

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2023-0808  
FOR  
LEVITREE, INC. AND XIANCHANG ZOU  
LEVITREE SUBTERRANEAN WOOD INJECTION PILOT STUDY  
SACRAMENTO COUNTY

Issued by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) pursuant to Water Code section 13267, subdivision (b)(1), this Order establishes a Monitoring and Reporting Program (MRP) for Levitree, Inc. and Xianchang Zou (collectively, Dischargers) in connection with a proposed Pilot Study involving the injection of sawdust/wood chips (approximately 190 dry tons) beneath an approximately 10-acre area of walnut orchards (APN 136-0230-069), as described in the Dischargers' Levitree Subterranean Wood Injection Pilot Proposal V2 (Report) received on 25 June 2023.

The Pilot Study will evaluate the feasibility of elevating the terrain and improving the suitability of an existing orchard that is unusable due to flooding during the winter. The Pilot Study procedure uses a pump to open a shallow subterranean aperture, which is then injected with a sawdust/wood chip and water mixture. Once the slurry mixture is injected, the slurry water is slowly extracted leaving the wood chips in place. The Pilot Study will target a shallow clay/sand layer at a depth around 15 feet below ground surface. It is anticipated that there will be between 10 and 40 injection locations, most of which will be temporary and only operational for a week. The overall Pilot Study injection activity shall take place over approximately 120 days.

This Order requires the Dischargers to monitor and report on the quality of Pilot Study injection water and underlying groundwater. This Order shall remain in effect for the duration of the Pilot Study (through submission of the Pilot Study Completion Report) and may be subject to revision by the Executive Officer as necessary. This Order shall not be construed as Waste Discharge Requirements (WDRs), which may be prescribed at a later date based on the results of the Pilot Study.

Section 13267 of the California Water Code states, in part:

*A regional board ... may investigate the quality of any waters of the state within its region [and, in doing so] may require that any person who has discharged... or who proposes to discharge waste within its region ... shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.*

As described above, the Dischargers have proposed to discharge waste within the Central Valley region by carrying out the Pilot Study. Pursuant to Water Code section 13267, this Order requires implementation of monitoring and reporting requirements necessary to inform the Central Valley Water Board of water quality impacts or threats that could arise from the Pilot Study. The burden, including costs, of preparing the reports required by this order bears a reasonable relationship to the need for the reports and the benefits to be obtained thereby.

Section 13268 of the California Water Code states, in part:

*(a) Any person failing or refusing to furnish technical or monitoring program reports as required by subdivision (b) of Section 13267.... is guilty of a misdemeanor and may be liable civilly in accordance with subdivision (b).*

*(b)(1) Civil liability may be administratively imposed by a regional board...in an amount which shall not exceed one thousand dollars (\$1,000) for each day in which the violation occurs.*

A glossary of terms used in this MRP is included on the last page.

**IT IS HEREBY ORDERED, pursuant to Water Code section 13267, that the Dischargers shall conduct monitoring and reporting in accordance with the following requirements:**

## **I. GENERAL MONITORING REQUIREMENTS**

### **A. SAMPLING**

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. Except as specified otherwise in this MRP, grab samples will be considered representative of supply water, wastewater, soil, and groundwater. The time, date, and location of each sample shall be recorded on the sample chain of custody form.

Field test instruments (such as those used to measure pH, electrical conductivity, dissolved oxygen, wind speed, and precipitation) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are field calibrated at the frequency recommended by the manufacturer;
3. The instruments are serviced and/or calibrated at the manufacturer's recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

## B. SAMPLE ANALYSIS

All analyses shall be performed in accordance with the [Standard Provisions and Reporting Requirements for Waste Discharge Requirements](#), 1 March 1991 ed. (SPRRs).

[[https://www.waterboards.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/sd\\_provisions/wdr-mar1991.pdf](https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/sd_provisions/wdr-mar1991.pdf)]

Laboratory analytical procedures shall comply with the methods and holding times specified in the following (as applicable to the medium to be analyzed):

1. Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (EPA);
2. Test Methods for Evaluating Solid Waste (EPA);
3. Methods for Chemical Analysis of Water and Wastes (EPA);
4. Methods for Determination of Inorganic Substances in Environmental Samples (EPA);
5. Standard Methods for the Examination of Water and Wastewater (APHA/AWWA/WEF); and
6. Soil, Plant, and Water Reference Methods for the Western Region (WREP 125).

