

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

RESPONSE TO WRITTEN COMMENTS

on the Tentative Order for

Amendment to Waste Discharge Requirements for Long-Term Flood Protection Considerations at Closed
and Operating Municipal Solid Waste Bayfront Landfills

The Regional Water Board received written comments on a tentative order distributed on June 8, 2022, for public comment from the following:

1. Friends of Five Creeks (July 14, 2022)
2. Dr. Kristina Hill, UC Berkeley (July 15, 2022)
3. The San Francisco Bay Shoreline Contamination Cleanup Coalition (July 20, 2022)
4. Brisbane Baylands Community Advisory Group (BBCAG)- Clara Johnson (July 20, 2022)
5. Dana Dillworth (July 20, 2022)
6. Sierra Club- Loma Prieta Chapter (July 20, 2022)
7. City of Sunnyvale (July 7, 2022)
8. Libby Lucas (July 20, 2022)

Regional Water Board staff have included substantive excerpts from the comments and our responses below, in the same order presented above.

Friends of Five Creeks:

- 1) The board's approach appears to omit older landfill areas that may be as toxic or more than the Bulb or others with this requirement, and/or pose greater risk to groundwater. Our question is: Why? Are the cities easy targets? Does this focus pre-empt or make less likely a more thoughtful and sensible approach to the region-wide threat of sea-level rise, powerful storms, groundwater contamination and changes, and the realities of fill and dumping along the Bay?

Response: The proposed Amendment to Waste Discharge Requirements (WDRs) for Long-Term Flood Protection Considerations at Closed and Operating Municipal Solid Waste Bayfront Landfills (Amendment to WDRs) focuses on municipal solid waste landfills that the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) regulates under existing WDRs. The Amendment to WDRs primarily affects municipalities because cities happen to be the owners of these older landfills in many cases. The Regional Water Board does not have existing regulatory orders that can be amended in a similar manner for the types of fill sites that the commenter identifies.

Regional Water Board staff are evaluating potential regulatory mechanisms to require similar evaluations at other types of sites, including unregulated fill sites and cleanup sites as these will also be impacted by sea level and groundwater level rise. The Regional Water Board has already issued regulatory directives and amended WDRs to require vulnerability assessments and plans for other types of sites (e.g., wastewater treatment plants, military facilities, and contaminated

sites from industrial sources), and is continuing to evaluate and prioritize which sites and areas are most vulnerable to advance similar requirements.

- 2) The toxicity of these former municipal dumps, however, seems far less threatening than that of other sine (sic) sites. We feel that it is important to have prioritization and coordination with the state Department of Toxic Substances, in charge of such seriously contaminated areas as the former Selby Works/ASARCO smelter at Tormey, north of Rodeo, operated until 1971, and once the largest gold, silver and lead refinery in the Western U.S. Besides the paved cap visible from the Vallejo ferry, what will keep those heavy metals out of the Bay? We also believe that no agency is yet considering effects of sea-level rise on neighborhoods at or below sea level, but inland beyond the BCDC jurisdiction limit. This includes low-lying and reasonably low-income areas of Richmond protected by tide flaps on storm drains that are not being maintained by the City of Richmond or their contractor Veolia.

Response: Regional Water Board staff communicate regularly with the Department of Toxic Substances Control (DTSC) about sites for which we share regulatory agency responsibility around the Bay. Staff have given DTSC input on their guidance document to address contaminated shoreline sites in their jurisdiction (expected to be available for public review in October 2022). DTSC’s guidance document also considers and prioritizes low-income communities. Regarding agencies considering effects of sea level rise (SLR) on neighborhoods, most cities either have or are preparing climate action plans. Examples are the low-lying cities of Alviso (earlier this year, South Bay officials broke ground on the first phase of the South San Francisco Bay Shoreline Project—a local, state, and federal partnership to provide tidal flood protection in the area, as well as restore and enhance tidal marsh and related habitats); Foster City (extending the height of the existing levee around 6.2 miles of the Bay with a steel-reinforced earthen levee, to be completed next year); and Marin County (completed a vulnerability assessment for Richardson Bay to understand SLR along the Bayshore). The City of Richmond has its own Flood Protection Management Strategy which details resilience measures in place to manage possible flooding (https://www.richmond.ca/_shared/assets/Flood_Protection_Management_Strategy57596.pdf). The Regional Water Board collaborates with the Bay Conservation and Development Commission (<https://www.bayadapt.org/jointplatform/>), Bay Area Regional Collaborative (<https://barc.ca.gov/>), the San Francisco Estuary Partnership (<https://www.sfestuary.org/estuary-blueprint/>), Association of Bay Area Governments, and other local and regional agencies on planning, permitting, technical, and financial assistance for projects and strategies to protect shorelines from SLR.

Dr. Kristina Hill, UC Berkeley

- 3) Adaptation plans should consider subsidence of protective structures such as levees, as well as subsidence of the landfill itself. The requirement to monitor subsidence of the landfills seems to be included in the amendment, but not the need to monitor subsidence of coastal structures that may be assumed to protect the landfill from wave action. If they are adjacent to or nearby the landfill, the weight of the landfill could easily cause subsidence to affect the elevation of coastal protection structures as well. It seems important to include this subsidence impact in the

amended order, since it may challenge the assumptions about how long or how well the landfill will be protected from wave action by a subsiding coastal structure.

Response: We agree that subsidence of any protective structures should be considered where they exist already; however, most of these landfills do not currently have any such structures in place. If it is determined through the assessment required under the Amendment to WDRs that a protective structure is needed for any given landfill, the landfill owner and/operator will need to comply with current construction standards and consider subsidence in the design and build of the structure.

