PIPING COMPONENTS FOR THE WASTEWATER TREATMENT SYSTEM EXPANSION PROJECT FOR LAKE HAVASU CITY

ENVIRONMENTAL ASSESSMENT

City of Lake Havasu City, Mohave County, Arizona
June 2007

U.S. Environmental Protection Agency, Region IX
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Piping Components for the Wastewater Treatment System Expansion Project for Lake Havasu City – Environmental Assessment

I. Purpose and Need:

Lake Havasu City, Arizona (Figure 1) is in the fifth year of an eleven year wastewater collection expansion in an effort to mitigate against elevated nitrate levels in the City's aquifer, which is hydrologically connected to the Colorado River. More than 25,000 septic tanks were in place in the City prior to the sewer expansion program and about 1/3 have been decommissioned as residences are tied into the collection system. The phased collection system expansion will cover about 90% of the incorporated city by the program's end in 2013.

Sewage is currently being processed at two existing wastewater treatment facilities, the 24 acre Island Wastewater Treatment Plant (IWWTP) on Pittsburg Point Island (Island; Section 16 Township 13 N and Range 20 W of the Gila & Salt River Baseline and Meridian, within Mohave County, Arizona (USGS Lake Havasu City South, Arizona 7.5', 1984) and the 13 acre Mulberry Wastewater Treatment Plant (MWWTP) off of Mulberry Drive (Sec. 14 T13N R20W) and about ½ mile up hill from State Highway 95. The maximum rated capacities of the IWWTP and MWWTP, both conventional aeration-activated sludge operations, are 2.5 million gallons per day (MGD) and 2.2 MGD, respectively. Effluent from the IWWTP is discharged into 3.2 million gallon capacity percolation ponds at that site and provides irrigation water for several customers on the Island. Effluent generated at the MWWTP is temporarily stored in a 1.8 million gallon capacity commingling pond (lake water can be mixed in with the effluent to bring down the total dissolved solids content), from which effluent is drawn for delivery to the London Bridge Golf Course for irrigation.

Wastewater treatment volumes are expected to rise as the City continues to expand its sewer collection system with totals projected to near 5.9 MGD by 2013 (Effluent Reuse Master Plan, 2006). The Arizona Department of Environmental Quality (ADEQ) states in their Aquifer Protection Permits for wastewater treatment facilities that when a plant reaches 80% of its treatment capacity, the community has to submit either a design plan for expansion or justify why the plant won't have to be expanded (written communication from ADEQ, December 26th, 2006). The latter choice is reserved for no growth regions, which is not applicable to Lake Havasu City. The design plan should cover the next 20-year expansion, either at that facility or at a new site. The IWWTP is currently operating at 72% capacity year round and the MWWTP is projected to meet its capacity during the cooler, low effluent-use demand months by 2008.

In response to the growing wastewater treatment capacity demand and the limitations of the existing facilities, Lake Havasu City underwent an extensive review of 185 possible new treatment plant sites and selected to construct the North Regional Wastewater Treatment Plant (NRWWTP), one-half mile southeast of Lake Havasu Municipal Airport. This treatment plant will ease the pressure of the existing facilities and satisfy Lake Havasu City's wastewater treatment demands for the foreseeable future. Funding is being sought to help defray infrastructure costs for the new treatment plant, specifically yard pipe acquisition and installation. Yard pipe provides a critical means to conduct influent wastewater from a forcemain leading to the plant, to transfer wastewater from one operational stage to the next

during the treatment process, to deliver the effluent out of the facility, and to provide conduit for odor control treatment. Details of the treatment plant conceptual design are presented in the proposed action section below and in Figure 2.

Proposed Action

A 40 acre parcel located in Lake Havasu City's North Airport Region and bordered on three sides by another 280 acres of city-owned property, was determined after a lengthy site selection process (see Alternative 3). Approximately 13.8 acres of previously undisturbed, upland alluvial fan terrace deposits within the parcel were selected for the North Regional Wastewater Treatment Plant (NRWWTP) construction site (Figure 2). Elevations of the property vary from 880' to 940' above mean sea level and the cadastral location is in the northeast quarter of Section 15 of Township 14 N and Range 20 W of the Gila & Salt River Baseline and Meridian, within Mohave County, Arizona (USGS Lake Havasu City North, Arizona 7.5', 1970). A water line leading from a service pump station ½ mile west of the site and within Lake Havasu City's water distribution system runs along the southern boundary of the site property. Northwest-southeast oriented high transmission power lines managed by the Western Power Administration occur a few hundred feet west of the parcel's western boundary.

The NRWWTP construction is divided into four 3.5 MGD capacity phases with the first phase scheduled for completion in July 2007. This phase should help the City meet the capacity needs when the sewer expansion program reaches its end in 2013. The next phases will be added, contingent on demand, as the sewer system grows beyond 2013. Maximum build-out of the City is expected at 96,000 by 2060, at which time all four phases of the NRWWTP will have been completed to yield a maximum capacity of 14 MGD. A majority of the time, the NRWWTP will be serving the northern section of Lake Havasu City and outside developments north of the city; however, the wastewater collection system is configured such that wastewater can also be transferred from the central and southern portions of the city. This flexibility of the collection system was included in case either the IWWTP or MWWTP has to reduce capacity or completely shut down for maintenance or emergencies.

The NRWWTP is designed as an activated sludge treatment facility utilizing state of the art membrane bioreactor (MBR) technology, removing biological nutrients and small particulates (NRWWTP Preliminary Design Report, 2004). Components in the facility include headworks screens, a flow equalization basin, aeration basins, membrane filtration basins, a chemical feed facility, a low pressure, high-intensity ultraviolet disinfection system, a sludge holding tank, and a 0.6 million gallon reuse holding tank (Figure 2). Air scrubbers will be provided for odor control and all pumps, blowers, and electrical equipment will be housed within buildings for noise control. A flow diagram of the plant's operations is presented in Figure 3.

Buried yard pipe will provide the transport means for wastewater and treated effluent throughout the facility and to convey gas generated during the odor control process (Figure 4). Specifically, the underground piping network will consist of the following systems: sewer system, non-potable water system, air piping, and odor control piping. Ductile iron and glass lined-ductile iron pipes of the plant sewer system will convey waste flows to a pump station and the plant sewer pump station will recycle flows back to a screens building. Vitrified clay pipe lines will

be installed to collect flows from restrooms, basin washdown flows, basin drain flows, belt press filtrate, and sludge tank supernatant. The main recycle flows will include belt filter press filtrate, wash water, and sanitary wastes. Schedule 80 polyvinyl chloride lines will supply non-potable reclaimed water throughout the NRWWTP for onsite irrigation and to provide wash down water for treatment processes. Stainless steel air piping will be installed between several facilities in the treatment operation, including between process air blowers and aeration basins, between membrane blowers and membrane cassettes, and between the sludge holding tank and mixing blowers and the equalization basin and mixing blowers. Fiber reinforced plastic odor control piping will be installed between the odor control scrubbers and the screens and dewatering building, equalization basin, septage receiving station, sludge holding tank, aeration basins, and membrane basins.

The facility will have the ability to produce effluent that will meet Arizona State Class A+ Reclaimed Water Standards and the Aquifer Water Quality Standards with total nitrogen levels below 8 mg/l and BOD and TSS concentrations less than 10mg/l (Table 1). Monitoring of discharge from the plant will take place after the wastewater has completed the UV disinfection process. Parameters to be analyzed will include flow, pH, turbidity, total coliform, fecal coliform, nitrogen, metals, and volatile organic compounds (Table 2). Frequency of water quality analyses will range from daily to semi-annually, depending on the parameter.

Effluent or reclaimed water may be utilized for beneficial purposes according to the Lake Havasu City Class A+ Reclaimed Water Agent Permit (Permit #R-101612). Lake Havasu City's Wastewater Master Plan (1998 and 2001) considers various methods of effluent disposal such as direct transfer for irrigation, direct disposal into percolation ponds, and injection into the subsurface via either deep aquifer wells and/or shallow vadose wells. The disposal methods were considered with the following results:

1) Direct irrigation has been utilized and will be expanded in the near future, but it is a seasonal application with highest use during the warmer months. Effluent generated from the MWWTP and IWWTP have been and will continue to be the sources for direct irrigation on golf courses and other landscaping. The MWWTP has a co-mingling pond that has the ability to blend effluent with lake water before delivery to customers.

2) Percolation ponds at the IWWTP have historically been used as a primary method of effluent disposal and they will continue to play a role in the foreseeable future. There will be no percolation ponds at the NRWWTP.

3) Injection wells have not been previously incorporated into the City's effluent disposal system, but this method could provide the opportunity for releasing greater volumes of unused effluent in shorter time periods. Two types of injection, direct phreatic aquifer recharge and vadose zone injection: a) Two municipal water wells at the City's South Well Field in Sec. 15 T13N R20W, are planned to be converted into injection wells to send effluent below the water table after the ADEQ approves an aquifer protection permit application the City submitted in 2005. These wells will facilitate effluent disposal when customer demand is low and the percolation ponds at the IWWTP are near or at capacity; however, a nominal injection rate is required at all times to keep the wells properly functional. The well depths in this field are 150 feet below ground surface. Effluent generated at the NRWWTP, although able to be delivered to this site, will not likely utilize these wells except for emergency situations (i.e. if vadose zone injection wells fail - see next.).

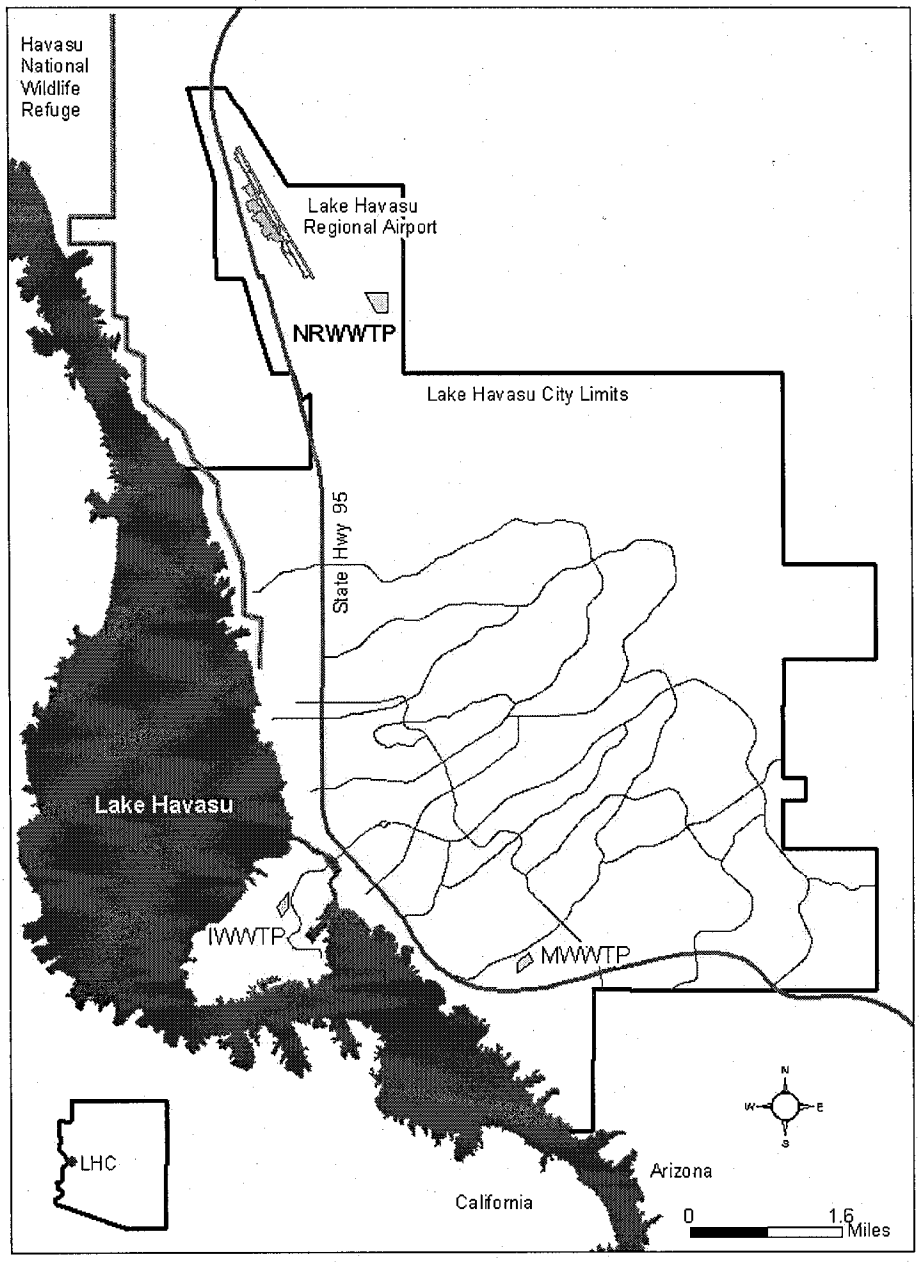

Figure 1: Lake Havasu City, Arizona with locations of the existing Island Wastewater Treatment Plant (IWWTP), the Mulberry Wastewater Treatment Plant (MWWTP), and the proposed North Regional Wastewater Treatment Plant (NRWWTP).

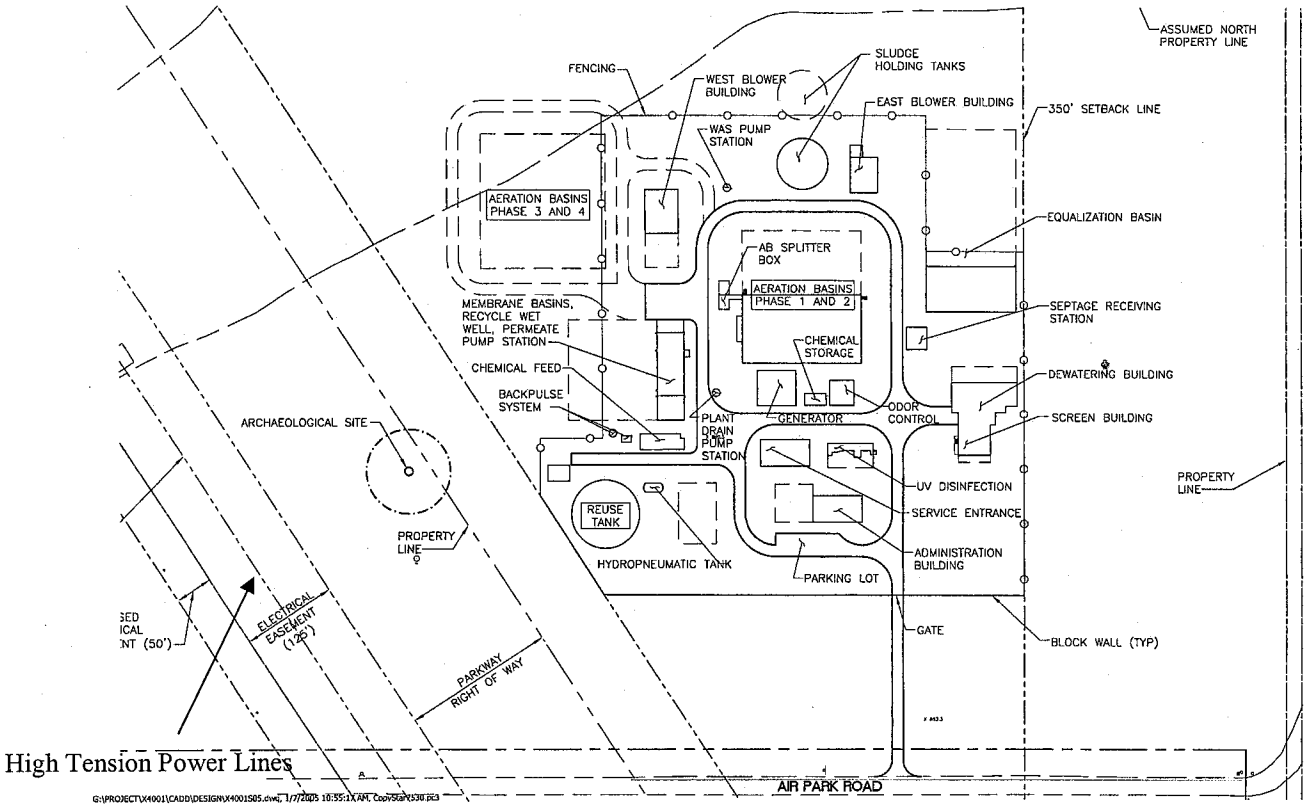

Figure 2: Site design for the North Regional Wastewater Treatment Plant. Also note relative locations for the archaeological site and high tension power lines administered by the Western Power Administration, both referenced in the text. North is up and note the 125' wide electrical easement for the high power tension lines for map scale.

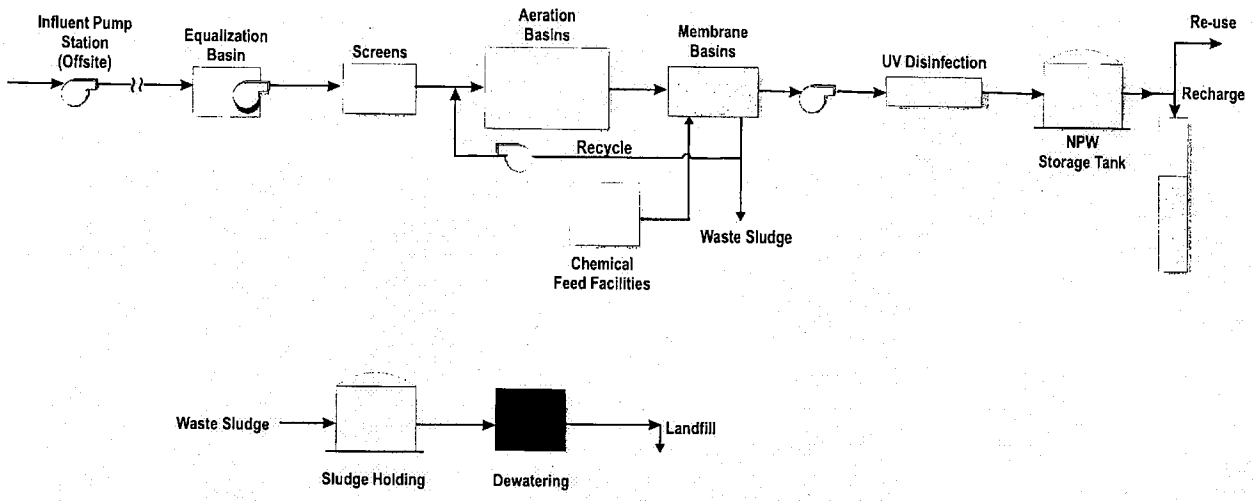

Figure 3: Process flow schematic for the North Regional Wastewater Treatment Plant using membrane bioreactor technology, which replaces a clarifying basin.

Table 1 – Lake Havasu City North Regional Wastewater Treatment Plant optimum reduction of pollutants through application of best control technologies.

Parameter	Optimum Reduction	Design
Fecal Coliform	2.2 CFU/100 ml	Non-detectible
Turbidity	<2.0	5 NTU
Total Nitrogen	1 to 10 mg/l	8 mg/l
Fluorides	Safe Drinking Water Act MCL	None
Hazardous Substances	Safe Drinking Water Act MCL	None
Hazardous Substances without MCLs	Action Level or Concentration representing 1×10^{-6} cancer risk which ever is lower	None
Hazardous Substances pursuant to ARS 49-243.D	Non-Detectable	None

b) A second injection method, vadose zone injection, is under consideration at the NRWWTP. Vadose injection wells, drilled to 180 feet depth, are planned to send effluent to a level above the water table underneath the NRWWTP so that once in the subsurface, a water mound may be created that can be partially recovered from down gradient pumping wells. This method has the potential to increase the City's water reuse program and create a new water resource for a City that is otherwise totally reliant on its Colorado River water entitlement. Two initial vadose wells for determining the feasibility of this method will be drilled and tested in early 2007. Lake Havasu City received notification from ADEQ in July, 2006 that the NRWWTP aquifer protection permit has been approved, which includes permitting recharge injection wells (APP# P-105478, see appendix F).

The Lake Havasu City Wastewater Master Plan (1998 and 2001) has built flexibility into the influent and effluent distribution by providing infrastructure to allow influent from various parts of the city to flow to either the IWWTP or NRWWTP, and to send effluent to any one of the three wastewater treatment plants for disposal. The NRWWTP is expected to be able to discharge effluent on-site via injection wells, send effluent for direct irrigation to customers or to the MWWTP for temporary storage in its commingling pond, to send effluent to the IWWTP percolation ponds, or to the proposed South Well Field injection wells. In doing so will necessitate the construction of force mains and pump stations that will allow the transfer of flow. A 24" force main with pump stations will deliver influent to the plant and an 18" effluent line will be laid adjacent to the influent line. Without this infrastructure, the two existing wastewater treatment plants will soon reach capacity and have no way to transfer effluent to the third plant.

Biosolids produced at the NRWWTP will be first conveyed to a sludge holding tank, then dewatered through filter pressing, and transferred to the Lake Havasu City Landfill for disposal after they meet the paint filter test per Title 40 of the CFR Part 257. This is the same method used at the other two wastewater treatment facilities.

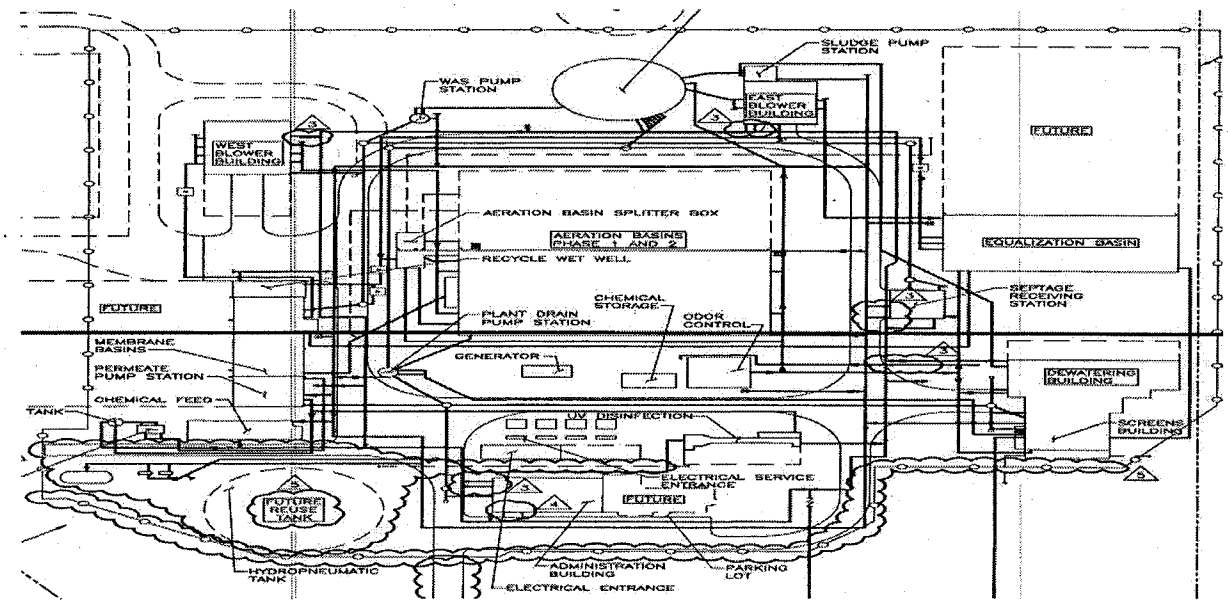

Figure 4: NRWWTP schematic drawing including yard pipe distribution between facilities.

