California Regional Water Quality Control Board
Santa Ana Region

ORDER NO. R8-2003-0085

Amending Order No. R8-2002-0007, NPDES No. CAG918001
General Groundwater Cleanup Permit for Discharges to Surface Waters of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons Mixed with Lead and/or Solvents
and
Amending Order No. R8-2002-0033
General Waste Discharge Requirements for the Reinjection/Percolation of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons Mixed with Lead and/or Solvents

For the
Santa Ana Region

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board), finds that:

1. On January 23, 2002, the Board adopted Order No. R8-2002-0007, NPDES No. CAG918001, General Groundwater Cleanup permit. The Order regulates discharges to surface waters of extracted and treated groundwater resulting from the cleanup of groundwater polluted by petroleum hydrocarbons, solvents and/or petroleum hydrocarbons mixed with lead and/or solvents.

2. Order No. R8-2002-0007 specifies maximum daily effluent concentration limits for total petroleum hydrocarbons, benzene, toluene, xylene, ethylbenzene, carbon tetrachloride, chloroform, dichlorobromomethane, methyl ethyl ketone, methyl isobutyl ketone, methyl tertiary butyl ether (MTBE), naphthalene, tetrachloroethylene (PCE), trichloroethylene (TCE), 1,1-dichloroethane, 1,1-dichloroethylene, 1,2-dichloroethylene, and 1,1,1-trichloroethane (TCA) based on multiplier factor of 1.55. The multiplier factor corresponds to a coefficient of variation of 0.6 and number of samples equal to 4 and is taken from Table 2 of the State Water Resources Control Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SWRCB Policy). However, the correct multiplying factor for converting a monthly average limit into a maximum daily effluent limit (MDEL) based on a coefficient of variation of 0.6 and number of samples of four, as shown in Table 2 of the Policy, is **2.01**. Based on this, it is necessary to correct the maximum daily effluent concentration limits that were specified in Order No. R8-2002-0007.

3. Order No. R8-2002-0007 also specifies effluent limits for tert-butyl alcohol (TBA) based on the Department of Health Services action level of 12 μg/L. Using the State Water Resources Control Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California, the action level was specified as an average monthly limit based on a criteria to protect human health. Using the calculation procedures in the SWRCB Policy, a MDEL for TBA of 18.6 μg/L was subsequently established. The same 1.55 multiplier factor that is discussed in Finding 2., above was used to derive the MDEL.

4. On May 31, 2002, Regional Board adopted Order No. R8-2002-0033 for the reinjection/percolation of extracted and treated groundwater resulting from the cleanup of groundwater polluted by petroleum hydrocarbons, solvents and/or petroleum hydrocarbons mixed with lead and/or solvents. This Order also includes a monthly average effluent limit of 12 µg/L for TBA based on the Department of Health Services action level for drinking water. Due to concerns raised by some dischargers including the Western States Petroleum Association (WSPA) with regards to uncertainties about the treatability of TBA and the dischargers' ability to achieve consistent compliance, the Order required the dischargers to collect influent and treatability data, and to conduct studies necessary to assess whether the final TBA limit can be reasonably achieved. The Order also specified a time schedule for complying with the TBA limit.

5. As required by Order No. R8-2002-0033, WSPA conducted a TBA Treatability Study to develop data to recommend an appropriate technology based limit for TBA. On May 12, 2003, WSPA's consultant, GeoSyntec Consultants, submitted the "TBA Treatment Technology Evaluation" report. The study concluded the following:

   a. Treatment system effluent concentrations of up to 36 µg/L have been observed as a result of the unpredictable nature of TBA treatment using granular activated carbon (GAC). The data set means, medians, and 95% upper confidence levels around the medians remained below 12 µg/L, indicating concentrations as high as 36 µg/L can be present in the treatment system effluent and maintain the long term goal of the 12 µg/L discharge limit;
   b. Concentrations of TBA of up to 36 µg/L were observed in the treatment system effluents, indicating that more variation exists in effluent results for TBA than is predicted by the SWRCB guidance;
   c. Using the SWRCB guidance and the study results, the values for the MDEL for TBA range from 30.5 µg/L to 41.3 µg/L;
   d. Most effluent sample concentration data (84.8%) collected over a variety of flow and influent concentration conditions were below detection limits of 12 µg/L and less, indicating that currently available treatment technology is capable of treating TBA to below 12 µg/L, with a number of exceedances on a sporadic basis;
   e. Statistical evaluation of the data set resulted in means, medians, and 95% confidence levels around the median below 12 µg/L, indicating that currently available treatment technology is capable of treating TBA to below 12 µg/L as a long-term average;
   f. Each type of treatment system (GAC, biologically active-GAC, air stripping, bio-systems (fluidized bed bioreactor or trickling filter bioreactor), and advanced oxidation processes) included at least one exceedance of the AMEL, indicating each type of treatment system has difficulty meeting the AMEL on a consistent basis;
   g. The study suggests that a startup period of 30 to 45 days is required for inoculation/acclimation of Bio-GAC and bio-systems to allow efficient treatment of TBA; and

6. Based on the actual data set, the study determined that a coefficient of variation of 1.45 is more appropriate since it is based on actual monitoring data. Using the SWRCB Policy and the calculated coefficient of variation, a MDEL of 34 µg/L is recommended. Regional Board staff agrees with this recommendation.