- 4) 3D modeling should be used for landfill sites with the extent set to the extent of the surrounding OLU, because SLR can produce more lateral flows that do not go directly towards the Bay from the landfill. My concern is that modeling done strictly within the boundaries of a landfill site may not reveal this increased lateral flow. This change in flow direction could be missed because the agency responsible for the landfill uses only 2D modeling instead of 3D modeling techniques, or it could be missed because the dynamics of flows outside the site boundary are not included in the study. If the OLU is used as the extent of the study area, the modeling is more likely to observe this change. A change in flow direction would put different ecosystems and people at risk from leachate; therefore, predicting changes in groundwater flow direction is a critical component of adaptation planning. Any study of the impact of a rising sea level on groundwater levels and water quality should include a prediction of the future flow directions of groundwater as well as the future elevations of the groundwater surface, since changes in direction indicate changes in impacts.

Response: The guidance cited in the Amendment to WDRs includes the United States Geological Survey Coastal Storm Modeling System (CoSMoS) and the BCDC Adapting to Rising Tides Flood Explorer (an appendix to the BCDC Bay Plan), both of which are 3D models that can be viewed on an operating landscape unit (OLU) scale. The Dischargers must consider and reference these 3D models and other official state guidance on climate change in their long-term protection plans (see Amendment to WDRs, Provision 1a). New information on groundwater rise in four Bay Area counties is expected to be available through the San Francisco Estuary Institute (SFEI) in the coming months and will provide another resource for dischargers and their consultants to use. Additional research on groundwater rise has been proposed by various academic institutions, and if funding is made available for those projects, we anticipate more information to be made publicly available in the coming years.

- 5) Coastal protection structures such as levees and seawalls, as well as rain or groundwater barriers such as caps, leachate collection systems, pumping systems, slurry walls and biologically-active permeable barriers could all fail as a result of lateral spreading or loss of soil strength in a seismic event. Adaptation plans for landfills should consider this potential failure pathway for coastal protection structures as well as rain and leachate barriers and collection systems.

Response: We agree with this statement. Any remediation system or protective structure currently in place must be part of the landfill's vulnerability assessment, as required by

Provisions 1c and 1f (identify vulnerable infrastructure and describe how vulnerable features and infrastructure will be protected). The Ocean Protection Council (OPC) guidance referenced in the Amendment to WDRs (which the Dischargers must consider and reference in the long-term protection plans) also explains that as part of a vulnerability assessment, risk tolerance for critical infrastructure must be assessed. We consider caps, leachate collection systems, groundwater monitoring wells, and any levee(s) around the site to be critical infrastructure. There are also other regulatory mechanisms for landfills that mandate the consideration of seismic activity in protecting the site, containment features, and vulnerable infrastructure, which are already in place at the landfills named in the Amendment to WDRs. However, these requirements do not specifically address sea level or groundwater rise.

The San Francisco Bay Shoreline Contamination Cleanup Coalition

6) General Comment 1:

- a. We are concerned with the large number of bayfront landfills, many of which are marginally capped and have limited lateral containment, most of which have some degree and real probabilities of contaminants within, certainly none of which have robust containment, and probably also none of which are fully prepared for climate change and all that entails, such as SLR and rising shallow groundwater elevations.
- b. Additionally, we are concerned with the inadequacy of the RWQCB, DTSC, and USEPA regulated cleanups at several of the former industrial facilities in proximity to the San Francisco Bay.
- c. Furthermore, we are concerned that there has not been a programmatic, comprehensive, and rigorous review/evaluation of all the SF Bay front areas for other potential contamination sources areas, especially so in view of contemporary knowledge of historical industrial activity, human and ecological risks, seismicity, and climate change.
- d. Finally, we are concerned that neither the RWQCB nor the DTSC has yet to meaningfully and comprehensively address the potential of contamination from the content of the historical filling of the Bay.

Response: We note and share your concerns regarding the extent of contamination around the Bay margin, and we acknowledge your opinions regarding the adequacy of evaluation and cleanup efforts by the Regional Water Board and other environmental protection agencies. The Regional Water Board is continuing to coordinate with other state agencies and USEPA on cleanup oversight in light of emerging concerns and information about risks of mobilization from sea level and groundwater rise, by funding and providing technical assistance on studies to assess the risks, and reprioritizing issues and cases for cleanup oversight accordingly.

7) General Comment 2:

- a. Please identify the other Order/Orders under which the seventeen landfills have already been required to submit Flood Protection reports and five-year updates.

Response:

American Canyon Landfill – R2-2019-0010; Napa-Vallejo Waste Management Authority

Berkeley Landfill – R2-2010-0064; City of Berkeley
 Davis St Landfill – R2-2019-0033; Republic Services
 Mussel Rock Landfill – R2-2015-0007; City of Daly City
 Palo Alto Landfill – R2-2016-0029; City of Palo Alto
 Potrero Hills Landfill – R2-2011-0032; Waste Connections
 Oyster Point Landfill – required by letter December 2015
 Redwood Landfill – R2-2009-0053; Waste Management Inc.
 San Quentin Landfill – R2-2012-0064; Cal-Pox Inc and Glendale, LLC
 Santa Clara All-Purpose Landfill – R2-2017-0021; City of Santa Clara
 Shoreline Landfill – R2-2020-0029; City of Mountain View
 Tri-Cities Landfill – R2-2014-0005; Waste Management of Alameda County
 Turk Island Landfill – R2-2012-0020; Turk Island Company
 West Contra Costa Landfill – R2-2022-0011; West Contra Costa Landfill, Inc.
 West Winton Landfill – R2-2012-0028; Waste Management of Alameda County & City of Hayward
 Zanker Road Landfill – R2-2018-0054; Zanker Road Resource Management (ZRRM)
 Zanker Materials Processing Facility – R2-2016-0010; Zanker Road Resource Management

- b. We request the RWQCB provide a modified Table 1, with entries for all 30 plus Bayfront landfills. Such a table would provide clarity with respect to the universe of San Francisco Bay Bayfront landfills and would also facilitate community involvement and participation in this regard.