Table 2 – Lake Havasu City North Regional Wastewater Treatment Plant Discharge Monitoring.			
Sampling Point Number	**Sampling Point Identification**	**Latitude**	**Longitude**
1	Discharge line from UV Disinfection	34° 33' 29.8" North	114° 20' 19.8" West

Parameter	**AL[1]**	**DL[2]**	**Sampling Frequency**	**Reporting Frequency**
Flow: Daily	Reserved	Reserved	Daily	Quarterly
Flow: Average Monthly	Reserved	3.5 MGD	Monthly	Quarterly
Flow to Reuse Sites	Reserved	Reserved	Monthly	Quarterly
pH	Reserved	6 - 9	Daily	Quarterly
Turbidity (24-hour average)	Reserved	2 NTU	Daily	Quarterly
Turbidity (continuous)	Reserved	5 NTU	Continuous	Quarterly
Fecal Coliform (single sample maximum)	Reserved	23 CFU/100 ml	Daily	Quarterly
Fecal Coliform (4 of the last 7 samples)	Reserved	Absence	Daily	Quarterly
Enteric Virus	Reserved	Non-Detect	Reserved	Reserved
Total Nitrogen	9.0	10.0	Daily	Quarterly

Metals (Total):

Parameter	**AL[1]**	**DL[2]**	**Sampling Frequency**	**Reporting Frequency**
Antimony	0.0048	0.006	Semi-Annual	Semi-Annual
Arsenic	0.04	0.05	Semi-Annual	Semi-Annual
Barium	1.60	2.00	Semi-Annual	Semi-Annual
Beryllium	0.0032	0.004	Semi-Annual	Semi-Annual
Cadmium	0.004	0.005	Semi-Annual	Semi-Annual
Chromium	0.08	0.1	Semi-Annual	Semi-Annual
Lead	0.04	0.05	Semi-Annual	Semi-Annual
Mercury	0.0016	0.002	Semi-Annual	Semi-Annual
Nickel	0.08	0.1	Semi-Annual	Semi-Annual
Selenium	0.04	0.05	Semi-Annual	Semi-Annual
Thallium	0.0016	0.002	Semi-Annual	Semi-Annual

1. AL = Alert Level.
2. DL = Discharge Limit. All discharge and alert limits are in mg/l, except flow which is presented in million gallons per day (MGD). The Als and DLs are maximum numbers.

II. Analysis of Alternatives:

Three alternatives to the proposed action of constructing the NRWWTP have been considered in regard with the handling of sewage treatment in Lake Havasu City. The alternatives are; taking no action, expanding existing treatment systems, and other site selections. These alternatives are discussed below.

Alternative 1 - No-action alternative –

Lake Havasu City would continue processing wastewater at the IWWPT and MWWTP as they are currently operating. The IWWTP and MWWTP together are currently treating 2.9 MGD of wastewater and they have a maximum combined treatment capacity of 4.7 MGD, but the ADEQ limits their combined disposal capacity to 4.115 MGD (ADEQ APP No. P-101612, Place ID 1534, LTF 33803, MWWTP Significant Amendment, 2005). Lake Havasu City Wastewater Effluent Master Plan 2006 projects that the City will exceed 4.7 MGD by 2008 as the City's population and development continues to grow and will reach a 5.9 MGD demand by 2013. However, as stated in the Purpose and Needs section, ADEQ requires a community to establish plans for treatment expansion when the existing facilities reach 80% capacity. This alternative would put the City in the awkward position of not having enough wastewater treatment capacity beginning in 2008, which would lead to environmental, legal, and financial issues. A significant portion of the city would have to remain on septic systems as would all new development, contradictory to the wishes of the ADEQ (see 2001 ADEQ New Release in Appendix A). Since the Lake Havasu City would be out of compliance with EPA and ADEQ regulations, this alternative has been rejected as a viable means of wastewater management.

Alternative 2 – Expansion of existing wastewater treatment facilities (EEWTF) alternative –

Enlarging the treatment capacity of either or both existing wastewater treatment plants to handle the increasing demand as more residences and business are connected to the sewer collection system was explored in the Lake Havasu City's 1998 Phase 2 Comprehensive Wastewater Master Plan and by City staff. The MWWTP was originally built to treat 1.1 MGD sewage and the IWWTP, the City's original treatment facility, is designed to treat a maximum of 2.5 MGD wastewater. The Phase 2 Comprehensive Wastewater Master Plan addressed the issue of the optimum mix of existing and new treatment plants to provide the city with the necessary treatment capacity at city build-out. The master plan supported that the MWWTP had the physical space to expand its treatment capacity to 2.2 MGD as per industry standards to help accommodate the increasing treatment demand. The City Council in 2001 approved a call for a bond election, which included the expansion of the MWWTP. The voter approved project was subsequently completed in 2005. The expansion and upgrade work included: installing a pump reuse station, replacing the influent pumps, modifying the existing aeration basin, constructing a new aeration basin, extending piping in the splitter box, constructing a new clarifier, modifying the existing clarifier, removing and replacing the existing tertiary filter, removing and replacing the existing UV disinfection system, and replacing the odor control system.

The IWWTP was not recommended for enlargement because the existing facility occupied all the available land the City owns at that site. At the time of the expansion analysis in the

Phase 2 Wastewater Master Plan, the IWWTP was bordered on two sides by vacant Arizona state trust land, which was not available for purchase. Impact considerations of expansion to this site included its proximity to residential and recreational facilities and the requirement to put more force mains under the Bridge Water Channel near the London Bridge. Similarly, the 1.1 MGD treatment expansion at the MWWTP site was limited to this capacity as it occupies the remaining available space on this property. With the exception of a wash along the south side of the MWWTP, land surrounding both treatment plants today is now either privately owned and developed or is bounded by paved arterial streets. The City could have condemned surrounding properties, but this would not be a politically or financially wise decision, since land would have to be purchased, homes razed, citizens displaced, permanently rerouting of traffic causing access problems to residential areas, and property readied for construction.

Alternative 3 – Other sites for a new wastewater treatment facility (OSNWTF) alternative – Lake Havasu City's 1998 Phase 2 Comprehensive Wastewater Master Plan also analyzed the possibility of building a new wastewater treatment plant at a new location within the city other than the NRWWTP site described in the proposed action. The Master Plan evaluated 158 city-owned, undeveloped parcels in the platted portion of the city not scheduled for future development and 27 other city-owned parcels slated for future parks. These parcels, along with undeveloped private parcels, were scrutinized based on a number of factors, including surrounding land use, size of the parcel, access to the site, aesthetic value, whether the site facilitates sewage collection and reuse, and land ownership.

Size criteria is one of the most important factors as the existing IWWTP and MWWTP sit on 24 and 13 acre parcels, respectively. Almost all the city-owned properties are less than 8 acres in size, including those scheduled for park development. The City could have built more than one small treatment plants spaced around the city, but one large plant drawing sewage from a large region was considered much more cost effective and practical in terms of collection and effluent reuse logistics and economics. Based on future sewage production of 5.9 MGD by 2013, a new treatment facility of at least 2.6 MGD would be need to be operating on at least a 15 acre parcel. Lake Havasu City's population is projected to reach 96,000 within 50 years, so City staff has recommended the construction of a wastewater facility that could be augmented in the future to accommodate the associated sewage treatment demands.

Proximity to residential or highly visible commercial/industrial properties were factored into the surrounding land use, access, and aesthetics considerations. Public perception of living or working next to a potentially odiferous source is difficult to overcome. Wastewater treatment plants are also high traffic use areas and the volume and size of vehicles, such as eighteen wheel tractor trailers, must take into account other criteria such as volume of pedestrian traffic, conditions and standards of road surfaces, and ingress–egress room. Topography of the land surface plays a large role for system hydraulics when considering the interaction with the existing wastewater treatment plants and the collection system. Gravity feeding presents a much lower financial burden both for overall construction (i.e. few pump stations are needed) and operation (power consumption to run the pump stations). Property ownership is also a consideration, particularly in an area with rapidly rising property values.

The cost and time involved in purchasing Arizona state trust lands or leasing Bureau of Land Management property may outweigh their spacious attraction. The cost of ground preparation for construction was also considered.

A parcel ranking system was devised in the 1998 Phase 2 Comprehensive Wastewater Master Plan to prioritize potential treatment plant sites based on each of the above factors and a list of seven new sites was generated (Table 3; Figure 5). The top ranked site, the North Airpark Region and where the NRWWTP is under construction today, has plenty of room, is close to proposed major sites for reuse and where most of the city's future growth will be, and will be the least costly for construction and operation, but is relatively remote and scored low in facilities collection. The second ranked new site, located on Sweetwater Avenue, would have worked for a 2 MGD facility, but adjacent land would have had to be purchased from the Bureau of Land Management for future expansions. Also facilities reuse, access, aesthetics, and surrounding land use were not particularly conducive for this site. SARA Park, a BLM parcel at the south end of Lake Havasu City and leased by Mohave County, was the third ranked site that has plenty of space, good access, and good effluent reuse potential, but suffers from in the other factors, particularly facilities collection due to its remote location. An area at the northern platted part of the City, the city-owned North Old Landfill, was ranked 4th and has the size for a 2.5 MGD treatment facility, but is surrounded by residential properties and cannot be expanded, has less than nominal access and aesthetic value, and is ranked moderately high for facilities collection and reuse. Two city-owned, vacant, industrial parcels in the heart of the city ranked 5th and 6th based on size, but would not be good for the overall industrial development intended for these areas and there may not be enough room for solids handling facilities. The 10.5 acre Kiowa Ponds site, with its location on State Hwy 95 in the city, and concerns with access, aesthetics, facilities collection and reuse was ranked 7th.

Of the above listed sites, the North Airport Region site was recommended as the prime site; however, the Sweetwater and SARA Park sites were also seen as viable potential locations in the Master Plan. Based on this recommendation, Lake Havasu City decided on the cost effective, expandable nature of the North Airport Region location.

Subsequent to the Master Plan, City staff in 2002-2003 evaluated ten 40 acre parcels in the North Airport Region for their infrastructural, economic, and logistical impacts (Figure 6). Eight of these parcels were not city-owned, so land acquisition was a major consideration. Five parcels were within a half-mile of residential developments, seven needed extensive site preparation, and nine needed significant forcemain additions to the parcel. A site cost comparison among the ten parcels, based on the expense relative to available funding from the Community Improvement Project funding for 2002-2003, indicated that only two city-owned sites would not cost more than available funds to develop. One site ("Proposed RTP Site" on Figure 6) resides in alluvial fan floodplain and extensive ground preparation would be needed to raise the complex above the floodplain as per ADEQ requirements for wastewater treatment plants. The other parcel, located on an upland alluvial fan terrace ("Original RTP Site" on Figure 6), was originally slated for a baseball park complex, but City Council voted to scratch that project noting the importance and need of the wastewater treatment plant.

Table 3: Score Matrix for Top Seven Potential New Locations for a Wastewater Treatment Plant in Lake Havasu City.

Property	Surrounding Use	Size	Access	Aesthetic Value	Ownership	Fac
North Airpark Region – 320 acres	10	10	8	10	10	
Sweetwater Site – 12.3 acres	8	10	8	8	8	
SARA Park	8	10	10	8	8	
North Old Landfill – 20 acres	3	8	5	5	10	
Industrial Tract Lot 114-A	3	8	10	8	0	
Industrial Tract Lot 2290	5	8	8	8	0	
Kiowa Ponds – 10.5 acres	3	5	10	3	10	

Score Values: 0 – No Value, 3 – Below Average, 5 – Average, 8 – Above Average, 10 – Maximum Value

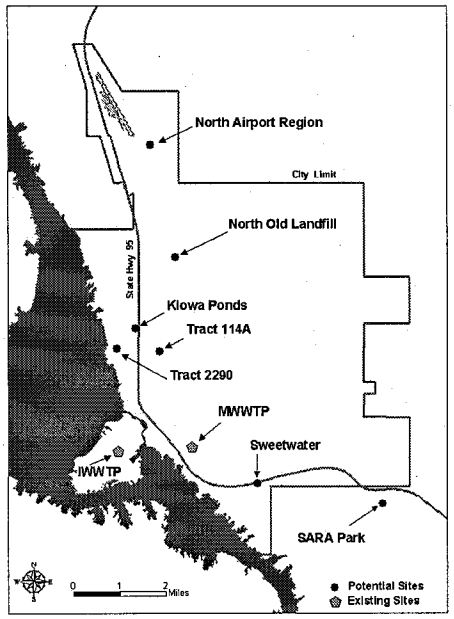

Figure 5: Locations of existing and potential wastewater treatment plant sites.

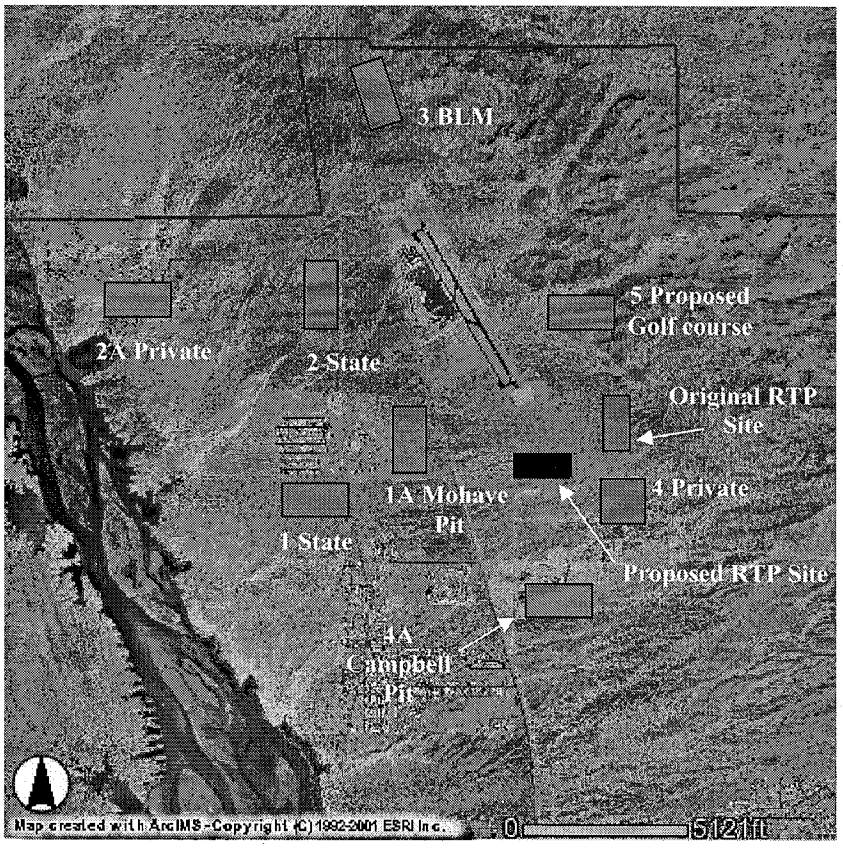

Figure 6: Location of ten 40 acre parcels in the North Airport Region evaluation for a new wastewater treatment plant.

III. Present Environment:

A. Community location

Lake Havasu City, Arizona, on the eastern shore of Lake Havasu and part of the Colorado River, is a rural community whose dominant economic activities are recreation, service, and construction. The recreational and service economy can be divided into a warm weather water sport season and cool weather "winter visitor" season, each with its own characterization of how they support the local economy. The warm boating season is typically associated with high hotel, restaurant, and water sport rental receipts, particularly on holiday weekends and during Spring break. Winter visitors from the northern tier of the continent provide more continuous, elevated commercial expenditures. Residential and commercial construction with associated services has been a major factor in the growth of the city over the past five to six years. Mohave

Community College's Lake Havasu City campus attracts students from the tri-state area, who also contribute to the city's economy.

Land use within the city includes residential of mixed single and multi-families, commercial, industrial, resorts, and parks. The main transportation access to the city is the north-south oriented State Highway 95, which leads 19 miles north to Interstate 40 and 20 miles south to the town of Parker, Arizona.. A small ferry service also takes people across the lake to the Chemehuevi Indian Reservation. The city is serviced by electrical, natural gas, water, trash, wastewater, and communications utilities.

B. Service area

Lake Havasu City has approached the expansion of the sewage collection system in a regional sense, with the anticipation of providing service not only to the incorporated portion of the city, but also to new developments outside the city limits such as the Refuge, Canterbury Estates, and North Point developments, and eventually to the adjacent unincorporated communities of Desert Hills, Crystal Beach, and Windsor Heights (LHC Wastewater Master Plan 1998 and 2001). In doing so, the North Regional Wastewater Treatment Plant (NRWWTP), has been designed to handle the extra influent, if all potential customers to build-out are realized.

C. Population

From 1995 to 2000, the average yearly population growth rate in Lake Havasu City was about 5 percent per year. Since 2000, the population has increased by over 12,000 or almost 30%. Lake Havasu City's specific population estimate as of July 2005 was 53,435 (Arizona Department of Economic Security website; http://www.workforce.az.gov/?PAGEID=67&SUBID=137). The 2006 population of Lake Havasu City and surrounding developments that will be serviced by the sewer collection system is close to 60,000. The City's projected build-out population of 96,000 is expected by 2060.

D. Topography

The Chemehuevi Valley, on which Lake Havasu City was established, consists of a west-southwest sloping, heavily dissected piedmont surface that developed on a bajada, a coalescing group of alluvial fans composed of gravel and sand braided stream flood deposits originating from the adjacent Mohave Mountains to the east-northeast. Elevations range from approximately 450 feet above mean sea level (ft/msl) on Lake Havasu, to 5,148 ft/msl at Crossman Peak in the Mohave Mountains. Elevations in the City range up to 1,800 feet in the mountain foothills. The city is crossed by numerous ephemeral stream channels that drain the mountains (Figure 7), yet many were modified by constructing diversion dikes and through channelization to feed into "master" washes within the incorporated portion of the city.

E. Geology

Lake Havasu City lies in a complex geologic setting with Proterozoic crystalline mountain cores, bordered by Miocene volcanic and sedimentary units, all of which have experienced the effects of thermal extension 20 to 8 million years ago, resulting in the development of syntectonic half grabens, detachment faults and corresponding translation faults. There are no known active faults in the Chemehuevi Valley, which has been mapped in a 4-8 %g zone (formerly Zone II), a seismic zone that has a low probability of significant seismic activity, by the USGS's Seismic Hazards Program (Figure 8, Frankel, et al., 1997). Primary erosion hazards in the valley stem from flash floods within the alluvial fan wash system that could create undercutting of wash banks and headward down-cutting of wash beds, threatening any structures built on the banks or roads that cross the washes.

The NRWWTP location sits on Quaternary alluvial fan terrace deposits of poorly sorted gravel mapped as Qs_2a on the Geologic Map of the Mohave Mountains Area, Mohave County, Arizona (Howard et al., 1999). The site is within Zone C of the FEMA flood insurance map program, above the surrounding fan surface (Figure 9). The south end of the site, which will not contain the NRWWTP and will be left undeveloped, lies in Zone A0. Zone A0 is considered to be in an area of 100-year shallow flooding.

As described in the Soil Survey for Mohave County (2005) the predominant soil classification in Lake Havasu City is the Laveen-Carrizo-Antho association. This association consists of nearly level to moderately sloping soils on dissected high terraces and alluvial fans. Slopes are dominantly 0 to 8 percent but include short slopes up to 50 percent. The soils are formed in both old and recent mixed alluvium and this association comprises about 4 percent of the county. Laveen soils make up about 40 percent of this association; Carrizo soils, 25 percent; and Antho soils, 25 percent. Cavelt, Rillito, Gilman, Vint and Brios soils and Riverwash make up the remaining 10 percent.

Laveen soils have pale brown loam surface layers 10 to 15 inches thick over brown loam substrata that contains many soft to hard masses of lime down to 60 inches or more. Local areas are alkali (sodic) or saline-alkali. These soils are on ridges of dissected terraces with dominant slopes of 0 to 5 percent but having some short side slopes that range up to 50 percent. Carrizo soils have very pale brown loamy fine sand surface layers up to 6 inches thick over stratified very gravelly coarse sand substrata that extends to a depth of 60 inches or more. These soils have slopes of 0 to 8 percent. Local areas are gravelly to very gravelly on the surface. The Antho soils have brown or light yellowish brown sandy loam or gravelly sandy loam surface layers and stratified sandy loam, fine sandy loam, or gravelly sandy loam substrata with thin layers of silt loam, loamy sand, or gravelly loamy sand to a depth of 60 inches or more. These soils have slopes of 0 to 5 percent. Carrizo and Antho soils are subject to brief flooding in local areas.

F. Climate and air quality

The climate of Lake Havasu City is typically sunny with low humidity, except during July to September when moisture laden air moves into the area from the Gulf of California and Gulf of Mexico. The temperatures normally range from 78° to 120° F in the summer and from 37° to 68° F in the winter. Rainfall data for the last 18 years indicate an average annual precipitation of 4.21 inches, with two distinct rainy seasons, in February from cold fronts moving past from the Pacific Ocean and July-August monsoonal thunderstorms. The area is in an ecotone, an overlapping transition zone between the Mojave and Sonoran deserts, with native vegetation that includes creosote bush, bursage, paloverde, acacia, alfileria, many species of cacti, three-awns and annual weeds and grasses.

Air quality in Lake Havasu City, due to the generally low population and absence of heavy industry in the valley, is generally very good except during high wind events when dust is picked up from the surface. Vehicles of local residents and businesses are not subject to annual Arizona Department of Motor Vehicles emissions inspections. The only local concern has been an elevation of carbon monoxide levels along the Bridge Water Channel underneath the London Bridge during the high use boating season. Carbon monoxide monitoring equipment has been installed to provide for an early warning system to city officials who have the option to temporarily close the channel.

G. Existing Facilities

Existing wastewater facilities, the IWWTP and MWWTP, both active sludge aeration systems and discussed under the Purpose and Needs section, have each recently undergone improvements to their sites. The IWWTP is near the completion of constructing a new, covered, aerobic digester with mixing, aeration and odor control, replacement of the waste activated sludge pumps, construction of a new open channel UV disinfection system, installation of a new influent flow meter, construction of a new electrical building, expanding the existing blower building, replacing an aeration blower, replacing the irrigation pump station, and installing a new emergency generator. The plant is currently producing Arizona State Class A+ effluent as the UV disinfection system is now in operation. None of the above improvements to this facility increases its maximum capacity.

Improvements and capacity expansion of the MWWTP is discussed in the alternatives section. However, both treatment facilities are linked by means of an 18" effluent pipeline and pumping systems exist to deliver water to and from both facilities through the 18" line.

The average daily effluent flows from the IWWTP and MWWTP over the period from July 2005 through June 2006 was 2.318 MGD (CIP Draft for Project #SS2300). The residential contribution equals to 69 gallons per capita per day. The amount of wastewater received during the year is not constant, yet comparison over a five year period does not indicate a preferred time of year when treatment volumes are high or low. Water use in Lake Havasu City varies throughout the year with most increases occurring during the summer due to

escalating residential irrigation needs. Since this consumption does not return via the sewer collection system, wastewater treatment flows have not mimicked the water use.

H. Quality of receiving waters

Effluent is not directly discharged into Lake Havasu, but is either used for irrigation or discharged into percolation ponds for slow seepage into the subsurface. Water samples taken from surrounding monitoring wells at both existing wastewater treatment plants have not revealed elevated chemical signatures that would lead to MCL violations, yet there have been random positive results for total coliform bacteria in wells around the IWWTP. These results have not been consistent on a well to well basis and do not violate ADEQ standards for total coliform bacteria. The NRWWTP effluent will not be discharged directly to the lake or into on-site percolation ponds. Effluent disposal methods are outlined in the NRWWTP APP105478 (Appendix F) and will meet all reporting and monitoring requirements therein. Recent results of monitoring well and lake water chemical analyses are given in Table 4.

