APPENDIX 5

HYDROGEOLOGIC REPORT

URS

HYDROGEOLOGIC REPORT
CITY OF PHOENIX
SR 85 LANDFILL
BUCKEYE, ARIZONA

Prepared for
CITY OF PHOENIX

URS Job No. 23441667
COP Project No. PW17800001

August 2003

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1.0 INTRODUCTION

The City of Phoenix (City) is a municipality with a current population of over 1.3 million people. The City, through its Public Works Department, provides solid waste management services to its residents. Currently the City operates the Skunk Creek Landfill, which is estimated to reach its capacity in 2005. Therefore, the State Route (SR) 85 Landfill (Landfill) has been sited to meet the City's waste management and disposal needs. The Landfill is expected to be operational in 2005.

This report provides data for characterizing the hydrogeologic conditions of the Landfill site and surrounding area, and provides supporting data to demonstrate that the Landfill will not cause or contribute to a violation of an Aquifer Water Quality Standard (AWQS) at the applicable point of compliance (POC).

1.1 SITE LOCATION

The Landfill site is located in southwestern Maricopa County approximately 17 miles south of Interstate 10, approximately 1/2 mile west of SR 85 and immediately south of Patterson Road, as shown on Figure 1. The Landfill site is within the municipal corporate limits of the Town of Buckeye. The Gila Bend Canal and Old U.S. Highway 80 bound the site to the west. The Landfill site encompasses portions of Sections 8, 9, 10, 15, 16, 17, 21, 22, and 27, Township 3 South, Range 4 West as depicted on the Cotton Center NW (1972) 7.5-minute U.S. Geological Survey (USGS) topographic quadrangle (Figure 2).

The Landfill site covers an area of 2,652 acres and is located on agricultural land. Surrounding land use includes agriculture, commercial, and residential uses. Major developed features include SR 85, Sam Lewis Prison, and Southwest Regional Landfill. Two natural water bodies near the site include Rainbow Wash to the north and Gila River to the west.

1.2 TOPOGRAPHY

The site slopes gently to the west-southwest, ranging from approximately 860 feet above mean sea level (amsl) in elevation in the northeast corner of the property (Township 3 South, Range 4 East, Section 10) to approximately 750 feet amsl along the western boundary. The natural surface drainage of the area is to the west-southwest, toward the Gila River. The topography of the site is shown on Figure 2.

1.3 MAJOR DESIGN FEATURES

Although the Landfill site encompasses 2,652 acres of land, approximately only 2,050 acres will eventually be used for solid waste disposal; the remainder of the site will be occupied with ancillary facilities, storm water management structures, 350- to 500-foot buffer zones around the perimeter of the Landfill, as well as a 160-acre retention area at the south end of the site.

The Landfill is proposed to be built in sequential phases, beginning at the northeastern corner of the property. The basic design and operation of the Landfill will include disposal of municipal solid waste (MSW) within specified areas known as "cells." Each cell will have several 25- to 30-acre phases that are active at any given time. Farming operations will continue for as long as possible during landfill operations. Berms and landscaping will be used to screen the landfill operations as each phase is constructed. Fuel storage tanks, emergency equipment, and other operation support facilities will be located adjacent to and generally north of the initial phase of landfill cells.

The Landfill will have a maximum cap height of 150 feet above the existing grade and will be shaped in a manner to minimize visual impacts to the surrounding landscape. Native plants and grasses will be planted to blend with the surrounding area. Environmental controls will be incorporated into the Landfill design to contain the waste materials including a composite liner system that will provide groundwater protection. The maximum depth of the Landfill will range from 60 feet on the western side to 120 feet on the eastern side; the bottom of the Landfill will range from approximately 690 feet amsl on the western side to approximately 720 feet amsl on the eastern side.

5.0 PROPOSED POINTS OF COMPLIANCE

The POC is defined in A.R.S. §49-244 as a "vertical plane down gradient of the facility that extends through the uppermost aquifers underlying that facility." For the purpose of identifying POC locations, the active solid waste management unit is defined as the landfill cells (e.g., Landfill Cell Nos. 1, 2, and 3, shown on Figure 14). The City is proposing seven POCs at the locations shown on Figure 14. As per 40 CFR 258.40 requirements, the POC locations will be within 150 meters (approximately 450 feet) of the active solid waste management unit. (A.R.S. §49-244.2 requires the POC be within 750 feet from the edge of the pollutant management area [Landfill cells]). A groundwater monitor well will be installed at each of the proposed POCs, as discussed further below.

Cell 1 will be constructed in four phases and located in the southwestern quadrant of Section 10 in Township 3 South, Range 4 West. As shown in Figure 6, the current direction of groundwater flow in the vicinity of Cell 1 is south, toward a cone of depression located near Section 27. Hence, the POC monitor wells for Cell 1 will be located along the eastern and southern (down gradient) edge of the first phase area. Monitor wells will be constructed prior to the facility's initial operation at locations POC-1 and POC-2. Subsequent POC monitor wells will be installed at the locations shown on Figure 14 prior to the operation of Cells 2 and 3, as appropriate. Figure 14 also shows in background the 2002 groundwater elevation contours. Monitor well design specifications will be in accordance with 40 CFR Part 258.51 and will be submitted to ADEQ for approval prior to construction.

As the Landfill construction progresses beyond Cell 3, the City will evaluate the location of additional POC monitor wells.

In addition to the down-gradient POC wells, the City proposes to install two up-gradient wells for the purpose of characterizing background water quality. Although the specific location is not yet determined, one up-gradient monitor well will be located along the Landfill's northern boundary and the second well will be located along the northwestern boundary, near the Gila Bend canal, in Section 8.

In May 2000, Dames & Moore installed a production well in Section 17, Township 5 South, Range 4 West, approximately 12 miles south of the Landfill site (Dames & Moore 2000) as part of an unrelated project. According to the drilling log, three distinct hydrogeologic units were encountered:

- UAU: mostly coarse- to fine-grained sands with minor gravels and minor fine-grained layers from ground surface to approximately 345 feet bls.
- MFU: predominantly fine-grained sediments (silt, clay) with interbedded fine-grained sand layers from approximately 345 to 625 feet bls.
- LAU: partially cemented well- to poorly-graded sands, with a significant increase in gravel content, from 625 to 950 feet bls.

The basin-fill deposits comprise a regional aquifer ranging in thickness from less than 100 feet near the margins of the basin to more than 3,000 feet in the central part of the basin, southeast of the Town of Gila Bend. Although groundwater is produced from all three units, the main water-bearing units in the Gila Bend basin are the UAU and LAU. Groundwater in the UAU is generally unconfined to semi-confined (Rascona 1996). According to a Dames & Moore (2000) water supply investigation of the area, the UAU yields more water and is more transmissive. However, the groundwater quality of the UAU is poorer as represented by total dissolved solids (TDS) than deeper units including the MFU and LAU.

The thickness of the basin fill sediments in the area of the Landfill site is estimated to be 1,000 feet (Rascona 1996). This is consistent with the findings of the gravity survey (Oppenheimer and Sumner 1980) that indicated depth to bedrock to be less than 1,600 feet.

The nearest fault indicating Holocene (<10,000 years before present) activity is located approximately 30 miles south-southwest of the site, near the Sand Tank Mountains. Landfill siting regulations require new landfills to be sited in excess of 200 feet from known active faults or active fault zones. In addition, there is no evidence of unstable ground or subsidence (Hoque & Associates, Inc. 2003). Geological literature on the site indicates no significant seismic hazards, as defined by state and federal landfill siting regulations.

2.1.1 Site Specific Subsurface Conditions

A geotechnical investigation was conducted in December 2001 by Hoque & Associates, Inc. (2003) to determine the soil suitability and general foundation engineering constraints associated with the site. The field investigation consisted of 26 hollow-stem auger soil borings to 50 feet bls each and 21 borings to 99 feet bls each. Five additional borings were drilled in the northeastern portion of the site in August 2002 to depths of up to 150 feet bls (Hoque & Associates, Inc. 2003). Samples were retrieved at 10-foot intervals; a field geologist logged all holes, and standard penetration tests were conducted at each sample horizon. The soil samples were analyzed for particle size distribution, Atterburg limits, Proctor compaction, and moisture content. All holes were completed above the water table and abandoned by backfilling with drill cuttings or a combination of drill cuttings and cement slurry (Hoque & Associates, Inc. 2003).

Two distinct soil types were encountered on the site: a silty and clayey sand (classified as SC) in the northern portion, and silty sand (SM) in the southern portion of the site. Soil moisture varied considerably in the samples. Four of the borings (B-4, B-16, B-20, and B-29) encountered saturated conditions with water levels that were noted to occur from 21.5 to 77 feet bls. All four of these borings are located in the northwestern portion of the Landfill site. The occurrence of water at various depths in the four borings, surrounded by other borings where no water occurs, is likely the result of excess irrigation water. The water found in the vadose zone in these locations does not represent any aquifer system, perched or continuous, as current depths to groundwater are in excess of 235 feet bls in this area (see Section 2.4). None of the other 48 borings encountered free moisture or saturated conditions even though some of the soil borings were in very close proximity to the soil borings where water occurred.

As the Landfill is constructed, agricultural activities will cease in the cell where the construction is occurring, which will eliminate the source of the recharge for water to occur in the vadose zone in this area. When combined with the additional excavation activities that are part of the Landfill construction, this will eliminate any water that occurs in the vadose zone in this area.

Permeability tests on the soil samples from the site indicated that the soil within the unsaturated zone has permeability in the range of 2.6×10^{-6} centimeters per second (cm/sec) to 2.0×10^{-7} cm/sec (Hoque & Associates, Inc. 2003).

2.2 WELL INVENTORY

According to the ADWR Well Registry and Groundwater Site Inventory databases, there are 95 wells on and within a 1-mile radius of the Landfill site. Figure 2 shows the locations of the wells (a description of Arizona's well numbering system is provided in Figure 3). Table 1 provides the location, well use, depth of well, well owner, and most recent water level for each well. In cases where more than one well was registered in the same 10-acre quadrant, only one well symbol is shown on the map. These well locations are based on ADWR data. Forty-seven of the 95 wells listed on Table 1 are reportedly used for irrigation purposes. Other water uses reported for wells in this area include domestic, unused, destroyed, cathodic protection, and monitoring.

2.3 PUMPAGE HISTORY AND WATER LEVEL TRENDS

Agricultural pumpage in the Gila Bend basin began in the late 1940s and steadily increased from about 20,000 acre-feet per year (ac-ft/yr) in 1945 to about 250,000 ac-ft/yr in 1960. Agricultural pumping has fluctuated between 110,000 and 310,000 ac-ft/yr in the period up to 1990, when the USGS ceased compilation of pumpage estimates (Anning and Duet 1994). The increase in pumpage resulted in a lowering of groundwater levels, such that the present groundwater flow direction is toward a pumping center in the vicinity of Sections 15, 16, 21, and 22 of Township 3 South, Range 4 West.

Hydrographs for wells in the area show as much as 169 feet of decline in water level elevations from 1945 to the 1960s. (Groundwater levels used for the hydrographs were obtained from ADWR.) The hydrographs indicate that since approximately 1980, a leveling off of the decline rate has occurred. This can probably be attributed to several factors, including a reduction in irrigated acreage, increased irrigation efficiency, and increased river recharge during periods of above-normal precipitation in the early 1980s and 1990s.

The surrounding areas and the Landfill site have been developed for agricultural purposes and, aside from the Landfill and Sam Lewis Prison, will likely continue to be cultivated. In the future, groundwater will continue to be utilized as a source of supply regardless of the type of development that will occur. To the extent that future development is for non-agricultural use, it is likely that use would decrease; however, groundwater pumpage in the basin is expected to continue in the future and, hence, groundwater levels are not expected to return to predevelopment levels.

2.4 DEPTH TO GROUNDWATER AND DIRECTION OF FLOW

Groundwater level measurement data are available dating back to 1945. As discussed below, an evaluation of these data (Appendix A) indicates that three significant periods of available data include 1945, 1993, and 2002. The 1945 data provided water level information when the basin was under minimal stress and can be interpreted as representative of "pre-development" conditions. The 1945 water level data represent the highest historic groundwater conditions for which data are available. The 1993 data provided water level information when groundwater levels were impacted by increased surface water flows from significant flooding on the Gila

River. The 2002 data provided the most recent information on the depths to groundwater in the vicinity of the Landfill.

2.4.1 1945 Water Levels

The USGS reported the earliest groundwater level measurements collected from wells along the Gila Bend Canal in 1945. The 1945 data, which is limited to wells along the Gila Bend Canal on the west side of the Landfill site, indicate that depth to groundwater in the vicinity of the Landfill site ranged from about 65 to 73 feet bls near the Gila Bend Canal to over 150 feet bls near the highest elevation on the east side of the site. The water level data were extrapolated from the groundwater contours from the west to the east across the Landfill site based on the conservative assumption that the water table was relatively flat across the area. Groundwater elevation ranged from 676 to 683 feet amsl across the Landfill site.

A groundwater level contour map of the 1945 groundwater levels is provided on Figure 4. Direction of groundwater flow in 1945 in the area of the Landfill site was to the south, generally following the flow path of the Gila River channel. The hydraulic gradient at that time is estimated to have ranged from 0.0002 foot/foot (1.2 feet/mile) to 0.0009 foot/foot (4.7 feet/mile).

2.4.2 1993 Water Levels

In November 1993, ADWR conducted a basin-wide study and collected water levels from over 100 wells in the Gila Bend basin. Figure 5 presents a groundwater contour map of the area surrounding the Landfill site from water levels obtained by ADWR in 1993. Based on the November 1993 data, groundwater flow direction in the vicinity of the Landfill site is to the east due to flooding conditions as discussed further in Section 2.7, then southeast of Township 3 South, Range 4 West. The hydraulic gradient ranged from 0.00187 foot/foot (9.9 feet/mile) to 0.00377 foot/foot (19.9 feet/mile). Depth to water in November 1993 for the immediate area around the Landfill site ranged from 119 feet bls (corresponding water level elevation is 629 feet amsl) on the western side to 208 feet bls (604 feet amsl) along the eastern side of the site.

2.4.3 2002 Water Levels

In June 2002 during the agricultural pumping season, URS measured water levels in 13 wells to establish both groundwater elevations and directional flow for groundwater in the area (Figure 6). Eleven of the 13 wells are in the same township/range as the Landfill site. Table 2 lists the wells and corresponding water levels. June 2002 groundwater levels ranged from 238 feet bls (552 feet amsl) in the north-central portion of the site to 274 feet bls (541 feet amsl) in the southeastern corner of the site.

The June 2002 data indicated that groundwater entering the Gila Bend basin from the north and as recharge along the Gila River flows southeasterly toward a cone of depression centered around the agricultural wells in the southeastern quadrant of Township 3 South, Range 4 West (see Figure 6). South of the Landfill site, beyond the zone of capture for the agricultural wells, the regional groundwater flow direction is to the southeast and south. The hydraulic gradient in June 2002 for the area west of the Landfill site was calculated to be approximately 0.00507 foot/foot (26.8 feet/mile).

2.4.4 Discussion of Water Level Data

Water level hydrographs for four wells in the vicinity of the Landfill are presented in Figure 7. One well, C-03-04 06BBA (see Figure 2), has data back to 1945 and shows that water levels declined significantly once agricultural activities began in the basin. Fifty-six years of measurements indicate that the water table has not returned to the pre-development level. The closest it came was in November 1993 when the water level was measured at 90.7 feet bls (29 feet below the 1945 measurement). Water level data from ADWR's Groundwater Site Inventory database (see Appendix A) were used to construct the well hydrographs shown on Figure 7. Water level data for all wells included in the site inventory within Township 3 South, Ranges 4 and 5 West are also provided in Appendix A. See Section 2.7 for further discussion regarding groundwater levels in response to flood events.

Figure 8 shows depths to groundwater for three conditions that include pre-development water levels, flood stage water levels, and current conditions. Three wells within the boundaries of the Landfill site were measured in November 1993 by ADWR and June 2002 by URS. Groundwater level declines due to pumping for agricultural irrigation are evident when the June 2002 water level data collected by URS is compared with the November 1993 data collected by ADWR. The June 2002 water levels are 75 feet (in well C-03-04 16ABB) to 94 feet (in well C-03-04 21DDA) lower than the November 1993 water levels.

The bottom of the Landfill will range from approximately 690 feet amsl on the western side to 720 feet amsl on the eastern side. Comparing the elevation of the bottom of the Landfill with the three above time periods indicates that the Landfill in all three scenarios is above the groundwater table. The thickness of the vadose zone (unsaturated subsurface soils) between the bottom of the Landfill and the water table ranges from 14 feet (1945 pre-development levels) to 138 feet (2002 level) on the western side, and 37 feet (1945 level) to 179 feet (2002 level) on the eastern side.

The 1993 groundwater level map presents a scenario, should severe flooding again occur on the Gila River that recharges the groundwater system in this area, where the bottom of the Landfill site will remain above the groundwater table even during a significant flooding and/or a series of storm events. See Section 2.7 for further analysis.

2.5 AQUIFER HYDRAULIC PROPERTIES

Transmissivity for wells in the Gila River basin was estimated from specific capacity data (pumping rate divided by drawdown) by Manera (1987) and ranged from 17,000 to 541,000 gallons per day per foot (gpd/ft) for wells south of Gillespie Dam. Using Manera's estimates for wells in the immediate vicinity of the Landfill site, the average transmissivity is about 200,000 gpd/ft.

In September and October 2001, URS conducted long-term aquifer tests on six production wells for an unrelated project, all located in Township 5 South, Range 4 West, approximately 9 miles south of the southern end of the Landfill site. Transmissivity values from the pumping tests for wells screened in the MFU and LAU were estimated at 56,000 to 128,700 gpd/ft (URS 2002). Data from the recovery tests yielded transmissivity values ranging from 30,500 to 121,000 gpd/ft (URS 2002). Storativity values ranged from 1.26×10^{-3} to 1.03×10^{-6}.

An estimate of groundwater velocity can be obtained by using the values obtained from the long-term aquifer tests conducted in September 2001 (transmissivity and corresponding saturated thickness), the hydraulic gradient obtained from the June 2002 groundwater level data (0.00507 foot/foot), and an estimated effective porosity of 25 percent. These values produce groundwater velocities ranging from 0.28 to 0.72 feet/day. Groundwater velocity may vary in other parts of the basin where hydraulic gradient, effective porosity, and hydraulic conductivity are different.

2.6 GROUNDWATER RECHARGE AND DISCHARGE

Groundwater in the Gila Bend basin receives recharge primarily from infiltration of perennial flow and runoff events in the Gila River. Smaller amounts of recharge occur as underflow from the Rainbow Valley sub-basin to the northeast, as infiltration from smaller stream channels during runoff events, from infiltrated irrigation water, and from mountain front recharge along the basin margins. Direct seepage from precipitation is negligible. Groundwater discharges mainly to pumping wells and as underflow to the south.

