

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION

**BOARD ORDER NO. R6V-2003-028**  
**WDID NO. 6B360207001**

**WATER RECYCLING REQUIREMENTS**  
**FOR**  
**VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY (VWVRA) and**  
**CITY OF VICTORVILLE;**  
**WESTWINDS GOLF COURSE**

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Regional Board) finds:

1. Producer and User<sup>1</sup>

On December 12, 2002 the Victor Valley Wastewater Reclamation Authority (VWVRA), hereafter referred to as the “Producer”, and City of Victorville, hereafter referred to as the “User”, submitted a complete *Report of Recycled Water Use* pursuant to Section 13522.5 of the California Water Code (CWC). Recycled wastewater will be used to irrigate the Westwinds Golf Course at the Southern California Logistics Airport (SCLA), which was formerly George Air Force Base. The report consists of the information described in Attachment “D,” which is made a part of this Regional Board Order (Order). For purposes of this Order “recycled water” as defined in Section 13050 (CWC) and “reclaimed water” as used in Section 13523 (CWC) are synonymous and refer to treated domestic wastewater suitable for reuse.

2. Other Related Requirements

The discharge of treated wastewater from the Producer’s wastewater treatment plant (WWTP) is regulated by Board Order No. 6-99-58 (Waste Discharger Identification No. 6B360109001 and National Pollutant Discharger Elimination System No. CA 0102822) that was adopted on November 17, 1999. Findings No. 7 and 9 of that Order recognized the planned reuse of effluent at the golf course, and Finding No. 9 states that the golf course is an authorized disposal site.

3. Reason for Action

Section 13523 of the CWC provides the authority by which the Regional Board can prescribe water reclamation (recycling) requirements for users and/or producers of recycled water following consultation with the California Department of Health Services (DHS).

Section 60323 of Title 22, California Code of Regulations (CCR - part of the DHS water recycling criteria regulations) requires the submittal of an *Engineering Report* to DHS for any proposed wastewater reuse. DHS approved the *Engineering Report* submitted for this proposed reuse in letters dated August 22, 2000 and October 3, 2002. The project approved by VWVRA (as Lead Agency) is to supply up to 1,680 acre-feet per year (at a maximum rate of 1.5 million gallons per day [mgd]), of recycled water from VWVRA to be used at the SCLA for various landscape projects. This Order establishes individual Water Recycling Requirements limiting the use of water

<sup>1</sup> Reference to “Waste Discharge Requirements” in the Standard Provisions attached also to the Order refer to Water Recycling Requirements as used in this Order. Reference to “Discharger” in the Standard Provisions also applies to the “User and Producer” in this Order.

to the existing Westwinds Golf Course, which is estimated to need about 300 to 500 acre-feet per year. The ultimate delivery of 1,680 acre feet per year of recycled water is planned but uses other than at the existing Westwinds Golf Course are not authorized at this time. This Order grants no water rights authority to use recycled water, but only regulates the use of recycled water.

4. Facility Location

The Producer's WWTP facilities are located in Section 12, T6N, R5W, SBB&M and the Westwinds Golf Course is located in Section 25, T6N, R5W, SBB&M as shown on the figures in Attachments "A", "B" and "C", which are made a part of this Order.

5. Description of Producer' WWTP

The Producer's WWTP is currently able to collect, treat, and dispose of up to 11 mgd of wastewater. Expansion of the WWTP for treatment of wastewater up to 15.5 mgd by 2007 is planned. The WWTP is currently designed to provide tertiary-level treatment for 8.3 mgd of disinfected wastewater discharged to the Mojave River and secondary-level treatment for 2.7 mgd of undisinfected wastewater discharged to onsite percolation ponds. Only disinfected tertiary-level treated effluent will be used for water recycling at the golf course. The treatment processes at the Producer's WWTP consist of the following.

- a. Preliminary treatment (mechanical removal of large debris) is provided through bar screens and grit chambers.
- b. Primary treatment in clarifiers to remove settleable and floatable material.
- c. Secondary (biological) treatment in return-activated sludge basins followed by secondary clarifiers.
- d. In-Line Coagulation/flocculation and multimedia filtration.
- e. Disinfection facilities consist of a chlorine contact chamber where chlorine gas and ammonia are added to produce chloramines. The Producer has demonstrated that the disinfection system meets CA DHS criteria for water recycling.

6. Description of Producer's Recycled Water Delivery Plans

- a. The Producer has constructed a recycled water pump station with a capacity to pump up to 1.5 mgd (1,680 acre-feet per year) of recycled water through an approximately 3-mile long pipeline to the Westwinds Golf Course. This pipeline is planned for construction in early 2003.
- b. The Producer plans to deliver only wastewater flows that are in excess of 8.86 mgd (9,700 acre-feet per year) for this reuse project. Up to 1.5 mgd of tertiary-treated water would be delivered to the Westwinds Golf Course, and up to 6.8 mgd of tertiary-treated water would be discharged directly into the Mojave River. Secondary-treated effluent (undisinfected) up to 2.7 mgd would be discharged into percolation ponds adjacent to the Mojave River. Currently, only water to meet existing seasonal golf course irrigation needs will be pumped for recycling (about 500 acre-feet per year or an annual average of 0.446 mgd).

7. Description of User Facilities

Recycled water will be discharged into an existing storage pond located adjacent to the northern side of the Westwinds Golf Course. Currently, the storage pond receives ground water pumped from former George AFB wells located east of the golf course. Water from the storage pond is supplied to an irrigation system for the existing 9-hole golf course that covers approximately 100 acres. The storage pond was lined with 18 inches of compacted bentonite clay in 1998 to reduce percolation losses. The storage pond is about 0.34 acres in size and has a capacity of about 600,000 gallons. The User has provided information to indicate the pond has the capacity to retain both the recycled water and any stormwater resulting from a 100-year, 24-hour storm event. There are no cross connections between the storage pond, the irrigation system and the potable water supply line that supplies water to the storage pond.

8. Land Ownership

The Westwinds Golf Course is located on land owned by the U.S. Government, Department of the Air Force (former George Air Force Base). The Victor Valley Economic Development Authority (VVEDA – a joint powers authority) leases the facility and subleases it to the City of Victorville.

9. VVWRA Effluent Quality

In calendar year 2002, VVWRA’s effluent had the following quality.

*Table 1 – VVWRA Effluent Quality<sup>2</sup>*

<i>Constituent</i>	<i>Units</i>	<i>Range</i>	<i>Daily Average</i>
Total Dissolved Solids (TDS)	Mg/L	228 – 436	348
Chloride	Mg/L	57 – 84	70
Sodium	Mg/L	85 – 98	94
Sulfate	Mg/L	51 – 65	57
Biochemical Oxygen Demand	Mg/L	1.0 – 13.0	4.9
Nitrate as nitrogen	Mg/L	4.7 – 28.0	9.4
Ph	Units	6.1 – 7.3	6.7
Total Coliform (MPN)	#/100 ml	<2.0 – 240	N/A
Turbidity, 24-hour	Ntu	0.13 – 2.05	0.88

10. Site Hydrogeology

The Westwinds Golf Course is situated on the bluffs about one mile west of the Mojave River on land sloping toward the east. At this location the following four dominant alluvial units and three associated aquifers have been identified (refer to Attachment “C”).

