater basin or violate

the Basin Plan water quality standards outside the defined treatment zone, cause long-term loss of assimilative capacity of the groundwater basin, cause a condition of pollution or nuisance, and to discharge waste classified as 'hazardous' under Section 2521, Chapter 15 of Title 23 or 'designated', as defined in CWC section 13173. The discharge of waste to ephemeral drainages that are perennial, discharge to wetlands and discharge to waters of the US are prohibited. Treated groundwater and amendments discharged to all authorized sites must not contain trace elements, pollutants or contaminants, or combinations thereof in concentrations that are toxic or harmful to humans or to aquatic or terrestrial plant or animal life.

The disposal of waste to property that is not an authorized part of the remediation project, disposal of treated groundwater in a manner that causes erosion, disposal of treated groundwater with concentrations of constituents of concern above cleanup goals, and overflows from the disposal system is prohibited.

For full details regarding the prohibitions of the General Order, see section V of the General Order.

### **Provisions of the General Order**

Applicants are required to submit a Notice of Intent (NOI) and RAP for approval by the Lahontan Water Board Executive Officer to determine if the project is eligible for enrollment under the General Order. The Executive Officer has the discretion to issue an NOA for enrollees whose projects meet the eligibility provisions of the General Order or to require individual WDRs for regulatory coverage on a site-by-site basis. Therefore, the Lahontan Water Board cannot speculate on how many activities may be enrolled in, constructed, or expanded as a result of the General Order, and is not required to determine the location or design of any facilities that may be constructed.

The Lahontan Water Board is authorized to initiate enforcement against the Discharger should the discharge of waste be in a manner which creates, or threatens to create conditions of pollution, contamination, or nuisance, as defined in CWC section 13050.

The Discharger must comply with all conditions of the General Order and MRP. Any noncompliance with the General Order or MRP constitutes a violation of the CWC and is grounds for: 1) enforcement action; 2) termination, revocation and reissuance, or modification of the General Order; or 3) denial of the ROWD in application for new or revised WDRs.

The Discharger must obtain all other applicable local, state, and federal permits to construct and operate remediation systems and facilities necessary for compliance with this General Order and allow Lahontan Water Board staff to enter and inspect the

facility.

The Discharger must take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the General Order, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the noncompliance.

Changes in discharge requires submittal of a revised NOI and RAP and payment of the annual fee. Changes in ownership requires a written notice and a copy of the written agreement be submitted to the Lahontan Water Board 30 days in advance of the change.

Waste discharges must conform to the CWC, the Basin Plan, and other applicable policies of the State Water Board and other regulatory agencies as applicable.

### **Lead Agency**

Under CEQA, the lead agency is the public agency with primary responsibility over the proposed project. The Lahontan Water Board is the lead agency under CEQA for this project.

### **Purpose of the Initial Study**

The purpose of this Initial Study (IS) is to evaluate the foreseeable potential environmental impacts that may occur as a result of groundwater remediation activities and adoption of the General Order. The IS has been prepared in accordance with Public Resources Code section 21000 (et seq.) and California Code of Regulations (CCR), title 14, section 15000 (et seq.). In accordance with the CEQA Guidelines, section 15064(a), an environmental impact report (EIR) must be prepared if there is substantial evidence (including the results of an IS) that a project may have a significant effect on the environment. A negative declaration or mitigated negative declaration may be prepared if the lead agency determines that the project would have no potentially significant impacts or that revisions made to the project mitigate the potentially significant impacts to a less than significant level.

### **Environmental Factors Potentially Affected**

None of the environmental factors listed on the attached environmental checklist, section III, would have a Potentially Significant Impact to the environment.

### **Determination**

Based on the evaluation of the environmental factors potentially affected, the Lahontan

Water Board finds the proposed project will not have a significant effect on the environment and a draft NEGATIVE DECLARATION will be prepared for this project pursuant to the provisions of CEQA.

### **Public Review and Comment**

As a discretionary action, issuance of the proposed General Order fits the CEQA definition of a project (Public Resources Code §21065 [c]). The Lahontan Water Board, as the project's lead agency, has consulted with state responsible and trustee agencies before deciding whether a project's impacts are significant (Public Resources Code §21080.3; CCR, Title 14, §15063) and prior to determining what type of CEQA document to prepare. The list of agencies consulted was developed with assistance from the California Office of Planning and Research.

This IS/ND will be available for a 30-day public review and comment period as described in the Notice of Intent to adopt a Negative Declaration and General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation Projects. Written comments must be received during the comment period to be considered. If you have any questions about document availability or the public review and comment process, please contact Kerri O'Keefe at (530) 542-5473 or, [kerri.okeefe@waterboards.ca.gov](mailto:kerri.okeefe@waterboards.ca.gov).

## **II. PROJECT SETTING AND LOCATION**

The General Order is proposed to be applicable throughout the Lahontan Region. The Region is approximately 570 miles long with a total area of 39,210 square miles and is separated into north and south basins. The north basin extends from the Oregon border southward to Conway summit (just north of Mono Lake) and is generally bounded to the west by the Sierra Nevada mountains and the east by the Nevada state line. The south basin extends from Conway summit southward to the San Gabriel and San Bernardino Mountains and is generally bounded to the west by portions of the Sierra Nevada and Tehachapi Mountains, to the south by portions of the San Gabriel and San Bernardino Mountains, and to the east by the Nevada state line (Figure 1).

### **Regulatory Setting**

The Lahontan Water Board is one of nine Regional Water Quality Control Boards in California that operates under the authority of the State Water Resources Control Board (State Water Board). The State Water Board, together with the Department of Toxic Substance Control (DTSC), California Air Resources Board (CARB), Department of Resources Recycling and Recovery (CalRecycle), Office of Environmental Health Hazard Assessment (OEHHA), and Department of Pesticide Regulation (DPR), operate

as regulatory agencies of the California Environmental Protection Agency (CalEPA). The departments of CalEPA are responsible for the restoration, protection, and enhancement of the environment to ensure public health, environmental quality, and economic vitality. Many of the projects eligible for coverage under the General Order may be jointly regulated by such CalEPA departments and other state agencies.

The Lahontan Water Board specifically is responsible for the preservation, enhancement, restoration, and protection of water resources for beneficial uses. Various federal and state laws provide the Lahontan Water Board the authority to regulate waste discharges that have the potential to cause adverse impacts to water quality and beneficial uses.

These laws include the federal Water Pollution Control Act (Clean Water Act), Safe Drinking Water Act, and the Porter-Cologne Water Quality Control Act (CWC, Division 7).

### ***Federal Water Pollution Control Act (Clean Water Act)***

The federal Clean Water Act (CWA) was enacted to restore and maintain the chemical, physical, and biological integrity of waters of the United States (waters of the US) through the elimination of discharges of pollutants to surface water bodies. Under section 401 of the CWA, the Lahontan Water Board regulates discharges of dredge and fill material to waters of the State. Water of State is defined as any surface water or groundwater including saline waters, within the boundaries of the state. Waters of the state includes all waters of the US.

### ***Federal Safe Drinking Water Act***

The Safe Drinking Water Act (SDWA) is a federal law that provides protection of public water systems. The US Environmental Protection Agency (US EPA) sets national standards for drinking water to protect against health risks. In title 40, part 131.4, Code of Federal Regulations, and pursuant to section 510 of the CWA, the states are provided the authority to develop drinking water standards more stringent than the US EPA.

In response to the SDWA, the State of California adopted the Human Right to Water (AB 685), which establishes that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes (CWC, Division 1, section 106.3). The Office of Environmental Health Hazard Assessment (OEHHA), a partner agency within CalEPA, is responsible for performing major risk assessments and hazard evaluations on chemical contaminants in drinking water. These activities include developing Public Health Goals (PHG) for

chemical substances in drinking water to identify the concentration of chemical contaminant in drinking water that does not pose a significant risk to human health.

Pursuant to the California Health and Safety Code §116365, the State Water Board adopts Primary Drinking Water Standards (Maximum Contaminant Levels [MCLs]) based on the PHGs established by the OEHHA. For waters designated with a Municipal (MUN) beneficial use, the Basin Plan (a regulation) establishes both primary and secondary MCLs as numerical water quality objectives in receiving surface waters and groundwater to protect their beneficial use of municipal and domestic supply.

***Porter-Cologne Water Quality Control Act (California Water Code, Division 7)<sup>4</sup>***

Article 3 of the CWC requires the nine Regional Water Boards to formulate and adopt water quality control plans for all areas within each region. The Lahontan Water Board adopted the Basin Plan in 1995, with subsequent amendments. The Basin Plan establishes beneficial uses and water quality objectives for surface water and groundwater and an implementation program for achieving the water quality objectives. The water quality standards are reviewed every three years.

Section 13260 of the CWC requires persons proposing to discharge potentially harmful constituents to waters of the State, to file a Report of Waste Discharge (ROWD) with the Lahontan Water Board. The ROWD must characterize the waste, indicate the method of discharge, and propose procedures to remain compliant with water quality objectives.

To obtain coverage under the General Order, a complete ROWD must be submitted to the Lahontan Water Board, pursuant to CWC section 13260(a)(1). A complete ROWD includes a complete NOI, a RAP, and the initial annual fee based upon the project type's TTWQ/CPLX. The NOI and required RAP information is provided in Attachment B of the General Order. The discharge of waste must not commence until an NOA from the Executive Officer that includes a site-specific monitoring and reporting program (MRP) and cleanup levels for the remediation project has been issued to the applicant.

CWC section 13263(i) authorizes the Lahontan Water Board to prescribe general WDRs for a category of discharges if the Lahontan Water Board determines the following criteria are met:

1. The discharges are produced by the same or similar operations.
2. The discharges involve the same or similar types of waste.
3. The discharges require the same or similar treatment standards.
4. The discharges are more appropriately regulated under general discharge

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<sup>4</sup> Lahontan Regional Water Quality Control Board, 1995, rev 2016.

requirements than individual discharge requirements.

CWC section 13267 authorizes the Lahontan Water Board to investigate the quality of the waters of the State by requiring anyone who proposes to discharge waste within the region to furnish technical monitoring reports. The unique MRP required for every enrollee under the General Order is established pursuant this criterion.

CWC section 13304 requires responsible parties in violation of any WDR or other order or prohibition issued by a Water Board, or who have caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be discharged into waters of the state and creates, or threatens to create, a condition of pollution or nuisance, upon order of the regional board, to clean up the waste or abate the effects of the waste.

Because the General Order only establishes requirements for waste discharge and does not establish requirements for groundwater remediation, nor establish groundwater cleanup levels, it does not address other cleanup requirements that may apply such as the State Water Board Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*.

### ***State Water Resources Control Board Resolution 68-16***

In October 1968, the State Water Resources Control Board adopted Resolution 68-16 (State Antidegradation Policy) which incorporates the federal antidegradation policy. Under the State Antidegradation Policy, whenever the existing quality of water is better than that needed to protect all existing and probable future beneficial uses, the existing high quality shall be maintained until or unless it has been demonstrated to the State that any change in water quality will be consistent with the maximum benefit of the people of the State and will not unreasonably affect present and probable future beneficial uses of such water. Any activity which proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

### **Geologic Environmental Setting<sup>5</sup>**

The Lahontan Region is a geologically complex portion of California. The land encompassed by the Lahontan Water Board boundaries has experienced all four types

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<sup>5</sup> Harden, 2004; Norris and Webb, 1990;

of plate boundaries beginning approximately 700 million years ago (Passive, Japanese, Andean, and Transform). The different types of plate boundaries created the rocks, minerals, mountains, soil and lakes that we see today.

California has eleven different geomorphic provinces that were deposited and shaped by the four geologic processes. The geomorphic provinces included in the Lahontan Water Board jurisdictional boundaries include the Basin and Range, Cascade Range, Modoc Plateau, Mojave Desert, Sierra Nevada, and Transverse Ranges (Figure 2). The geomorphic provinces are each defined by topography and structure and contain significantly different rock formations, unique geologic features, hydrology, mineral resources, and soils.

### ***Basin and Range Geomorphic Province***

The Basin and Range province is the largest province within the Lahontan region and is found in the counties of eastern Modoc, northeastern and southern Lassen, eastern Mono, Inyo, northeastern Kern, and northern San Bernardino. It is the western most portion of the Great Basin, a much larger physiographic feature covering the greater portion of Nevada and smaller portions of Oregon, Idaho, Wyoming, and Utah. The northernmost portion of the province within the Lahontan region, encompasses the Surprise Valley area and further south, the Honey Lake area. The largest portion of the province encompasses the area east of the Sierra Nevada, mostly in Inyo County.

The major mountain ranges in the northern province include the Warner Mountains. The major mountain ranges in the southern province include the Argus Range, Black Mountains, Cottonwood Range, El Paso Mountains, Funeral Mountains, Grapevine Range, Inyo Mountains, Last Chance Range, Panamint Range, Slate Range, and the White Mountains. The major valleys include the Owens Valley, Panamint Valley, and Death Valley. The Basin and Range is most noted for the northwest trending mountain ranges, due to extensional faulting, with peaks up to approximately 14,500 feet above mean sea level (amsl), and valleys as low as 282 feet below mean sea level (bmsl). The major valleys are bounded by active normal faults.

### ***Cascade Range Geomorphic Province***

The portion of the Cascade Range geomorphic province within the jurisdiction of the Lahontan Water Board is in a small portion of southwestern corner of Lassen County. The major mountains of this province within the Lahontan Region boundaries include Campbell Mountain, Crater Lake Mountain, Little Harvey Mountain and Logan Mountain. The major valleys include Harvey Valley, Pine Creek Valley, and portions of Clover Valley. Major Lakes in the region include Feather Lake, Hog Flat Reservoir, Long Lake, McCoy Flat Reservoir, and Silver Lake. Major rivers and streams include Pine Creek



and the Susan River. The portion of the Cascade Range geomorphic province within the Lahontan Region is characterized by low undulating hills with elevations averaging 4,000 feet amsl to 7,000 feet amsl.

### ***Modoc Plateau Geomorphic Province***

The portion of the Modoc Plateau geomorphic province within the Lahontan Water Board's jurisdiction is found in central Lassen County, border by the Basin and Range geomorphic province to the north and the south, and the Cascade Range geomorphic province to the west.

The Modoc Plateau is an undulating plateau averaging 4,000 feet amsl to 5,000 feet amsl. Major mountains include Horse Lake Mountain, Shaffer Mountain, and the Skedaddle Mountains. Major lakes include Eagle Lake and Horse Lake. Major valleys include Grasshopper Valley and the Madeline Plains.

### ***Mojave Desert Geomorphic Province***

The Mojave Desert geomorphic province encompasses the southernmost portion of the region and is located in the counties of eastern Kern, north eastern Los Angeles, and northern San Bernardino. The major mountain ranges include the Clark Mountains, Providence Mountains, Rodman Mountains, Ord Mountains, Soda Mountains, Rand Mountains, and Avawatz Mountains. Major valleys include Antelope Valley, Ivanpah Valley, and Mojave Valley. The valley bottoms range in elevation from 2,000 feet amsl to 4,000 feet amsl and mountains range between 3,500 feet amsl and 8,000 feet amsl, with the highest elevation found at Clark Mountain at 7,929 feet amsl. Drainage is to the interior. The Amargosa flows from Nevada to California, terminating in Death Valley.

### ***Sierra Nevada Geomorphic Province***

The Sierra Nevada geomorphic province is a northwest trending mountain range 400 miles long and up to 100 miles wide in some areas. The province encompasses the westernmost boundary of the region from eastern Kern County to southern Lassen County. Elevations in the province range from 400 feet amsl to 14,496 feet amsl at Mount Whitney, the highest point in California and the conterminous United States (US).

The Sierra Nevada mountains are largely composed of granitic rocks underlying deep marine and volcanic sediments. The overlying rocks were metamorphosed, which gave rise to the iconic mother lode gold belt, and these roof pendant rocks, combined with the Sierran granitics are the source of most sediments found in the Lahontan region.