2.7 GROUNDWATER LEVELS IN RESPONSE TO FLOOD EVENTS

2.7.1 Streamflow Data Corresponding to Flood Events

Groundwater levels in the area of the Landfill site fluctuate in response to variations in pumpage and recharge to the aquifer from flow in the Gila River. Annual flows of the Gila River vary from negligible flow to over 40,000 cubic feet per second (ft^3/sec). The USGS maintains a stream gaging station (09519500) located just below Gillespie Dam on the Gila River, in Section 28 of Township 2 South, Range 5 West, approximately 6 miles northwest of the Landfill site. Streamflow data have been collected from this gaging station since 1922. Figure 9 shows the mean daily stream flow from 1922 through 2000. According to the USGS data, the largest mean monthly stream flow through this specific gaging station occurred in January 1993, at 47,510 ft^3/sec. The 1993 flood event was a rare occurrence that resulted from heavy storms and runoff in the watershed along the upper Salt River. Saguaro, Canyon, Apache, and Roosevelt lakes filled to capacity, forcing Salt River Project (SRP) to release water into the normally dry Salt River. Until the 1993 flood event, two dams controlled flow on the Gila River: Gillespie Dam, upstream of the Landfill site; and Painted Rock Dam, downstream of the Landfill site. In January 1993 Gillespie Dam was breached when a 135-foot section of the structure collapsed during flooding. As a result, the downstream Painted Rock Dam also reached full capacity in January 1993 causing floodwaters to back up along the upstream portion of the Gila River. This flooding did not impact the Landfill site due to the fact that the site is approximately 90 feet above the Painted Rock Dam spillway elevation of 661 feet amsl.

Since the 1993 flood event there has been construction of numerous upstream flood control structures. Due to a substantial increase in storage capacity behind Roosevelt Dam, the frequency and magnitude of flood events in the Gila River are expected to be substantially reduced. Modifications to Roosevelt Dam were completed in 1996 and included adding 77 feet of height to the dam and 20 percent more total storage capacity, to 1,609,168 acre-feet (USBR 2002). In addition to the expansion of storage capacity behind Roosevelt Dam, there has been an increase in use and diversion of surface water along both the Salt and Verde rivers due to additional development demands in the Phoenix metropolitan area.

2.7.2 Groundwater Data in Response to Flood Events

A review of continuous water level data from wells in the area of the Landfill provides an indication of the aquifer's response to flood events. Well C-03-04 17ADD, located immediately adjacent to the western edge of the Landfill site (see Figure 2), is an ADWR Index well, equipped with a strip chart and float which records continuous groundwater levels. Groundwater level measurements for this well date back to 1961 (see Figure 7); continuous groundwater level records began in 1988. According to ADWR data, the groundwater level in well C-03-04 17ADD reached a record high of 106.4 feet bls on February 17, 1994, indicating a one-year time period between the flood event and the peak groundwater level.

2.7.3 Groundwater Level Response to 1979 and 1983 Flood Events

The second largest mean monthly stream flow recorded at the Gila River gaging station was in January 1979, at 14,549 ft^3/sec. Water level data for well C-03-04 17ADD were collected in February 1979 but not again until 1983, hence the water level response to this "flood" is not available. Water level data for well C-03-04 06BBA show a response of approximately 15 feet. However, water level data for well C-03-04 09BAA responded by a water level rise of almost 60 feet (see Figures 7 and 10; Appendix A). This data point is likely anomalous due to the fact that well C-03-04 09BAA is located approximately 2½ miles from the Gila River and that the significantly larger flood event of 1993 likely caused a water level response (rise) in this well of only approximately 20 feet.

2.7.4 Groundwater Level Response to 1993 Flood Event

Floodwaters retained behind the Painted Rock Dam probably continued to contribute recharge to the aquifer months after the January 1993 flood event. Although the flood event occurred in 1993 and the highest recorded water levels occurred in 1994, the water level contour map was constructed based on the combined 1993 water level data. The 1993 data were used to construct the water level contour map because of the numerous available groundwater level measurements that were collected during that year. Only seven groundwater level measurements were collected in 1994 versus 74 collected in 1993 (see Appendix A). Not all groundwater level measurements collected can be used to construct the water level contour maps because measurements have been made on the same well for different months of the year. For wells with multiple data points in 1993, the November data were chosen, because in November ADWR collected data from many wells in the area.

As noted above, after this flood event passed, the effects were transmitted through the aquifer, and depths to water increased throughout this area. This effect is demonstrated in well C-03-04 17ADD: the February 1994 water level was approximately 12 feet higher than the November 1993 level. Therefore, it is reasonable and conservative to assume that the peak groundwater level in response to the 1993 flood event was approximately 10 to 15 feet higher than shown on the 1993 groundwater level contour map (see Figure 5). Prior to the January 1993 flood event, groundwater levels in well C-03-04 17ADD ranged from 167 feet bls in August 1992 to 153 feet bls in November 1992 (corresponding water level elevations: 581 to 595 feet amsl). Other wells with available water levels before and after the January 1993 flood event show less of a change.

Figure 7 shows a hydrograph from four wells, including well C-03-04 17ADD. These data indicate that water levels collected by ADWR during their November 1993 basin-wide study were at or near the maximum water level elevation since pre-development conditions. Figure 10 illustrates the correlation between surface water flows in the Gila River during flooding and the response in nearby wells (C-03-04 06BBA, C-03-04 09BAA, and C-03-04 17ADD) showing changes in groundwater levels. Groundwater level rises in response to the 1993 flood event ranged from approximately 40 to 70 feet (see Figure 10; Appendix A). It is evident from the hydrograph data shown in Figure 10 that groundwater levels were affected by prior storm events beginning in 1992. This is likely due to a combination of prior years' flooding events and reduced groundwater pumpage from wells within the study area (see Figure 10).

2.7.5 Summary of Groundwater Level Response to Flood Events

Vertical cross-sections showing land surface, maximum landfill sump depth, and water level elevations from 1945 (predevelopment conditions), November 1993 (peak flood conditions), and June 2002 (current conditions) are presented on Figure 11. The cross-sections show the vertical separation between the Landfill base and the groundwater level for the three selected years. Based on increased management of flood flows, and continued groundwater pumpage in the basin, the depth to groundwater beneath the Landfill site is expected to remain at levels greater than the 1993 groundwater levels (see Figures 8 and 11).

2.7.6 Current Conditions

The most recent recorded depth to groundwater measurements are from June 2002 and range from 238 feet bls in the north-central portion of the Landfill site to 274 feet bls in the southeastern corner of the site. Based on 2002 data for cells on the east side of the Landfill, the distance to groundwater from the bottom of the Landfill will be approximately 179 feet on the east side of the Landfill site to 138 feet in the southwestern portion of the site (see Figure 11).

2.8 GROUNDWATER QUALITY

In general, groundwater quality in the Gila Bend basin is poor, primarily due to poor surface water quality and agricultural irrigation water recharge. A groundwater basin investigation conducted by ADWR in 1981 consisted of water level and water quality data collection (Sebenik 1981). The ADWR water quality data focused on dissolved solids and fluoride and included a series of Stiff (1951) diagrams for selected wells in the Gila Bend basin. In the northern portion of the basin, in the area from Gillespie Dam to Cotton Center, specific electrical conductivity (EC) values, a measure of the dissolved solids, ranged from 3,100 to 8,200 micro Siemens per centimeter (μS/cm) (Sebenik 1981). The EC value can be multiplied by 0.6 to obtain a reasonable estimate of the TDS concentration for most groundwaters. The TDS range for the wells sampled in the northern portion of the Gila Bend basin would then range from 1,860 and 4,920 milligrams per liter (mg/L).

Although there is no drinking water standard (primary Federal maximum contaminant level [MCL]) for TDS, the U.S. Environmental Protection Agency (EPA) has established a secondary MCL for TDS of 500 mg/L. Secondary MCLs are based on aesthetic qualities (taste, odor, color) and are not enforceable. The TDS concentrations in the northern Gila Bend basin may be suitable for livestock water and some crops but would be difficult to use for most crops (Bagley et al. 1998; Follet and Soltenpour 1999).

Fluoride ranged from 0.6 to 4.6 mg/L, in some cases above the AWQSs of 4.0 mg/L and well above the livestock recommended level of 2.0 mg/L (Anon 1984). Of the 16 wells sampled by ADWR, four contained nitrate in concentrations above the AWQS; the AWQS for nitrate is 10 mg/L. Stiff diagrams indicated sodium-chloride-type groundwaters.

ADWR also collected groundwater quality samples from the Gila Bend basin from 1991 through 1993. The ADWR data indicate that the EC of the groundwater in the vicinity of the Landfill ranged from 1,920 to 3,750 μS/cm (Rascona 1996). This range of EC values converts to 1,152 to 2,250 mg/L TDS, which is above the secondary MCL of 500 mg/L. Groundwater in the vicinity of the Landfill site was shown to contain higher concentrations of calcium and magnesium than in the southern and western portions of the basin (Rascona 1996).

In addition to the aquifer tests conducted by URS in September 2001 on the six production wells, zonal groundwater samples (samples from specific depth intervals bls, representative of aquifer water quality at those depths) were collected from one of the wells (located approximately 9 miles south of southern end of the Landfill site). Analytical results are shown in the table below:

Sample Interval (feet bls)	pH (S.U.)	Conductivity (μS/cm)	TDS (mg/L)
375 – 395	8.17	3,300	1,800
453 – 473	8.29	1,700	970
690 – 711	8.10	3,400	1,800
830 – 850	7.82	6,100	3,500

In December 2001, URS collected one sample from an irrigation well (well C-03-04 09CAA) formerly used by Bioflora Systems, Inc. The sample was analyzed for inorganic and organic compounds, including volatile organic compounds, semi-volatile organic compounds, pesticides and polychlorinated biphenyl compounds. The results of the analysis are provided in Appendix B. The depth to water in well C-03-04 09CAA was 258.5 feet bls. Analytical results showed no organic compounds or metals in concentrations above the laboratory reporting limits, with the exception of zinc (0.31 mg/l). However, nitrate was 13.0 mg/L, which is above the AWQS of 10 mg/L. Fluoride was 3.0 mg/L (AWQS for fluoride is 4.0 mg/L). Analytical results for this sample are provided in Appendix B.

3.0 SURFACE WATER FEATURES

The two main natural water bodies near the Landfill site are the Gila River on the west and Rainbow Wash on the northeast (see Figures 1 and 2). Manmade surface water features within the basin include Gillespie Dam, Gila Bend Canal, Painted Rock Dam, and Painted Rock Reservoir. The Gila River enters the basin at Gillespie Dam about 6 miles northeast of the Landfill site and flows southward along the western side of the basin. The Gila River flows perennially due to effluent discharge from the 91st Avenue Wastewater Treatment Plant in Phoenix. The river is partially diverted at Gillespie Dam into two irrigation canals. The Enterprise Canal transports water along the western edge of the basin to agricultural fields on the west side of the Gila River beginning about 6 miles south of the dam. The Gila Bend Canal transports water along the east side of the Gila River to agricultural areas north and east of Gila Bend, Arizona.

Figure 12 presents the delineation of the 100-year floodplains of the Gila River and Rainbow Wash, as well as the floodplain areas caused by damming of stormwater behind the elevated Gila Bend Canal (hereafter referred to as the Gila Bend Canal floodplains). The Landfill site lies outside of the 100-year floodplain of the Gila River and Rainbow Wash. The delineation of the floodplain is in accordance with requirements of the Flood Control District of Maricopa County (2000).

Approximately 50 acres of the western edge of the Landfill site are located within the current 100-year floodplain of the Gila Bend Canal. The Gila Bend Canal forms a barrier for stormwater flowing southwest following the natural ground slope. Stormwater is allowed to cross the Gila Bend Canal through an overchute (see Figure 12). Since the overchute has limited capacity, during a 100-year, 24-hour storm, water is forced to pond temporarily on the east side of the canal forming the 100-year floodplain. However, the Landfill cells will be developed either outside the floodplain, or drainage improvements for the Landfill will eliminate the floodplain at the upstream (east) side of the canal within the operational footprint of the Landfill. Additional details are presented in a drainage report prepared by URS (URS 2003a).

4.0 DEMONSTRATION OF COMPLIANCE WITH AWQS

Arizona Revised Statutes (A.R.S.) §49-243.B.2 states that "pollutants discharged will in no event cause or contribute to a violation of aquifer water quality standards at the applicable point of compliance." The demonstration of compliance with AWQS for the Landfill is based on the engineering design, construction, and integrity of the composite liner system and leachate collection and removal system (LCRS). Other factors include the arid climate (low rainfall and high evaporation rates in this area), depth to groundwater, natural attenuation capacity of the soils in the vadose zone, and the groundwater-monitoring program (see Section 4.3). The Landfill is designed to prevent a discharge to the aquifer.

4.1 LINER SYSTEM

Standard liner design criteria for Municipal Solid Waste Landfill Facilities (MSWLF) are specified in Title 40 of the Code of Federal Regulations (40 CFR), Chapter I, Section 258.40. The standard liner design consists of a "composite liner" that is composed of an upper component of a minimum 30-mil flexible membrane liner (FML) and a lower component of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. In addition, 40 CFR 258.40 requires that the LCRS be designed to maintain less than a 30-cm depth of leachate over the liner. Alternative designs are allowed if the alternative design can be shown to be capable of controlling the migration of hazardous constituents to the groundwater.

The City is proposing an alternative liner design for the Landfill that will provide comparable or greater protection to the groundwater. The proposed composite liner system for the Landfill will consist of the following components (listed from top to bottom):

- 2-foot operations soil layer
- Non-woven geotextile (bottom of Landfill only)
- Drainage geonet layer (bottom of Landfill only)
- 60-mil high density polyethylene (HDPE) liner
- Geosynthetic clay liner (GCL) with a permeability no more than 3×10^{-9} cm/sec

The composite liner system for the Landfill differs from the standard liner design in that the HDPE liner will be 60-mil and a GCL will be included. The reinforced GCL will be placed directly on top of the native soil over the bottom and side slopes of the Landfill. The GCL provides a layer of low permeability liner beneath the 60-mil HDPE liner. The permeability of this material is on the order of 3 x 10^{-9} cm/sec. Two feet of compacted clay may be used as an alternative to the GCL; the compacted clay would have a permeability no greater than 1 x 10^{-7} cm/sec. The 60-mil HDPE liner will be placed directly on top of the GCL or clay. The HDPE liner will serve as a containment layer for any leachate that infiltrates to the bottom of the Landfill.

A drainage geonet will be placed on top of the HDPE liner on the bottom of the Landfill. The drainage geonet will convey any leachate that infiltrates to the bottom of the Landfill to a collection trench and sumps located along the perimeter of the Landfill.

A non-woven geotextile will be installed over the geonet. This geotextile will serve as a filter layer between the 2-foot soil operations layer and the drainage geonet to prevent any soil materials from clogging the geonet.

The 2-foot operations soil layer will be placed directly on top of the geotextile. This soil layer will serve as a protective cover to prevent damage to any of the components of the composite liner system.

In order to demonstrate the effectiveness of the City's alternative liner system design, the Hydrologic Evaluation of Landfill Performance (HELP) computer model (version 3.07) was used to analyze the potential for fluid migration through the liner system. The HELP model was originally developed by the U.S. Army Engineer Waterways Experiment Station and is approved by the EPA for simulating water movement across, into, through, and out of landfills. The model results show that the proposed liner system using GCL performs as well as the standard liner system design in preventing leachate infiltration through the composite base liner system (URS 2003b). The equivalency demonstration comparing leachate infiltration rates through the composite liner systems for the standard and the alternative cases is presented in the Engineering Report (URS 2003b).

4.2 LEACHATE COLLECTION AND REMOVAL SYSTEM

The design of the Landfill will incorporate an LCRS to collect and remove leachate from the landfill while maintaining less than 1 foot (30 cm) of head over the liner system during the 25-year, 24-hour storm. The LCRS consists of a drainage geonet, collection ridges and trenches, lateral gravel trenches and pipes, header pipes, and collection sumps.

The excavation side slopes of the Landfill will be constructed at a maximum 3:1 (H:V) slopes. Each Landfill cell will have a minimum bottom slope of 3 percent toward collection trenches located throughout the Landfill cells. Each collection trench will contain a perforated collection pipe or gravel bedding that slopes at 1.5 percent into collection header pipes that convey leachate to the sump. Leachate captured in the collection sump will be pumped out of the sump. Details of the LCRS are presented in the Engineering Report for the Landfill (URS 2003b).

4.3 OTHER FACTORS

The time of travel of leachate from a MSWLF to the groundwater is primarily dependent upon five factors: the precipitation rate, evaporation rate, net infiltration rate, depth to groundwater, and permeability of the soil. Average annual rainfall (precipitation) in the area of the Landfill site is 6.08 inches (Western Regional Climate Center 2003); the average annual evaporation rate is approximately 90.0 inches (Farnsworth and Thompson 1982). The water balance resulting from the annual precipitation rate minus the annual evaporation rate indicates that a negligible amount, if any, direct precipitation on the Landfill or land surface will infiltrate into the subsurface beyond a few feet. As discussed in Section 2.4, the most current (June 2002) depth to groundwater in the area of the Landfill site ranged from 238 feet bls in the north-central portion of the site to 274 feet bls in the southeastern corner of the site (see Figure 11). The permeability of the soils within the vadose zone in the area of the Landfill site range from 2.6×10^{-6} cm/sec to 2.0×10^{-7} cm/sec (Hoque and Associates 2003).

The relatively deep groundwater in the area of the Landfill also provides a thick vadose zone for the processes of natural attenuation to operate. Natural attenuation refers to the dilution, dispersion, (bio)degradation, irreversible sorption, and/or radioactive decay of contaminants in soils and groundwater. The primary natural attenuation mechanisms for the removal of metals from soil and groundwater are dilution and sorption to mineral surfaces (clay, silt) and/or soil organic matter. Natural attenuation of organic contaminants typically occurs from degradation by microorganisms.

Finally, as discussed in Sections 6.0 and 7.0, the City will implement a groundwater monitoring program that includes establishing background water quality and periodic sampling of down-gradient monitor wells to allow for early detection of groundwater impacts.

4.4 EPA NO-MIGRATION EXEMPTION

EPA regulations, 40 CFR Part 258.50(b), allow an exemption to groundwater monitoring requirements if the facility can demonstrate that, due to specific climatic and hydrogeologic conditions, there is no potential for migration of hazardous constituents from the landfill to the groundwater during the active life and post-closure care period for the MSWLF. This exemption is referred to as the No-Migration exemption. Screening criteria for the No-Migration exemption include the same general factors as discussed above in Section 4.3 including precipitation rate, evapotranspiration potential, depth to groundwater, and permeability of the soil. The EPA provides a screening tool, replicated in Figure 13, to assist MSWLF owners and operators in evaluating their site's potential for the exemption (EPA 1999). Figure 13 shows four columns, each column representing one of the four screening criteria. Site-specific values for each criterion are plotted on the corresponding column. Specific details of the connection and intersection of lines are provided on Figure 13. The point of intersection within the center column indicates a facility's probability of success for obtaining a No-Migration exemption. As shown on Figure 13, and using site-specific values, the Landfill would have a good probability of qualifying for the No-Migration exemption.

Although the City intends to conduct groundwater monitoring as proposed in Sections 6 and 7, the No-Migration exemption evaluation supports the demonstration of compliance with AWQS for the Landfill.

5.0 PROPOSED POINTS OF COMPLIANCE

The POC is defined in A.R.S. §49-244 as a "vertical plane down gradient of the facility that extends through the uppermost aquifers underlying that facility." For the purpose of identifying POC locations, the active solid waste management unit is defined as Landfill Cell Nos. 1, 2, and 3, shown on Figure 14. The City is proposing seven POCs at the locations shown on Figure 14. As per 40 CFR 258.40 requirements, the POC locations will be within 150 meters (approximately 450 feet) of the active solid waste management unit. (A.R.S. §49-244.2 requires the POC be within 750 feet from the edge of the pollutant management area [Landfill cells]). A groundwater monitor well will be installed at each of the proposed POCs, as discussed further below.

