RESPONSE TO COMMENTS

CONSIDERATION OF ENROLLMENT OF SPACE EXPLORATION TECHNOLOGIES CORPORATION, VANDENBERG SPACE FORCE BASE (VSFB) SANTA BARBARA COUNTY SPACE LAUNCH COMPLEX 4 (SLC-4)

IN GENERAL WAIVER FOR SPECIFIC TYPES OF LIMITED-THREAT DISCHARGES PROPOSED ORDER R3-2026-0032, PURSUANT TO ATTACHMENT A, SECTION D AND PROPOSED MONITORING AND REPORTING PROGRAM ORDER R3-2026-0011

During a 30-day public comment period, which began on January 26, 2026, the Central Coast Water Board received written comments from four commenters on the proposed enrollment in Order R3-2024-0035 (subsequently revised to Proposed Order R3-2026-0032) *General Waiver for Specific Types of Limited-Threat Discharges* (General Waiver) for discharges of rocket launch water and intermittent comingled stormwater via onsite land surface disposal. As a condition of enrollment, Space Exploration Technologies Corporation (SpaceX; Discharger) must implement Proposed Monitoring and Reporting Program (MRP) Order R3-2026-0011. Central Coast Water Board staff responses to these comments are provided herein. The proposed General Waiver Notice of Applicability (NOA) and MRP Order R3-2026-0011 were not revised based on the public comments received.

Comments are listed in chronological order based on the date the comment was received by the Central Coast Water Board. While all comments are direct transcriptions from the comment letters, some comments have been revised for formatting, grammar, or removal of citations, links, or footnotes. Citations, links, and footnotes have been replaced, where necessary, by referrals to the documents.

Commenter Number	Commenter
--	Acronyms List for Response to Comments
1	Janet Brown
2	Carolyn E. Warren, California Native Plant Society - Channel Islands Chapter
3	Jim Stewart PhD
4	Nancy Okada, Sierra Club California Coastal, Chair

Acronym	Definition
BO	Biological Opinion
CA	California
CNPS -CIC	California Native Plant Society – Channel Islands Chapter
Central Coast Water Board	Central Coast Regional Water Quality Control Board
Deluge Water	Rapid release of water during launch/lift-off, to suppress vibrations, and reduce heat
Degrees C	Degrees Celsius
DAF	Department of the Air Force
DoD	Department of Defense
Discharger	Space Exploration Technologies Corp.; SpaceX
EA/FONSI	Environmental Assessment / Finding of no Significant Impact
EIS	Environmental Impact Statement
General Waiver	Order R3-2024-0035 (subsequently revised, Proposed Order R3-2026-0032); General Waiver for Specific Types of Limited-Threat Discharges
IRP	Air Force's Installation Restoration Program, responsible for legacy contamination assessment and cleanup (an Air Force program, not a Space Force program)
mg/L	Milligrams per Liter (also known as parts per million)
MMP	Mitigation and Monitoring Plan
MJ/M^3C	Megajoules per cubic Meter-Celsius; a unit used to measure the volumetric heat capacity of a material; the amount of energy in megajoules required to raise the temperature of one cubic meter of a substance by one degree Celsius, or 33.8 degrees Fahrenheit.
MMP	Mitigation and Monitoring Plan (Spring Canyon)
MRP	Monitoring and Reporting Program
NEPA	National Environmental Policy Act
NOA	Notice of Applicability
Order	Proposed Order R3-2026-0011
ROD	Record of Decision
Resolution 68-16	State Water Board Resolution 68-16*, Statement of Policy with Respect to Maintaining High Quality of Waters in California*
ROWD	Report of Waste Discharge
SLC- 4	Space Lauch Complex 4, located on south base VSFB, overlies a portion of the IRP's legacy cleanup site WP008.

