

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

RESOLUTION NO.

WAIVING WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF TRACY
DEMONSTRATION PHASE
AQUIFER STORAGE AND RECOVERY PROJECT
SAN JOAQUIN COUNTY

WHEREAS, Water Code Section 13260(a) requires that any person discharging wastes or proposing to discharge wastes within the region that could affect the quality of waters of the State shall file a Report of Waste Discharge; and

WHEREAS, the City of Tracy (City) submitted a complete Report of Waste Discharge, including a \$1,960 filing fee, for the demonstration phase of its aquifer storage and recovery (ASR) project on 9 April 2004; and

WHEREAS, on 18 March 2004, the City filed a Categorical Exemption for the demonstration program in accordance with the California Environmental Quality Act (Public Resources Code Section 21000, et seq.); and

WHEREAS, the ASR demonstration program is a study which will be used to evaluate opportunities to store treated water from the City's Water Treatment Plant (WTP) in the groundwater basin underlying the City by direct injection when excess water is available, followed by extraction during times of need; and

Injection and Monitoring Wells

WHEREAS, the ASR testing program will be conducted using the existing ASR Demonstration Well which is in the City Corporation Yard at the northeast corner of 6th Street and Tracy Boulevard in Tracy; and

WHEREAS, the City has installed two groundwater monitoring wells to measure the effect of the injection and extraction on the underlying groundwater; and

WHEREAS, one groundwater monitoring well is approximately 35 feet west of the ASR Demonstration Well, and the other groundwater monitoring well is approximately 75 feet southeast of the ASR Demonstration Well; and

WHEREAS, the ASR Demonstration Well consists of an 18-inch diameter casing screened at three intervals in a single aquifer between 370 and 820 feet below ground surface, and the two monitoring wells are screened within the same intervals as the ASR Demonstration Well; and

WHEREAS, the two existing groundwater monitoring wells are not adequate to monitor groundwater quality impacts during the ASR demonstration program, and therefore this Resolution requires the installation of additional monitoring wells; and

Injected Water

WHEREAS, the source of the water injected into the aquifer will be surface water from the Delta Mendota Canal, which will first be treated in the City WTP by conventional treatment (including pre-oxidation, temperature equalization, coagulation, flocculation, sedimentation, filtration, and chlorine disinfection); and

WHEREAS, the quality of the treated water injected into the aquifer will meet Department of Health Services drinking water standards for all constituents; and

WHEREAS, complete characterization of background constituents in the aquifer has not been completed, but, based on data provided by the City, groundwater constituent concentrations are expected to be greater than that in the treated injected water, with the exception of copper, foaming agents (MBAS), total trihalomethanes (THMs), total haloacetic acids (HAAs), other disinfection byproducts that form during the treatment process (such as NDMA), and other chemical constituents (such as personal care products and pharmaceuticals) that may be present in the raw source water and which are not removed by conventional treatment; and

WHEREAS, the City has reported that the concentration of THMs in the treated injected water was 51.8 micrograms per liter (ug/l), while no THMs were detected in the groundwater at a detection limit of 0.5 ug/l; and

WHEREAS, the City has reported that the concentration of HAAs in the treated injected water 15.8 ug/l, while no HAAs were detected in the groundwater at a detection limit of 2 ug/l; and

WHEREAS, the City has not indicated whether the THM and HAA data cited above are average data or data from a single monitoring event and has not indicated whether the groundwater data were collected from the ASR Demonstration well or from wells throughout the area; and

Injection-Storage-Recovery Cycles

WHEREAS, the entire ASR demonstration project will include four separate injection-storage-recovery (ISR) cycles, with the first and shortest cycle consisting of 41 days and the final and longest cycle consisting of 322 days; and

WHEREAS, due to concerns about water quality impacts from THMs, HAAs, and other constituents that may be in the injected water, this Resolution waives Waste Discharge Requirements for the first two ISR cycles only; and

WHEREAS, the first ISR cycle will consist of an injection of 20 million gallons of water for 14 days, a storage period of 20 days, and a recovery period of 7 to 14 days; and

WHEREAS, the second cycle will consist of an injection of 43 million gallons of water for a period of 30 days, a storage period of 33 days, and a recovery period of 15 to 30 days; and

WHEREAS, the City has conducted preliminary aquifer testing, and, based on those data, has generated a model to estimate the anticipated injection fronts and capture zones for each ISR cycle; however, that model must be revised to reflect the pumping of other supply wells; and

WHEREAS, the City proposes to recover 100 percent of the volume of injected water during the first three ISR cycles, and 200 percent of the volume of injected water during the fourth cycle; and

WHEREAS, the City's model predicts that 200 percent withdrawal of the volume of water injected during the fourth cycle should effectively recapture all of the injected waters in order to ensure that no threat to water quality will remain after the test; however, the City's model predicts that the injected water will not be fully captured in the first three cycles; and

