Los Angeles Regional Water Quality Control Board

October 6, 2023

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Torrance, California 90509-2975

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Mr. Aram Chaparyan
City Manager
City of Torrance
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SUBJECT: REVIEW OF A TECHNICAL MEMORANDUM - PURSUANT TO CALIFORNIA WATER CODE SECTION 13304 CLEANUP AND ABATEMENT ORDER NO. R4-2021-0079

SITE: SKYPARK COMMERCIAL PROPERTIES (ASSESSOR PARCEL NO. 7377-006-906), 24701 – 24777 CRENSHAW BOULEVARD AND 2530, 2540, AND 2600 SKYPARK DRIVE, TORRANCE, CALIFORNIA (SCP NO. 1499, GLOBAL ID NO. T10000014333)

Dear Mr. Darville, et al.:

The California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board) is the state agency with primary responsibility for the protection of groundwater and surface water quality within major portions of Los Angeles and Ventura counties, including the above-referenced site (Site). To accomplish this, the Los Angeles Water Board oversees the investigation and cleanup of discharges of waste that may affect the quality of waters of the state as authorized by the Porter-Cologne Water Quality Control Act (California Water Code [CWC], Division 7).

On October 18, 2022, the Los Angeles Water Board conditionally approved the Groundwater Removal Action Workplan (Groundwater IRAP), dated January 31, 2022, submitted on behalf of the City of Torrance (City) by Terraphase Engineering Inc. (Terraphase), and subsequently updated and revised its conditions on April 14, 2023, after reviewing supplemental technical justifications and clarifications provided by Terraphase. The Groundwater IRAP includes two interim remedial components, the installation of a zero-valent iron (ZVI) barrier along Crenshaw Boulevard and enhanced in-situ bioremediation treatment of groundwater beneath the Hi-Shear Corporation (HSC) property. The report documenting the implementation of the Groundwater IRAP is due by December 15, 2023 with quarterly performance monitoring of said interim remedies commencing in 2024.

On September 5, 2023, the Los Angeles Water Board received the *Removal Action Work Plan Amendment and Extension Request – Amendment to Groundwater Removal Action Work Plan – ZVI Barrier* (ZVI Amendment Memo), submitted on behalf of the City by Terraphase for review. The ZVI Amendment Memo proposes an expansion of the ZVI barrier and requests a time extension for its implementation.

A summary of the ZVI Amendment Memo followed by Los Angeles Water Board comments and requirements are included below.

SUMMARY OF THE ZVI AMENDMENT MEMO

The ZVI Amendment Memo asserts that recent higher-resolution environmental data proximal to the ZVI barrier, obtained as part of the investigative component of the *Revised EA Properties RAW* (Revised EAP IRAP), warrants increasing the length of the ZVI barrier and injecting more ZVI treatment media.

Terraphase provided the following findings and associated changes to the ZVI barrier design:

1. Groundwater concentrations from the recent collected environmental data detected trichloroethene (TCE) concentrations up to six times greater than the concentrations upon which the ZVI barrier was previously designed for.

    a. TCE was detected up to 18,000 micrograms per liter (µg/L) (detected in regional grab groundwater sample EA-RGW-10), as shown in Attachment 1, *Figure 2 – TCE concentrations in Regional Groundwater* (Figure 2).

    b. Tetrachloroethene (PCE) was detected up to 3,400 µg/L (detected in regional groundwater monitoring well EA-MW-05), as shown in Attachment 2, *Figure 3 – PCE Concentrations in Regional Groundwater* (Figure 3).

    c. Total chlorinated volatile organic compounds (VOCs) were detected up to 19,244 µg/L (detected in EA-RGW-10), as shown in Attachment 3, *Figure 4 – Proposed ZVI Injection Locations* (Figure 4).

2. ZVI barrier design changes include:

    a. Injecting 390 metric tons of ZVI (previously 134 metric tons)

    b. Injecting 175 liters of bioaugmentation culture KB-1® (previously 90 liters)

    c. Injecting at 46 injection points, as shown in Figure 4 (previously 27 injection points).

        i. Two rows of injection points will be in areas where total VOCs exceed 5,000 µg/L.

        ii. One row of injection points will be in areas where total VOCs range from 2,000 to 5,000 µg/L.

3. Submit an amendment to the current Report of Waste Discharge application.

Terraphase estimates the ZVI barrier interim remedial component of the Groundwater IRAP will take approximately 14 months to complete. The 14-month period includes:

permitting, access agreements and tenant negotiations; installing injection points; ZVI injections; first post-groundwater monitoring event; reporting.

LOS ANGELES WATER BOARD COMMENTS AND REQUIREMENTS

The Los Angeles Water Board concurs with and approves the ZVI Amendment Memo with the addition of the following comments and requirements:

1. The network of groundwater monitoring wells that monitors the effectiveness of the ZVI barrier shall include groundwater monitoring wells: MW-12 (upgradient), EA-MW-04 (upgradient/treatment), EA-MW-05 (treatment), MW-20 (downgradient), and the following:

    a. Install and include a minimum of one additional treatment zone (i.e., within the ZVI barrier's array of injection points and/or their radii of influence) multi-nested groundwater monitoring wells (i.e., screened within the regional [also known as shallow; screened approximately from 85 to 95 ft-bgs], intermediate [screened approximately from 140 to 150 ft-bgs], and deep [screened approximately from 240 to 250 ft-bgs] groundwater zones).

        i. The additional multi-nested groundwater monitoring well(s) must be installed in the immediate vicinity of regional grab groundwater sample EA-RGW-10 (i.e., where the highest TCE and total chlorinated VOCs concentrations were detected [from the recent collected environmental data proximal to the ZVI barrier collected as part of the investigative component of the Revised EAP IRAP]).

        ii. Collect soil samples at 5 ft-bgs at 5-foot intervals and analyze for VOCs and perchlorate using USEPA Method 8260B and 314.0, respectively.

    b. Install and include a minimum of three downgradient (i.e., after ZVI barrier) multi-nested groundwater monitoring wells (i.e., screened within the regional [also known as shallow], intermediate, and deep groundwater zones).

        i. Two of the multi-nested groundwater monitoring wells must be installed north of groundwater monitoring well MW-20 to be downgradient of and roughly mirror regional grab groundwater samples EA-RGW-09, EA-RGW-10 and EA-RGW-11.

ii. One of the multi-nested groundwater monitoring wells must be installed south of groundwater monitoring well MW-20 to be downgradient of and roughly mirror regional grab groundwater samples EA-RGW-14 and EA-RGW-15 and recently installed groundwater monitoring well EA-MW-05.

iii. Collect soil samples at 5 ft-bgs at 5-foot intervals and analyze for VOCs and perchlorate using USEPA Method 8260B and 314.0, respectively.