Acronym	Definition
SLC-6	Space Lauch Complex 6, located on south base VSFB, approximately 3.3 miles south of SLC-4.
SpaceX	Space Exploration Technologies Corp.
TEA-TEB	Triethylaluminum-triethylboron; pyrophoric liquids that ignite spontaneously upon contact with liquid oxygen, water, and/or moisture in the atmosphere.
USFWS	United States Fish and Wildlife Service
VSFB	Vandenberg Space Force Base, formerly the Vandenberg Space Force Base; a Department of the Air Force installation.
Water Code	California Water Code
WDR	Waste Discharge Requirement
WQS	Water Quality Standard

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1.1	I strongly urge all involved to reject any attempt to increase rocket launches from Vandenberg, including here the wastewater discharge portion, involving commingling of launch wastewater with rainwater and stormwater, which, along with sonic booms and so on, is highly detrimental to native (and endangered) species in the sensitive coastal ecosystem (as well as to my older dog, who has been traumatized by sonic booms). This increase in launches (and a heavy launch rocket site) would create even more damage to all our local communities along the unique and vulnerable California coast with unique lands and species (which groups such as Audubon and the CA Native Plant Society are working tirelessly to preserve). Thank you for your help!	The Central Coast Water Board acknowledges these concerns. To the extent that this comment concerns potential impacts to water quality, the Central Coast Water Board has examined the evidence in the 2024 environmental assessment / finding of no significant impact (EA/FONSI) prepared by the Department of the Air Force (DAF) pursuant to the National Environmental Policy Act (NEPA); the 2025 NEPA environmental impact statement (EIS) prepared by DAF; the record of decision (ROD) authorizing space launch complex 6 (SLC-6) redevelopment and an overall launch cadence of up to 100 launches per year for Falcon 9 and Falcon Heavy launches from SLC-4 and SLC-6 combined; and the water quality data provided by SpaceX in its report of waste discharge (ROWD), and in groundwater monitoring data collected at the request of the Central Coast Water Board. The evidence shows that there will be no significant impact to water quality from discharges of launch wastewater commingled with stormwater. See, also, responses to comments 2.1 and 4.6.
2.1	We respectfully request that the Central Coast Water Board: 1. Require a comprehensive biological assessment evaluating potential impacts to native plant communities, sensitive habitats,	The Central Coast Water Board is authorized by federal and state statutes and regulations to issue waste discharge requirements (WDR) that regulate point source discharges and ensure compliance with the applicable surface water

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	and special-status species in and around the discharge area.	and groundwater water quality standards (WQS). Requiring an applicant of WDRs to perform biological assessments that do not pertain to water quality is not a common regulatory authority for the Central Coast Water Board. However biological-related mitigation is commonly required by the Central Coast Water Board 401 Program. In this regard, however, it should be noted that such issues were evaluated in the 2024 EA/FONSI and the 2025 EIS, notably in the United States Fish and Wildlife Service (USFWS) biological opinions (BOs) within the 2024 EA/FONSI and the 2025 EIS. The 2023 USFWS BO describes biological assessments, native plant communities, sensitive habitats, and special-status species in and around the SLC-4 facility. Potential impacts are evaluated/identified. The 2023 USFWS BO can be found in GeoTracker: https://geotracker.waterboards.ca.gov/?surl=ma5uv. The 2023 USFWS BO is an integral part of the 2024 EA/FONSI mentioned in response to comment 1.1 above. The 2024 EA/FONSI can be found in GeoTracker: https://geotracker.waterboards.ca.gov/?surl=jj85t.

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		The August 2025 USFWS BO is related to the 2023 USFWS BO, with some aspects related to SLC-4, but focuses more on SLC-6, which is located south of SLC-4. The 2025 BO is found in the 2025 EIS's Appendix Volume I; Appendix B and can be found in GeoTracker: https://geotracker.waterboards.ca.gov/?surl=sisdk. All of the 2025 EIS PDF files that make up the EIS, including the Record of Decision, can be accessed in GeoTracker: https://geotracker.waterboards.ca.gov/?surl=efwcr. As an example of implementation of USFWS mitigation findings, and subsequent regulatory authority exercised by the Central Coast Water Board, in a 2017 USFWS BO, the USFWS identified that 3.3-acres of vegetation in Spring Canyon, down-slope of the SLC-4 launch infrastructure, needed to be removed to just above ground level to avoid and minimize impacts to nesting migratory birds. In response to this the Air Force developed *Spring Canyon Riparian Mitigation and Monitoring Plan for the Falcon 9 Launch and Landing Program at SLC-4* (MMP) to mitigate 1.1 acres of willow riparian habitat removed.[1] In December 2017, Central