Cell 1 will be constructed in four phases and located in the southwestern quadrant of Section 10 in Township 3 South, Range 4 West. As shown in Figure 6, the current direction of groundwater flow in the vicinity of Cell 1 is south, toward a cone of depression located near Section 27. Hence, the POC monitor wells for Cell 1 will be located along the eastern and southern (down gradient) edge of the first phase area. Monitor wells will be constructed prior to the facility's initial operation at locations POC-1, POC-2, and POC-3. Subsequent POC monitor wells will be installed at the locations shown on Figure 14 prior to the operation of Cells 2 and 3, as appropriate. Figure 14 also shows in background the 2002 groundwater elevation contours. Monitor well design specifications will be in accordance with 40 CFR Part 258.51 and will be submitted to ADEQ for approval prior to construction.

As the Landfill construction progresses beyond Cell 3, the City will evaluate the location of additional POC monitor wells.

In addition to the down-gradient POC wells, the City proposes to install two up-gradient wells for the purpose of characterizing background water quality. Although the specific location is not yet determined, one up-gradient monitor well will be located along the Landfill's northern boundary and the second well will be located along the northwestern boundary, near the Gila Bend canal, in Section 8.

6.0 PROPOSED GROUNDWATER MONITORING PROGRAM

This section discusses the City's proposed groundwater monitoring (Detection and Assessment Monitoring) program for the Landfill site. The proposed groundwater monitoring program will consist of three separate phases:

1. Ambient, or background, monitoring of both up-gradient and down-gradient POC wells
2. Compliance monitoring of down-gradient POC wells only
3. Assessment monitoring of down-gradient POC wells, in the event of an Alert Level or Aquifer Quality Limit exceedance

The monitoring program presented in this section complies with the requirements set forth in the EPA's Subtitle D regulations, *EPA Criteria for Municipal Solid Waste Landfills* (40 CFR Part 258.54; 56 FR 51016, October 9, 1991; amended at 57 FR 28627, June 26, 1992.)

For the initial phase of groundwater monitoring, the City proposes to collect 12 consecutive months of groundwater samples from each up-gradient and down-gradient POC monitor well upon each well's completion in order to establish ambient or background conditions. The 12 months of data collected from these wells will represent the "background" groundwater quality.

These groundwater samples will be analyzed for all of the parameters included in Appendix I of 40 CFR Part 258 (Appendix C). In addition to the parameters listed in Appendix I, the City will analyze the initial 12 groundwater samples for alkalinity, TDS, potassium, calcium, magnesium, fluoride, and nitrate in order to provide important groundwater chemistry data and allow mass and charge balance checks on the consistency of the data.

Groundwater sampling of the POC wells will be conducted according to the protocol specified in 40 CFR Part 258.53 and presented in Appendix D of this report. Upon obtaining the initial 12 months of groundwater quality analyses, these data will be statistically evaluated using either the tolerance or upper prediction interval method. A report will be prepared by the City and submitted to ADEQ. The report will present the 12 months of laboratory analytical data in a tabulated format and include proposed Alert Levels (AL) and Aquifer Quality Limits (AQL) for each constituent, along with the calculations of the proposed ALs and AQLs.

Once the ALs and AQLs have been established, semi-annual compliance monitoring of the down-gradient POC wells will commence. The semi-annual compliance samples will be collected according to the protocol presented in Appendix D. The laboratory analyses from each well will be compared to the established ALs and AQLs to determine if any constituent is present at a level above the established AL or AQL

The initial 12 months of groundwater quality data will also be evaluated for the purpose of preparing an abbreviated list of the parameters from Appendix I (40 CFR Part 258). Chemicals or compounds that were not detected in the groundwater in the 12 months of background sampling may be proposed to be eliminated from the semi-annual sampling. The abbreviated list of semi-annual sampling parameters will be submitted to ADEQ for review and approval prior to implementation.

If an exceedance of an AL or AQL occurs, the City will implement the Assessment Monitoring Program (discussed below in Section 7.0).

7.0 ASSESSMENT MONITORING PROGRAM

Part 258.55 of 40 CFR states "Assessment monitoring is required whenever a statistically significant increase over background has been detected for one or more of the constituents listed in the Appendix I to this part or in the alternative list approved in accordance with § 258.54(a)(2)." The purpose of an Assessment Monitoring Program is to systematically determine the cause of a significant, error-free, exceedance over background of a regulated, groundwater quality parameter, and to assess the exceedance of any AL for constituents listed in Appendix C. The Assessment Monitoring Program will conform to 40 CFR Part 258.55(a)-(f) of the federal solid waste regulations as provided in Appendix E.

If the concentration of a constituent is determined to exceed the established AL or AQL, the City will, at a minimum:.

- Note the event in the facility operating record,
- Perform statistical analysis to see if it is a statistically significant increase; if so,
- Notify ADEQ within 14 days of determination of the exceedance.

If the AL or AQL exceedance is the result of an error in sampling, calculation, analysis, or statistical application, this will be noted in the record with appropriate demonstration of the source of the error, brief description of the resampling/reanalysis/recalculation event, and corrective measure to avoid future errors.

In the event of a statistically significant exceedance above background of an AL or AQL that is not due to a clear and specific error, the City will:

1. Collect a verification sample from the well(s) that contained the exceedance within 90 days of determining that the exceedance is not due to laboratory or sampling error
2. Submit the sample for analyses of all the parameters listed on Appendix II, 40 CFR Part 258
3. Upon receiving laboratory analyses for the verification sample, compare results to background data

4. If the concentrations of all Appendix II constituents in the verification sample(s) are shown to be at or below background concentrations, the City will notify ADEQ of this finding and will return to semi-annual compliance monitoring

If the concentrations of any Appendix II constituents in the verification sample(s) are above ALs, AQLs, and/or background concentrations, then specific actions required by the Assessment Monitoring Program will be implemented by the City as applicable in accordance with 40 CFR 258.55 (Appendix E).

8.0 SUMMARY AND CONCLUSIONS

The Landfill site is located in the central-north portion of the Gila Bend groundwater basin. The most recent recorded depth to groundwater measurements are from June 2002 and range from 238 feet bls in the north-central portion of the Landfill site to 274 feet bls in the southeastern corner of the site. Corresponding groundwater elevations for these depths to groundwater are 552 feet and 541 feet amsl, respectively. The elevation of the bottom of the Landfill ranges from 690 feet amsl on the western portion of the site to 720 feet amsl on the eastern edge of the site. The thickness, therefore, of the vadose zone between the bottom of the Landfill and the groundwater levels collected in June 2002 ranges from 138 feet to 179 feet. Groundwater level data obtained from 1945 (pre-development levels) and 1993 (flood levels) also show that the bottom of the Landfill will remain above the groundwater table.

The largest mean monthly stream flow through this specific gaging station (No. 09519500) occurred in January 1993, at 47,510 ft^3/sec. In January 1993 Gillespie Dam upstream of the Landfill site was breached when a 135-foot section of the structure collapsed during flooding. As a result, the downstream Painted Rock Dam also reached full capacity in January 1993 causing floodwaters to back up along the upstream portion of the Gila River. This flooding did not impact the Landfill site due to the fact that the site is approximately 90 feet above the Painted Rock Dam spillway elevation of 661 feet amsl. Groundwater level rises in response to the 1993 flood event ranged between approximately 40 to 70 feet (see Figure 10; Appendix A) as shown by hydrographs for wells C-03-04 06BBA, C-03-04 09BAA, and C-03-04 17ADD. The 1993 groundwater levels are approximately 75 feet below the 1945 groundwater elevations.

The groundwater quality in the Gila River basin is, in general, poor. In the vicinity of the Landfill site, TDS is typically above 1,000 mg/L; the secondary Federal MCL for TDS is 500 mg/L. Nitrate concentrations are frequently above the AWQS of 10 mg/L.

The Landfill will be designed and constructed with a LCRS and a composite liner system to protect the groundwater. The LCRS is designed to remove leachate from the Landfill, maintaining less than 1 foot of head over the liner system during a 25-year, 24-hour storm event. The composite liner system design consists of (bottom to top) a low-permeability GCL (or 2-foot clay layer), a 60-mil HDPE liner, a geonet drainage layer, a non-woven geotextile, and a 2-foot operations soil layer.

To monitor groundwater quality, the City is proposing to install two up-gradient monitor wells and seven down-gradient POC wells for the first three cells of the Landfill construction. The proposed locations will be within 150 meters (approximately 450 feet) of the active solid waste management unit. In addition, the City will develop and implement a groundwater monitoring program consisting of a Detection Monitoring Program and an Assessment Monitoring Program in accordance with the requirements specified in 40 CFR Sections 258.54 and 258.55.

The Landfill has been designed, and will be constructed, with a composite liner system and LCRS to prevent any migration of leachate from the Landfill to groundwater.

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TABLES

TABLE 1
WELLS LOCATED ON AND WITHIN 1 MILE OF THE SR 85 LANDFILL SITE

	Cadastral Location	ADWR Registration Number	Well Type	Water Use	Well Depth	Well Casing Depth	Well Casing Diameter	Well Owner	Most Recent Depth to Groundwater Measurement	Date of Most Recent Water Level Measurement
1	C-03-04 04AAA	55-613622	Non-exempt	Irrigation	377	293	8	ACFSC Properties Corporation		
2	C-03-04 04ACB	55-613624	Non-exempt	Irrigation	337	280	8	ACFSC Properties Corporation		
3	C-03-04 04BAA	55-808064		Irrigation	250	250		Bruce & Cameron Farm	230	01/02/1978
4	C-03-04 04BCB	55-582217							198.1	11/19/1993
5	C-03-04 04BDD	55-808063		Irrigation	492	492		Bruce & Cameron Farm		
6	C-03-04 04CBA1			Destroyed	246	246			246	01/24/1961
7	C-03-04 04CBA2			Irrigation					183.6	11/19/1993
8	C-03-04 04CD	55-613623	Non-exempt	Irrigation	350	350	12	ACFSC Properties Corporation		
9	C-03-04 05AAA	55-613626	Non-exempt	Irrigation	500	489	18	ACFSC Properties Corporation	178.4	11/18/1993
10	C-03-04 05DAB	55-613625	Non-exempt	Irrigation	380	380	20	ACFSC Properties Corporation	161.3	11/18/1993
11	C-03-04 06BBA	55-622286	Non-exempt	Irrigation	545	545	20	Paloma Ranch Investments	139	11/20/2001
12	C-03-04 06BDD	55-622287	Non-exempt	Irrigation	815	815	20	Paloma Ranch Investments	94	11/17/1993
14	C-03-04 06DAB	55-623268	Non-exempt	Irrigation	500	500		John Christopher	116.4	11/18/1993
15	C-03-04 07AAA			Unused	153	153		Gillespie Land & Irrigation	67.7	04/10/1946
16	C-03-04 07AAB			Unused	190	190		Gillespie Land & Irrigation	169.8	01/13/1972
17	C-03-04 07AAD			Unused	332	332		Gillespie Land & Irrigation	113.7	11/18/1993
18	C-03-04 07ADA	55-622363	Non-exempt	Irrigation	761	761	18	Paloma Ranch Investments	172	05/03/1977
19	C-03-04 07DBA	55-086792	Non-exempt	Irrigation	803	803		Paloma Ranch Investments	80.7	11/17/1993
20	C-03-04 07DDA	55-085352	Non-exempt	Irrigation	850	800	18	Paloma Ranch Investments		
21	C-03-04 08AAB	55-605982	Non-exempt	Irrigation	400	400	20	BioFlora Systems LLC		
22	C-03-04 08BAB1			Irrigation	406	406		A. N. Sorensen		
23	C-03-04 08BAB2			Domestic						
24	C-03-04 08BAB3			Domestic						
25	C-03-04 08BAD	55-502018	Non-exempt	Irrigation	400	400	16	C.A. Miccia		
26	C-03-04 08CAA	55-622288	Non-exempt	Irrigation	817	817	20	Paloma Ranch Investments	67.81	12/18/1945
27	C-03-04 08CAD	55-636854	Exempt	Domestic	360		14	C.A. Miccia		
28	C-03-04 08DCB	55-622289	Non-exempt	Irrigation	745	745	20	Gillespie Land & Irrigation	115.1	11/17/1993

TABLE 1 – Continued

	Cadastral Location	ADWR Registration Number	Well Type	Water Use	Well Depth	Well Casing Depth	Well Casing Diameter	Well Owner	Most Recent Depth to Groundwater Measurement	Date of Most Recent Water Level Measurement
29	C-03-04 09AAA	55-530685	Exploration	Cathodic	260	260	6	Southwest Gas Corp.		
30	C-03-04 09AAD			Domestic	474	474		Rainbow Land Company	270.7	01/19/1966
31	C-03-04 09BAA	55-605978	Non-exempt	Irrigation	490	490	20	BioFlora Systems LLC	251.1	11/20/2001
32	C-03-04 09BBA	55-605981	Non-exempt	Irrigation	400	400	20	BioFlora Systems LLC		
33	C-03-04 09BBB	55-622862	Exempt	Domestic	220	220	8	Turner & Turner Ltd		
34	C-03-04 09BDD	55-622863	Exempt	Domestic			8	BioFlora Systems LLC		
35	C-03-04 09CAA	55-506979	Exempt	Domestic	370	370	6	Desert Valley Baptist	176.1	11/18/1993
36	C-03-04 09CAB	55-605980	Non-exempt	Irrigation	600	600	20	BioFlora Systems LLC	164.4	11/18/1993
37	C-03-04 09DDA	55-605976	Non-exempt	Irrigation	302	302	20	BioFlora Systems LLC	201	11/18/1993
38	C-03-04 10CAA1			Unused				Jewell Turner	275.9	12/14/1990
39	C-03-04 10CAA2	55-804381	Non-exempt	Unused	500	500	20	John C. Vinson	244	11/18/1993
40	C-03-04 11CCC	55-642967	Exempt	Domestic	420	420		BLM – Phoenix District		
41	C-03-04 15AAC	55-803532	Non-exempt	Irrigation	630		20	John C. Vinson		
42	C-03-04 15ACC			Unused	465	465		Jewell Turner	268.5	01/19/1966
43	C-03-04 15ADC			Unused	652	652		Ed Ambrose	235.8	11/18/1993
44	C-03-04 15BDD	55-803533	Non-exempt	Irrigation	365		20	John C. Vinson		
45	C-03-04 15CBA	55-586007								
46	C-03-04 15DAA			Unused	420	420		Jewell Turner	247.7	11/18/1993
47	C-03-04 16BAA	55-605992	Non-exempt	Irrigation	800	800	20	BioFlora Systems LLC	162.7	11/18/1993
48	C-03-04 16CBC	55-540043	Monitor	Monitoring				Gila Growers CO-OP		
49	C-03-04 16CBC	55-540044	Monitor	Monitoring				Gila Growers CO-OP		
50	C-03-04 16CCC	55-643970	Exempt	Domestic	300		6	Gila Growers Gin		
51	C-03-04 16DAA	55-605977	Non-exempt	Irrigation	412	412	20	BioFlora Systems LLC	185.2	11/18/1993
52	C-03-04 17ABA	55-622290	Non-exempt	Irrigation	780	780	20	Paloma Ranch Investments	119.4	11/17/1993
53	C-03-04 17ABB	55-624841	Non-exempt	Irrigation	683	683	20	John Farms Partnership	112.3	11/17/1993
54	C-03-04 17ADB	55-624840	Non-exempt	Irrigation	710	710	20	John Farms Partnership	119.9	11/17/1993
55	C-03-04 17ADD	55-622291	Non-exempt	Unused	302	302	20	Paloma Ranch Investments	156.9	02/13/2001
56	C-03-04 19BBB	55-612578	Non-exempt	Unused	1200	1200		A Tumbling T Ranches	43.5	11/16/1993
57	C-03-04 19CCD	55-612571	Non-exempt	Irrigation	1107	1107		A Tumbling T Ranches	102.7	11/20/2001
58	C-03-04 20AAA	55-626509	Non-exempt	Irrigation	681	666	20	D. Layton	109.2	11/17/1993
59	C-03-04 20DAA	55-626507	Non-exempt	Irrigation	500	500	20	D. Layton	108.9	11/17/1993
60	C-03-04 20DBA	55-626513	Exempt	Domestic	720	680	6	D. Layton	123	11/17/1993

TABLE 1 – continued

	Cadastral Location	ADWR Registration Number	Well Type	Water Use	Well Depth	Well Casing Depth	Well Casing Diameter	Well Owner	Most Recent Depth to Groundwater Measurement	Date of Most Recent Water Level Measurement
61	C-03-04 21ADA	55-605996	Non-exempt	Irrigation	450	450	18	BioFlora Systems LLC		
62	C-03-04 21BBA	55-622293	Non-exempt	Irrigation	797	797	20	Paloma Ranch Investments		
63	C-03-04 21BDB	55-622292	Non-exempt	Irrigation	302	302	20	Paloma Ranch Investments		
64	C-03-04 21BDB									
65	C-03-04 21CAB	55-622294	Non-exempt	Irrigation	550	550	20	Paloma Ranch Investments	70.4	12/18/1945
66	C-03-04 21CAD			Unused						
67	C-03-04 21CCC	55-622378	Non-exempt	Irrigaton	824	824	18	Paloma Ranch Investments		
68	C-03-04 21CDA	55-622295	Non-exempt	Irrigation	812	812	20	Paloma Ranch Investments	127.5	11/17/1993
69	C-03-04 21DDA	55-086793	Non-exempt	Irrigation	1045	1045	18	Paloma Ranch Investments	167.6	11/18/1993
70	C-03-04 22DDC	55-803535	Exempt	Unused				John C. Vinson	236.2	11/18/1993
71	C-03-04 22DDD1			Unused	465	465		Jewell Turner	250	11/18/1993
72	C-03-04 22DDD2	55-803536	Non-exempt	Irrigation	600	600	20	John C. Vinson		
73	C-03-04 23BAA	55-611051	Non-exempt	Unused	372	372		C.E. Sanders	338.6	11/20/2001
74	C-03-04 23BBA	55-612675	Non-exempt	Unused	397	397	20	LA Land Holding Company		
75	C-03-04 23BBA	55-611053	Non-exempt	Irrigation	450	450	20	C.E. Sanders		
76	C-03-04 23CAB			Unused					265.9	11/23/1993
77	C-03-04 23CCA	55-611052	Non-exempt	Irrigation	420	420	20	C.E. Sanders		
78	C-03-04 23CCC	55-611057	Exempt	Domestic			8	C.E. Sanders		
79	C-03-04 23CCC	55-612676	Exempt	Domestic	400	400	8	John F. Ronney		
80	C-03-04 26BCC	55-614968	Exempt	Unused				Arizona State Land Department	262.9	11/18/1993
81	C-03-04 26BCC	55-614967	Exempt				8	Arizona State Land Department		
82	C-03-04 27BAA	55-803534	Non-exempt	Unused	388	388	20	John C. Vinson	207.9	11/18/1993
83	C-03-04 27CCC	55-568723	Exempt	Domestic						
84	C-03-04 27DAD	55-642432	Exempt	Domestic	335		6			
85	C-03-04 27DBB	55-593431								
86	C-03-04 27DDA	55-608735	Exempt	Domestic	350	350	6	V.A. Rice		
87	C-03-04 28ABB	55-622296	Non-exempt	Irrigation	918	918	20	Paloma Ranch Investments	129.6	11/17/1993
88	C-03-04 28ACC	55-622297	Non-exempt	Irrigation	1000	1000	20	Paloma Ranch Investments	72.5	12/18/1945
89	C-03-04 28BBB	55-622388	Non-exempt	Irrigation	1045	1045	18	Paloma Ranch Investments		
90	C-03-04 28DBB	55-608737	Non-exempt	Irrigation	578	578	22	Desmond G. Wood	125	11/17/1993
91	C-03-04 28DCD	55-561528	Exempt	Domestic	500		6	R. Deon Layton		
92	C-03-04 28DCD	55-608736	Exempt	Domestic	340	340	8	Deon Layton		