Approved editions shall be those that are approved for use by the U.S. Environmental Protection Agency or the State Water Resources Control Board's Environmental Laboratory Accreditation Program (ELAP). The Discharger may propose alternative methods for approval by the Executive Officer. Where technically feasible, laboratory reporting limits shall be lower than concentrations that implement applicable water quality objectives/limits for the constituents to be analyzed.

## II. SPECIFIC MONITORING REQUIREMENTS

### A. SOURCE WATER MONITORING

1. Source water used to create the slurry mixture shall be sampled at the start of the Pilot Study and analyzed for the following:

**Table 1 - Source Water Monitoring**

| Parameter      | Units    | Monitoring Type | Monitoring Frequency |
|----------------|----------|-----------------|----------------------|
| pH             | pH units | Meter           | One-time sample      |
| TDS            | mg/L     | Grab            | One-time sample      |
| Total Nitrogen | mg/L     | Grab            | One-time sample      |

| Parameter           | Units | Monitoring Type | Monitoring Frequency |
|---------------------|-------|-----------------|----------------------|
| Nitrate as Nitrogen | mg/L  | Grab            | One-time sample      |
| Arsenic, dissolved  | mg/L  | Grab            | One-time sample      |

## B. INJECTION SLURRY MONITORING

1. Whenever injection activity is occurring in the course of the Pilot Study, the following shall be monitored in accordance with **Table 2** and the following specifications:
  - a. Injection activity shall be recorded daily.
  - b. Average pump rate is measured in gallons per day (gpd) or alternative units may be used to report the data.
  - c. Sampling shall be performed when injection occurs.

**Table 2 – Injection Slurry Monitoring**

| Parameter   | Units    | Sample Type | Monitoring Frequency  |
|---|----------|-------------|---|
| Daily Average Injection Rate                        | gpd      | Meter       | Continuous per injection event  |
| Injected Slurry, cumulative total for year to date. | gallons  | Meter       | Continuous per injection event  |
| pH  | pH units | Meter       | Per injection event   |
| EC  | µmhos/cm | Meter       | Three injection events, including at the beginning, middle, and end of Pilot Study. |
| TDS   | mg/L     | Grab        | Three injection events, including at the beginning, middle, and end of Pilot Study. |
| Nitrate (as Nitrogen)                               | mg/L     | Grab        | Three injection events, including at the beginning, middle, and end of Pilot Study. |

## C. EXTRACTION MONITORING

1. Monitoring of extraction shall include at least the constituents and parameters shown in **Table 3** and meet the following specifications:
  - a. Extraction activity shall be recorded on a daily basis.

- b. Average pump rate is measured in gallons per day (gpd) or alternative units may be used to report the data.
- c. Extracted Water/Year represents the total of water extracted from a well for the duration of the pilot test.
- d. Sampling shall be performed when fluid extraction occurs.

**Table 3 - Extraction Monitoring**

| <b>Parameter</b>                                   | <b>Units</b> | <b>Sample Type</b> | <b>Monitoring Frequency</b>  |
|--|--------------|--------------------|--|
| Average Pumping Rate                               | gpd          | Meter              | Continuous per extraction event  |
| Extracted Water, cumulative total for year to date | gallons      | Meter              | Continuous per extraction event  |
| pH   | pH units     | Meter              | Three field readings during each extraction event.                                   |
| EC   | µmhos/cm     | Meter              | Three extraction events, including at the beginning, middle, and end of Pilot Study. |
| TDS  | mg/L         | grab               | Three extraction events, including at the beginning, middle, and end of Pilot Study. |
| Total Nitrogen                                     | mg/L         | grab               | Three extraction events, including at the beginning, middle, and end of Pilot Study. |
| Nitrate as Nitrogen                                | mg/L         | grab               | Three extraction events, including at the beginning, middle, and end of Pilot Study. |
| Arsenic, dissolved                                 | mg/L         | grab               | Three extraction events, including at the beginning, middle, and end of Pilot Study. |

**D. INJECTION/EXTRACTION WELL MONITORING**

1. Whenever injection/extraction activity is occurring in the course of the Pilot Study, all injection/extraction wells shall be monitored in accordance with **Table 4** and the following specifications:
  - a. Well operational status shall be reported for each well associated with the Pilot Study.
  - b. During injection activities, injection wells shall be visually inspected at the intakes daily for evidence of siltation or other physical issues that may impede or impact their operation.
  - c. Injection activity shall be recorded daily.