- a. An Upper Alluvial Unit of well- to poorly-graded sands contains the Upper Aquifer. The Upper Aquifer is encountered at about 80 feet below ground surface (bgs) and is about 80 feet thick. Historically, there were springs or seeps in the area but now there are none. The Upper Aquifer ground water flow direction is to the east. The west part of Westwinds Golf Course overlies the Upper Aquifer.

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<sup>2</sup> Compiled from VVWRA’s Annual Report for 2002

- b. An Aquitard comprised of old lakebed lacustrine deposits with highly plastic clay approximately 25 feet thick occurs beneath the Upper Aquifer. The Upper Aquifer is perched on this unit. The aquitard “pinches out” in the vicinity of the Westwinds Golf Course.
- c. A Lower Alluvial Unit lies beneath the aquitard and consists of a heterogeneous mixture of interbedded sands, gravel, silt and clay. The upper 50 feet of this unit is unsaturated. The Lower, or Regional Aquifer is thought to extend to bedrock located more than [or approximately] 700 feet bgs. The Regional Aquifer is located approximately 200 - 250 feet bgs. The ground water flow direction is generally northeast, however may be affected locally by ground water pumping.
- d. The Mojave River Floodplain Aquifer occupies the Mojave River channel sediments and is in communication with the Regional Aquifer. The hydraulic conductivity is much greater in this aquifer than the Regional Aquifer and it is the major water supply source for the area. The ground water flow direction is generally to the north; however, it is influenced by local pumping from the former George AFB (golf course irrigation) and the City of Adelanto well fields, which are located directly east of the golf course in this aquifer.
- e. There is no data regarding ground water quality directly underlying the Westwinds Golf Course. Additional wells are planned for installation at the golf course and former base housing area in 2003 as part of the Air Force dieldrin investigation. If the City of Victorville is not allowed to use the Air Force wells, the Monitoring and Reporting Program attached to this Order requires additional wells to be installed. Water quality in the underlying Lower (Regional) Aquifer generally has the following quality based on data from wells in the same formation located approximately one mile north (cross gradient) of the facility<sup>3</sup>.

***Table 2 – Underlying Ground Water Quality***

<b><i>Constituent</i></b>	<b><i>Units</i></b>	<b><i>Range</i></b>
TDS	mg/L	357 – 571
Chlorides	mg/L	11 – 78
Sodium	mg/L	55 – 69
Sulfate	mg/L	50 – 117

11. Ground Water Degradation Analysis

The Producer completed a ground water anti-degradation analysis and concluded that the project would not significantly affect beneficial uses or numerical water quality objectives defined in the Water Quality Control Plan for the Lahontan Region (Basin Plan). The Regional Board has considered the results of this study and concurs.

For purposes of the analysis, the Upper Aquifer ground water TDS concentrations were considered which ranged from 218 mg/L to 492 mg/L. The City of Adelanto wells, currently used as the source of irrigation water, are located in the Mojave River Floodplain Aquifer and contained TDS concentrations ranging from 385 – 1,254 mg/L. TDS concentrations in VVWRA effluent are also variable but were assumed to average 394 mg/L for purposes of the analysis. The average TDS concentration in VVWRA effluent as of 2002 is 348 mg/L (about 10% less than used in the analysis).

<sup>3</sup> CH2MHill, 1999. Data is from January 1996 for George AFB Wells NZ-57, NZ-58, NZ-60 & NZ-62.

Some degradation to the Upper Aquifer beneath the Westwinds Golf Course has already occurred because the irrigation source water contains higher TDS concentrations than the underlying ground water. TDS concentrations in underlying ground water are increased due to percolating irrigation water returning to the water table beneath the site. Only minimal adverse changes to the underlying Upper Aquifer quality are expected from the use of recycled VVWRA effluent instead of Mojave River Floodplain Aquifer water to irrigate the golf course. The TDS concentration in recycled water produced by VVWRA are similar to the current irrigation water supply quality. The analysis also concludes that rises in ground water levels associated with decreased pumping could be short-lived as ground water no longer used for irrigation may be made available for other uses.

12. Receiving Waters

The receiving waters are the ground waters of the Upper Mojave Hydrologic Area of the Mojave Hydrologic Unit (Department of Water Resources [DWR] Unit No. 628.20). The ground water basin is called the Upper Mojave River Valley (DWR Unit No 6-42).

13. Lahontan Basin Plan

The Regional Board adopted a Water Quality Control Plan for the Lahontan Region (Basin Plan) which became effective on March 31, 1995, and this Order implements the Basin Plan as amended.

14. Beneficial Uses – Ground Water

The beneficial uses of the ground waters of the Upper Mojave Valley ground water basin as set forth and defined in the Basin Plan are as follows:

- a. Municipal and Domestic Supply (MUN)
- b. Agricultural Supply (AGR)
- c. Industrial Service Supply (IND)
- d. Freshwater Replenishment (FRSH)
- e. Aquaculture (AQUA)

15. California Environmental Quality Act Compliance (CEQA)

Pursuant to CEQA (Public Resources Code 21000, et seq.), an Initial Study for this project was prepared by Tom Dodson Associates and circulated by VVWRA under State Clearinghouse No. 98121026. VVWRA (Producer – as CEQA Lead Agency) filed a Notice of Determination, dated April 6, 1999, indicating that the project would not have a significant effect on the environment, and that it had adopted a Mitigated Negative Declaration for the Project. In addition, VVWRA filed a Notice of Determination, dated September 24, 2002, indicating that an Addendum to the original Mitigated Negative Declaration was adopted on September 24, 2002 incorporating the same mitigation measures as were adopted in April 1999.

The City of Victorville (User – as CEQA Responsible Agency) approved the agreement to purchase recycled water from VVWRA on January 7, 2003 and filed a Notice of Determination indicating it had relied on the Mitigated Negative Declaration prepared by VVWRA to approve the project.

As required in Section 15096 of the CEQA Guidelines, the Regional Board (as CEQA Responsible Agency) considered the Mitigated Negative Declaration adopted by VVWRA and finds that there are no issues that require a Subsequent Environmental Impact Report under Section 15162, or that require the Regional Board to become Lead Agency under Section 15052(a) of the CEQA Guidelines.

16. Notification of Interested Parties

The Regional Board has notified the User, Producer and interested persons of its intent to adopt Water Recycling Requirements for the golf course project.

17. Consideration of Public Comments

The Regional Board, in a public meeting, heard and considered all comments pertaining to the recycled water use project.