The abovementioned existing and required groundwater monitoring wells supersede the network of wells that was previously established in the Los Angeles Water Board's conditional approval of the Groundwater IRAP, dated October 18, 2022 (Attachment 4 [i.e., Los Angeles Water Board Comment and Requirement No. 1]) to monitor the effectiveness of the ZVI barrier.

2. All groundwater monitoring wells must be incorporated into the Site's groundwater monitoring program established in the Los Angeles Water Board's approved groundwater monitoring program for the Site, dated April 14, 2023. Note that new and/or future groundwater monitoring wells shall be monitored on a quarterly basis until written approval is obtained from the Los Angeles Water Board for any proposed modifications as evaluation of each well's location, purpose, concentration trends, and concentration stability after four events is needed before a recommendation for modification to the monitoring program can be considered.

3. Ensure all amendments, and their ingredients (if applicable), are acceptable under the General Permit to avoid delays and install the ZVI barrier in an expeditious manner.

4. You must apply for (and/or revise) the waste discharge requirements (WDR) permit from the Los Angeles Water Board. You are required to submit a complete application/report of Waste Discharge (Form 200) by **November 3, 2023**, including the appropriate fee and supporting documents to the Los Angeles Water Board, Groundwater Permitting Unit, attention Dr. Jim Kang. Form 200 and the fee schedules can be found at the following addresses:

   a. https://www.waterboards.ca.gov/publications_forms/forms/docs/form200.pdf

   b. https://www.waterboards.ca.gov/resources/fees/water_quality/docs/fy1819_wdr_fees.pdf

Note that WDRs permit(s) may warrant additional groundwater monitoring parameters and/or monitoring wells that are not sampled and analyzed for in the routine semi-annual groundwater monitoring program.

5. After reviewing the ZVI Amendment Memo, the additional information and file documents for the Site, the Los Angeles Water Board approves your extension request from December 15, 2023 to **December 31, 2024** to submit the implementation report for the installation of the ZVI barrier located roughly along the eastern boundary of the Site (i.e., Property 1 and Property 2 eastern boundaries along Crenshaw Boulevard).

    a. Note that this time extension is specific only to the ZVI barrier interim remedial component of the Groundwater IRAP.

    b. The conditions in the Los Angeles Water Board's conditional approval of the Groundwater IRAP, dated October 18, 2022 (Attachment 4) that remain operative include the following:

        i. Ensure that performance monitoring parameters for the selected remedy alternatives, at a minimum, include oxidation-reduction potential, terminal electron-accepting processes (i.e., ferrous iron, manganese), electrical conductivity, major cations (e.g., Al, Ba, Fe, Mn, Ca, Mg, Na, K), major anions (e.g., HS^-, Cl^-, NO_2^-, NO_3^-, SO_4^{-2}, PO_4^{-3}, CO_3^{-2}), alkalinity, total dissolved solids, total sulfide, dissolved organic carbon or total organic carbon, dissolved gases (methane, ethane, ethene, carbon dioxide, hydrogen, oxygen), pH, temperature, and Dehalococcoides.

        Note the primary performance measures for the remedy alternatives will be reduction in contaminant concentrations in groundwater. The geochemical and microbial data, where applicable, may be evaluated to identify any changes in environmental conditions that may impact the remedy alternatives' efficiencies.

        ii. The Los Angeles Water Board does not consider the Groundwater IRAP as the final Site cleanup plan. The Groundwater IRAP provides source reduction and containment, but it does not actively address the VOC concentrations downgradient and off-Site. Subsequent interim remedial action plan(s) and/or comprehensive remedial action plan(s) are warranted to address impacts that have migrated off-Site.

iii. *Regarding necessary cleanup levels, note that State Water Resources Control Board Resolution No. 92-49 establishes that the Los Angeles Water Board shall require dischargers to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality or, if background levels of water quality are not achievable, the best water quality which is reasonable. If background levels of water quality are not achievable, alternative cleanup levels must be established that are protective of human health and the environment and which take into account technical and economic feasibility. (See Cal. Code Regs., tit. 23, § 2550.4.)*

The Los Angeles Water Board does not consider the ZVI barrier and/or the Groundwater IRAP as the final Site cleanup plan. The final Site cleanup plan and the cleanup levels proposed therein must address the requirements of State Water Resources Control Board Resolution No. 92-49. Therefore, any discussion regarding cleanup levels at this time is premature without first demonstrating that cleanup to achieve background levels of water quality is not achievable.

c. In the event that groundwater conditions are exacerbated and/or do not improve in groundwater monitoring wells EA-MW-04, EA-MW-05, MW-20, and wells required in Los Angeles Water Board Comment and Requirement Nos. 1.a. and 1.b. above following the installation of the ZVI barrier, future lateral and/or vertical expansion of the ZVI barrier and/or additional interim remedial actions may be warranted.

d. Results and data from the ongoing future investigative and remedial activities at the Site may also warrant future lateral and/or vertical augmentation of the ZVI barrier and/or additional multi-media interim remedial actions.

e. Prior to starting fieldwork, obtain all applicable permits from appropriate regulatory and local agencies, as necessary. Copies of agency-approved permits should be included in the report(s) submitted to the Los Angeles Water Board.

f. Notify the Los Angeles Water Board case manager at least ten working days in advance of field work.

g. Prepare and submit quarterly performance monitoring reports following the installation of the ZVI barrier with the first performance monitoring report

due **April 15, 2025**. Continue to submit quarterly performance monitoring reports, in accordance with the following schedule, until otherwise instructed to do so by the Executive Officer of the Los Angeles Water Board.

Reporting Period	Report(s) Due Date
January – March	April 15th
April – June	July 15th
July – September	October 15th
October – December	January 15th

The above requirements and conditional approval and the revised Attachment B (attached hereto) is an amendment to Cleanup and Abatement Order No. R4-2021-0079. All other aspects of the Order No. R4-2021-0079, originally dated June 18, 2021, and the amendments thereto, remain in full force and effect. Pursuant to section 13350 of the California Water Code, a person who violates a cleanup and abatement order issued or amended by a regional board may be subject to civil liabilities of up to fifteen thousand dollars ($15,000) for each day the violation occurs. The Los Angeles Water Board or the California Attorney General's Office reserves their rights to take any further enforcement action authorized by law.