I. Water quality problems

There are no known groundwater or surface water quality problems within 3.5 miles of the proposed NRWWTP. Further south in Lake Havasu City, elevated hexavalent chromium concentrations occur in groundwater near a former industrial plant. Mitigating work over the last five years has identified the extent of the chromium plume, which is slowly moving towards Lake Havasu and away from the NRWWTP site. Design for the removal of the chromium is now underway.

Groundwater containing nitrate concentrations above 10 mg/l has been documented in several areas within ½ mile of Lake Havasu; from monitoring wells in Lake Havasu City and from Windsor Beach State Park, and from drinking water wells in the Desert Hills and Crystal Beach unincorporated developments just northwest of Lake Havasu City. Lake Havasu City, along with ADEQ, has had a monitoring well water sampling survey in place for more than seven years, tracking nitrate concentrations, which have ranged from 2 to 23 mg/l. Groundwater sampled from monitoring wells installed adjacent to the NRWWTP have not yielded nitrate concentrations above 3mg/l since monthly sampling was initiated in 2005. The NRWWTP is approximately 2 miles from the nearest wells with documented nitrate concentrations above 10 mg/l.

There are also two known, isolated, hydrocarbon contaminant sites further south in Lake Havasu City that have been under remedial measures for several years. Neither poses a risk to interact with any material generated from the NRWWTP site, 5-6 miles to the north.

J. Characteristics of air basin

Lake Havasu City is not within an air quality restricted area as designated by ADEQ and is in attainment for all listed pollutants on the EPA nonattainment webpage

(http://www.epa.gov/ebtpages/airairqunonattainment.html). Vehicle registration in this part of Arizona does not require vehicle emissions testing. The NRWWTP site is located away

Table 4: Nine month water quality average for two monitoring wells at the NRWWTP site and a 9-2005 Lake Havasu water sample.

	Method	NP-3	NP-1	Lake Water
Temperature (°F. field)		96.84	96.87	NA
pH (field)		7.80	7.75	NA
Conductivity (µS/cm, field)		905.89	921.36	NA
Antimony	EPA 200.9	<0.004	<0.004	<0.004
Arsenic	EPA 200.9	0.01	0.01	ND
Barium	EPA 200.7	0.06	0.05	0.18
Beryllium	EPA 200.7	<0.004	<0.004	ND
Cadmium	EPA 200.7	<0.005	<0.005	ND
Calcium	EPA 200.7	27.67	27.33	79
Chromium	EPA 200.7	<0.01	0.01	ND
Copper	EPA 200.7	<0.02	<0.02	ND
Iron	EPA 200.7	0.77	1.80	0.22
Lead	EPA 200.9	0.01	0.00	ND
Magnesium	EPA 200.7	2.64	3.12	30
Manganese	EPA 200.7	0.06	0.03	ND
Mercury	EPA 245.1	<0.0002	<0.0002	ND
Selenium	EPA 200.9	<0.004	<0.004	ND
Silver	EPA 200.7	<0.005	<0.005	ND
Sodium	EPA 273.1	166.67	174.44	97
Thallium	EPA 200.9	<0.002	<0.002	ND
Zinc	EPA 200.7	<0.05	<0.05	ND
Alkalinity as CaCO3	SM2320B	110.00	110.00	140
Chloride	EPA 300.0	156.67	163.33	92
Fluoride	EPA 300.0	7.51	7.64	0.27
Hardness (CaCO3)	SM2340B	82.89	84.33	320
Nitrate-N	EPA 300.0	0.61	0.70	0.2
Nitrite-N	EPA 300.0	<1.0	<1.0	ND
Sulfate	EPA 300.0	108.89	113.33	260
Total Dissolved Solids	SM2540C	568.89	595.56	700
pH	EPA 150.1	7.95	7.94	8.36
pH Temperature (°C)	EPA 150.1	21.06	21.49	17.6
Total Kjeldahl Nitrogen	SM4500-NORG,C	3.75	2.69	NA
Total Cyanide	SM4500-CN-C,E	<0.02	<0.02	NA

from residential and industrial development where air quality is subject only to elevated air-borne dust during high wind conditions.

K. Environmental Inventory

1. Wetlands

The north end of Lake Havasu on the Colorado River contains wetlands along the shorelines, which are approximately 2.8 miles directly down slope and southwest of the NRWWTP (Figure 1). These wetlands are the southern most part of the Havasu National Wildlife Refuge (which protects a 30-mile reach of the lower Colorado River) and consist of shallow water, cattail-filled stretches along the margins of the lake and along offshore sandbars. There are no closer wetlands to the project site and all washes surrounding the site are ephemeral, carrying running water only during infrequent, significant rain events.

2. Groundwater Resources

A gravel quarry operation just east of the NRWWTP site has a 820 feet deep water well approximately 1400 feet northeast of the northeast corner of the site property. Water is drawn from fractured volcanic rock between 800 and 820 feet and is used for the mining operation. A second industrial well is located approximately 2150 feet south of the NRWWTP, where it encountered volcanic rock 302 feet below ground level and is 722 feet deep. Water is used for quarry excavations and is perforated starting at 500 feet below ground surface. A third water well, used for irrigation and possible domestic purposes, is located over 3500 feet to the south of the NRWWTP property. This well is 545 feet deep, encountered rock and gravel at 225 feet below ground level and is perforated below the 460 feet depth. A community drinking water well for the Arizona American Water Company water service area exist ~1.5 miles to the southwest from the NRWWTP site.

3. Floodplain

The NRWWTP construction is within Zone C of the FEMA flood insurance map program (Figure 9). The south end of the site property lies in Zone A0, but will be left undeveloped. Zone A0 is considered to be in an area of 100-year shallow flooding. The platted portion of Lake Havasu City has been exempt from FEMA flood zone designation because of the extensive diversion dike and wash channel system in place around and through the city.

4. Important/significant agricultural lands

There are no agricultural lands within 25-30 miles of Lake Havasu City in any direction.

5. Wild and Scenic rivers

There are no wild and scenic river designations on the lower Colorado River, although the Havasu Wildlife Refuge protects a 20-mile reach of the river approximately 6 miles to the northwest of the NRWWTP site.

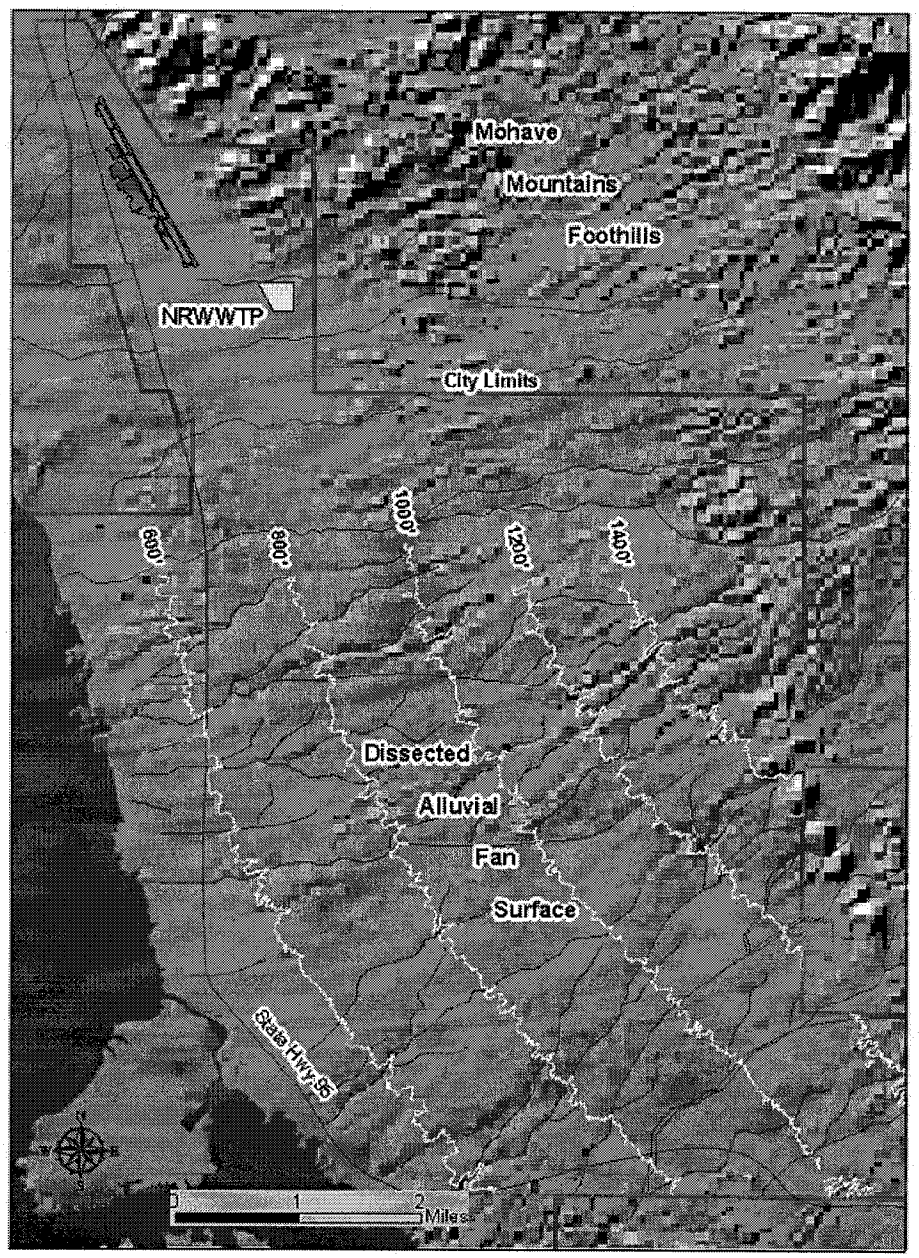

Figure 7: Hillshade map of Lake Havasu City area showing the change in topography from

rugged mountains and foothills to the east-northeast of the city limits to a dissected alluvial fan plain on which the city resides.

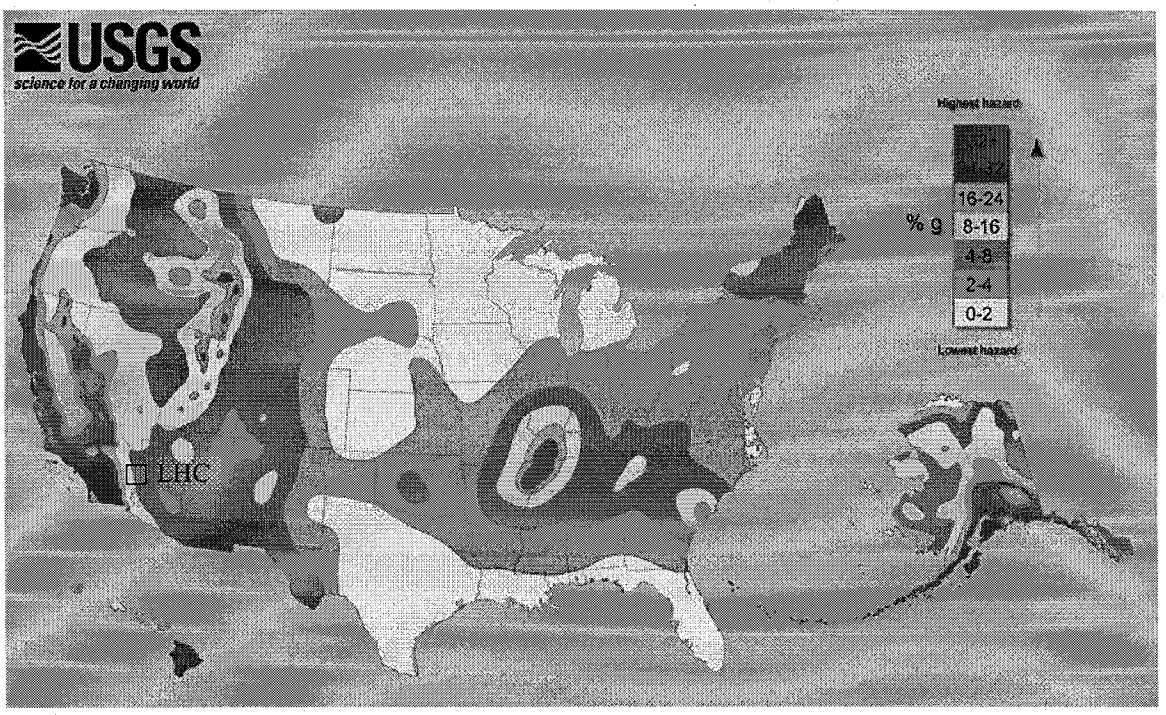

Figure 8: Earthquake hazard map of the United States depicting magnitude of potential earth shaking averaged from past history in terms of %gravitational force. Lake Havasu City lies within the green 4-8%g zone.

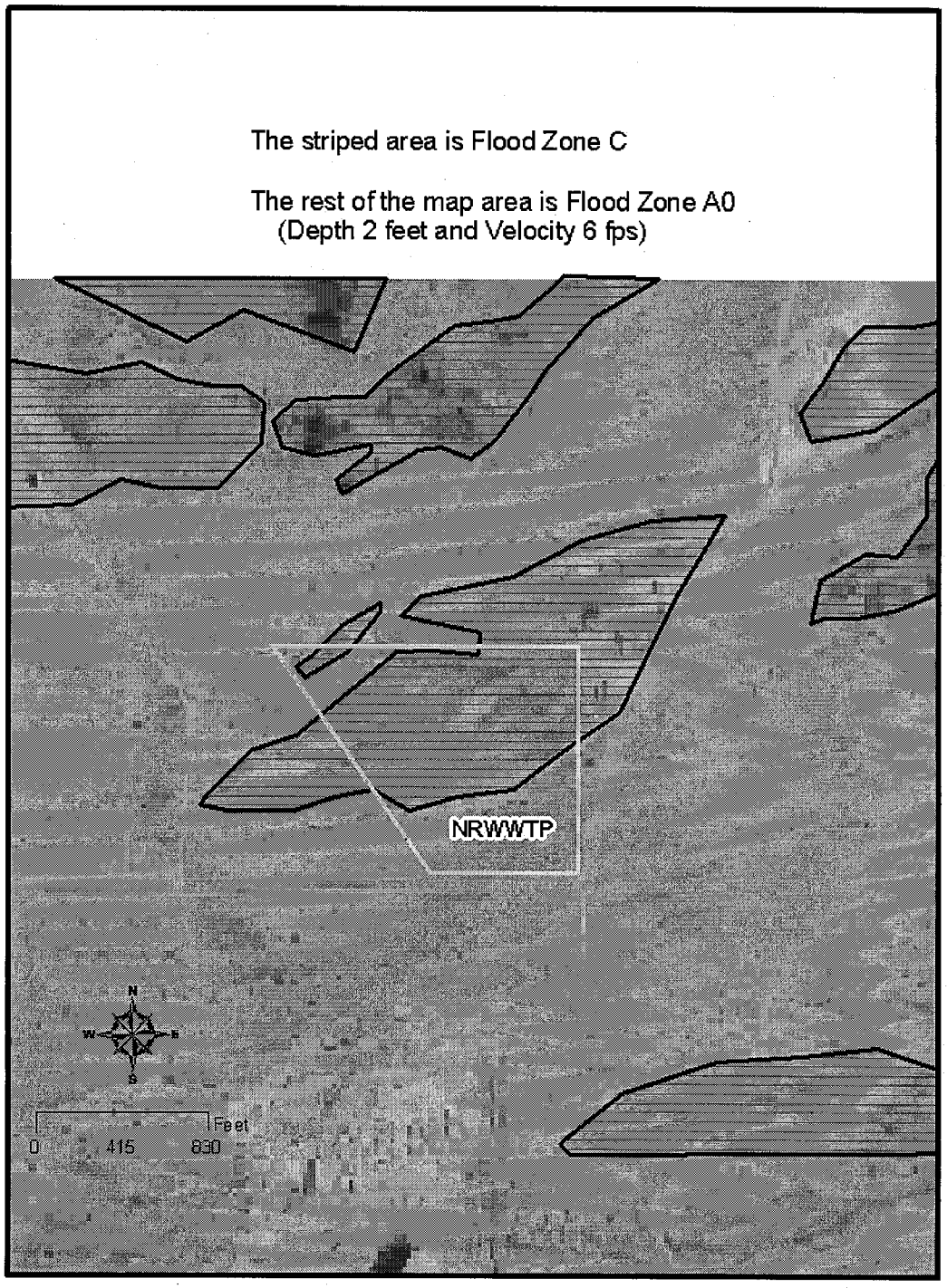

Figure 9: FEMA designated Flood Zones around the NRWWTP site. The NRWWTP lies on an alluvial fan terrace remnant above the Zone A0 floodplain.

6. Major botanical features

Plants present on the NRWWTP site are presented in Table 5. A 2002 biological survey of the site area did not reveal any sensitive, threatened, or endangered species (NEI Project No. 01-103b, January, 2002). Biological and cultural evaluations of the NRWWTP site revealed no environmentally sensitive areas or aesthetic resources on or adjacent to the terraced alluvial fan surface (Biological evaluation, NEI Project No. 01-103b, 2002; Biological Evaluation, Burns & McDonald, 2003; Cultural Resources Survey, Archaeological Research Services, 2001).

7. Important fish and wildlife

There are no fish within the NRWWTP site or its immediate surroundings as there are no surface water bodies. Possible wildlife passing through the NRWWTP site include: coyote, desert cottontail, kangaroo rat, Mojave ground squirrel, feral burro, rarely desert tortoise, chuckwalla, western diamondback and Mojave rattlesnakes, California kingsnake, Gambel's quail, mourning dove, house finch, red-tail hawk, turkey vulture, great blue heron, merlin, and American kestrel.

8. Endangered Species

The endangered bony-tail chub (*Gila elegans*) and razorback suckers (*Xyrauchen texanus*) have been reintroduced in Lake Havasu approximately 3 miles southwest of the site. Two threatened bird species that may be in the wetlands within the Havasu National Wildlife Refuge are the Yuma clapper rail (*Rallus longirostris yumanensis*) and southwestern willow flycatcher (*Empidonax traillii extimus*).

The desert tortoise (*Gopherus agassizii*) was first listed as threatened species in1980 over its entire range, except in Arizona south and east of Colorado River and in Mexico. In 1990, the excluded population in Arizona was named as a Similarity of Appearance to a Threatened Taxon. The Bureau of Land Management (BLM) treats the Arizona population of desert tortoise as a sensitive species and has designated three classes of desert tortoise habitat (see below), but since this population is not listed as a threatened or endangered, the BLM is not required to follow the Endangered Species Act strict procedures to protect this population.

Arizona Game and Fish Department issued a correspondence in 2003 of no anticipated significant adverse impacts to listed species during the concerning the City's Phase II Sewer Construction Program although they note the City needs to follow their guidelines for handling any Sonoran desert tortoises (Appendix B).

9. Critical habitats

Although the desert tortoise in the Lake Havasu City area is not a threatened species, the BLM has devised three categories of desert tortoise habitat and given criteria and goals for each category. The overall goal of Category I habitat, the most critical, is to maintain a large viable population, protect existing habitat, and increase populations where

possible. Category II habitat goals are to maintain a stable population and halt further declines. Category III habitat goals include limiting habitat and population declines to the extent possible by mitigating impacts.

Table 5: Plants on NRWWTP site noted from the 2002 NEI biological evaluation.	
Palo Verde	*Cercidium floridum*
Creosote	*Larrea tridentata.*
Brittlebush	*Encelia farinosa*
Bursage	*Ambrosia sp.*
Barrel Cactus	*Ferocactus wislezenii*
Spiny Fruit Cholla Cactus	*Opuntia acanthocarpa*
Hedgehog Cactus	*Echinocereus sp.*
Prickly Pear Cactus	*Opuntia Sp.*
Beavertail Cactus	*Opuntia basilaris*
A variety of grasses	

There are no Category I habitat areas in the Lake Havasu area and Category II habitat occurs in the higher elevations of the Mohave Mountains. The foothills of the Mohave Mountains and the upper alluvial fan surface north and east of Lake Havasu City are classified as Category III lands. Most of the lower alluvial fan surface, on which Lake Havasu City and other developments have been established, is not included in the classification scheme. The NRWWTP site lies, on the boundary between Category III habitat and non-designation lands (Figure 10). The Lake Havasu BLM Field Office has issued no negative comments concerning the NRWWTP construction site in terms of desert tortoise habitat.

10. Environmental sensitive areas

The Aubrey Hills and Crossman Peak are the only environmental sensitive areas outside of the Havasu National Wildlife Refuge in the Lake Havasu City area. The Aubrey Hills, south of Lake Havasu City and currently designated as a special prescriptions area, is valued for its outstanding non-motorized recreation and geology and is a desert bighorn sheep lambing area. The land, proposed in the 2006 Bureau of Land Management's Resource Management Plan to be re-designated as a Special Recreational Management Area inside the Lake Havasu Regional Management Area, lies approximately ten miles south of the NRWWTP site.

The Crossman Peak area east and northeast of the city, designated a Natural Scenic Area in 1987, is proposed to be expanded and included in an area of critical environmental concern (ACEC) for the purpose of continuing to protect its scenic value and to protect cultural resources and desert bighorn sheep lambing grounds. The current Natural Scenic Area boundary is approximately 1 ½ miles east of the NRWWTP site, yet the proposed expanded ACEC boundaries are expected to be within one mile east and north of the project site (Figure 10). An extensive active gravel quarry operation; however, lies between the NRWWTP site and the proposed ACEC.

11. Natural national landmarks

There are no natural national landmarks (NNL) designated by the National Park Service in the Lake Havasu area. The nearest landmark area is in the Turtle Mountains NNL approximately 40 miles west in California.

12. Historic, prehistoric, architectural, archaeological, and cultural [SHPO]

An archaeological, historical, and cultural study of Lake Havasu City was performed in 1991 by Willdan Associates as a requirement for the City's water contract with the Bureau of Reclamation. The document reports 15 other cultural resources studies of the North Airport Region dating from 1981 to 1990 and none near the SARA Park or Sweetwater sites. Twenty-five archaeological sites were identified in the region.

A more recent study in 2001 that focused on the NRWWTP area (Curtis, 2001) found one more site and five isolated occurrences of historical artifacts. The newly found prehistoric archaeological occurrence exists near the western boundary of the NRWWTP site. This site of undetermined cultural affiliation consists of a rock ring of angular basalt about four meters in diameter, possibly the foundation of a brush structure, with an associated cleared area containing two flaked stone artifacts. A four by three meter cleared area west of the rock ring may have been used for some short-occupancy activity. The site is in good condition, has been registered with the state of Arizona (AZ L:7:27 (ASM)), and has a high potential to provide data important to the understanding of the prehistoric/historic development of the Lake Havasu City area. This site has been fenced off and will not be disturbed during the construction of the NRWWTP. Five small isolated historic artifacts were also located near the property, but they were deemed not significant resources (Curtis, 2001).

Other prehistoric and historic cultural resources occur in the Mohave Mountains three to six miles east and almost eight miles northwest of the NRWWTP site and one military historic locality occurs over seven miles to the southwest on the Island in Lake Havasu City (BLM Management Resource Plan, 2006).

There are no Native American lands adjacent to the site. The closest current Native American land to the NRWWTP site is the Chemehuevi Indian Reservation, approximately 6.5 miles to the southwest, across Lake Havasu in California. This reservation has submitted a letter to Lake Havasu City indicating there are no known religious or cultural sites of significance in the NRWWTP area (Appendix C). It is Lake Havasu City's policy to follow Arizona Revised Statutes 41-841 and 41-844 during construction activities, in which construction is immediately halted and an archaeologist notified once an artifact is uncovered.