**IT IS HEREBY ORDERED** pursuant to the CWC Sections 13523, 13263, and 13267, that the Producer and User shall comply with the following:

I. PRODUCER EFFLUENT SPECIFICATIONS

- A. The Recycled Water supplied by the Producer to the User shall meet all requirements of Section 60304, (Use of recycled water for irrigation), Title 22, CCR and related Sections of Title 22 as described in Attachment E.
- B. The total flow of recycled water to the Westwinds Golf Course storage pond shall not exceed its capacity.
- C. The pH of the recycled water delivered to the storage pond shall, at all times, be not less than 6.0 nor more than 9.0.
- D. All recycled water delivered to the storage pond shall have a dissolved oxygen concentration of not less than 1.0 mg/L at all times.

II. USER RECYCLED WATER REQUIREMENTS

- A. The User shall only use recycled water in a manner that meets all use area requirements as described in Section 60310, Title 22, CCR (Use area requirements) and related Sections of Title 22 as described in Attachment E.
- B. The recycled water may only be used for irrigation of the landscaping and turf on the existing Westwinds Golf Course following storage in the existing onsite-storage pond (considered the Use areas pursuant to Section 60301.900, Title 22, CCR). The storage pond may be considered a "Nonrestricted recreational impoundment" pursuant to Section 60301.620, Title 22, CCR.
- C. Recycled water shall not be used at other locations or for uses other than those specified in Section II.B., above. Before any use may be changed or expanded, the User/Producer must file a revised Report of Recycled Water Use to the Regional Board in accordance with Section 13523 of the CWC, a revised Title 22 engineering report (approved by the State

DHS) and the Regional Board must issue new or modified Water Reclamation Requirements.

- D. Recycled water shall be applied at such a rate and volume as not to exceed golf course vegetative needs and to prevent excess ponding from runoff.
- E. Precautions must be taken to prevent clogging of spray nozzles, to prevent over-watering, and to minimize the production of ponding or run-off. Pipelines shall be maintained so as to prevent leakage.
- F. Adequate freeboard and/or protection shall be maintained in the recycled water storage pond to ensure that direct rainfall or recycled water delivered from the treatment plant will not cause pond overflow.
- G. The wastewater treatment and use of recycled water shall not result in problems caused by breeding of mosquitoes, gnats, midges, or other pests.

III. GENERAL REQUIREMENTS AND PROHIBITIONS FOR RECYCLED WATER USE  
APPLICABLE TO BOTH THE PRODUCER AND USER

- A. There shall be no discharge, bypass, or diversion of raw or partially treated sewage, sewage sludge, grease, or oils from the collection, transport, treatment, or disposal facilities to adjacent land areas or surface waters.
- B. All facilities used for collection, transport, treatment, or disposal of waste regulated by these Water Recycling Requirements shall be adequately protected against overflow, washout, inundation, structural damage or a significant reduction in efficiency resulting from a 24-hour storm or flood having a recurrence interval of once in 100 years.
- C. A copy of these requirements shall be maintained at VVWRA and the Westwinds Golf Course so as to be available at all times to operating personnel.
- D. The Producer and User shall, at all times, properly operate and maintain all treatment facilities and control systems (and related appurtenances) which are installed or used to achieve compliance with the conditions of this Order. Proper operation and maintenance includes: effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls (including appropriate quality assurance procedures).
- E. The reuse of recycled water shall not cause a pollution, as defined in Section 13050 (l) of the CWC, or a threatened pollution.
- F. Neither the treatment nor the use of recycled water shall cause a nuisance, as defined in Section 13050(m) of the CWC.
- G. The Producer and User shall comply with the "Standard Provisions for Waste Discharge Requirements, dated September 1, 1994, in Attachment "F" <sup>4</sup> which are made a part of this

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<sup>4</sup> Reference to "Waste Discharge Requirements" in the Standard Provisions attached also to the Order refers to Water Recycling Requirements as used in this Order. Reference to "Discharger" in the Standard Provisions also applies to the "User and Producer" in

- Order.
- H. Pursuant to Section 13267 of the CWC, the Producer and User shall comply with the Monitoring and Reporting Program No. R6V-2003-028 as specified by the Executive Officer.
- I. The Producer and User shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made a part of the Monitoring and Reporting Program.
- J. If any modifications are made to the disinfection system, the modal contact time shall be recalculated. Should the Producer use another method to determine CT compliance, the alternative method must first be acceptable to the State DHS and such approval from State DHS will be obtained in writing and provided to the Regional Board.

I, Harold J. Singer, 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, Lahontan Region, on June 11, 2003.

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HAROLD J. SINGER  
EXECUTIVE OFFICER

- Attachments:
- A. Location Map
  - B. Proposed Well Locations
  - C. Hydrogeologic Cross Section
  - D. List of Information Received
  - E. Title 22 Recycled Water Criteria
  - F. Standard Provisions for Waste Discharge Requirements

JC/rp 6/2003 (WestWinds wdr)



**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION**

**MONITORING AND REPORTING PROGRAM NO. R6V-2003-028  
WDID NO. 6B360207001**

**WATER RECYCLING REQUIREMENTS  
FOR  
VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY (VWVRA) and  
CITY OF VICTORVILLE;  
WESTWINDS GOLF COURSE**

San Bernardino County

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**I. MONITORING**

For the purposes of the Monitoring and Reporting Program, the City of Victorville is the User and VWVRA is the Producer.

**A. Producer Flow Monitoring**

The following shall be recorded:

1. The volume, in million gallons, of recycled water delivered to the User for each day.
2. The total volume, in million gallons, of recycled water delivered to the User for each month.
3. The maximum instantaneous flowrate, in million gallons per day (mgd), of recycled water delivered to the User that occurs each day.
4. The average flowrate, in mgd, of recycled water delivered to the User for each month.
5. The cumulative volume, in acre-feet, of recycled water delivered to the User for the calendar year.

**B. Producer Recycled Water Monitoring**

1. Representative samples shall be collected and analyzed for the parameters listed in Table 1. The Producer is currently collecting some of this information as required in a separate Order, however it must be reported as required herein.

**Table 1 - Recycled Water Monitoring**

Parameter	Station	Units	Sample Type	Analytical Method	Minimum Frequency
Flow	Final Effluent Station	Mgd	Continuous	SCADA <sup>1</sup>	see below
Turbidity	CCT <sup>2</sup>	NTU	Continuous	EPA 180 – field	see below
Chlorine Residual	CCT <sup>3</sup>	Mg/L	Continuous	EPA 330	see below
CT	CCT	Mg-minutes/L	Calculated	SCADA	Daily – see below
Total Coliform	CCT	MPN/100ml	Grab	SM 9221	Daily - see below
PH	SBMS	PH Units	Grab	EPA 150 – field	Daily
Dissolved Oxygen	SBMS	Mg/L	Grab	SM 4500 – field	Weekly
Total Dissolved Solids (TDS)	Storage Pond	Mg/L	Grab	EPA 160	Quarterly

2. For CT calculation, the following information must be taken from 24-hour chart readings:
  - a. Modal contact time under the highest flow and corresponding chlorine residual at that time;
  - b. Lowest residual and corresponding modal contact time;
  - c. Highest residual and corresponding modal contact time; and
  - d. Modal contact time under lowest flow and corresponding residual.