Response: It is not appropriate to include all Bayfront landfills in Table 1 in the Amendment to WDRs. The Amendment to WDRs focuses on landfills that have yet to be required to submit a Long-Term Flood Protection Plan. Table 1 identifies the landfills and corresponding WDRs that are subject to this Amendment. The other 17 Bayfront landfills that are not subject to the Amendment to WDRs are identified in the response to Comment 7a above. Naming the other landfills in Table 1 will confuse readers and dischargers, making it unclear which landfills are subject to this Amendment. Any amendments to the WDRs for the other landfills will be publicly noticed and the community will have an opportunity to participate. Additionally, Regional Water Board staff can provide the commenter with the requested information and facilitate community involvement for Bayfront landfills outside of the proceedings for the Amendment to WDRs. (See also responses to Comments 9 and 10.)

- 8) General Comment 3: We are also concerned that the guidance does not include direction for assessing and preventing the impacts of potential earthquake liquefaction, as well as proper test procedures to identify liquefaction impacts after earthquakes.

Response: The Regional Water Board staff does not have the authority or expertise to specifically inform dischargers how to assess or prevent liquefaction. However, the Regional Water Board does impose requirements under Title 27 through the respective WDRs for the landfills that require that the landfill be stabilized, and monitoring/maintenance structures and water quality be protected. In each of the individual WDRs there is a standard specification

implementing the Title 27 requirement that states,¹ “The dischargers shall assure that the foundation of the site, the refuse fill, and the structures will control leachate, surface drainage, erosion and gas for this site are constructed and maintained to withstand conditions generated during the maximum probable earthquake.” Additionally, there is a provision in the respective WDRs requiring a “Post-Earthquake Inspection and Corrective Action Report for any earthquake greater than Richter Magnitude 6 at or within 30 miles of the landfill. The report shall describe the results of the post-earthquake inspection and any corrective actions necessary to ensure landfill stability and prevent water quality impacts which may result from seismic events.” These provisions are included so that any potential impacts to water quality are considered after such an event.

- 9) General Comment 4: One of the RWQCB Region 2 regulatory programs identified on the website is for landfills. To facilitate community involvement and participation in this regulatory program, and build public confidence in the RWQCB oversight, we strongly request the following features be added to the Region 2 webpage: a. Create a page presenting the program, b. Provide a complete table listing the open and closed sites regulated under this program and with links to the specific corresponding site listings in GeoTracker, c. Provide an overview video of this program and other videos on how to use this webpage and GeoTracker, d. Provide additional videos on elements of the program (e.g. periodic sampling, 5-year reviews, long term monitoring, financial responsibility assurance, post-earthquake protocols/re-evaluations).

Response: We appreciate the interest and involvement of the community and agree that our website can be updated to be more informative to the public. See the response to Comment 7b above about providing additional information. We will also consider the commenter’s suggested changes to our webpages to make more information regarding landfills available on our Groundwater Protection Division page.

The State Water Resources Control Board runs the GeoTracker program. There is a tutorial demonstrating how to use the GeoTracker website under the header “How to Use GeoTracker” on the homepage (<https://geotracker.waterboards.ca.gov/>). In addition, the public may contact Regional Water Board staff for help at alyx.karpowicz@waterboards.ca.gov.

- 10) General Comment 5: The list of landfills under this program does not include all landfills in close proximity to the SF Bay. Please provide the criterion for determining which landfill sites are designated bayfront landfills and covered by this order. Additionally, please explain why some and not all landfills under your jurisdiction are included in this program, (including landfills at the former Hunters Point, Treasure Island and Alameda Naval shipyards over which the Water Board and DTSC are responsible for ensuring the State of California’s interests are protected).

Response: The Amendment to WDRs applies to the 16 Bayfront landfills that have not yet been required to submit flood protection or vulnerability assessments to the Regional Water Board

¹ There is some non-substantive variation in the specific language used to implement the Title 27 requirements in the individual WDRS. The quoted permit provisions throughout this response document are provided as examples and are generally representative of what is required of each landfill but may not track the precise language used in all individual WDRs.

related to water quality from risks of climate impacts. The existing WDRs for these landfills do not have such a requirement. (See also response to Comment 7b.)

The Amendment to WDRs does not apply to the other 17 Bayfront landfills in the region (listed in the response to Comment 7a) because the Regional Water Board previously amended the respective WDRs for the 17 landfills to require those landfills to submit a “Long-Term Flood Protection Report.” The requirements for the other 17 Bayfront landfills vary and are less comprehensive than the requirements in the Amendment to WDRs (e.g., previous requirements do not include specific requirements to consider extreme storm events and groundwater rise). We plan to expand the requirements in this amendment to the other 17 Bayfront landfills for the five-year plan updates. (See also responses to Comments 1 and 7b.)

Closed, non-operating landfills on military bases (such as Hunters Point Naval Station, Treasure Island, and Alameda Naval Shipyard) that are being remediated under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) are not subject to WDRs issued by the Regional Water Board. However, the military bases regulated under CERCLA must comply with relevant and appropriate state laws, including landfill requirements, in their remedial action plans. Additionally, these sites must conduct Five-Year Reviews to evaluate their remedies to determine if they remain protective of human health and the environment. During each Five-Year Review, the Regional Water Board will urge application of the considerations in these Amendments to WDRs. This will be in coordination with USEPA and DTSC per the Federal Facilities Agreement that governs who and how we oversee waste disposal sites on federal facilities. The Regional Water Board provided a draft of the Amendment to WDRs to the Navy this year so that they would be aware of future considerations the Board will be raising for evaluation during the Five-Year Reviews.

- 11) Comment 7, part 1: Provision A.1.b requires the Long-Term Flood Protection Plan to consider the 100-year storm event, plus the 2050 "medium-high" (0.5% probability of exceedance) or "extreme" risk aversion SLR scenarios. Specifications of SLR protections must consider the projected lifetime of the project, which is indefinite in this case. Provision A.1.d requests for Dischargers to 'briefly' describe an adaptation strategy that protects their facilities from the 2100 "medium-high" or "extreme" risk aversion SLR scenarios. The Dischargers have not indicated any plans for relocating or restoring the landfills in question in the next thirty years, and the Water Board staff provides no rationale for selecting a planning horizon of 2050.