13. Aesthetic resources

The BLM has included in its Resource Management Plan a visual resource management (VRM) process to identify and manage scenic values and reduce visual impacts of

development or other surface disturbing activities on public lands. The visual resources are classified into four categories with Class I the most critical. Class IV lands provide for management activities that would allow for major modification of the existing character of the landscape. The Mohave Mountains foothills east of the NRWWTP site are included in Class II and III (medium scenic quality) rating, yet the alluvial fan surfaces in the valley and on which the NRWWTP site is located, are mapped as Class IV.

The City's General Plan contains a provision for protecting certain land from development within the extended water service area and in the foothills of the Mohave Mountains. These open space areas, known as Mountain Protection Areas (Figure 10), will require extensive, detailed studies prior to justifying any general plan amendment that would permit any non-residential or residential development. The nearest designated area is between one-half mile and one mile to the east of the NRWWTP site.

14. Hazardous wastes

The NRWWTP will be designed to meet all best available demonstrated control technology requirements for a new sewage treatment facility as required by Arizona Administrative Code R18-9-B201. Class A+ effluent and associated biosolids will be the sole products from this facility. No hazardous wastes will be generated at the NRWWTP. Sodium hypochlorite, sodium hydroxide, and citric acid will be used as cleaning solutions and for odor control during plant operation. The first two compounds will react with hydrogen sulfide and other odiferous gases to produce sodium sulfate and sodium chloride, which are dissolved in fresh water and recycled through the plant. Polymer type Catfloc T will be mixed in with the biosolids to help the dewatering process. The polymer, incorporated with the dewatered biosolids, will be disposed in the city landfill.

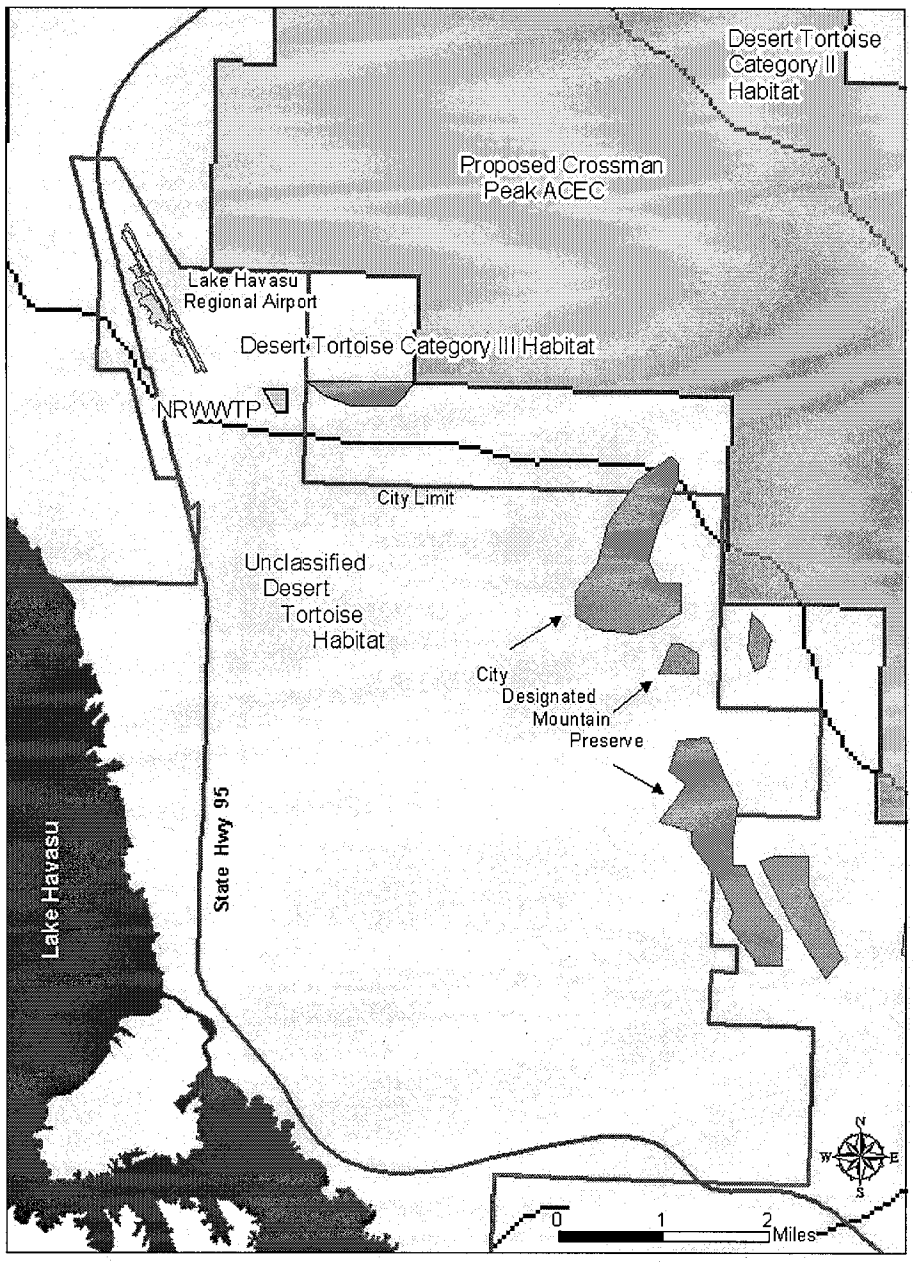

Figure 10: Bureau of Land Management desert tortoise designated habitat, the proposed Crossman Peak ACEC, and the Lake Havasu City designated Mountain Protection areas in relation to the NRWWTP site.

IV. Evaluation of Direct and Indirect Impacts

A. For each alternative in the following areas:

1) Wetlands

None of the alternatives directly impacts wetland environmental quality.

No-Action Alternative:

Existing facilities do not directly discharge effluent into wetlands, but either into percolation ponds or transported for irrigation application.

EEWTF Alternative:

Existing facilities do not directly discharge effluent into wetlands, but either into percolation ponds or transported for irrigation application.

OSNWTF Alternative:

None of the new parcels evaluated occur adjacent to a wetland, although one 40 acre parcel, labeled 4A Private on Figure 6, is within a quarter mile of the Colorado River and the Havasu National Wildlife Refuge wetlands. The planned design and operations of the new wastewater treatment plant, where ever located, does not include discharging into percolation ponds at that site.

Proposed Action:

Effluent generated in the NRWWTP proposed action will not be directly discharged in to the Colorado River/Lake Havasu, but will be either used for irrigation, stored in percolation ponds, or may be injected into the subsurface. If injection proves feasible, effluent will mix with groundwater and may eventually migrate to Lake Havasu and its wetlands over many years. Monitoring wells down gradient of the NRWWTP will sample groundwater quality to ascertain any potential threats as required in NRWWTP APP Permit-105478 (Appendix F).

2) Floodplain

No-Action Alternative:

There would be no impact to floodplain dynamics as no undeveloped land would be disturbed to cause potential hydrological or erosion concerns.

EEWTF Alternative:

There would be no impact to floodplain dynamics as no undeveloped land would be disturbed to cause potential hydrological or erosion concerns.

OSNWTF Alternative:

Evaluated sites within the platted city parcels would not be constructed in floodplain pathways according to recent preliminary FEMA studies, in which simulated model runs restrict flooding to existing wash channels. Some of evaluated sites outside the platted city parcels and outside the city limits, such as the "Proposed RTP site" on Figure 6, are within designated Zone A0 flood zones. Mitigating

efforts to raise the footprint of the treatment plants or to construct up slope diversion structures would be required and may involve permitting with the U.S. Army Corps of Engineers under section 404 of the Clean Water Act, a lengthy and potentially expensive effort.

Proposed Action:

The proposed action will disturb soils on the alluvial fan terraced uplands mapped as Flood Zone C by leveling the surface for construction of the NRWWTP. The work will include razing the tops of the terrace surface and filling low areas with heavy construction equipment. The small portions of the surrounding Zone A0 surfaces will be only temporarily disturbed for access to the site during construction. The paved road leading to the facility is raised above the surrounding alluvial fan surface as are the drive ways into the facility so that the NRWWTP can be accessed during flood events.

3) Significant and/or important farmlands

As there are no farmlands in the Lake Havasu City area, neither the proposed action nor alternatives 1, 2, or 3 will have any impact on such lands.

4) Wild and Scenic Rivers

As there are no scenic river designations along the stretch of the Colorado River near Lake Havasu, neither the proposed action nor alternatives 1, 2, or 3 have any impact with these designated waters.

5) Air quality

No-Action Alternative:

Air quality in the form of hydrogen sulfide offensive odors could locally occur from the failure or overflow of the existing plants.

EEWTF Alternative:

Air quality in the form of hydrogen sulfide offensive odors could locally occur from the failure or overflow of the existing plants. Vehicle exhaust and dust from construction would be two other concerns that may cause temporary air quality changes.

OSNWTF Alternative:

Vehicle exhaust and dust from construction would be the two most probable concerns of temporary air quality changes common to all evaluated sites. Proximity to residential areas would be a sensitive issue in this case; however, dust control is an integral part of Lake Havasu City's Special Conditions of the Contract Documents and is usually done by spraying unpaved road and parking lot surfaces with water. Workers on site will have air-masks available. Once the plant is in place, odor control methods will include a chemical feed system at the plant to essentially eliminate hydrogen sulfide and other odiferous gases.

Proposed Action:

Vehicle exhaust and dust from construction are the two most probable concerns of temporary air quality changes, yet the site is approximately ½ mile from any residential or commercial development. Dust control is an integral part of Lake Havasu City's Special Conditions of the Contract Documents and is usually done by spraying unpaved road and parking lot surfaces with water. Vehicle exhaust will have a minimum impact on human health as the dominant westerly winds carry the exhaust towards the unpopulated Mohave Mountains, away from development. Workers on site will have air-masks available. Once the plant is in place, odor control methods will include a chemical feed system at the plant to essentially eliminate hydrogen sulfide and other odiferous gases.

6) Important vegetation types

No-Action Alternative:

The no-action alternative will not impact important vegetation types as no construction would take place.

EEWTF Alternative:

The EEWTF alternative will not impact important vegetation types as the affected sites have been previously disturbed for home construction.

OSNWTF Alternative:

The OSNWTP alternative involves replacing native vegetation with an artificial surface, but no endangered, threatened, or sensitive species have been found through biological surveys of the Lake Havasu City area.

Proposed Action:

The NRWWTP alternative, although involves replacing native vegetation with an artificial surface, no endangered, threatened, or sensitive species have been found through biological surveys of the site area.

7) Endangered or threatened species and critical habitats

No-Action Alternative:

The no-action alternative will have no impact on endangered or threatened species and critical habitats as no construction would take place to disturb the surrounding environment.

EEWTF Alternative:

The EEWTF alternative would have no impact on endangered or threatened species and critical habitats as the sites do not affect undisturbed habitat and there are no surface water discharges to affect outlying areas.

OSNWTF Alternative:

Evaluated parcels inside the platted portion Lake Havasu City have been previously disturbed and contain no prime habitat for known endangered species in the region (i.e. southwestern willow flycatcher and Yuma clapper rail – riparian and wetland species; the razorback sucker and bony-tailed chub – Colorado River/Lake Havasu species). Most evaluated parcels lying in undisturbed areas are one to three miles away from these habitats, but parcel 2A-Private on Figure 6, is close to the riparian/wetland zone on Lake Havasu.

Proposed Action:

The construction site of the NRWWTP alternative is located almost three miles away from the nearest habitat where the endangered southwest willow flycatcher or Yuma clapper rail may occur, so no impact is expected from the construction process. The operation of the wastewater facility will not include discharging either into surface percolation ponds or into adjacent washes that lead to Lake Havasu. Effluent will be kept contained either in a pump reuse tank, transported via pipeline to either the IWWTP or MWWTP, or injected into the subsurface (if this method proves feasible). No impact on endangered species or critical habitat is expected.

The U.S. Fish and Wildlife Service (USFS) issued a correspondence in January 2007 in compliance with section 7 of the Endangered Species Act which stated that it is extremely unlikely that the two bird species listed above currently occur in the action area of the proposed project based on the lack of suitable habit for nesting, foraging, and migration. Therefore, any potential direct or indirect effects on these species are discountable (Appendix E). In a September 2003 letter, the Arizona Game and Fish Department stated that it 'did not anticipate any significant adverse impacts to the listed special status species listed, or other wildlife species', resulting from the proposed project (Appendix B).

8) Topography

No-Action Alternative:

The no-action alternative will not significantly impact topography as the residential sites have already been modified for home construction.

EEWTF Alternative:

The EEWTF alternative will not significantly impact topography as the residential sites surrounding the existing treatment plants have already been modified for home construction.

OSNWTF Alternative:

Evaluated sites within the platted city parcels would not significantly impact topography as the parcels have been previously modified for future construction. Those parcels outside the platted city would have various impact magnitudes to site topography, depending on the natural conditions. Those sites within floodplains would require more modifications to allow floodwaters to either pass through the

property or around the property without impact to the treatment facility, to access to the facility, or to structures down slope from the facility. Those sites on topographic highs, such as the "5 Proposed Golf Course" on Figure 6, would have to be extensively modified to create a construction footprint sufficient for the treatment facility infrastructure.

Proposed Action:

The alluvial fan terrace upland, on which the NRWWTP is proposed, will be modified using conventional construction equipment, effectively lowering portions of the surface and raising other portions to develop a level plan site for the wastewater facility. The volcanic foothills of the Mohave Mountains lie east of the site and will not be impacted by the construction of this facility. The margins of the terraced upland will also be modified to mitigate against potential flood waters that may be produced in the surrounding Zone A flood zone.

9) Groundwater

No-Action Alternative:

The no-action alternative may impact groundwater quality. Continued acceptance of wastewater into the existing facilities will result in disposal volume problems as the city continues to grow. The percolation ponds and effluent reuse customers will not be able to absorb the excess effluent. Influent treatment capacities will also be exceeded, potentially leading to overflows, spills, or back-ups in the sewer system, which could enter the subsurface and migrate to the underlying aquifer.

EEWTF Alternative:

The EEWTF alternative would similarly impact groundwater quality, but due to the extended capacity of the MWWTP, the effects of excess influent would be prolonged.

OSNWTF Alternative:

The construction of percolation ponds are not a part of a new wastewater treatment plant, where ever the site chosen. A new wastewater treatment plant at most sites evaluated would transport effluent generated away from the site for either irrigation use, disposal into the existing percolation ponds at the IWWTP, or injected into the subsurface at either the MWWTP or at the City's old South Well Field down slope from the MWWTP (Aquifer Protection Permits from the ADEQ are either signed or pending). On-site effluent injection is not an attractive disposal alternative at most sites because once the water is injected, it is below the BOR's accounting surface for withdrawing Colorado River water and any recovery program would be counted against the City's contracted allocation. In terms of nitrate contamination, the aquifer in these two areas has already been impacted from septic tanks within the city, a main reason why the City is expanding its sewer collection system. Nitrate concentrations from monitoring wells near these locations have exceeded 15 mg/l and Class A+ effluent injected into the aquifer from the new treatment plant would

actually help dilute the nitrate concentrations since the effluent nitrate levels are expected to be below 3 mg/l (see proposed action below).

A few of the evaluated sites in the North Airport Region, such as the "5 Proposed Golf Course", "4 Private", "Proposed RTP Site", and "4A Campbell Pit" on Figure 6, may be conducive for onsite subsurface injection as they occur near the foothills to the Mohave Mountains and may have a sufficient sediment thickness to facilitate effluent injection. In this case, groundwater will mix with injectate and blend down gradient. Since the Class A+ effluent will contain nitrate concentrations less than 3 mg/l (see proposed action below), exceeding nitrate MCL's will not be a problem.

Proposed Action:

If no subsurface injection methods are used at the NRWWTP, groundwater will not be impacted as effluent will not be disposed on site. Instead effluent will be transported off site for irrigation use or to percolation ponds at the IWWTP. If injection of effluent through the NRWWTP alternative becomes a reality, the addition of Class A+ reclaimed water, according to A.A.C. R18-11-3, to the subsurface is not expected to provide a contamination issue. Essential constituents in effluent produced using the membrane bioreactor technology (ZeeWeed®) at the facility is expected not to exceed:

BOD	< 2 mg/L
TSS	< 0.5 mg/L
NH_3-N	< 0.5 mg/L
Total N	< 3 mg/L
Total P	< 0.05 mg/L
Turbidity	< 0.2 NTU
Fecal Coliform	< 10 CFU/100 mL
Transmissivity	> 75

In accordance with the ADEQ Aquifer Protection Permit (APP# 105478 see Appendix F) for the NRWWTP, wastewater treatment performance will follow best available demonstrated control technology, which includes developing and implementing approved contingency and emergency response plans if effluent or points of compliance groundwater samples exceed alert levels or aquifer quality limits for regulated chemical constituents. Mitigating efforts to determine the cause of contamination or to reduce concentrations to acceptable limits include verification sampling, shortening sampling periods, and investigate determination of cause through inspection of all discharge units and all related pollution control devices, review of operational and maintenance practices that might have resulted in an

unexpected discharge, and review of aquifer water quality up gradient of the discharge area.

Actions from the above diagnoses will be initiated in the ADEQ approved contingency plan for the NRWWTP dated April 30th, 2004, which include the City's written determination and submission to ADEQ for their review. The ADEQ will make a determination and act accordingly to any directive.

Three groundwater points of compliance monitoring wells have been installed down gradient of the facility following requirements of APP# 105478 for the NRWWTP. Groundwater sampling following the APP regulations has been in place for the last nine months to obtain a background level of constituents prior to operation of the NRWWTP and effluent injection (if this method proves feasible for disposal). A summary of results obtained to date are given in Table 4. More monitoring wells will be installed this winter after pilot vadose wells have been tested to verify the validity of employing injection as a disposal alternative.

The City will be installing three more monitoring wells to better determine the hydrogeologic nature of the subsurface, including hydraulic conductivity, flow path direction and velocities, and to monitor water quality for those regulated constituents outlined in the APP and for other organic wastewater compounds. An up-gradient existing water well will also be used for a point of compliance. This network of wells will help determine the extent and character of the water mound created during injection and will follow water quality conditions before and during injection operation (Figure 11). The staggered well setting will provide an early warning system if any compliance complications arise. This monitoring program will alert the City to any water quality problems that develop.

Two water wells exist within a mile of the NRWWTP injection site; however, they are used for sand and gravel quarry processing and for irrigation. The nearest drinking water wells occur over 1.8 miles southwest of the injection site, although whether groundwater from the NRWWTP would migrate to this site is unclear. The groundwater gradient from the NRWWTP is also southwesterly, although the bulk of the flow from this site would likely pass to the north of the drinking water wells (Figure 11). Groundwater and effluent (approved for this type of discharge through the APP) will mix as they travel downgradient diminishing the effluent chemical signature.

10) Hazardous materials

No-Action Alternative:

Existing facilities have and will not produce hazardous materials beyond the potential for sewage seepage.

EEWTF Alternative:

The EEWTF alternative should not present a threat of releasing hazardous chemicals into the environment as the treatment process is unchanged from existing facilities.

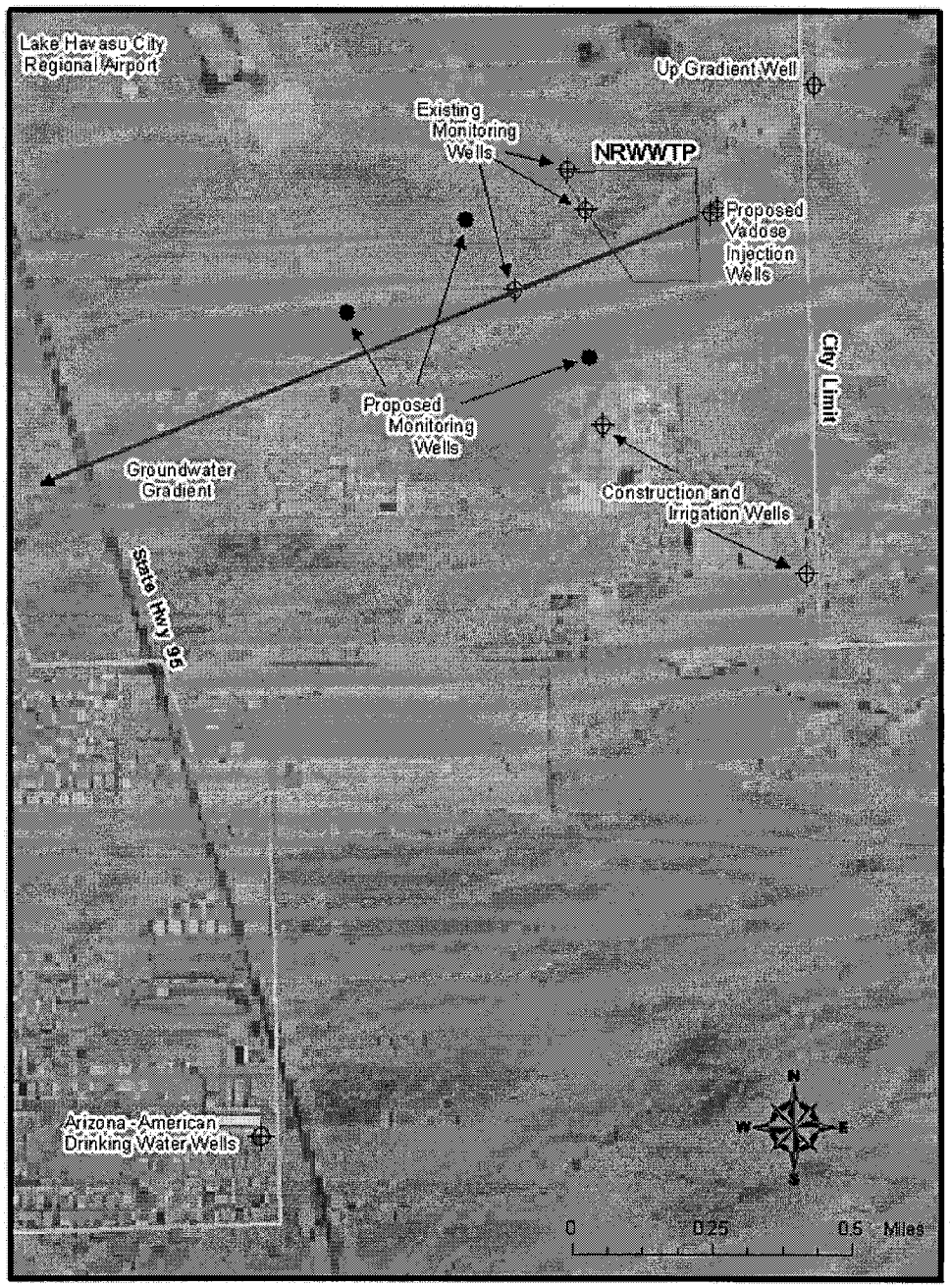

Figure 11: Groundwater gradient from the NRWWTP and locations of existing water and monitoring wells and proposed monitoring and vadose

injection wells.

OSNWTF Alternative:

Site selection of the new wastewater treatment plant will affect the proposed technology used at the plant. Sodium hypochlorite, sodium hydroxide, and citric acid that will be used as cleaning solutions and for odor control during the new treatment plant's operation, will be stored in tanks inside concrete block buildings and foundations to contain any leaks or spills. No other hazardous chemical is expected to be either used or produced during facility operation. Biosolids that could be a health-risk will be dewatered and transferred to the City's landfill.

Proposed Action:

Similar to the OSNWTF alternative, sodium hypochlorite, sodium hydroxide, and citric acid that will be used as cleaning solutions and for odor control during the NRWWTP operation, will be stored in tanks inside concrete block buildings and foundations to contain any leaks or spills. No other hazardous chemical is expected to be either used or produced during facility operation. Biosolids that could be a health-risk will be dewatered and transferred to the City's landfill.