CT values are calculated from these four sets of data and the lowest value would be used to determine worst case CT for the daily period. For purposes of this determination, modal contact time would be derived from a pre-determined plot correlating modal contact times to varying flow conditions. Continuous flow and chlorine residual monitoring shall be conducted. The Producer may propose alternate methods for determining daily CT compliance for review and approval by the California Department of Health Services (DHS) (e.g. for delivery periods less than 24-hours). A copy of the request and DHS approval shall be provided to the Regional Board and implemented. Individual data and all four calculations for each day shall be reported. Any CT values less than 450 mg-min/l with a minimum modal contact time of at least 90 minutes based on a peak dry weather design flow (stated in each report) shall be reported.

3. Filter effluent turbidity analysis should be conducted continuously using a continuous monitoring and recording turbidimeter. The following information must be collected and reported:
  - a. Turbidity readings at 72-minute (1.2 hour) intervals (representing 5% of a 24 hr period).

<sup>1</sup> SCADA - Supervisory Control and Data Acquisition system

<sup>2</sup> CCT – Chlorine Contact Tank

<sup>3</sup> CCT – Chlorine Contact Tank effluent prior to dechlorination

- b. These readings are minimum to evaluate compliance during a 24-hour period. Additional readings may be taken if included in compliance calculations. For delivery periods less than 24-hours (e.g. irrigation only at night), the Producer may propose to the DHS an alternate data recording plan so that sufficient data are collected to evaluate turbidity levels during 5 percent of the time within a 24-hour period. A copy of the request and DHS approval shall be provided to the Regional Board and implemented.
  - c. The daily average operating filter effluent turbidity (must be less than 2 NTU) should be determined by averaging the levels of recorded turbidity taken as specified in 3.a.above (arithmetic mean).
  - d. Evaluation of compliance with the turbidity standard of not exceeding 5 NTU more than 5 percent of the time over a 24-hour period should be determined using the levels of recorded turbidity. In the first monitoring report submitted provide a description of the Producer's evaluation approach.
  - e. The maximum reading during recycled water delivery in a 24-hour period must be used to evaluate the 10 NTU maximum at-any-time criteria.
  - f. Should the continuous turbidity meter and/or recorder fail, grab sampling at a minimum frequency of 1.2 hours may be substituted for a period of up to 24-hours. Continuous turbidity monitoring should also be provided prior to filtration to ensure adequate process control.
  - g. Daily maximum turbidity.
  - h. The percent of samples greater than 5 NTU in any 24-hour period.
4. Coliform samples shall be obtained immediately after disinfection. Daily total coliform bacteria results shall be reported along with a running 7-day median calculation. Any coliform bacteria sample results exceeding the following shall be reported:
- a. A median MPN of 2.2 /100 ml for a running seven-day period;
  - b. A total MPN of 23/100 ml in more than one sample in any running 30-day period; and
  - c. A total MPN of 240/100 ml in any sample.

C. User Ground Water Monitoring

1. Grab samples from within the top five feet of ground water following standard well purging shall be collected from a minimum of three monitoring wells established around the golf course (Refer to Attachment “B” of the Order for existing well locations). The samples shall be analyzed to determine the magnitude of the parameters listed in Table 2.
2. Each monitoring report submitted with ground water information shall include a map showing well locations, ground water elevation contours and tables summarizing the final field and laboratory analytical data.

**Table 2 – Ground Water Monitoring**

Parameter	Station	Units	Sample Type	Analytical Method	Minimum Frequency
Depth to water	TBD <sup>4</sup>	Feet bgs	--	Measured – field	Semiannually
Conductivity	TBD	micromhos/cm	Grab	EPA 120 – field	Semiannually
PH	TBD	pH units	Grab	EPA 150 – field	Semiannually
Dissolved Oxygen	TBD	mg/L	Grab	SM 4500 – field	Semiannually
Temperature	TBD	Deg. F or C	Grab	SM 2550 – field	Semiannually
Turbidity	TBD	NTU	Grab	EPA 180 – field	Semiannually
Static Water Level	TBD	Feet amsl	--	Determined	Semiannually
Direction of Gradient	TBD		--	Determined	Semiannually
TDS	TBD	mg/L	Grab	EPA 160	Semiannually
Alkalinity (Alk)	TBD	mg/L	Grab	EPA 300	Annually
Hardness (Hrdns)	TBD	mg/L	Grab	SM 2340	Annually
Methylene blue active substances (MBAS)	TBD	mg/L	Grab	EPA 425	Annually
Calcium (Ca)	TBD	mg/L	Grab	EPA 200	Annually
Potassium (K)	TBD	mg/L	Grab	EPA 200	Annually
Magnesium (Mg)	TBD	mg/L	Grab	EPA 200	Annually
Copper (Cu)	TBD	mg/L	Grab	EPA 200	Annually
Iron (Fe)	TBD	mg/L	Grab	EPA 200	Annually
Manganese (Mn)	TBD	mg/L	Grab	EPA 200	Annually
Zinc (Zn)	TBD	mg/L	Grab	EPA 200	Annually
Chloride (Cl)	TBD	mg/L	Grab	EPA 300	Annually
Sulfate (SO4)	TBD	mg/L	Grab	EPA 300	Annually
Nitrate (NO3)	TBD	mg/L	Grab	EPA 300	Annually
Total organic carbon	TBD	mg/L	Grab	EPA 415	Annually

3. The User shall install at least three (3) ground water monitoring wells to monitor the upper ten (10) feet of the first encountered ground water beneath the golf course. The proposed well locations, designs, well development methods, and purging methods; as well as the sample collection, handling, preservation and laboratory analysis methods shall be described in a

<sup>4</sup> TBD – To Be Determined.

workplan that is to be submitted by **August 1, 2003** for acceptance by the Regional Board Executive Officer prior to initiation.

At least one well shall be located upgradient of the facility and two wells downgradient. The design of the wells shall conform to the "California Well Standards, Bulletins 74-90 and 74-81" prepared by the CA Department of Water Resources. Well permits shall be obtained from San Bernardino County for the installation and demolition of any wells. Following acceptance of the workplan, the wells shall be installed according to the workplan.

The design of the ground water monitoring system, sample collection procedures and data analysis methods shall conform to methods outlined in Section 20415 and Section 20420(b),(c),(f),(h), and (i) of California Code of Regulations (CCR), Title 27, or an equivalent.

Sufficient data should be collected to establish the background values for all parameters listed in Table 2, above, except for "Depth to Water", "Static Water Level" and "Direction of Gradient." Background water quality should be determined from a minimum of four samples collected from all wells evenly spaced (no less than 60 days apart) between installation of the wells and the start of recycled water use (expected to be in February 2004).