TABLE 1 – continued

	Cadastral Location	ADWR Registration Number	Well Type	Water Use	Well Depth	Well Casing Depth	Well Casing Diameter	Well Owner	Most Recent Depth to Groundwater Measurement	Date of Most Recent Water Level Measurement
93	C-03-04 28DDD	55-601945	Exempt	Domestic				Aldorado Place Inc.		
94	C-03-04 28DDD	55-601947	Exempt	Domestic				Aldorado Place Inc.		
95	C-03-04 30ABA			Domestic					38.4	11/16/1993

TABLE 2
GROUNDWATER LEVELS MEASURED IN JUNE 2002

	Cadastral Location	ADWR Registration Number	Well Type	Water Use	Well Depth (ft)	Well Casing Depth (ft)	Well Casing Diameter (inches)	Well Owner	2002 Depth to Groundwater (feet bls)	2002 Groundwater Elevation (feet amsl)
1	C-02-04 33CAC	55-605991	Non-exempt	Irrigation	565	565	20	BioFlora Systems	261.91	553.09
2	C-02-05 35DDD	55-085350							94.31	636.69
3	C-03-04 06BBA	55-622286	Non-exempt	Irrigation	545	545	20	Paloma Ranch Investments	154.7	595.3
4	C-03-04 09BDD	55-622863	Exempt	Domestic			8	BioFlora Systems LLC	253.0	542.0
5	C-03-04 16ABB	55-605992	Non-exempt	Irrigation	800	800	20	BioFlora Systems LLC	237.7	552.3
6	C-03-04 16DAA	55-605977	Non-exempt	Irrigation	412	412	20	BioFlora Systems LLC	271.55	528.45
7	C-03-04 19CCD	55-612571	Non-exempt	Irrigation	1107	1107		A Tumbling T Ranches	115.85	589.15
8	C-03-04 21DDA	55-086793	Non-exempt	Irrigation	1045	1045	18	Paloma Ranch Investments	261.55	518.45
9	C-03-04 23BBA	55-611053	Non-exempt	Irrigation	450	450	20	C.E. Sanders	329.1	545.9
10	C-03-04 26BCC	55-614968	Exempt	Unused				Arizona State Land Department	330.81	529.19
11	C-03-04 27BAA	55-803534	Non-exempt	Unused	388	388	20	John C. Vinson	273.83	541.17
12	C-03-04 27CCC	55-568723	Exempt	Domestic	310	250	8	Stephen Cline	261.93	518.07
13	C-03-04 28ACC	55-622297	Non-exempt	Irrigation	1000	1000	20	Paloma Ranch Investments	221.98	523.02

FIGURES

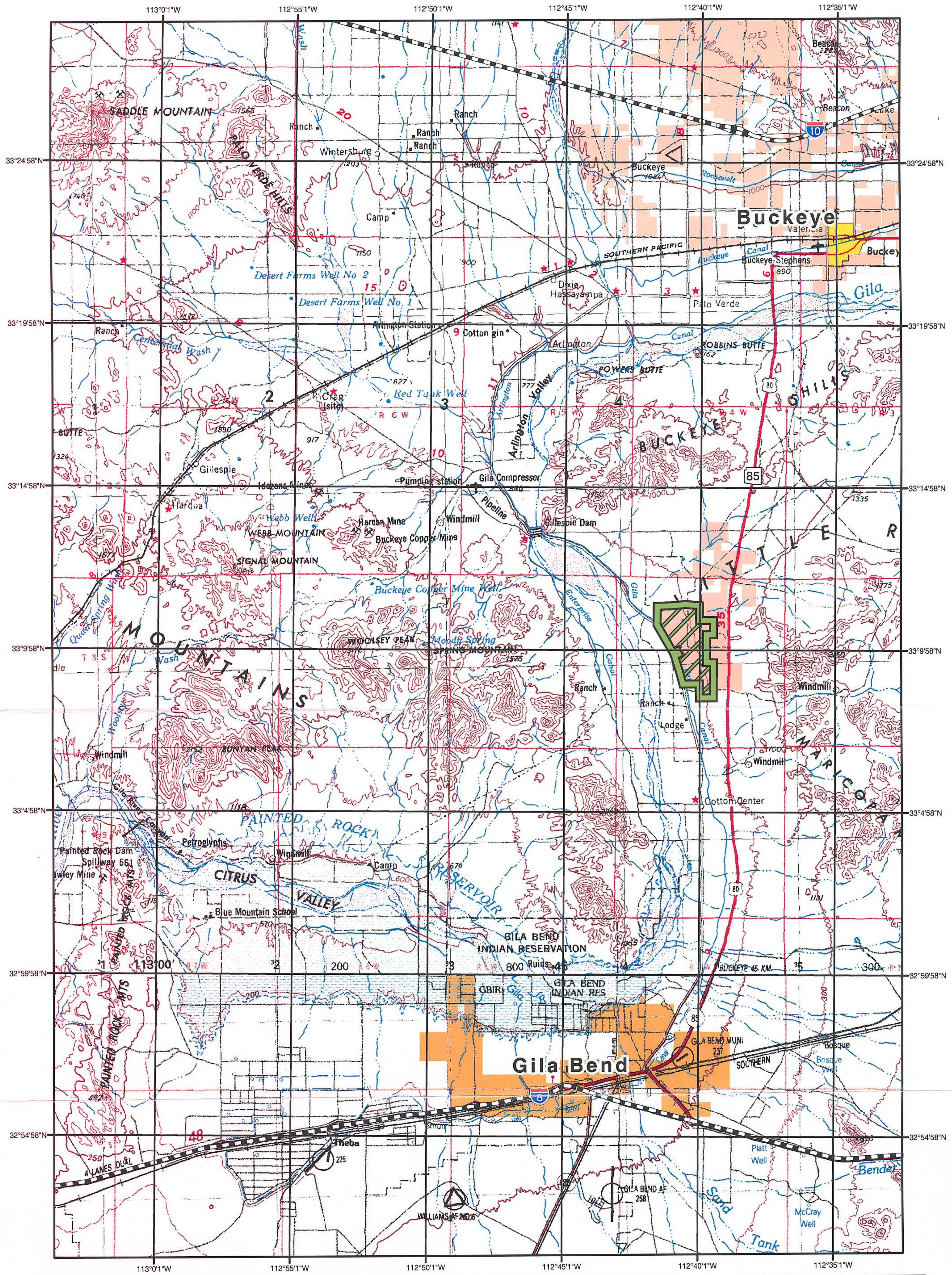
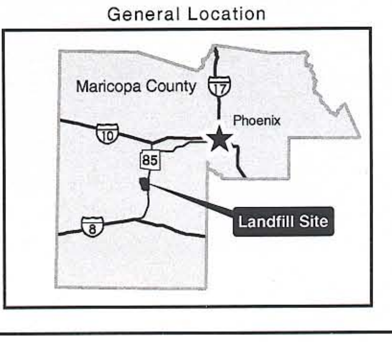


Figure 1
Regional Location Map

Legend

- Landfill Perimeter
- Town of Buckeye
- Town of Gila Bend

General Location



N

0 1 2 3 4
Miles

Map Produced 05/16/03
Source:
United States Geologic Survey, Ajo 1x2 Degree Quadrangle Map, 1969.
United States Geologic Survey, Phoenix 1x2 Degree Quadrangle Map, 1969.
Arizona State Land Department, 1997.

URS

X:\City\Phoenix\Landfill\GIS\mxds\sr85_study\SR-85_Wells_Figure1.mxd

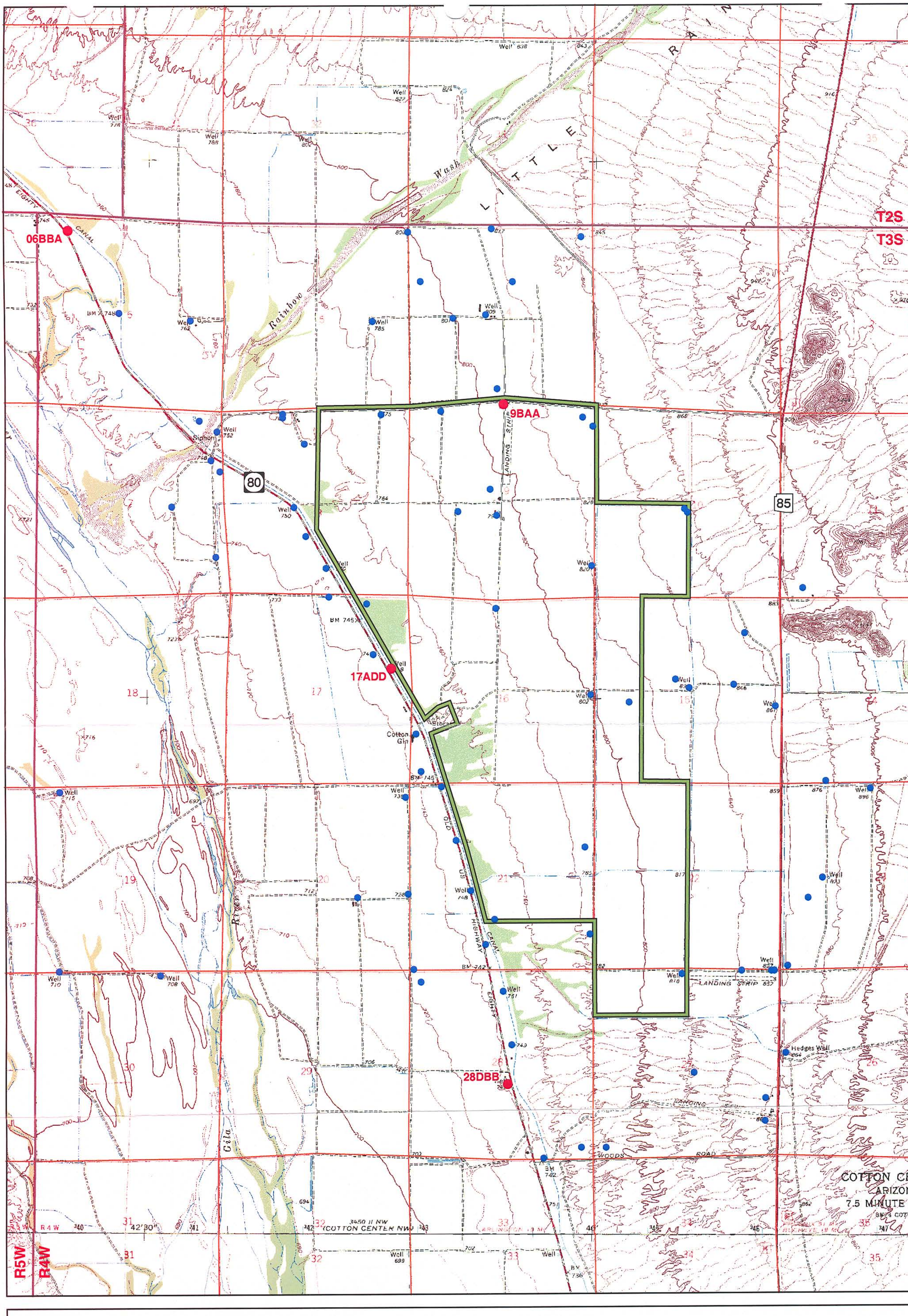


Figure 2
Site and Well Location Map

Legend

Landfill Site Perimeter

Township Range Section

Well Location as Reported in ADWR-55 Registry or GWSI Databases

Well with Hydrograph in Figure 7

0 0.25 0.5 1
Scale In Miles

N

URS

Source:
USGS 7.5 Minute Quadrangle, Cotton Center, 1991.
USGS 7.5 Minute Quadrangle, Cotton Center NW, 1991.
Arizona Department of Water Resources, 2002.

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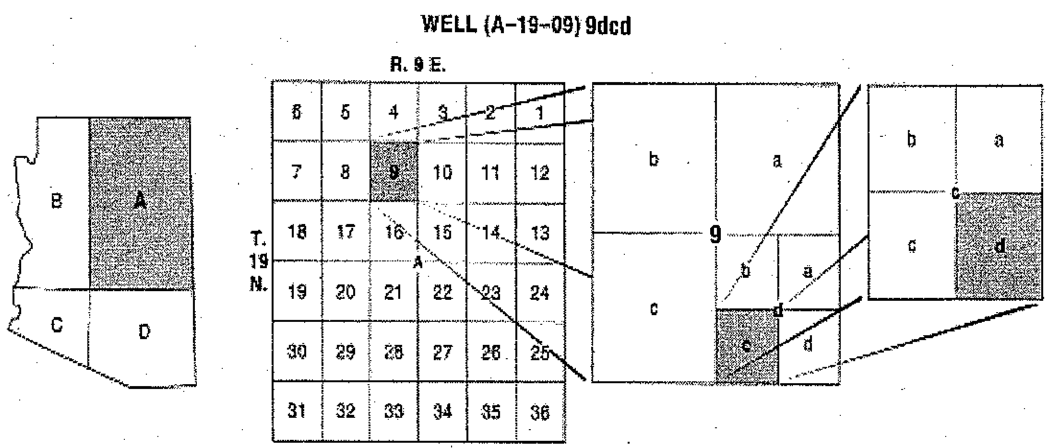
Figure 3. Arizona Well Numbering System

**Quadrant A, Township 19 North, Range 9 East, Section 9,
Quarter Section d, Quarter Section c, Quarter Section d**

The well numbers used by the U.S. Geological Survey in Arizona are in accordance with the Bureau of Land Management's system of land subdivision. The land survey in Arizona is based on the Gila and Salt River meridian and base line, which divide the State into four quadrants and are designated by capital letters A, B, C, and D in a counterclockwise direction beginning in the northeast quarter of the state. The first digit of a well number indicates the township, the second the range, and the third the section in which the well is situated. The lowercase letters a, b, c, and d after the section number indicate the well location within the section. The first letter denotes a particular 160-acre tract, the second the 40-acre tract and the third the 10-acre tract. These letters also are assigned in a counterclockwise direction beginning in the northeast quarter. If the location is known within the 10-acre tract, three lowercase letters are shown in the well number. Where more than one well is within a 10-acre tract, consecutive numbers beginning with 1 are added as suffixes. In the example shown, well number (A-19-09) 9dcd designates the well as being in the SE1/4, SW1/4, SE1/4, section 9, Township 19 North, and Range 9 East.



Source of Diagram: U.S. Geological Survey, 2002. Generalized Hydrogeology and Ground-Water Budget for the C Aquifer, Little Colorado River Basin and Parts of the Verde and Salt River Basins, Arizona and New Mexico.

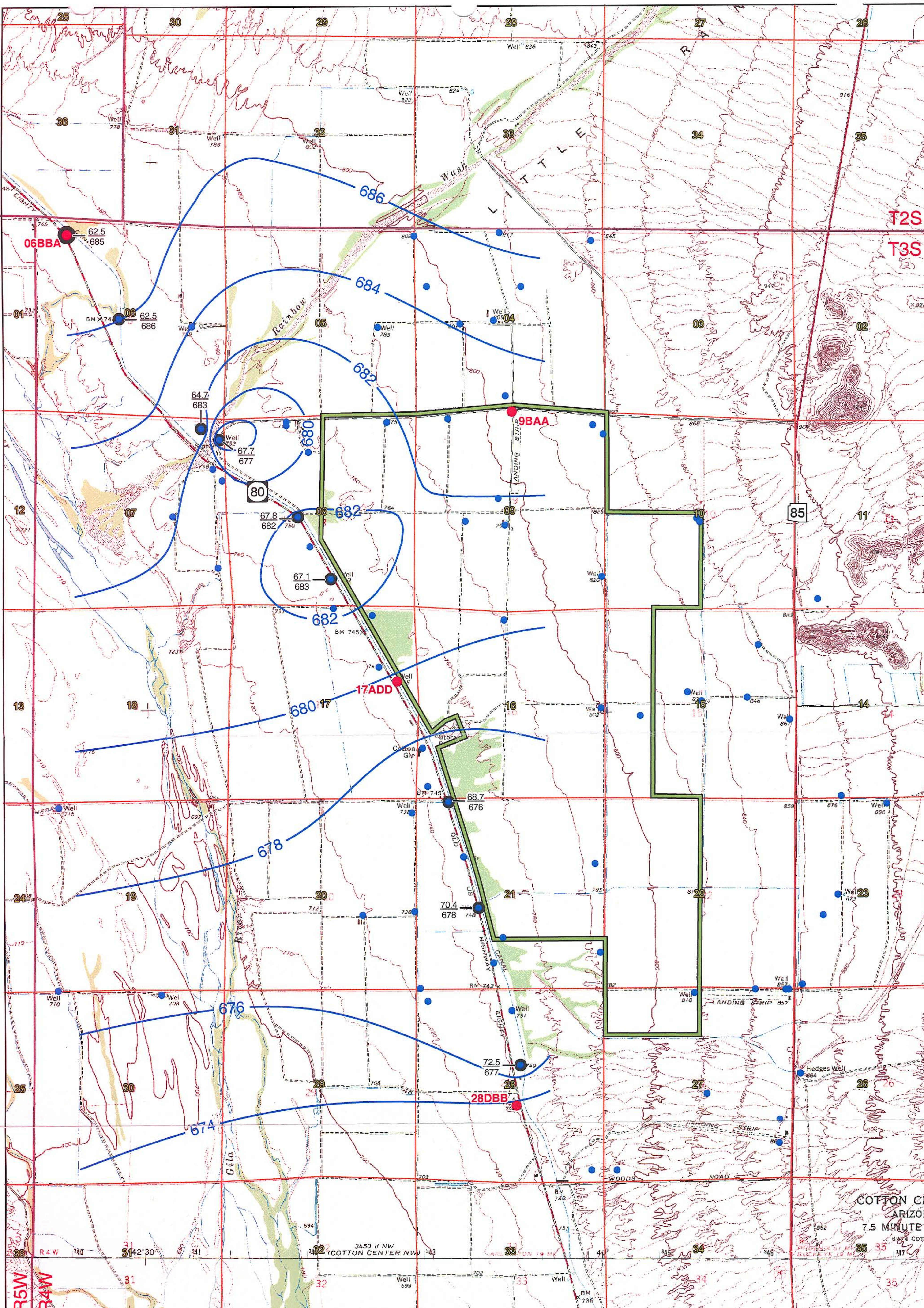


Figure 4
1945 Groundwater Level Contour Map

Legend

Landfill Site Perimeter

Township Range Section

Well Location as Reported in ADWR-55 Registry or GWSI Databases

Well with Hydrograph in Figure 7

76.1 / 689 — Well in which depth to water was measured by USGS December 1945 to April 1946. Upper number is depth to water, in feet below land surface. Lower number is altitude of the water level in feet above mean sea level.

Note: Water level measurements accurate to within ± 10 feet.

520 — Groundwater Level Contour (Line showing equal elevation of groundwater)

0 0.25 0.5 1

Scale In Miles

N

URS

Source:
USGS 7.5 Minute Quadrangle, Cotton Center, 1991.
USGS 7.5 Minute Quadrangle, Cotton Center NW, 1991.
Arizona Department of Water Resources, 2002.