7. Order No. R8-2003-0085 revises the maximum daily effluent concentration limits (MDELs) that were specified in Order No. R8-2002-0007. In most cases, the changes are necessary to correct a technical error made in calculating the limits. The corrected MDELs are less stringent than those specified in Order No. R8-2002-0007, though to an insignificant degree. In the case of TBA, the MDEL is revised to a significantly less stringent number, based on the results of TBA studies. Federal law prohibits the relaxation of effluent limits, with certain exceptions that are met here. In the case of MDELs based on Best Professional Judgement/Best Available Technology (BPJ/BAT), less stringent limitations can be specified to correct technical mistakes. In the case of MDELs based on water quality, less stringent limitations can be specified when antidegradation requirements are met. The revised limits will continue to assure the protection of beneficial uses, and water quality consistent with maximum benefit to the people of the state will be maintained. Antidegradation requirements are thereby satisfied.

8. It is appropriate to revise Order No. R8-2002-0007 and Order No. R8-2002-0033 to include effluent limits for both the cis and trans isomeric forms of 1,2-dichloroethylene, 1,4 dioxane and perchlorate. These Orders include effluent limits for 1,2-dichloroethylene but do not distinguish between the isomeric forms, each of which has an established Maximum Contaminant Level (MCL). 1,4 dioxane is a stabilizer that has been associated with chlorinated solvents and may be found in groundwater at solvent release sites. While perchlorate is neither a solvent nor petroleum hydrocarbon, it may be present at these groundwater cleanup sites. It is appropriate to assure that it is not present in discharges from groundwater cleanup sites at levels that pose a threat to the quality and beneficial uses of receiving waters affected by these discharges.

9. To assure conformance with federal regulations (40 CFR 122.6), it is appropriate to revise Provisions E.3. of Order No. R8-2002-0007 to require surface water discharger(s) reapply for regulatory coverage at least 180 days prior to the expiration of Order No. R8-2002-0007, NPDES No. CAG918001

10. In accordance with Water Code Section 13389, the amendment of Order No. R8-2002-0007, NPDES No. CAG918001 and R8-2002-0033 is exempt from those provisions of the California Environmental Quality Act contained in Chapter 3 (commencing with Section 21100), Division 13 of the Public Resources Code.

11. The Board has notified the dischargers and other interested agencies and persons of its intent to amend Order No. R8-2002-0007 and Order No. R8-2002-0033 and has provided them with an opportunity to submit their written views and recommendations.

12. The Regional Board, in a public meeting, heard and considered all comments pertaining to the amendment.

IT IS HEREBY ORDERED that Order No. R8-2002-0007 and Order No. R8-2002-0033 shall be amended[1] as follows:

1. Order No. R8-2002-0007, revise the table shown in Discharge Specifications A.1 as follows:

    1. The discharge of wastes shall not contain constituent concentrations in excess of the following limits:

EFFLUENT LIMITATIONS APPLICABLE TO DISCHARGES INTO RECEIVING WATERS DESIGNATED MUN (see Basin Plan Table 3-1)		
Constituent	Maximum Daily Concentration Limit (µg/L)	Average Monthly Concentration Limit (µg/L)
Total Petroleum Hydrocarbons	201	100
Benzene	2.0	1.0
Toluene	20.1	10.0
Xylene	20.1	10.0
Ethylbenzene	20.1	10.0
Carbon Tetrachloride	0.5	0.25
Chloroform	11.5	5.7
Dichlorobromomethane	1.13	0.56
Methyl Ethyl Ketone	241.2	120
Methyl Isobutyl Ketone	241.2	120
Methyl Tertiary Butyl Ether (MTBE)	26.1	13.0
Naphthalene	20.1	10.0
Tetrachloroethylene (PCE)	1.6	0.8
Trichloroethylene (TCE)	5.4	2.7
1,1-Dichloroethane	10.1	5.0
1,1-Dichloroethylene	0.115	0.057
1,2-Dichloroethylene	20.1	10.0
cis-1,2-Dichloroethylene	12.1	6
trans-1,2-Dichloroethylene	20.1	10
1,1,1-Trichloroethane (TCA)	10.1	5.0
Tert Butyl Alcohol (TBA)	34	12.0
1,4-Dioxane	6.0	3
Perchlorate	8.0	4

EFFLUENT LIMITATIONS APPLICABLE TO DISCHARGES INTO RECEIVING WATERS NOT DESIGNATED MUN (see Basin Plan Table 3-1)		
Constituent	Maximum Daily Concentration Limit (µg/L)	Average Monthly Concentration Limit (µg/L)
Total Petroleum Hydrocarbons	201	100
Benzene	2.0	1.0
Toluene	20.1	10.0
Xylene	20.1	10.0
Ethylbenzene	20.1	10.0
Carbon Tetrachloride	1.0	0.5
Chloroform	10.1	5.0
Dichlorobromomethane	10.1	5.0