Prior to **February 1, 2004** (the approximate date of initiation of recycled water use for irrigation), the User shall submit a technical report, signed by either a CA Registered Geologist or Civil Engineer, describing the selected methods used to determine "background" groundwater quality. The approach used should follow performance standards outlined in Section 20415(e) (9, 10 & 12)(CCR) Title 27 (Data Analysis Methods Performance Standards, Background Values/Procedures, Sampling Methods, respectively), or an equivalent method. The User shall determine background concentrations for each of the parameters described in Table 2, above, except for "Depth to Water", "Static Water Level" and "Direction of Gradient."

For each subsequent ground water monitoring event, the User shall determine whether there is a "measurably significant" evidence of groundwater quality degradation from the Westwinds Golf Course as a result of recycled water use. The results of this determination shall be stated in the monthly report following semi-annual ground water sampling for the parameters analyzed except for "Depth to Water", "Static Water Level", and "Direction of Gradient."

Additional monitoring points, over the three minimum, may be required to establish background water quality.

The U.S. Air Force has installed ground water monitoring wells at the site to investigate dieldrin in the ground water. The User may propose to use selected Air Force wells for this ground water monitoring requirement provided each of the above criteria are satisfied. Additionally, if the User proposes to utilize wells installed by the Air Force, it must submit a copy of an agreement that allows use of these wells for the life of this project plus any post-project monitoring. Otherwise, separate, properly-constructed monitoring wells must be installed so that a minimum of four (4) samples are collected and the above described technical reports are submitted prior to the first use of recycled water at Westwinds Golf Course.

D. Use Area Monitoring

1. A storage pond freeboard monitoring station shall be established and freeboard recorded weekly and reported in each report submitted.
2. A visual inspection of the golf course for compliance with Use Area Requirements shall be made monthly and the results submitted in each report.
3. A visual inspection shall be made after significant rainstorm events of large duration or intensity, (e.g. > 0.1 inches).

II. REPORTING

A. General Provisions

1. The Producer/User shall comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of this Monitoring and Reporting Program.
2. Laboratory and Field data sheets shall be included with each report.
3. Each report shall discuss violations and corrective actions taken or planned to bring the Producer and/or User into full compliance with Water Recycling Requirements.
4. Tables listing final observed field parameters (described in Tables 1 and 2) shall be included with each report.
5. Each report shall include an evaluation of the data in a tabular form with respect to the requirements listed in the Board Order to determine whether compliance has been achieved. Spreadsheets and supporting calculations shall be included.
6. All data collected at the approved monitoring locations, over the minimum frequency specified above, shall be reported and included in the compliance calculations.

B. Special Reporting

Any of the following conditions should be notified to the Regional Board within 24-hours of occurrence:

1. Failure of chlorination equipment;
2. Effluent total coliform bacteria MPN greater than 240/100 ml;
3. Turbidity greater than 10 NTU; and
4. CT less than 450 mg-min/l.

The State DHS and County DEHS should be contacted by the User or Producer whenever they are aware that water treated to a level requiring a 24-hour notification has been delivered to the distribution system, or if there is a question about whether the treatment plant should be returned to service. Any known direct cross-connection between recycled and potable water should be reported to the Regional Board and State DHS and County DEHS immediately, or at least within 24-hours.

C. Monthly Submittal Periods

Beginning on **July 30, 2003**, monthly monitoring reports including the preceding information shall be submitted to the Regional Board by the 30th day of the month following each monthly monitoring period. The Producer has agreed to submit all monitoring reports. Until the month after the first delivery of recycled water by the Producer to the User for the Westwinds Golf Course, a letter report may be substituted stating the status of delivery pipeline construction and time schedule of expected first recycled water delivery.

D. Annual Reports

An Annual Report shall be submitted to the Regional Board by **April 1** of each year. The report shall contain both tabular and graphical summaries of the prior year's monitoring data. The compliance record shall be evaluated and a summary provided of corrective actions taken or planned to bring the Producer and User into full compliance with the Order.

The Annual Report shall include a list of each analytical method used for testing and associated laboratory quality assurance/quality control procedures. The report shall state the laboratories used to monitor compliance and the status of their certification.

E. Summary of Monitoring and Reporting

<b>Report Designation</b>	<b>Monitoring Period</b>	<b>Reporting Date</b>
Monthly Reports – including Producer, Use Area Information	Monthly	30th of the following month
Semiannual Ground Water Information	April and October	with following monthly report
Ground Water Monitoring System Design	not applicable	August 1, 2003
Background Water Quality Evaluation	August 1, 2003 – February 1, 2004 – 4 evenly spaced samples	February 1, 2004
Annual Report	prior year	April 1
Special Reports	not applicable	as required