If you have any questions regarding this letter, please contact Mr. Kevin Lin at (213) 576-6781 or via email at kevin.lin@waterboards.ca.gov, or contact Dr. Angelica Castaneda, Site Cleanup Unit IV Supervisor, at (213) 576-6737 or via email at angelica.castaneda@waterboards.ca.gov.

Sincerely,

Hugh Marley

Digitally signed by Hugh Marley
Date: 2023.10.06 10:53:36 -07'00'

Water Boards

for Susana Arredondo
Executive Officer

Attachments:

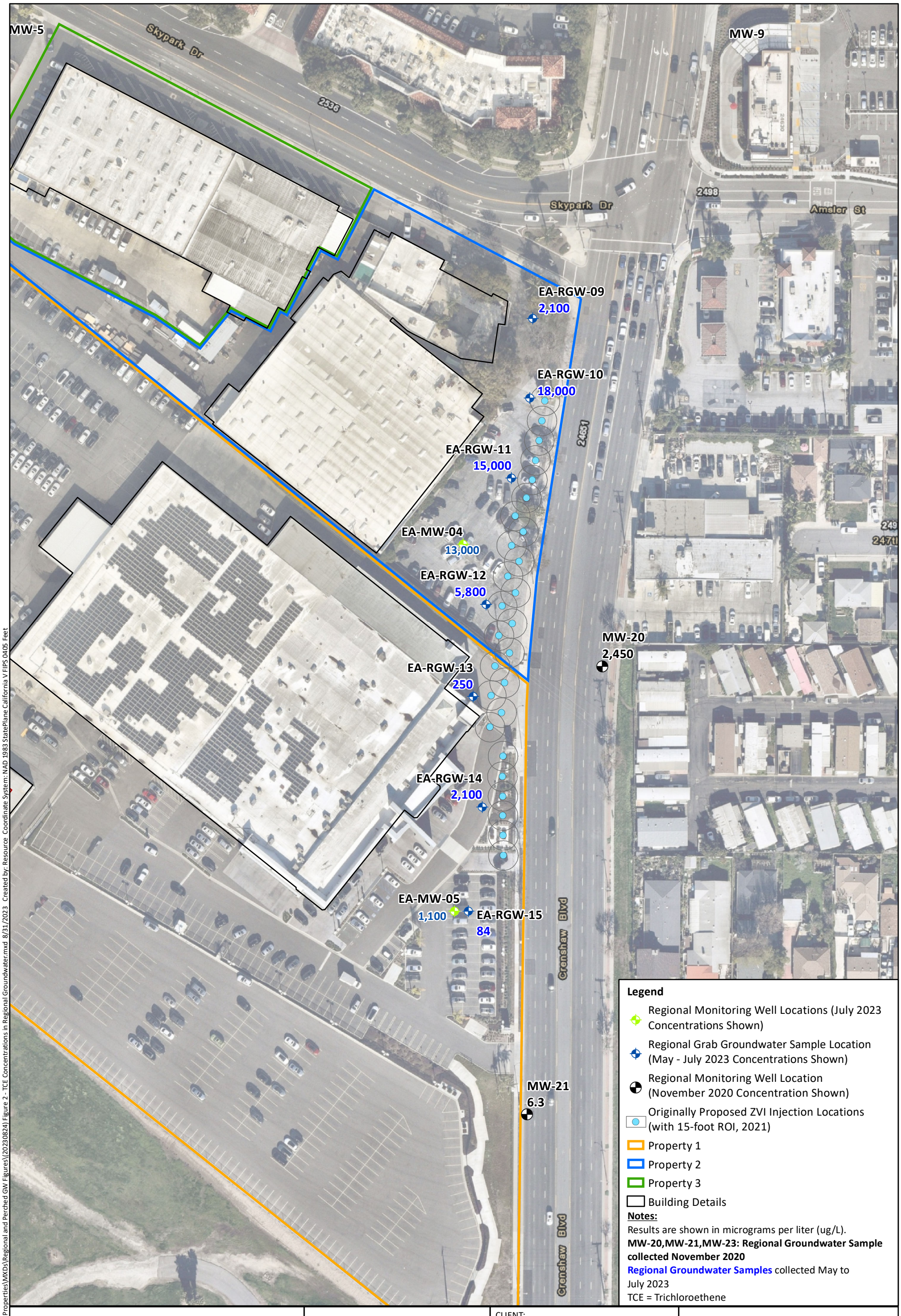
1. Figure 2 – TCE concentrations in Regional Groundwater
2. Figure 3 – PCE Concentrations in Regional Groundwater
3. Figure 4 – Proposed ZVI Injection Locations
4. *Review of Interim Remedial Action Plan*, dated October 18, 2022 (also known as Los Angeles Water Board's conditional approval of the Groundwater IRAP; its attachments were excluded for brevity)

5. Cleanup and Abatement Order No. R4-2021-0079, Attachment B Revised Time Schedule of Order
6. Cleanup and Abatement Order No. R4-2021-0079, Attachment B Revised Time Schedule of Order (underline/strikeout version)