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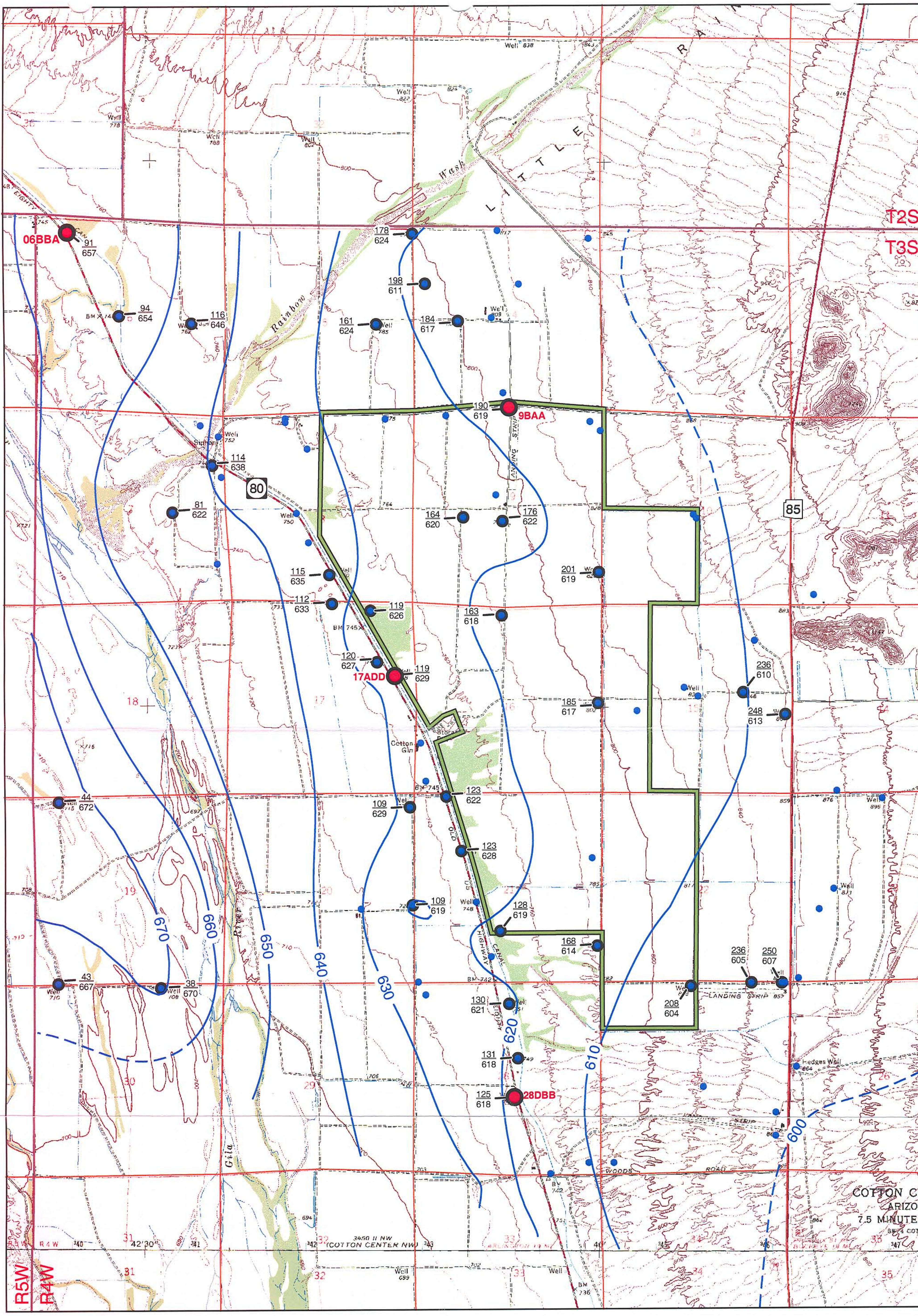

Figure 5
1993 Groundwater Level Contour Map

Legend

Landfill Site Perimeter

Township Range Section

Well Location as Reported in ADWR-55 Registry or GWSI Databases

Well with Hydrograph in Figure 7

163 / 618 — Well in which depth to water was measured by ADWR in November 1993. Upper number is depth to water, in feet below land surface. Lower number is altitude of the water level in feet above mean sea level.

Note: Water level measurements accurate to within ± 10 feet.

520 — Groundwater Level Contour - Dashed Where Inferred (Line showing equal elevation of groundwater)

0 0.25 0.5 1
Scale In Miles

N

URS

Source:
USGS 7.5 Minute Quadrangle, Cotton Center, 1991.
USGS 7.5 Minute Quadrangle, Cotton Center NW, 1991.
Arizona Department of Water Resources, 2002.

x:/cityofphoenix/landfill/gis/mxds/sr85_study/SR-85_Wells_Figure5.mxd

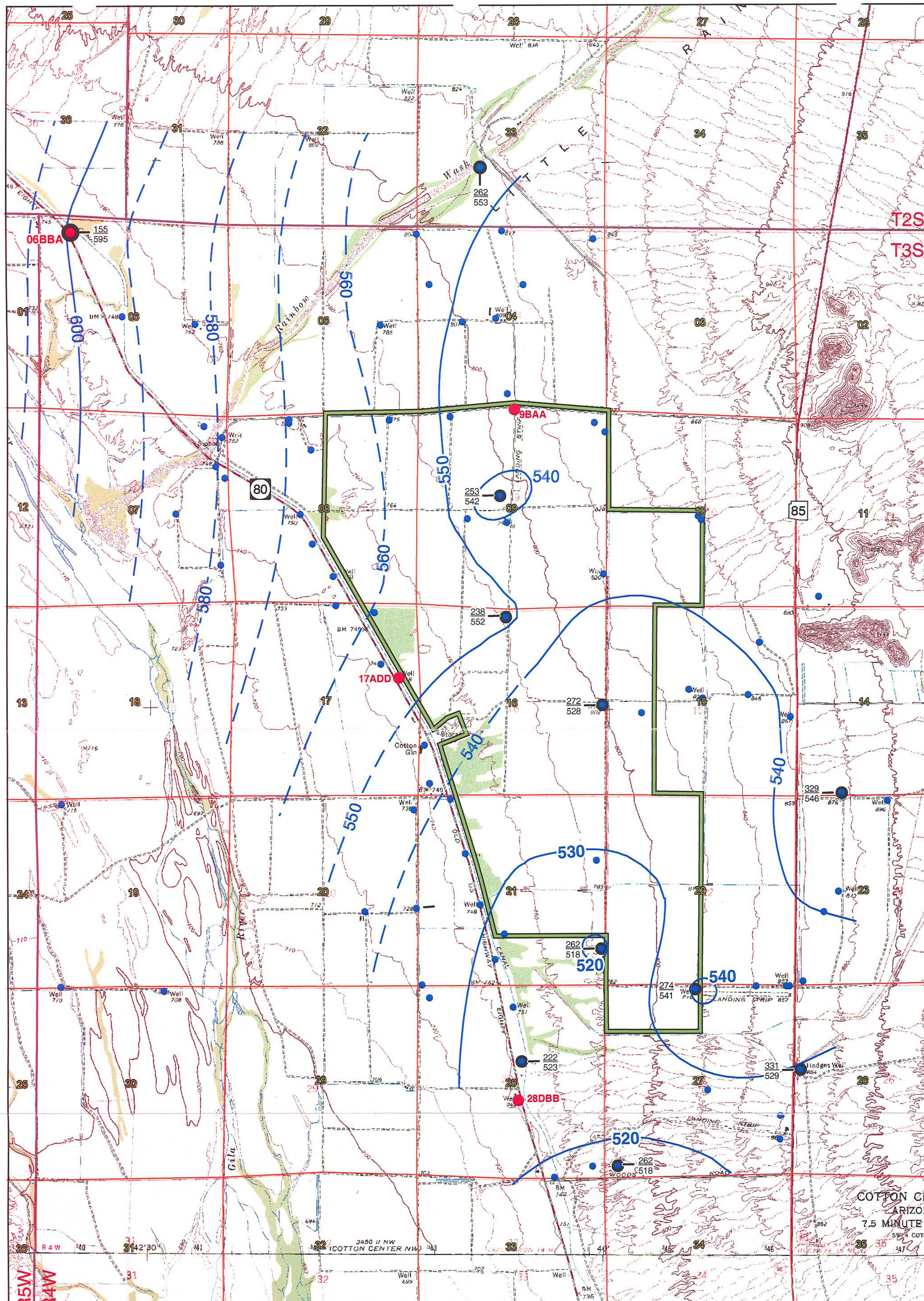

Figure 6
2002 Groundwater Level Contour Map

Legend

Landfill Site Perimeter

Township Range Section

Well Location as Reported in ADWR-55 Registry or GWSI Databases

Well with Hydrograph in Figure 7

222 / 523 — Well in which depth to water was measured by URS in June 2002. Upper number is depth to water, in feet below land surface. Lower number is altitude of the water level in feet above mean sea level. Note: Water level measurements accurate to within ± 10 feet.

520 — Groundwater Level Contour - Dashed Where Inferred (Line showing equal elevation of groundwater)

0 0.25 0.5 1
Scale In Miles

N

URS

Source:
USGS 7.5 Minute Quadrangle, Cotton Center, 1991.
USGS 7.5 Minute Quadrangle, Cotton Center NW, 1991.
Arizona Department of Water Resources, 2002.

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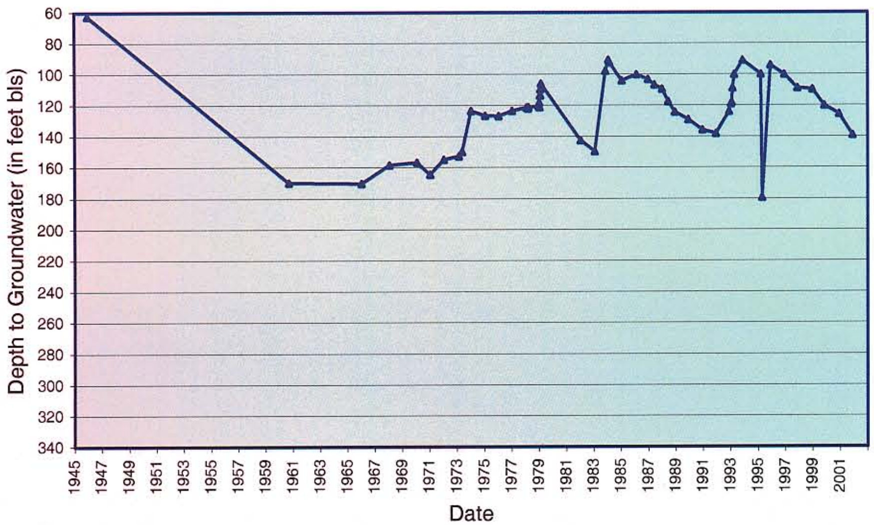
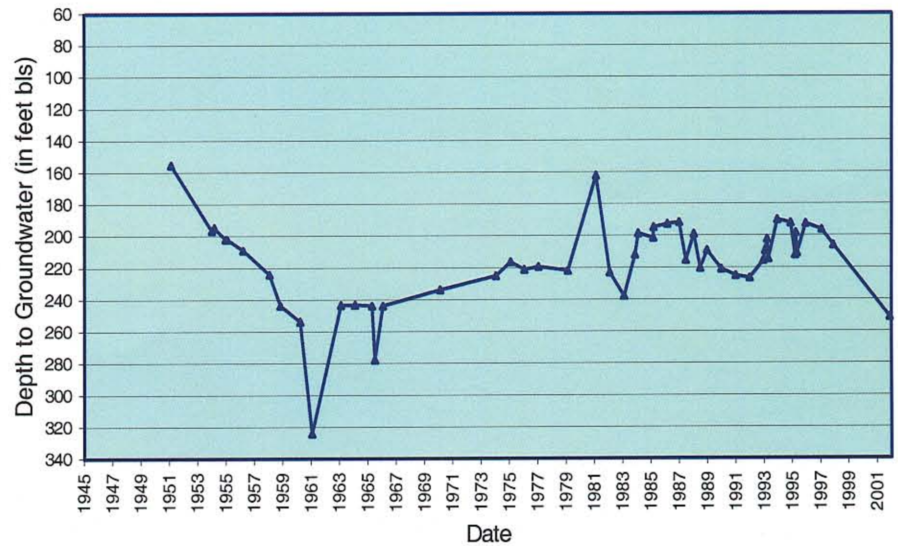
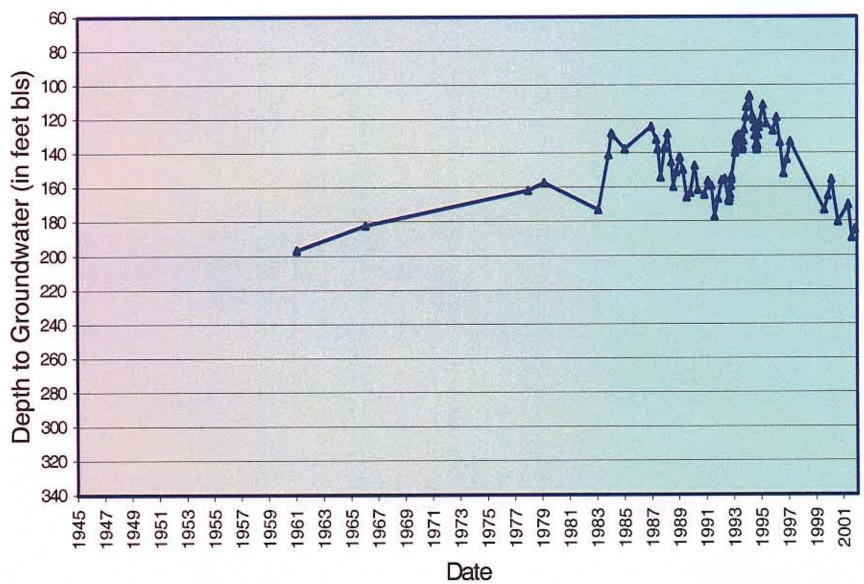
FIGURE 7
HYDROGRAPHS OF SELECTED WELLS