### ***Transverse Ranges Geomorphic Province***

The Transverse Ranges geomorphic province is in the southern portion of the region. It extends along the western most portion of the region from northeastern Kern County to southwestern San Bernardino County. The province is a long narrow east-west trending series of mountain ranges. The province's major mountain ranges within the Lahontan region include portions of the San Bernardino and San Gabriel mountains. These two mountain ranges lie along the San Andreas fault.

Major creeks and rivers include Deep Creek, Holcomb Creek, Grass Valley Creek, West Fork Mojave River and East Fork Mojave River; tributaries to the Mojave River, a water of the US located in the Mojave Desert geomorphic province. In the Antelope Valley, major drainage courses are Little Rock Wash, Big Rock Wash, Amargosa Creek, Cottonwood Creek, and Oak Creek. Cache Creek is the major drainage for the Fremont Valley.

### ***Metallic Mineral Resources***

The following metallic mineral resources are found within Lahontan Water Board boundaries.

***Copper.*** Minor copper deposits can be found in Alpine County and are recovered from the Pine Creek tungsten mine near Bishop in Inyo County.

***Gold and Silver.*** Minor amounts of silver have been found in Alpine County. Briggs Mine in Panamint Valley of Inyo County uses a cyanide leaching process to separate gold (primary commodity) and silver (secondary commodity) from ore that was mined until around 2015 and placed on a leach pad. Gold and silver ore is also recovered as a by-product of tungsten mining at the Pine Creek Tungsten Mine in Inyo County. Recoverable amounts of silver have been found in Randsburg in Kern County. The Blue Eagle Lode Mine in Kern County is an active gold mine that is extracting gold from the bottom of the existing open-pit and processed offsite. Gold and silver deposits were mined between 1909 and 1934 at the High Grade Mine in the Warner Range of Modoc County.

***Mercury.*** Minor amounts of mercury have been recovered north of Monitor (Loope) in Alpine County where cinnabar is in silicified breccia in andesite.

***Rare-earth Metals.*** Rare-earth minerals were discovered near Mountain Pass in northeastern San Bernardino County in April 1949. Open pit mining and exploration was conducted between the 1950's until approximately 1965. Rare-earth minerals were discovered near Mountain Pass in northeastern San Bernardino County in April 1949,

and the following year the Sulphide Queen carbonate body was found. This body is the worlds greatest known concentration of rare-earth metals with a tonnage larger than the total of all rare earths used in the world prior to 1950. The rare-earths in the Mountain Pass district are chiefly cerium, lanthanum, and neodymium. These elements occur principally in bastnaesite, a rare-earth fluorocarbonate which is found in very few localities throughout the world.

**Uranium.** Autunite and other secondary uranium minerals have been found northeast of Hallelujah Junction in Lassen County. The uranium minerals were found in lake beds that overlap granitic basement rock and are concentrated in and near woody and leafy organic material that is scattered in the lakebed.

**Tungsten.** Minor amounts of tungsten have been found in Alpine County, but Pine Creek Tungsten Mine located in Inyo County has yielded over 1.5 million units of tungsten trioxide.

### ***Nonmetallic Mineral Resources***

The following nonmetallic mineral resources are found within the Lahontan Water Board boundaries.

**Coal.** Thin seams of low-grade coal, and many weathered out fragments, occur in lake beds and volcanic sedimentary rocks of Modoc County, but not in commercial quality of quantity.

**Diatomite.** Diatomite is a sedimentary rock composed of fossilized skeletal remains of single cell aquatic algae known as “diatoms.” It is a unique form of silica that is crushed and used as a filter aid, absorbent, a filler in a variety of products including paints, an insulation material, a mild abrasive in polishes, and an additive in cement and other various compounds. Diatomite occurs in lakebed deposits in portions of Lassen County. The deposits are from a few feet thick to several hundred feet thick and relatively pure and potentially useful.

**Hot Springs (Geothermal).** A large number of hot springs are found throughout the region, related to the recency of volcanic eruptive activity and the abundance of faulting. Hot springs can be found in the northern and southern portion of the region. Geothermal power sources were explored in the Surprise Valley of Modoc County, but no development resulted. However, electrical energy is produced at the Coso geothermal area in Inyo County. In Coso, two separate hydrothermal circulation systems exist: 1) a deep geothermal reservoir; and 2) a shallow system where manifestations of the shallow geothermal reservoir exist in the form of fumaroles and hot springs.

**Perlite.** Perlite is a volcanic glass with high water content that expands when heated. It is used in building construction products, as a filler, as a horticulture aggregate, filter aid, and in cosmetics. Deposits of perlite, north of Honey Lake in Lassen County, were prospected and tested for lightweight aggregate in the late 1940s but no production has resulted.

**Pumice.** Pumice deposits can be found in Lassen County, north of Hallelujah Junction, but most of the production comes from areas outside the region.

**Salt.** At Koehn Lake in Kern County nearly pure salt is harvested directly. Brine pumped by windmills from shallow wells and ponds in lake sediments east of Middle Surprise Lake in Modoc County once yielded a small tonnage of crude salt by solar evaporation. The salt was used locally for stock feed in the early 1900's but processing the brine has been inactive in that area since 1925 and the reserve is almost completely gone. Since 1904, five plants have been constructed at Owens Lake for the manufacture of soda ash or sesquicarbonate and one plant the manufacture of caustic soda, but production of caustic soda was unsuccessful. All operations, with the exception of the US Borax plant north of Cartago, have ceased. More than 1,000,000 tons of alkali and about 30,000 tons of borax were produced during the operations of all the plants. Salt and associated gypsum occur in the northern foothills of the Avawatz Mountains in San Bernardino County. Borate minerals are mined in Kern County at the Boron Mine. The borate deposits are present in the form of tincal, kernite or rasorite, colemanite and ulexite. Production of borax at the Boron Mine is ongoing. Searles Valley Minerals in Trona processes brine solutions from Searles Lake to produce boric acid, sodium carbonate, sodium sulfate, several specialty forms of borax, and salts.

**Sand and Gravel.** The principal sources of sand and gravel are local stream alluvium in various areas including Surprise Valley in Modoc County, and Honey Lake Valley and in the Madeline Plains of Lassen County and is used in Portland cement concrete for road construction, curbs, gutters, bridges, etc. Large reserves of recent and Tertiary gravels are mined near Lake Tahoe.

**Stone, Crushed.** Decomposed granitic rock is quarried for road and fill purposes in Honey Lake Valley of Lassen County.

**Stone, Dimension.** In the 1800's and early 1900's, small tonnages of Tertiary tuffs and tuff breccias near Susanville in Lassen County were quarried for local use in a few public and commercial buildings. The quarry has not been active for several decades.

**Sulfur.** Recoverable amounts of sulfur have been recovered from the Leviathan Mine, an inactive open-pit sulfur mine in Alpine County.

**Volcanic Cinders.** Volcanic cinder quarry is located north of Eagle Lake in Lassen County. The main tonnage of volcanic cinders has been used for railroad ballast, road material fill, asphaltic concrete aggregate, and building blocks.

### ***Zoned Active Faults with Recent Surface Rupture***<sup>6</sup>

California has been tectonically active since the Precambrian period, when the formation of California began, and tectonics continue to play a major role in the formation of the state. The Lahontan region has twenty-nine active faults zoned by the Alquist-Priolo Earthquake Fault Zoning Act (Act). Areas zoned by the Act are susceptible to surface rupture and ineligible for human habitation within fifty feet from the mapped fault trace. The following faults in the Lahontan region are areas zoned by the Act and have experienced surface rupture within the last two hundred years:

**Fort Sage Mountains Fault Zone.** The Fort Sage Mountains fault zone is a normal fault within the Walker Lane deformation belt located along the northwestern portion of the Fort Sage mountains in Lassen County. It is approximately 10.5 miles long with a slip rate of less than 0.2 millimeters per year (mm/yr). The most recent earthquake was a 5.6-magnitude in 1950.

**Garlock Fault Zone.** The Garlock fault zone is a 160-mile-long left-lateral fault zone running northeast-southwest along the northern Mojave Desert and the southern base of the Tehachapi mountains in Kern County. The Garlock fault is composed of three segments: The Central Garlock segment, the Eastern Garlock segment, and the Western Garlock segment. The Central Garlock segment is approximately 67 miles long with a slip rate that is greater than 5.0 mm/yr. The Eastern Garlock segment is approximately 37 miles long with a slip rate between 1.0 and 5.0 mm/yr. The Western Garlock segment is approximately 68 miles long with a slip rate greater than 5.0 mm/yr. In 1992, a 5.7-magnitude earthquake occurred, triggered by the Landers earthquake, and ongoing aseismic creep is noticeable along the Western Garlock segment.

**Hilton Creek Fault.** The Hilton Creek fault is a normal fault within the Sierra Nevada frontal fault zone located along the eastern side of the Sierra Nevada in Mono County. It is approximately 19 miles long with a slip rate between 1.0 and 5.0 mm/yr. The most recent earthquake includes a swarm of four (4) 6.0-magnitude earthquakes in 1980.

**Little Lake Fault Zone.** The Little Lake fault zone is a very active right-lateral fault zone within the Indian Wells Valley located north of Ridgecrest in Kern County. It is

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<sup>6</sup> California Department of Conservation, 2020; Southern CA Earthquake Data Center, 2013; USGS Quaternary Fault and Fold Database, 2020.

approximately 28 miles long with a slip rate between 1.0 and 5.0 mm/yr. The most recent earthquakes include two (2) large earthquakes, a 6.4-magnitude earthquake on July 4, 2019 and 7.1-magnitude on July 5, 2019. Rupture of the fault on July 5, 2019 identified a 30-mile segment that was previously unknown.

***Manix Fault.*** The Manix fault is another left-lateral fault approximately 22 miles long in the central Mojave Desert in San Bernardino County, east of Barstow. The slip rate is estimated to be 0.1 mm/yr. In 1947, the fault slipped leaving a small but notable surface rupture. This marked the first historic example of surface rupture along a fault in the Mojave Block.

***Owens Valley Fault Zone.*** Located along the eastern side of the Sierra Nevada, the Owens Valley fault zone is composed of a right-lateral fault segment approximately 73 miles long, and a normal fault segment approximately 13 miles long. The slip rate is between 1.0 and 5.0 mm/yr for both segments. In 1872, a 7.6-magnitude earthquake occurred along the right-lateral segment that caused 62 miles of surface rupture.

***Pisgah-Bullion Fault Zone.*** The Pisgah-Bullion fault is a right lateral fault approximately 90 miles long and is separated into four segments: the Bullion section, the East Bullion section, the Pisgah section, and the West Bullion section. The segment of the Pisgah-Bullion fault within the Lahontan region is the Pisgah section. This section of the fault is 20 miles long with a slip rate of between 0.2 mm and 1.0 mm/yr. The Landers earthquake in 1992 triggered slip along the Pisgah-Bullion fault.

***San Andreas Fault Zone.*** The San Andreas fault zone is a right-lateral fault zone approximately 756 miles long. The segment of the San Andreas fault within the Lahontan region is known as the Mojave section and runs through San Bernardino and Los Angeles Counties. The slip rate along this section is greater than 5.0 mm/yr. The most recent significant earthquake along this section was the 1857 Fort Tejon earthquake near Wrightwood. This earthquake was one of the largest earthquakes ever recorded in the U.S., with a surface rupture over 225 miles. The average slip was 15 feet with a maximum displacement of 30 feet in the Carrizo Plain area (outside the Lahontan region). Recent seismological studies of this earthquake indicate a low angle thrust fault may have slipped simultaneously suggesting future movements along the San Andreas may produce catastrophic “double earthquakes”.

## **Hydrologic Environmental Setting<sup>7</sup>**

The Lahontan Region includes over 700 lakes, 3,170 miles of streams, and 19,710 square miles of groundwater basins. Consumptive municipal and agricultural use of

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<sup>7</sup> California Department of Water Resources, 2003; State Water Resources Control Board, 2020.

water is relatively low in most parts of the Lahontan Region compared to other parts of California, due to the lower resident population compared to the rest of the state and the agricultural emphasis on range livestock grazing rather than for row crops and orchards. The dominant water use was historically agricultural pumping. However, increase in urbanization throughout the region has increased the domestic use of groundwater supplies making it the current dominant use of groundwater in the Lahontan Region. Large volumes of water are exported for consumptive use outside the Lahontan Region. The waters of Truckee, Carson, and Walker Rivers, and of Lake Tahoe, are allocated by court decisions, federal law, and interstate agreements among water users in California and Nevada. The City of Los Angeles Department of Water and Power diverts water from the Mono and Owens River Basins via the Los Angeles Aqueduct for use in the Los Angeles area. Some water is imported to the South Lahontan Basin via the State Water's Project California Aqueduct.

Careful consideration of the relationships between water quality and water quantity are important aspects of Regional Board planning activities. Reasons for concern include projected increases in population and consequent demands for water, and possible future water shortages due to drought, global climate change, and contamination of some water supplies by pollutants. There is increasing scientific and public awareness of environmental values associated with natural water volumes in streams, lakes, wetlands, and groundwater aquifers.

### ***Water Quality***

The natural quality of surface water at higher elevations, derived from snowmelt, is assumed to be very good or excellent, although localized problems related to heavy metals and radioactive elements occur. The soils and waters of the Sierra Nevada have low buffering capacity for acids, and its lakes and streams are considered sensitive to acidification as a result of wet and dry deposition of pollutants from urban areas. Although high quality water supplies are available near streams in desert areas of the Lahontan Region, many desert areas have naturally poor quality (e.g., high concentrations of arsenic, fluoride, selenium and/or salts).

Threats to beneficial uses from naturally high concentrations of salts and metallic minerals can be aggravated by geothermal and agricultural discharges, groundwater overdraft which concentrates salts, and disposal of stormwater under conditions where it is likely to receive adequate treatment by soils and vegetation.

Water quality problems in the Lahontan Region are largely related to erosion from construction, timber harvesting, livestock grazing, stormwater, wastewater disposal systems, leaking petroleum underground storage tank systems, leachate from unlined landfills, acid drainage from inactive mines, and use of solvents at Department of

Defense sites and dry cleaners.

### ***Surface Water Hydrology***

There are forty major watersheds (called “hydrologic units” under the Department of Water Resources mapping system). Although the majority of surface water runoff from the mountains drains to the interior of the province today (does not empty to the Pacific Ocean), parts of the region probably had external drainage during prehistoric times. Most of the basins have been produced by block faulting, and interior drainage resulted because rain and snowfall produce less water than is lost by evaporation. Lakes in the Basin and Range geomorphic province lose an estimated 2 to 2.5 meters (7-8 feet) to evaporation annually. When the water is not replaced, the lakes become dry lakes or playas.

The drainages that transport the snowmelt and precipitation to these dry lakes are generally ephemeral in nature. Recent research indicates ephemeral drainages are areas where significant groundwater recharge may occur in arid and semi-arid environments and can occur during summer and winter months. Although the majority of streams within the Lahontan Region are ephemeral, there are a few perennial streams located in the southern and northern portions of the region.

The most prominent stream in the southern Lahontan Region is the Owens River, owing its existence to the Sierra Nevada. Most of the water to the Owens River is diverted by Los Angeles Department of Water and Power (LADWP); however, unusually heavy runoff from the Sierra Nevada may fill the Owens basin but the lake disappears during dry years. To preserve native wildlife and implement dust management control measures within the Owens Lake, due to the diversion of water from the Owens River, LAWDP allows minor discharges to the lake on a routine basis. Although most of the lakes are ephemeral, holding water only after heavy rain, there are a few permanent lakes in the Lahontan Region such as Mono Lake. Mono Lake, the most notable permanent lake without an outlet, and is also fed by streams from the Sierra Nevada.

**Mono Lake**<sup>8</sup>. Mono Lake is a terminal lake within the Basin and Range geomorphic province and is designated an Outstanding National Resource Water (ONRW). Pursuant to the federal Clean Water Act, no permanent or long-term reduction in water quality is allowable for an ONRW. Mono Lake was designated an ONRW due to its unique water quality (high alkalinity and high salt content) that supports important ecosystems.