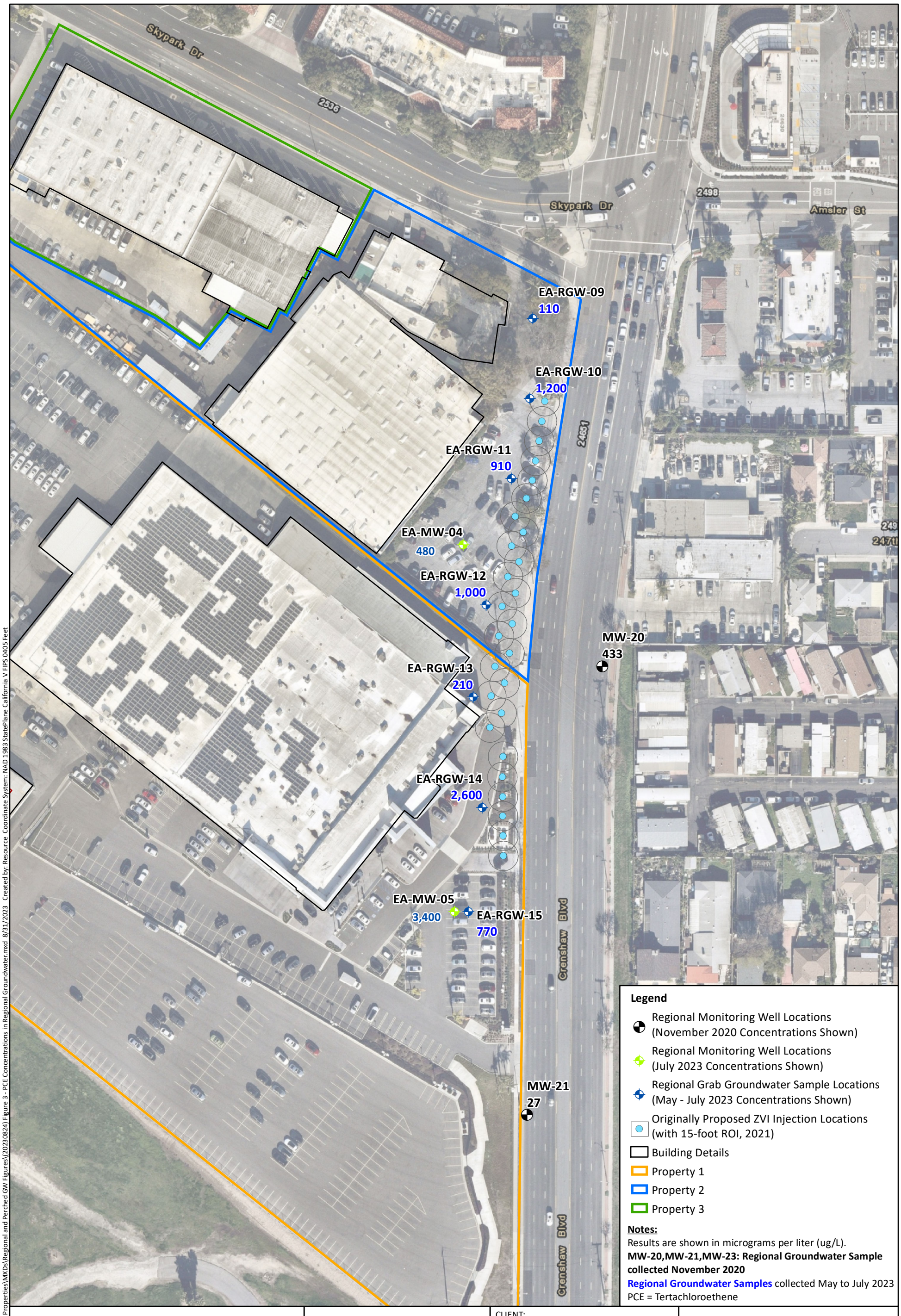
cc (via email):

Dmitriy Ginzburg, State Water Board Division of Drinking Water
Joseph Liles, Water Replenishment District
Carla Dillon, City of Lomita
Ryan Smoot, City of Lomita
Trevor Rusin, City of Lomita
Alan B. Fenstermacher, Rutan & Tucker, LLP
Travis Van Ligten, Rutan & Tucker, LLP
Richard Montevideo, Rutan & Tucker, LLP
Darren Croteau, Terraphase Engineering Inc.
Charlie Robinson, Terraphase Engineering Inc.
Timothy Wood, GSI Environmental Inc.
Peter Scaramella, GSI Environmental Inc.
Sonja A. Inglin, Cermak & Inglin, LLC
Scott D. Warner, BBJ Group
Patrick L. Rendon, Lamb and Kawakami, LLP
Mike Kinworthy, MK Environmental Consulting, Inc.
William J. Beverly, Law Offices of William J. Beverly
Brian M. Ledger, Gordon Rees Scully Mansukhani, LLP
Christopher T. Johnson, Gordon Rees Scully Mansukhani, LLP
Thomas Schmidt, Hamrick & Evans, LLP
David L. Evans, Hamrick & Evans, LLP
Jeff W. Poole, Hamrick & Evans, LLP
Steve Van der Hoven, Genesis Engineering & Redevelopment
Solomon Seyum, Genesis Engineering & Redevelopment

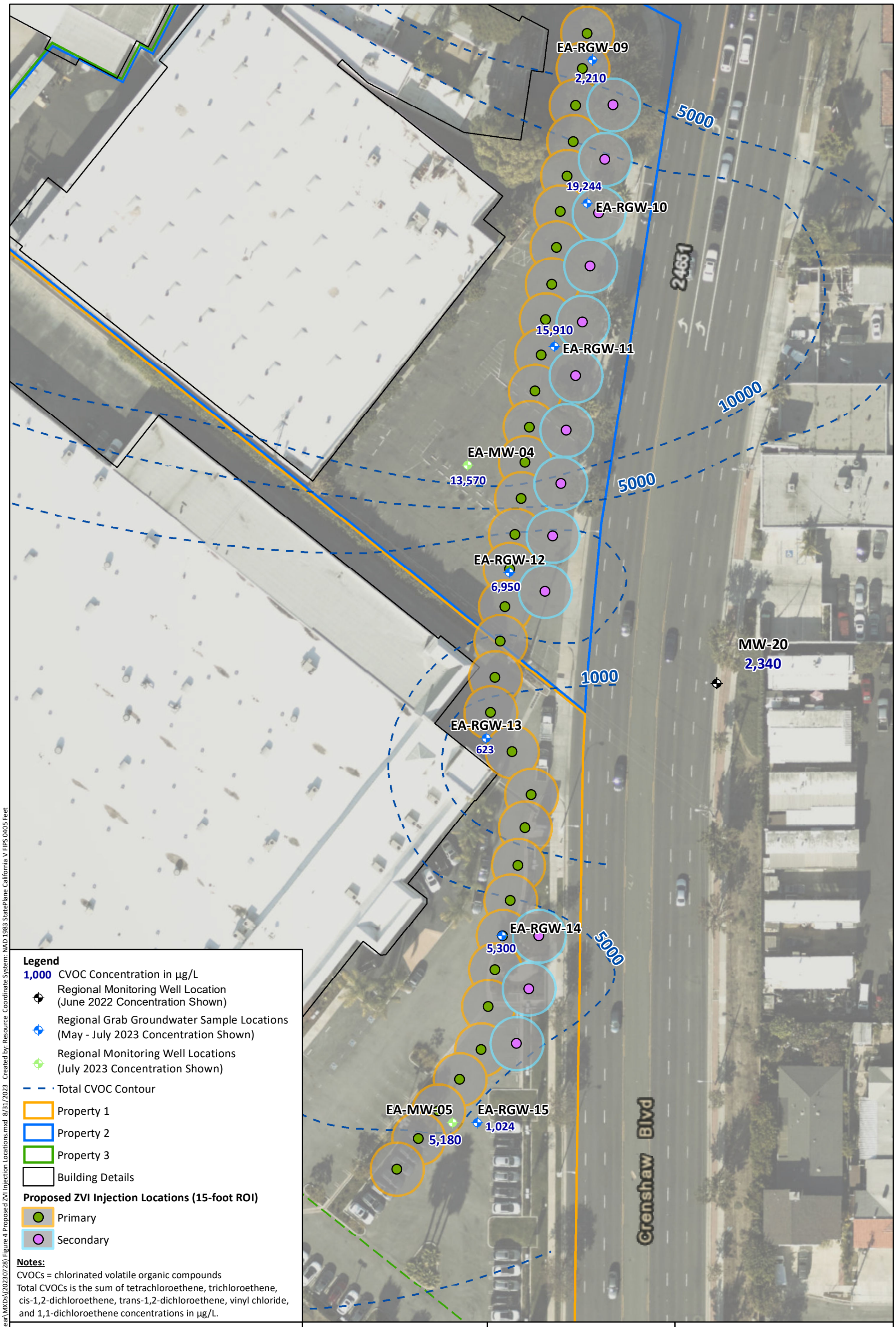
Attachment 1 - Figure 2 – TCE concentrations in Regional Groundwater



