State Water Resources Control Board
Division of Drinking Water

September 25, 2026

(Sent via email: dhanson@morrobay.ca.gov)
Damaris Hanson
Utilities Division Manager
City of Morro Bay
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Morro Bay, CA 93442

DIVISION OF DRINKING WATER COMMENTS FOR THE CITY OF MORRO BAY GROUNDWATER REPLENISHMENT REUSE PROJECT SITING OF INJECTION AND MONITORING WELLS AND 2024-2025 INTERIM GROUNDWATER TRACER TEST (4090016-701)

Dear Ms. Hanson,

This letter transmits the California State Water Resources Control Board, Division of Drinking Water (DDW) comments on the City of Morro Bay (City) proposed injection well and monitoring wells for the City's proposed Groundwater Replenishment Reuse Project (GRRP or Project). These comments supplement DDW's comments provided to the City on July 23, 2026 and respond to the City's letter to DDW dated August 24, 2026.

In June 2026, DDW received a request from the City to review and comment on the City's proposed GRRP injection and monitoring wells, because the City intended to initiate bids for construction of the wells this year. Prior to the City's request, DDW received a Technical Memorandum on the proposed wells (received in December 2025), a revised[1] GRRP Title 22 Engineering Report (received in April 2026), and an Interim Tracer Test[2] conducted at the City's Injection Well 1 to assess groundwater travel times (received in April 2026). More recently, DDW received geophysical assessments[3] of the proposed GRRP area (received in August 2026).

[1] The City revised the April 2026 Title 22 Engineering Report in response to DDW review comments dated October 6, 2025. The previous Title 22 Engineering Report is dated January 2025.
[2] From November 2024 to March 2025, the City conducted a four-month interim groundwater tracer test (Interim Tracer Test) using treated drinking water at Injection Well 1 (IW-1). The test assessed the feasibility of injecting water at IW-1 to meet the underground retention time requirements of the Water Recycling Criteria for the proposed GRRP.
[3] The geophysical assessments include two reports on the vertical spectral ratio (HVSR) passive seismic and electrical resistivity tomography (ERT), dated August 15, 2025. These reports provide definition of subsurface geology that impacts the flow of water underground.

DDW has the following comments for the City regarding the GRRP proposed injection well and monitoring well locations,[4] underground retention times, groundwater model, and interim groundwater tracer tests.

1. **Update of the Groundwater Model:** DDW strongly recommends the City update and recalibrate the groundwater model ahead of the final selection of the GRRP injection and monitoring well locations, and document findings in a revised Title 22 Engineering Report. In the City's August 24, 2026 letter to DDW, the City stated "[…] a refined analysis of hydrogeologic conditions will be developed following Interim Injection Test #2 […]", which is currently planned for mid-2027. The tracer injected during the 2024–2025 Interim Tracer Test does not fit with particle tracking from the April 2026 Title 22 Engineering Report and was not detected at the proposed GRRP monitoring and extraction wells north of Morro Creek. Therefore, the underground retention time and migration pathways of injected water is highly uncertain or unknown in the absence of an updated groundwater model.[5]
    a. Provide an updated groundwater model and revised Title 22 Engineering Report that represents the final proposed GRRP well configurations, design, and operation. The well configurations and groundwater flow paths of the April 2026 Title 22 Engineering Report conflict with more recent information received from the City. For example, Figure 21 in the April 2026 Title 22 Engineering Report depicts three injection wells (IW-1, SB-4, SB-5), whereas the City has stated a final selection of four injection wells (IW-1, IW-2, IW-3, and IW-4) in their August 27, 2026 presentation.
    b. Incorporate the latest available information, including the 2024-2025 Interim Tracer Test results, as well as August 2025 geophysical assessments on vertical spectral ratio (HVSR) passive seismic and electrical resistivity tomography (ERT) into the groundwater model. Based on the 2024-2025 Interim Tracer Test[6] and the August 2025 geophysical assessments,[7] it is not clear how or when water injected at the injection wells will ultimately reach the extraction wells.
    c. Provide the technical basis for each estimated retention time in the August 24, 2026 letter. Address alternative explanations, including preferential flow

[4] Based on recent direction from the City, this comment letter refers to the locations of the proposed injection and monitoring wells from the "Vicinity Map" from the August 27, 2026 meeting between DDW and the City, shown on page 11 of 31 of the meeting presentation slides.

[5] As documented in Table 1 of the City's August 24, 2026 letter to DDW, the estimated underground retention times (URTs) from three of the four proposed injection wells (IW-2, IW-3, and IW-4) to the monitoring and extraction wells are stated as "unknown".