[1] *Spring Canyon Riparian MMP for the Falcon 9 Launch and Landing Program at SLC-4*: https://geotracker.waterboards.ca.gov/?surl=52203

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		Coast Water Board 401 Program staff approved the MMP, and required reporting.[2] The mitigation was implemented, monitored as required, and the outcome was successful. Monitoring reports can be accessed on GeoTracker: http://geotracker.waterboards.ca.gov/?gid=WDR100034387. Also refer to response to comment 4.6.
2.2	2. Evaluate cumulative impacts from repeated launches and wastewater discharges over time.	Evaluation of cumulative impacts from repeated discharges of wastewater will occur. Indeed, proposed Monitoring and Reporting Program (MRP) R3-2026-0011 requires launch deluge flame duct wastewater sampling from the retention basin once every 30 launches and annual groundwater monitoring from six groundwater monitoring wells located near and downgradient of the launch water spray field and within adjacent Spring Canyon. The required wastewater constituent analyses as presented in Tables 3 and 5 of the MRP will provide information to Central Coast Water Board staff to assess potential cumulative impacts to receiving water bodies over time. Furthermore, it should be noted that the Department of Defense (DoD) Installation Restoration Program (IRP) has been performing

[2] December 12, 2017, Central Coast Water Board MMP Approval Letter: https://geotracker.waterboards.ca.gov/?surl=52203

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		groundwater monitoring at Space Launch Complex 4 (SLC-4) since 1999; therefore, there is a baseline of groundwater quality information for near and downgradient of the discharge area. Should the cumulative impacts from repeated wastewater impacts be significant, the Central Coast Water Board will reevaluate whether enrollment in the General Waiver is the appropriate regulatory mechanism.
2.3	3. Consider whether enrollment under Section D of the General Waiver is appropriate given the unique and potentially hazardous nature of rocket launch wastewater, or whether individual waste discharge requirement would provide more protective oversight.	See responses to comments 1.1 and 2.2. Upon reviewing the data presented in the SLC-4, Falcon 9 Launch Facility ROWD application, Central Coast Water Board staff determined that the launch activity wastewater is not a hazardous waste and will not significantly impair or degrade water quality. Enrollment into Section D of the General Waiver is appropriate due to the low-threat nature of the discharge. Furthermore, there are additional conditions imposed on the Discharger via the MRP and as a condition of enrollment, as set forth in the NOA, which will further protect water quality. Finally, it should be noted that, since the General Waiver permit is conditional, enrollment does not permit any illegal activity, does not preclude the need for permits that may be required by other state or local government agencies, may be terminated at any time, and does not preclude the Central Coast Water

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		Board from administering enforcement remedies pursuant to the California Water Code. Nothing prevents the Central Coast Water Board from issuing individual waste discharge requirements (WDR) in the future, if necessary.
2.4	4. Extend the public comment period to allow for adequate time for review of technical documents.	Since the discharge at issue involves enrollment into Section D of the General Waiver and since the discharge at issue is not specifically listed in the General Waiver, the Central Coast Water Board provided the legally-required 30-day comment period in accordance with Water Code § 13167.5, subd. (a). A 30-day comment period is standard and provides adequate opportunity for stakeholders to review the enrollment documents and related technical documents. In this regard, it should be noted that, in May 2025, the DAF provided an opportunity to comment on the draft EIS, which included assessment of the potential ecological and biological impacts from the increase in launches at SLC-4. The EIS culminated in a ROD that was finalized on October 10, 2025. The ROD, EIS, and Attachment A with required mitigations are available on GeoTracker: https://geotracker.waterboards.ca.gov/?surl=efwcr. Therefore, there has been ample time to review the technical documents associated with this discharge and the activities in question. Finally, any additional comments may be