Mono Lake is a remnant of Lake Russel, an old Pleistocene lake. Several times during

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<sup>8</sup> Lahontan Regional Water Quality Control Board, 1995, rev 2016.



the past 3 million years, Lake Russel had an outlet, first to the north into the Walker River system and later to the south Adobe Valley and Owens River system. As the climate got warmer and drier, the lake level fell and since about 80,000 years ago water no longer reached the outlet resulting in a closed basin and forming the present Mono Lake.

Mono Lake is fed by Sierra Nevada snowmelt and calcium rich spring water. Because the only way water leaves the lake is through evaporation, this causes a buildup of salts. The calcium rich spring water and alkaline lake water, containing an abundance of carbonate, mixes and crystallizes into the mineral calcite ( $\text{CaCO}_3$ ) forming the large tufa towers that are visible within and around the lake. The exposed tufa towers mark the level of the Pleistocene Lake Russel.

Surface water hydrology is notably different in the northern portion of the region. There are several permanent lakes and perennial streams, creeks and rivers. The most prominent permanent lake within the northern region is Lake Tahoe. The lake has one outlet, the Truckee River, and is fed by several streams, creeks and rivers originating from the Sierra Nevada as well as other mountains surrounding the lake.

**Lake Tahoe**<sup>9</sup>. Within the Sierra Nevada geomorphic province is Lake Tahoe. Lake Tahoe is a designated Outstanding National Resource Water (ONRW), renowned for its extraordinary clarity, purity, and deep blue color. Elevations of the lake basin range from 6,225 feet at lake level to 10,891 feet at Freel Peak. Over millions of years, the area records periods of marine deposition, granitic intrusion, tectonic uplift, volcanic eruptions, glaciation, and erosion.

Section 114 of the CWA indicates the need to “preserve the fragile ecology of Lake Tahoe.” No permanent or long-term reduction in water quality is allowable in areas given special protection as ONRW. In response, additional water quality objectives above those that are already established for general surface waters, were added to the Basin Plan for the Lake Tahoe Hydrologic Unit. These additional water quality objectives include algal growth potential, biological indicators, clarity, electrical conductivity, pH, plankton counts, suspended sediment, and transparency.

### ***Groundwater Hydrology***

Precipitation that infiltrates into the ground may be stored in the spaces within sediments and rocks beneath the earth’s surface. This stored water is groundwater, and it is an important part of California’s water supply. As water seeps into the ground, some of it is held by the soil near the surface in the unsaturated zone. This zone may be dry

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<sup>9</sup> Lahontan Regional Water Quality Control Board, 1995; rev 2016; Saucedo, G.J., 2005

during periods when evaporation and transpiration are greater than infiltration. Beneath the unsaturated zone, groundwater fills all available spaces in the rock or sediment in the zone of saturation. The boundary between the unsaturated and saturated zone is the water table. The water table marks the depth at which one encounters saturated materials while digging a hole or drilling a well. The water table fluctuates drastically throughout the Lahontan Region. Groundwater is found at earth's surface in river valleys or at springs at various locations and can be found at depths greater than 250 ft bgs. The position of the water table changes seasonally, rising as the groundwater is recharged with infiltrated precipitation and falling during dry periods and periods of over pumping. During prolonged droughts in California, drops in the water table of tens of feet have been recorded. Groundwater is a critical resource in California that must be preserved and protected. Groundwater is considered a critical resource because it is used for municipal, domestic, and agricultural supply to many residents on a daily basis and also provides a vital role in maintaining environmental sustainability during times of drought.

### ***Assimilative Capacity of a Groundwater Basin***

In general terms Assimilative Capacity of a surface water or a groundwater is the ability of the water body to receive and accommodate natural and anthropogenic sources of pollutants (from point and nonpoint sources), while maintaining water quality standards that are protective of beneficial uses of the water resource. In practical terms, Assimilative Capacity is estimated as the difference between the water quality objectives and the existing groundwater quality for each basin/subarea as described in Section 4 of the Basin Plan. The General Order prohibits long-term loss of the assimilative capacity of the groundwater basin from the proposed remedial activities.

### ***Salt and Nutrient Management Plans***

The State Water Resources Control Board adopted the Recycled Water Policy (Policy) on February 3, 2009. The Policy requires development of salt and nutrient management plans (SNMP) for each basin and subbasin in the region to achieve long term water quality objectives where salts and nutrients are a threat to water quality. Past analyses of various amendments, including corn syrup, molasses, HRC™, and edible oils have shown elevated concentrations of sodium and other salts. The General Order requires that discharges associated with remedial activities within a basin or subbasin that has an accepted SNMP be consistent with that SNMP. A Salt and Nutrient Management and Protection Plan is required to be submitted with the RAP to determine applicability for enrollment under the General Order.

Eighteen (18) groundwater basins have been identified in the Lahontan Region that require a salt and nutrient management plan. Five (5) groundwater basins and one (1)

groundwater subbasin currently have SNMPs that have been accepted by the Lahontan Water Board. The accepted SNMPs includes: the Antelope Valley (6-44), Bicycle Valley (6-25), Fremont Valley (6-46), Indian Wells Valley (6-54), Langford Valley (6-36), and the Tehachapi Valley (6-45) groundwater basins; and the Irwin subbasin of the Langford Valley (6-36.02). Details regarding the accepted [SNMP within the Lahontan Region](#) can be found on the [Lahontan Water Board](#) internet website.

### ***Sustainable Groundwater Management Act***

On September 16, 2014, a three-bill legislative package, composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), was signed into law. The three-bill package is known as the Sustainable Groundwater Management Act (SGMA). SGMA provided the framework for sustainable groundwater management requiring governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. The General Order has been developed to comply with the SGMA and work cooperatively with the Department of Water Resources (DWR) and other water agencies.

In response to SGMA and basin prioritization, hydrologists have divided California into ten hydrologic regions. The nine Regional Water Boards are defined (for the most part) by the boundaries of these hydrologic regions, as described in CWC section 13200. The hydrologic regions within Lahontan boundaries are the North Lahontan Hydrologic Region and the South Lahontan Hydrologic Region. These two hydrologic regions are further divided into several groundwater basins and subbasins (Figures 3 and 4).

Groundwater pumping has contributed to declining groundwater tables in many aquifers. Under SGMA, adjudicated groundwater basins are subjected to separate reporting. Adjudicated groundwater basins in the Lahontan Region are the Inyo/Owens Valley Groundwater Basin, Mojave Groundwater Basin and Antelope Groundwater Basin.

### ***North Lahontan Hydrologic Subregion***

Groundwater in the northern half of the North Lahontan Hydrologic Subregion is primarily contained in basin-fill and volcanic rock aquifers, with some fractured hard rock zones. The southern half of this region is dominated by fractured hard rock zones, but small segments of basin-fill aquifers also exist in this part of the subregion. In general, the water quality in the North Lahontan Hydrologic Subregion is good. In basins in the northern portion of the region, groundwater quality is widely variable. The groundwater quality along these basin margins tends to be of higher quality, but the potential for future groundwater pollution exists as urbanization increases, especially in hard rock areas. Groundwater quality in the alpine basin ranges from good to excellent (Figure 3).

### ***High and Medium Priority Basins in the North Lahontan Hydrologic Subregion***

Tahoe Valley South groundwater subbasin (DWR Basin Number 6-005.01) is listed as a medium-priority basin. In compliance with SGMA, groundwater sustainability agencies (GSAs) are required to develop and implement a groundwater sustainability plan (GSP) for the basin by January 31, 2022.

All other groundwater basins in the North Lahontan Hydrologic Subregion are listed as low- or very-low priority. These groundwater basins are not subject to SGMA, but local public agencies are encouraged to form GSAs and develop GSPs for long-term groundwater resource sustainability.

### ***South Lahontan Hydrologic Subregion***

The South Lahontan Hydrologic Subregion is bounded on the west by the crest of the Sierra Nevada, on the north by the watershed divide between Mono Lake and East Walker River drainages, on the east by the Nevada state line, and on the south by the crest of the San Gabriel and San Bernardino mountains and the divide between watersheds draining south toward the Colorado River and those draining northward. The subregion includes all of Inyo County and parts of Mono, San Bernardino, Kern, and Los Angeles Counties (Figure 4).

The South Lahontan Hydrologic Subregion contains numerous basin-fill aquifers, separated by fractured hard rock zones. Although the quantity of surface water is limited in the South Lahontan Hydrologic Subregion, the quality is very good, being greatly influenced by snowmelt from the eastern Sierra Nevada. However, at lower elevations, groundwater and surface water quality can be degraded, both naturally from geothermal activity, and because of human-induced activities. Drinking water standards are most often exceeded for total dissolved solids (TDS), fluoride, arsenic and boron content. Groundwater near the edges of valleys generally contains lower TDS content than water beneath the central part of the valleys or near dry lakes.

### ***High and Medium Priority Basins in the South Lahontan Hydrologic Subregion***

Indian Wells Valley groundwater basin (DWR Basin Number 6-054) is identified as a high priority critically overdrafted basin. In compliance with SGMA, the Indian Wells Valley Groundwater Authority (GSA) submitted the GSP for the Indian Wells groundwater basin to DWR on January 31, 2020. The GSP identifies impacts to the beneficial uses and users due to reduction in groundwater storage, increased lowering of groundwater levels, degraded groundwater quality and land subsidence. In response, several management actions are proposed to reduce the negative impacts while preserving the quality of life for the residents of the Indian Wells Valley groundwater

basin. A copy of the GSP can be found online at: <https://sgma.water.ca.gov/portal/>.

Within the boundaries of the Indian Wells Valley groundwater basin, the Lahontan Water Board regulates discharges from land disposal sites, wastewater treatment plants, wastewater reclamation sites, Department of Defense operations, and cannabis growing operations. Active facilities currently under WDRs within Lahontan Water Board jurisdiction include Oro LTD Mine and Mill, Ridgecrest/Inyokern Landfill, Inyokern Community Services District Wastewater Treatment Facility, Ridgecrest Wastewater Treatment Facility, Ridgecrest Reclamation Irrigation Site, China Lake Naval Air Weapons Station, and Chief Farms LLC. All relevant case files associated with each facility are available on the State Water Board GeoTracker database (GeoTracker). GeoTracker is accessible online at: <https://geotracker.waterboards.ca.gov/>.

### ***Precipitation***

Most of the Lahontan region receives less than 30 inches precipitation annually except for the Sierra Nevada mountain range. As shown in Figure 5, the Sierra Nevada experiences on average 25 to 80 inches annually, concentrated around Alpine, El Dorado, Placer, and Mono Counties. Much of the climatic variation in the region results from the patterns of global weather systems, oceanic influences, the location and orientation of the mountains, and the jet stream typically brings the weather from west to east. Specifically, the Sierra Nevada range causes orographic uplift of the weather that comes from the west, resulting in increased precipitation on the mountains. As the jet stream takes the weather pattern eastward over the mountains there is a rain shadow effect from the Sierra Nevada which dramatically decreases the precipitation eastward. This is evident especially in the Owens Valley and Death Valley areas.

On average, about 75 percent of the annual precipitation in the region falls between November and March; with about 50 percent occurring between December and February. However, amounts of precipitation vary greatly from year to year, which can often make surface water supplies and groundwater recharge highly variable.

### **Biological Environmental Setting<sup>10</sup>**

The Lahontan region is rich in natural biological diversity due to the varying climate, topography, precipitation, and soils. The region is divided into 3 different bioregions by the US Department of Agriculture-Forest Service (USDA): Modoc, Mojave Desert, and Sierra. To manage environmental problems and natural resources, the US Environmental Protection Agency (USEPA) and the United States Geological Survey

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<sup>10</sup> Bailey, R.G., 1995; CA Dept of Fish and Wildlife, 2020; CA Dept of Forestry, 2019; McNab, W.H. and Avers, P.E., 1996; US EPA, 2020; USGS, 2020.

(USGS) adopted the delineation of these bioregions. The biodiversity of the flora, fauna, and ecosystems in each bioregion tend to be distinct from that of others. It is accepted the biological communities do not exist in isolation, but rather interact with one another so that the use of one will affect another.

The Lahontan region houses seventy-five (75) different state and/or federal listed threatened and endangered species, including amphibians, birds, crustaceans, dicots, fish, insects, mammals, monocots, and reptiles (Appendix B). Threats to these species vary, but urbanization and drought are key factors to the decline of many species and ecosystems. Other factors include grazing, deforestation, off road vehicle use, introduction of non-native species, water diversion, groundwater overdraft, and unauthorized discharges of contaminants to soil and water.

The protection of these species is the responsibility of federal, state, and local governments. The Lahontan Water Board, as a responsible agency for the protection of human health and the environment, works cooperatively with all agencies to protect valuable biological resources and implement conservation and management plans.

### **III. CEQA ENVIRONMENTAL CHECKLIST**

The CEQA Environmental Checklist (Checklist) is a series of questions grouped by subject that identifies different types of potential environmental impacts that a project may cause. CEQA considers what are the existing conditions of the physical project site as a baseline. It then compares how much change will occur to the environment if the project is implemented. Based on the CEQA Guidelines, the impact severity is rated on a scale of four impact levels. The four levels are: potentially significant impact, less than significant with mitigation incorporated, less than significant impact, or no impact.

The Lahontan Water Board prepared the IS and Checklist to evaluate reasonably foreseeable environmental impacts and determine if a significant impact to the environment is likely with the adoption of the General Order. The baseline physical conditions by which a lead agency determines whether an impact is significant are the existing physical conditions in the vicinity of the project at the time the CEQA document is being prepared. Adoption of the General Order is for regionwide application and does not address site-specific impacts. The Lahontan Water Board has the discretion whether to use the General Order or require individual WDRs for regulatory coverage on a site-by-site basis. The Lahontan Water Board cannot speculate on how many remediation activities may be enrolled in, constructed, or expanded as a result of General Order, and is not able to determine the location or design of any remediation activity.

Pursuant to CCR, title 14, section 15064(d), a change which is speculative or unlikely to

occur is not reasonably foreseeable and should not be considered in the environmental analysis. As such, this analysis is limited to the general effects associated with the eligible remediation activities. This Initial Study was prepared based upon typical in-situ and ex-situ systems. Since it is speculative to estimate the type, size, and location of any remediation activity, this evaluation makes no attempt to quantify the impacts from the construction and operation of expanded or new remediation system. The Regional Water Board also does not specify the methods in which dischargers can choose to comply with the General Order. Thus, the level of analysis is of a general nature and is commensurate with that level of detail.

The evaluation considers potential environmental impacts that may result from in-situ and ex-situ remediation activities including: 1) construction and operation of remediation systems; 2) injection of amendments to the vadose zone and groundwater basin; 3) discharges of the waste to land; 4) direct reinjection of waste; 4) impacts from monitoring activities, and 5) handling and off-site disposal of investigation derived waste.

The General Order contains requirements that protect water quality and the impacts from the project are expected to be “No Impact”, “Less Than Significant Impact”, and “Less Than Significant with Mitigation.” The Lahontan Water Board cannot speculate on how many facilities or remediation sites would be covered as a result of adoption of the General Order and is not able to determine the location or design of any facilities.

For the environmental analysis of the checklist, any conditions and/or requirements of the General Order are considered project design features and are not evaluated as mitigation measures. The General Order does not alter or supersede any regulations of other agencies but will provide more stringent regulation than is currently in place at the regionwide level.

## **1. Aesthetics**

The level of impacts to aesthetics are evaluated based on the following questions posed under impact description in the matrix below, except as provided in Public Resources Code section 21099. Will the project:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Have a substantial adverse effect on a scenic vista?	No	No	Yes	No
B	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	No	No	Yes	No
C	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	No	No	Yes	No
D	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	No	No	Yes	No

### Discussion of Impact Assessment

- 1A. Except as provided in Public Resources Code Section 21099, would the project have a substantial adverse effect on a scenic vista?

**Less than significant impact.** Remediation activities that are eligible for coverage under the General Order have the potential to be situated within areas that offer scenic resources. In-situ and ex-situ remediation design may include construction of temporary structures to house remediation equipment and materials, construction of above ground remediation infrastructure, security lighting, fencing and roads. Though the General Order requires applicants to comply with the local regulations and the impacts are expected to be temporary and the structures and other project-related infrastructure must be removed when remediation is complete. Local scenic quality ordinances must be complied with and could include reduced building size and compatible architectural design and color. The impact to aesthetics is



less than significant.