Attachment 2 - Figure 3 – PCE Concentrations in Regional Groundwater



Attachment 3 - Figure 4 – Proposed ZVI Injection Locations



Los Angeles Regional Water Quality Control Board

October 18, 2022

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City of Torrance
3031 Torrance Boulevard
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SUBJECT: REVIEW OF INTERIM REMEDIAL ACTION PLAN FOR SITE GROUNDWATER, PURSUANT TO CALIFORNIA WATER CODE SECTION 13304 CLEANUP AND ABATEMENT ORDER NO. R4-2021-0079

SITE: SKYPARK COMMERCIAL PROPERTIES (ASSESSOR PARCEL NO. 7377-006-906), 24701 – 24777 CRENSHAW BOULEVARD AND 2530, 2540, AND 2600 SKYPARK DRIVE, TORRANCE, CALIFORNIA (SCP NO. 1499)

Dear Mr. Darville, et al.:

The California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board) is the state agency with primary responsibility for the protection of groundwater and surface water quality within major portions of Los Angeles and Ventura counties, including the above referenced site (Site). To accomplish this, the Los Angeles Water Board oversees the investigation and cleanup of discharges of waste that may affect the quality of waters of the state as authorized by the Porter-Cologne Water Quality Control Act (California Water Code [CWC], Division 7).

On January 31, 2022, the Los Angeles Water Board staff received the *Groundwater Removal Action Workplan* (Groundwater IRAP), submitted on behalf of the City of Torrance by Terraphase Engineering Inc. (Terraphase) for review.

A summary of the Groundwater IRAP followed by Los Angeles Water Board comments are included below.

SUMMARY OF GROUNDWATER IRAP

According to the Groundwater IRAP, the objectives of the proposed remedial actions are to:

1. Reduce the potential for vapor intrusion risk into the City of Lomita, east of Crenshaw Boulevard, by addressing the regional groundwater impacted by volatile organic compounds (VOCs).

2. Reduce contaminant mass and migration at and/or beneath the Hi-Shear Corporation portion (Hi-Shear Property) of the Site.

3. Achieve water quality objectives (i.e., maximum contaminant levels [MCLs]) in the regional groundwater within a reasonable time frame.

The Groundwater IRAP evaluated the following remedy alternatives to achieve the objectives:

1. No Action

2. Monitored Natural Attenuation (MNA)

3. Enhanced In-Situ Bioremediation (EISB)

4. Zero-Valent Iron (ZVI) Barrier

5. Groundwater Pump and Treat

6. Thermal Technologies with Soil Vapor Extraction

7. In-Situ Chemical Oxidation

Terraphase proposed to retain the following two remedy alternatives to achieve the objectives:

1. ZVI Barrier

    a. Intends to minimize the migration of the VOC plume into the City of Lomita and to reduce groundwater contaminant concentrations.

    b. Is located roughly along the eastern boundary of the Site (i.e., along Crenshaw Boulevard) and measuring approximately 500 feet (see attached Figure 6 – Plume Margin ZVI Barrier) to treat groundwater total VOC concentrations greater than 200 micrograms per liter (µg/L).

    c. Is installed by injecting ZVI, KB-1 Plus (a commercial bioaugmentation culture), and plant-based substrate (guar) at 28 injection points into a 25-foot zone approximately 90 to 115 feet below ground surface (ft-bgs). The injection points are organized in an array of two rows approximately in the center 250 feet of the groundwater VOC plume with single rows of injection points extending 125 to the north and south. The north and south extent and placement of the ZVI barrier will be better understood with confirmation groundwater samples collected during installation of the outmost injection wells.

        i. Injections through 4-inch-diameter polyvinyl chloride casings installed to 115 ft-bgs by sonic drilling technology

        ii. Terraphase estimates the barrier will be composed of 134 metric tons of ZVI injected under high pressure with 43 metric tons of sand in a water- and food-grade guar carrier fluid with 90 liters of KB-1 Plus. Limited EISB substrate will also be applied during ZVI placement to increase reductive conditions.

        iii. The radius of influence of each injection point is expected to be 15 feet and will be confirmed with continuous pressure logging. The 15 feet radii allow for a minimum of 30 percent and 10 percent overlap along the single injection rows and double injection rows, respectively.

iv. The exact locations of the 28 injection points are subject to change as confirmation groundwater samples will be collected during injection well installations that may better inform placement of injection points.