[1] *For the amendments showing the added and deleted text, see the staff report.*

EFFLUENT LIMITATIONS APPLICABLE TO DISCHARGES INTO RECEIVING WATERS NOT DESIGNATED MUN (see Basin Plan Table 3-1)		
Constituent	Maximum Daily Concentration Limit (µg/L)	Average Monthly Concentration Limit (µg/L)
Methyl Ethyl Ketone	241.2	120.0
Methyl Isobutyl Ketone	241.2	120.0
Methyl Tertiary Butyl Ether (MTBE)	26.1	13.0
Naphthalene	20.1	10.0
Tetrachloroethene (PCE)	10.1	5.0
Trichloroethylene (TCE)	10.1	5.0
1,1-Dichloroethane	10.1	5.0
1,1-Dichloroethylene	12.1	6.0
1,2-Dichloroethylene	20.1	10.0
cis-1,2- Dichloroethylene	12.1	6
trans-1,2- Dichloroethylene	20.1	10
1,1,1-Trichloroethane (TCA)	10.1	5.0
Tert Butyl Alcohol (TBA)	34	12.0
1,4-Dioxane	6.0	3
Perchlorate	8.0	4

2. Order No. R8-2002-0007, add new Compliance Determination D.2 as follows and renumber subsequent paragraphs accordingly:

   2. Compliance determination with the TBA average monthly limit shall be based on all samples taken within the month or if the monitoring frequency requirement is once monthly, every two months or quarterly, a minimum of four test results from the most recent sample events.

3. Order No. R8-2002-0007, revise Provision E.3. as follows:

   3. This Order expires on January 1, 2007. However, coverage under the permit shall continue in force and effect until a new Order is issued for those dischargers who are authorized to discharge under the terms and conditions of the Order and who submit a renewal application at least 180 days prior to the January 1, 2007 expiration date.

4. Order No. R8-2002-0007, page 18 of 19, Application Requirements I.4.a, revise as follows:

   a. Chemical analysis of the untreated groundwater. A representative groundwater sample shall be analyzed for organic pollutants using EPA method 8260, priority pollutants including 1,4-dioxane and perchlorate and results shall be reported with ML or PQL and MDL;

5. Order No. R8-2002-0033, revise Discharge Specifications 1 as follows:

   1. The discharge of wastes containing constituent concentrations in excess of the following limits is prohibited:

Constituent	Average Monthly Concentration Limit[2]
Total Lead	50 microgram per liter (µg/l)
Total Petroleum Hydrocarbons	100 µg/l
Benzene	0.7 µg/l
Toluene	10 µg/l
Ethylbenzene	5 µg/l
Xylene	10 µg/l
Tetrachloroethylene (PCE)[3]	5 µg/l
Trichloroethylene (TCE)	5 µg/l
1,1,1-Trichloroethane (1,1,1-TCA)	200 µg/l
1,1-Dichloroethylene (1,1-DCE)	6 µg/l
1,1-Dichloroethane (1,1-DCA)	5 µg/l
Methyl Tertiary Butyl Ether (MTBE) interim limit effective until May 31, 2003	13 µg/l
MTBE final limit effective by June 1, 2003	5 µg/l
Tert butyl alcohol (TBA)[4]	12 µg/l
cis-1,2- Dichloroethylene	6 µg/l
trans-1,2- Dichloroethylene	10 µg/l
1,4-Dioxane	3 µg/l
Perchlorate	4 µg/l

2 *Average monthly concentration limit means the highest allowable average of daily pollutant discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of measurements.*

3 *Tetrachloroethylene is synonymous to percholorethylene.*

4 *See Provisions 4 and 5.*

6. Order No. R8-2002-0033, add new Provision C.24. as follows:

   24. Compliance determination with the TBA average monthly limit shall be based on all samples taken within the month or if monitoring frequency requirement is once monthly, every two months or quarterly, a minimum of four test results from the most recent sample events.

7. Monitoring and Reporting Program No. 02-033, revise paragraph in section B - Influent Monitoring as follows:

   A grab sample of the influent to the treatment system shall be monitored on a monthly basis for total petroleum hydrocarbons, benzene, toluene, ethylbenzene, xylene, trichloroethylene (TCE), tetrachloroethylene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethylene (1,1-DCE), and 1,2-dichloroethane (1,2-DCA), cis-1,2-Dichloroethylene (cis-1,2-DCE), trans-1,2- Dichloroethylene (trans-1,2-DCE), methyl tertiary butyl ether (MTBE), tert butyl alcohol (TBA), 1,4-dioxane, and perchlorate.