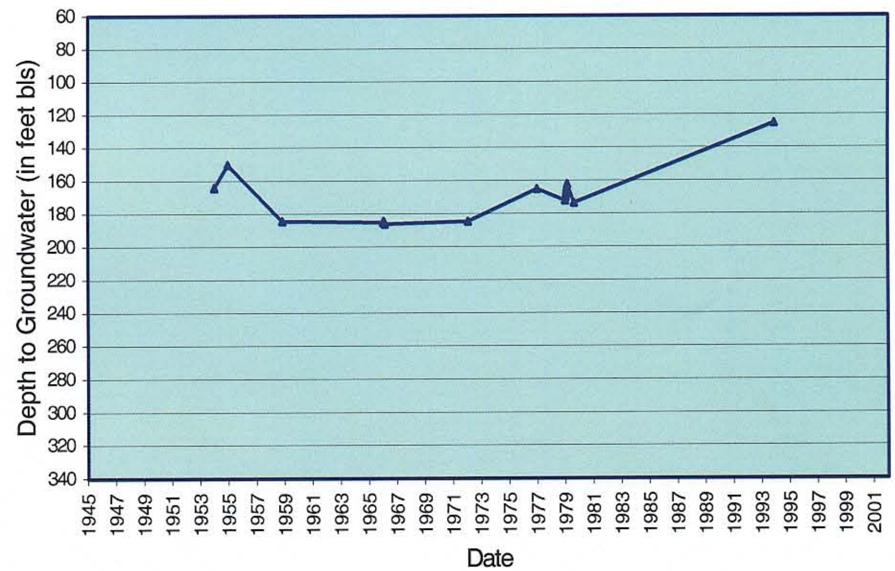
Well (C-03-04) 06BBA



Well (C-03-04) 09BAA

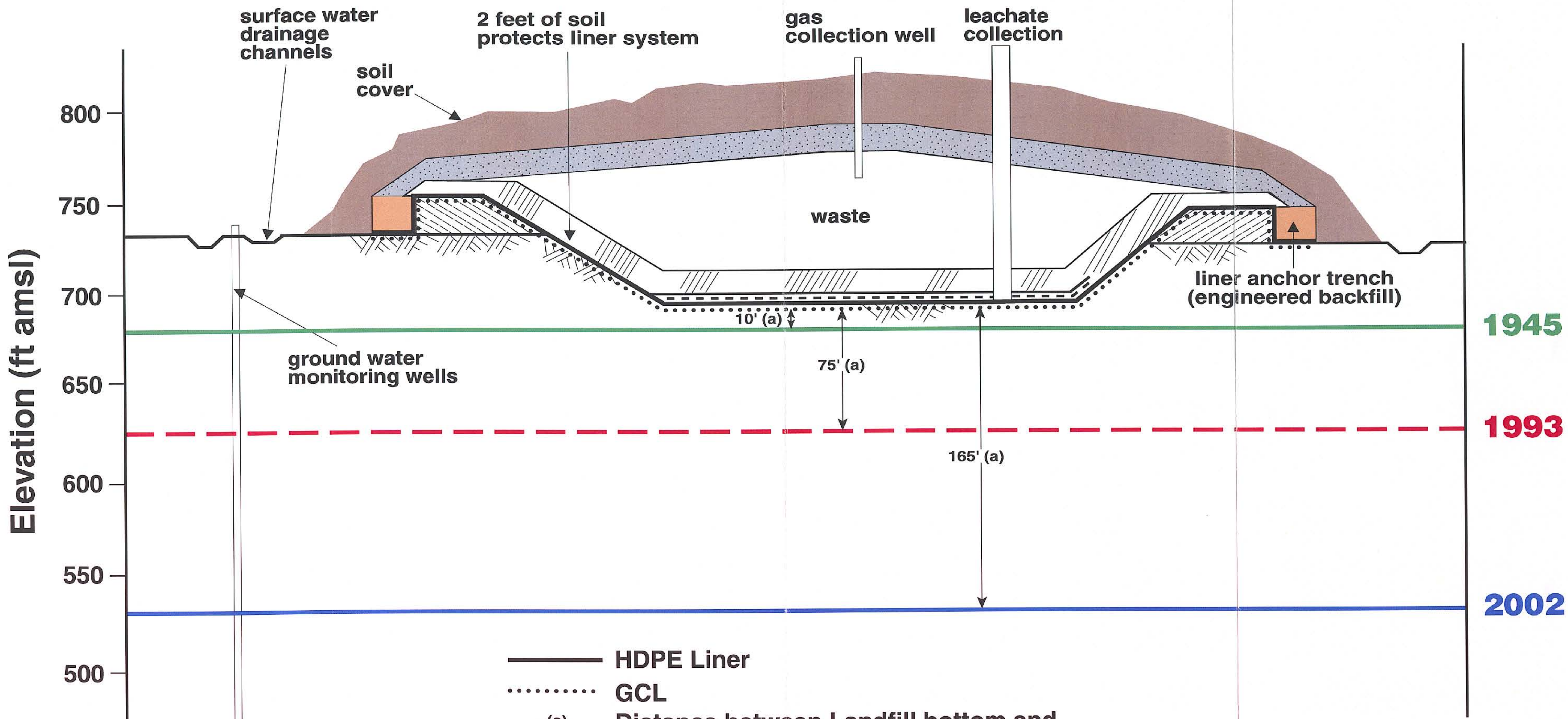


Well (C-03-04) 17ADD



Well (C-03-04) 28DBB

Generalized Cross Section



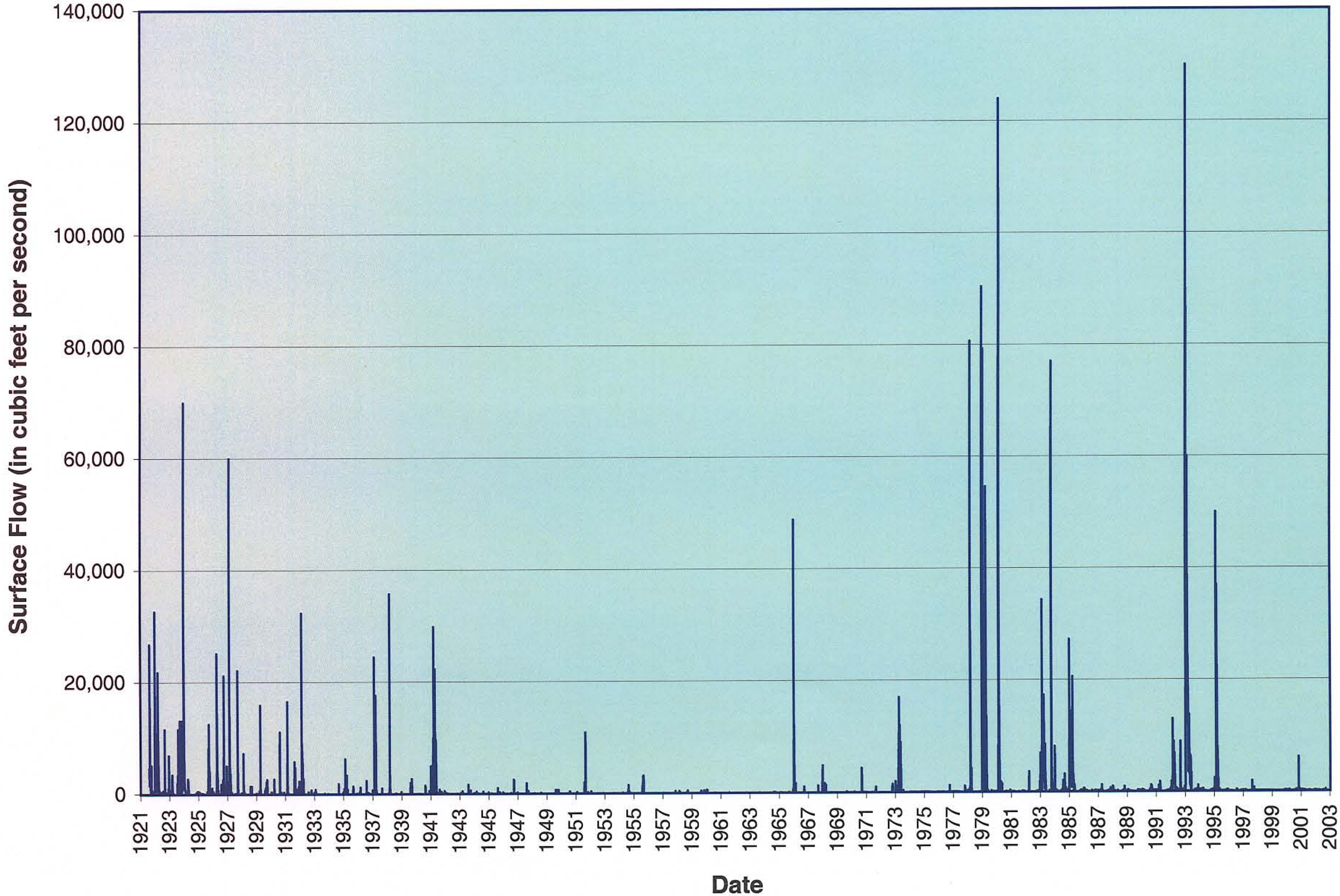
HDPE Liner

GCL

(a) Distance between Landfill bottom and groundwater at a representative location within the Landfill site

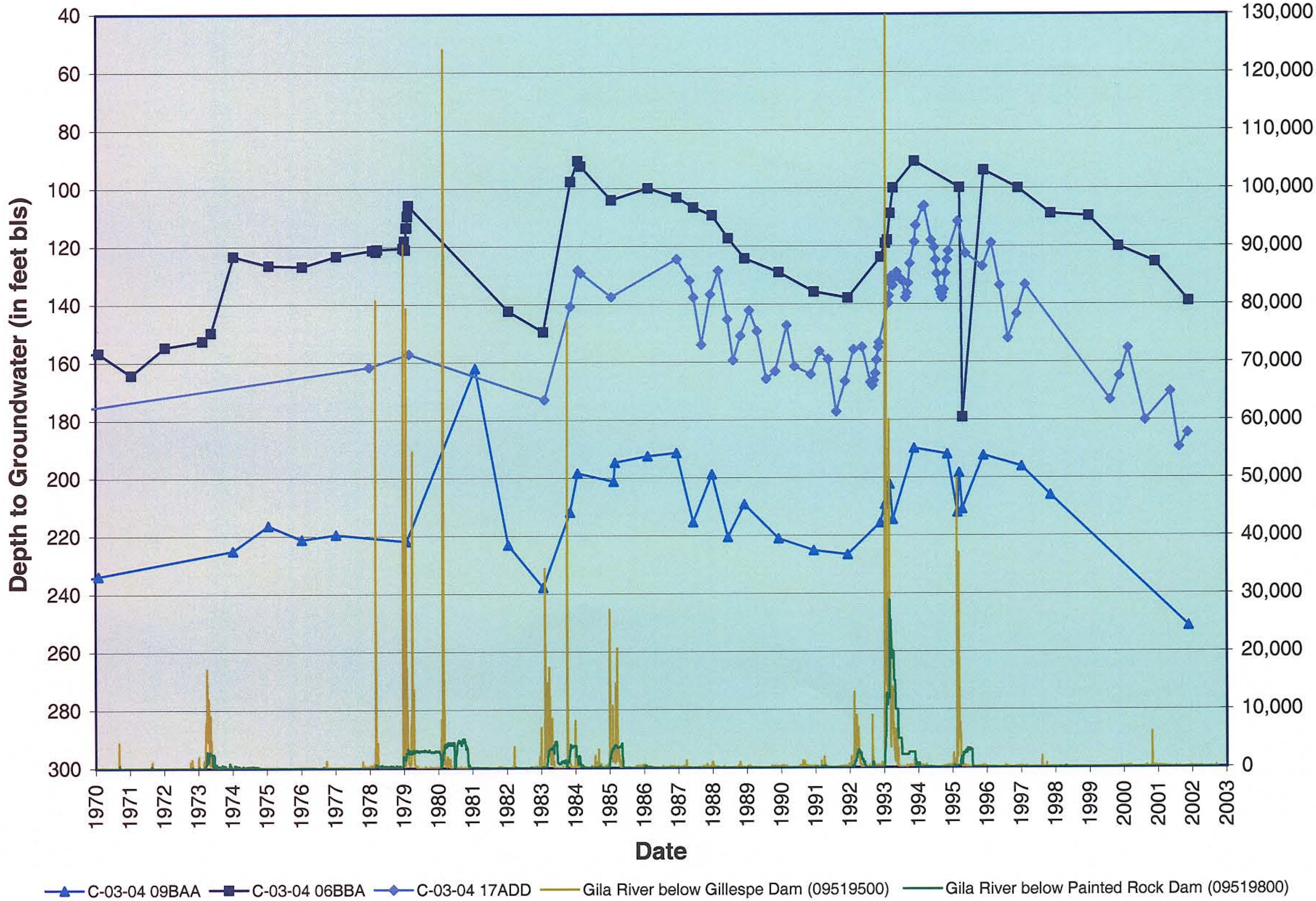
Figure 8

FIGURE 9
MEAN DAILY STREAM FLOW FOR GAGING STATION No. 09519500
(Gila River below Gillespe Dam, 1921 through 2002)

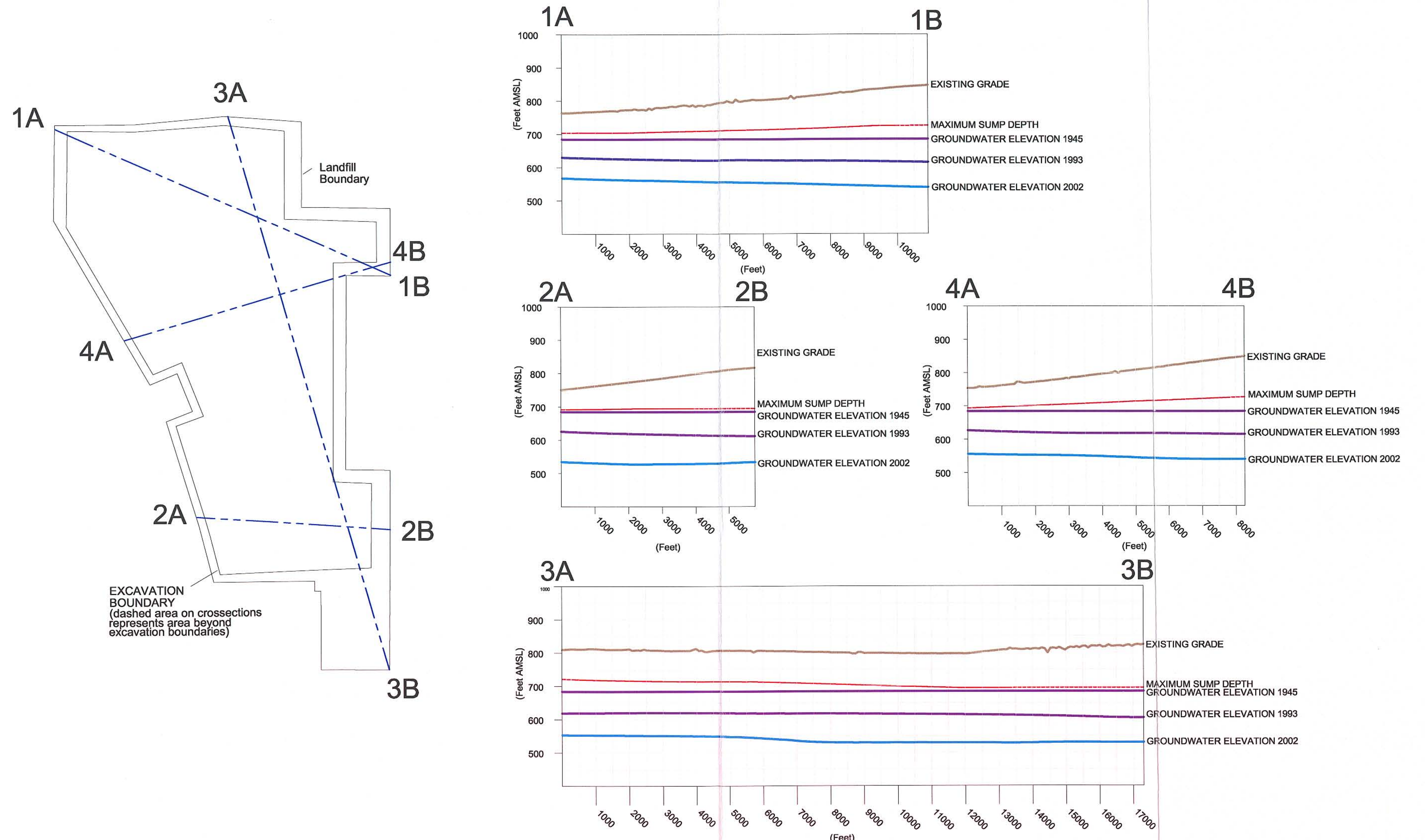


P:\City_of_Phoenix\E1001546\Hydrologic Study\Streamflow Figure 9

FIGURE 10
HYDROGRAPHS OF SELECTED WELLS COMPARED WITH SURFACE FLOW IN GILA RIVER



P:\City_of_Phoenix\E1001546\Hydrologic Study\Streamflow Figure 10



Evaluation of Maximum Landfill Depth

City of Phoenix

SR-85 Landfill

Figure 11

1"=3000' HORIZONTAL SCALE

1"=300' VERTICAL SCALE

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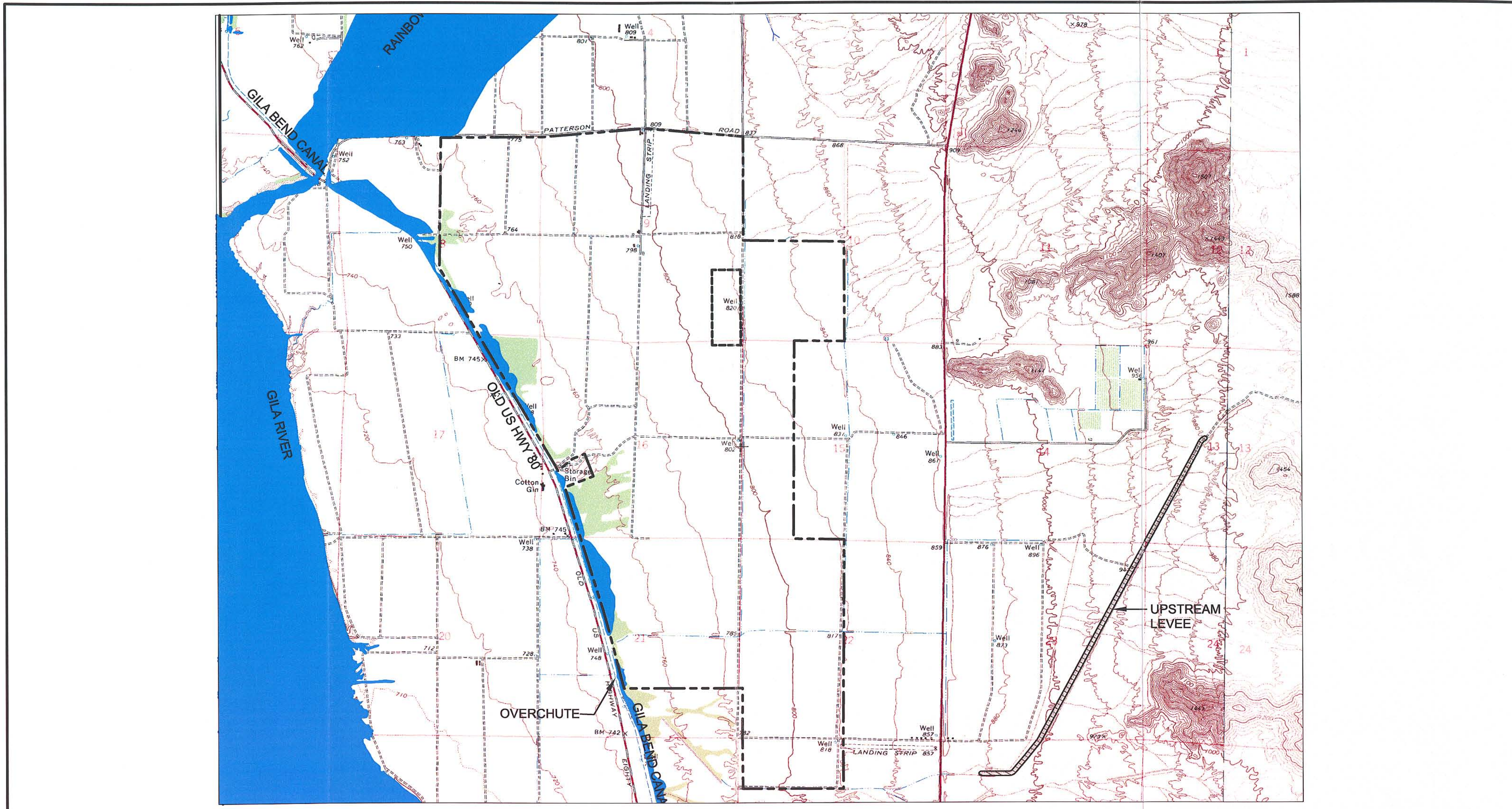

REFERENCE: USGS TOPOGRAPHIC QUAD COTTON CENTER NW, AZ 1973;
FLOODPLAIN - MARICOPA COUNTY FLOOD CONTROL DISTRICT, 2000

LEGEND:

PROPERTY BOUNDARY

100-YEAR FLOODPLAIN

N

0 1500 3000 6000 9000

SCALE IN FEET

100-Year Floodplain Delineations of Gila River, Gila Bend Canal, and Rainbow Wash

City of Phoenix
SR 85 Landfill

Figure 12

URS

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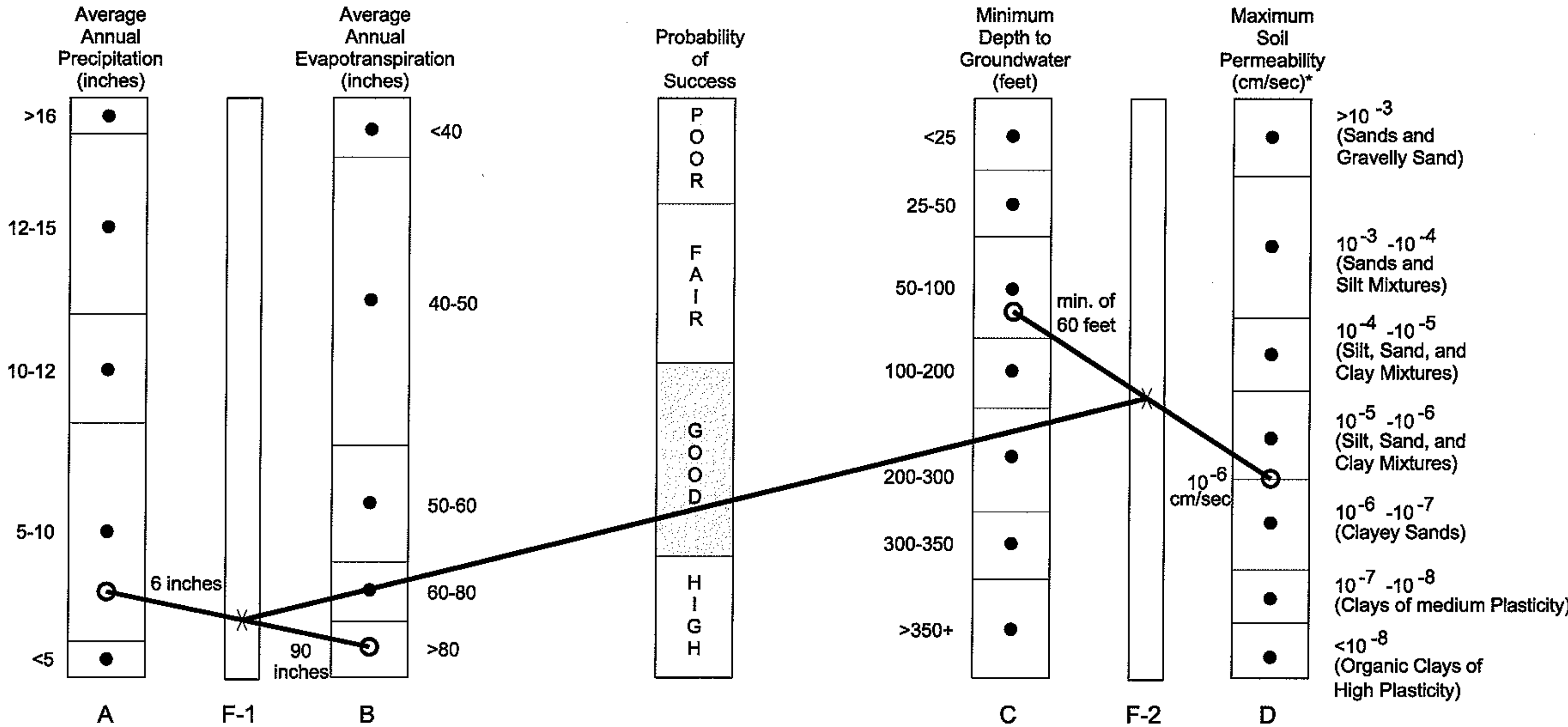

1] To use this tool:

a) Find the dot within the range of values that correspond to your MSWLF on Bars A through D.
b) Draw a line from the value for your MSWLF on Bar A to that on Bar B.
c) Repeat the above procedure and draw a line from Bar C to Bar D.
d) Draw aline from Bar f-1 to Bar f-2 at the points of intersection from your first two lines.
e) Read the center Bar at the point of intersection of the line last drawn.
f) The lines drawn on this figure correspond to the example described on page 9.