2. EISB, followed by MNA

    a. Intended to treat "the primary VOC source at the Hi-Shear Property" (as described by Terraphase) and to prevent continued migration of VOCs in the regional groundwater from the Hi-Shear Property.

    b. EISB pilot studies were conducted in 2013 and 2015 followed by one injection event in 2017 at the Hi-Shear Property. The results suggest that EISB is effective in the remediation of VOC impacts to groundwater. Terraphase cites short duration and incomplete and limited application of EISB within the Hi-Shear Property as key shortcomings of past efforts.

    c. Utilizes the existing 77 dual-nested injection wells, screened from 88 to 98 ft-bgs and 103 to 113 ft-bgs, at the Hi-Shear Property to reestablish and maintain a biologically active zone conducive for dechlorination (see attached Figure 5 – High-Shear Injection Well Locations).

        i. Terraphase estimates a total injection volume of 724,500 gallons. The EISB amendment concoction includes soybean oil, emulsifiers, nutrients, and other soluble organic carbon substrates (i.e., Electron Donor Solution-extended release [EDS-ER; soybean-oil based], Electron Donor Solution-Activator [EDS-Activator; alkaline and donor], substrate shuttle [alcohol based], and TersOx Nutrients-QR).

    d. Terraphase estimates 4 quarterly sampling events, 4 bi-annual sampling events, and 10 years of annual sampling post-injection.

3. Terraphase anticipates quarterly Waste Discharge Requirement (WDR) groundwater compliance monitoring for one year, bi-annually for two years, and annually thereafter for up to 15 groundwater monitoring wells.

FACT SHEET AND NOTICE OF OPPORTUNITY TO COMMENT

Pursuant to sections 13307.1 and 13307.5 of the California Water Code (CWC), Los Angeles Water Board staff issued a *Project Update and Notice of Opportunity to Comment* (Update) on May 11, 2022 to all businesses, residents, and property owners within a 500-foot radius of the aerial extent of the Site and to interested parties. The Update invited all recipients of the Update to participate in the cleanup process by reviewing and providing comments on the Groundwater IRAP to the Los Angeles Water Board by June 20, 2022.

LOS ANGELES WATER BOARD COMMENTS AND REQUIREMENTS

The Los Angeles Water Board conditionally approves the Groundwater IRAP with the following comments and requirements:

1. In addition to the groundwater monitoring wells highlighted in the Groundwater IRAP (MW-20, MW-21, and MW-23), groundwater monitoring wells MW-8, MW-12, and the five wells conditionally approved to be installed in the regional groundwater zone (three on Property 1, one on Property 2, and one on the former Nike Missile Base), as part of the investigative component of the revised *Removal Action Workplan for the East Adjacent Properties* (EAP IRAP), shall be included in the network of wells that monitors the effectiveness of the ZVI barrier.

2. Based on recent groundwater monitoring data reported in the *First Tri-Annual 2022 Groundwater Monitoring Report*, submitted on behalf of Hamrick & Evans, LLP (attorney representative for Hi-Shear Corporation) by Genesis Engineering & Redevelopment, Inc. on May 13, 2022, additional EISB injection wells shall be installed in the immediate vicinity of groundwater monitoring wells MW-4, MW-13, and MW-14. Recent tetrachloroethene, trichloroethene, and 1,1-dichloroethene groundwater concentrations at these wells were up to two orders of magnitude greater than their respective State Water Resources Control Board Division of Drinking Water's MCLs of 5 µg/L, 5 µg/L, and 6 µg/L, respectively, and have historically been elevated.

   These injection wells shall be installed in a similar construction and configuration as the existing injection points and incorporated in the implementation of the Groundwater IRAP.

3. The existing dual-nested injection wells that are deemed to be in poor working or nonworking conditions during inspection shall be rehabilitated or replaced with a new injection well of the same construction and configuration.

4. Consistent with the EISB activities implemented in 2017 by Hi-Shear Corporation at the Hi-Shear property, the network of wells that monitors the effectiveness of the EISB injections shall include groundwater monitoring wells MW-7R (serves as an upgradient well); MW-6, MW-15, MW-18, MW-5, MW-10, MW-16, MW-19, CMW-11C (serve as treatment zone wells); and MW-8 and MW-12 (serve as downgradient wells). Based on Los Angeles Water Board Comment No. 2, groundwater monitoring wells MW-4, MW-13, and MW-14 shall also be included in the network to serve as treatment zone monitoring wells.

5. Ensure that performance monitoring parameters for the selected remedy alternatives, at a minimum, include oxidation-reduction potential, terminal electron-accepting processes (i.e., ferrous iron, manganese), electrical conductivity, major cations (e.g., Al, Ba, Fe, Mn, Ca, Mg, Na, K), major anions (e.g., HS^-, Cl^-, NO_2^-, NO_3^-, SO_4^{-2}, PO_4^{-3}, CO_3^{-2}), alkalinity, total dissolved solids, total sulfide, dissolved

organic carbon or total organic carbon, dissolved gases (methane, ethane, ethene, carbon dioxide, hydrogen, oxygen), pH, temperature, and Dehalococcoides.

Note the primary performance measures for the remedy alternatives will be reduction in contaminant concentrations in groundwater. The geochemical and microbial data, where applicable, may be evaluated to identify any changes in environmental conditions that may impact the remedy alternatives' efficiencies.

6. In addition to the proposed criteria of treating groundwater total VOC concentrations greater than 200 µg/L, the north and south ends of the ZVI barrier shall also be extended along the eastern boundary of the Site, as necessary, to address groundwater VOC concentrations that exceed one order of magnitude of their respective MCLs. The extension of the north and south ends of the ZVI barrier shall be based on the proposed confirmation groundwater sampling during the ZVI barrier installation and data from the investigative component of the EAP IRAP (i.e., grab groundwater sample data from the transects).

7. The Los Angeles Water Board does not concur at this time with the MNA aspect of the EISB remedy alternative retained. It is premature at this time to conclude that MNA following EISB injections can achieve the necessary cleanup levels in a reasonable timeframe. MNA may be considered as an alternative in the future based on the positive results of interim and comprehensive remedial activities implemented at the Site.

8. Notify the Los Angeles Water Board case manager at least ten working days in advance of field work.

9. Submit the Groundwater IRAP implementation report by **May 15, 2023**. The report should include field observations, a detailed map of the injection points, conclusions, and recommendations for the Site.

10. Prepare and submit tri-annual performance monitoring reports for the Site on the same schedule as the tri-annual groundwater monitoring reports with the first performance monitoring report due **May 15, 2023**. Continue to submit tri-annual performance monitoring reports and tri-annual groundwater monitoring reports until otherwise instructed to do so by the Executive Officer of the Los Angeles Water Board.

11. The Los Angeles Water Board does not consider the Groundwater IRAP as the final Site cleanup plan. The Groundwater IRAP provides source reduction and containment, but it does not actively address the VOC concentrations downgradient and off-Site. Subsequent interim remedial action plan(s) and/or comprehensive remedial action plan(s) are warranted to address impacts that have migrated off-Site.