Response: We do not know what the dischargers may plan for the future of their sites. They may decide that it makes sense to remove the waste based on projected SLR and GWR for their sites, and not incur the financial burden of protecting that site from those threats (this applies to Comment 14, below, as well). Our planning horizon does not stop at 2050, as we require both the years 2050 and 2100 to be evaluated for adaptation. Most of these landfills have been closed for 30 years or more already, and we assume they are likely to remain past the 2100 timeframe as well. While we cannot specify manner of compliance and set a specific strategy for protection at a facility, we will continue to use our permitting authorities to ensure landfills are adequately protective into the future.

12) Comment 7, part 2: Given the permanence of the region's shoreline landfills, we advise the Water Board to assume, at a minimum, a 100-year lifetime of these landfills. Protective planning for the Bay and nearby communities demands the Water Board to specify particular SLR scenarios and avoid options for higher ('extreme') versus lower ('medium-high') flood scenarios. We recommend that Provision A.1.b specifies the Ocean Protection Council's high-emissions scenario (0.5% probability) for 2120, to develop the Long-Term Flood Protection Plan equivalent to 8.6 feet of SLR, on top of a 100-year storm scenario.

Response: While we appreciate the suggested wording and selection of specific targets for landfill dischargers to use when evaluating their sites, we have selected the particular SLR scenarios to use based on the OPC 2018 Guidance (medium-high and extreme at the 2050 and 2100 time horizons). This strategy allows for a range of future actions at different climate change thresholds to address uncertainty, allow for flexibility, and plan protections over the long term.

13) Comment 8, Page 4, paragraph 5, Findings number 14: Please provide the scheduled date for the Regional Board public meeting for these Amendments to WDRs.

Response: We have added the date of the Board meeting at the end of the Tentative Order, above the signature block.

14) Comment 9, Page 5, Provisions 1, Long-Term Flood Protection Plan: Historically, the siting of dumps, landfills, waste disposal sites near surface water bodies was not uncommon. Notwithstanding, it is environmentally and fundamentally unsound. Ideally, all this waste would be removed from bay front land. Yet we acknowledge practical limits to this approach. We request that this Order be revised to require each Long-Term Flood Protection Report to evaluate a complete/partial removal as an alternative response plan.

Response: See our response to Comment 11.

15) Comment 10, Page 5, Provisions 1, Long-Term Flood Protection Plan: Given that all historical dump sites and landfills have considerable uncertainties regarding hazardous waste volumes/contents, we urge the RWQCB to move toward robust containment features for these bay front landfills as well, with elements that one might reasonably expect for isolation of hazardous waste on the bay margins (e.g. engineered low permeability cut-off walls for full perimeter, full perimeter leachate extraction systems, verification of an adequate low permeable bay mud foundation underneath the landfill, RCRA subtitle C-like cap with biobarrier membrane and with more than the minimum soil layer thicknesses to further address EPA National Contingency Plan (NCP) criteria for effectiveness and permanence.

Response: These Amendments to WDRs address only Class III non-hazardous landfills, any plans to protect human health and the environment are expected to appropriately address the type of waste stored in them. The Regional Water Board cannot specify the means by which dischargers choose to protect their sites, but we can and will review any plans for installation of containment features. If the Water Board deems a plan to be inadequate for appropriate levels

of protection, the Water Board will not approve the plan until the Water Board agrees that the remedy selected is protective of human health and the environment.

- 16) Comments 6 and 11: The Amendments to WDRs would require updates to this assessment every five years. We request that this be revised to require updates no later than five years or sooner if conditions change or when prudence would dictate otherwise.

Response: The OPC Guidance that we are relying upon for elements of these Amendments to WDRs are updated every five years, with the next update due in 2023. These plans will align with the five-year update of that document. However, the Regional Water Board has the authority to review and revise WDRs. If circumstances change or new information emerges to support changing the period for updates, the Regional Water Board may propose changes in these timeframes.

- 17) Comment 12, Page 5, Provisions number 2, Financial Assurance: We request this paragraph be revised to also include all infrastructure elements, in particular features that are components of a comprehensive/robust containment system. As an example, this may include surrounding soil acting to limit the spread of contaminants and that may not continue to have adequate integrity in the future.

Response: The landfills affected by the Amendment to WDRs are already required under their existing WDRs to have financial assurances for the infrastructure elements identified by the commenter. The existing requirement for financial assurance requires (with some variation among the WDRs) the following: “The Discharger shall obtain and maintain a Financial Assurance Instrument acceptable to the Executive Officer until the end of the Post-Closure Maintenance Period for the landfill subject to the California Code of Regulations Title 27, Chapter 6, Subdivision 1, Division 2. The Discharger shall submit a report every five years that either validates the Instrument's ongoing viability or proposes and substantiates any needed changes (e.g., a documented increase in the monitoring systems' ability to provide reliable early detection of a release can cause a decrease in the Instrument's financial coverage). For the purposes of planning the amount of the fund, the Discharger shall assume a post-closure period of at least 30 years. However, the post-closure maintenance period shall extend as long as the wastes pose a threat to water quality.” The consideration of groundwater rise is a new element that is not captured under the existing financial assurance provisions.

- 18) Comment 13, Page 5, Provisions number 2, Financial Assurance: We request the Order be revised to require an FA analysis including costs to remove existing buildings and associated infrastructure, for when they reach the end of service, and are not allowed to become abandoned.

Response: Once a landfill submits a closure plan to the Regional Water Board for approval, they are required to comply with the Title 27 requirements dictating Closure and Post Closure Maintenance Standards for Disposal Sites and Landfills. Section 21137 specifically addresses the removal of structures from the site: “(a) the operator shall dismantle and remove site structures at the time of closure to protect public health and safety in accordance with the implementation schedule of the approved final closure plan.”