11) Environmental sensitive areas

No-Action Alternative:

The existing treatment plants occur near residences within the city limits, significantly down slope from environmental sensitive areas such as the proposed Crossman Peak ACEC in the Mohave Mountains.

EEWTF Alternative:

The existing and expanded treatment plants occur near residences within the city limits, significantly down slope from environmental sensitive areas such as the proposed Crossman Peak ACEC in the Mohave Mountains.

OSNWTF Alternative:

Evaluated sites within the platted city parcels would not significantly impact environmental sensitive area as the parcels have been previously modified for future construction. Those sites outside the platted parcels, such as SARA Park and sites in the North Airport Region will disturb natural landscape. The SARA Park site (Table 3) lies within in a quarter mile of the BLM's Special Recreational Management Area inside the Lake Havasu Regional Management Area. The impact of an operating treatment plant adjacent to this area, which is a lambing ground for desert bighorn sheep, is uncertain, yet no hazardous materials are expected to emanate from the plant.

Several sites in the North Airport Region lie within a mile of either the Havasu National Wildlife Refuge (HNWR) or the western boundary of the proposed BLM Crossman Peak ACEC lands. Sites "2A Private" and "1 State" on Figure 6 just up gradient from the HNWR, although not in the favored wetland or riparian habitat of

most species existing on the refuge. Regardless, more careful planning would be needed to construct and operate a wastewater treatment plant at these locations, particularly concerning the mitigation of any spills or leaks from the plant. Impacts concerning the Crossman Peak ACEC lands from sites under this alternative would be the same as those under the proposed action (see below).

Proposed Action:

The western boundary of the proposed Crossman Peak ACEC (currently the Crossman Peak Natural Scenic Area) lies approximately 1 mile east and northeast of the NRWWTP site and will not be directly impacted by construction at the site. Exhaust from construction equipment and dust generated during construction may be temporarily blown into the Crossman Peak area when winds are favorable, but no permanent impact is expected. Every effort to minimize dust generation will be made at the site by applying water to bare soil areas under construction or on roads for transportation. The Crossman Peak area is upslope from the NRWWTP site, which should protect the environmentally sensitive area from any groundwater impacts generated at the NRWWTP site if injection of effluent is initiated.

12) Geology/seismic consideration /soils

No-Action Alternative:

No soil or other geological disturbance would occur since no construction is scheduled for this alternative.

EEWTF Alternative:

Expansion of an existing wastewater treatment would occur on disturbed soil surfaces. Foundations and yard pipe would further modify the surface; however, all impacts are localized and acceptable for an urbanized setting.

OSNWTF Alternative:

Proposed sites within the platted city parcels would not be constructed on undisturbed soils as the surface in this portion of the city was reworked to create parcel lots when the city was established in the 1960's. Proposed sites outside the platted city parcels and outside the city limits most likely have undisturbed surfaces, which would be modified in preparation for construction.

Proposed Action:

The Lake Havasu area is in a low-risk earthshaking environment, although tremors have been experienced from earthquakes west in California. Structures proposed at the NRWWTP site will be built according to City code requiring reinforcement to the standards of the seismic zone in which Lake Havasu City lies (4-8 %g zone or Zone II). No geologically sensitive areas will be impacted at this site.

13) National natural landmarks

Since there are no national natural landmarks in the region, none of the alternatives or proposed action would impact this category.

14) Historical, architectural, archaeological, and cultural sites

No-Action Alternative:

The no-action alternative would not impact any man-made sites of significance as no construction would occur at the existing treatment plants.

EEWTF Alternative:

The EEWTF alternative would not impact any man-made sites of significance as construction would occur on previously disturbed or surveyed land.

OSNWTF Alternative:

The 1991 Willdan document and other archaeological reports in the North Airport Region indicate that four separate rock rings are located near or on two evaluated sites, the "2A Private" and the"4A Campbell Pit" on Figure 6. If the new wastewater treatment plant was located on either of these two locations, mitigating measures to protect these archaeological sites would have included contacting the Arizona State Parks State Historic Preservation Office notifying them for comments in accordance with Section 106 of the National Historic Preservation Act of 1966, fencing the areas, with adequate buffer zones, to protect them during construction, and providing access for research documentation. A similar process was followed for the Lake Havasu City sewer collection expansion program in 2003 (written communitcation, 2004, M. H. Bisbarrow, Arizona State Histrotic Preservation Office, Appendix D)

Proposed Action:

The NRWWTP site contains one documented and registered archaeological site that will be left undisturbed and accessible for possible scientific research (Curtis, 2001). The rock ring and associated cleared area is fenced and a 50 feet buffer zone established to protect it during construction and operation of the facility. The prehistoric site is on city property, which will not be further developed. The footprint of the construction site will not impact any other known historical, architectural, archaeological, or cultural site.

15) Aesthetic resources

No-Action Alternative:

The no-action alternative would not impact any aesthetic resources as this alternative would not disturb the landscape or change existing facilities.

EEWTF Alternative:

The EEWTF alternative would not impact any aesthetic resources as this alternative would occur on previously disturbed city property. The new expansion

to the MWWTP was below street level and not in view from either the street or most residences.

OSNWTF Alternative:

Each evaluated site, whether in the platted city parcels or outside the city, would have its own local scenic characteristics and the treatment plant design would take into account how well it would fit into that area. Sites near residential and industrial areas would accommodate for its neighbors by blending as well as it could or by hiding the facility behind a decorative wall. Most sites away from current development in the North Airport Region and in SARA Park would be designed to blend in with the environment, minimizing aesthetic impacts. The proposed action is an example of this second situation. One evaluated site, the "5 Proposed Golf Course" on Figure 4, would be the most challenging as it would have been located at the precipitous end of the Mohave Mountains foothills and adjacent to a significant wash east of the Havasu Regional Airport.

Proposed Action:

The NRWWTP site alternative will change the scenic setting in the upper alluvial fan system just south of the Lake Havasu Regional Airport, but will not impact foothills and other uplands of the Mohave Mountains and the Crossman Peak Natural Scenic Area and proposed ACEC. When finished, the facility will be painted with brown and gray earth tones to better blend in with the local scenery. The NRWWTP site is not the only type of development in the immediate area that could visually impact the area. The active gravel quarry operation just east of the facility consists of two large open pits, a leveled eastern most part of the alluvial fan terrace that the NRWWTP will be on, and a dirt access road. Thirty meter high, high-power lines and other somewhat shorter, electrical lines lie just west of the NRWWTP site, closer to State Highway 95. An electrical substation also lies northwest of the NRWWTP site towards the Havasu Regional Airport.

16) Land use and zoning

No-Action Alternative:

The no-action alternative would not change or affect land use or zoning as no new land acquisitions would be necessary.

EEWTF Alternative:

The EEWTF alternative would not affect land use or zoning standings as any activities would occur on established city properties.

OSNWTF Alternative:

Two evaluated sites within the platted city parcels, tract lot 119-A and tract lot 2290, are in the industrial section of the city and putting a treatment plant at either of these locations, means the loss of prime industrial space, and the potential to impact economic concerns. Sites north of the platted parcels in the North Airport Region, particularly those not currently city-owned, have vacant parcels adjacent to them,

which if constructed; the new treatment plant could affect zoning status and how these properties may be developed in the future. Sites adjacent to residential sections in the platted parcel area, if selected, could lead to lower property values of the residential lots.

Proposed Action:

The NRWWTP site alternative would not impact land use or zoning regulations as outlined in the City's 2002 General Plan. The site sits within a 40 acre city-owned parcel, bordered on three sides with other city-owned property, some of which is scheduled for industrial development. Infrastructure needed to transport water to and from the NRWWTP will be conducted through easements along Highway 95 and through vacant, city-owned property.

17) Socioeconomic impacts

No-Action Alternative:

The no-action alternative could have a direct negative impact on the socioeconomic resources in the form of restricted commercial and residential growth. As the wastewater treatment capacities reach their maximum, the real estate and construction industry, two major aspects of the City's economy, would suffer as new buildings would be severely limited.

EEWTF Alternative:

The EEWTF alternative could similarly lead direct negative economic impacts, albeit delaying the impact due to the increased treatment capacities over the no-action alternative. Expansion of the MWWTP has also helped the local economy by providing jobs during construction and by creating a demand for additional wastewater operators.

OSNWTF Alternative:

As mentioned in the section above, placement of a new wastewater treatment plant could have an impact on property values within a certain zone around the plant and on the types of land use, which could have a direct impact (good or bad) on the economy of the region. Construction and operation of the plant will add jobs to the area, which is not dependent on the plant location.

Proposed Action:

Construction and operation of the NRWWTP will open up new job opportunities to the community and could serve an educational role in helping students learn about the advanced technology needed to best treat wastewater. The ability to deliver effluent to customers for irrigation use will provide an income to the City to help cover treatment plant operating costs. The possible re-use of the water for potable consumption will also lessen the cost burden of obtaining water from a new source when the City experiences shortages of Colorado River water during Bureau of Reclamation shortage declarations.

18) Utilities

No-Action Alternative:
The no-action alternative would not impact utilities as no new infrastructure with such demands would be constructed.

EEWTF Alternative:
Construction of new facilities at the existing treatment plants will put a higher demand on power needs during operation; however, no adverse affects would be expected to utilities as a result of this action.

OSNWTF Alternative:
Construction of new facilities at a new location will put a higher demand on power needs during operation; however, no adverse affects would be expected to utilities as a result of this action. Careful planning of the site in the North Airport Region should include consideration of power and water needs to operate the plant.

Proposed Action:
The NRWWTP site sits a few hundred feet east of a Western Power Administration high-tension power line that cross the area. The construction and operation of the site will not impact the operation of the utility.

19) Transportation and access

No-Action Alternative:
The no-action or on-site treatment alternatives would not impact transportation or access routes as these activities would occur on established residential properties where utilities have been established.

EEWTF Alternative:
The EEWTF alternative would not impact transportation or access routes as activities in this alternative would occur on established city properties with adequate access.

OSNWTF Alternative:
The OSNWTF alternative could impact transportation or access routes depending on the sited location. Parcels in residential and industrial areas, such Kiowa Ponds, North Old Landfill, tract lot 119-A and tract lot 2290, could impact traffic congestion and access to the sites could be difficult at certain times of the day. Access plans for a site surrounded by development would have to account for large truck traffic and other equipment. Those evaluated sites at SARA Park and in the North Airport Region where development is sparse would probably have fewer transportation and access impacts. However, a few sites in the North Airport Region, such as "2A Private", "2 State", "3 BLM", and "5 Proposed Golf Course"

on Figure 6, would have to have roads constructed to them, requiring rights of way permits on intervening properties.

Proposed Action:

The NRWWTP alternative will not impact transportation or access routes currently in place. Only one paved road accesses the NRWWTP and to the active gravel quarry east of the site. There are no other development activities currently in place along this road; however, the NRWWTP construction and operation will not restrict access to other potential development of open space in the area.

20) Climate

None of the alternatives would issue emissions that would have a negative impact on the local climate.

21) Noise considerations

No-Action Alternative:

The no-action alternative would not generate significant noise pollution as there are few mechanical or motorized components to the treatment plant technologies.

EEWTF Alternative:

THE EEWTF alternative would not generate significant noise pollution during plant operation as there are few mechanical or motorized components to these technologies. Construction noise during plant expansion would temporarily be a problem as the plants are near residential developments.

OSNWTF Alternative:

If a new wastewater treatment plant was constructed on one of the evaluated parcels adjacent to residential areas in the platted portion of the city, noise levels through the construction stage and by truck traffic during plant operation might be unacceptable and would have to be closely monitored. Noise impacts on sites away from residential areas may be minimal, especially in the North Airport Region and possibly at the SARA Park and Sweetwater sites.

Proposed Action:

The NRWWTP site alternative would generate some noise during construction and operation due to mechanical or motorized equipment in operation; however, there is no significant residential development within ½ mile of the proposed construction site. Normal working hours of 6:00am to 5:00pm Monday through Friday during the construction period are specified in the Special Conditions of the Contract Documents. Specific dBa noise ratings for mechanical systems are specified in the technical specifications of the Contract Documents as well. The NRWWTP will operational 24 hours per day once construction is completed, but noise levels may be a bit higher during the day as city personnel work travel to and from the facility, and as the facility treats more wastewater. As mentioned in the

proposed action section, all pumps, blowers and electrical equipment will be housed in buildings to abate noise levels.

22) Environmental justice considerations

No-Action Alternative:

The no action alternative should not immediately impact low-income or minority residents in the city, at least until the wastewater treatment plants reach maximum capacity. Restricted development in the city just prior and at this point could force low-income or minority groups as well as more affluent residents to move away from the area and/or keep new comers from moving into the city.

EEWTF Alternative:

The EEWTF alternative should not immediately impact low-income or minority residents in the city, at least until the wastewater treatment plants reach maximum capacity. Restricted development in the city could force low-income or minority groups as well as more affluent residents to move away from the area and/or keep new comers from moving into the city.

OSNWTF Alternative:

The OSNWTF alternative would have a positive effect on low-income and minority residents whose homes have been or will be connected to the sewer collection system. Employment during construction of the plant could benefit low-income and minorities workers economically. None of the evaluated sites are located adjacent to low-income or minority housing areas that might be impacted.

Proposed Action:

The proposed action would have a positive effect on low-income and minority residents whose homes have been or will be connected to the sewer collection system. Employment during construction of the plant has already benefited low-income and minorities workers economically. The advanced treatment technology of this plant will result in high quality, low-nitrate effluent, lowering negative environmental impacts to the aquifer from which Lake Havasu City withdraws water for drinking purposes. Lastly, no residents from this demographic would be forced to relocate as a result of the proposed action. The no action and EEWTF alternatives would have potential negative environmental justice impacts leading to lower property values or worse could halt development within the city, including the construction of affordable housing. Human health and environmental concerns would arise in the form of sewage overflows, spills and back-ups if the capacities of the existing facilities were pushed beyond their limits under the no action and EETPF alternatives.

23) Tribal Issues

None of the alternatives involve tribal issues. Communication from the Chemehuevi Indian Reservation of the California side of Lake Havasu has indicated that the tribe has no formal or informal claim in this area (Appendix C).

24) Other – odor

No-Action Alternative:

Although the existing treatment plants have odor control technology, odor concerns probably would arise under the no action alternative when this equipment fails during operation. To mitigate against odor production in this situation, the wastewater collection has the ability to chemically inject oxidizers at pump stations. Scrubbers have also been added to several pump stations to treat gas emissions.

EEWTF Alternative:

Although the existing treatment plants have odor control technology, odor concerns probably would arise under the EEWTF alternative when this equipment fails during operation. Pump stations in the collection system also have odor abatement technologies that would be in operation if problems occurred at any of the treatment plants.

OSNWTF Alternative:

The new wastewater treatment plant, where ever constructed, will have odor control technology (see proposed action below). Pump stations in the collection system also have odor abatement technologies that would be in operation if problems occurred at any of the treatment plants. If the new plant's odor control system did fail at some point, short-term negative odor impacts would more likely occur at sites adjacent to residential areas. Evaluated sites in the North Airport Region that are surrounded by vacant property not city-owned could present a similar odor impact when those properties are developed.

Proposed Action:

The NRWWTP site alternative has little potential to produce a significant long-term odor problem as the design for this facility has included odor abatement technology, specifically, chemical air scrubbers. Four odor control alternatives were initially considered: Harrington chemical scrubber, Harrington biological scrubber, Bio·Reaction Industries biological scrubber, and Calgon water regenerable carbon. Each of these technologies can achieve up to 99% hydrogen sulfide removal efficiency, which is the primary odorous compound. Because of the high reliability and current experience in the operation of similar systems, Lake Havasu City decided to use a chemical scrubber. The facility is required to have a 350 feet setback from the nearest adjacent property line while utilizing full noise, order, and aesthetic controls. This means that treatment technologies are to be enclosed with scrubbers installed on all odor-producing units and fenced to aesthetically match the surrounding facility. As this site is ½ miles away from residential property, this technology and design should essentially eliminate obnoxious odors at these localities. If the odor abatement equipment fails in the future, the collection system has the ability to control odors before the wastewater reaches the treatment plant (described in the no action alternative above).

B. Summary of significant impacts and mitigation measures.

The proposed action is expected to have minimal long-term environmental impacts to the Lake Havasu City region other than local permanent disturbance to the natural landscape of the constructed facility. Odor, scenic value to the alluvial fan surface, and the potential for the occurrence of sensitive species have been addressed in the design concept of the NRWWTP and will be closely monitored during the facility operation. Short-term potential impacts include dust and noise created during the construction phase that will be addressed to minimize those effects.

The registered archaeological site on the property (a rock ring) will be protected and available for future scientific study. Groundwater points of compliance monitoring wells will continue to be sampled as per the requirements of the aquifer protection permit to scrutinize water quality and implement corrective procedures if problems occur once the facility is in operation. The NRWWTP will create positions as plant operators, maintenance crews, and lab technicians are needed, which will benefit the local economy.

C. Water quality benefits of the operation of the proposed project.

The advanced MBR technology utilized at the NRWWTP will produce high quality effluent that will have the flexibility (legal and infrastructural) of multiple disposal means that lead to either beneficial direct application or to subsurface percolation for possible recovery. No water will be directly discharged into Lake Havasu or any tributaries leading into the lake; therefore, water quality of the lake will not be adversely impacted. This alternative will help keep high nitrate-laden wastewater from entering the subsurface, as is currently the situation with the no-action alternative of utilizing standard septic tank treatment. The aquifer quality beneath Lake Havasu City will steadily improve as more residences are connected to the sewer collection system.

D. Short-term resource uses versus long-term productivity.

Construction and operation of the NRWWTP will result in the consumption of building materials, electricity for energy to operate the facility, and future operation and maintenance materials for plant upkeep. These resource uses are far outweighed by the ability to properly process high quality wastewater, minimize negative environmental impacts to the surface or subsurface, and to generate a water source through recycling a significant portion of the city's domestic and municipal water supply. The proposed action also follows Lake Havasu City's 2002 General Plan and applicable ADEQ regulations as applied to the facility's aquifer protection permit.

The no action alternative would initially result in no resource expenditures, yet when the existing systems reach their treatment capacities, significant resource use (i.e. fuel, energy, human resources, and mitigation materials) could result to mitigate excess wastewater treatment. The EEWTF alternative, if there was space to continue to implement this alternative, would utilize similar resources and possibly deliver the same long-term benefits as the proposed action.

E. Irreversible and irretrievable commitment of resources.

The no action alternative would commit no new resource burden to the environment or to the city.

The footprint and the construction and operation of the NRWWTP proposed action, the EEWTF alternative, or the OSNWTF alternative are an irreversible commitment of open space, materials, and energy resources, but are logistically important to the general planning of Lake Havasu City, and will help secure the surrounding environment from further discharge of high-nitrate wastewater. The resource commitment is more significant in the proposed action, yet the benefits to the environment and to economic growth of the city outweigh those provided by the EEWTF alternative.

Labor and financial resources to construct the NRWWTP may also be considered irreversible, yet these resources exist for this purpose and are retrievable in the sense that the result is a more experienced and productive work force, and revenues from customers will eventually recover the capital expenditures.

V. Cumulative Impacts

A. The combined impacts of other activities:

The NRWWTP will be connected to the sewer collection system as part of an overall wastewater treatment program that will eventually serve Lake Havasu City and surrounding developments as they are established. The cumulative impacts on the environment will be in accord with the Lake Havasu City 2002 General Plan. All work will be accomplished within the city limits, which has no critical or sensitive natural environments that would directly affect wildlife.

The dominant growth area for Lake Havasu City is towards the north side and as new development is added, the NRWWTP will play an increasingly important role to satisfy the wastewater treatment demand, thus keeping the subsurface cleaner overall. The sewer collection expansion is scheduled to continue for another six years, at which point a majority of the Lake Havasu City population and surrounding developments will be connected to the system. The bulk of this work is occurring within the platted portion of the city and will have little long-term adverse affects on the surrounding environment. Most of the infrastructure to support the entire program is buried except pump stations

that boost the influent and effluent to and from the three wastewater treatment plants. These stations have been designed and constructed with noise abatement structures and contain pipeline vaults for easy access to correct problems and to reduce the visual impact of these structures.

The greatest impact on the environment from the entire wastewater collection expansion program and its satellite projects such as the NRWWTP, is to prevent high volumes of nitrate from entering the Colorado River aquifer, which is the objective of the entire program.

B. Synergistic impacts from multiple activities:

The addition of the NRWWTP, as part of Lake Havasu City's collection and treatment system, will have a more far reaching environmental impact in terms of nitrate concentration improvement in the underlying groundwater system, than if this plant were a stand alone operation servicing a limited area. The plant is designed for future treatment capacity expansion (up to 14 MGD) and can handle extra wastewater treatment if one of the other treatment plants has to decrease their treatment volumes due to either failures or to routine maintenance. This in turn will help prevent sewage or effluent spills from those plants into the surrounding environment.

The ability to inject effluent from any wastewater plant into the subsurface at the NRWWTP will create a new water source for the city, decreasing the need to explore and extract precious groundwater or surface water resources elsewhere. Neither the IWWTP nor the MWWTP are at locations that will permit effluent injection that may be subsequently recovered without the water counted against the City's Colorado River water allocation.

C. Impacts from the interaction of two activities:

A business park scheduled in three phases over the next ten years is planned on open space one-quarter to one-half mile west and south of the NRWWTP. Disruptions to the environment (i.e. air quality and habitat alteration in a flood zone) are expected to occur from building and road construction and establishment of flood diversion structures during this project.

A proposed highway bypass around Lake Havasu City has been planned to run parallel and a few hundred feet west of the NRWWTP property. If this proposal is followed through, short-term road construction will present the same dust and air quality concerns as those on the NRWWTP construction site.

The completed highway and business park will not hamper transportation or access to the NRWWTP or other property east of the highway, but could lead to more traffic congestion in the region. However, positive impacts to socioeconomic growth, including low-income and minority groups in the form of employment, in Lake Havasu City are expected from all activities.

VI. References

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City of Lake Havasu City, June 2006 Effluent Reuse Master Plan Update, AMEC Infrastructure.

City of Lake Havasu City, August 2006, Capital Improvement Program Draft Evaluation, Project #SS2300, AMEC Infrastructure.

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Class I Archaeological Documentation for the Lake Havasu City Water Allocation, Alternatives 1, 2, and 3, Lake Havasu City, Mohave County, Arizona, 1991, prepared by McKenna et. al., for Willdan Associates.

Curtis, R., 2001, A Cultural Resources Survey of 256 acres of Private Land for a New Sports Complex in Lake Havasu City, Mohave County, Arizona, Archaeological Research Services Inc., 12 p.

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Knowles, W. C., Arizona Game and Fish Department; Letter dated September 10, 2003 to Burn& McDonnell Engineering.

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North Regional Wastewater Treatment Preliminary Design Report, 2004, Wilson & Company, City Project No. SS1860.

2005, Preliminary results of flood insurance study Mohave County, Arizona incorporated and unincorporated areas, volume 1 of 1 DVD prepared by Map IX-Mainland for the Federal Emergency and Management Agency.

Soil Survey of Mohave County, Arizona, South Part, 2005, U. S. Department of Agriculture, Natural Resource Conservation Service, 685 pages.

Appendix A

NEWS RELEASE

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

For more information contact:
Kurt Maurer, Office of Communications
Phone - (602) 207-4500
E-mail - maurer.kurt@ev.state.az.us
ADEQ Web - http://www.adeq.state.az.us

FOR IMMEDIATE RELEASE: October 2, 2001

ADEQ Director Offers Cooperation to Address Wastewater Needs

LAKE HAVASU CITY, Ariz. – In a presentation to Mayor Melanie Grinstead-Hanak and the city council, Arizona Department of Environmental Quality Director Jacqueline E. Schafer today outlined what actions ADEQ would likely take if the city fails to implement a wastewater master plan, but emphasized her agency's continued support and assistance in addressing the community's wastewater treatment needs.