12. Regarding necessary cleanup levels, note that State Water Resources Control Board Resolution No. 92-49 establishes that the Los Angeles Water Board shall

require dischargers to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality or, if background levels of water quality are not achievable, the best water quality which is reasonable. If background levels of water quality are not achievable, alternative cleanup levels must be established that are protective of human health and the environment and which take into account technical and economic feasibility. (See Cal. Code Regs., tit. 23, § 2550.4.)

As noted in Comment No. 11 above, the Los Angeles Water Board does not consider the Groundwater IRAP as the final Site cleanup plan. The final Site cleanup plan and the cleanup levels proposed therein must address the requirements of State Water Resources Control Board Resolution No. 92-49. Therefore, any discussion in the Groundwater IRAP regarding cleanup levels is premature without first demonstrating that cleanup to achieve background levels of water quality is not achievable.

13. On May 11, 2022, the Groundwater IRAP was presented to you and posted for public comment with the issuance of a *Project Update and Notice of Opportunity to Comment*. The public comment period ended on June 20, 2022. The Los Angeles Water Board has reviewed the comments received and prepared the attached document, entitled *Response to Public Comments to Groundwater Removal Action Plan* (Response to Comments), summarizing the pertinent comments received and the responses to those comments.

The revisions to Attachment B Third Revised Time Schedule (attached) constitute an amendment to the requirements of the Cleanup and Abatement Order No. R4-2021-0079 (Order) originally dated June 18, 2021. All other aspects of the Order No. R4-2021-0079 originally dated June 18, 2021, and the amendments thereto, remain in full force and effect. Pursuant to section 13350 of the California Water Code, failure to comply with the requirements of the Order No. R4-2021-0079 by the specified due date, including date(s) in this amendment, may result in civil liability administratively imposed by the Los Angeles Water Board in an amount up to five thousand dollars ($5,000) for each day of failure to comply.

If you have any questions regarding this letter, please contact Mr. Kevin Lin at (213) 576-6781 or via email at kevin.lin@waterboards.ca.gov, or contact Ms. Jillian Ly, Remediation Section II Manager, at (213) 576-6664 or via email at jillian.ly@waterboards.ca.gov.

Sincerely,

R Purdy
Digitally signed by R Purdy
Date: 2022.10.18 15:21:44 -07'00'
Water Boards

Renee Purdy
Executive Officer

Attachments:

1. Figure 6 – Plume Margin ZVI Barrier
2. Figure 5 – High-Shear Injection Well Locations
3. Attachment B Third Revised Time Schedule of Order
4. Attachment B Third Revised Time Schedule of Order (underline/strikeout version)
5. Response to Comments to Groundwater Removal Action Plan
6. Comments Received to Groundwater Removal Action Plan

cc:

Dmitriy Ginzburg, State Water Board Division of Drinking Water
Joseph Liles, Water Replenishment District
Carla Dillon, City of Lomita
Ryan Smoot, City of Lomita
Trevor Rusin, City of Lomita
Alan B. Fenstermacher, Rutan & Tucker, LLP
Travis Van Ligten, Rutan & Tucker, LLP
Richard Montevideo, Rutan & Tucker, LLP
Darren Croteau, Terraphase Engineering Inc.
Sonja A. Inglin, Cermak & Inglin, LLC
Patrick L. Rendon, Lamb and Kawakami, LLP
William J. Beverly, Law Offices of William J. Beverly
Brian M. Ledger, Gordon Rees Scully Mansukhani, LLP
Thomas Schmidt, Hamrick & Evans, LLP
David L. Evans, Hamrick & Evans, LLP
Jeff W. Poole, Hamrick & Evans, LLP
Steve Van der Hoven, Genesis Engineering & Redevelopment
Solomon Seyum, Genesis Engineering & Redevelopment

CLEANUP AND ABATEMENT ORDER NO. R4-2021-0079
ATTACHMENT B: REVISED TIME SCHEDULE

DIRECTIVE	DUE DATE
1. Site Conceptual Model: The Dischargers shall prepare and submit to the Regional Board a Site Conceptual Model which provides details on and illustrates waste discharge scenario(s), geology and hydrogeology, waste constituent fate and transport in soil, soil vapor, and groundwater, distribution of waste constituents, exposure pathways, sensitive receptors and other relevant information. [Note that the Regional Board may require revisions to the Site Conceptual Model as necessary to complete the Model.]	(Directive 1) Site Conceptual Model due **September 10, 2021.** Revisions due within 60 days of receiving directive from the Regional Board.
2. Risk Assessment: The Dischargers shall:	
a. Prepare and submit a comprehensive HHRA	(Directive 2.a.) **September 10, 2021**
b. Prepare and submit implementation reports for the response zones designated in the Vapor Intrusion Response Plan.	
i. Completion report for the Accelerated Response Zone	(Directive 2.b.i.) **August 15, 2022**
ii. Interim completion report for the Evaluate Need for Action Zone.	(Directive 2.b.ii.) **August 15, 2022**
iii. Completion report for the Evaluate need for Action Zone	(Directive 2.b.iii.) **March 17, 2023**
c. Submit a revised Evaluate Need for Action Zone Plan and its Figure 7 – Proposed VI Assessment Sectors	(Directive 2.c.) **August 13, 2021**
d. Prepare and submit **semi-annual** and **annual** soil vapor monitoring reports.	
i. Continue to monitor and submit semi-annual soil vapor probe monitoring reports for the	(Directive 2.d.i) **Semi-annually beginning January 31, 2022**

DIRECTIVE	DUE DATE
network of soil vapor probes (at 5 and 15 feet below ground surface) east of Crenshaw Boulevard as conditionally approved on November 15, 2021.	
ii. Monitor and submit annual soil vapor monitoring reports for all soil vapor probes across all depths associated with the Site, not otherwise covered in Directive 2.d.i. (above).	(Directive 2.d.ii.) First Site-wide annual soil vapor monitoring report due **July 31, 2024**.
Monitoring Periods April – June (Semiannual; Annual) October – December (Semiannual)	**Report Due Date** July 31st January 31st
3. Site Assessment:	
a. The Dischargers shall prepare and submit Site Assessment Work Plan(s) for each Property	(Directive 3.a.) **September 10, 2021**
The Dischargers shall implement the Site Assessment Work Plan(s) according to the approved schedule	(Directive 3.a.) According to the schedule approved by the Executive Officer. Vertical and lateral delineation must be completed no later than **September 12, 2022**
The Dischargers shall submit the Site Assessment Completion Report(s)	(Directive 3.a.) According to the schedule approved by the Executive Officer
Submit implementation report for the investigative component of the Revised EAP IRAP.	(Directive 3.a.) **December 30, 2022**
b. Hi-Shear Corporation shall submit the Additional Scope Report	(Directive 3.b.) **October 15, 2021**
c. Hi-Shear Corporation shall submit the Module IV Report	(Directive 3.c.) **October 15, 2021**
d. Hi-Shear Corporation shall submit the Onsite Vertical Groundwater Investigation Report	(Directive 3.d.) **August 27, 2021**