19) Comment 14, Page 5, Provisions number 3: We request that permanent settlement monitoring features also be required and added to this Provisions paragraph to verify adequacy of soil cap layer/s thicknesses over time.

Response: The Amendment to WDRs requires two permanent settlement monuments which will be monitored for settlement in general- that can be of the waste mass below the cap, the cap itself, or of any foundation/structure that may be on top of the landfill. The existing WDRs for these landfills already include provisions implementing Title 27 requirements that address soil cap thickness: the final cap is required to be monitored, inspected, and maintained on an annual basis (generally). If any deficiency in the cap is noted, the Discharger must immediately repair it. The purposes of a final cover are to ensure waste containment, minimize surface water intrusion, accommodate settlement and subsidence, isolate wastes from the surface (and human contact), and reduce the potential for odors and landfill gas emissions.

Brisbane Baylands Community Advisory Group (BBCAG)- Clara Johnson

20) We believe your decision to regulate using the “2050 “medium-high (0.5% probability of exceedance) or “extreme” risk aversion SLR scenarios as described in the most recent official State of California Sea-Level Guidance (e.g. the 2018 OPC Sea-Level Rise Guidance) is inadequate.

Response: The Amendment to WDRs specifies consideration of two scenarios—the medium-high and extreme risk aversion over two timeframes, 2050 and 2100. The timeframes are based on the best available climate science and existing State Guidance (which is updated every 5 years, the next update is scheduled for 2023). This is the equivalent of asking dischargers to consider and prepare for the possibility of a 66” (2050 medium-high scenario, on top of the 100-year storm) and 77” (2050 extreme scenario on top of the 100-year storm) rise in sea level. We require dischargers to provide technical justification for the scenario they choose to protect their site and for any associated infrastructure to monitor and/or contain any contaminants that may affect human health or the environment.

21) The cumulative effect of Sea-Level Rise encountering storm runoff must be thoroughly studied on these Landfills. There must be uniform specific criteria to guide the initial vulnerability assessment and subsequent updates.

Response: The amounts of stormwater runoff will vary from site to site based on location, the amount of rain a site gets, and the types of stormwater conveyance systems in place. However, the dischargers named in the Amendment to WDRs are already required to manage stormwater at their respective landfills. The following standard requirements are included in each of their existing WDRs for the landfills: “surface drainage shall not contact or percolate through wastes during the lifetime of the site”; and “the site shall be protected from washout or erosion of wastes or cover materials and from inundation which could occur as a result of a 100-year, 24-hour precipitation event.” Furthermore, some of these landfills are covered under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activities and are required under that permit to prepare stormwater pollution and prevention plans to manage stormwater on their sites. The Amendment to WDRs

also includes a range of existing mapping tools in the guidance section to help dischargers evaluate storm-related coastal flooding, SLR, and shoreline change, and to evaluate impacts and change at their sites into the future. The collaborative planning efforts mentioned in the response to Comment 2 (Friends of Five Creeks) include several flood prevention and stormwater management districts or municipal representatives to guide consideration of climate change's effect of more intense storms and the related stormwater management challenges; additionally, organizations like the [San Francisco Bay Regional CHARG – Coastal Hazards Adaptation Resiliency Group \(sfbaycharg.org\)](http://sfbaycharg.org), are specifically evaluating regional coastal flooding impacts and adaptation approaches which are likely to apply to areas co-locate with some Bayfront landfills.

Regarding the vulnerability assessment, the guidance cited in the Amendment to WDRs (specifically the 2018 OPC document) provides a step-by-step framework for dischargers to utilize when preparing plans to consider and prepare for SLR at their sites. We cannot specify exactly how dischargers evaluate their sites, but their plans must meet the minimum acceptance standards outlined in the Amendment to WDRs and be approved by the Executive Officer.

- 22) Prior to capping the Landfills there must be a transfer of soil to the existing surface. The Brisbane General Plan requires that any and all stored soil must be cleared of potential radiation before moving it elsewhere on the Baylands property.

Response: We agree. Landfill regulations, implemented through the landfills' respective WDRs, require that waste be capped with two feet of foundation soil, a low-permeability soil above that, and finally a cover soil of at least one foot (to support vegetation growth). All layers of soil are required to be free of waste and leachate, and the Regional Water Board must approve of any final cover design and specifications prior to installation. Class II and III landfills are prohibited from accepting radiological material. Any soil that potentially contains radioactive materials must be screened, and if detected, the radiological health branch of the California Department of Public Health should be contacted immediately to advise safe handling and disposal options. In addition to state and federal requirements, landfills must also comply with applicable local laws and regulations.

- 23) We strongly support robust capping and robust lateral containment for all these Landfills. The designs should be based on the most up to date predictions available.

Response: We agree. Any plans for either final capping of a landfill, or proposal for containment features that are submitted in response to these Amendments to WDRs must be approved by the Regional Water Board's Executive Officer. The Amendment to WDRs also specifies that the best available and most up to date scientific information must be utilized in preparation of any report submitted to evaluate sea level and groundwater rise.

- 24) We believe there should be a review and evaluation of other risks to the integrity of these Landfills e.g. Earthquakes, Nearby Toxic Contamination, Upland Surface Water Infiltration, Groundwater Infiltration. Sea-Level Rise.