**Table 4 - Injection/Extraction Well Monitoring**

| <b>Parameter</b>                                  | <b>Units</b> | <b>Monitoring Type</b> | <b>Reporting Frequency</b> |
|---|--------------|------------------------|----------------------------|
| Well Operational Status                           | NA           | Recorded               | Daily                      |
| Water Levels                                      | 0.01 ft      | Calculated             | Monthly                    |
| Daily Average Injection Rate                      | gpd          | Meter                  | Continuous                 |
| Injected water, cumulative total for year to date | ac-ft/yr     | Meter                  | Continuous                 |

**D. SOIL VAPOR MONITORING**

1. The Dischargers have voluntarily elected to conduct soil vapor monitoring as shown in **Table 5**. A pre-injection event will take place to establish background conditions and will continue quarterly for a two-year period following the final injection.

**Table 5 – Soil Vapor Monitoring**

| <b>Parameter</b> | <b>Units</b> | <b>Sample Type</b> | <b>Sample Frequency</b> |
|------------------|--------------|--------------------|-------------------------|
| CO <sub>2</sub>  | ppmv         | Grab               | Every 3 months          |
| Methane          | ppmv         | Grab               | Every 3 months          |

## E. GROUND WATER MONITORING

1. The Dischargers shall conduct shallow groundwater monitoring in areas where groundwater is found at depths within 25 feet below ground surface for the parameters listed in **Table 6**. If no groundwater is found within 25 feet, the Dischargers shall state in the final report upon completion of the Pilot Study.

**Table 6 - Groundwater Monitoring**

| <b>Parameter</b>    | <b>Units</b> | <b>Sample Type</b> | <b>Sample Frequency</b>   |
|---------------------|--------------|--------------------|---|
| pH                  | pH units     | Grab               | One-time sample before and after completion of extraction event |
| TDS                 | mg/L         | Grab               | One-time sample before and after completion of extraction event |
| Total Nitrogen      | mg/L         | Grab               | One-time sample before and after completion of extraction event |
| Nitrate as Nitrogen | mg/L         | Grab               | One-time sample before and after completion of extraction event |
| Arsenic, dissolved  | mg/L         | Grab               | One-time sample before and after completion of extraction event |

## III. REPORTING REQUIREMENTS

All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50MB should be emailed to: [centralvalleysacramento@waterboards.ca.gov](mailto:centralvalleysacramento@waterboards.ca.gov).

Documents that are 50 MB or larger should be transferred to a CD, DVD, or flash drive and mailed to the following address:

Central Valley Regional Water Quality Control Board  
ECM Mailroom  
11020 Sun Center Drive, Suite 200  
Rancho Cordova, California 95670

To ensure that your submittals are routed to the appropriate staff, the following information block should be included in any correspondence used to transmit documents to this office:

Facility: Levitree Subterranean Wood Injection Pilot Study, Sacramento County  
Program: Non-15 Compliance  
Order Number: MRP R5-2023-0808  
CIWQS Place ID: 889144

A transmittal letter shall accompany each monitoring report. The letter shall include a discussion of all violations of this MRP during the reporting period and actions taken or planned for correcting each violation. If the Dischargers have previously submitted a report describing corrective actions taken and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. Pursuant to Section B.3 of the SPRRs, the transmittal letter shall contain a statement by the Dischargers or the Dischargers' authorized agent certifying under penalty of perjury that the report is true, accurate, and complete to the best of the signer's knowledge.

In reporting monitoring data, the Dischargers shall arrange the data in tabular form so that the date, sample type (e.g., source water, injection slurry, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the MRP shall be reported to the Central Valley Water Board.

Laboratory analysis reports shall be included in the monitoring reports. For a Discharger conducting any of its own analyses, reports must also be signed and certified by the chief of the laboratory.