8. Monitoring and Reporting Program No. 02-033, add the following to Effluent Monitoring C.1.

   1. A sampling station shall be established for each point of discharge and shall be located where representative samples of the discharge can be obtained. The following shall constitute the effluent monitoring program:

Constituent	Type of Sample	Units	Minimum Frequency of Sampling
Flow	Flow meter	GPD	Daily
pH	Grab	pH units	Daily
Total Dissolved Solids	Grab	mg/l	Weekly
Suspended Solids	Grab	mg/l	Weekly
Trichloroethylene (TCE),	Grab	µg/l	Weekly
Total Petroleum Hydrocarbons	Grab	µg/l	Weekly
Benzene	Grab	µg/l	Weekly
Toluene	Grab	µg/l	Weekly
Ethylbenzene	Grab	µg/l	Weekly
Xylene	Grab	µg/l	Weekly
Tetrachloroethylene (PCE),	Grab	µg/l	Weekly
1,1,1-Trichloroethane (1,1,1-TCA)	Grab	µg/l	Weekly
1,1-Dichloroethylene (1,1-DCE),	Grab	µg/l	Weekly
1,2-Dichloroethane (1,2-DCA)	Grab	µg/l	Weekly
cis-1,2- Dichloroethylene	Grab	µg/l	Weekly
trans-1,2- Dichloroethylene	Grab	µg/l	Weekly
Perchlorate	Grab	µg/l	Weekly
1,4-Dioxane	Grab	µg/l	Weekly
Methyl Tertiary Butyl Ether (MTBE)	Grab	µg/l	Weekly
Tert Butyl Alcohol (TBA)	Grab	µg/l	Weekly

Constituent	Type of Sample	Units	Minimum Frequency of Sampling
Volatile Organics Portion of the EPA Priority Pollutants (See Attachment "B")	Grab	µg/l	Annually

9. All other conditions and requirements of Order No. R8-2002-0007 and Order R8-2002-0033 shall remain unchanged.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on October 3, 2003.

Gerard J. Thibeault
Executive Officer

California Regional Water Quality Control Board
Santa Ana Region

October 3, 2003

STAFF REPORT

ITEM: 7

SUBJECT: Amendment to Orders No. R8-2002-0007, NPDES No. CAG918001 and R8-2002-0033 – General Groundwater Cleanup Permits for the Discharge to Surface Waters and for the Reinjection/Percolation, Respectively, of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons Mixed with Lead and or Solvents within the Santa Ana Region, Order No. R8-2003-0085

SUMMARY:

On January 23, 2002, the Regional Board adopted Order No. R8-2002-0007, NPDES No. CAG918001, revising waste discharge requirements for discharges into surface waters of extracted and treated groundwater resulting from groundwater cleanup projects within the Santa Ana Region. On May 31, 2002, the Regional Board adopted Order No. R8-2002-0033 for the reinjection/percolation of extracted and treated groundwater resulting from the cleanup of groundwater polluted by petroleum hydrocarbons, solvents and/or petroleum hydrocarbons mixed with lead and/or solvents. The intent of the proposed amendment of these Orders is to (1) revise maximum daily effluent limits (MDELs) in Order No. R8-2002-0007 that were calculated incorrectly; (2) revise the MDEL for tert-butyl alcohol (TBA) in Order No. R8-2002-0007 based on empirical evidence of TBA treatability; (3) incorporate a TBA compliance determination provision in both Orders, again based on TBA studies; and (4) incorporate limits for both isomeric forms of 1,2-dichloroethylene, 1,4 dioxane and perchlorate.

DISCUSSION:

1. Correct MDELs in Order No. R8-2002-0007

Order No. R8-2002-0007 specifies maximum daily effluent concentration limits (MDELs) for total petroleum hydrocarbons, benzene, toluene, xylene, ethylbenzene, carbon tetrachloride, chloroform, dichlorobromomethane, methyl ethyl ketone, methyl isobutyl ketone, methyl tertiary butyl ether (MTBE), naphthalene, tetrachloroethylene (PCE), trichloroethylene (TCE), 1,1-dichloroethane, 1,1-dichloroethylene, 1,2-dichloroethylene, tert-butyl alcohol (TBA) and 1,1,1-trichloroethane (TCA). These MDELs were calculated using procedures specified in the State Water Resources Control Board's Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SWRCB Policy). These procedures entail the multiplication of the average monthly effluent limit (AMEL) by a multiplier. The multiplier is selected from Table 2 of the SWRCB Policy based on the coefficient of variation and number of samples. In Order No. R8-2002-0007, the selected coefficient of variation was

0.6 and the number of samples was set equal to 4. The correct multiplier under these circumstances is 2.01. However, an incorrect multiplier (1.55) was inadvertently applied in calculating the MDELs in Order No. R8-2002-0007. Staff recommends that these MDELs be corrected by applying the proper multiplier.

No maximum daily effluent concentration limits for these pollutants are specified in Order No. R8-2002-0033 and so no corrections to the effluent limitations of that Order are necessary.