Response: The existing WDRs for the landfills named in the Amendments to WDRs include Title 27 requirements, with some variation in language among the WDRs, that address earthquakes, surface water, and groundwater infiltration:

- i. Earthquakes: “The dischargers shall assure that the foundation of the site, the refuse fill, and the structures that will control leachate, surface drainage, erosion and gas for this site are constructed and maintained to withstand conditions generated during the maximum probable earthquake.” Additionally, there is a provision in the WDRs requiring a “Post-Earthquake Inspection and Corrective Action Report for any earthquake greater than Richter Magnitude 6 at or within 30 miles of the landfill. The report shall describe the results of the post-earthquake inspection and any corrective actions necessary to ensure landfill stability and prevent water quality impacts which may result from seismic events.”
- ii. Surface water infiltration: “Surface drainage from tributary areas and internal site drainage from surface or subsurface soils shall not contact or percolate through wastes during the life of the site.”
- iii. Groundwater infiltration: “The Discharger shall not cause the following conditions to exist in waters of the State or United States at any place outside the landfill boundary: degradation of groundwater quality, or substantial worsening of existing groundwater impacts.” And the “final cap shall be maintained to promote lateral runoff and prevent ponding and infiltration of water.” The existing WDRs do not include requirements that specifically address nearby contamination. However, the landfill Dischargers should be aware of any nearby contaminated sites. For many landfills in former or current industrial areas, there are other sites in close proximity that may have their own contamination in soil or groundwater. In the case of the Brisbane landfill, the adjacent Kinder Morgan facility shares a groundwater plume with the landfill since a portion of that facility was built over the western limit of the landfill. While each entity has its own monitoring program, they are each aware of which contaminants are related to one site versus the other.

SLR is not addressed in the existing WDRs for the landfills subject to this Amendment to WDRs; however, the Dischargers will be required to consider SLR as directed in this Amendment.

25) There should be clear performance standards for actions required in this Order. These standards would avoid a wide range of interpretation of the rules from one employee of the RWQCB to another in the enforcement of the Order. It would make it less likely that the rules would be more vigorously enforced in wealthy areas and less vigorously enforced where poor people live.

Response: The Amendment to WDRs clearly outline the requirements for both a vulnerability assessment and an adaptation plan for each of the 16 named landfills. The performance standards will vary from site to site, but each of them must prove the same thing: that they have considered the effects of both sea level and groundwater rise across the same planning horizon and timeframe, and to the same predicted levels of SLR, discussed above in response to Comment 20, and put plans in place to protect critical infrastructure. The requirements described in the Amendment to WDRs minimizes variability in interpretation from case worker

to case worker. Also, the Regional Water Board has staff with special climate-related expertise who will support the team of landfill case workers and set consistent expectations. Additionally, these same criteria apply regardless of the location of the site.

- 26) There should be extensive efforts to involve the public in the implementation of these Amended Waste Discharge Requirements. Meetings should be held and local government and environmental organizations should be consulted. There should be 3 or more meetings held.

Response: Regional Water Board staff have already conducted the following public input opportunities, beyond the legally required public input opportunities, for consideration of these Amendments to WDRs by the Board. Staff sent emails to interested parties on June 7, 2022, for early review and input, and met with the BBCAG to discuss questions and concerns with the group on July 12, 2022, ahead of comments being due on July 20, 2022. Staff will also be available to meet with community members about implementing the Amendment of WDRs. The Regional Water Board Meeting Agenda reports associated with the Amendment to WDRs will be available to the public on our website, and any of the comment letters submitted in response can be requested by email from alyx.karpowicz@waterboards.ca.gov. Regional Water Board staff assigned to oversee compliance with WDRs for any of these landfills can assist any person to access and interpret the information.

27. Given all the uncertainties of Sea-Level Rise, rising groundwater and changed climate resulting in excess storm runoff, it would be better to have complete perimeter slurry walls. There should be full perimeter leachate extraction systems. The landfill gas extraction system should extend to the edge of the waste regardless of ownership by several entities.

Response: While we agree this may be good approach for certain facilities, slurry walls are not a one-size-fits-all type of solution for managing sea level and groundwater rise, and stormwater runoff at all Bayfront landfills. Complete capture of leachate and landfill gas is required in the existing WDRs for the 16 landfills to protect groundwater and surface water quality, as well as protect human health and the environment. The following specifications, with some variation in language, are included in the respective WDRs: “Leachate from waste and ponded water containing leachate or in contact with solid waste shall not be discharged to water of the State or of the United States”; “The dischargers shall install any reasonable additional groundwater or leachate monitoring devices to fulfill the terms of any future Detection Monitoring Program issued by the Executive Officer”; and “Landfill gases shall be adequately vented, removed from the landfill, or otherwise controlled to minimize the danger of explosion, adverse health effects, nuisance conditions, or the impairment of beneficial uses of water.” In the case of the Brisbane Landfill, Provision 10 in its WDRs requires a leachate management plan (see Order R2-2001-0041); when staff discussed these Amendments to WDRs with the landfill owner on July 12, 2022, they stated that their plan is to install a leachate capture system along with a slurry wall in the near future.

- 28) There should be more than the minimum requirement of soil thickness and capping membrane to assure both effectiveness and permanence.

Response: We agree that the final cap must be both effective and permanent, and we rely on the California Code of Regulations (CCR), title 27, cited in the existing WDRs to ensure just that. A final cover must consist of at least four feet of soil: two feet of a foundation soil, one foot of a low-permeability soil, and one foot of an erosion resistant layer. More durable final cap materials may be necessary and required where higher rates of erosion or wave action are noted or anticipated. The cap is required to be inspected at least annually, and any deficiencies noted shall be reported to Water Board staff and repaired immediately.

29) Financial Assurance Requirement should extend to all parts of the planning, design, construction and maintenance needed to secure these Landfills.

Response: Financial assurance is required for both closure and post-closure maintenance of a landfill. CCR, Title 27 says “At Class II and Class III Units for which the CIWMB does not require a closure fund, the RWQCB shall require the discharger to establish an irrevocable closure fund (or to provide other means) pursuant to the CIWMB-promulgated sections of this chapter but with the RWQCB named as beneficiary, to ensure closure of each classified Unit in accordance with an approved plan meeting all applicable SWRCB-promulgated requirements of this subdivision.” (CCR, tit. 27, § 22207(a).) The same is true of post-closure funding requirements.

30) Settlement Monitoring Data must be clearly presented so that the public will understand it. It must be available to the public. It must continue to be available in perpetuity.

Response: All reports, including the settlement data, will be made publicly accessible via GeoTracker in accordance with our document retention policy. Regional Water Board staff are available to help the public understand any information or data related to the site, including settlement data.