- 1B. Except as provided in Public Resources Code section 21099, would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

**Less than significant impact.** In-situ and ex-situ remediation activities issued coverage under the General Order are not anticipated to impact scenic resources; however, any impacts would be temporary and short-term. Applicants are required to comply with federal, state, and local regulations.

- 1C. Except as provided in Public Resources Code section 21099, would the project in non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

**Less than significant impact.** Project applicants will be required to ensure impacts are reduced to a less than significant level by complying with local scenic quality requirements. Remediation sites situated in urbanized areas would not conflict with any applicable zoning or any other regulation governing scenic quality. Remediation activities may include construction of temporary structures to house remediation equipment and materials, construction of above ground remediation infrastructure, security lighting, fencing and roads. Periodically, crews will visit remediation facilities for operation and maintenance and to conduct monitoring. The impacts are expected to be temporary and the structures and other project-related infrastructure removed when remediation is complete.

- 1D. Except as provided in Public Resources Code section 21099, would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

**Less than significant impact.** In the event additional lighting is required as part of the operation and maintenance of the in-situ and ex-situ remediation systems, project applicants will be required to ensure the lighting is directed downward and does not cause substantial light or glare which would adversely affect day or nighttime views.

## 2. Agriculture and Forestry Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

The level of impacts to agriculture and forestry resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	No	No	No	Yes
B	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	No	No	No	Yes
C	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	No	No	No	Yes

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
D	Result in the loss of forest land or conversion of forest land to non-forest use?	No	No	No	Yes
E	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	No	No	No	Yes

### Discussion of Impact Assessment

- 2A. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

**No impact.** The Farmland Mapping and Monitoring Program provides detailed maps of information related to soil candidate listing for Prime Farmland and Farmland of Statewide Importance, summary of the acreage of each type of the agricultural land use category, and the total acreage converted to another use for each County statewide. According to the map, Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are in the counties of Kern, Los Angeles, Modoc, San Bernardino, and Sierra.

Coverage under the General Order will not be for the purpose of converting agricultural lands to non-agricultural use. Although the use of fertilizers, herbicides and pesticides has contributed to groundwater contamination, which may require permitting to remediate under the General Order, the in-situ and ex-situ remediation activities covered under the General Order will not convert Farmland to non-agricultural use because the project is intended for the completely unrelated purpose of cleaning up contamination.

- 2B. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

**No impact.** In-situ and ex-situ remediation activities covered under the General Order will not conflict with any zoning ordinances or the Williamson Act contract.

- 2C. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

**No impact.** In-situ and ex-situ remediation activities covered under the General Order are not anticipated to conflict with existing zoning ordinances or necessitate the rezoning of forest lands.

- 2D. Would the project result in the loss of forest land or conversion of forest land to non-forest use?

**No impact.** In-situ and ex-situ remediation activities that are eligible for coverage under the General Order will not result in the loss of forest land or convert forest land to non-forest use because the project is intended for the completely unrelated purpose of cleaning up contamination. Adopting the General Order does not change zoning or land use designation and will not alter the economics of forest land conversion to other uses.

- 2E. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

**No impact.** Agriculture and forest resources are important in many parts of the Lahontan region. Adoption of the General Order and the in-situ and ex-situ remediation activities eligible for coverage would not convert farmland to non-agricultural use or conflict with any zoning laws or result in loss of forest lands. The General Order allows use of the treated groundwater (waste) for irrigation purposes. The treated groundwater must be returned to the same groundwater basin from which it was extracted. The discharge of groundwater with detectable concentrations of man-made organic compounds is prohibited.

Chapter 4 of the Basin Plan outlines the regulatory authority of the Lahontan Water Board to implement water quality objectives and provisions that protect agricultural and forest beneficial uses. Agricultural uses include ranching, dairying, aquaculture (the cultivation of aquatic plants and animals for food), and crop (vegetable, fruit, nut, and legume) production. The Lahontan region

encompasses at least part of nine National Forests and ten designated wilderness areas within the national forests.

### 3. Air Quality

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. The level of impacts to air quality are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Conflict with or obstruct implementation of the applicable air quality plan?	No	No	Yes	No
B	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality?	No	No	Yes	No
C	Expose sensitive receptors to substantial pollutant concentrations?	No	No	Yes	No
D	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	No	No	Yes	No

#### Discussion of Impact Assessment

- 3A. Would the project conflict with or obstruct implementation of the applicable air quality plan?

**Less than significant.** In-situ and ex-situ remediation activities are not anticipated to conflict with any applicable air quality plan, because remediation of contaminated soil and groundwater is not expected to significantly increase aerial emissions of contaminants. In-situ and ex-situ remediation activities could lead to an increase in air emissions from vehicles coming to and from the site during construction and operation of the remediation system. The impacts are expected to be temporary, and the structures and other project-related infrastructure must be removed when remediation is completed. All remediation equipment which generates aerial

emission (such as air stripping towers, and petroleum powered generators) are required to comply with local, state, and federal air quality standards.

- 3B. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard?

**Less than significant impact.** In-situ and ex-situ remediation is not anticipated to result in a cumulative net increase of any criteria pollutants because the activities are expected to be temporary and short-term in duration and limited in number. Remediation activities could lead to an increase in air emissions from vehicles coming to and from the site during construction and operation of the remediation system. However, the impacts are expected to be temporary, and the structures and other project-related infrastructure removed when remediation is completed. Also, every project must comply with local, state, and federal air quality emission standards for remediation equipment that generates emissions.

- 3C. Would the project expose sensitive receptors to substantial pollutant concentrations?

**Less than significant impact.** Though the project may involve handling hazardous concentrations of contaminants or amendments for the remediation, the project must comply with all federal, state, and local public health requirements and air quality emission standards. Therefore, it is not expected the project will expose sensitive receptors to substantial pollutant concentrations.

- 3D. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

**Less than significant impact.** In-situ and ex-situ remediation activities may have the potential to emit odors that are less than satisfactory during soil excavation activities. Short-term increases in heavy equipment used during construction and installation of remedial equipment and short-term increases in vehicular traffic, caused by ongoing operation and maintenance of the remediation systems, are a less than significant source of vehicle emissions (sulfur dioxide, ammonia, nitrogen dioxide, and carbon dioxide) and emission factors will vary depending on the size and location of the project. Emissions may be a factor when assessing ambient air quality.

Some remedial devices, equipment, or materials (i.e., pumps, above ground

gasoline and diesel storage fuel tanks, chemicals, and contaminated soil) also have the potential to be a source of objectionable odors. This impact is anticipated to be short-term for most sites. Also, excavation of soils contaminated with solvents and fuel may present objectionable odors to site workers and neighboring communities.

#### 4. Biological Resources

The level of impacts to biological resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	No	No	Yes	No
B	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	No	No	Yes	No
C	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	No	No	Yes	No
D	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
E	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	No	No	No	Yes
F	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No	No	Yes	No

### Discussion of Impact Assessment

- 4A. Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

**Less than significant impact.** There are seventy-five (75) federal or California threatened or endangered species that are listed in the Lahontan Region (Appendix B). Grading, vehicular use, installation of structures and impervious surfaces, operation and maintenance of the remediation equipment and disposal systems, and discharges of treated groundwater to land and to ephemeral drainages has the potential to impact these species depending on the location.

The proposed General Order requires each applicant to include a Sensitive Receptor Survey and Protection Plan that identifies the biological resources and surface waters (including waters of the State and water of the US) located onsite and within one (1) mile of the remediation project. Applicants that propose to discharge to an ephemeral drainage must identify the best management practices that will be implemented to prevent scouring, erosion, and sediment transport downstream. Some restrictions on discharges during storm events will apply.

Enrollees are also required to submit and implement an Operation and Maintenance Plan and a Site Restoration Plan for the remediation site. The



plans must identify the actions taken to maintain the site conditions during remediation activities in a manner that is protective of wildlife (and human life), does not contribute to a condition of pollution, preserves natural site conditions to the maximum amount practicable, and restores natural areas of impact to the maximum extent practicable after the remediation site is closed. The plan may need to be updated periodically as the remediation process continues and prior to site closure.

Because the exact locations of the remediation activities are unknown, studies to evaluate the value and quantity of biological resources that might be impacted by the remediation project will need to be conducted by the applicant. If there is the potential to have a substantial adverse effect on species identified as a candidate, sensitive, or special status species (protected species) in local or regional plans, policies, or regulation, or by the California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFW), coordination will be recommended with the applicable agency to avoid impacts prior to qualifying for the General Order.

- 4B Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

**Less than significant impact.** Healthy, vegetated riparian habitat is essential to the natural ecological functioning of associated rivers and streams throughout the Lahontan Region. To preserve and protect riparian habitat and sensitive natural communities, applicants of the General Order are required to submit a Stormwater Management Plan with the NOI and RAP. In The General Order prohibits discharges of wastes in a manner that causes offsite sediment deposition, runoff, or erosion. Adequate stormwater facilities must be incorporated into the remediation system design to divert stormwater from the application area, treatment system, and waste storage areas, to protect against washout, inundation, structural damage, or significant reduction in efficiency resulting from the maximum historic rain event. See also response #4a (above).

- 4C. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

**Less than significant impact.** Discharges to perennial and intermittent

waters of the State including wetlands and discharges to waters of the US are prohibited by the General Order. Therefore, the discharges are unlikely to have a substantial adverse effect on state or federally protected wetlands.

- 4D. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

**Less than significant impact.** In-situ and ex-situ remediation activities covered under the General Order requires compliance with all local, state, and federal laws, ordinances, and regulations that protect biological resources. If barriers to travel corridors cannot be avoided, provisions for new protected travel corridors may need to be incorporated into the project design.

Any above ground components including remediation equipment housing structures, fencing and waste containment structures are typically small in size and can be placed in areas that will not impede the movement of species.

Discharges to ephemeral drainages are not anticipated to impede the movement of any species. The volume of treated groundwater discharged to the ephemeral drainages will be restricted during rain events to maintain the natural flow of the surface water and protect against impedance upon wildlife and the environment.

- 4E. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

**No impact.** The proposed General Order requires compliance with all local, state, and federal laws, ordinances, and regulations that protect biological resources.

- 4F. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

**Less than significant.** The proposed General Order will not conflict with any adopted state habitat conservation plan. See responses above.

## 5. Cultural Resources

The level of impacts to cultural resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project

will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	No	No	No	Yes
B	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	No	No	No	Yes
C	Disturb any human remains, including those interred outside of formal cemeteries?	No	No	Yes	No

### Discussion of Impact Assessment

- 5A. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

**No impact.** Historical resources, as defined in §15064.5, are not anticipated to be changed or impacted by the proposed General Order. Section II.A of the proposed General Order requires applicants to submit a Remedial Action Plan including a Sensitive Receptor Survey and Protection Plan to identify potential impacts to cultural resources. If potential impacts are identified, then the applicant must revise the design to avoid impacts.

- 5B. Would the project cause a substantial adverse change in the significance of an archaeological resources pursuant to §15064.5?

**No impact.** The significance of archaeological resources, as defined in §15064.5 and Public Resources Code section 21083.2, are not anticipated to be changed or impacted by the proposed General Order. Section II.A of the proposed General Order requires applicants to submit a RAP including a Sensitive Receptor Survey and Protection Plan to identify and mitigate impacts to cultural resources. Projects eligible for coverage under the General Order are not authorized to demolish, destroy, relocate, or alter any historical resource such that the significance of the historical resource would be materially impaired, or a unique archeological resource as defined in Section 21083.2 of the Public Resources Code.

5C. Disturb any human remains, including those interred outside of formal cemeteries?

**Less than significant.** Should previously unknown/undocumented human remains or artifacts be discovered, project proponents will be required to halt excavation activities and contact the coroner of the county. Upon discovery of human remains, project proponents will need to comply with Health and Safety Code section 7050.5 and Public Resources Code section 5097.98. The following actions will be taken immediately upon the discovery of human remains:

Work in the vicinity of the discovery will stop immediately and the county coroner will immediately be notified. The coroner has two working days to examine human remains after being notified by the responsible person. If the remains are Native American, the coroner has 24-hours to notify the Native American Heritage Commission. The Native American Heritage Commission will immediately notify the person it believes to be the most likely descendent of the deceased Native American. The most likely descendent has 48-hours of being granted access to the site to make recommendations to the owner, or representative, for the treatment or disposition, with proper dignity, of the human remains and any associated grave goods.

## 6. Energy

The level of impacts to energy are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	No	No	Yes	No
B	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	No	No	No	Yes

## Discussion of Impact Assessment

- 6A. Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

**Less than significant.** Energy consumption during operation of remedial equipment including security lighting is not expected to impact available resources because energy requirements are typically low for the remediation equipment operation and are expected to be temporary and short-term in duration. Project applicants may site, orient, and design the remediation area to reduce energy consumption and promote clean, renewable energy use. Design may include the installation of photovoltaic panels and energy efficient pumps and lighting. Operation may be reduced during times of peak energy use to reduce demand on the system. Emergency generators may need to be used to continue operation during times of utility shutoff.

- 6B. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

**No impact.** The proposed General Order is not designed to conflict with or obstruct with any state or local plans regarding renewable energy or energy efficiency.

## 7. Geology and Soils

The level of impacts to geology and soils are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving rupture of known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	No	No	Yes	No
B	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving strong seismic ground shaking?	No	No	Yes	No
C	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving seismic-related ground failure, including liquefaction?	No	No	No	Yes
D	Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving landslides?	No	No	No	Yes
E	Result in substantial soil erosion or the loss of topsoil?	No	No	Yes	No
F	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	No	No	Yes	No
G	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
H	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	No	No	No	Yes
I	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	No	No	Yes	No

**Discussion of Impact Assessment**

7A. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

**Less than significant impact.** Any constructed facility will be designed and reviewed by a licensed Civil Engineer and will be built in accordance with California seismic design standards. The structures associated with remediation activities are usually small one-story structures constructed in accordance with current seismic standards contained in the Uniform Building Code. While it is possible that injection could trigger an earthquake, this occurrence is rare and will cause minor seismic activity. Therefore, substantial adverse effects including risk of loss, injury, or death are unlikely. In addition, the siting criteria of the local agencies will establish appropriate locations and seek to avoid or minimize, on a site-specific basis, any potential for risk to people or structures

7B. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

**Less than significant impact.** See response 7a (above).

7C. Would the project directly or indirectly cause potential substantial adverse

effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage under the proposed General Order are not anticipated to cause ground failure or liquefaction due to limited amendment volumes and returning of waste from the groundwater basin from which it originated.

- 7D. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage under the proposed General Order are not anticipated to cause landslides.

- 7E. Would the project result in substantial soil erosion or the loss of topsoil?

**Less than significant.** Grading, installation of impervious surfaces, and improper storm water management may cause soil erosion and loss of topsoil during construction and operation of the remediation system. However, section II.A of the proposed General Order requires applicants to prepare a RAP that includes a Stormwater Management Plan to control off-site sediment deposition.

- 7F. Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

**Less than significant.** Applicants are required to assess the geology and incorporate applicable building standards or mitigation measures to avoid geologic catastrophes and protect human health. See response #7a (above).

- 7G. Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks of life or property?

**Less than significant.** The exact locations of the groundwater remediation projects within the Lahontan Water Board boundaries is unknown. The General Order is designed to comply with applicable general plans, specific plans, and regional plans. All applicants are required to comply with local government ordinances and California building codes. According to section 1803.2 of the 1994 Uniform Building Code, when expansive characteristics of soil are determined an expansive index test must be conducted and the soil



classified. Foundations for structures resting on soils with an expansive index greater than 20 requires special design consideration.

- 7H. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

**No impact.** Applicants are required to assess the geology and incorporate applicable building standards or mitigation measures to avoid geologic catastrophes and protect human health. The proposed General Order does not regulate disposal of domestic wastewater. Those activities may be regulated under separate WDRs.