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		presented orally to the Central Coast Water Board for its consideration at the scheduled adoption hearing for this matter. As a courtesy, on March 18, 2026, Central Coast Water Board staff provided links to relevant technical documents to the Commentor 2 by email.
2.5	The California Native Plant Society – Channel Islands Chapter appreciates the opportunity to comment on this proposed action. We urge the Board to prioritize protection of the Central Coast's irreplaceable native plant communities and sensitive habitats by requiring a more thorough assessment of ecological impacts before authorizing this discharge. Thank you for your consideration. Please include this letter in the administrative record for this matter.	See response to comment 2.1. See, also, response to comment 4.6 regarding ecological impacts.[3]
3.1	I oppose enrollment into the General Waiver because when there is rain, there is significant contaminated water that washes into the ocean from the "spray" field injuring marine life. Enrollment into the General Waiver should not be permitted until this contamination during rain events is carefully measured.	Based on sampled rocket launch wastewater provided by the applicant, the launch wastewater sprayed onto the disposal area is not expected to have any contaminants of concern. Launch wastewater may not be sprayed onto the disposal area when soil saturation conditions exist, which coincides with rain events. As described in the notice of applicability (NOA)/MRP, the Discharger is not authorized to discharge to surface water, and

[3] This letter, and all timely comments received, have been made part of the record and have been uploaded to GeoTracker, and can be found at this link by navigating to and clicking on the "Site Maps / Documents" tab and scrolling down to the Site Documents: http://geotracker.waterboards.ca.gov/?gid=DOD100411300

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		the disposal areas must be inspected to ensure they are allowing wastewater to infiltrate as designed, there is no runoff, and surface soils are not saturated to the point of ponding. Moreover, enrollment in the General Waiver covers the discharge of rocket launch wastewater and commingled stormwater. Together with the monitoring and reporting plan, the General Waiver provides adequate controls and monitoring (i.e., via MRP) to ensure protection of water quality.
4.1	We would like to raise concerns in regard to several issues. The Sierra Club Coastal Committee is concerned that there have not been sufficient studies for the potential environmental effects from the increase in SpaceX launches from 36 to 50 and now to 100 launches, with the increased usage of large amounts of water, which is then disposed of into the surrounding environment. We question the possible effect of the raised temperature of the disposed wastewater on surrounding habitats, as this water will have been used to absorb and cool the flames of the proposed 100 launches, and thus would be above average temperature even when mixed and sprayed. It would also contain residual chemicals from the rocket fuels. Thermal pollution from discharged water used for cooling the launches	See responses to comments 1.1, 2.1, 2.2, and 3.1. Additionally, it is highly unlikely that any wastewater will adversely impact the ocean or marine life. As an initial matter, launch wastewater does not discharge directly into the Pacific Ocean because the discharge is applied to land with soil properties that result in percolation through the soil column, recharging groundwater, rather than over-land flow from the discharge to the ocean that is approximately 0.66 mile west of the spray field(s). In addition, there is heat loss before discharge, during discharge, and the soil and groundwater have a heat capacity that moderates any residual heat. Therefore, there are no temperature impacts on the ocean and the habitat the ocean supports. To explain further, wastewater is collected in

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	and equipment has potentially significant adverse impacts on the health and survival of biota in natural waterways taking this cooling water to the ocean, as well as on marine life near the discharge point. Many organisms are temperature-sensitive and may react negatively to temperature changes of only a few degrees. The near-shore coast is critical habitat for Zostera sp., eelgrass. Offshore, kelp forests may be also impacted by raised temperatures, associated with waters at the discharge point and beyond. The oceans are already impacted by warming temperatures from the climate's overall warming.	retention basin (where there is heat loss after the launch) and then pumped (with heat loss as it moves through the piping) to the spray field, with additional heat loss when sprayed and discharged to land. The discharged water that does not evaporate into the atmosphere is cooled when sprayed, enters the soil, where some of the water is subject to evapotranspiration (the spray field is vegetated) into the atmosphere and the balance of the discharged water percolates (rather than sheet flow on the surface, because of the soil type present and also because of the topography) through a soil column that is approximately 142 feet thick, before recharging groundwater. The heat capacity of this 142-foot (42.7-meter) soil column between the land and groundwater is significant; calculated to be approximately 153,700 MJ/M^{3}C {approximately 2 megajoules per cubic meter-Celsius (MJ/M^{3}C) for soil, times the 42.7 meter depth, times the 1,800 square meter spray field, which results in a total heat capacity of approximately 153,700 MJ/M^{3}C for the soil between the land surface and groundwater]. Additional factors that prevent adverse thermal impacts to marine life include the heat capacity of the soil and groundwater laterally as it travels distance of approximately 0.66 mile (3,480 feet) to the ocean; cold water percolation through the soil and recharge to groundwater during the rainy season; and,