Dana Dillworth

31) General Comment: “To adequately cover Brisbane, there are two areas missing. The Consolidated Chemical (VWR) property, and the Unocal building”.

Response: This order specifically amends the WDRs for existing waste disposal sites, and is not inclusive of all sites, or types of sites, that may be required to perform SLR vulnerability assessments in the future. The Regional Water Board intends to apply this requirement to cleanup sites and other land disposal sites not covered by this Amendment through future board actions. Please see our responses to Comments 1 and 10 above.

32) Under Provision A 1. We would appreciate the language to include City and community acceptance in addition to RWQCB’s Executive Officer’s acceptance.

Response: The “acceptance” by the Executive Officer is a formal approval stating that the plans comply with the requirements in the Amendment to WDRs. The Regional Water Board may delegate its authority to approve the plans to its Executive Officer, but it cannot delegate its authority to cities or community members. (See Water Code, § 13223.) However, the city and community members, and any persons, are welcome to review and comment on any plans submitted in response to the Amendment to WDRs. All plans are required to be uploaded to

GeoTracker, and City or community members can request to be informed when the plans are available for review and can comment on them to the staff assigned oversight of the landfill that submitted the plan. We welcome and will consider any input received from community members.

- 33) I'm concerned about piecemeal planning and putting communities at risk. Our city needs to be involved. I have reviewed studies and EIR's on Kinder Morgan, the Brisbane Baylands, Consolidated Chemical (VWR,) and Sierra Point, Brisbane. What concerns me is that landowners, with Water Board approval, have managed to reduce their cleanup levels (no longer to drinking water standards, but maintain lower industrial standards), under-characterize the fill (shipyard waste called household waste,) and do their wetland and tidal studies in off season or drought-torn periods.

Response: While this Order doesn't pertain to all of the sites or types of studies listed, the Sierra Point landfill does compare groundwater and leachate concentrations to federal and state drinking water standards, although they are not required to meet drinking water standards as the groundwater beneath the site is saline. The Regional Water Board sets cleanup goals on a site-specific basis depending on the type of contamination detected; the proposed use of the land, in the case of developments; or based on protection of beneficial uses that may be impacted by site use which tend to be more stringent. When we set these cleanup goals, it is usually part of a public process, such as approval of a remedial action plan (like the VWR site) or the adoption of site cleanup requirements (like the Kinder Morgan site) or WDRs (like the Brisbane Landfill). This public process includes both direct notification to interested parties, posting on our website, public meetings with interested parties such as the Brisbane Baylands Community Advisory Group, and a 30-day public comment period to solicit input on these plans and requirements. We agree that the city should be aware of all of these actions at cleanup/landfill sites and how they may impact one another. We support municipalities conducting city-wide vulnerability assessments that would identify and address these concerns. See our response to Comment 2 above regarding collaborative efforts to address these issues on a community and regional scale.

- 34) The waterboard should require a comprehensive watershed management plan to understand seasonal and local tidal, wetland, and groundwater movement. Monitoring with frequent leachate chemical composition tests during king and negative tides, dry and wet seasons. To have a hodgepodge of strategies and clean-up goals along our waterfront makes no sense.

Response: This type of requirement is outside the scope of this very specific sea level and groundwater rise evaluation for landfills with existing WDRs. However, some of these elements will be incorporated into the Flood Protection Reports, namely understanding local tidal data to determine the appropriate SLR scenario to consider; groundwater movement should already be well known at a majority of our sites that have been doing groundwater monitoring as part of their Self-Monitoring Plans; leachate monitoring is required on a semi-annual to annual basis at sites where this applies; and king tides will also be an element of SLR to be considered in the Flood Protection Report. Additionally, as mentioned in our response to Comment 4 above, the upcoming SFEI study will help refine groundwater rise information in specific Bay Area counties.

The Regional Water Board is contributing funding for collection of groundwater rise data in another Bay Area county as well. We intend to provide technical assistance throughout the process, and encourage local community involvement (see our response to Comment 2 regarding additional collaborative efforts and our response to Comment 33 regarding cleanup goals). We are one of the lead organizations developing the Wetland Regional Monitoring Program (www.wrmp.org) to assess the effects of multiple stressors on the region's tidal wetlands.

- 35) Provision 3. Settlement Analysis should state a maximum, not to exceed distance between permanent survey monuments. Given the current surcharge operation, proposed landform changes, and multiple landholders, future surveying may be difficult, particularly if it doesn't go to bedrock or have some modern GPS connection.

Response: There are specific criteria to follow when installing and monitoring the monuments, though distances between them is not specifically covered. Title 27, Section 20950(2d) specifies the following: Closed Units shall be provided with at least two permanent monuments installed by a licensed land surveyor or a registered civil engineer, from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the post-closure maintenance period. The monuments will be surveyed using the most current GPS technology.

- 36) There is no mention of landfills with interim orders or no protections in place. Our solid waste landfill (R2-2001-0041) ceased operation but has no closure plan to date (60 years.) Their current soils consolidation use is causing the waste layer to pancake and ooze out. That doesn't seem to alarm anyone.... Waste compaction potentially impacting the Bay may also be occurring on Marina Boulevard property, Sierra Point (R2-1996-58, R2-2015-0006) with the construction in the northwest corner. Reporting once every five years doesn't seem adequate if your neighbors' de-watering or your current land uses are having an impact.

Response: As stated above in the responses to Comments 1, 10, and 31 above, this type of evaluation will be considered at more sites in the future, both those that are covered under WDRs not listed in these Amendments and those sites that do not have orders at all. Regarding waste oozing out of the landfill, that would be in direct violation of their WDRs and require immediate repairs, and likely enforcement. If you have observed this, please report it to the Regional Water Board. All of our regulated landfills, including the Sierra Point and Brisbane landfills, submit monitoring reports at least annually, where water quality information is reported and reviewed by staff for indications of actual or threats to water quality. These landfills are typically inspected by Regional Water Board staff on an annual basis as well. Due to the location of this landfill, and the previously mentioned saline water beneath it, there is no use of groundwater beneath the site. There are no homes on or in the immediate vicinity of the Sierra Point landfill where dewatering would be an issue.