- 7I. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

**Less than Significant Impact.** Applicants are required to submit a Sensitive Receptor Survey and Protection Plan as part of their Report of Waste Discharge that includes an assessment of unique paleontological resources paleontological resources to ensure the area is protected from discharges of waste and disturbance. Despite diligent advance research, inadvertent discoveries may occur of paleontological resources. In such cases, work crews will stop work in the vicinity of a cultural resource discovery to avoid damage until a qualified archaeologist can assess the significance of the find. If necessary, treatment measures will be developed in consultation with appropriate agencies and tribal representatives.

## 8. Greenhouse Gas Emissions

The level of impacts to greenhouse gas emissions are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
B	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	No	No	No	Yes

### Discussion of Impact Assessment

- 8A Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

**Less than significant impact.** Greenhouse gas emissions generated by an increase in vehicular traffic and operation of remedial equipment will be minor, localized, temporary, and will have less than significant impacts to the environment. Project proponents will be required to comply with local, state and federal laws, regulations, and plans associated with reducing greenhouse gas emissions. If in a remote area where no power exists, using a portable gas-powered generator to power the pumps and whatever other equipment is needed, the exhaust released would insignificantly add to the carbon emissions, which is a greenhouse gas emission. The incremental addition is expected to be extremely small and temporary, thus having a less than significant impact.

- 8B. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

**No impact.** The proposed General Order is not designed to conflict with any local, state, or federal plans related to reducing greenhouse gas emissions. The Lahontan Water Board supports in-situ and ex-situ remediation activities that incorporate methods to reduce greenhouse gases into the project design.

### 9. Hazards and Hazardous Materials

The level of impacts to hazards and hazardous materials are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	No	No	Yes	No
B	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	No	No	Yes	No
C	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	No	No	Yes	No
D	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	No	No	Yes	No
E	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	No	No	Yes	No
F	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	No	No	No	Yes
G	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	No	No	Yes	No

## Discussion of Impact Assessment

- 9A. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

**Less than significant impact.** Many of the chemical compounds (groundwater amendments) used to remediate groundwater may create hazardous conditions due to their physical composition and characteristics. For example, the dust from oxidants' permanganate and persulfate is hazardous, the presence of ozone and permanganate increases the flammability of many materials, the generation of ozone can involve high voltage equipment concerns, there is a potential for uncontrolled exothermic reactions, and there is the potential for preferential migration of oxidants and/or pollutants through underground utilities.

Some of the amendments and investigation derived waste may need to meet federal and state hazardous waste transportation and waste generation guidelines

Waste designated as hazardous waste is not authorized for disposal at remediation sites eligible for enrollment under the General Order.

Although many groundwater amendments are listed as hazardous materials, the compounds are known to treat groundwater to acceptable drinking water levels when used in a controlled environment.

The General Order is designed to be applicable throughout the Lahontan region and in a variety of situations. In-situ and ex-situ remediation are anticipated to occur in locations where the land use pertains to solid waste disposal, wastewater treatment, and industrial activities (i.e., mining, metal plating, petroleum dispensing/production, and automobile/aircraft maintenance, etc.) to name a few. Remediation sites may be located near schools, airports, residential neighborhoods, and hazardous materials/wastes sites identified on the Cortese List compiled pursuant to Government Code section 65962.5. Lahontan Water Board and Department of Toxic Substance Control (DTSC) staff work cooperatively at groundwater remediation sites. Responsible parties/dischargers may be jointly regulated by Lahontan Water Board and DTSC staff and other state agencies.

To ensure protection against exposure to hazardous materials/hazardous waste, section II.A. of the General Order requires submittal of a RAP including development of a Health and Safety Plan (HSP), Remediation

System Failure Contingency Plan (RSFCP), and an Operation and Maintenance plan (OMP). These plans must identify the chemicals that are to be used, possible exposure risks, and the health and safety measures that will be incorporated throughout the life of the project to protect workers, the public, and the environment from exposure to hazardous material/hazardous waste due to an unauthorized release of amendments. The plans must indicate the training and qualifications of the personnel required to implement the various aspects of the plans and respond to any emergencies caused by an unauthorized release and potential exposure to hazardous concentrations of amendments. These documents must outline the requirements for the handling of hazardous materials and limit the possibility of these materials being released to the public and/or the environment. Development and implementation of these documents reduces these impacts to a less than significant level.

The proposed General Order is not anticipated to create a significant hazard to the public. Enrollees are required to comply with local, state and federal laws and regulations associated with the transportation, use and disposal of hazardous materials including the Resource Conservation and Recovery Act (RCRA) and CCR, Title 22, Division 4.5. Project proponents are not authorized under the General Order to dispose of hazardous materials outside designated disposal facilities.

The plans required in the NOI/RAP must be designed to avoid creating hazards to the public or environment through the routine transport, use, or disposal of hazardous materials.

- 9B. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

**Less than significant impact.** See response #9a (above). The proposed General Order is not anticipated to create a significant hazard to the public. Project proponents are required to comply with local, state, and federal regulations associated with the generation, handling, and transportation of hazardous materials. Furthermore, spills and accidental release of amendments are prohibited and applicants must evaluate health and safety issues associated with the remedial activities and provide a protection plan for those involved in the operation and maintenance of the site.

- 9C. Would the project emit hazardous emissions or handle hazardous or acutely

hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

**Less than significant impact.** See response #9a (above). Any unauthorized release of contaminants to soil or groundwater requires remediation of the release regardless of the location. All groundwaters basins within the state have designated municipal beneficial uses, for drinking water purposes, unless the basin has been de-designated. The responsible party of the unauthorized release will be required to remediate the release which may include the use of amendments. Several amendments listed are considered hazardous due to their corrosivity and toxicity values. However, in a controlled environment, the listed amendments are known and proven to treat contaminated groundwater to comply with California Division of Drinking Water Maximum Contaminant Levels.

Applicants are required to assess the project and the amendments being used to determine if hazardous emissions will occur and if special handling of the chemical is required. Hazardous emissions are regulated by the California Air Resources Board and all applicants are required to comply with all local, state and federal regulations regarding air quality. Applicants are also required to submit a Sensitive Receptor Survey and Protection Plan to identify sensitive receptors and mitigation measure to protect those receptors and a Health and Safety Plan to identify the chemicals being used and mitigation measures that will be incorporated throughout the life of the project to protect on-site workers and the general public. Furthermore, applicants are required to submit a Remediation System Failure Contingency Plan to address procedures that will be implemented to respond to any emergencies caused by an unauthorized release due to failure of the remediation system.

- 9D. Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

**Less than significant impact.** See responses #9a and #9c (above). It is possible that a project eligible for coverage under the proposed General Order will be located on a site that is listed as a hazardous material site pursuant to Government code section 65962.5. However, the purpose of the proposed General Order is to cleanup the sites, eliminating the hazard from the public, and removing the sites from the list.

- 9E. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

**Less than significant impact.** See responses #9a and #9c (above). All external equipment must comply with federal, state, and local ordinances regarding noise and safety. Noise abatement equipment or techniques must be incorporated where necessary to meet applicable noise ordinances.

- 9F. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

**No impact.** The proposed General Order is not anticipated to interfere with any emergency response or evacuation plan.

- 9G. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

**Less than significant.** Some of the amendments authorized for use under the General Order may accelerate burning when involved in a fire and present other fire and explosion hazards. Proper handling and storage of the amendments is required under the General Order. Dischargers must evaluate the hazards and implement measures for protection of on-site personnel, emergency personnel, and the general public as a prerequisite for coverage under the General Order. Remedial activities that do not meet the requirements, may have coverage terminated and individual WDRs issued by the Executive Officer.

## 10. Hydrology and Water Quality

The level of impacts to hydrology and water quality are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
B	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	No	No	Yes	No
C	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in a substantial erosion or siltation on- or off-site?	No	No	Yes	No
D	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?	No	No	Yes	No
E	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	No	No	Yes	No
F	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows?	No	No	Yes	No



No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
G	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	No	No	Yes	No
H	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	No	No	No	Yes

**Discussion of Impact Assessment**

10A. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

**Less than significant impact.** Water quality standards are a combination of established beneficial uses and numerical or narrative water quality objectives in both surface water and groundwater. The Basin Plan, Chapter 2, lists the present and potential beneficial uses. Chapter 3 lists the narrative and numerical water quality objectives. In addition, the Basin Plan, Chapter 4.1 lists Regionwide Prohibitions that apply to all discharges regionwide, including those regulated under the General Order. Violation of the waste discharge requirements is prohibited and violation of water quality standards, including accepted SNMPs, outside the treatment zone is prohibited. Project that are expected to cause long term degradation of the assimilative capacity of a groundwater basin are not eligible for enrollment under the General Order.

Water quality standards may be exceeded during in-situ groundwater remediation through the application of amendments directly to the groundwater basin, but the degradation is only authorized within a defined treatment zone. Ex-situ remediation projects may also utilize amendments but are not anticipated to violate water quality standards because the groundwater within the treatment zone is extracted, treated above the ground surface, and routinely sampled prior to discharge to ensure the waste meets cleanup goals.

The amendments authorized for use are intended to have an overall, long-term beneficial effect, improving groundwater quality by promoting

degradation or stabilization of wastes for a variety of organic, inorganic, and heavy metal pollutants. Impacts to downgradient receptors outside the treatment zone are not authorized under the General Order. Pursuant to section II.A. of the General Order, project proponents are required to submit a RAP that describes the hydraulic controls to be employed to ensure the groundwater beneficial uses and water quality objectives, included in Chapters 2 and 3 of the Basin Plan, are not adversely affected nor exceeded, respectively, beyond the treatment zone.

Furthermore, coverage under the General Order will require implementation of an MRP, issued by the Executive Officer, to protect human health and the environment. The MRP will incorporate stringent groundwater monitoring both inside and outside the treatment zone for in-situ and ex-situ remediation activities to ensure pollutants, amendments, and by-products are not migrating offsite. Project proponents that violate water quality standards outside the treatment zone will be required to remediate the impacts and are subject to enforcement action, including imposition of administrative civil liabilities and potential criminal indictments. Individuals affected by the pollution may be provided safe and clean drinking water until the water quality meets regulatory standards, pursuant to the federal Safe Drinking Water Act and state regulations. The General Order prohibits violation of cleanup goals and continued discharge of pollutants.

- 10B. Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

**Less than Significant.** The General Order does not authorize significant depletion of groundwater supplies or interference with groundwater recharge, but a small net loss may occur from discharges to land due to evaporation. Ex-situ remediation activities must return the groundwater to the same groundwater basin from which it was withdrawn, and the treated groundwater may be discharged to ephemeral drainages in attempt to limit the amount of loss and promote groundwater supply sustainability.

- 10C. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on- or off- site?

**Less than significant impact.** Project applicants are required, pursuant to

section II.A of the General Order, to submit a RAP that includes a Storm Water Management Plan to control storm water to limit erosion and offsite sediment deposition and to submit a Maintenance Plan for those projects that propose to discharge treated groundwater to an ephemeral drainage to limit alteration of the existing drainage pattern and course of the drainage.

- 10D. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite?

**Less than significant impact.** See response #10c (above).

- 10E. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would create or contribute runoff water which would exceed the capacity or existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

**Less than significant impact.** The General Order is designed to allow the addition of impervious surfaces, if necessary, which may increase the rate of runoff and to allow discharges to ephemeral drainages. However, Storm water runoff and discharges to ephemeral drainages must be managed by project proponents in a manner that prevents scouring, erosion and sediment deposition downstream. Discharges to ephemeral drainages during storm events may be restricted to prevent exceedance of the drainage capacity and discharges are routinely sampled to ensure the treated groundwater meets cleanup goals.

- 10F. Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would impede or redirect flood flows?

**Less than significant impact.** The proposed General Order is designed to prohibit the alteration of drainage patterns and impacts to surface waters, but additional impervious surfaces may be installed. The amount of runoff generated as a result of the additional impervious surfaces is anticipated to

be relatively small in volume and not increase flood flows.

- 10G. Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

**Less than significant impact.** The General Order is designed to be applicable throughout the Lahontan region. Flooding and seiche hazards are present in various counties within Lahontan region; therefore, pollutants have the potential to be released into the environment during a natural disaster. Project proponents are required, pursuant to section II.A of the General Order to submit a RAP that includes identification of natural hazard zones and to prepare an Emergency Response Plan in the event of a natural disaster.

- 10H. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

**No impact.** The General Order would not obstruct implementation of a water quality control plan or sustainable groundwater management plan.

## 11. Land Use and Planning

The level of impacts to land use and planning are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Physically divide an established community?	No	No	No	Yes
B	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	No	No	No	Yes

### Discussion of Impact Assessment

- 11A. Would the project physically divide an established community?

**No impact.** The General Order does not support division of an established community. The nature of remediation activities (non-linear, small size, limited infrastructure, temporary) allowed under the General Order does not

contribute to physically dividing an established community.

- 11B. Would the project cause a significant environmental impact due to conflict with any land use plan, policy or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

**No impact.** Adoption of the General Order and the remediation activities eligible for coverage would not conflict with any land use plan, policy, or regulation.

## 12. Mineral Resources

The level of impacts to mineral resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	No	No	No	Yes
B	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	No	No	No	Yes

### Discussion of Impact Assessment

- 12A. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

**No impact.** Many quarries exist in the Lahontan region, extracting lanthanide minerals, iron ore, pumice, marble, limestone, talc, asbestos, sand and gravel, and gold. Some technologies used to extract the minerals include the use of man-made volatile organic compounds. Therefore, in-situ and ex-situ remediation may occur at a mining quarry that produces a valuable mineral resource which are subject to the same regulatory standards, but project implementation is not anticipated to reduce the availability of the commodity.

- 12B. Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or

other land use plan?

**No impact.** Adoption of the General Order and remediation activities eligible for coverage, are not anticipated to impact the availability of a local mineral resource recovery site.

### 13. Noise

The level of impacts to noise are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Generation a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	No	No	Yes	No
B	Generation of excessive groundborne vibration or groundborne noise levels?	No	No	Yes	No
C	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	No	No	Yes	No

### Discussion of Impact Assessment

- 13A. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

**Less than significant impact.** Remediation sites eligible for coverage under the General Order are not anticipated to generate noise levels above local government ordinances. Noise abatement equipment or techniques must be incorporated where necessary to comply with local regulatory noise ordinances.

13B. Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?

**Less than significant impact.** In-situ and ex-situ remediation activities are not anticipated to generate excessive ground-borne vibration of ground-borne noise levels.

13C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

**Less than significant impact.** In-situ and ex-situ remediation activities may occur in the vicinity of a private airstrip, within two miles of a public airport, and in the vicinity of an airport land use plan. Project proponents are required to comply with all local regulatory noise ordinances. Noise abatement equipment or techniques must be incorporated where necessary to comply with local regulatory noise ordinances.

#### 14. Population and Housing

The level of impacts to population and housing are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	No	No	No	Yes
B	Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	No	No	No	Yes

#### Discussion of Impact Assessment

14A. Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or

directly (for example, through extension of roads or other infrastructure)?

**No impact.** In-situ and ex-situ remediation are not predicted to induce substantial unplanned population growth.

14B. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

**No impact.** In-situ and ex-situ remediation activities are not expected to displace people and housing or generate the need for replacement housing.

## 15. Public Services

The level of impacts to public services are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Fire protection?	No	No	No	Yes
B	Police protection?	No	No	No	Yes
C	Schools?	No	No	No	Yes
D	Parks?	No	No	No	Yes
E	Other public facilities?	No	No	No	Yes

## Discussion of Impact Assessment

15A. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any fire protection, police protection, schools, parks, or any other public facilities?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage are not expected to necessitate the need to increase the numbers of emergency personnel or construction of new government facilities to maintain emergency



response times or other performance objectives for any other public services listed.

## 16. Recreation

The level of impacts to recreation are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	No	No	No	Yes
B	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	No	No	No	Yes

### Discussion of Impact Assessment

- 16A. Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

**No impact.** In-situ and ex-situ remediation projects eligible for coverage are not anticipated to increase the use of existing regional parks or recreational facilities.

- 16B. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage do not include recreational facilities and are not anticipated to require the construction or expansion of recreational facilities.