DIRECTIVE	DUE DATE
e. The Dischargers shall submit the Groundwater Modeling Work Plan	(Directive 3.e.) **January 7, 2022**
4. Conduct Remedial Action: The Dischargers shall:	
a. Develop and submit the IRAP(s)	(Directive 4.a.) **August 31, 2021**
i. Submit the Groundwater IRAP implementation report	(Directive 4.a.i.) **December 15, 2023**
1. Implementation of Hi-Shear Corporation's *Source Control Pilot Study Work Plan*	
a. Commence operation of pilot air sparging system	(Directive 4.a.i.1.a.) **December 15, 2023**
b. Implementation report for air sparging period (i.e., six months of air sparging) of *Source Control Pilot Study Work Plan*	(Directive 4.a.i.1.b.) **July 31, 2024**
This is a conditional reprieve from the EISB component of the Groundwater IRAP at the Hi-Shear Corporation property. If AS is determined to be ineffective, then the following conditional deadlines will become operative.	
a. Submit a complete application/report of Waste Discharge (Form 200)	(Directive 4.a.i.1.a. [conditional]) **September 30, 2024**
b. EISB implementation at the Hi-Shear Property	(Directive 4.a.i.1.b. [conditional]) **December 31, 2024**
c. Prepare and submit quarterly EISB progress reports	(Directive 4.a.i.1.c. [conditional]) Quarterly beginning **April 15, 2025**.
Monitoring Period January – March April – June	**Report Due Date** April 15 July 15

DIRECTIVE	DUE DATE
July – September October – December	October 15 January 15
2. Implementation of the ZVI barrier interim remedial component of the Groundwater IRAP, as conditionally approved on October 18, 2022, subsequently updated and revised on April 14, 2023, and as conditionally approved in Los Angeles Water Board letter dated October 6, 2023.	
a. Submit and/or revise complete application/report of Waste Discharge (Form 200).	(Directive 4.a.i.2.a.) **November 3, 2023**
b. Install ZVI barrier located roughly along the eastern boundary of the Site and submit the implementation report.	(Directive 4.a.i.2.b.) **December 31, 2024**
c. Prepare and submit quarterly ZVI barrier progress reports **Monitoring Period** January – March April – June July – September October – December	(Directive 4.a.i.2.c.) Quarterly beginning **April 15, 2025**
ii. Prepare and submit Remediation Progress Reports for the implementation of the Groundwater IRAP according to the Los Angeles Regional Water Quality Control Board letter, "Review of a Technical Memorandum," dated April 14, 2023	(Directive 4.a.ii.) Quarterly beginning April 15 of the year implementation of the Groundwater IRAP begins.
iii. Submit the Revised EAP IRAP implementation report	(Directive 4.a.iii.) **September 15, 2023**
1. Submit a complete application/report of Waste Discharge (Form 200)	(Directive 4.a.iii.1.) **February 24, 2023**

DIRECTIVE	DUE DATE
iv. Prepare and submit Remediation Progress Reports for the implementation of the Revised EAP IRAP	(Directive 4.a.iv.) Tri-annually beginning September 15 of the year implementation of the Revised EAP IRAP begins.
v. Develop and submit a work plan to address soil vapor impacts beneath the northern half of the Hi-Shear Corporation property.	(Directive 4.a.v.) **November 30, 2023**
vi. Prepare and submit quarterly Hi-Shear Corporation property *SVE System Operation* reports	(Directive 4.a.vi.) Quarterly beginning October 15, 2023
Monitoring Period January – March April – June July – September October – December	**Report Due Date** April 15 July 15 October 15 January 15
b. Develop and submit the RAP(s)	(Directive 4.b.) **March 31, 2022**
i. Amend and revise Hi-Shear Corporation's Draft Remedial Action Plan (a.k.a. Draft RAP) to propose comprehensive remedial action plan(s) for cleanup of wastes in soil matrix, soil vapor, and groundwater	(Directive 4.b.i.) **March 31, 2025**
Implement the RAP(s)	(Directive 4.b.) According to the schedule in the RAP approved by the Executive Officer. RAP Implementation must be complete and cleanup achieved by **March 31, 2027**.
Prepare and submit Remediation Progress Reports for the implementation of the RAP(s)	(Directive 4.b.) Quarterly beginning January 15 of the year implementation of the RAP begins
Upon completion of implementation of the RAP, submit a Remedial Action Completion Report	(Directive 4.b.) 60 days after completion of implementation of the RAP

DIRECTIVE	DUE DATE
5. Groundwater Monitoring: The Dischargers shall conduct groundwater monitoring according to the Los Angeles Regional Water Quality Control Board letter, "Review of Proposed Revisions to the Groundwater Monitoring Plan and Second Tri-Annual 2022 Groundwater Monitoring Report," dated April 14, 2023; Attachment C (Monitoring and Reporting Program) and the following schedule.	(Directive 5) The next groundwater monitoring report is due on **October 15, 2023**.
Monitoring Period January – March (Quarterly gauging; Semiannual monitoring and reporting)	(Directive 5) **Report Due Date** April 15th
April – June (Quarterly gauging)	(Directive 5) To be included in the October 15th due date
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October – December (Quarterly gauging)	(Directive 5) To be included in the April 15th due date
6. Public Participation: The Dischargers shall submit information and take actions addressing public participation requirements of CWC sections 13307.5 and 13307.6, including, but not limited to:	
a. Submit a baseline community assessment	(Directive 6.a.) According to the schedule approved by the Executive Officer.
b. Submit an interested persons contact list	(Directive 6.b.) According to the schedule approved by the Executive Officer.
c. Submit a draft fact sheet	(Directive 6.c.) According to the schedule approved by the Executive Officer.

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c. Submit a draft fact sheet	

DIRECTIVE	DUE DATE
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