The effluent limits specified in Order No. 2002-0007 are based on Best Professional Judgement (BPJ), Best Available Technology (BAT) or water quality (criteria specified in the California Toxics Rule (CTR)); Department of Health Services Maximum Contaminant Levels and Action Level. The corrected MDELs would be less stringent than the established MDELs, though to an insignificant degree. However, the federal Clean Water Act (CWA) prohibits modifying a permit to include less stringent effluent limitations unless certain exceptions defined in CWA are met. In the case of effluent limitations based on BPJ/BAT, less stringent limitations can be specified when there were technical mistakes made in issuing the Order. As stated above, in Order No. R8-2002-0007, an incorrect multiplier was used to calculate the MDELs for all constituents (for which, as stated, a combination of BPJ/BAT and water quality based limits are specified). Less stringent water quality based limits can be specified provided that the requirements of the state's antidegradation policy (SWRCB Resolution No. 68-16) are satisfied. Namely, there must be a demonstration that beneficial uses would be protected and that water quality consistent with maximum benefit to the people of the state would be maintained. The proposed MDELs would protect beneficial uses. The second requisite demonstration is also satisfied since it is of maximum benefit to the people of the state to allow regulated discharges associated with cleanup of contaminated groundwater.

2. Revise TBA MDEL in Order No. R8-2002-0007

Order No. R8-2002-0007 and Order No. R8-2002-0033 both include a monthly average effluent limit (AMEL) of 12 μg/L for TBA that is based on the Department of Health Services action level for drinking water. No Maximum Contaminant Levels (MCLs) or water quality objectives have yet been established for TBA. The same AMEL applies to waters that are designated MUN, and those that are not.

Using the 12 μg/L AMEL and the calculation procedures in the SWRCB Policy described above, a MDEL for TBA of 18.6 μg/L was specified in Order No. R8-2002-0007. This limit was derived using a conservative coefficient of variation of 0.6 and a number of samples of four.

During consideration of Order No. R8-2002-0033, concerns were raised by some dischargers, including the Western States Petroleum Association (WSPA), with regard to the treatability of TBA and the dischargers' ability to achieve consistent compliance with the AMEL. In response to these concerns, the Order included both interim and final TBA limits and required the dischargers to conduct studies necessary to assess whether the final TBA limit (12 μg/L) can be achieved reasonably and reliably. The Order also specified a time schedule for complying with the final TBA limit. With sporadic exceptions, compliance is being achieved.

As required by Order No. R8-2002-0033, WSPA conducted a TBA Treatability Study. The Study included the evaluation of TBA data from 45 sites, the collection and evaluation of additional TBA data from fourteen sites, evaluation of the fourteen treatment systems, and the evaluation and screening of the resulting data set to evaluate its appropriateness for inclusion in the Study. Treatment technologies that were evaluated as part of the Study included granular activated carbon (GAC), biologically active GAC (Bio-GAC), air stripping, bio-systems (fluidized bed bioreactor or trickling filter bioreactor), and advanced oxidation processes (AOP).

On May 12, 2003, WSPA's consultant, GeoSyntec Consultants, submitted the "TBA Treatment Technology Evaluation" report. Regional Board staff has reviewed this report and have determined the Study is reliable and acceptable. The report concluded the following:

a. "Treatment system effluent concentrations of up to 36 µg/L have been observed as a result of the unpredictable nature of TBA treatment using GAC. The data set means, medians, and 95% upper confidence levels around the medians remained below 12 µg/L, indicating concentrations as high as 36 µg/L can be present in the treatment system effluent and maintain the long term goal of the 12 µg/L discharge limit;
b. Concentrations of TBA of up to 36 µg/L were observed in the treatment system effluents, indicating that more variation exists in effluent results for TBA than is predicted by the SWRCB guidance [SWRCB Policy];
c. Using the SWRCB guidance [Policy] and the study results, the values for the MDEL for TBA range from 30.5 µg/L to 41.3 µg/L;
d. Most effluent sample concentration data (84.8%) collected over a variety of flow and influent concentration conditions were below detection limits of 12 µg/L and less, indicating that currently available treatment technology is capable of treating TBA to below 12 µg/L, with a number of exceedances on a sporadic basis;
e. Statistical evaluation of the data set resulted in means, medians, and 95% confidence levels around the median below 12 µg/L, indicating that currently available treatment technology is capable of treating TBA to below 12 µg/L as a long-term average;
f. Each type of treatment system (Bio-GAC, GAC, Bio-systems, and AOP) included at least one exceedance of the AMEL, indicating each type of treatment system has difficulty meeting the AMEL on a consistent basis; and
g. The study suggests that a startup period of 30 to 45 days is required for inoculation/acclimation of Bio-GAC and bio-systems to allow efficient treatment of TBA."

Based on the monitoring data assessed, the "TBA Treatment Technology Evaluation" report recommended that a coefficient of variation of 1.45, rather than 0.6, be applied in calculating the MDEL in Order No. R8-2002-0007. Using a coefficient of variation of 1.45 and n=4, the appropriate multiplier calculated from Table 2 of the SWRCB Policy is 2.86. Application of this multiplier to the average monthly effluent limitation results in an MDEL of 34 µg/L. Since this

MDEL is based on empirical evidence regarding TBA treatability and compliance, staff believes that it is more appropriate than the MDEL based on an assumed coefficient of variation. Therefore, staff recommends that Order No. R8-2002-0007 be amended to incorporate this revised MDEL.

3. Incorporate a TBA Compliance Determination Provision in Orders No. R8-2002-0007 and R8-2002-0033.

The TBA Treatment Technology Evaluation report demonstrates that compliance with the AMEL specified in Order No. R8-2002-0007 and R8-2002-0033 and the revised MDEL of 34 µg/L proposed to be included in Order No. R8-2002-0007 can be achieved, with sporadic values higher than these limits. These sporadic problems result from the unpredictable nature of TBA treatment.