## 17. Transportation

The level of impacts to transportation are evaluated based on the following questions

posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	No	No	No	Yes
B	Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	No	No	No	Yes
C	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	No	No	Yes	No
D	Result in inadequate emergency access?	No	No	Yes	No

### Discussion of Impact Assessment

- 17A. Would the project conflict with program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

**No impact.** In-situ and ex-situ remediation activities eligible for coverage are not anticipated to conflict with any local government ordinance regarding safe and effective transportation policies.

- 17B. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?

**No impact.** Adoption of the General Order and activities associated with groundwater and soil remediation would not conflict with or be inconsistent with any CEQA guidelines.

- 17C. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

**Less than significant impact.** \*In-situ and ex-situ remediation activities are not anticipated to increase hazards due to geometric design features or

create incompatible uses. Applicants should comply with all local planning and building design ordinances intended to address such conditions.

17D. Would the project result in inadequate emergency access?

**Less than significant impact.** Remediation sites eligible for coverage should comply with local government laws and ordinances regarding emergency access. Applicants are required to submit an Emergency Response Plan to identify the actions taken throughout the life of the project to protect on-site workers and the public.

**18. Tribal Cultural Resources**

The level of impacts to tribal cultural resources are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	No	No	No	Yes
B	A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	No	No	No	Yes

## Discussion of Impact Assessment

- 18A. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

**No impact.** The Lahontan Water Board initiated AB 52 Tribal Consultation on July 3, 2018, pursuant to Public Resources Code section 21080.3.1. A request for consultation was received from San Manual Band of Mission Indians, and the Lahontan Water Board consulted with the Tribe.

When soil excavation is necessary to construct and implement the remediation, that work is anticipated to occur in areas already constructed or disturbed and the likelihood of encountering tribal cultural resources is low. Any associated soil movement and disturbance is unlikely to create a significant impact to cultural resources in comparison to existing baseline conditions. However, Section II.A of the proposed General Order requires applicants to submit a RAP including a Sensitive Receptor Survey and Protection Plan to identify impacts to cultural resources. In-situ and ex-situ remediation activities eligible for coverage under the General Order are not authorized to demolish, destroy, relocate, or alter the historical resource such that the significance of the historical resource would be materially impaired. Applicants are encouraged to contact the California Historical Resources Information Center relative to the County at which the proposed remediation will occur. A list of information centers can be found on the [National Register of Historic Places](#) website. Despite diligent advance research, inadvertent discoveries may occur. In such cases, work crews will stop work in the vicinity of a cultural resource discovery to avoid damage until a qualified archaeologist can assess the significance of the find. If necessary, treatment measures will be developed in consultation with appropriate agencies and tribal representatives. Such measures could include requiring that the site be avoided, conducting recovery excavations, and/or capping the site to avoid further disturbance of artifacts.

- 18B. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined

in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency must consider the significance of the resources to a California Native American tribe.

**No impact.** See response #18a (above).

**19. Utilities and Service Systems**

The level of impacts to utilities and service systems are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	No	No	Yes	No
B	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	No	No	No	Yes
C	Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	No	No	No	Yes
D	Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure,	No	No	No	Yes

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
	or otherwise impair the attainment of solid waste reduction goals?				
E	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	No	No	No	Yes

### Discussion of Impact Assessment

- 19A. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities or the construction or relocations of which could cause significant environmental effects?

**Less than significant impact.** In-situ and ex-situ remediation activities are not anticipated to affect existing utilities and service systems. New construction of on-site treatment systems may occur, additional stormwater drainage systems may need to be constructed, and the project may need to connect to the existing utility systems. Applicants are required to submit a RAP that describes the treatment system and to submit a Stormwater Management Plan.

- 19B. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

**No impact.** It is anticipated sufficient water supplies will be available for treatment throughout the life of the remediation project.

- 19C. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

**No impact.** The waste is not anticipated to be discharged to a wastewater treatment system.

- 19D. Would the project generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

**No impact.** The amount of solid waste generated by remediation activities is expected to be minimal and not exceed state or local standards, local infrastructure, or impair the attainment of solid waste reduction goals. Solid waste must be containerized, properly labeled, and disposed of within 90 days of generation.

- 19E. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

**No impact.** In-situ and ex-situ remediation activities are anticipated to comply with all local, state, and federal regulations regarding solid waste disposal. Copies of hazardous waste and/or non-hazardous waste manifests produced during generation and transportation of waste should be submitted to the Lahontan Water Board in the routine compliance monitoring reports.

## 20. Wildfire

The level of impacts to wildfire are evaluated based on the following questions posed under impact description in the matrix below as to whether the project is located in or near state responsibility areas or lands classified as very high fire hazard severity zones will the project:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Substantially impair an adopted emergency response plan or emergency evacuation plan?	No	No	No	Yes
B	Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	No	No	Yes	No
C	Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
D	Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	No	No	Yes	No

### Discussion of Impact Assessment

- 20A. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

**No impact.** Adoption of the General Order will not impair an adopted emergency response plan or emergency evacuation plan.

- 20B. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentration from a wildfire or the uncontrolled spread of a wildfire?

**Less than significant impact.** In-situ and ex-situ remediation activities eligible for coverage under the General Order will not exacerbate wildfire risks. However, portable generators use gasoline and some amendments used for groundwater and soil remediation have the potential to cause combustion, cause explosions, and produce harmful vapors when exposed to flame which may require siting, design, and installation of fire safety infrastructure in the event of a wildfire. Enrollees are required to comply with all Occupational Safety and Health Administration regulations. The regulations include proper training of personnel, an emergency response plan, proper labeling of chemicals, access to chemical safety data sheets, and on-site fire extinguishers.

- 20C. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?



**Less than significant impact.** Installation of remediation infrastructure is not anticipated to exacerbate fire risk. All remediation infrastructure are required to comply with local and state fire hazard ordinances and laws, intended to reduce a project's fire risk.

20D. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff post-fire slope stability, or drainage changes?

**Less than significant impact.** In-situ and ex-situ remediation sites should be designed to be protective of life and structures.

## 21. Mandatory Findings of Significance

The level of impacts to mandatory findings of significance are evaluated based on the following questions posed under impact description in the matrix below as to whether the project will:

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
A	Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	No	No	Yes	No

No.	Impact Description	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
B	Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)?	No	No	Yes	No
C	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	No	No	Yes	No

**Discussion of Impact Assessment**

Pursuant to CCR, title 14, section 15065, the Lahontan Water Board assessed the Mandatory Findings of Significance to determine if the proposed General Order would have a significant impact on human health and the environment. The mandatory findings of significance include the following:

- 21A. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

**Less than significant impact.** Discharges of waste authorized under the General Order are prohibited from causing a condition of pollution and nuisance, adversely affecting beneficial uses of groundwater and surface water outside the treatment zone, and causing an exceedance of any applicable Basin Plan water quality objective for groundwater and surface water outside of the treatment zone. The General Order is designed to regulate the discharges of waste associated with groundwater remediation in a manner that is protective of public health, wildlife, and aquatic life while

implementing the State Antidegradation Policy. The degradation within the defined treatment zone from the remedial activities is anticipated to be relatively short-term and produce maximum benefits with respect to water quality and long-term groundwater sustainability.

Pursuant to the provisions of the General Order, project proponents are required to comply with the WDRs outlined under the General Order. Enrollees must implement an MRP to observe the success of the remediation system and detect unauthorized impacts to downgradient receptors. In-situ and ex-situ remediation activities are not authorized to commence until a written determination is received by the Executive Officer that the remedial activities are protective of human health and the environment to the maximum extent practicable.

- 21B. Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of the past projects, the effects of other current projects, and the effects of probable future projects)?

**Less than significant impact.** Considering the effects of past remediation activities, the effects of current cleanup actions, and the effects of probably future cleanup actions, the project is unlikely to result in cumulatively considerable effects on the environment. Waste may either be disposed of by subsurface infiltration or injection, surface infiltration or percolation trenches or basins, evaporation ponds, land spreading, spray disposal, irrigation, or discharged to ephemeral drainages. Discharge of waste must be limited to the same groundwater basin from which the water was withdrawn. While more than one remediation activity could occur within the same groundwater basin, it is unlikely to result in cumulatively considerable effect. Infrastructure associated with the remediation would be removed and the site restored to pre-project conditions to the maximum extent practicable upon completion and pollution would be remediated thus improving conditions in the groundwater.

Some of the amendments authorized for use are considered hazardous to humans and aquatic organisms, are reactive, combustible, and require special handling and storage. However, the General Order contains requirements and prohibitions to ensure the hazardous materials are handled, stored, and disposed of properly. Adoption of the General Order and the remediation activities eligible for coverage are expected to result in net

positive benefits to groundwater quality while allowing temporary water quality degradation within a defined treatment zone. Prior to eligibility determination, applicants are required to submit a RAP to identify the methods of compliance with WDRs and prohibitions to protect human health and the environment. Enrollees are required to monitor groundwater downgradient of the treatment zone to guarantee compliance with the WDRs and prohibitions.

Pursuant to section II.A of the General Order, project proponents are required to submit a RAP that identifies all sensitive receptors and measures to protect sensitive receptors. The document must include all biological resources, cultural resources (including unique paleontological resources), surface waters, and water supply wells (municipal and private domestic water supply, agricultural supply, industrial supply, etc.) located onsite and within 500 feet of the plume boundary and compliance point(s). The technical documents required in the RAP are required to ensure protection of water quality and the environment.

- 21C. Does the project have environmental effects which will cause substantially adverse effects on human beings, either directly or indirectly?

**Less than significant.** See response #21C (above). In-situ and ex-situ remediation activities eligible for coverage under the proposed General Order are expected to remediate groundwater. The General Order requires compliance with all local, state, and federal laws and regulations. Compliance will bring favorable results and not cause adverse effects on human beings, either directly or indirectly.

#### **IV. NEGATIVE DECLARATION**

**Project Title:** General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation Projects

**Lead Agency:** Lahontan Regional Water Quality Control Board

**South Lake Tahoe Office Address:** 2501 Lake Tahoe Boulevard  
South Lake Tahoe, CA 96150

**Victorville Office Address:** 15095 Amargosa Road, Building 2, Suite 210  
Victorville, CA 92394

**Contact person and information:** Kerri O’Keefe, Engineering Geologist  
Phone: (530) 542-5473  
Email: kerri.okeefe@waterboards.ca.gov

**Project location:** Project locations will vary throughout the jurisdiction of the Lahontan Water Board including portions of Alpine, El Dorado, Inyo, Kern, Lassen, Los Angeles, Modoc, Mono, Nevada, Placer, Plumas, San Bernardino, and Sierra counties.

**Zoning:** The remediation sites are anticipated to be conducted in areas with varying zoning ordinances. The restrictions may vary per project location. All applicants should remain compliant with city, county, state and federal ordinances and laws related to zoning and land use.

**General Plan Designation:** Varies throughout the Lahontan region.

**Surrounding land uses and setting:** The project will apply to sites throughout the jurisdiction of the Lahontan Water Board, including areas with all types of land uses and settings. Land use restrictions may be placed on the land associated with remediation sites if hazardous materials or hazardous wastes or constituents remain in soils and groundwater on the site property at levels that are harmful to human health and the environment.

**Other public agencies whose approval is required:** Permits may be required by local governments and other regulatory agencies for, but not limited to, working in public right-of-way, scenic quality requirements, installing groundwater monitoring/remediation wells, site grading, construction of structures and roads, installation of utilities, and discharges that have the potential to impact air quality.

**Project Description:** Pursuant to Division 7 of the California Water Code, the Lahontan Water Board is proposing to adopt a General Waste Discharge Requirements for In-situ and Ex-situ Groundwater Remediation (General Order) to regulate the use of chemical,

organic and biological compounds for cleanup at polluted groundwater sites and to regulate the discharges of the waste associated with the cleanup.

Under regulatory oversight and strict monitoring, the various compounds authorized for use are known to reduce pollutant concentrations in groundwater to acceptable drinking water levels. The compounds include chemical oxidants, chemical oxidant activators, aerobic bioremediation enhancement compounds, anaerobic degradation enhancement compounds, reduction degradation enhancement compounds, metals precipitation/stabilization, sorption/biodegradation biomatrix, surfactants/co-solvents, bioaugmentation organisms, tracer study compounds, buffer solutions and pH adjusters, biofouling control agents, adsorption injectants.

The proposed General Order will authorize the disposal of waste by subsurface infiltration or injection, surface infiltration or percolation trenches or basins, evaporation ponds, land spreading, spray disposal (i.e., for dust control), or irrigation and allow discharge to ephemeral drainages that are not waters of the US. The waste must be returned to the same groundwater basin that the water was withdrawn to promote groundwater supply sustainability.

Adoption of the General Order and the remediation activities eligible for coverage are expected to result in net positive benefits to groundwater quality while allowing temporary water quality degradation within a defined treatment zone. Prior to eligibility determination, applicants are required to submit a Remedial Action Plan (RAP) to identify the methods of compliance with waste discharge requirements and prohibitions to protect human health and the environment. Issuance of coverage under the General Order is at the discretion of the Executive Officer. Applicants are required to determine the assimilative capacity of the groundwater basin, establish background water quality and monitor groundwater downgradient of the treatment zone to guarantee compliance with the waste discharge requirements and prohibitions. The technical documents are required to ensure protection of water quality and the environment.

Adoption of the General Order would: (a) simplify the application process for enrollees; (b) provide a level of protection comparable to individual, site-specific waste discharge requirements; and (c) preserve water resources by returning the waste to the same groundwater basin.

**Finding:** This is to advise that the Lahontan Water Board, acting as Lead Agency, has approved the project described, above, on June 8, 2022, and has made the following determinations regarding the project:

1. The project **will not** have a significant effect on the environment.

2. A Negative Declaration was prepared for this project pursuant to the provision of CEQA.
3. Mitigation measures **were not** made a condition of the approval of the project.
4. A statement of Overriding Consideration **was not** adopted for this project.