* To convert cm/sec to ft/yr multiply by $1x10^{6}$; note that $1x10^{-6}$ cm/sec equals approximately 1 ft/yr.

O SR-85 Landfill site-specific values as discussed in Section 4.3

Decision Tool for Determining the Probability of a Successful No-Migration Determination

City of Phoenix
SR-85 Landfill

Figure 13

URS

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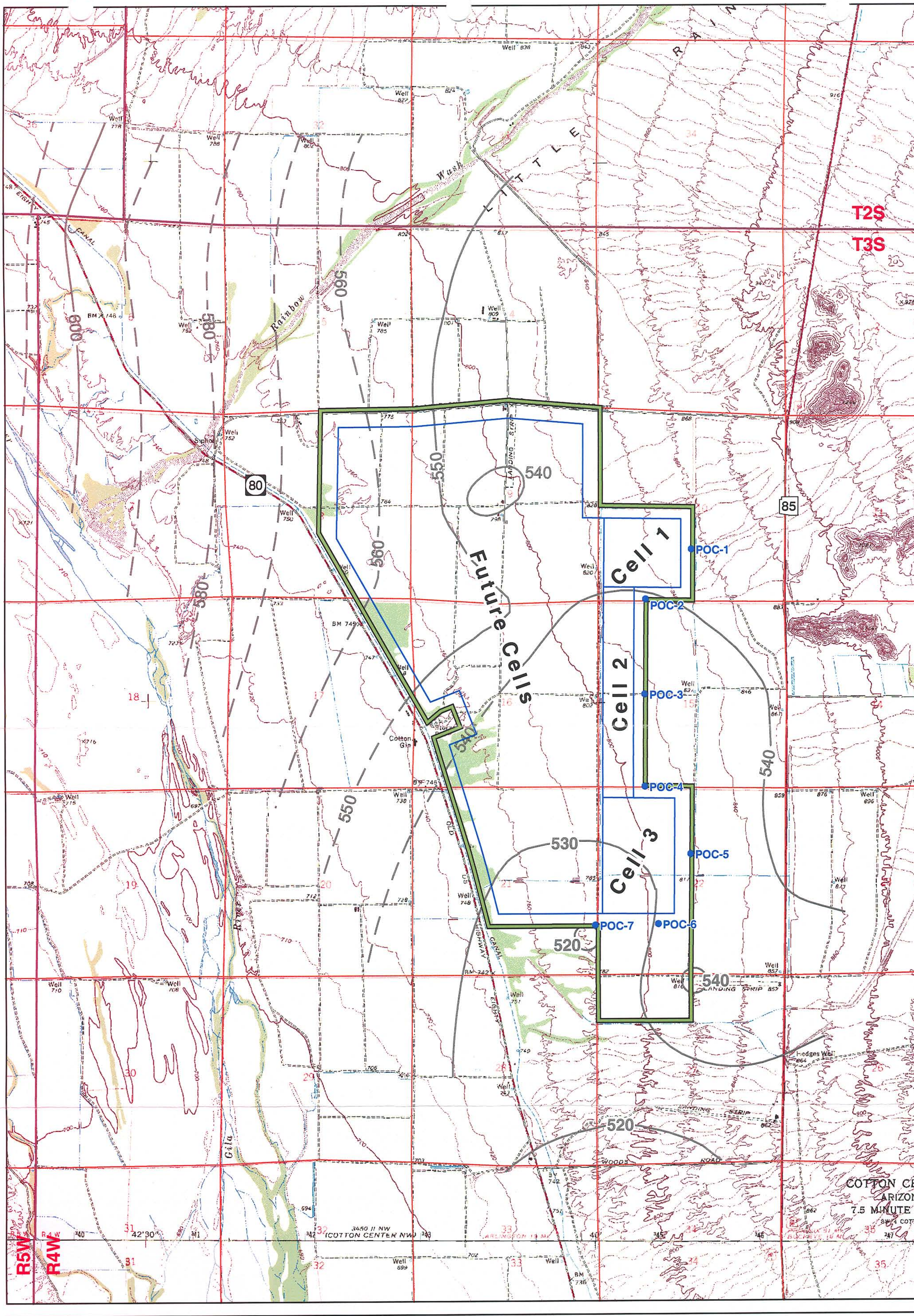

Figure 14
Proposed Points of Compliance

Source:
USGS 7.5 Minute Quadrangle, Cotton Center, 1991.
USGS 7.5 Minute Quadrangle, Cotton Center NW, 1991.
Arizona Department of Water Resources, 2002.

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APPENDIX A

GROUNDWATER SITE INVENTORY DATABASE

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 04BAA	02/13/51	159.68	657
C-03-04 04BAA	12/28/53	176.87	640
C-03-04 04BAA	12/14/54	206.37	611
C-03-04 04BAA	10/28/58	219.5	598
C-03-04 04BAA	09/21/60	203.11	614
C-03-04 04BAA	01/02/78	230	587
C-03-04 04BDD	12/28/53	186.35	623
C-03-04 04BDD	12/14/54	200.92	608
C-03-04 04BDD	10/28/58	227.87	581
C-03-04 04BDD	06/29/77	242.5	567
C-03-04 04BDD	02/23/79	219.8	589
C-03-04 04BDD	11/19/93	198.1	611
C-03-04 04CBA1	10/28/58	236.93	563
C-03-04 04CBA1	01/24/61	246.04	554
C-03-04 04CBA1	02/19/80		
C-03-04 04CBA2	01/02/78	214.6	586
C-03-04 04CBA2	11/19/93	183.6	617
C-03-04 05AAA	01/02/78	208.2	594
C-03-04 05AAA	02/23/79	206	596
C-03-04 05AAA	11/18/93	178.4	624
C-03-04 05DAB	02/13/73	209.7	575
C-03-04 05DAB	11/18/93	161.3	624
C-03-04 06BBA	12/18/45	62.52	685
C-03-04 06BBA	09/19/60	169.7	578
C-03-04 06BBA	01/14/66	170.2	578
C-03-04 06BBA	01/23/68	158.21	590
C-03-04 06BBA	02/04/70	156.7	591
C-03-04 06BBA	01/20/71	164.3	584
C-03-04 06BBA	01/14/72	154.7	593
C-03-04 06BBA	02/15/73	152.6	595
C-03-04 06BBA	05/17/73	149.7	598
C-03-04 06BBA	01/11/74	123.3	625
C-03-04 06BBA	01/21/75	126.5	622
C-03-04 06BBA	01/13/76	126.8	621
C-03-04 06BBA	01/11/77	123.3	625
C-03-04 06BBA	01/30/78	121.3	627
C-03-04 06BBA	03/09/78	121.8	626
C-03-04 06BBA	03/16/78	121	627
C-03-04 06BBA	03/23/78	121	627
C-03-04 06BBA	12/20/78	120.5	628
C-03-04 06BBA	12/28/78	120.7	627
C-03-04 06BBA	01/04/79	118.1	630
C-03-04 06BBA	01/15/79	121.1	627
C-03-04 06BBA	01/22/79	113.5	635
C-03-04 06BBA	01/29/79	113.4	635
C-03-04 06BBA	02/05/79	109.5	639
C-03-04 06BBA	02/06/79	109.4	639
C-03-04 06BBA	02/16/79	105.7	642

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 06BBA	01/18/82	142.4	606
C-03-04 06BBA	01/24/83	149.5	599
C-03-04 06BBA	11/09/83	97.6	650
C-03-04 06BBA	01/26/84	90.5	658
C-03-04 06BBA	02/27/84	92.3	656
C-03-04 06BBA	01/16/85	104	644
C-03-04 06BBA	02/11/86	99.93	648
C-03-04 06BBA	12/16/86	103.1	645
C-03-04 06BBA	06/11/87	106.6	641
C-03-04 06BBA	12/28/87	109.3	639
C-03-04 06BBA	06/13/88	117.2	631
C-03-04 06BBA	12/06/88	124.2	624
C-03-04 06BBA	12/05/89	129	619
C-03-04 06BBA	12/14/90	135.8	612
C-03-04 06BBA	12/12/91	137.9	610
C-03-04 06BBA	11/23/92	123.8	624
C-03-04 06BBA	01/12/93	119	629
C-03-04 06BBA	02/03/93	117.9	630
C-03-04 06BBA	03/01/93	108.7	639
C-03-04 06BBA	04/05/93	99.9	648
C-03-04 06BBA	11/17/93	90.7	657
C-03-04 06BBA	03/13/95	99.8	648
C-03-04 06BBA	04/18/95	179.1	569
C-03-04 06BBA	11/27/95	93.8	654
C-03-04 06BBA	11/27/96	100	648
C-03-04 06BBA	11/10/97	108.8	639
C-03-04 06BBA	12/21/98	109.6	638
C-03-04 06BBA	11/03/99	120.1	628
C-03-04 06BBA	11/27/00	125.5	623
C-03-04 06BBA	11/20/01	139	609
C-03-04 06BDD	12/18/45	62.5	686
C-03-04 06BDD	09/19/60	169.7	578
C-03-04 06BDD	01/14/66	170.2	578
C-03-04 06BDD	01/14/72	155.9	592
C-03-04 06BDD	02/15/73	155.9	592
C-03-04 06BDD	11/17/93	94	654
C-03-04 06DAB	10/28/58	179.97	582
C-03-04 06DAB	01/24/61	188.7	573
C-03-04 06DAB	01/19/66	188.77	573
C-03-04 06DAB	11/18/93	116.4	646
C-03-04 07AAA	04/10/46	67.73	677
C-03-04 07AAA	09/21/60		
C-03-04 07AAA	03/14/95		
C-03-04 07AAB	04/10/46	64.72	683
C-03-04 07AAB	02/13/51	98.36	650
C-03-04 07AAB	04/01/52	100.25	648
C-03-04 07AAB	09/21/60	189.7	558
C-03-04 07AAB	01/24/61	179.7	568

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 07AAB	01/14/66	182.4	566
C-03-04 07AAB	01/13/72	169.8	578
C-03-04 07AAB	03/14/95		
C-03-04 07AAD	09/21/60	189.72	562
C-03-04 07AAD	01/24/61	179.67	572
C-03-04 07AAD	01/14/66	182.43	570
C-03-04 07AAD	01/13/72	169.8	582
C-03-04 07AAD	02/13/73	172.1	580
C-03-04 07AAD	12/28/78	155	597
C-03-04 07AAD	02/26/79	126.5	626
C-03-04 07AAD	11/18/93	113.7	638
C-03-04 07ADA	05/03/77	172	576
C-03-04 07DBA	11/17/93	80.7	662
C-03-04 08BAB1	02/15/51	111.83	651
C-03-04 08BAB1	04/01/52	103.8	659
C-03-04 08BAB1	12/28/53	160.56	602
C-03-04 08BAB1	12/14/54	154.28	609
C-03-04 08BAB1	10/28/58	185.87	577
C-03-04 08BAB1	01/24/61	192.5	571
C-03-04 08CAA	12/18/45	67.81	682
C-03-04 08CAA	09/19/60	182.5	568
C-03-04 08CAA	01/25/61	181.05	569
C-03-04 08CAA	01/14/66	180.92	569
C-03-04 08DCB	12/18/45	67.08	683
C-03-04 08DCB	09/15/55	150.48	600
C-03-04 08DCB	10/30/58	177.21	573
C-03-04 08DCB	09/19/60	217.4	533
C-03-04 08DCB	01/25/61	192.45	558
C-03-04 08DCB	01/14/66	182.42	568
C-03-04 08DCB	12/28/78	161.25	589
C-03-04 08DCB	11/17/93	115.1	635
C-03-04 09AAD	10/28/53	261.32	564
C-03-04 09AAD	12/14/54	228.72	596
C-03-04 09AAD	02/14/57	245.58	579
C-03-04 09AAD	01/23/58	250.18	575
C-03-04 09AAD	03/02/60	262.3	563
C-03-04 09AAD	09/21/60	276.3	549
C-03-04 09AAD	03/05/62	269.89	555
C-03-04 09AAD	02/04/63	269.4	556
C-03-04 09AAD	01/28/64	270.78	554
C-03-04 09AAD	04/14/65	270.4	555
C-03-04 09AAD	01/19/66	270.71	554
C-03-04 09BAA	02/13/51	154.95	654
C-03-04 09BAA	12/27/53	196.3	613
C-03-04 09BAA	03/05/54	194.5	615
C-03-04 09BAA	12/14/54	201.99	607
C-03-04 09BAA	01/24/55	201.83	607
C-03-04 09BAA	03/12/56	208.89	600

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 09BAA	01/23/58	224.08	585
C-03-04 09BAA	10/28/58	243.64	565
C-03-04 09BAA	03/21/60	253.8	555
C-03-04 09BAA	01/20/61	324.14	485
C-03-04 09BAA	02/06/63	243.3	566
C-03-04 09BAA	01/28/64	243.26	566
C-03-04 09BAA	04/14/65	243.83	565
C-03-04 09BAA	06/23/65	277.7	531
C-03-04 09BAA	01/19/66	243.79	565
C-03-04 09BAA	02/04/70	233.7	575
C-03-04 09BAA	01/11/74	225	584
C-03-04 09BAA	01/21/75	216.3	593
C-03-04 09BAA	01/13/76	221.1	588
C-03-04 09BAA	01/11/77	219.4	590
C-03-04 09BAA	02/02/79	221.8	587
C-03-04 09BAA	01/30/81	162.1	647
C-03-04 09BAA	01/18/82	223	586
C-03-04 09BAA	01/24/83	237.7	571
C-03-04 09BAA	11/08/83	211.8	597
C-03-04 09BAA	01/26/84	198.3	611
C-03-04 09BAA	02/13/85	201.2	608
C-03-04 09BAA	02/27/85	194.6	614
C-03-04 09BAA	02/11/86	192.4	617
C-03-04 09BAA	12/16/86	191.3	618
C-03-04 09BAA	06/11/87	215.3	594
C-03-04 09BAA	12/28/87	198.7	610
C-03-04 09BAA	06/13/88	220.4	589
C-03-04 09BAA	12/06/88	209.1	600
C-03-04 09BAA	12/05/89	220.9	588
C-03-04 09BAA	12/14/90	225.1	584
C-03-04 09BAA	12/12/91	226.5	583
C-03-04 09BAA	11/23/92	215.5	594
C-03-04 09BAA	01/12/93	209.2	600
C-03-04 09BAA	02/03/93	207.8	601
C-03-04 09BAA	03/02/93	202.2	607
C-03-04 09BAA	04/05/93	214.4	595
C-03-04 09BAA	11/18/93	189.8	619
C-03-04 09BAA	11/07/94	191.8	617
C-03-04 09BAA	02/23/95	212	597
C-03-04 09BAA	03/13/95	198.2	611
C-03-04 09BAA	04/17/95	210.8	598
C-03-04 09BAA	11/27/95	192.2	617
C-03-04 09BAA	01/08/97	196	613
C-03-04 09BAA	11/10/97	206	603
C-03-04 09BAA	11/20/01	251.1	557
C-03-04 09CAA	12/14/54	208.19	590
C-03-04 09CAA	10/28/58	229.51	568
C-03-04 09CAA	01/19/66	233.5	565

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 09CAA	11/18/93	176.1	622
C-03-04 09CAB	11/18/93	164.4	620
C-03-04 09DDA	12/14/54	222.37	598
C-03-04 09DDA	10/28/58	261.11	559
C-03-04 09DDA	09/21/60	264.5	556
C-03-04 09DDA	01/20/61	259.53	560
C-03-04 09DDA	01/02/78	236	584
C-03-04 09DDA	02/26/79	231.5	589
C-03-04 09DDA	11/18/93	201	619
C-03-04 10CAA1	12/28/53	251.54	607
C-03-04 10CAA1	12/15/54	261.1	598
C-03-04 10CAA1	10/28/58	299.3	560
C-03-04 10CAA1	09/21/60	304.95	554
C-03-04 10CAA1	01/21/61	298.61	560
C-03-04 10CAA1	12/16/86	242.7	616
C-03-04 10CAA1	06/11/87	248.5	611
C-03-04 10CAA1	12/28/87	251.4	608
C-03-04 10CAA1	06/13/88	255.4	604
C-03-04 10CAA1	12/06/88	260.8	598
C-03-04 10CAA1	12/05/89	272.3	587
C-03-04 10CAA1	12/14/90	275.9	583
C-03-04 10CAA1	11/18/93	244.7	614
C-03-04 10CAA2	01/19/66	297.4	562
C-03-04 10CAA2	01/12/72	299.6	559
C-03-04 10CAA2	02/13/73	292.8	566
C-03-04 10CAA2	02/26/79	274.4	585
C-03-04 10CAA2	02/08/83	280.4	579
C-03-04 10CAA2	11/08/83	266.3	593
C-03-04 10CAA2	01/26/84	254.2	605
C-03-04 10CAA2	02/27/84	251.4	608
C-03-04 10CAA2	01/16/85	259.5	600
C-03-04 10CAA2	02/21/86	245.4	614
C-03-04 10CAA2	11/18/93	244	615
C-03-04 11CCC	11/15/69	313	558
C-03-04 14AAD	11/18/93	348.1	608
C-03-04 14ADD	11/18/93	335.6	604
C-03-04 14BDD	03/14/95		
C-03-04 15ACC	12/29/53	225.64	605
C-03-04 15ACC	12/15/54	234.07	597
C-03-04 15ACC	10/28/58	266.99	564
C-03-04 15ACC	02/16/61	271.4	560
C-03-04 15ACC	01/19/66	268.51	562
C-03-04 15ADC	01/19/66	285.15	561
C-03-04 15ADC	11/18/93	235.8	610
C-03-04 15DAA	05/05/53	142	719
C-03-04 15DAA	12/29/53	259.24	602
C-03-04 15DAA	12/15/54	265.72	595
C-03-04 15DAA	10/28/58	316.54	544