[6] The City provided revised estimates of underground retention times in the August 24, 2026 letter to DDW. In Table 1 of the letter, travel time estimates of greater than four months (">4") are provided for many of the well connections based on tracer non-detection at 18P-02 and MB-15 during the 2024-2025 Interim Tracer Test. Non-detection at wells north of Morro Creek is not a reliable marker for establishing travel time, because non-detection could also indicate an unlikely or non-existent flow path.

[7] For example, Figure 15 of the August 2025 Electricity Resistivity Tomography geophysical assessment report identifies two major and one minor paleochannels and a bedrock high that may influence these flow paths. The August 2025 Electricity Resistivity Tomography geophysical assessment report states: "The high permeability channel structures which lie on either side of the bedrock high provide a high permeability pathway which would tend to move water approaching the high from the north or south in an east/west direction."

paths that bypass the well screens or redirect tracer west or east, creek and groundwater interactions, dilution, and insufficient monitoring duration

d. Document and discuss in a revised Title 22 Engineering Report the model calibration metrics, such as comparison of predicted and observed groundwater levels in monitoring wells and total water budget discrepancy within the modeled system (e.g., total water inflows, outflows, and change in storage).

e. Based on scenario analysis using the updated groundwater model, document in a revised Title 22 Engineering Reportthe anticipated groundwater flow paths and travel times from the proposed injection wells to the proposed monitoring and extraction wells.

2. **Selection of Injection and Monitoring Well Locations.** Re-evaluate the proposed injection and monitoring well locations and screened intervals based on scenario analyses using the updated groundwater model. The current proposed well locations were established using groundwater modeling conducted prior to the 2024-2025 Interim Tracer Test. Based on the misalignment of the 2024-2025 Interim Tracer Test and past groundwater modeling results, the selected injection and monitoring well locations may not be suitable to meet subsurface GRRP underground retention requirements of the Recycled Water Criteria.
    a. Provide the technical basis for retaining or revising each proposed well location, including consideration of potential preferential flow paths (e.g., major and minor paleochannels), geological impediments (e.g., the bedrock high), predicted underground retention times, and the ability of the monitoring well network to detect recycled water along relevant flow paths before it reaches extraction wells.
    b. Based on an updated groundwater model, submit revised information for injection and monitoring wells that includes the injection wells, monitoring wells, well locations and coordinates, screened intervals, associations between wells (e.g., associated monitoring wells and extraction wells to each injection well), estimated travel time from injection wells to monitoring wells, and estimated travel times from injection wells to extraction wells.

3. **Proposed 2027 Interim Tracer Test**. The City is proposing a second interim groundwater tracer test (Interim Tracer Test #2) for mid-2027, which would be conducted at injection well #2 (IW-2). Address the following comments regarding Interim Tracer Test #2.
    a. Describe the anticipated tracer migration pathways for injection at IW-2. IW-2 is located west of IW-1, on the other side of the bedrock high and near the northern paleochannel identified in the August 2025 electricity resistivity tomography report. Address how IW-2’s location relative to the identified bedrock high and northern major paleochannel may affect tracer movement and arrival times at monitoring and extraction wells.
    b. Provide a tracer test protocol for review prior to the start of the test that specifies monitoring well locations and screened intervals, sampling methods, tracer dose, analytical sensitivity, sampling frequency, and criteria for extending or concluding monitoring. Describe what contingency

monitoring is included for tracking tracer where tracer migrates outside the predicted pathways or is not detected at anticipated locations. DDW recommends addition of groundwater monitoring locations in other areas in the east, south, and west of the injection wells to detect lateral movement of the tracer migrates away from the GRRP monitoring wells and City extraction wells north of Morro Creek.[8]

If you have any questions regarding this letter, please contact Scott Miller at (510) 620-3459 or via email at Scott.Miller@waterboards.ca.gov or me at (818) 551-2046 or via email at Ginachi.Amah@waterboards.ca.gov.

Sincerely,

Ginachi Amah
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Water Boards

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cc on next page

[8] The interim tracer tests are not subject to Recycled Water Criteria regulatory requirements due to the use of a non-recycled water source. However, for reference, when determining groundwater monitoring well sampling frequencies in a tracer test, demonstration of retention time underground under full-scale operating conditions requires: “The retention time shall be the time representing the difference from when the water with the tracer is applied at the GRRP to when either; two percent (2%) of the initially introduced tracer concentration has reached the downgradient monitoring point, or ten percent (10%) of the peak tracer unit value observed at the downgradient monitoring point reached the monitoring point.” (Cal. Code Regs., tit. 22, § 60320.208 subd. (d))

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