For most types of discharges, such as those from Publicly Owned Treatment Works (POTWs), which are continuous, it is generally feasible to address such sporadic, unpredictable exceedances of average monthly effluent limits by resampling the effluent and including all the results in the calculation of average monthly effluent quality. However, in the case of the types of discharges addressed by Order No. R8-2002-0007 and Order No. R8-2002-0033, if effluent sample analytical results exceed permit limitations, the treatment system is typically shut down temporarily and further discharges cease until the problem can be identified and corrected. This generally makes it impossible to collect, analyze and take into account subsequent additional samples within a given month. In light of the TBA Treatability study findings that the AMEL of 12 µg/L is effectively met over the long-term, with sporadic exceedances, staff believes that it is appropriate to account for treatment unpredictability by considering also the results of multiple sequential samples collected prior to the problem sample. Tentative Order No. R8-2003-0085 would amend Orders No. R8-2002-0007 and R8-2002-0033 to include the provision that determination of compliance with the TBA average monthly limit shall be based on a minimum of four test results from most recent sample events. Staff believes that this approach is protective of water quality and reasonable.

4. Incorporate effluent limits for cis and trans 1,2-dichloroethylene, 1,4-dioxane and perchlorate in the Discharge Specifications in Orders No. R8-2002-0007 and R8-2002-0033.

Orders No. R8-2002-0007 and R8-2002-0033 include effluent limits for 1,2-dichloroethylene. This substance may exist in two isomeric forms, cis and trans. In each case, a Maximum Contaminant Level (MCL) has been established. It is appropriate to modify the Orders to distinguish these isomers and specify appropriate effluent limitations based on the MCLs.

When Order No. R8-2002-0007 was adopted, all dischargers covered under the Order were required to monitor for the presence of 1,4-dioxane and perchlorate. Monitoring results indicate the presence of these substances at a number of sites.

1,4-dioxane is a man-made compound primarily used as an industrial solvent or solvent stabilizer. 1,4-dioxane is generally not biodegradable and is effectively treated through an advance oxidation process in the form of ultraviolet light combined with hydrogen peroxide. This treatment breaks down the compound into mostly carbon dioxide and water.

Perchlorate is both a naturally occurring and man-made chemical. Perchlorate is the primary ingredient of solid rocket propellant. Perchlorate affects human health by interfering with the uptake of iodide into the thyroid gland and disrupts the function of the thyroid. To remove perchlorate from water, biological treatment and ion (anion) exchange systems are among the technologies that are being used.

Neither 1,4-dioxane nor perchlorate are listed in the California Toxics Rule and no MCLs have been established. DHS recommends that monitoring be conducted for such "unregulated" chemicals[1] (DHS, February 8, 2002). However, DHS has adopted an action level (AL) for 1,4-dioxane (3 µg/L) and perchlorate (4 µg/L). Chemicals for which ALs have been adopted may eventually be regulated by MCLs.

To assure that receiving waters affected by discharges resulting from the groundwater cleanup activities regulated by the Orders are not adversely affected by 1,4-dioxane or perchlorate, it is appropriate to revise the Orders to specify appropriate effluent limitations. The proposed effluent limitations are based on the Action Levels and will assure the protection of the most sensitive beneficial use (MUN).

The following were the recommended changes to Order No. R8-2002-0007 and Order No. R8-2002-0033 that were considered and adopted by the Board at the October 3, 2003 meeting. (Deleted text is struck out and added text is bold and highlighted.)

1. Order No. R8-2002-0007, revise the table shown in Discharge Specifications A.1 as follows:

   a. The discharge of wastes shall not contain constituent concentrations in excess of the following limits:

EFFLUENT LIMITATIONS APPLICABLE TO DISCHARGES INTO RECEIVING WATERS DESIGNATED MUN (see Basin Plan Table 3-1)		
Constituent	Maximum Daily Concentration Limit (µg/L)	Average Monthly Concentration Limit (µg/L)
Total Petroleum Hydrocarbons	~~155~~ **201**	100
Benzene	~~1.6~~ **2.0**	1.0
Toluene	~~15.5~~ **20.1**	10.0
Xylene	~~15.5~~ **20.1**	10.0
Ethylbenzene	~~15.5~~ **20.1**	10.0

[1] *"Unregulated Chemicals" are "unregulated" in that they lack drinking water standards—MCLs.*