- 37) I would also suggest that the Lead Agency, the city of endangerment order, should be among the signing agents in the list of B,2b i-iii.

Response: This requirement designates who within the discharger’s organization must sign and certify the reports that are submitted to the Executive Officer for approval. It is not appropriate to add anyone who cannot act on behalf of the discharger as a signing agent.

38) It was asked at our July 12th meeting about third-party independent reviews. When the BBCAG started we had received grants and assistance from Washington University and other professionals in community landfill remediation planning. An open community planning process subject to peer review would be appreciated over a rushed document due in 180 days.

Response: We don’t typically require a third-party review to be conducted for a technical report that we ask for as part of an Order. We welcome community involvement at any point, but the 180 days is a due date for the first Flood Protection Report to be submitted by the individual dischargers. We support community involvement in preparing and finalizing the plans prior to submittal to the Regional Water Board if the community, landfill owners/operators see value in that and are willing, but that is not required by these Amendments or existing WDRs. The Regional Water Board is not planning any community input process while the plans are being prepared, but staff can answer any questions during that time. These Amendments to WDRs require the dischargers/landfill owners to conduct the report preparation as appropriate for the specific facility and submit the reports to us after 270 days. The original deadline of 180 days was revised in the tentative order to allow an extra time to complete the report.

Sierra Club- Loma Prieta Chapter

39) While we generally support the Order, we urge you to provide greater clarity about the Board’s overall approach regarding all Bayfront and low-elevation landfills. In particular, we request that the order be amended as follows:

Identify the complete list of Bayfront and other low-elevation landfills recognized by the Water Board as “vulnerable to climate change and SLR.”

Response: See our response to Comment 7a in addition to the sites listed in Table 1 of the Amendment to WDRs for a total of 33 sites.

40) Describe the process and criteria by which the Water Board determined which Bayfront and other low-elevation landfills are “vulnerable to climate change and SLR.”

Response: This Amendment to WDRs is for landfills subject to the Regional Water Board’s regulatory authority that are known to be in close proximity to a water body (generally within ½ mile or less of a creek, river, and/or the Bay) and are likely to be impacted by both sea level and groundwater rise, wave action and scour, and king tides. Since most of the landfills named in the Amendment to WDRs are right on the Bay, they will be some of the first to experience this aspect of climate change.

41) Identify the seventeen shoreline landfills that are already subject to the Long-term Flood Protection Plan requirements.

Response: See our response to Comment 7a.

42) Describe the process and criteria by which the Water Board will determine, going forward, whether the Long-term Flood Protection Plan requirements should be expanded and/or extended to any additional Bayfront and other low-elevation landfills.

Response: The fundamental requirements of the Amendment to WDRs will be adapted to fit other sites in the region that are vulnerable to sea level and groundwater rise, including wastewater treatment plants and waste management units at our refineries, cleanup sites along and near the Bay, and some of our former military sites. See our responses to Comments 7b and 10.

City of Sunnyvale

43) Our concern with the proposed Amendment is that we doubt the ability of the 16 landfills to complete the required scope of work, which includes a long-term flood protection plan, calculation/submittal of Financial Assurance, and settlement analysis, all within a 6-month time frame. We respectfully request at least two years to complete the required scope of work. We appreciate your providing us the opportunity to share our concerns.

Response: We recognize that this is a big effort and appreciate that this process may take longer than six months for certain entities. We have received feedback from other municipalities with similarly complex contracting restrictions and agree to extend the due date for the Flood Protection Requirement by 90 days. The new compliance date will be 270 days after adoption of these Amendments to WDRs. Note there were no compliance dates listed for the Financial Assurance and Settlement Analysis requirements. Data from the Settlement Analysis is expected to be incorporated in the first five-year update to the report, so there is enough time to install the monuments and collect data over a number of years. We expect the Financial Assurance mechanism to be updated after the first Flood Protection Report is submitted, once the vulnerability assessment has been completed, and landfill owners have a better sense of which infrastructure may be impacted by future sea level and groundwater rise.

Libby Lucas

44) In regards the Long Term Flood Protection element of RWQCB Tentative Order No. R2-2022-00XX I would urge you to incorporate US Fish & Wildlife's preferred horizontal levee design within this 5 year implementation window for those Municipal Solid Waste Bayfront Landfills most in need of shoreline protection.

In the South Bay at #237, America Center Maintenance Association, previously known as David Hoxie's Refuse Dump, which is increasingly threatened by erosive bay tidal action at the southern end of Pond 8, would be an ideal prospect for a horizontal levee to contain toxic discharges and shore up its undermined slopes.

I would also include the Mountain View Shoreline Park refuse site as a candidate for a prioritized horizontal levee as Ponds A1 and A2 are opened up to Bay tides.

Newby Island is in an especially exposed location and would probably need a SF COE generated Environmental Report that would incorporate horizontal levees to absorb three foot wave ride

up at end of the Bay, as well as increase to buffer levees for Coyote Creek high flows that pass East and North of Newby Island.

Response: We acknowledge the comments and agree that horizontal levees or ecotones are a type of shoreline protection that bayfront landfills should consider as they prepare for rising sea levels. While we cannot dictate how these sites choose to provide protection of the landfill and its vulnerable infrastructure, Provision 1d states that a phased adaptation plan shall describe the potential future projects that may be necessary to provide for protection from the 2100 “medium-high” or “extreme” risk aversion SLR scenarios, as well as potential accompanying changes in groundwater rise and extreme storm events. The plan shall allow for a range of future actions at different climate change thresholds to address uncertainty and allow for flexibility over the long term. Proposal and construction of a horizontal levee would certainly be one of these actions landfills can take. Regarding the Highway 237 Landfill, an ecotone has been started along the northern shoreline for protection of the site.