Ordered by: \_\_\_\_\_

HAROLD J. SINGER  
EXECUTIVE OFFICER

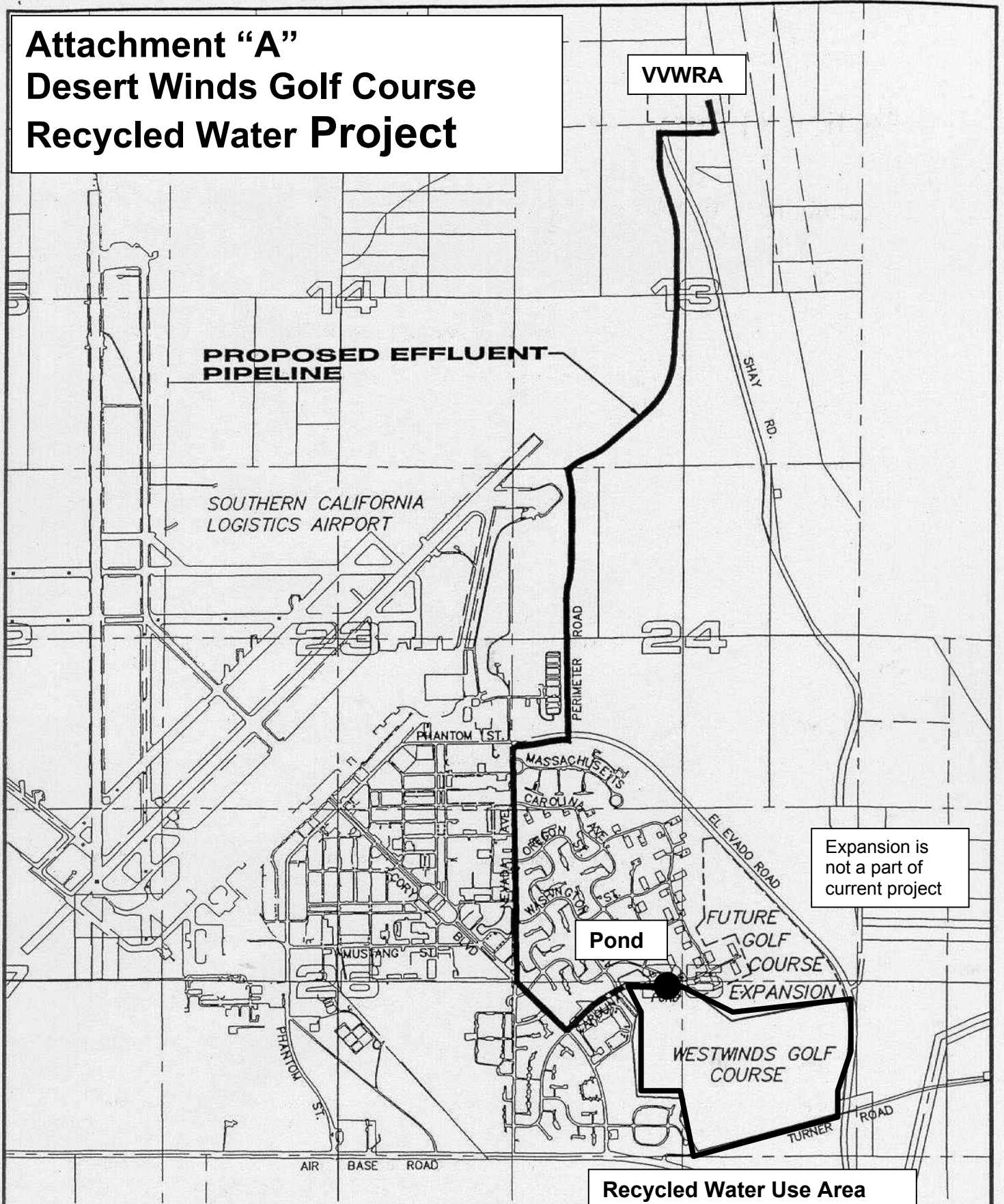
Dated: **June 11, 2003**

Attachment: General Provisions for Monitoring and Reporting

6/2003 JC/rp (Westwinds MRP-rev4 rsd)



# Attachment "A" Desert Winds Golf Course Recycled Water Project



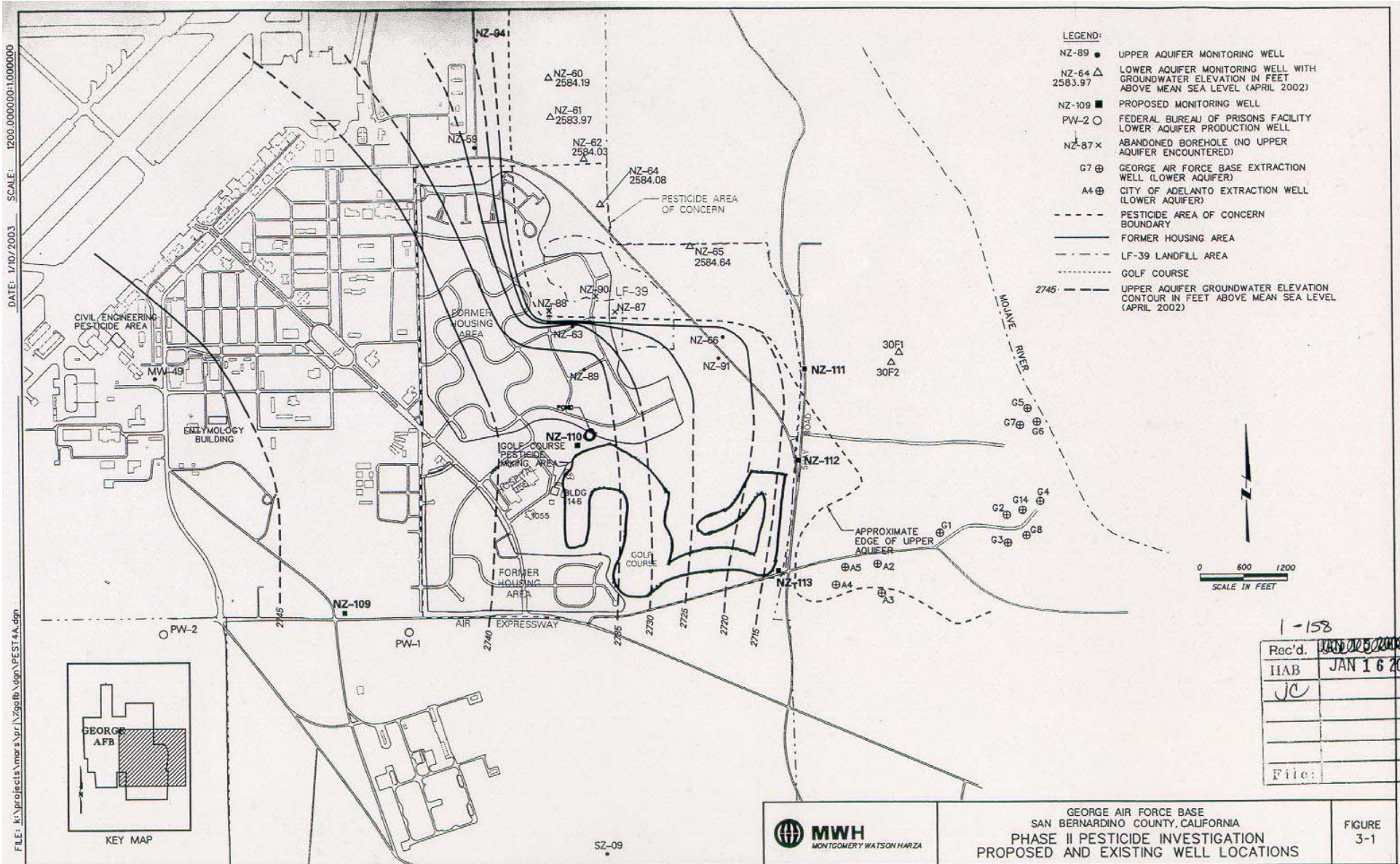
SCALE: 1"=2000'

**VICTOR VALLEY WASTEWATER  
RECLAMATION AUTHORITY**

**TITLE 22 ENGINEERING REPORT  
PROPOSED EFFLUENT PIPELINE  
ROUTE AND REUSE AREAS**

# Attachment "B"

## Westwinds Golf Course; Existing and Proposed Groundwater Wells



1-158

Rec'd.	1/16/2003
IAB	JAN 16 2003
JC	
File:	