"While I'm here at the mayor's request to address the question so many have been asking: 'What will ADEQ do if ...?', I am really here today to applaud your initiative and to encourage Lake Havasu City to continue what you've been doing: making plans, seeking voter approval, and securing financial support of a needed project to protect and enhance the quality of the water resources for your community," Schafer said. She noted that state law not only authorizes her to prevent and stop water pollution, but also encourages cooperation between ADEQ and other entities with similar goals.

Schafer offered the services of several experienced staff, including Susan Keith, the department's southeast Arizona liaison who helped Bisbee achieve 95 percent voter support to upgrade its wastewater treatment system. Schafer also reminded leaders that ADEQ chairs the state's Water Infrastructure Finance Authority, which could make available low interest financing for some wastewater master plan components.

-more-

During the presentation, department officials provided evidence that septic tank discharges are causing nitrate levels to threaten the community's drinking water supply.

"Clearly, based on monitor well results, the cumulative discharge from Lake Havasu City's roughly 20,000 septic systems is the source of the nitrate contamination," said Chuck Graf, deputy director of ADEQ's water quality division. "Any time the density of septic tanks reaches more than about one per acre, relatively simple calculations show that the cumulative effluent loading can easily cause nitrate levels in groundwater to exceed maximum contaminant levels," he said.

If Lake Havasu City determines it will not implement its wastewater master plan on its own initiative and schedule, Schafer said ADEQ will most likely revoke all existing and future general permits for onsite septic systems within Lake Havasu City and require the city to apply for an individual Aquifer Protection Permit covering the wastewater master plan area. That permit would require the city to expand its sewer collection system throughout the wastewater master plan area in accordance with a compliance schedule. All onsite systems would be required to hook-up to the sewer once it became available, and the city would have to install monitoring wells to track groundwater quality in key areas down gradient from septic tank concentrations.

Schafer noted early in her remarks that ADEQ has authority to do what is necessary to prevent further contamination of the groundwater underlying Lake Havasu City, and it is prepared to do so.

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Appendix B

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
2221 WEST GREENWAY ROAD, PHOENIX, AZ 85023-4399
(602) 942-3000 • AZGFD.COM

Yuma Office, 9140 E 28th Street, Yuma, AZ 85365-8694 (928) 342-0091

GOVERNOR
JANET NAPOLITANO
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SUSAN E. CHILTON, ARIVACA
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JOE MELTON, YUMA
MICHAEL M. GOLIGHTLY, FLAGSTAFF
DIRECTOR
DUANE L. SHROUFE
DEPUTY DIRECTOR
STEVE K. FERRELL

September 10, 2003

Brian R. Roh
Environmental Scientist
Burns and McDonnell
9400 Ward Parkway
Kansas City Missouri 64114-3319

Re: Lake Havasu City Phase II Sewer Construction Program, Mohave County

Dear Mr. Roh:

The Arizona Game and Fish Department (Department) has reviewed your letter dated September 8, 2003, requesting comments on the sewer construction project located in Township 13 North, Range 19 West, Sections 7 and 17-20; Township 13 North, Range 20 West, Sections 1-3, 10-13, and 24; and Township 14 North, Range 20 West, Sections 16, 21, 22, 26-28, 34 and 35. The following comments are provided for your consideration.

The Department's Heritage Data Management System (HDMS) records have been accessed and the results provided to you in a letter dated August 28, 2003 (enclosed).

The Department understands that this proposed project is Phase II of the Lake Havasu City conventional gravity sewer system construction project. The Department notes that construction will occur within the developed areas of Lake Havasu City. We further note that the project proponents propose to follow the Department's guidelines for handling any Sonoran desert tortoises. For these reasons, the Department does not anticipate any significant adverse impacts to the listed special status species listed, or other wildlife species, resulting from the approval of this proposed project.

Thank you for the opportunity to review and comment on this proposed project. If you have any questions, please contact me at 928-342-0091.

Sincerely,

William C. Knowles

William C. Knowles
Habitat Specialist
Region IV, Yuma

Appendix C

RECEIVED
OCT
PUBLIC WORKS DEPARTMENT

Chemehuevi Indian Tribe

P. O. Box 1976 · Havasu Lake, CA 92363 · (760) 858-4219 · Fax: (760) 858-5400

TO: Mr. Jeremy Abbot
Engineering Tech/Coordinator
Lake Havasu Public Works Department
2330 McCulloch Blvd. N
Lake Havasu City, AZ 86403

October 12, 2006

FROM: Ronald D. Escobar
Secretary/Treasurer,
Chemehuevi Indian Tribe

SUBJECT: Consultation on the North Regional WWTF
Lake Havasu City Public Works Program

Lake Havasu City Public Works sought consultation with the Tribe on a planned addition to its water treatment capability. The project is known as the North Regional Waste Water Treatment Facility (NRWWTF) located to the southeast of the Lake Havasu City Airport; east of AZ 95 and north of Victoria Farms Road. This area is part of the traditional Chemehuevi Homelands.

An archeological evaluation done on the 13.8 acre site reported that nothing of immediate significant pre-historic or Native American associated value had been detected. There was however an area that has been fenced and will be further evaluated at a later date. We have noted that your standard operating procedures (SOPs) are based on Arizona Revised Statutes (ARS) Title 41 §841 and §844 which require immediate work stoppage if any unexpected artifacts or human remains are uncovered. Additionally, you have indicated that you will notify the State Historic Preservation Officer (SHPO) of the discovery and you or the SHPO will then notify the Tribe of the discovery. At that point, the Tribe would have the opportunity to evaluate the discovery for cultural significance as it related to our Tribe.

With this understanding, the Chemehuevi Indian Tribe has no negative comments and agrees to the addition and construction of the NRWWTF.

Any questions may be addressed to me at 760 858-4301 or to our Environmental Protection Department at 760 858-1140.

Respectively submitted,

Ronald D. Escobar

C:\Documents and Settings\CIT EnviroDirector\My Documents\Chemehuevi Concerns\Cultural Concerns\LHC NoRegional WWTF 101206.doc

Appendix D

"Mana g and conserving natural, cultural, d recreational resources"

Arizona State Parks

In reply, please refer to
SHPO-2003-2294 (18466)
National Historic Preservation Act
no historic properties affected

RECEIVED
JAN 26 2004
WATER INFRASTRUCTURE FINANCE AUTHORITY

January 21, 2004

Layla Hedayat, Environmental Coordinator
Water Infrastructure Finance Authority
1100 West Washington, Suite 290
Phoenix, Arizona 85007

RE: Lake Havasu City Sewer Expansion Program 2003-2007, Mohave County, AZ

Dear Ms. Hedayat:

Thank you for continuing to consult with this office regarding the above-mentioned project that entails financing the construction of 390 miles of sewer mains, 400 miles of laterals, 9700 manholes, 75 pump stations, expansion and/or upgrade of existing wastewater facilities, and a new regional waterwater treatment plant. I offer the following comments pursuant to Section 106 of the National Historic Preservation Act as implemented by 36 C.F.R. 800:

The additional information attached to your December 23, 2003 letter addresses my previous concerns. According to the literature review and analysis of the prehistoric settlement pattern, the undertaking's area of potential effect for ground disturbance is unlikely to contain archaeological sites, particularly those containing intact cultural features and deposits. We assume that your agency identified and consulted with consulting parties, such as Indian tribes pursuant to 36 C.F.R. 800.3 (f) (2) and 800.4 (a) (4).

Based on the above, we concur with your agency's finding of no historic properties affected for this undertaking. Should unanticipated effects or previously unidentified historic properties be discovered during undertaking-related activities the Agency official shall make reasonable efforts to avoid, minimize or mitigate any adverse effects and follow the procedures outlined at 36 C.F.R. 800.13 covering post-review discoveries. Please notify this office promptly of any such discoveries. In cases involving archaeological resources, we recommend that they be avoided by and protected from ground-disturbing activities until inspected by an archaeologist. If a discovery involves human remains or funerary objects and occurs on state, city, or private land, procedures implementing state law (A.R.S. § 41-844 or 865) must be followed.

We appreciate your agency's cooperation with this office in considering the impacts of state plans on important cultural resources situated in Arizona pursuant to the State Historic Preservation Act. If you have any questions or concerns, please contact me at (602) 542-7137 or electronically via mbilsbarrow@pr.state.az.us.

Sincerely,

Matthew H. Bilsbarrow, RPA
Planner/ Archaeologist
Arizona State Historic Preservation Office

Janet Napolitano
Governor

State Parks Board Members

Chair
Suzanne Pfister
Phoenix

Gabriel Beechum
Casa Grande

John U. Hays
Yarnell

Elizabeth Stewart
Tempe

William C. Porter
Kingman

William Cordasco
Flagstaff

Mark Winkleman
State Land Commissioner

Kenneth E. Travous
Executive Director

Arizona State Parks
1300 W. Washington
Phoenix, AZ 85007

el & TTY: 602.542.4174
www.azstateparks.com

800.285.3703 from
(520 & 928) area codes

General Fax:
602.542.4180

Director's Office Fax:
602.542.4188

Appendix E

United States Department of the Interior

U.S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer to:
AESO/SE
22410-2007-I-0120

January 4, 2007

Mr. Doyle Wilson
Lake Havasu City
Public Works Department
2330 McCulloch Boulevard North
Lake Havasu City, Arizona 86403-5950

Dear Mr. Wilson:

Thank you for your correspondence of December 22, received on December 26, 2006. This letter documents our review of the North Regional Wastewater Treatment Plant, in Mohave County, in compliance with section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 et seq.). Your letter concluded that the proposed project may affect, but is not likely to adversely affect the southwestern willow flycatcher (*Empidonax traillii extimus*), and Yuma clapper rail (*Rallus longirostris yumanensis*). We concur with your determination(s) and provide our rationale(s) below.

Description of the Proposed Action

A complete description of the proposed action is found in your letter requesting our concurrence. The proposed project is the construction of a new wastewater treatment facility approximately three miles east of Lake Havasu near the existing Lake Havasu City Airport. The proposed location is in a desertscrub vegetation community type dominated by creosote bush and various cactus species.

DETERMINATION OF EFFECTS

We concur with your determination that the proposed action may affect, but is not likely to adversely affect listed species for the following reasons:

Southwestern willow flycatcher

- It is extremely unlikely that the flycatcher currently occurs in the action area of the proposed project based on the lack of suitable habitat for nesting, foraging, or migration. The flycatcher would not be expected to use desertscrub vegetation communities for any

normal activities. Therefore, any potential direct or indirect effects on the species are discountable.

Yuma clapper rail

- It is extremely unlikely that the clapper rail currently occurs in the action area of the proposed project based on the lack of suitable habitat for nesting, foraging, or migration. The clapper rail would not be expected to use desertscrub vegetation communities for any normal activities. Therefore, any potential direct or indirect effects on the species are discountable.

Thank you for your continued coordination. No further section 7 consultation is required for this project at this time. Should project plans change, or if information on the distribution or abundance of listed species or critical habitat becomes available, this determination may need to be reconsidered. In all future correspondence on this project, please refer to the consultation number 22410-2007-I-0120. Should you require further assistance or if you have any questions, please contact Lesley Fitzpatrick at (602) 242-0210 x236 or me at x244.

Sincerely,

Steven L. Spangle
Field Supervisor

cc: Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

W:\Lesley Fitzpatrick\07-0120 LHC.doc:MTR

Appendix F

STATE OF ARIZONA
AQUIFER PROTECTION PERMIT NO. P-105478
PLACE ID 21739, LTF 32789

1.0 AUTHORIZATION

In compliance with the provisions of Arizona Revised Statutes (A.R.S.) Title 49, Chapter 2, Articles 1, 2 and 3, Arizona Administrative Code (A.A.C.) Title 18, Chapter 9, Articles 1 and 2, A.A.C. Title 18, Chapter 11, Article 4 and amendments thereto, and the conditions set forth in this permit, Lake Havasu City is hereby authorized to operate the **North Regional Wastewater Treatment Plant**, located on Air Park Road, Lake Havasu City, in Mohave County, Arizona, over groundwater of the Lake Havasu groundwater basin, in Township 14 N, Range 20 W, Section 15, NE ¼, of the Gila and Salt River Base Line and Meridian.

This permit becomes effective on the date of the Water Quality Division Director's signature and shall be valid for the life of the facility (operational, closure, and post-closure periods), unless suspended or revoked pursuant to A.A.C. R18-9-A213. The permittee shall construct, operate and maintain the permitted facilities:

1. Following all the conditions of this permit including the design and operational information documented or referenced below, and
2. Such that Aquifer Water Quality Standards (AWQS) are not violated at the applicable points of compliance (POCs) set forth below or if an AWQS for a pollutant has been exceeded in an aquifer at the time of permit issuance, that no additional degradation of the aquifer relative to that pollutant and as determined at the applicable POC occurs as a result of the discharge from the facility.

1.1 PERMITTEE INFORMATION

Facility Name:	LHC North Regional Wastewater Treatment Plant
Facility Address:	Air Park Road Lake Havasu City, Arizona
Permittee:	Lake Havasu City
Permittee Address:	1150 McCulloch Blvd. Lake Havasu City, Arizona 86403
Facility Contact:	Douglas M Thomas, Wastewater Manager
Emergency Phone No.:	(982) 855-3999
Latitude/Longitude:	34^{0}°33' 25" N/ 114^{0}°20' 20" W
Legal Description:	Township 14N, Range 20W, Section 15, NE¼ of the Gila and Salt River Baseline and Meridian

1.2 AUTHORIZING SIGNATURE

_____

Joan Card, Director
Water Quality Division
Arizona Department of Environmental Quality
Signed this _____day of _____, 2006

2.0 SPECIFIC CONDITIONS [A.R.S. §§ 49-203(4), 49-241(A)]

2.1 Facility / Site Description [A.R.S. § 49-243(K)(8)]

The permittee is authorized to operate the North Regional Wastewater Treatment Plant (WWTP) with a design flow of 3.5 million gallons per day (MGD). The WWTP process shall consist of headworks screens, an equalization basin, aeration basins, membrane filtration basins, ultraviolet (UV) disinfection system, and sludge holding tank. All treatment units upstream of the filters shall be covered with concrete or aluminum covers and air scrubbers will be provided for odor control. All pumps, blowers and electrical equipment shall be housed within buildings for noise control. The entire WWTP will be surrounded by a six feet high chain-link fence and/or masonry wall, for aesthetic control. The WWTP shall meet the required setbacks of 350 feet on all sides, for design flow of 3.5 MGD. All sludge, including screenings, grit and scum, will be hauled off-site for disposal in accordance with State and Federal regulations. Effluent will be discharged for reuse or recharge under valid permits.

The WWTP is classified for producing Class A+ reclaimed water in accordance with A.A.C. R18-11-3. The facility provides chemical feed treatment, when necessary, to meet turbidity standards for Class A+ reclaimed water. Reclaimed water may be used for beneficial purposes according to the Lake Havasu City Class A+ Reclaimed Water Agent Permit (Permit # R-101612).

Effluent may also be recharged at a number of recharge facilities throughout Lake Havasu City. Recharge facilities are located at the Mulberry WWTP (recharge wells permitted in APP # P-101612), the Island WWTP (recharge basins permitted in APP # P-101611), and the North Regional WWTP (recharge wells permitted in APP# P-105478).

The depth to groundwater is approximately 344 to 389 feet below ground surface (bgs) and the direction of groundwater flow is towards the west-southwest.

The site includes the following permitted discharging facilities:

Facility	Latitude	Longitude
North Regional WWTP UV disinfection outlet	34^0 33' 30" N	114^0 20 ' 20" W
North Regional WWTP - Recharge Well #RW1	34^0 33' 28" N	114^0 20 ' 11" W
North Regional WWTP -Recharge Well #RW2	34^0 33' 27" N	114^0 20' 12" W
North Regional WWTP - Recharge Well #RW3	34^0 33' 27" N	114^0 20 ' 13" W
North Regional WWTP - Recharge Well #RW4	34^0 33' 29" N	114^0 20 ' 11" W
North Regional WWTP - Recharge Well #RW5	34^0 33' 28" N	114^0 20 ' 12" W
North Regional WWTP - Recharge Well #RW6	34^0 33' 28" N	114^0 20 ' 13" W
North Regional WWTP - Recharge Well #RW7	34^0 33' 30" N	114^0 20 ' 11" W
North Regional WWTP - Recharge Well #RW8	34^0 33' 29" N	114^0 20 ' 12" W
North Regional WWTP - Recharge Well #RW9	34^0 33' 29" N	114^0 20 ' 13" W
North Regional WWTP - Recharge Well#RW10	34^0 33' 31" N	114^0 20 ' 11" W
North Regional WWTP - Recharge Well#RW11	34^0 33' 30" N	114^0 20 ' 12" W
North Regional WWTP - Recharge Well#RW12	34^0 33' 30" N	114^0 20 ' 13" W
North Regional WWTP - Recharge Well#RW13	34^0 33' 32" N	114^0 20 ' 11" W
North Regional WWTP - Recharge Well#RW14	34^0 33' 32" N	114^0 20 ' 12" W
North Regional WWTP - Recharge Well#RW15	34^0 33' 32" N	114^0 20 ' 13" W
North Regional WWTP - Recharge Well#RW16	34^0 33' 32" N	114^0 20 ' 15" W
North Regional WWTP - Recharge Well#RW17	34^0 33' 32" N	114^0 20 ' 16" W

Facility	Latitude	Longitude
North Regional WWTP - Recharge Well#RW18	34^0 33' 33" N	114^0 20 ' 13" W
North Regional WWTP - Recharge Well#RW19	34^0 33' 33" N	114^0 20 ' 11" W
North Regional WWTP - Recharge Well#RW20	34^0 33' 33" N	114^0 20 ' 12" W
North Regional WWTP - Recharge Well#RW21	34^0 33' 33" N	114^0 20 ' 13" W
North Regional WWTP - Recharge Well#RW22	34^0 33' 33" N	114^0 20 ' 16" W

Annual Registration Fee [A.R.S. § 49-242(D)]

The Annual Registration Fee for this permit is established by A.R.S. § 49-242(D) and is payable to ADEQ each year. The design flow is 3.5 MGD.

Financial Capability [A.R.S. § 49-243(N) and A.A.C. R18-9-A203]

The permittee is a municipality that has demonstrated financial capability under A.R.S. § 49-243(N) and A.A.C. R18-9-A203(B)(2). The permittee shall maintain financial capability throughout the life of the facility. The estimated cost of operation is $800,000 per year and the estimated cost of closure is $925,000.

2.2 Best Available Demonstrated Control Technology [A.R.S. § 49-243(B) and A.A.C. R18-9-A202(A)(5)]

The Wastewater Treatment Plant shall be designed, constructed, operated and maintained to meet the treatment performance criteria for new facilities with a design flow of 3.5 MGD as specified in R18-9-B204. The facility shall meet the requirements for pretreatment by conducting monitoring as per A.A.C. R18-9- B204(A)(6)(b)(iii).

All industrial hookups and other non-residential hookups to the treatment system shall be authorized according to the applicable federal, state or local regulations.

Conceptual designs for the on-site vadose and direct injection wells have been initially submitted. 12 inch diameter vadose zone wells shall be installed under the compliance schedule of this permit and shall be no more than 180 feet deep with perforations extending from approximately 80 feet to the bottom of the well. Where direct injection wells are installed for use, the 18-inch diameter wells are proposed to be approximately 750 feet deep with perforations extending from approximately 420 feet to the bottom of the well.

2.2.1 Engineering Design

The WWTP shall be designed and constructed as per the design report prepared by Uday K. Gandhe, P.E., Wilson and Company, Inc., dated April 29, 2004. The recharge wells and monitor wells shall be designed and constructed as per the report by HydroSystems, dated April 30, 2004.

2.2.2 Site-specific Characteristics

Site specific characteristics were used in determining the method of effluent recharge. Up to 22 vadose zone and/or direct injection wells may be installed to recharge effluent. The vadose zone wells were chosen as the primary recharge method based on sub-surface hydrogeology. The vadose zone wells are perforated in a zone located above the water table that is believed to have sufficient permeability to recharge 3.5 MGD. Direct injection recharge wells may also be installed as a contingency in the future, based on the performance (recharge capacity) of the vadose wells.

2.2.3 Pre-Operational Requirements

2.2.3.1 Wastewater Treatment Plant

The permittee shall submit a signed, dated, and sealed Engineer's Certificate of Completion in a format approved by the Department per Compliance Schedule in Section 3.0.

2.2.3.2 Recharge Wells

Within 60 days of the signature date of this permit, or of the completion of any recharge well, the operator shall inspect the well installation(s) to verify that all components function as designed. The permittee shall provide written certification within 90 days following final completion of the construction to ADEQ Water Quality Compliance, that inspection of all components was performed. [see also Section 2.7.4 concerning installation reports] The results of inspection should also be indicated.

2.2.4 Operational Requirements

1. The permittee shall maintain a copy of the up-to-date O & M manual at the WWTP site at all times and shall be available upon request during inspections by ADEQ personnel.

2. The pollution control structures shall be inspected for the items listed in Section 4.0, Table III - FACILITY INSPECTION.

3. If any damage of the pollution control structures is identified during inspection, proper repair procedures shall be performed. All repair procedures and material(s) used shall be documented on the Self-Monitoring Report Form submitted quarterly to the ADEQ Water Quality Compliance.

2.2.5 Wastewater Treatment Plant Classification A.C. R18-9-703(C)(2)(a), A.A.C. R18-11-303 THROUGH 307]

The WWTP will produce reclaimed water meeting Class A+ Reclaimed Water Standards and can be used for any allowable use in that class under a valid reclaimed water permit issued per A.A.C. R18-9-7 et seq.

2.3 Discharge Limitations [A.R.S. §§ 49-201(14), 49-243 and A.A.C. R18-9-A205(B)]

1. The permittee is authorized to operate the WWTP with a maximum average monthly flow of 3.5 MGD.
2. The permittee shall notify all users that the materials authorized to be disposed through the WWTP are typical household sewage and shall not include motor oil, gasoline, paints, varnishes, hazardous wastes, solvents, pesticides, fertilizers or other materials not generally associated with toilet flushing, food preparation, laundry facilities and personal hygiene.

3. Specific discharge limitations are listed in Section 4.0, Table IA and IB.

4. The permittee shall operate and maintain all permitted facilities to prevent unauthorized discharges pursuant to A.R.S. § 49-201(12) resulting from failure or bypassing of BADCT

pollutant control technologies including liner failure[1], uncontrollable leakage, exceeding reclaimed water permitted capacity, overtopping (e.g., exceeding the maximum storage capacity defined as a fluid level exceeding the crest elevation of a permitted impoundment), of basins, lagoons, impoundments or sludge drying beds, berm breaches, accidental spills, or other unauthorized discharges.

2.4 Points of Compliance (POCs) [A.R.S. § 49-244]

The locations of the POCs are determined by an analysis of the pollutant management area (PMA), the discharge impact area (DIA), and locations and uses of groundwater wells in the area. The POC locations are selected to protect off-site uses of groundwater, to verify BADCT performance, and to allow early detection of potential impact from the WWTP discharges. Three hazardous/non-hazardous POCs have been designated for this facility as follows:

POC #	Descriptive Location	Latitude	Longitude
1	Monitor Well NP-1 deep monitor well located near the west side of the WWTP; ADWR Registration #55-597190.	34°33'32"N	114°20'29" W
2	Monitor Well NP-2: shallow monitor well located approximately 750 feet west-southwest of the WWTP and recharge site; ADWR Registration # 55-203231.	34°33'20" N	114°20'33" W
3	Monitor Well NP-3: shallow monitor well located near the west side of the WWTP ADWR Registration #55-904049	34°33'28"N	114°20'26" W

Ambient groundwater monitoring and routine groundwater monitoring shall be performed at the POC wells according to Section 4.0 Table II.