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		upgradient groundwater flowing into the area at ambient temperatures. All of this means that the energy and heat from the launch water will dissipate prior to reaching the ocean and therefore will not impact the ocean or marine life.
4.2	We would like answers to the following questions: 1. When will the "preliminary/draft/unvalidated" groundwater monitoring data be finalized, and will the public have an opportunity to review it before the April hearing?	In May 2025, at the Central Coast Water Board's request, groundwater was sampled by the Air Force's Installation Restoration Program's contractor from twelve select wells located near the SLC-4 retention basin, along Spring Canyon, proximal to the spray fields, and downgradient of these areas. The groundwater samples were analyzed for TPH-diesel and for TPH using a jet-fuel quantification standard (TPH-JP-5). TPH-diesel and TPH-JP-5 were not detected above the limits of detection, which ranged from 99 to 100 µg/L. Validated/finalized results are available in GeoTracker: https://geotracker.waterboards.ca.gov/?surl=a5deo The table at that link also includes validated results for perchlorate and select chlorinated solvents (trichloroethane and its degradation products *cis*-1,2-dichloroethane and vinyl chloride). These chemicals are associated with legacy releases (e.g., circa 1960s to 1980s) and not associated with current launch-related activities. Please note that where there is a "U" in the

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		qualifier column, the analyte was analyzed for but not detected. As a courtesy, on March 18, 2026, Central Coast Water Board staff provided a link to access the validated/finalized groundwater monitoring data to Commentor 4 by email.
4.3	2. Has independent (non-SpaceX) water quality testing been conducted at SLC-4? If so, what were the results?	Groundwater quality at SLC-4/WP008 is tested/monitored on a regular basis; one to four times a year, depending on the specific monitoring well (e.g., well 8-MW-7 is monitored twice a year and closest to the spray fields) by the IRP's contractor, which is independent of SpaceX. Analytical results since 2007 through 2024 (2025 analytical results are not yet available in GeoTracker) are archived, and available to the public on the GeoTracker website for IRP Site WP008: http://geotracker.waterboards.ca.gov/?gid=DOD100411300. Most of the testing done under the IRP program is associated with monitoring and treating chlorinated solvents and perchlorate. A concentration through time graph for well 8-MW-7 can be found on GeoTracker: https://geotracker.waterboards.ca.gov/linechartxy?global_id=DOD100411300&locid=MW-7-S8&mymatrix=GW&combine=False&SHOWDTW=True&parlabel=PCATE&parlabel=TCE&parlabel=VC&parlabel=DCE12C.

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		Pre-2007 analytical results are in individual monitoring reports, which can be found using the same GeoTracker link for WP008.
4.4	3. What specific contaminants are being tested for in the deluge water and retention basin? Does testing include hydrocarbons, TEA-TEB igniter compounds, and heavy metals?	In January 2025, as part of the ROWD application for launch wastewater, samples were collected and tested for metals, polycyclic aromatic hydrocarbons (PAHs), fuel components (e.g., total petroleum hydrocarbons [TPH], volatile organic compounds, semi-volatile organic compounds, polychlorinated biphenyls, cresols, organochlorine pesticides (e.g., dieldrin, dichlorodiphenyltrichloroethane [DDT], etc.) phthalates and other constituents for comparison with Ocean Plan criteria; for a complete list of analytes/parameter, and laboratory analytical results, see Figure I-1 in the ROWD (beginning on page 91). Analytical results and parameters tested for 2018 are also included in ROWD's Figure I-1. The ROWD can be found on GeoTracker: https://geotracker.waterboards.ca.gov/?surl=omnyf The analytical suite prescribed in the proposed MRP Order R3-2026-0011 is consistent with standard WDR testing requirements, including the testing for metals, with the addition of testing for TPH; see the MRP portion of the draft NOA made available for public comment on January 26, 2026.