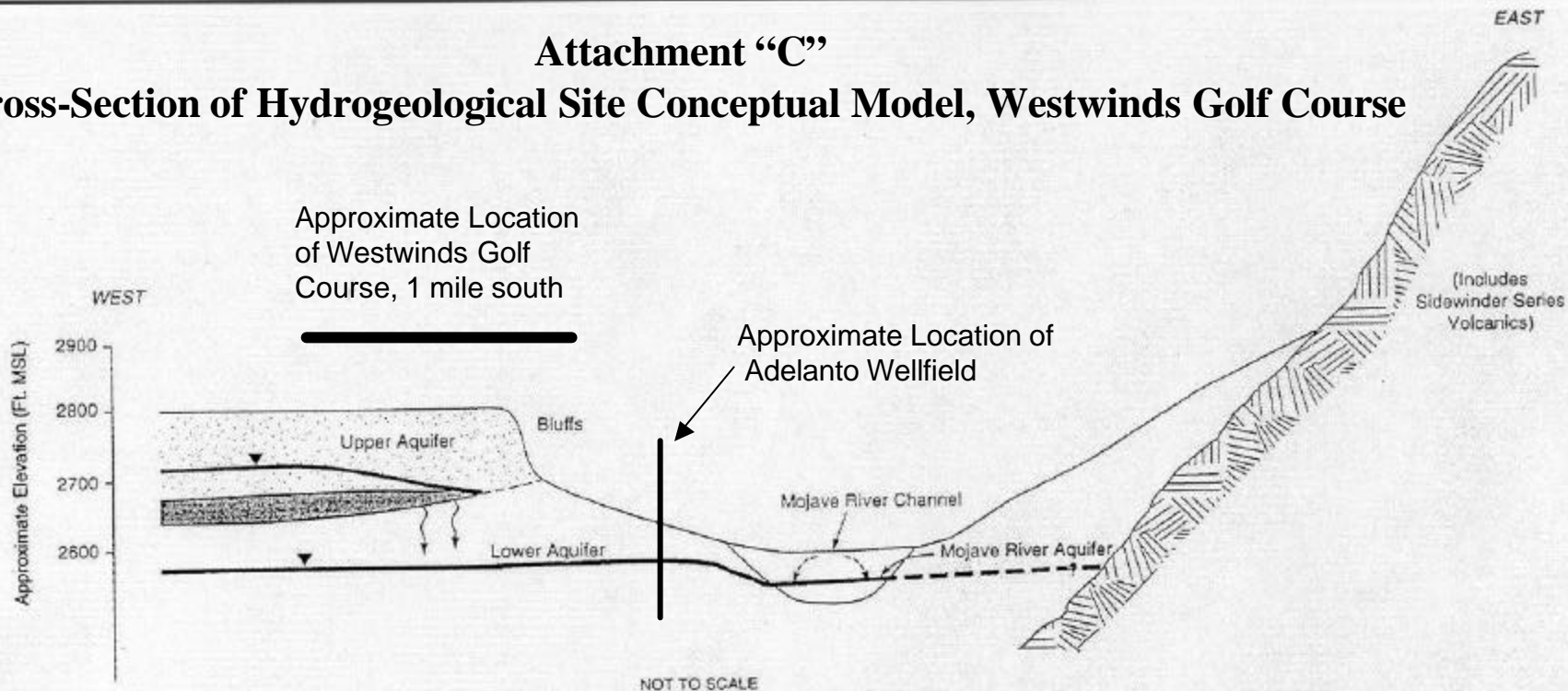


GEORGE AIR FORCE BASE  
SAN BERNARDINO COUNTY, CALIFORNIA  
PHASE II PESTICIDE INVESTIGATION  
PROPOSED AND EXISTING WELL LOCATIONS

FIGURE 3-1







# Attachment "C"

## Cross-Section of Hydrogeological Site Conceptual Model, Westwinds Golf Course

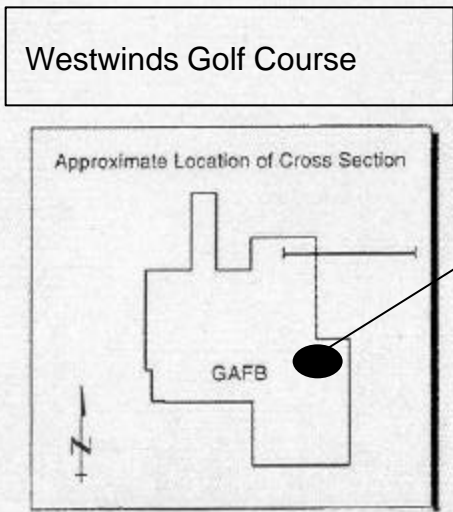


Note: The Lower (Regional) Aquifer and Mojave River (Floodplain) Aquifer are in hydraulic continuity. The Floodplain aquifer has a higher transmissivity. The boundary between aquifers is uncertain.

### LEGEND

-  Upper Alluvial Unit
-  The Aquitard
-  Lower Alluvial Unit
-  Mojave River Channel Deposits
-  Potentiometric Surface
-  Bedrock

Source: The Thomas Guide, (1998a).



**FIGURE 2.3**  
**SIMPLIFIED CONCEPTUAL HYDROGEOLOGIC CROSS-SECTION**  
 Passive Diffusion Bag Sampler Demonstration  
 George AFB, California  
**PARSONS**  
 Denver, Colorado

## Attachment “D”

### List of Information Constituting the Report of Recycled Water Use (RRWU) Regarding the Proposed Use of Recycled Water at Desert Winds Golf Course, Victorville - Including CEQA Information

<b>Date</b>	<b>Sender</b>	<b>Purpose</b>	<b>Subject</b>
12/10/98	VVWRA	CEQA	Transmittal of an Initial Study (SCH# 98121026) prepared by Tom Dodson Associates, dated December 8, 1998, to use up to 1.5 MGD of recycled water at Southern California International (now Logistics) Airport
3/4/99	Dodson	CEQA	Letter from Dodson to VVWRA transmitting comments and responses to comments received on the Initial Study to Regional Board staff's 1/11/99 letter.
5/28/99	VVWRA	CEQA	Letter transmittal of ground water anti-degradation analysis, prepared by CH2M Hill, dated 5/8/99, in response to RWQCB request
7/1/99	VVWRA	RRWU	Copy of Ordinance No. 001 as most recently amended – Rules and Regulations for sewerage service, VVWRA
10/1/99	Mowry	RRWU	Title 22 Engineering Report for VVWRA
4/16/00	DHS	RRWU	Letter from Department of Health Services to VVWRA with comments on the Title 22 report
1/15/02	VVWRA	RRWU	Letter seeks RWQCB's guidance on the process to obtain approval to deliver recycled water suggesting a Master Reclamation Permit
7/2/02	VVWRA	RRWU	Transmittal letter for Form 200 (as Producer) – Application for Recycled Water Use Requirements
9/4/02	VVWRA	RRWU	Filing Fee and additional information regarding project
9/30/02	VVWRA	CEQA/ RRWU	Transmittal of Addendum to Mitigated Negative Declaration, Notice of Determination and Addendum to Title 22 Engineering Report
10/3/02	DHS	RRWU	Letter of concurrence with Title 22 Engineering Report and concurrence with acceptable modal contact time requirements
11/21/02	Victorville	RRWU	Form 200 (as User) along with technical information
12/6/02	VVWRA	CEQA	Responses to RWQCB Comments dated 9/24/02
12/12/02	City VVL	RRWU	Email indicating how the storage pond is lined
12/12/02	VVWRA	RRWU	Letter responding to Regional Board staff's email of 12/6/02
1/13/03	VVWRA and City of VVL	RRWU	Comments responding to Tentative Order. Included also is an amendment to the anti-degradation study dated 1/11/03

**Attachment “E”**  
**Title 22 Recycled Water Criteria**

A. PRODUCER RECYCLED WATER REQUIREMENTS

1. Pursuant to Section 60304(a), (Use of recycled water for irrigation), Title 22, Cal. Code of Regs, the recycled water for this project must meet the following.