The Director may amend this permit to designate additional points of compliance if information on groundwater gradients or groundwater usage indicates the need.

2.5 Monitoring Requirements [A.R.S. § 49-243(K)(1), A.A.C. R18-9-A206(A)]

All monitoring required in this permit shall continue for the duration of the permit, regardless of the status of the facility. All sampling, preservation and holding times shall be in accordance with currently accepted standards of professional practice. Trip blanks, equipment blanks and duplicate samples shall also be obtained, and chain of custody procedures shall be followed, in accordance with currently accepted standards of professional practice. The permittee shall consult the most recent version of the ADEQ Quality Assurance Project Plan (QAPP) and EPA 40 CFR PART 136 for guidance in this regard. Copies of laboratory analyses and chain of custody forms shall be maintained at the permitted facility. Upon request these documents shall be made immediately available for review by ADEQ personnel.

2.5.1 Discharge Monitoring

The permittee shall monitor the wastewater according to Section 4.0, Tables IA and IB. A representative sample of the wastewater shall be collected at the point of discharge from the UV disinfection unit.

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[1]Liner failure in a single-lined impoundment is any condition that would result in leakage exceeding 550 gallons per day per acre.

2.5.1.1 Reclaimed Water Monitoring

The permittee shall monitor the Class A+ reclaimed water under Section 4.0, Table IB in addition to the routine discharge monitoring parameters listed in Table IA.

2.5.2 Facility / Operational Monitoring

Operational monitoring inspections shall be conducted according to Section 4.0, Table III.

1. If any damage of the pollution control structures is identified during inspection, proper repair procedures shall be performed. All repair procedures and materials used shall be documented on the Self-Monitoring Report Form (SMRF) submitted quarterly to the ADEQ Water Quality Compliance. If none of the conditions occur, the report shall say "no event" for a particular reporting period. If the facility is not in operation, the permittee shall indicate that fact in the SMRF.

2. The permittee shall submit data required in Section 4.0, Table III regardless of the operating status of the facility unless otherwise approved by the Department or allowed in this permit.

2.5.3 Groundwater Monitoring and Sampling Protocols

The permittee shall monitor the groundwater according to Section 4.0, Table II. Ambient groundwater monitoring shall be performed in accordance with the compliance schedule of this permit as per Table IIA. Routine groundwater monitoring shall be conducted as per Table II B.

Static water levels shall be measured and recorded prior to sampling. Wells shall be purged of at least three borehole volumes (as calculated using the static water level) or until field parameters (pH, temperature, and conductivity) are stable, whichever represents the greater volume. If evacuation results in the well going dry, the well shall be allowed to recover to 80% of the original borehole volume, or for 24 hours, whichever is shorter, prior to sampling. If after 24 hours there is not sufficient water for sampling, the well shall be recorded as "dry" for the monitoring event. An explanation for reduced pumping volumes, a record of the volume pumped, and modified sampling procedures shall be reported and submitted with the Self- Monitoring Report Form (SMRF).

2.5.4 Surface Water Monitoring and Sampling Protocols

Routine surface water monitoring is not required under the terms of this permit.

2.5.5 Analytical Methodology

All samples collected for compliance monitoring shall be analyzed using Arizona state approved methods. If no state approved method exists, then any appropriate EPA approved method shall be used. Regardless of the method used, the detection limits must be sufficient to determine compliance with the regulatory limits of the parameters specified in this permit. Analyses shall be performed by a laboratory licensed by the Arizona Department of Health Services, Office of Laboratory Licensure and Certification. For results to be considered valid, all analytical work shall meet quality control standards specified in the approved methods. A list of Arizona State certified laboratories can be obtained at the address below:

Arizona Department of Health Services
Office of Laboratory Licensure and Certification
250 North 17th Ave.
Phoenix, AZ 85007
Phone: (602) 364-0720

2.5.6 Installation and Maintenance of Monitoring Equipment

Monitoring equipment required by this permit shall be installed and maintained so that representative samples required by the permit can be collected. If new groundwater wells are determined to be necessary, the construction details shall be submitted to the ADEQ Water Permits Section for approval prior to installation and the permit shall be amended to include any new points.

2.6 Contingency Plan Requirements [A.R.S. § 49-243(K)(3), (K)(7) and A.A.C. R18-9-A204 and R18-9-A205]

2.6.1 General Contingency Plan Considerations

At least one copy of the approved contingency and emergency response plan(s) submitted in the application shall be maintained at the location where day-to-day decisions regarding the operation of the facility are made. The permittee shall be aware of and follow the contingency and emergency plans.

Any alert level (AL) that is exceeded or any violation of an aquifer quality limit (AQL), discharge limit (DL), or other permit condition shall be reported to ADEQ following the reporting requirements in Section 2.7.3.

Some contingency actions involve verification sampling. Verification sampling shall consist of the first follow-up sample collected from a location that previously indicated a violation or the exceedance of an AL. Collection and analysis of the verification sample shall use the same protocols and test methods to analyze for the pollutant or pollutants that exceeded an AL or violated an AQL. The permittee is subject to enforcement action for the failure to comply with any contingency actions in this permit. Where verification sampling is specified in this permit, it is the option of the permittee to perform such sampling. If verification sampling is not conducted within the timeframe allotted, ADEQ and the permittee shall presume the initial sampling result to be confirmed as if verification sampling has been conducted. The permittee is responsible for compliance with contingency plans relating to the exceedance of an AL or violation of a DL, AQL or any other permit condition.

2.6.2 Exceeding Alert Levels/Performance Levels

2.6.2.1 Exceeding of Performance Levels (PL) set for Operational Conditions

1. If the operational PL set in Section 4.0, TABLE III has been exceeded (permit condition exceeded) the permittee shall:

    a. Notify the ADEQ Water Quality Compliance Section within five (5) days of becoming aware of an exceedance of any permit condition in accordance with Section 2.7.3 of this permit.

    b. Submit a written report within thirty (30) days after becoming aware of an exceedance of a permit condition. The report shall document all of the following:

1. A description of the exceedance and its cause;

2. the period of exceedance, including exact date(s) and time(s), if known, and the anticipated time period during which the violation is expected to continue;

3. any action taken or planned to mitigate the effects or the exceedance, or the spill, or to eliminate or prevent recurrence of the exceedance;

4. any monitoring activity or other information which indicates that any pollutants would be reasonably expected to cause a violation of an Aquifer Water Quality Standard; and

5. any malfunction or failure of pollution control devices or other equipment or process.

2. The facility is no longer on alert status once the operational indicator no longer indicates that a PL is being exceeded. The permittee shall, however, complete all tasks necessary to return the facility to its pre-alert operating condition.

2.6.2.2 Exceeding of Alert Levels Set for Discharge Monitoring

1. If an AL set in Section 4.0, TABLE IA or IB, has been exceeded, the permittee shall immediately investigate to determine the cause of the AL being exceeded. The investigation shall include the following:

   a. Inspection, testing, and assessment of the current condition of all treatment or pollutant discharge control systems that may have contributed to the AL being exceeded.

   b. Review of recent process logs, reports, and other operational control information to identify any unusual occurrences;

2. The permittee shall initiate actions identified in the approved contingency plan referenced in Section 5.0 and specific contingency measures identified in Section 2.6 to resolve any problems identified by the investigation which may have led to an AL being exceeded. To implement any other corrective action the permittee shall obtain prior approval from ADEQ according to Section 2.6.6.

3. Within thirty (30) days after confirmation of an AL being exceeded, the permittee shall submit the laboratory results to the ADEQ Water Quality Compliance Section, Data Unit, along with a summary of the findings of the investigation, the cause of the AL being exceeded, and actions taken to resolve the problem.

4. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions or other actions.

2.6.2.2.1. Exceeding Permit Flow Limit

1. If the AL for average monthly flow in Section 4.0, Table I is exceeded, the permittee shall submit an application for an APP amendment to expand the WRF or submit a report detailing the reasons that expansion is not necessary.

2. Acceptance of the report instead of an application for expansion requires ADEQ approval.

2.6.2.3 Exceeding of Alert Levels in Groundwater Monitoring

2.6.2.3.1 Alert Levels for Indicator Parameters

Not required at time of permit issuance.

2.6.2.3.2 Alert Levels for Pollutants with Numeric Aquifer Water Quality Standards

1. If an AL for a pollutant set in Section 4.0, Tables IIB has been exceeded, the Permittee may conduct verification sampling within 5 days of becoming aware of an AL being exceeded. The permittee may use results of another sample taken between the date of the last sampling event and the date of receiving the result as verification.

2. If verification sampling confirms the AL being exceeded or if the permittee opts not to perform verification sampling, then the permittee shall increase the frequency of monitoring to Daily', 'Weekly', and 'Monthly' for constituents that have a permit monitoring frequency of 'Weekly', 'Monthly', and 'Quarterly', 'Semi-Annual' or 'Annual' respectively. In addition, the permittee shall immediately initiate an investigation of the cause of the AL being exceeded, including inspection of all discharging units and all related pollution control devices, review of any operational and maintenance practices that might have resulted in an unexpected discharge, and hydrologic review of groundwater conditions including upgradient water quality.

3. The permittee shall initiate actions identified in the approved contingency plan referenced in Part 5.0 and specific contingency measures identified in Part 2.6 to resolve any problems identified by the investigation which may have led to an AL being exceeded. To implement any other corrective action the permittee shall obtain prior approval from ADEQ according to Section 2.6.6. Alternatively, the permittee may submit a technical demonstration, subject to written approval by the Water Permits Section, that although an AL is exceeded, pollutants are not reasonably expected to cause a violation of an AQL. The demonstration may propose a revised AL or monitoring frequency for approval in writing by the Water Permits Section.

4. Within thirty (30) days after confirmation of an AL being exceeded, the permittee shall submit the laboratory results to the Water Quality Compliance Section, Data Unit along with a summary of the findings of the investigation, the cause of the AL being exceeded, and actions taken to resolve the problem.

5. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions or other actions.

6. The increased monitoring required as a result of ALs being exceeded may be reduced to 4.0, Table I frequencies, if the results of four

sequential sampling events demonstrate that no parameters exceed the AL.

2.6.2.3.3 Alert Levels to Protect Downgradient Users from Pollutants without Numeric Aquifer Water Quality Standards

Not required at time of issuance.

2.6.3 Discharge Limitations (DL) Violations

1. If a DL set in Section 4.0, Table IA or IB has been violated, the permittee shall immediately investigate to determine the cause of the violation. The investigation shall include the following:

a. Inspection, testing, and assessment of the current condition of all treatment or pollutant discharge control systems that may have contributed to the violation;

b. Review of recent process logs, reports, and other operational control information to identify any unusual occurrences;

c. Sampling of individual waste streams composing the wastewater for the parameters in violation.

The permittee also shall submit a report according to Section 2.7.3, which includes a summary of the findings of the investigation, the cause of the violation, and actions taken to resolve the problem. The permittee shall consider and ADEQ may require corrective action that may include control of the source of discharge, cleanup of affected soil, surface water or groundwater, and mitigation of the impact of pollutants on existing uses of the aquifer. Corrective actions shall either be specifically identified in this permit, included in an ADEQ approved contingency plan, or separately approved according to Section 2.6.6.

2. The permittee shall comply with the freeboard requirements as specified in Section 4.0, Table III (Facility Inspections) to prevent the overtopping of an impoundment. If an impoundment is overtopped, the permittee shall follow the requirements in Section 2.6.5.3 and the reporting requirements of Section 2.7.3.

3. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions, or other actions.

2.6.4 Aquifer Quality Limit (AQL) Violation

1. If an AQL set in Section 4.0, Tables IIB has been exceeded, the permittee may conduct verification sampling within 5 days of becoming aware of an AQL being exceeded. The permittee may use results of another sample taken between the date of the last sampling event and the date of receiving the result as verification.

2. If verification sampling confirms that the AQL is violated for any parameter or if the permittee opts not to perform verification sampling, then, the permittee shall increase the frequency of monitoring to 'Daily', 'Weekly', and 'Monthly' for constituents that have a permit monitoring frequency of 'Weekly', 'Monthly', and 'Quarterly', 'Semi-Annual' or 'Annual' respectively. In addition, the permittee shall immediately initiate an evaluation for the cause of the violation, including inspection of all discharging units and all related

pollution control devices, and review of any operational and maintenance practices that might have resulted in unexpected discharge.

The permittee also shall submit a report according to Section 2.7.3, which includes a summary of the findings of the investigation, the cause of the violation, and actions taken to resolve the problem. A verified exceedance of an AQL will be considered a violation unless the permittee demonstrates within 30 days that the exceedance was not caused or contributed to by pollutants discharged from the facility. Unless the permittee has demonstrated that the exceedance was not caused or contributed to by pollutants discharged from the facility, the permittee shall consider and ADEQ may require corrective action that may include control of the source of discharge, cleanup of affected soil, surface water or groundwater, and mitigation of the impact of pollutants on existing uses of the aquifer. Corrective actions shall either be specifically identified in this permit, included in an ADEQ approved contingency plan, or separately approved according to Section 2.6.6.

3. Upon review of the submitted report, the Department may amend the permit to require additional monitoring, increased frequency of monitoring, amendments to permit conditions or other actions.

2.6.5 Emergency Response and Contingency Requirements for Unauthorized Discharges pursuant to A.R.S. § 49-201(12) and pursuant to A.R.S. § 49-241

2.6.5.1 Duty to Respond

The permittee shall act immediately to correct any condition resulting from a discharge pursuant to A.R.S. § 49-201(12) if that condition could pose an imminent and substantial endangerment to public health or the environment.

2.6.5.2 Discharge of Hazardous Substances or Toxic Pollutants

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of suspected hazardous substances (A.R.S. § 49-201(18)) or toxic pollutants (A.R.S. § 49-243(I)) on the facility site, the permittee shall promptly isolate the area and attempt to identify the discharged material. The permittee shall record information, including name, nature of exposure and follow-up medical treatment, if necessary, on persons who may have been exposed during the incident. The permittee shall notify the ADEQ NRO Field Services Unit at (928) 779-0313, within 24 hours upon discovering the discharge of hazardous material which: a) has the potential to cause an AWQS or AQL exceedance; or b) could pose an endangerment to public health or the environment.

2.6.5.3 Discharge of Non-hazardous Materials

In the event of any unauthorized discharge pursuant to A.R.S. § 49-201(12) of non-hazardous materials from the facility, the permittee shall promptly attempt to cease the discharge and isolate the discharged material. Discharged material shall be removed and the site cleaned up as soon as possible. The permittee shall notify the ADEQ NRO Field Services Unit at (928) 779-0313, within 24 hours upon discovering the discharge of non-hazardous material which: a) has the potential to cause an AQL exceedance; or b) could pose an endangerment to public health or the environment.

2.6.5.4 Reporting Requirements

The permittee shall submit a written report for any unauthorized discharges reported under Sections 2.6.5.2 and 2.6.5.3 to the ADEQ NRO Field Services Unit, 1801 W. Route 66, Suite 117, Flagstaff, Arizona 86001, within thirty days of the discharge or as required by subsequent ADEQ action. The report shall summarize the event, including any human exposure, and facility response activities and include all information specified in Section 2.7.3. If a notice is issued by ADEQ subsequent to the discharge notification, any additional information requested in the notice shall also be submitted within the time frame specified in the notice. Upon review of the submitted report, ADEQ may require additional monitoring or corrective actions.

2.6.6 Corrective Actions

Specific contingency measures identified in Part 2.6 have already been approved by ADEQ and do not require written approval to implement.

With the exception of emergency response actions taken under Section 2.6.5, the permittee shall obtain written approval from the Water Permits Section prior to implementing a corrective action to accomplish any of the following goals in response to exceeding an AL or violation of an AQL, DL, or other permit condition:

1. Control of the source of an unauthorized discharge;
2. Soil cleanup;
3. Cleanup of affected surface waters;
4. Cleanup of affected parts of the aquifer;
5. Mitigation to limit the impact of pollutants on existing uses of the aquifer.

Within 30 days of completion of any corrective action, the operator shall submit to the ADEQ Water Quality Compliance Section, a written report describing the causes, impacts, and actions taken to resolve the problem.

2.7 Reporting and Recordkeeping Requirements [A.R.S. § 49-243(K)(2) and A.A.C. R18-9-A206(B) and R18-9-A207]

2.7.1 Self Monitoring Report Forms (SMRF)

1. The permittee shall complete the SMRFs provided by ADEQ, and submit them to the Water Quality Compliance Section, Data Unit.

2. The permittee shall complete the SMRF to the extent that the information reported may be entered on the form. If no information is required during a quarter, the permittee shall enter "not required" on the SMRF and submit the report to ADEQ. The permittee shall use the format devised by ADEQ.

3. The tables contained in Sections 4.0 list the parameters to be monitored and the frequency for reporting results for groundwater compliance monitoring. Monitoring methods shall be recorded on the SMRFs. The permittee reserves the right to request a relaxation of the monitoring frequency for metals and volatile organic compounds if the data indicate that water quality standards are being achieved.

4. In addition to the SMRF, the information contained in A.A.C. R18-9-A206(B)(1) and Section 6.7 shall be included for exceeding an AL or violation of an AQL, DL, or any other permit condition being reported in the current reporting period.

2.7.2 Operation Inspection / Log Book Recordkeeping

A signed copy of this permit shall be maintained at all times at the location where day-to-day decisions regarding the operation of the facility are made. A log book (paper copies, forms or electronic data) of the inspections and measurements required by this permit shall be maintained at the location where day-to-day decisions are made regarding the operation of the facility. The log book shall be retained for ten years from the date of each inspection, and upon request, the permit and the log book shall be made immediately available for review by ADEQ personnel. The information in the log book shall include, but not be limited to, the following information as applicable:

1. Name of inspector;
2. Date and shift inspection was conducted;
3. Condition of applicable facility components;
4. Any damage or malfunction, and the date and time any repairs were performed;
5. Documentation of sampling date and time;
6. Any other information required by this permit to be entered in the log book, and

Monitoring records for each measurement shall comply with R18-9 A206(B)(2).

2.7.3 Permit Violation and Alert Level Status Reporting

1. The permittee shall notify the Water Quality Compliance Section, Enforcement Unit in writing within five (5) days (except as provided in Section 2.6.5) of becoming aware of a violation of any permit condition, discharge limitation or of an Alert Level being exceeded.

2. The permittee shall submit a written report to the Water Quality Compliance Section, Enforcement Unit within 30 days of becoming aware of the violation of any permit condition or discharge limitation. The report shall document all of the following:

   a. Identification and description of the permit condition for which there has been a violation and a description of its cause.

   b. The period of violation including exact date(s) and time(s), if known, and the anticipated time period during which the violation is expected to continue.

   c. Any corrective action taken or planned to mitigate the effects of the violation, or to eliminate or prevent a recurrence of the violation.

   d. Any monitoring activity or other information which indicates that any pollutants would be reasonably expected to cause a violation of an Aquifer Water Quality Standard.

   e. Proposed changes to the monitoring which include changes in constituents or increased frequency of monitoring.

   f. Description of any malfunction or failure of pollution control devices or other equipment or processes.

2.7.4 Operational, Other or Miscellaneous Reporting

The permittee shall complete the Self-Monitoring Report Form provided by the Department to reflect facility inspection requirements designated in Section 4.0, Table III and submit to the ADEQ, Water Quality Compliance quarterly along with other reports

required by this permit. Facility inspection reports shall be submitted no less frequently than quarterly, regardless of operational status.

If the treatment facility is classified for reclaimed water under this permit, the permittee shall submit the reclaimed water monitoring results as required in Table IA and flow volumes to any of the following in accordance with A.A.C. R18-9-703(C)(2)(c):

1. any reclaimed water agent who has contracted for delivery of reclaimed water from the permittee;

2. any end user who has not waived interest in receiving this information.

Well installation reports/documentation for recharge wells and monitoring wells shall be submitted within 30 days of construction to ADEQ Groundwater Permits Unit for final review after construction. Include the final latitude and longitude of the constructed wells location and the construction data where it is different from the design. Include the well drillers log with the description of the geology at each depth. Include the initial water quality monitoring data from each well within 5 days of receiving that data.

2.7.5 Reporting Location

All SMRFs shall be submitted to:

Arizona Department of Environmental Quality
Water Quality Compliance Section, Data Unit
Mail Code: 5415B-1
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4681

All documents required by this permit to be submitted to the Water Quality Compliance Section shall be directed to:

Water Quality Compliance Section, Enforcement Unit
Mail Code: 5415B-1
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4614

All documents required by this permit to be submitted to the Water Permits Section shall be directed to:

Arizona Department of Environmental Quality
Water Permits Section
Mail Code: 5415B-3
1110 W. Washington Street
Phoenix, AZ 85007
Phone (602) 771-4428

All documents required by this permit to be submitted to ADEQ's Southern Regional Office (SRO) Field Services Unit shall be directed to:

Arizona Department of Environmental Quality
Northern Regional Office
1801 W. Route 66, Suite 117
Flagstaff, Arizona 86001
Phone: (928) 779-0313

2.7.6 Reporting Deadline

The following table lists the quarterly report due dates:

Monitoring conducted during quarter:	Quarterly Report due by:
January-March	April 30
April-June	July 30
July-September	October 30
October-December	January 30

2.7.7 Changes to Facility Information in Section 1.0

The Water Permits Section and Water Quality Compliance Section shall be notified within 10 days of any change of facility information including Facility Name, Permittee Name, Mailing or Street Address, Facility Contact Person or Emergency Telephone Number.

2.8 Temporary Cessation [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A209(A)]

The permittee shall give written notice to the Water Quality Compliance Section before ceasing operation of the facility for a period of 60 days or greater. The permittee shall take the following measures upon temporary cessation:

1. If applicable, direct the wastewater flows from the facility to another State approved wastewater treatment facility.

2. Correct the problem that caused the temporary cessation of the facility.

3. Notify ADEQ with a monthly facility Status Report describing the activities conducted on the WWTP to correct the problem.

At the time of notification the permittee shall submit for ADEQ approval a plan for maintenance of discharge control systems and for monitoring during the period of temporary cessation. Every three years during the period of temporary cessation, the permittee shall provide written notice to the Water Quality Compliance Section of the operational status of the facility. If the permittee intends to permanently cease operation of any facility, the permittee shall submit closure notification, as set forth in Section 2.9 below.

2.9 Closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9-A209(B)]

For a facility addressed under this permit, the permittee shall give written notice of closure to the Water Quality Compliance Section of the permittee's intent to cease operation without resuming activity for which the facility was designed or operated.

2.9.1 Closure Plan

Within 90 days following notification of closure, the permittee shall submit for approval to the Water Permits Section, a detailed Closure Plan which meets the requirements of A.R.S. § 49-252 and A.A.C. R18-9-A209(B)(1)(a).

If the closure plan achieves clean closure immediately, ADEQ shall issue a letter of approval to the permittee. If the closure plan contains a schedule for bringing the facility to a clean closure configuration at a future date, ADEQ may incorporate any part of the schedule as an amendment to this permit.