WHEREAS, the water extracted during each recovery cycle will be beneficially used in the City's drinking water distribution system, as approved by Department of Health Services (DHS); and

WHEREAS, water samples will be collected during each cycle to monitor hydrologic conditions, as well as the quality of water injected into the aquifer and changes in water quality; and

Regulatory Considerations

WHEREAS, the Regional Water Quality Control Board, Central Valley Region (hereafter Regional Board) has a statutory obligation to prescribe waste discharge requirements except where a waiver is not against the public interest; and

WHEREAS, a serious need exists for communities within the State of California to supplement their water supplies; and

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WHEREAS, both the California Bay-Delta Authority and the California Department of Water Resources recommend ASR technology for supplementing water supplies where agencies can conjunctively use both surface water and groundwater supplies; and

WHEREAS, the Regional Board has determined that, due to the limited nature and duration of the above-described discharge and its potential impacts, the discharge should not have a significant effect on water quality at the conclusion of the period addressed by this Resolution; and

WHEREAS, monitoring of the demonstration study is necessary to obtain technical data sufficient to assess potential long-term water quality impacts and the need for mitigation measures associated with more extensive testing or a full-scale project, including an analysis of whether the City must implement BPTC measures to reduce the concentrations of THMs, HAAs, other disinfection byproducts, or other constituents of concern in the water injected into the groundwater; and

WHEREAS, in order to ensure compliance with State Water Resources Control Board (State Board) Resolution No. 68-16 (the "Antidegradation Policy"), the City must demonstrate that concentrations of THMs, HAAs, other disinfection byproducts, or other constituents of concern remaining in the aquifer after completion of each cycle of the demonstration study are less than limits which apply applicable water quality objectives and are consistent with BPTC; and

WHEREAS, the City must conduct sufficient monitoring during the demonstration study to assess whether a full-scale ASR project would comply with the Antidegradation Policy; and

WHEREAS, the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition* (Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Board; and

WHEREAS, the designated beneficial uses of the groundwater in the vicinity of the Tracy ASR Project are municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply; and

WHEREAS, the Basin Plan contains several narrative water quality objectives that apply to groundwater in the vicinity of the Tracy ASR project.

WHEREAS, the Chemical Constituents objective requires that chemical constituents shall not be present in concentrations that adversely affect beneficial uses and shall not exceed maximum contaminant levels (MCLs) adopted by DHS.

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WHEREAS, the Toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses.

WHEREAS, the Tastes and Odors objective requires that groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

WHEREAS, Chapter IV of the Basin Plan contains the *Policy for Application of Water Quality Objectives*, which provides that “[w]here compliance with narrative objectives is required (i.e., where the objectives are applicable to protect specified beneficial uses), the Regional Water Board will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives”; and provides that to evaluate compliance with narrative water quality objectives the Regional Board considers, among other things, “relevant numerical criteria and guidelines developed and/or published by other agencies and organizations”.

WHEREAS, the following are appropriate water quality limits for THMs, HAAs, and other disinfection byproducts to apply applicable water quality objectives for groundwater:

<u>Constituent</u>	<u>Water Quality Limit, ug/l</u>	<u>Reference</u>
Total THMs	80	US EPA Primary MCL
Chloroform	1.1	Cal/EPA Cancer Potency Factor
Bromoform	4	US EPA IRIS Cancer Potency Factor
Bromodichloromethane	0.27	Cal/EPA Cancer Potency Factor
Dibromochloromethane	0.37	Cal/EPA Cancer Potency Factor
Total HAAs	60	US EPA Primary MCL
Dichloroacetic acid	0.7	US EPA IRIS Cancer Potency Factor
Trichloroacetic acid	20	US EPA Health Advisory
Dibromoacetic acid	None	None
Bromoacetic acid	None	None
Chloroacetic acid	30	US EPA Health Advisory
NDMA	0.002	Cal/EPA Cancer Potency Factor

WHEREAS, the City has submitted a filing fee of \$1,960, under the assumption that the ASR demonstration phase would fall under the “3B” Threat to Water Quality/Complexity classification; however, review of the RWD shows that the actual threat to water quality and complexity requires a “2B” classification, and therefore the City must submit an additional \$4,275 to meet the “2B” filing fee of \$6,235; and

WHEREAS, the Regional Board held a hearing on _____ 2004 and considered all evidence concerning this matter:

THEREFORE BE IT RESOLVED, in accordance with California Water Code section 13269, that the California Regional Water Quality Control Board, Central Valley Region, waives waste discharge requirements for the **first two cycles** of the City of Tracy's Demonstration Phase of its Aquifer Storage and Recovery Program, subject to the following conditions:

1. During either ISR cycle, the discharge of water shall not create a condition of pollution or nuisance (as defined in Section 13050, California Water Code) beyond the City's anticipated injection front for that cycle; and
2. Any condition of pollution or nuisance (as defined in Section 13050, California Water Code), including violation of any water quality objective, created during either ISR cycle shall not remain in the aquifer at the conclusion of that cycle; and
3. Only treated water from the City's WTP shall be injected into the ASR well, and at a volume not to exceed a total of 63 million gallons for the two ISR cycles; and
4. During the recovery cycle of each ISR cycle, the Discharger shall extract 200 percent of the volume of water injected during that same cycle; and
5. Prior to implementing the ASR cycle testing program, the Discharger shall obtain from the Department of Health Services written approval for discharge of extracted water to the drinking water distribution system, and shall submit a copy of that approval to the Regional Board; and
6. The City shall operate and maintain the ASR groundwater monitoring wells, and shall evaluate the potential for groundwater degradation and the need for removal of THMs, HAAs, other disinfection byproducts, or other constituents of concern from treated source water due to this activity; and
7. Water quality samples shall be collected and analyzed during the testing cycles in accordance with the Monitoring and Reporting Program (MRP) found in Attachment A, which is attached hereto and made part of this Resolution by reference. Upon receipt of the *Injection Water Quality Characterization Report*, described in Item No. 9, below, the MRP will be updated to show the actual list of constituents to be analyzed. This list will be based on constituents found in the injection water at concentrations greater than those in the aquifer; and
8. If THMs, HAAs, other disinfection byproducts, or other constituents of concern are detected at levels exceeding applicable water quality objectives (a) beyond the City's anticipated injection front during either ISR cycle, or (b) in the aquifer at the conclusion of either cycle, then the City shall notify the Regional Board within 24 hours of becoming aware of the detection, and shall immediately implement the Contingency Plan that is

required to be submitted by this Resolution; and

9. **At least 60 days prior to the first ISR cycle**, the City shall submit the remainder of filing fee (\$4,275) in a check made payable to the *State Water Resources Control Board*.
10. **At least 60 days prior to the first ISR cycle**, the City shall submit an *Injection Water Quality Characterization Report* that provides and summarizes (a) the results of the last three years of the City's drinking water sampling program as required by the Department of Health Services, (b) the results of two sampling episodes of representative samples of the treated water proposed for aquifer injection and (c) the results of two sampling episodes of groundwater collected from the ASR Demonstration well. The constituents to be analyzed for in the treated drinking water and groundwater shall include, at a minimum, those constituents included in Attachment B of this Resolution, "*Analytes to be Monitored for Injection Water Quality Characterization Report*". The report shall clearly identify those constituents that are found at greater concentrations in the proposed injection water than in the ASR Demonstration well; and
11. **At least 60 days prior to the first ISR cycle**, the City shall submit a revised capture zone model which details the anticipated injection fronts and capture zones for each ISR cycle; and
12. **At least 60 days prior to the first ISR cycle**, the City shall submit a *Monitoring Well Installation Workplan* and *Groundwater Sampling Plan (SAP)* for the installation of a sufficient number of properly located and designed monitoring wells to ensure that adequate data can be collected to 1) verify the accuracy of the aquifer model that is the basis for the program, 2) ensure that THMs, HAAs, other disinfection byproducts, or other constituents of concern do not migrate beyond the injection fronts estimated for each cycle, 3) ensure that, at the end of each ISR cycle, the THMs, HAAs, other disinfection byproducts, or other constituents of concern do not remain in the aquifer at concentrations greater than applicable water quality objectives, and 4) evaluate the implications of a full scale ASR project on water quality. The workplan shall propose, at a minimum, two additional monitoring wells at the edge of the anticipated injection front for the first ISR cycle and two additional monitoring wells at the edge of the anticipated injection front for the second ISR cycle. Both the *Workplan* and *Groundwater SAP* shall contain the information listed in the first section of Attachment C, "*Items to be Included in a Monitoring Well Installation Workplan and a Monitoring Well Installation Report of Results.*" The monitoring wells shall be installed upon approval of the workplan by Regional Board staff.
13. **At least 15 days prior to the first ISR cycle**, the City shall submit a *Monitoring Well Installation Report* that is consistent with, and contains the information listed in the second section of Attachment C.

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14. **At least 15 days prior to the first ISR cycle**, the City shall submit a *Contingency Plan* that describes in detail the manner and methods for actions that will be taken if those occurrences described in Item No. 8, above, should occur. The actions to be considered shall include the containment of a plume of groundwater degradation and/or pollution, the cleanup or abatement of a condition of groundwater pollution, and the need to treat the injected water prior to initiation of any additional ISR cycles; and
15. **No later than 60 days following completion of each ISR cycle, and at least 30 days prior to initiation of the second ISR cycle**, the City shall submit the Monitoring Report described in Attachment A; and
16. This waiver expires 150 days from the first day of injection.

BE IT FURTHER RESOLVED that this waiver of waste discharge requirements is conditional and may be terminated at any time.

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a true, full, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Central Valley Region, on _____.

THOMAS R. PINKOS, Executive Officer