This is to certify that the responses and record of project approval is available to the General Public at the offices of the Lahontan Water Board:

- 2501 Lake Tahoe Boulevard, South Lake Tahoe, CA, Phone: (530) 542-5400, Fax: (530) 544-2271
- 15095 Amargosa Road, Building 2 – Suite 210, Victorville, CA 92394, Phone: (760) 241-6583, Fax: (760) 241-730



MICHAEL R. PLAZIAK  
EXECUTIVE OFFICER  
LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD

Date: June 8, 2022

## V. REFERENCES

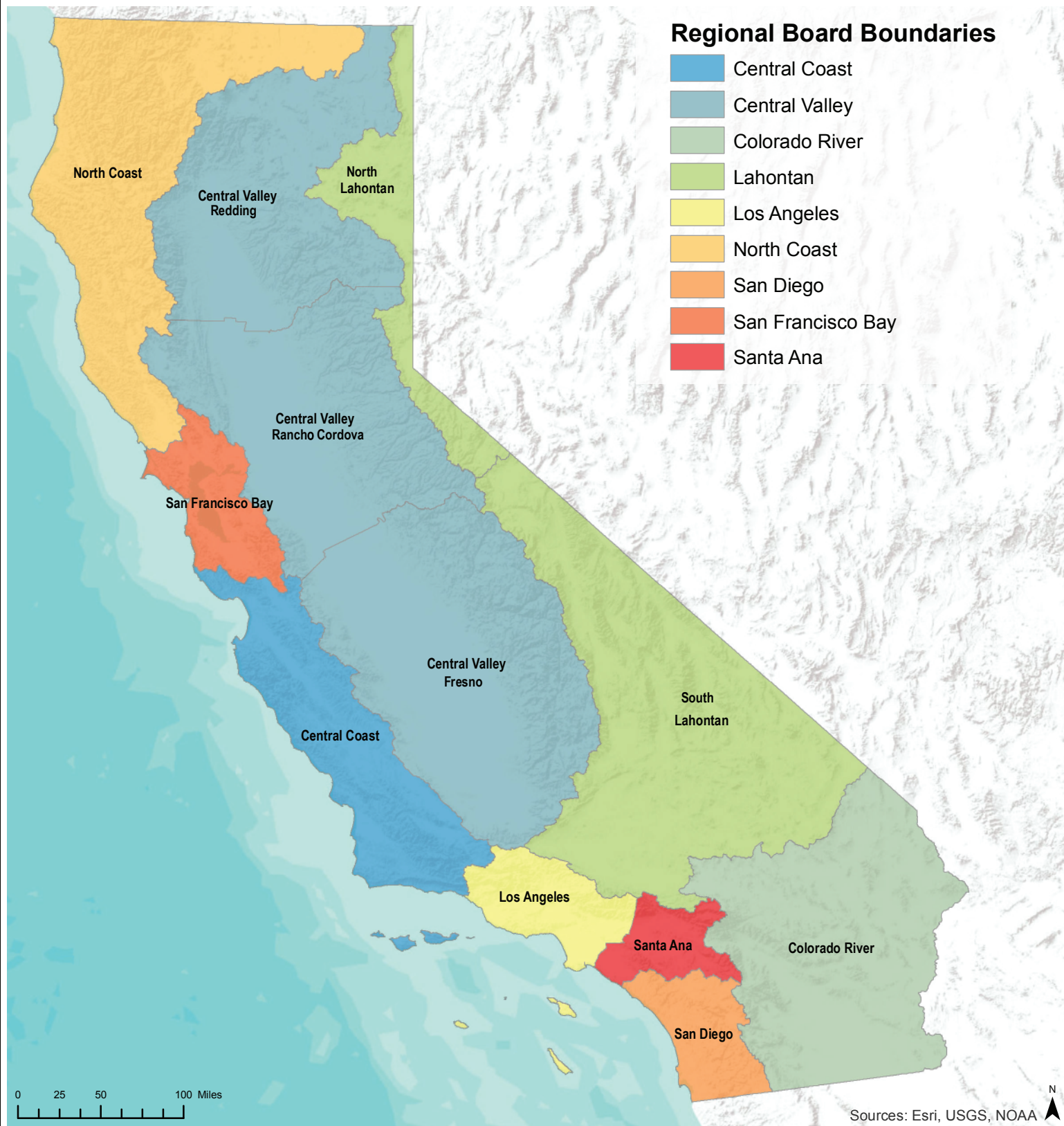
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# FIGURES

# Figure 1 California State Water Resources Control Board Regional Board Boundaries



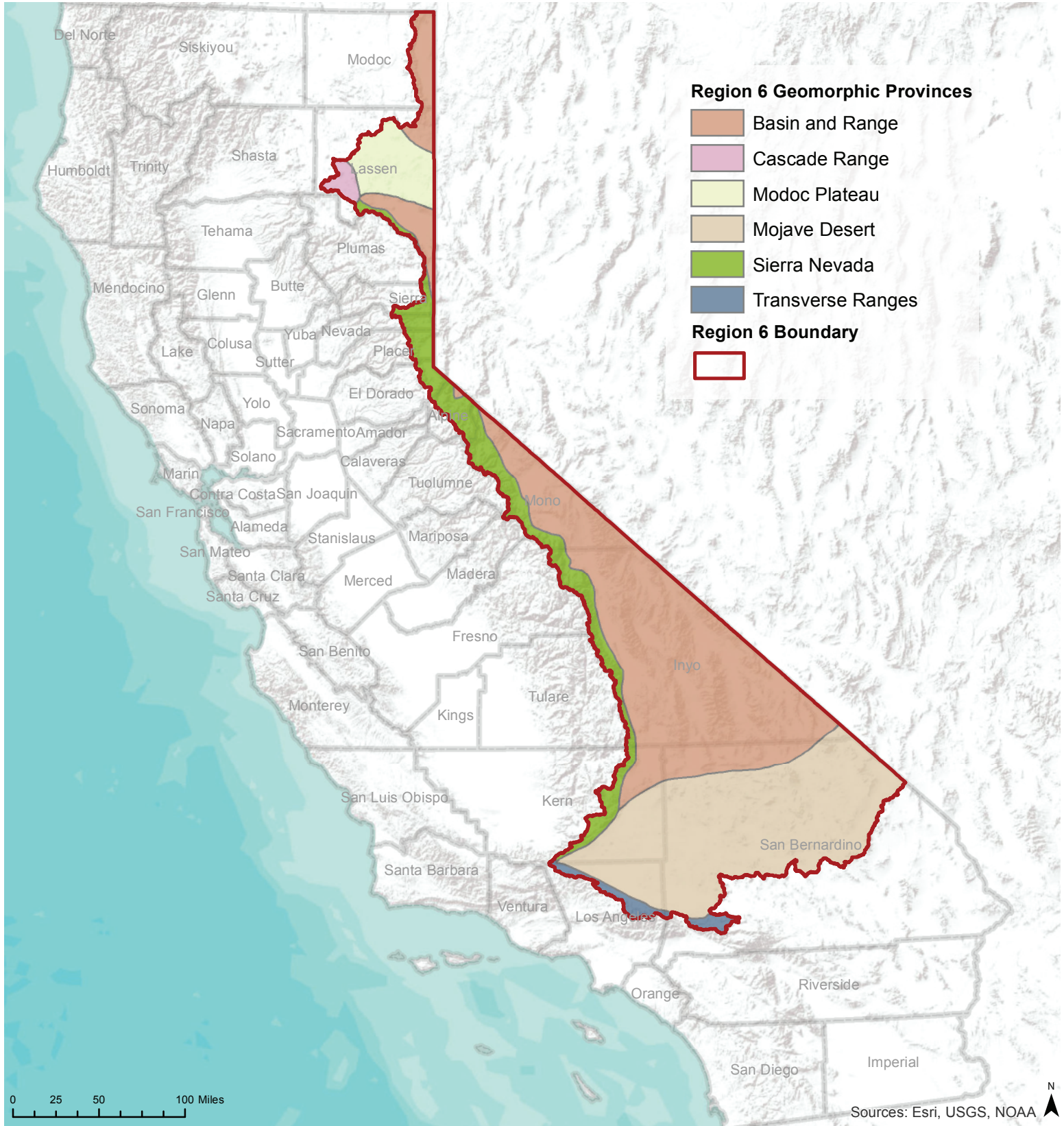
The RWQCB jurisdictions are defined in California Water Code section 13200 and are generally coterminous with the major surface water hydrologic basins of the state. The Regional Board Offices dataset has been compiled from sources (primarily the Calwater v.2.2.1 dataset) at 1:24,000 scale.

Document Path: R:\RB6\RB6Tahoe\SHARED\GIS\Projects\CEQA Maps\CABoardBoundaries.mxd



Figure 2

# Lahontan Regional Water Quality Control Board Geomorphic Provinces



The Geomorphic Provinces of California is a service provided by California's Department of Conservation via <https://gis.conservation.ca.gov/server/rest/services/CGS/GeoGems/MapServer>



Figure 3

# Lahontan Regional Water Quality Control Board North Lahontan Groundwater Basins

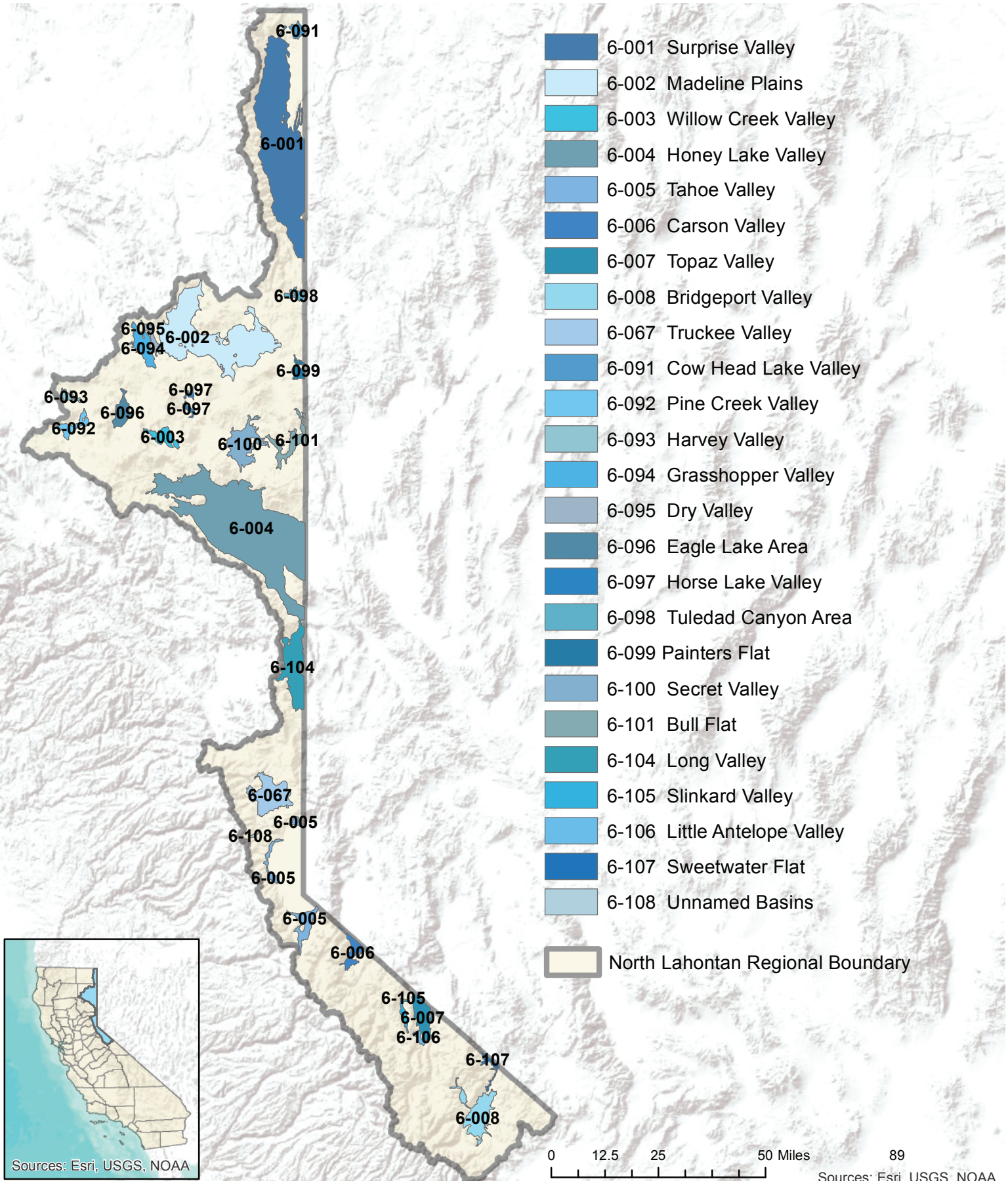
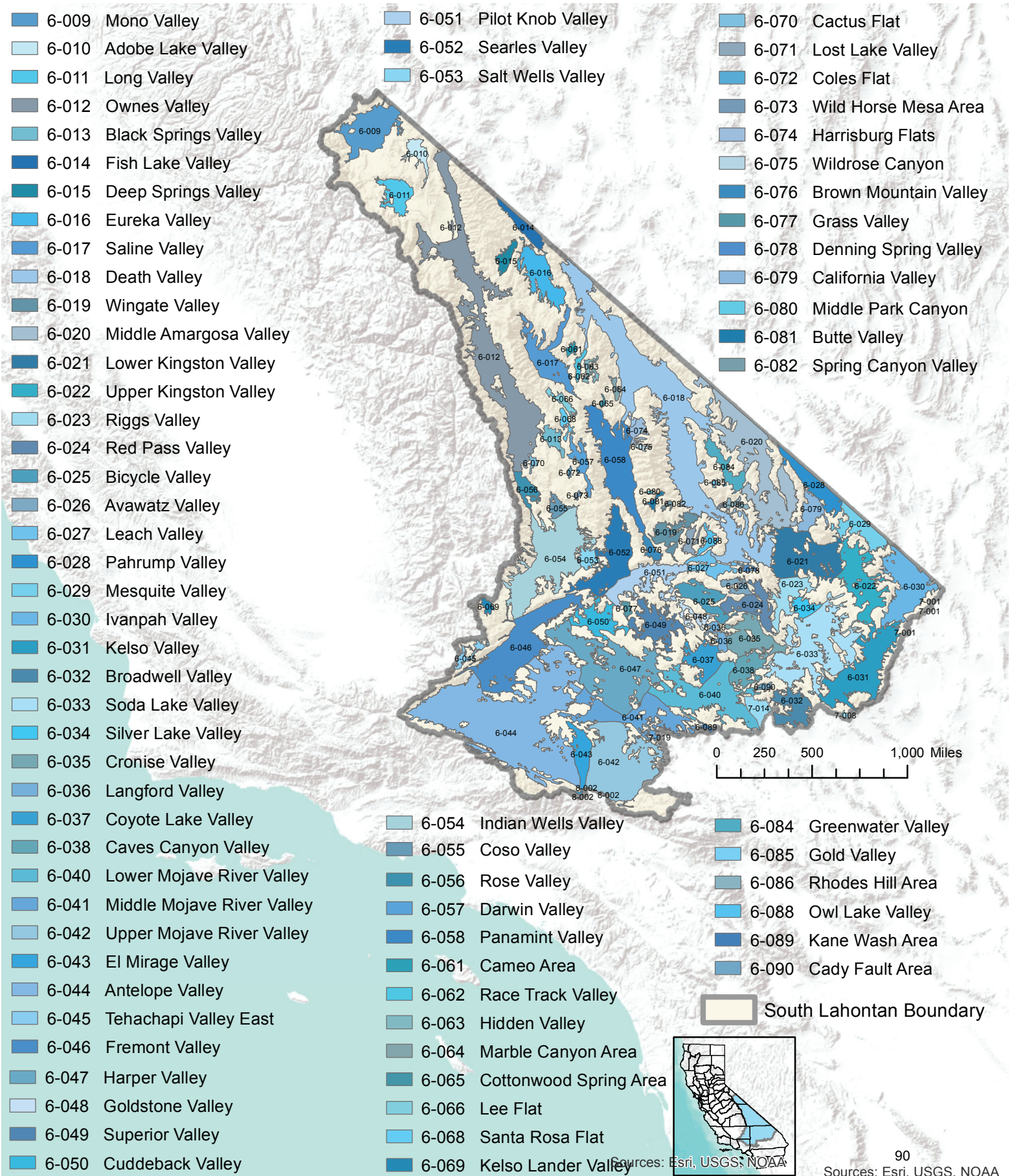