In addition to the requirements of Section C.3 of the SPRRs, monitoring information shall include the method detection limit (MDL) and the Reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

As required by the Business and Professions Code sections 6735, 7835, and 7835.1, all monitoring reports that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared under the direct supervision of a Registered Professional Engineer or Professional Geologist and signed by the registered professional.

## **A. QUARTERLY PROGRESS REPORTS**

1. Quarterly Progress Reports are due as described in **Table 7** below.



**Table 7 – Progress Report Due Dates**

| <b>Monitoring Report</b> | <b>Monitoring Period</b> | <b>Report Due Date</b> |
|--------------------------|--------------------------|------------------------|
| First Quarter            | 1 January to 31 March    | 1 May                  |
| Second Quarter           | 1 April to 30 June       | 1 August               |
| Third Quarter            | 1 July to 30 September   | 1 November             |
| Fourth Quarter           | 1 October to 31 December | 1 February             |

2. Quarterly Progress Reports shall include a discussion of status for all injection activity, any operational or water quality issues that occurred during the reporting quarter, and any monitoring data collected during the reported monitoring period. If no injection has occurred during the reporting quarter, a notification letter stating so will meet this requirement.
3. A copy of calibration log page(s) verifying calibration of all hand-help monitoring instruments performed during the quarter.

**B. PILOT STUDY COMPLETION REPORT**

1. **By 1 December 2025**, the Discharger shall submit a Completion Report which shall include the following:
  - a. Results of Injection Slurry Water, Extraction Water, Injection/Extraction Well, Source Water, Soil Vapor, and Ground Water Monitoring.
  - b. Tabular and graphical summaries of all monitoring data collected during the Pilot Study (reporting limits for non-detectable results).
  - c. Conclusions concerning engineering and/or geology evaluations of the site and potential impacts to groundwater from injection activities.
  - d. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the injection and extraction monitoring.
  - e. A scaled map showing relevant structures and features of the pilot testing area, proximity to surface water, the locations of injection/extraction wells and any other sampling stations.
  - f. Copies of the laboratory analytical data reports shall be maintained by the Discharger and submitted to the Central Valley Water Board.

This Order is issued under authority delegated to the Executive Officer by the Central Valley Water Board pursuant to Resolution R5-2018-0057 and is effective upon signature.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to \$1,000 per violation, per day, depending on the violation, pursuant to Water Code section 13268. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Resources Control Board to review the action in accordance with California Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Resources Control Board must receive the petition by 5:00 p.m., 30 days after the date of this MRP, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Resources Control Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the [internet](#) ([http://www.waterboards.ca.gov/public\\_notices/petitions/water\\_quality](http://www.waterboards.ca.gov/public_notices/petitions/water_quality)) or will be provided on request)

I, PATRICK PULUPA, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of the Monitoring and Reporting Program R5-2023-0808 issued by the Central Valley Regional Water Quality Control Board on 25 July 2023

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for PATRICK PULUPA, Executive Officer

## GLOSSARY

|                  |   |
|------------------|---|
| BOD <sub>5</sub> | Five-day Biochemical Oxygen Demand  |
| EC               | Electrical conductivity at 25° C  |
| EPA              | Environmental Protection Agency   |
| ELAP             | State Water Resources Control Board's Environmental Laboratory Accreditation Program      |
| FDS              | Fixed Dissolved Solids  |
| MRP              | Monitoring and Reporting Program  |
| MW               | Monitoring Well   |
| MCL              | Maximum Contaminant Level per Title 22  |
| N                | Nitrogen  |
| TKN              | Total Kjeldahl Nitrogen   |
| TDS              | Total Dissolved Solids  |
| TSS              | Total Suspended Solids  |
| Daily            | Every day except weekends or holidays   |
| Weekly           | Once per week   |
| Monthly          | Once per calendar month   |
| Quarterly        | Once per calendar quarter   |
| Semiannually     | Once every six calendar months (i.e., two times per year) during non-consecutive quarters |
| Annually         | Once per year   |
| gpd              | Gallons per day   |
| µg/L             | Micrograms per liter  |
| µmhos/cm         | Micromhos per centimeter  |
| mg/L             | Milligrams per liter  |
| mg[d]            | Million gallons [per day]   |
| ppmv             | Parts per million by volume   |