2.9.2 Closure Completion

Upon completion of closure activities, the permittee shall give written notice to the Water Permits Section indicating that the approved Closure Plan has been implemented fully and providing supporting documentation to demonstrate that clean closure has been achieved (soil sample results, verification sampling results, groundwater data, as applicable). If clean closure has been achieved, ADEQ shall issue a letter of approval to the permittee at that time. If any of the following conditions apply, the permittee shall follow the terms of Post Closure stated in this permit:

1. Clean closure cannot be achieved at the time of closure notification or within one year thereafter under a diligent schedule of closure actions;

2. Further action is necessary to keep the facility in compliance with aquifer water quality standards at the applicable point of compliance;

3. Continued action is required to verify that the closure design has eliminated discharge to the extent intended;

4. Remedial or mitigative measures are necessary to achieve compliance with Title 49, Ch. 2;

5. Further action is necessary to meet property use restrictions.

2.10 Post-Closure [A.R.S. §§ 49-243(K)(6), 49-252 and A.A.C. R18-9 A209(C)]

Post-closure requirements shall be established based on a review of facility closure actions and will be subject to review and approval by the Water Permits Section.

In the event clean closure cannot be achieved pursuant to A.R.S. § 49-252, the permittee shall submit for approval to the Water Permits Section a Post-Closure Plan that addresses post-closure maintenance and monitoring actions at the facility. The Post-Closure Plan shall meet all requirements of A.R.S. §§ 49- 201(29) and 49-252 and A.A.C. R18-9-A209(C). Upon approval of the Post-Closure Plan, this permit shall be amended or a new permit shall be issued to incorporate all post-closure controls and monitoring activities of the Post-Closure Plan.

2.10.1 Post-Closure Plan

A specific post closure plan may be required upon the review of the closure plan.

2.10.2 Post-Closure Completion

Not required at the time of permit issuance.

3.0 COMPLIANCE SCHEDULE [A.R.S. § 49-243(K)(5) and A.A.C. R18-9-A208]

For each compliance schedule item listed below, the permittee shall submit the required information, including a cover letter that lists the compliance schedule items, to the Groundwater Permits Section. A copy of the cover letter must also be submitted to the Water Quality Compliance Section, Data/Enforcement Unit.

No.	Compliance Item	Schedule
1	The permittee shall submit a signed, dated, and sealed Engineer's Certificate of Completion in a format approved by the Department that confirms that the facility is constructed according to the Department-approved design report or plans and specifications, as applicable.	Prior to discharging under this permit and within 90 days of completion of construction
2	The facility shall commence ambient monitoring of groundwater according to Section 4.0, Table IIA to determine the Alert Levels (ALs) and Aquifer Water Quality Levels (AQLs)	Within 30 days of the issuance of this permit. A minimum of eight samples shall be taken and reported within one calendar year.
3	Collect and analyze eight (8) minimum monthly ambient groundwater samples.	Within 12 months after permit issuance.
4	The ambient monitoring results, and proposed ALs and AQLs, shall be submitted to ADEQ with an application for an APP Other Amendment, with the appropriate fees, to establish the permit ALs and AQLs for groundwater monitoring in Table IIB.	Within 60 days of the final ambient sampling event.
5	The permittee shall submit a well installation report for each new monitoring and/or recharge well. That notification shall include, at a minimum, the ADWR Registration Report for each well, the as-built diagram, the drilling log, the pumping test results (aquifer testing), well development details, and the first round (initial sample) groundwater quality analysis for all of the parameters listed in Table II. This report shall include the WWTP certified operator's certification that the wells are operating as designed. If for any reason the design is changed, the facility will obtain ADEQ approval in writing prior to proceeding with construction.	Notify the Groundwater Permits Section within 90 days of the completion of the construction of each monitoring well.

4.0 TABLES OF MONITORING REQUIREMENTS

TABLE IA
ROUTINE DISCHARGE MONITORING

Sampling Point Number	Sampling Point Identification			Latitude	Longitude
1	Point of discharge from the UV disinfection unit			34° 33' 25" N	114° 20' 20" W
Parameter	**AL[2]**	**DL[3]**	**Units**	**Sampling Frequency**	**Reporting Frequency**
Total Flow: Daily[4]	Not Established[5]	Not Established	MGD[6]	Daily[7]	Quarterly
Total Flow: Average Monthly	3.33	3.5	MGD	Monthly[8]	Quarterly
Fecal Coliform: Single sample maximum	Not established	23	CFU or MPN[9]	Daily[10]	Quarterly
Fecal Coliform: four (4) of seven (7) samples in a week[11]	Not established	Non-detect[12]	CFU or MPN	Daily	Quarterly
Total Nitrogen[13]: 5-sample rolling geometric mean	8.0	10.0	mg/l	Monthly[14]	Quarterly

[2]AL = Alert Level
[3]DL = Discharge Limit
[4]Total flow is measured in million gallons per day (MGD).
[5]Not established = Monitoring required but no limits have been specified at time of permit issuance.
[6]MGD = Million Gallons per Day
[7]Flow shall be measured using a continuous recording flow meter.
[8]Monthly = Monthly average of daily flow values (calculated value)
[9]CFU = Colony Forming Units / 100 ml sample. MPN = Most Probable Number / 100 ml sample. For CFU, a value of <1 shall be considered to be non-detect. For MPN, a value of <2.2 shall be considered to be non-detect.
[10]**Daily** means at least four (4) samples per week must be analyzed.
[11]"Week" means a seven-day period starting on Sunday and ending on the following Saturday.
[12]If at least four (4) of the daily samples are non-detect, report "yes" in the appropriate space on the SMRF (indicating that the standard has been met). If at least four (4) of the daily samples have detections of fecal coliform, report "no" in the appropriate space on the SMRF (indicating that the standard has **not** been met).
[13]Total Nitrogen = Nitrate as N + Nitrite as N + Total Kjeldahl Nitrogen
[14]A 5-Month Geometric Mean of the results of the 5 most recent samples

4.0 TABLES OF MONITORING REQUIREMENTS

TABLE 1A
ROUTINE DISCHARGE MONITORING (Continued)

Parameter	AL	DL	Units	Sampling Frequency	Reporting Frequency
Metals (Total)[15]:					
Antimony	0.0048	0.006	mg/l	Quarterly	Quarterly
Arsenic	0.04	0.05	mg/l	Quarterly	Quarterly
Barium	1.60	2.00	mg/l	Quarterly	Quarterly
Beryllium	0.0032	0.004	mg/l	Quarterly	Quarterly
Cadmium	0.004	0.005	mg/l	Quarterly	Quarterly
Chromium	0.08	0.1	mg/l	Quarterly	Quarterly
Cyanide (As free cyanide)	0.16	0.2	mg/l	Quarterly	Quarterly
Fluoride	3.2	4.0	mg/l	Quarterly	Quarterly
Lead	0.04	0.05	mg/l	Quarterly	Quarterly
Mercury	0.0016	0.002	mg/l	Quarterly	Quarterly
Nickel	0.08	0.1	mg/l	Quarterly	Quarterly
Selenium	0.04	0.05	mg/l	Quarterly	Quarterly
Thallium	0.0016	0.002	mg/l	Quarterly	Quarterly

[15] If the Discharge Limit for listed pollutants has not been exceeded in all of eight (8) consecutive quarters, the owner or operator may apply to ADEQ's Groundwater Section to request this permit so as to reduce sampling and reporting frequencies for these pollutants.

4.0 TABLES OF MONITORING REQUIREMENTS

TABLE 1A
ROUTINE DISCHARGE MONITORING (Continued)

Parameter	AL	DL	Units	Sampling Frequency	Reporting Frequency
Volatile Organic Compounds (VOCs) [16]:					
Benzene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Carbon tetrachloride	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
o-Dichlorobenzene	0.48	0.6	mg/l	Semi-Annually	Semi-Annually
para-Dichlorobenzene	0.06	0.075	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,1-Dichloroethylene	0.0056	0.007	mg/l	Semi-Annually	Semi-Annually
cis-1,2-Dichloroethylene	0.05	0.07	mg/l	Semi-Annually	Semi-Annually
trans-1,2-Dichloroethylene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Dichloromethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloropropane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Ethylbenzene	0.56	0.7	mg/l	Semi-Annually	Semi-Annually
Hexachlorobenzene	0.0008	0.001	mg/l	Semi-Annually	Semi-Annually
Hexachlorocyclopentadiene	0.04	0.05	mg/l	Semi-Annually	Semi-Annually
Monochlorobenzene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Styrene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Tetrachloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Toluene	0.8	1.0	mg/l	Semi-Annually	Semi-Annually
Trihalomethanes (total) [17]	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
1,1,1-Trichloroethane	0.16	0.2	mg/l	Semi-Annually	Semi-Annually
1,2,4 - Trichlorobenzene	0.056	0.07	mg/l	Semi-Annually	Semi-Annually
1,1,2 - Trichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Trichloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Vinyl Chloride	0.0016	0.002	mg/l	Semi-Annually	Semi-Annually
Xylenes (Total)	8.0	10.0	mg/l	Semi-Annually	Semi-Annually

[16] If the Discharge Limit for listed pollutants has not been exceeded in all of four (4) semi-annual sampling events, the owner or operator may apply to ADEQ's Groundwater Section to request this permit so as to reduce sampling and reporting frequencies for these pollutants.

[17] Total Trihalomethanes comprised of Bromoform, Bromodichloromethane, Chloroform, and Dibromochloromethane.

4.0 TABLES OF MONITORING REQUIREMENTS

Table IB

RECLAIMED WATER MONITORING TABLE – CLASS A+[18]

Sampling Point Number	Sampling Point Identification	Latitude	Longitude
1	Point of discharge from the UV disinfection unit	34° 33' 25" N	114° 20' 20" W

Parameter	DL	Units	Sampling Frequency	Reporting Frequen
Flow: Daily	Not Established	MGD[19]	Everyday[20]	Quarterly
Flow: Total monthly flow provided for reuse	Not established	MGD	Monthly Calculation	Quarterly
Fecal Coliform: Single-sample maximum	23	CFU or MPN[21]	Daily[22]	Quarterly
Fecal Coliform: Four (4) of last seven (7) samples	Non-detect[23]	CFU or MPN	Daily	Quarterly
Turbidity[24]: Single reading	5.0	NTU[25]	Everyday[26]	Quarterly
Turbidity: 24-hour average	2.0	NTU	Everyday	Quarterly

[18] Reclaimed water monitoring is in addition to routine discharge monitoring.
[19] Million Gallons per Day
[20] Flow rate shall be measured using a continuously recording flow meter that totals the flow daily.
[21] CFU = Colony Forming Units per 100 ml: MPN = Most Probable Number per 100 ml. For CFU, a value of <1 shall be considered to be non-detect. For MPN, a value of <2.2 shall be considered to be non-detect.
[22] For fecal coliform, "daily" sampling means every day in which a sample can practicably be obtained and delivered in sufficient time for proper analysis, provided that no less than four (4) samples in each calendar week are obtained and analyzed.
[23] If at least four (4) of the last seven (7) samples are non-detect, report "yes" in the appropriate space on the SMRF (indicating that the standard has been met). If at least four (4) of the last seven (7) samples have detections of fecal coliform, report "no" in the appropriate space on the SMRF (indicating that the standard has **not** been met).
[24] Turbidimeter shall have a signal averaging time not exceeding 120 seconds. Occasional spikes due to back-flushing or instrument malfunction shall not be considered an exceedance. All exceedances must be explained and submitted to the Department with the corresponding quarterly SMRF.
[25] Nephelometric Turbidity Units
[26] For the single turbidity reading, "everyday" means the maximum reading during the 24 hour period.

4.0 TABLES OF MONITORING REQUIREMENTS

TABLE IIA
AMBIENT GROUNDWATER MONITORING[27]

Sampling point number	Sampling Point Identification	Latitude	Longitude
POC # 1	NP-1 deep monitor well located near the west side of the WWTP;	34^0 33' 28" N	114^0 20' 26" W
POC # 2	NP-2 located approximately 750 feet west-southwest of the WWTP and recharge site	34^0 33' 32" N	114^0 20' 30" W
POC#3	NP-3 shallow monitor well located near the west side of the WWTP	34^0 33' 21" N	114^0 20' 33" W

Parameter	AL[28]	AQL[29]	Units	Sampling Frequency	Reporting Frequency
Groundwater level	Not Established[30]	Not Established	Feet Below Ground Surface	Monthly	Quarterly
Total Nitrogen[31]	Not Established	Not Established	mg/l	Monthly	Quarterly
Nitrate-Nitrite as N	Not Established	Not Established	mg/l	Monthly	Quarterly
Total Kjeldahl Nitrogen (TKN)	Not established	Not Established	mg/l	Monthly	Quarterly
Total Coliform[32]	Absence	Absence	CFU or MPN[33]	Monthly	Quarterly

[27] Ambient groundwater monitoring is required monthly for a minimum of eight (8) months during the first year of operation following permit issuance. Ambient groundwater monitoring may be discontinued after collection of 8 monthly samples.
[28] AL = Alert Level
[29] AQWL = Aquifer Quality Limit
[30] Not Established = Monitoring required, but no limits have been set at this time. Limits will be set in accordance with the compliance schedule of the permit, submittal of an ambient groundwater monitoring report and permit amendment for proposing ALs and AQLs based on ambient data.
[31] Total Nitrogen = Nitrate as N + Nitrite as N + Total Kjeldahl Nitrogen
[32] A positive Result for total coliform may be verified with an analysis for fecal coliform. A positive result for fecal coliform shall be considered an exceedance of the AQL for total coliform.
[33] CFU =Colony Forming Units/ 100 ml sample. MPN = Most Probable Number 100 ml sample.

4.0 TABLES OF MONITORING REQUIREMENTS

TABLE IIB
ROUTINE GROUNDWATER MONITORING[34]

Sampling point number	Sampling Point Identification	Latitude	Longitude
POC # 1	NP-3 shallow monitor well located near the west side of the WWTP	34^0 33' 32" N	114^0 20' 30" W
POC # 2	NP-1 deep monitor well located near the west side of the WWTP;	34^0 33' 32" N	114^0 20' 30" W
POC # 3	NP-2 located approximately 750 feet west-southwest of the WWTP and recharge site	34^0 33' 32" N	114^0 20' 30" W

Parameter	AL[35]	AQL[36]	Units	Sampling Frequency	Reporting Frequency
Groundwater level	Not Established[37]	Not Established	Feet Below Ground Surface	Monthly	Quarterly
Total Nitrogen[38]	8.0	10.0	mg/l	Monthly	Quarterly
Nitrate-Nitrite as N	8.0	10.0	mg/l	Monthly	Quarterly
Total Kjeldahl Nitrogen (TKN)	8.0	10.0	mg/l	Monthly	Quarterly
Total Coliform[39]	Absence	Absence	CFU or MPN[40]	Monthly	Quarterly

[34] Routine groundwater monitoring is required monthly, following the ambient sampling, for all samples which are not to be changed by the ambient sampling report. The facility shall continue to monitor and report the monitoring data in relation to the above limits for those parameters not affected by ambient sampling reporting. If no changes are made, the facility shall continue to report as routine monitoring above requires.
[35] AL = Alert Level
[36] AQWL = Aquifer Quality Limit
[37] Not Established = Monitoring required, but no limits have been set at this time. Limits will be set in accordance with the compliance schedule of the permit, submittal of an ambient groundwater monitoring report and permit amendment for proposing ALs and AQLs based on ambient data.
[38] Total Nitrogen = Nitrate as N + Nitrite as N + Total Kjeldahl Nitrogen
[39] A positive Result for total coliform may be verified with an analysis for fecal coliform. A positive result for fecal coliform shall be considered an exceedance of the AQL for total coliform.
[40] CFU =Colony Forming Units/ 100 ml sample. MPN = Most Probable Number 100 ml sample.

4.0 TABLES OF MONITORING REQUIREMENTS

TABLE IIB
GROUNDWATER MONITORING (Continued)

Parameter	AL	AQL	Units	Sampling Frequency	Reporting Frequency
Metals (Total):					
Antimony	0.0048	0.006	mg/l	Quarterly	Quarterly
Arsenic	0.04	0.05	mg/l	Quarterly	Quarterly
Barium	1.60	2.00	mg/l	Quarterly	Quarterly
Beryllium	0.0032	0.004	mg/l	Quarterly	Quarterly
Cadmium	0.004	0.005	mg/l	Quarterly	Quarterly
Chromium	0.08	0.1	mg/l	Quarterly	Quarterly
Cyanide (as free cyanide)	0.16	0.2	mg/l	Quarterly	Quarterly
Fluoride	3.2	4.0	mg/l	Quarterly	Quarterly
Lead	0.04	0.05	mg/l	Quarterly	Quarterly
Mercury	0.0016	0.002	mg/l	Quarterly	Quarterly
Nickel	0.08	0.1	mg/l	Quarterly	Quarterly
Selenium	0.04	0.05	mg/l	Quarterly	Quarterly
Thallium	0.0016	0.002	mg/l	Quarterly	Quarterly

4.0 TABLES OF MONITORING REQUIREMENTS

TABLE IIB
GROUNDWATER MONITORING (Continued)

Parameter	AL	AQ	Units	Sampling Frequency	Reporting Frequency
Volatile Organic Compounds (VOCs):					
Benzene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Carbon tetrachloride	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
o-Dichlorobenzene	0.48	0.6	mg/l	Semi-Annually	Semi-Annually
para-Dichlorobenzene	0.06	0.075	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,1-Dichloroethylene	0.0056	0.007	mg/l	Semi-Annually	Semi-Annually
cis-1,2-Dichloroethylene	0.05	0.07	mg/l	Semi-Annually	Semi-Annually
trans-1,2-Dichloroethylene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Dichloromethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
1,2-Dichloropropane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Ethylbenzene	0.56	0.7	mg/l	Semi-Annually	Semi-Annually
Hexachlorobenzene	0.0008	0.001	mg/l	Semi-Annually	Semi-Annually
Hexachlorocyclopentadiene	0.04	0.05	mg/l	Semi-Annually	Semi-Annually
Monochlorobenzene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Styrene	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
Tetrachloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Toluene	0.8	1.0	mg/l	Semi-Annually	Semi-Annually
Trihalomethanes (total)[41]	0.08	0.1	mg/l	Semi-Annually	Semi-Annually
1,1,1-Trichloroethane	0.16	0.2	mg/l	Semi-Annually	Semi-Annually
1,2,4 - Trichlorobenzene	0.056	0.07	mg/l	Semi-Annually	Semi-Annually
1,1,2 - Trichloroethane	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Trichloroethylene	0.004	0.005	mg/l	Semi-Annually	Semi-Annually
Vinyl Chloride	0.0016	0.002	mg/l	Semi-Annually	Semi-Annually
Xylenes (Total)	8.0	10.0	mg/l	Semi-Annually	Semi-Annually

[41]Total Trihalomethanes are comprised of Bromoform, Bromodichloromethane, Chloroform, and Dibromochloromethane.

4.0 TABLES OF MONITORING REQUIREMENTS

TABLE III
FACILITY INSPECTION (operational monitoring)

Pollution Control Structures/Parameter	Performance Levels	Inspection Frequency
Pump Integrity	Good Working Condition	Weekly
Treatment Plant Components	Good Working Condition	Weekly
Vadose Zone Injection Wells	Good Working Condition, No Biofouling, No Clogging, and no Daylighting.	Monthly

5.0 REFERENCES AND PERTINENT INFORMATION

The terms and conditions set forth in this permit have been developed based upon the information contained in the following, which are on file with the Department:

1.	APP Application dated:	April 30, 2004
2.	Contingency Plan, dated:	April 30, 2004
3.	Final Hydrologist Report dated:	November 17, 2005
4.	Final Engineering Report dated:	October 18, 2005
5.	Public Notice dated:	April 28, 2006
6.	Public Hearing, dated:	N/A
7.	Responsiveness Summary, dated:	N/A

6.1 Annual Registration Fees

The permittee is notified of the obligation to pay an Annual Registration Fee to ADEQ. The Annual Registration Fee is based upon the amount of daily influent or discharge of pollutants in gallons per day as established by A.R.S. § 49-242(D).

6.2 Duty to Comply [A.R.S. §§ 49-221 through 263]

The permittee is notified of the obligation to comply with all conditions of this permit and all applicable provisions of Title 49, Chapter 2, Articles 1, 2 and 3 of the Arizona Revised Statutes, Title 18, Chapter 9, Articles 1 through 4, and Title 18, Chapter 11, Article 4 of the Arizona Administrative Code. Any permit non-compliance constitutes a violation and is grounds for an enforcement action pursuant to Title 49, Chapter 2, Article 4 or permit amendment, suspension, or revocation.

6.3 Duty to Provide Information [A.R.S. §§ 49-243(K)(2) and 49-243(K)(8)]

The permittee shall furnish to the Director, or an authorized representative, within a time specified, any information which the Director may request to determine whether cause exists for amending or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

6.4 Compliance with Aquifer Water Quality Standards [A.R.S. §§ 49-243(B)(2) and 49-243(B)(3)]

The permittee shall not cause or contribute to a violation of an Aquifer Water Quality Standard at the applicable point of compliance for the facility. Where, at the time of issuance of the permit, an aquifer already exceeds an Aquifer Water Quality Standard for a pollutant, the permittee shall not discharge that pollutant so as to further degrade, at the applicable point of compliance for the facility, the water quality of any aquifer for that pollutant.

6.5 Technical and Financial Capability
[A.R.S. §§ 49-243(K)(8) and 49-243(N) and A.A.C. R18-9-A202(B) and R18-9-A203(E) and (F)]

The permittee shall have and maintain the technical and financial capability necessary to fully carry out the terms and conditions of this permit. Any bond, insurance policy, trust fund, or other financial assurance mechanism provided as a demonstration of financial capability in the permit application, pursuant to A.A.C. R18-9-A203(D), shall be in effect prior to any discharge authorized by this permit and shall remain in effect for the duration of the permit.

6.6 Reporting of Bankruptcy or Environmental Enforcement [A.A.C. R18-9-A207(C)]

The permittee shall notify the Director within five days after the occurrence of any one of the following:

1. the filing of bankruptcy by the permittee;

2. the entry of any order or judgment not issued by the Director against the permittee for the enforcement of any environmental protection statute or rule.

6.7 Monitoring and Records [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A206]

The permittee shall conduct any monitoring activity necessary to assure compliance with this permit, with the applicable water quality standards established pursuant to A.R.S. §§ 49-221 and 49-223 and §§ 49-241 through 49-252.

6.8 Inspection and Entry [A.R.S. §§ 49-1009, 49-203(B), and 49-243(K)(8)]

In accordance with A.R.S. §§ 41-1009 and 49-203(B), the permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to enter and inspect the facility as reasonably necessary to ensure compliance with Title 49, Chapter 2, Article 3 of the Arizona Revised Statutes, and Title 18, Chapter 9, Articles 1 through 4 of the Arizona Administrative Code and the terms and conditions of this permit.

6.9 Duty to Modify [A.R.S. § 49-243(K)(8) and A.A.C. R18-9-A211]

The permittee shall apply for and receive a written amendment before deviating from any of the designs or operational practices authorized by this permit.

6.10 Permit Action: Amendment, Transfer, Suspension, and Revocation [A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]

This permit may be amended, transferred, suspended, or revoked for cause, under the rules of the Department. The permittee shall notify the Groundwater Section in writing within 15 days after any change in the owner or operator of the facility. The notification shall state the permit number, the name of the facility, the date of property transfer, and the name, address, and phone number where the new owner or operator can be reached. The operator shall advise the new owner or operators of the terms of this permit and the need for permit transfer in accordance with the rules.

7.0 ADDITIONAL PERMIT CONDITIONS

7.1 Other Information [A.R.S. § 49-243(K)(8)]

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, the permittee shall promptly submit the correct facts or information.

7.2 Severability [A.R.S. §§ 49-201, 49-241 through 251, A.A.C. R18-9-A211, R18-9-A212 and R18-9-A213]

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby. The filing of a request by the permittee for a permit action does not stay or suspend the effectiveness of any existing permit condition.

7.3 Permit Transfer

This permit may not be transferred to any other person except after notice to and approval of the transfer by the Department. No transfer shall be approved until the applicant complies with all transfer requirements as specified in A.A.C. R18-9-A212(B) and (C).