EFFLUENT LIMITATIONS APPLICABLE TO DISCHARGES INTO RECEIVING WATERS DESIGNATED MUN (see Basin Plan Table 3-1)		
Carbon Tetrachloride	~~0.39~~ **0.50**	0.25
Chloroform	~~8.8~~ **11.5**	5.7
Dichlorobromomethane	~~0.87~~ **1.13**	0.56
Methyl Ethyl Ketone	~~186.0~~ **241.2**	120
Methyl Isobutyl Ketone	~~186.0~~ **241.2**	120
Methyl Tertiary Butyl Ether (MTBE)	~~20.2~~ **26.1**	13.0
Naphthalene	~~15.5~~ **20.1**	10.0
Tetrachloroethylene (PCE)	~~1.2~~ **1.6**	0.8
Trichloroethylene (TCE)	~~4.2~~ **5.4**	2.7
1,1-Dichloroethane	~~7.8~~ **10.1**	5.0
1,1-Dichloroethylene	~~0.088~~ **0.115**	0.057
1,2-Dichloroethylene	~~15.5~~ **20.1**	10.0
cis-1,2-Dichloroethylene	**12.1**	**6**
trans-1,2-Dichloroethylene	**20.1**	**10**
1,1,1-Trichloroethane (TCA)	~~7.8~~ **10.1**	5.0
Tert Butyl Alcohol (TBA)	~~18.6~~ **34**	12.0
1,4-Dioxane	**6.0**	**3**
Perchlorate	**8.0**	**4**

EFFLUENT LIMITATIONS APPLICABLE TO DISCHARGES INTO RECEIVING WATERS NOT DESIGNATED MUN (see Basin Plan Table 3-1)		
Constituent	Maximum Daily Concentration Limit (µg/L)	Average Monthly Concentration Limit (µg/L)
Total Petroleum Hydrocarbons	~~155~~ **201**	100
Benzene	~~1.6~~ **2.0**	1.0
Toluene	~~15.5~~ **20.1**	10.0
Xylene	~~15.5~~ **20.1**	10.0
Ethylbenzene	~~15.5~~ **20.1**	10.0
Carbon Tetrachloride	~~0.8~~ **1.0**	0.5
Chloroform	~~7.8~~ **10.1**	5.0
Dichlorobromomethane	~~7.8~~ **10.1**	5.0
Methyl Ethyl Ketone	~~186.0~~ **241.2**	120.0
Methyl Isobutyl Ketone	~~186.0~~ **241.2**	120.0
Methyl Tertiary Butyl Ether (MTBE)	~~20.2~~ **26.1.**	13.0
Naphthalene	~~15.5~~ **20.1**	10.0
Tetrachloroethene (PCE)	~~7.8~~ **10.1**	5.0
Trichloroethylene (TCE)	~~7.8~~ **10.1**	5.0
1,1-Dichloroethane	~~7.8~~ **10.1**	5.0
1,1-Dichloroethylene	~~9.3~~ **12.1**	6.0
1,2-Dichloroethylene	~~15.5~~ **20.1**	10.0
cis-1,2- Dichloroethylene	**12.1**	**6**
trans-1,2- Dichloroethylene	**20.1**	**10**
1,1,1-Trichloroethane (TCA)	~~7.8~~ **10.1**	5.0
Tert Butyl Alcohol (TBA)	~~19.0~~ **34**	12.0

EFFLUENT LIMITATIONS APPLICABLE TO DISCHARGES INTO RECEIVING WATERS DESIGNATED MUN (see Basin Plan Table 3-1)		
1,4-Dioxane	**6.0**	**3**
Perchlorate	**8.0**	**4**

2. Order No. R8-2002-0007, add new Compliance Determination D.2 as follows and renumber subsequent paragraphs accordingly:

   2. Compliance determination with the TBA average monthly limit shall be based on all samples taken within the month or if the monitoring frequency requirement is once monthly, every two months or quarterly, a minimum of four test results from the most recent sample events.

3. Order No. R8-2002-0007, revise Provision E.3. as follows:

   3. This Order expires on January 1, 2007. However, ~~it~~ **coverage under the permit** shall continue in force and effect until a new Order is issued **for those dischargers who are authorized to discharge under the terms and conditions of the Order and who submit a renewal application at least 180 days prior to the January 1, 2007 expiration date.** ~~Upon reissuance of a new general permit, the dischargers shall file a notice of intent within 45 days of the effective date of the new Order and obtain a new authorization to discharge from the Executive Officer~~.

4. Order No. R8-2002-0007, page 18 of 19, Application Requirements I.4.a, revise as follows:

   a. Chemical analysis of the untreated groundwater. A representative groundwater sample shall be analyzed for organic pollutants using EPA method 8260, **priority pollutants including 1,4-dioxane and perchlorate** and results shall be reported with ML or PQL and MDL;

5. Order No. R8-2002-0033, revise Discharge specifications 1 as follows:

   1. The discharge of wastes containing constituent concentrations in excess of the following limits is prohibited:

Constituent	Average Monthly Concentration Limit[2]
Total Lead	50 microgram per liter (µg/l)
Total Petroleum Hydrocarbons	100 µg/l
Benzene	0.7 µg/l
Toluene	10 µg/l
Ethylbenzene	5 µg/l
Xylene	10 µg/l
Tetrachloroethylene (PCE)[3]	5 µg/l
Trichloroethylene (TCE)	5 µg/l
1,1,1-Trichloroethane (1,1,1-TCA)	200 µg/l
1,1-Dichloroethylene (1,1-DCE)	6 µg/l
1,1-Dichloroethane (1,1-DCA)	5 µg/l
Methyl Tertiary Butyl Ether (MTBE) interim limit effective until May 31, 2003	13 µg/l
MTBE final limit effective by June 1, 2003	5 µg/l
Tert butyl alcohol (TBA)[4]	12 µg/l
cis-1,2- Dichloroethylene	**6 µg/l**
trans-1,2- Dichloroethylene	**10 µg/l**
1,4-Dioxane	**3 µg/l**
Perchlorate	**4 µg/l**