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		Regarding triethylaluminum (TEA) and triethylborane (TEB), these are highly pyrophoric liquids that react violently with water, producing aluminum hydroxides, boron oxides, ethane, and other oxides. Due to this reactivity, TEA-TEB does not persist in water. Analysis/testing for elevated concentrations of aluminum and boron can be a way to gain insight regarding TEA-TEB breakdown products (e.g., are aluminum and boron concentrations anomalously high, are there concentrations increasing over time, etc.). Testing for aluminum and boron in wastewater are included in the proposed MRP (see Table 3). Existing launch-related wastewater analyte results from samples collected/tested in 2018 and 2025 are summarized in Figure I-1 in the ROWD (beginning on page 91) and can be compared to the criteria listed in the MRP's Table 3. Figure I-1 shows that one aluminum result out of 9 filtered (filtered water samples provide "dissolved" constituent results, but some solids do pass through the filter) samples collected from launch wastewater exceeded the typical maximum background aluminum concentration of 1.2 milligram per liter (mg/L) that is detected in VSFB background monitoring well groundwater samples. The aluminum concentration's geometric mean for the 9 filtered samples is 0.207 mg/L, which is approximately 17% of the 1.2 mg/L criteria concentration

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		prescribed in the MRP's Table 3. For boron, Figure I-1 in the ROWD shows that none of the 9 filtered sample analytical results exceeded VSFB's site-specific maximum background concentration in groundwater for boron of 0.541 mg/L. These data demonstrate that aluminum and boron concentrations in the launch wastewater are limited-threat. Pursuant to the MRP, there will be additional/future aluminum and boron results reported for wastewater to enable on-going water quality evaluation. The ROWD and its Figure I-1 can be accessed on GeoTracker: https://geotracker.waterboards.ca.gov/?surl=omnyf.
4.5	4. What monitoring is in place to detect cumulative impacts as launch frequency increases toward launches per year?	There is baseline groundwater quality information for near and downgradient of the planned discharge area with the ongoing IRP monitoring at VSFB. Proposed MRP Order R3-2026-0011 requires launch wastewater sampling from the retention basin once every 30 launches and annual groundwater monitoring from six groundwater monitoring wells located near and downgradient of the launch water discharge area and within Spring Canyon. Required wastewater constituent analyses as presented in Tables 3 and 5 of the MRP will provide information to Central Coast

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		Water Board staff to assess potential cumulative impacts to receiving water bodies over time.
4.6	5. What is the status of Spring Canyon watershed protection measures, and has any contamination been detected?	No contamination associated with Falcon 9 launches has been detected in Spring Canyon. To minimize potential effects on migratory birds by removing habitat in which they might normally nest, vegetation within an approximate 3.3-acre area in Spring Canyon was identified by the United States Fish and Wildlife Service (USFWS) for removal (e.g., mowing) to account for steam entering the canyon during launches. This required action involved removal of 1.1 acres of riparian vegetation from Spring Canyon. In December 2017, the Central Coast Water Board requested that a 1.1-acre riparian mitigation and monitoring plan (MMP) be developed and implemented. This MMP was developed and has been implemented by contractors on behalf of the Air Force. The March 2023 USFWS biological opinion, which describes minimizing potential effects on migratory birds, can be found in GeoTracker: https://geotracker.waterboards.ca.gov/?surl=ma5uv. The Central Coast Water Board's December 2017 letter requiring the MMP can be found in GeoTracker: https://geotracker.waterboards.ca.gov/?surl=tw

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		mol. The MMP can be found in GeoTracker: https://geotracker.waterboards.ca.gov/?surl=52203. The five subsequent annual MMP reports can be found in GeoTracker: http://geotracker.waterboards.ca.gov/?gid=WDR100034387 (click on the “Site Maps/Documents” tab, then scroll toward the bottom the Monitoring Reports section to find links to the Spring Canyon Mitigation & Monitoring Plan Implementation reports).