“(a) Recycled water used for the surface irrigation of the following shall be a disinfected tertiary recycled water, except that for filtration pursuant to Section 60301.320(a) coagulation need not be used as part of the treatment process provided that the filter effluent turbidity does not exceed 2 NTU, the turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes:

- (1) Food crops, including all edible root crops, where the recycled water comes into contact with the edible portion of the crop,
- (2) Parks and playgrounds,
- (3) School yards,
- (4) Residential landscaping,
- (5) Unrestricted access to golf courses, and
- (6) Any other irrigation use not specified in this section and not prohibited by other sections of the California Code of Regulations.”

2. Pursuant to Section 60301.230 (Disinfected tertiary recycled water), Title 22, Cal. Code of Regs, the Producer must deliver “**Disinfected tertiary recycled water**” meaning a filtered and subsequently disinfected wastewater that meets the following criteria. The Producer conducted a tracer test and verified this criteria under (a)(1) below.

“(a) The filtered wastewater has been disinfected by either:

- (1) A chlorine disinfection process following filtration that provides a  $CT^1$  (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or
- (2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque-forming units of F-specific bacteriophage MS-2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

(b) The median concentration of total coliform bacteria measured in the disinfected effluent shall not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analysis have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.”

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<sup>1</sup> CT is a term developed by the California Department of Health Services and used in the revised Title 22 Recycled Water Regulations promulgated in 2001. Not to be confused with “contact time”, it is defined in Section 60301.230 as “the product of total chlorine residual and modal contact time measured at the same point.” See Section 60301.600 for a definition of modal contact time.

3. Pursuant to Section 60301.600 (Modal contact time), Title 22, Cal. Code of Regs, the Producer must determine a “**modal contact time**” meaning “the amount of time that elapsed between the time that a tracer, such as salt or dye, is injected into the influent at the entrance of the chlorination chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber.” Units for modal contact time are mg-min/L.
4. Pursuant to Section 60301.320 (Filtered wastewater), Title 22, Cal. Code of Regs, the Producer must deliver a “**filtered wastewater**” meaning an oxidized wastewater that meets the criteria in subsection (a) below.
  - “(a) Has been coagulated and passed through natural undisturbed soil or a bed of filter media pursuant to the following:
    - (1) At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in a traveling bridge automatic backwash filter, and
    - (2) So that the turbidity of the filtered wastewater does not exceed any of the following:
      - (A) An average of 2 NTU within a 24-hour period;
      - (B) 5 NTU more than 5 percent of the time within a 24-hour period; and
      - (C) 10 NTU at any time.”
5. Pursuant to Section 60301.650 (Oxidized wastewater), Title 22, Cal. Code of Regs, the Producer must deliver “**oxidized wastewater**” meaning “wastewater in which the organic matter has been stabilized, is non-putrescible, and contains dissolved oxygen.”
6. Pursuant to Section 60301.160 (Coagulated wastewater), Title 22, Cal. Code of Regs, the Producer must deliver “**coagulated wastewater**” meaning “an oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated upstream from a filter by the addition of suitable floc-forming chemicals.”
7. Pursuant to Section 60301.660 (Peak dry weather flow), Title 22, Cal. Code of Regs, the Producer must base “**peak dry weather flow**” on “the arithmetic mean of the maximum peak flow rates sustained over some period of time (for example three hours) during the maximum 24-hour dry weather period. Dry weather period is defined as periods of little or no rainfall.”
8. Pursuant to Section 60301.300 (F-Specific bacteriophage MS-2), Title 22, Cal. Code of Regs, the term “**F-Specific bacteriophage MS-2**” means “F-specific bacteriophage MS-2 means a strain of a specific type of virus that infects coliform bacteria that is traceable to the American Type Culture Collection(ATCC 15597B1) and is grown on lawns of E. coli (ATCC 15597).”

B. USER RECYCLED WATER REQUIREMENTS

1. Pursuant to Section 60305 (Use of recycled water for impoundments), Title 22, Cal. Code of Regs, the water delivered to the golf course surface impoundment shall conform to the following.
  - “(a) Except as provided in subsection (b) {*not applicable to this application*}, recycled water used as a source of water supply for nonrestricted recreational impoundments shall be a disinfected tertiary recycled water that has been subjected to conventional treatment.
  - (c) The total coliform bacteria concentrations in recycled water used for nonrestricted recreational impoundments, measured at a point between the disinfection process and the point of entry to the use impoundment, shall comply with the criteria specified in section 60301.230 (b) for disinfected tertiary recycled water.”

2. Pursuant to Section 60310 (Use area requirements), Title 22, Cal. Code of Regs, the use of recycled water must conform to the following.

- “(a)<sup>2</sup> No areas irrigated with disinfected tertiary recycled water shall be located within 50 feet of any domestic water supply well unless all of the following conditions have been met:
- (1) A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from and the ground surface;
  - (2) The well contains an annular seal that extends from the surface into the aquitard;
  - (3) The well is housed to prevent any recycled water spray from coming into contact with the wellhead facilities;
  - (4) The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well; and,
  - (5) The owner of the well approves of the elimination of the buffer zone requirement.
- (b) No impoundment of disinfected tertiary recycled water shall occur within 100 feet of any domestic water supply well.
- (c)<sup>3</sup> No irrigation with, or impoundment of, disinfected secondary-2.2 or disinfected secondary-23 recycled water shall take place within 100 feet of any domestic water supply well.
- (d)<sup>4</sup> No irrigation with, or impoundment of, undisinfected secondary recycled water shall take place within 150 feet of any domestic water supply well.
- (e) Any use of recycled water shall comply with the following:
- (1) Any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.
  - (2) Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities,
  - (3) Drinking water fountains shall be protected against contact with recycled water spray, mist or runoff.
- (f) No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground , or a school yard.
- (g) All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording: “RECYCLED WATER – DO NOT DRINK”. Each sign shall display an international symbol similar to that shown in figure 60310-A<sup>5</sup>. The Department [of Health Services] may accept alternative signage and wording, or an educational program, provided the applicant demonstrates to the Department that the alternative approach will assure an equivalent degree of public notification.

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<sup>2</sup> Note: subsection (a) will apply only if recycled water use areas are adjacent to domestic or municipal supply wells.

<sup>3</sup> Does not apply for this application.

<sup>4</sup> Does not apply for this application.

<sup>5</sup> See Title 22 for illustration.

- (h) Except as allowed under Section 7604 of Title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water piping and any piping conveying potable water.
  - (i) The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibbs [a faucet or similar device to which a common garden hose can be readily attached]. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.”
3. Pursuant to Section 60301.620 (Nonrestricted recreational impoundment) Title 22, Cal. Code of Regs, the existing storage pond is classified a “Nonrestricted recreational impoundment” that means “an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities.”