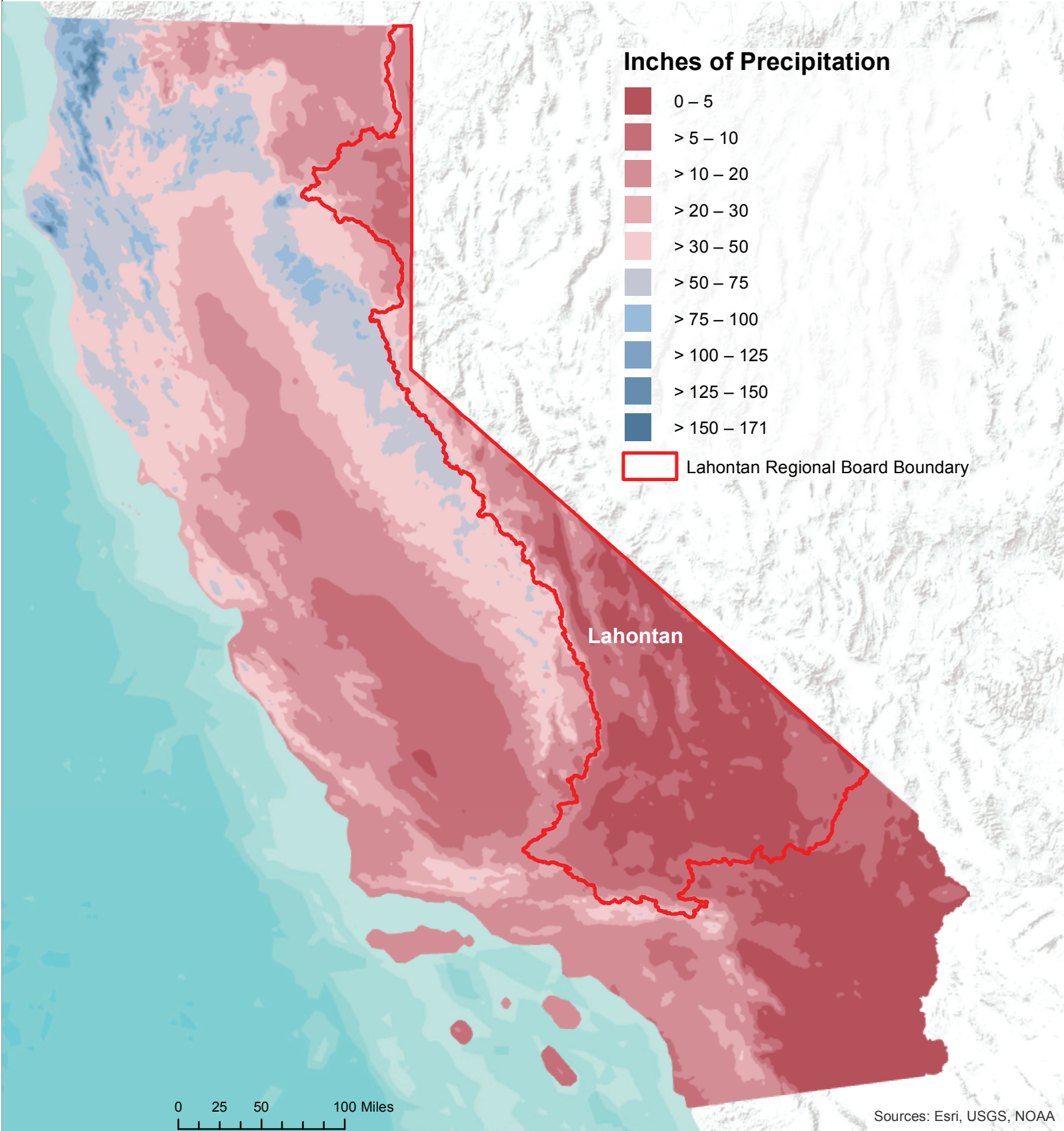
Figure 4

# Lahontan Regional Water Quality Control Board South Lahontan Groundwater Basins





# Figure 5 Lahontan Regional Water Quality Control Board Average Annual Precipitation

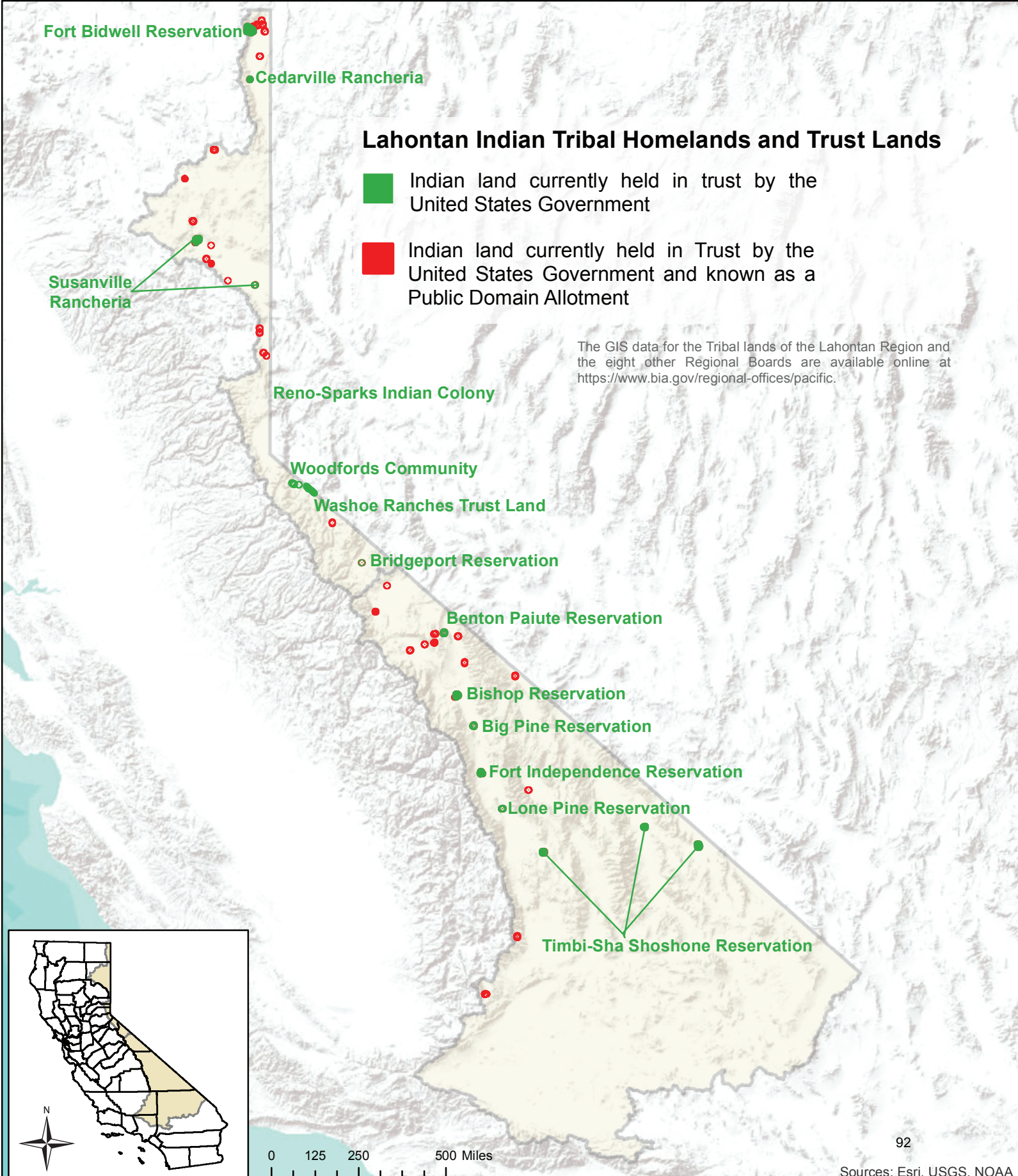


The precipitation data are average monthly and average annual precipitation for the climatological period 1961-1990, 1971-2000 and 1981-2010. The maps were created from 30 arc-seconds (~800m) PRISM derived grids. For further information, the online PRISM homepage can be found at <http://www.prism.oregonstate.edu>.



Figure 6

# Lahontan Regional Water Quality Control Board Tribal Homelands and Trust Lands





# **APPENDICES**

**Appendix A**  
**List of Amendments Proposed for In-Situ and Ex-Situ Remediation**  
California Regional Water Quality Control Board  
Lahontan Region

The list below does not represent any endorsement of products or materials by the Lahontan Regional Water Quality Control Board (Lahontan Water Board). Many of the products/materials listed are patented. Users of these products/materials shall comply with any regulations and laws applicable to the use or the products/materials. Some products/materials may contain byproducts or impurities that the Lahontan Water Board does not authorized to be used. Compounds listed under one category can also be used under another category.

**1. Chemical Oxidants**

- Fenton's reagent
  - Hydrogen peroxide
  - Ferrous iron catalyst
- pH buffer
- Hydrogen peroxide
- Ozone
- Potassium permanganate
- Potassium persulfate
- Sodium percarbonate
- Sodium permanganate
- Sodium persulfate

**2. Chemical Oxidant Activators**

- Calcium hydroxide
- Chelating agents
  - Ferric ethyldiaminetetraacetic acid (EDTA)
  - Sodium citrate
  - Sodium malonate
  - Sodium phytate
- Silica and silicates
  - Silicic acid
  - Sodium silicate
  - Silica gel
- Sodium hydroxide

**3. Aerobic Bioremediation Enhancement Compounds**

- Calcium oxide / peroxide

Calcium oxyhydroxide  
Magnesium  
    Oxide / hydroxide / peroxide  
Methane (dissolved phase)  
Propane (dissolved phase)

#### **4. Anaerobic Degradation Enhancement Compounds**

Ammonium chloride  
Ammonium nitrate  
Ammonium sulfate  
Calcium sulfate  
    Gypsum  
Cheese whey  
Complex organic materials  
    Starch  
    Wood chips  
    Yeast extract  
    Grain milling products  
    Chitin  
    Compost  
Complex sugars  
Corn syrup  
Disodium phosphate  
Emulsified vegetable oil  
Ethanol  
Glucose  
Glycerol esters of fatty acids and polylactates  
Glycerol polylactate / tripolylactate  
Glycerol, xylitol, sorbitol  
Guar  
Hematite  
Lactose  
Lecithin  
Magnesium sulfate  
Milk whey  
Methanol  
Molasses  
Monosodium phosphate  
Nitrous oxide  
Organic acids (acetate, lactate, propionate, benzoate, and oleate)  
Orthophosphoric salts

Phosphoric acid  
Polyphosphate salts  
Potassium phosphate  
Potassium sulfate  
Propanol  
Sodium trimetaphosphate  
Sorbitol cysteinate / cysteine  
Triethyl phosphate

**5. Reduction Degradation Enhancement Compounds**

Ferrous chloride  
Ferrous gluconate  
Ferrous sulfate  
Sodium dithionite  
Zero-valent iron

**6. *Metals Precipitation/Stabilization***

Calcium phosphate  
Calcium polysulfide  
Ferrous sulfate  
Sodium tripolyphosphate (STPP)

**7. Sorption/Biodegradation Biomatrix**

Liquid activated carbon

**8. Surfactants/Co-solvents**

Benzenesulfonic acid  
Dioctyl sodium sulfosuccinate  
D-limonene  
Ethoxylated castor oils surfactants  
Ethoxylated cocamide surfactants  
Ethoxylated coco fatty acid surfactants  
Ethoxylated octyl phenolic surfactants  
Sorbitan monooleate  
Xanthan gum

**9. Bioaugmentation Organisms**

Dischargers shall prove that any bacterial genomes in original injection form, its degradation form, other impurity or by-product shall not be human/animal pathogens. Genetically-modified organisms (GMO) should not be used.

Dehalococcoides spp.  
Dehalobacter spp.  
Geobacter  
Methanomethylovorans  
Desulfovibrio  
Desulfobacterium

#### **10. Tracer Study Compounds**

*The tracer compounds shall be highly contrasting and not reactive with current contaminants to be treated. The tracers may be chloride-, bromide-, or fluoride-based salts, or similar materials as approved by the Executive Officer.*

Calcium bromide  
Calcium chloride  
Eosin dyes  
Fluoride salts  
Iodide  
Potassium bromide  
Potassium iodide  
Sodium bromide  
Sodium chloride  
Sodium fluorescein

#### **11. Buffer Solutions and pH Adjusters**

Calcium carbonate  
Calcium magnesium carbonate  
Potassium bicarbonate  
Sodium (carbonate / bicarbonate)

#### **12. Biofouling Control Agents**

Chlorine dioxide  
Calcium hypochlorite  
Sodium hypochlorite  
Hydroxyacetic acid  
Sulfamic acid  
Acetic acid  
Glycolic acid

#### **13. Adsorption Injectants**

Organic Carbon Products

**Appendix B**  
**Threatened and Endangered Species in the Lahontan Region**  
California Regional Water Quality Control Board

Common Name	Taxon Group	Federal Listed	California Listed
Arroyo Toad	Amphibians	Endangered	None
Black Toad	Amphibians	None	Threatened
California Red-legged Frog	Amphibians	Threatened	None
Oregon Spotted Frog	Amphibians	Threatened	None
Sierra Nevada Yellow-legged Frog	Amphibians	Endangered	Threatened
Southern Mountain Yellow-legged Frog	Amphibians	Endangered	Endangered
Yosemite Toad	Amphibians	Threatened	None
<b>Birds</b>			
Bald Eagle	Birds	Delisted	Endangered
Bank Swallow	Birds	None	Threatened
California Condor	Birds	Endangered	Endangered
Gilded Flicker	Birds	None	Endangered
Great Gray Owl	Birds	None	Endangered
Greater Sandhill Crane	Birds	None	Threatened
Inyo California Towhee	Birds	Threatened	Endangered
Least Bell's Vireo	Birds	Endangered	Endangered
Southwestern Willow Flycatcher	Birds	Endangered	Endangered
Swainson's Hawk	Birds	None	Threatened
Tricolored Blackbird	Birds	None	Threatened
Western Snowy Plover	Birds	Threatened	None
Western Yellow-billed Cuckoo	Birds	Threatened	Endangered
Willow Flycatcher	Birds	None	Endangered
Yuma Ridgway's Rail	Birds	Endangered	Threatened
<b>Crustaceans</b>			
Vernal Pool Fairy Shrimp	Crustaceans	Threatened	None
<b>Dicots</b>			
Amargosa Nitrophila	Dicots	Endangered	Endangered
Ash Meadows Daisy	Dicots	Threatened	None
Ash Meadows Gumplant	Dicots	Threatened	None
Ash-gray Paintbrush	Dicots	Threatened	None
Big Bear Valley Sandwort	Dicots	Threatened	None
Bird-foot Checkerbloom	Dicots	Endangered	Endangered
Boggs Lake Hedge-hyssop	Dicots	None	Endangered
Bristlecone Cryptantha	Dicots	None	Rare
California Dandelion	Dicots	Endangered	None
Cushenbury Buckwheat	Dicots	Endangered	None
Cushenbury Oxytheca	Dicots	Endangered	None

<b>Common Name</b>	<b>Taxon Group</b>	<b>Federal Listed</b>	<b>California Listed</b>
Eureka Dunes Evening Primrose	Dicots	Delisted	Rare
Father Crowley's Lupine	Dicots	None	Rare
Fish Slough Milk-vetch	Dicots	Threatened	None
July Gold	Dicots	None	Rare
Lane Mountain Milk-vetch	Dicots	Endangered	None
Long Valley Milk-vetch	Dicots	None	Rare
Mojave Tarplant	Dicots	None	Endangered
Mono Milk-vetch	Dicots	None	Rare
Mt. Gleason Paintbrush	Dicots	None	Rare
Nevin's Barberry	Dicots	Endangered	Endangered
Owens Valley Checkerbloom	Dicots	None	Endangered
Parish's Daisy	Dicots	Threatened	None
Red Rock Tarplant	Dicots	None	Rare
Southern Mountain Buckwheat	Dicots	Threatened	None
Spreading Navarretia	Dicots	Threatened	None
Tahoe Yellow Cress	Dicots	None	Endangered
Tracy's Eriastrum	Dicots	None	Rare
Webber's Ivesia	Dicots	Threatened	None
<b>Fish</b>			
Cottonball Marsh Pupfish	Fish	None	Threatened
Lahontan Cutthroat Trout	Fish	Threatened	None
Mohave Tui Chub	Fish	Endangered	Endangered
Owens Pupfish	Fish	Endangered	Endangered
Owens Tui Chub	Fish	Endangered	Endangered
Paiute Cutthroat Trout	Fish	Threatened	None
<b>Insects</b>			
Carson Wandering Skipper	Insects	Endangered	None
Crotch Bumble Bee	Insects	None	Candidate Endangered
Nevarres Spring Naucorid Bug	Insects	Candidate	None
Quino Checkerspot Butterfly	Insects	Endangered	None
Western Bumble Bee	Insects	None	Candidate Endangered
<b>Mammals</b>			
Amargosa Vole	Mammals	Endangered	Endangered
California Wolverine	Mammals	Proposed Endangered	Threatened
Fisher - West Coast Distinct Population Segment	Mammals	Endangered	Threatened
Gray Wolf	Mammals	Endangered	Endangered
Mohave Ground Squirrel	Mammals	None	Threatened
Sierra Nevada Bighorn Sheep	Mammals	Endangered	Endangered
Sierra Nevada Red Fox	Mammals	Proposed Endangered	Threatened
<b>Monocots</b>			
Eureka Valley Dune Grass	Monocots	Threatened	Rare
San Bernardino Blue Grass	Monocots	Endangered	None

Common Name	Taxon Group	Federal Listed	California Listed
Desert Tortoise	Reptiles	Threatened	Threatened
Southern Rubber Boa	Reptiles	None	Threatened