6. Order No. R8-2002-0033, add new Provision C.24. as follows:

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2 *Average monthly concentration limit means the highest allowable average of daily pollutant discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of measurements.*

3 *Tetrachloroethylene is synonymous to percholorethylene.*

4 *See Provisions 4 and 5.*

24. Compliance determination with the TBA average monthly limit shall be based on all samples taken within the month or if monitoring frequency requirement is once monthly, every two months or quarterly, a minimum of four test results from the most recent sample events.

7. Monitoring and Reporting Program No. 02-033, add the following to Influent Monitoring B:

A grab sample of the influent to the treatment system shall be monitored on a monthly basis for total petroleum hydrocarbons, benzene, toluene, ethylbenzene, xylene, trichloroethylene (TCE), tetrachloroethylene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethylene (1,1-DCE), and 1,2-dichloroethane (1,2-DCA), **cis-1,2-Dichloroethylene (cis-1,2-DCE), trans-1,2- Dichloroethylene (trans-1,2-DCE),** methyl tertiary butyl ether (MTBE), tert butyl alcohol (TBA), 1,4-dioxane, and perchlorate.

8. Monitoring and Reporting Program No. 02-033, add the following to Effluent Monitoring C.1:

1. A sampling station shall be established for each point of discharge and shall be located where representative samples of the discharge can be obtained. The following shall constitute the effluent monitoring program:

Constituent	Type of Sample	Units	Minimum Frequency of Sampling
Flow	Flow meter	GPD	Daily
pH	Grab	pH units	Daily
Total Dissolved Solids	Grab	mg/l	Weekly
Suspended Solids	Grab	mg/l	Weekly
Trichloroethylene (TCE),	Grab	µg/l	Weekly
Total Petroleum Hydrocarbons	Grab	µg/l	Weekly
Benzene	Grab	µg/l	Weekly
Toluene	Grab	µg/l	Weekly
Ethylbenzene	Grab	µg/l	Weekly
Xylene	Grab	µg/l	Weekly
Tetrachloroethylene (PCE),	Grab	µg/l	Weekly
1,1,1-Trichloroethane (1,1,1-TCA)	Grab	µg/l	Weekly
1,1-Dichloroethylene (1,1-DCE),	Grab	µg/l	Weekly
1,2-Dichloroethane (1,2-DCA)	Grab	µg/l	Weekly
cis-1,2- Dichloroethylene	**Grab**	**µg/l**	**Weekly**
trans-1,2- Dichloroethylene	**Grab**	**µg/l**	**Weekly**
Perchlorate	Grab	µg/l	Weekly

Constituent	Type of Sample	Units	Minimum Frequency of Sampling
1,4-Dioxane	Grab	µg/l	Weekly
Methyl Tertiary Butyl Ether (MTBE)	Grab	µg/l	Weekly
Tert Butyl Alcohol (TBA)	Grab	µg/l	Weekly
Volatile Organics Portion of the EPA Priority Pollutants (See Attachment "B")	Grab	µg/l	Annually

Order No. R8-2003-0085 amends Order No. R8-2002-0007, NPDES No. CAG918001 and Order No. R8-2002-0033 to incorporate these changes.

RECOMMENDATION:

Adopt Order No. R8-2003-0085, amending Order No. R8-2002-0007, NPDES No. CAG918001 and Order No. R8-2002-0033, as presented.

Comments were solicited from the following agencies:

U.S. Environmental Protection Agency, Permits Issuance Section (WTR-5) - Doug Eberhardt
U.S. Army District, Los Angeles, Corps of Engineers - Regulatory Branch
U.S. Fish and Wildlife Service - Carlsbad
State Water Resources Control Board, Office of the Chief Counsel – Jorge Leon
State Water Resources Control Board, Division of Water Quality - James Maughan
State Department of Water Resources - Glendale
State Department of Fish and Game - Long Beach
State Department of Health Services, Santa Ana
State Department of Health Services, San Bernardino
State Department of Health Services, San Diego
Orange County Public Facilities and Resources Department - Chris Crompton
Orange County Health Care Agency - Seth Daugherty
Orange County Water District – Nira Yamachika
Riverside County Environmental Health Department - Sandy Bunchek
San Bernardino County Dept of Public Works, Env. Management Division – Naresh Varma
San Bernardino County Environmental Health Department – Daniel Avera
City of Fullerton Fire Department - John White
City of Santa Ana Fire Department - Bruce Guy
City of Orange Fire Department - Anne Bland
South Coast Air Quality Management District - James Lents
City of Santa Ana - City Manager
Orange County Coastkeeper – Garry Brown
Lawyers for Clean Water C/c San Francisco Baykeeper
And the attached mailing list (current enrollees)