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 15DAA	12/15/77	289.1	572
C-03-04 15DAA	02/26/79	278.9	582
C-03-04 15DAA	11/18/93	247.7	613
C-03-04 16BAA	11/18/93	162.7	618
C-03-04 16DAA	04/01/52	159.3	643
C-03-04 16DAA	12/15/54	205.9	596
C-03-04 16DAA	10/28/58	238.04	564
C-03-04 16DAA	01/19/61	251.33	551
C-03-04 16DAA	12/15/77	222	580
C-03-04 16DAA	11/18/93	185.2	617
C-03-04 17ABA	01/14/66	183.8	561
C-03-04 17ABA	04/16/69	172.25	573
C-03-04 17ABA	01/13/72	175.5	570
C-03-04 17ABA	11/17/93	119.4	626
C-03-04 17ABB	04/16/69	166.33	579
C-03-04 17ABB	02/26/79	132.4	613
C-03-04 17ABB	11/17/93	112.3	633
C-03-04 17ADB	04/16/69	172.25	575
C-03-04 17ADB	11/17/93	119.9	627
C-03-04 17ADD	01/25/61	196.64	551
C-03-04 17ADD	02/07/66	182	566
C-03-04 17ADD	12/28/77	161.7	586
C-03-04 17ADD	02/26/79	157.1	591
C-03-04 17ADD	02/08/83	172.9	575
C-03-04 17ADD	11/08/83	140.8	607
C-03-04 17ADD	01/26/84	128.2	620
C-03-04 17ADD	02/27/84	129.2	619
C-03-04 17ADD	01/16/85	137.5	611
C-03-04 17ADD	02/21/86	125.3	623
C-03-04 17ADD	12/16/86	124.4	624
C-03-04 17ADD	05/01/87	131.85	616
C-03-04 17ADD	06/11/87	137.6	610
C-03-04 17ADD	09/03/87	154	594
C-03-04 17ADD	12/07/87	136.6	611
C-03-04 17ADD	03/01/88	128.4	620
C-03-04 17ADD	06/06/88	145.2	603
C-03-04 17ADD	08/08/88	159.4	589
C-03-04 17ADD	10/25/88	151	597
C-03-04 17ADD	01/24/89	142.2	606
C-03-04 17ADD	04/17/89	149.4	599
C-03-04 17ADD	07/26/89	165.8	582
C-03-04 17ADD	10/31/89	163.2	585
C-03-04 17ADD	02/28/90	147.3	601
C-03-04 17ADD	05/23/90	161.5	587
C-03-04 17ADD	08/23/90	176.6	571
C-03-04 17ADD	11/13/90	164.3	584
C-03-04 17ADD	02/12/91	156.3	592
C-03-04 17ADD	05/17/91	159.1	589

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 17ADD	08/13/91	177.1	571
C-03-04 17ADD	11/14/91	166.7	581
C-03-04 17ADD	02/12/92	155.7	592
C-03-04 17ADD	05/11/92	154.85	593
C-03-04 17ADD	08/11/92	167	581
C-03-04 17ADD	11/09/92	153.3	595
C-03-04 17ADD	02/11/93	139.73	608
C-03-04 17ADD	05/13/93	129	619
C-03-04 17ADD	08/16/93	137.8	610
C-03-04 17ADD	11/17/93	118.7	629
C-03-04 17ADD	02/17/94	106.4	642
C-03-04 17ADD	05/16/94	117.95	630
C-03-04 17ADD	08/16/94	135.15	613
C-03-04 17ADD	11/14/94	121.75	626
C-03-04 17ADD	02/22/95	111.5	637
C-03-04 17ADD	05/17/95	122.5	626
C-03-04 17ADD	08/15/95	139.5	609
C-03-04 17ADD	11/13/95	127	621
C-03-04 17ADD	02/14/96	118.9	629
C-03-04 17ADD	05/14/96	133.6	614
C-03-04 17ADD	08/14/96	151.8	596
C-03-04 17ADD	11/13/96	143.5	605
C-03-04 17ADD	02/10/97	133.3	615
C-03-04 17ADD	05/20/97	144.8	603
C-03-04 17ADD	08/20/97	158.55	589
C-03-04 17ADD	11/17/97	149.7	598
C-03-04 17ADD	02/18/98	141.32	607
C-03-04 17ADD	05/19/98	146.6	601
C-03-04 17ADD	08/17/98	159.69	588
C-03-04 17ADD	11/17/98	156.1	592
C-03-04 17ADD	02/17/99	146.8	601
C-03-04 17ADD	08/10/99	173.1	575
C-03-04 17ADD	11/16/99	164.9	583
C-03-04 17ADD	02/15/00	155.3	593
C-03-04 17ADD	08/16/00	180.05	568
C-03-04 17ADD	11/16/00	171.35	577
C-03-04 17ADD	02/13/01	156.9	591
C-03-04 17ADD	05/11/01	170.2	578
C-03-04 17ADD	08/16/01	189.4	559
C-03-04 17ADD	11/13/01	184.5	563
C-03-04 19BBB	12/30/53	78.28	637
C-03-04 19BBB	12/01/54	87.66	627
C-03-04 19BBB	01/24/61	133.35	582
C-03-04 19BBB	11/16/93	43.5	672
C-03-04 19CCD	06/17/65	139.6	570
C-03-04 19CCD	01/11/66	137.09	573
C-03-04 19CCD	02/14/66	135.06	575
C-03-04 19CCD	01/25/68	125	585

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 19CCD	02/04/70	124.5	586
C-03-04 19CCD	01/20/71	126.4	584
C-03-04 19CCD	01/13/72	123.7	586
C-03-04 19CCD	02/16/73	124	586
C-03-04 19CCD	01/11/74	90.3	620
C-03-04 19CCD	01/13/76	95.5	615
C-03-04 19CCD	01/11/77	99.5	611
C-03-04 19CCD	01/30/78	97.3	613
C-03-04 19CCD	03/16/78	95.6	614
C-03-04 19CCD	01/04/79	85.8	624
C-03-04 19CCD	02/06/79	80	630
C-03-04 19CCD	03/21/80	58.6	651
C-03-04 19CCD	01/28/81	63.9	646
C-03-04 19CCD	01/18/82	82.7	627
C-03-04 19CCD	01/24/83	96.9	613
C-03-04 19CCD	11/08/83	59.3	651
C-03-04 19CCD	01/26/84	48.8	661
C-03-04 19CCD	02/27/84	48.2	662
C-03-04 19CCD	02/13/85	48.6	661
C-03-04 19CCD	02/11/86	38.8	671
C-03-04 19CCD	12/16/86	56.6	653
C-03-04 19CCD	06/11/87	62.3	648
C-03-04 19CCD	12/28/87	65.2	645
C-03-04 19CCD	06/13/88	71.1	639
C-03-04 19CCD	12/06/88	66.3	644
C-03-04 19CCD	12/05/89	83.3	627
C-03-04 19CCD	12/14/90	89.6	620
C-03-04 19CCD	12/12/91	94.5	616
C-03-04 19CCD	11/23/92	76.2	634
C-03-04 19CCD	04/05/93	51	659
C-03-04 19CCD	11/16/93	42.6	667
C-03-04 19CCD	11/07/94	49.6	660
C-03-04 19CCD	02/22/95	39.5	671
C-03-04 19CCD	03/13/95	39.2	671
C-03-04 19CCD	04/18/95	162.4	548
C-03-04 19CCD	11/27/95	46.6	663
C-03-04 19CCD	11/27/96	65.6	644
C-03-04 19CCD	11/10/97	77.1	633
C-03-04 19CCD	12/21/98	76.5	634
C-03-04 19CCD	11/03/99	85.2	625
C-03-04 19CCD	11/27/00	91.6	618
C-03-04 19CCD	11/20/01	102.7	607
C-03-04 20AAA	12/04/54	143.86	594
C-03-04 20AAA	02/14/57	152.26	586
C-03-04 20AAA	10/30/58	174.21	564
C-03-04 20AAA	02/04/59	178.8	559
C-03-04 20AAA	02/04/63	180.7	557
C-03-04 20AAA	01/28/64	179.36	559

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 20AAA	03/23/78	155	583
C-03-04 20AAA	11/17/93	109.2	629
C-03-04 20DAA	01/05/66	166.3	562
C-03-04 20DAA	01/13/66	165.7	562
C-03-04 20DAA	01/21/66	165.4	563
C-03-04 20DAA	02/16/66	166.1	562
C-03-04 20DAA	01/13/72	160.1	568
C-03-04 20DAA	12/15/77	147.5	581
C-03-04 20DAA	03/09/78	143.6	584
C-03-04 20DAA	01/15/79	139.5	589
C-03-04 20DAA	01/29/79	136.6	591
C-03-04 20DAA	02/26/79	129.7	598
C-03-04 20DAA	08/14/79	138	590
C-03-04 20DAA	11/17/93	108.9	619
C-03-04 20DBA	12/30/53	107.6	610
C-03-04 20DBA	12/04/54	119.38	599
C-03-04 21BBA	12/18/45	68.67	676
C-03-04 21BBA	01/28/52	104.8	640
C-03-04 21BBA	02/15/73	180.4	565
C-03-04 21BBA	12/15/77	165	580
C-03-04 21BBA	03/16/78	161.5	584
C-03-04 21BBA	03/23/78	160.5	585
C-03-04 21BBA	12/20/78	167.9	577
C-03-04 21BBA	12/28/78	166.4	579
C-03-04 21BBA	01/04/79	168.8	576
C-03-04 21BBA	01/15/79	165.9	579
C-03-04 21BBA	01/22/79	162.1	583
C-03-04 21BBA	11/17/93	123	622
C-03-04 21BDB	10/30/58	195.05	556
C-03-04 21BDB	11/24/93	123.3	628
C-03-04 21CAB	12/18/45	70.38	678
C-03-04 21CAB	09/19/60	208.7	539
C-03-04 21CDA	02/16/61	156.88	589
C-03-04 21CDA	11/17/93	127.5	619
C-03-04 21DDA	11/18/93	167.6	614
C-03-04 22DDC	11/18/93	236.2	605
C-03-04 22DDD1	05/06/53	248.33	609
C-03-04 22DDD1	12/15/54	261.49	596
C-03-04 22DDD1	11/18/93	250	607
C-03-04 22DDD2	10/28/58	295.1	562
C-03-04 22DDD2	09/20/60	366.2	491
C-03-04 22DDD2	01/19/61	327.1	530
C-03-04 22DDD2	01/19/66	298.4	559
C-03-04 22DDD2	01/12/72	297.1	560
C-03-04 22DDD2	02/15/73	295.2	562
C-03-04 22DDD2	12/15/77	287.9	569
C-03-04 22DDD2	02/16/79	281.2	576
C-03-04 22DDD2	03/02/79	279	578

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 23BAA	05/06/53	277.3	619
C-03-04 23BAA	04/05/67	334.9	561
C-03-04 23BAA	01/23/68	331.09	565
C-03-04 23BAA	01/22/69	328	568
C-03-04 23BAA	02/06/70	328.5	568
C-03-04 23BAA	01/22/71	329.6	566
C-03-04 23BAA	01/12/72	332.7	563
C-03-04 23BAA	02/15/73	331.5	565
C-03-04 23BAA	01/11/74	318.5	578
C-03-04 23BAA	01/23/75	310.6	585
C-03-04 23BAA	01/13/76	313.3	583
C-03-04 23BAA	01/12/77	315.5	581
C-03-04 23BAA	12/15/77	325.8	570
C-03-04 23BAA	02/02/78	317.2	579
C-03-04 23BAA	02/28/79	316.2	580
C-03-04 23BAA	03/21/80	301.3	595
C-03-04 23BAA	01/30/81	278	618
C-03-04 23BAA	01/20/82	315.7	580
C-03-04 23BAA	01/25/83	333.4	563
C-03-04 23BAA	11/10/83	309.1	587
C-03-04 23BAA	01/25/84	298.2	598
C-03-04 23BAA	02/29/84	295.2	601
C-03-04 23BAA	02/12/86	287.2	609
C-03-04 23BAA	12/16/86	280.2	616
C-03-04 23BAA	06/11/87	282.7	613
C-03-04 23BAA	12/28/87	290	606
C-03-04 23BAA	06/13/88	288.9	607
C-03-04 23BAA	12/06/88	299.6	596
C-03-04 23BAA	12/04/89	310.7	585
C-03-04 23BAA	12/14/90	315.4	581
C-03-04 23BAA	12/09/91	317.3	579
C-03-04 23BAA	11/23/92	309.5	587
C-03-04 23BAA	02/03/93	304.5	592
C-03-04 23BAA	03/01/93	300.2	596
C-03-04 23BAA	04/05/93	296.2	600
C-03-04 23BAA	11/18/93	288.2	608
C-03-04 23BAA	11/07/94	285.3	611
C-03-04 23BAA	02/23/95	279.8	616
C-03-04 23BAA	03/13/95	276.1	620
C-03-04 23BAA	04/17/95	278.2	618
C-03-04 23BAA	12/01/95	298.2	598
C-03-04 23BAA	11/27/96	304.8	591
C-03-04 23BAA	11/10/97	311.3	585
C-03-04 23BAA	12/21/98	310.1	586
C-03-04 23BAA	11/03/99	316.9	579
C-03-04 23BAA	11/20/01	338.6	557
C-03-04 23BBA	12/15/54	287.7	588
C-03-04 23BBA	10/28/58	322.13	554

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 23BBA	01/19/61	318.5	558
C-03-04 23BBA	01/19/66	328.6	547
C-03-04 23CAB	02/28/79	293.1	580
C-03-04 23CAB	11/23/93	265.9	607
C-03-04 26BCC	11/18/93	262.9	601
C-03-04 27BAA	04/01/52	191.5	621
C-03-04 27BAA	05/06/53	204.03	608
C-03-04 27BAA	10/28/58	248.02	564
C-03-04 27BAA	01/19/61	324.02	488
C-03-04 27BAA	02/26/79	240	572
C-03-04 27BAA	02/08/83	249.9	562
C-03-04 27BAA	06/11/87	211.5	601
C-03-04 27BAA	12/28/87	208.1	604
C-03-04 27BAA	06/13/88	217	595
C-03-04 27BAA	12/06/88	223.1	589
C-03-04 27BAA	12/04/89	230.1	582
C-03-04 27BAA	12/14/90	235.4	577
C-03-04 27BAA	11/18/93	207.9	604
C-03-04 28ABB	05/08/53	160.2	591
C-03-04 28ABB	11/17/93	129.6	621
C-03-04 28ACC	12/18/45	72.5	677
C-03-04 28ACC	11/17/93	130.9	618
C-03-04 28DBB	12/30/53	164.1	579
C-03-04 28DBB	12/15/54	150.1	593
C-03-04 28DBB	10/30/58	184.3	559
C-03-04 28DBB	01/05/66	185	558
C-03-04 28DBB	01/13/66	184.5	559
C-03-04 28DBB	01/21/66	184.3	559
C-03-04 28DBB	02/16/66	186.1	557
C-03-04 28DBB	01/13/72	184.5	559
C-03-04 28DBB	12/14/76	165	578
C-03-04 28DBB	12/20/78	172	571
C-03-04 28DBB	12/28/78	169.4	574
C-03-04 28DBB	01/04/79	169.7	573
C-03-04 28DBB	01/15/79	168	575
C-03-04 28DBB	01/22/79	167	576
C-03-04 28DBB	01/29/79	164.7	578
C-03-04 28DBB	02/05/79	163.7	579
C-03-04 28DBB	02/16/79	162	581
C-03-04 28DBB	08/14/79	173.3	570
C-03-04 28DBB	11/17/93	125	618
C-03-04 30ABA	11/16/93	38.4	670
C-03-04 30CBB	11/16/93	52.1	651
C-03-04 31CCA	11/16/93	52.5	655
C-03-04 32DAA	12/14/76	118	581
C-03-04 32DAA	12/15/77	123.5	576
C-03-04 32DAA	02/26/79	102	597
C-03-04 32DAA	11/19/93	60.7	638

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-04 33ABA	12/18/45	76.15	666
C-03-04 33ABA	11/17/93	134.1	608
C-03-04 33ADB	01/18/66	189.6	561
C-03-04 33ADB	01/13/72	185.1	566
C-03-04 33ADB	02/16/73	184.6	566
C-03-04 33ADB	11/17/93	134	617
C-03-04 33ADC	02/26/79	172.5	578
C-03-04 33ADC	02/08/83	182	568
C-03-04 33ADC	11/08/83	156.1	594
C-03-04 33ADC	01/26/84	149.8	600
C-03-04 33ADC	02/27/84	144.2	606
C-03-04 33ADC	02/21/86	130.3	620
C-03-04 33ADC	12/16/86	124.4	626
C-03-04 33ADC	06/11/87	139	611
C-03-04 33ADC	12/28/87	132.4	618
C-03-04 33ADC	06/16/88	146.7	603
C-03-04 33ADC	12/06/88	145.2	605
C-03-04 33ADC	12/04/89	154.5	596
C-03-04 33ADC	12/14/90	161.5	589
C-03-04 33ADC	11/19/93	134.9	615
C-03-04 33BAA	11/17/93	89.2	629
C-03-04 33DAB	04/24/53	133.6	611
C-03-04 33DAB	12/04/54	149.98	595
C-03-04 33DAB	10/30/58	187.01	558
C-03-04 33DAB	12/15/77	175	570
C-03-04 33DAB	02/08/83	182	563
C-03-04 33DAB	11/08/83	156.1	589
C-03-04 33DAB	01/26/84	149.8	595
C-03-04 33DAB	02/27/84	144.2	601
C-03-04 33DAB	02/21/86	130.3	615
C-03-04 33DAB	11/19/93	128.6	616
C-03-04 33DDD	10/30/54	143.97	598
C-03-04 33DDD	09/22/60	202.8	539
C-03-04 33DDD	02/28/79	175.2	567
C-03-04 33DDD	08/14/79	193	549
C-03-04 33DDD	11/19/93	137.4	605
C-03-05 01AAA	12/04/54	130.96	614
C-03-05 01AAA	02/14/57	144.2	601
C-03-05 01AAA	01/29/58	158.35	587
C-03-05 01AAA	10/28/58	163.56	581
C-03-05 01AAA	02/04/59	161.6	583
C-03-05 01AAA	03/02/60	155.2	590
C-03-05 01AAA	01/24/61	156.54	588
C-03-05 01AAA	03/05/62	154.33	591
C-03-05 01AAA	02/04/63	156.6	588
C-03-05 01AAA	01/28/64	160.37	585
C-03-05 01AAA	04/14/65	162.69	582
C-03-05 01AAA	11/17/93	79.1	666

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-05 02BBC	02/14/66	86.3	646
C-03-05 02BBC	12/15/77	33	699
C-03-05 02BBC	03/23/78	19.3	713
C-03-05 02BBC	11/16/93	18.9	713
C-03-05 02BDB	01/04/79	18	712
C-03-05 02BDB	01/15/79	18.9	711
C-03-05 02BDB	01/22/79	13.6	716
C-03-05 02BDB	01/29/79	14	716
C-03-05 02BDB	02/05/79	14.4	716
C-03-05 02BDB	02/16/79	15.2	715
C-03-05 02BDB	02/26/79	16.1	714
C-03-05 02BDB	06/13/79	21.1	709
C-03-05 02CBB	12/30/53	60.64	669
C-03-05 02CBB	12/01/54	67.35	663
C-03-05 02CBB	01/24/61	108.45	622
C-03-05 02CBB	01/11/66	119.05	611
C-03-05 02CBB	01/21/66	115.66	614
C-03-05 02CBB	02/14/66	107.98	622
C-03-05 02CBB	03/22/67	99.25	631
C-03-05 02CBB	01/25/68	89.62	640
C-03-05 02CBB	02/04/70	78.8	651
C-03-05 02CBB	01/20/71	65.15	665
C-03-05 02CBB	02/13/73	52.4	678
C-03-05 02CBB	05/17/73	23.5	707
C-03-05 02CBB	01/11/74	23.2	707
C-03-05 02CBB	01/21/75	26.2	704
C-03-05 02CBB	01/13/76	23.3	707
C-03-05 02CBB	01/11/77	25.7	704
C-03-05 02CBB	12/15/77	29	701
C-03-05 02CBB	01/30/78	26.1	704
C-03-05 02CBB	03/04/78	23.7	706
C-03-05 02CBB	03/09/78	24.8	705
C-03-05 02CBB	03/16/78	23	707
C-03-05 02CBB	12/19/78	22.1	708
C-03-05 02CBB	12/28/78	18.8	711
C-03-05 02CBB	01/04/79	18	712
C-03-05 02CBB	01/15/79	17.3	713
C-03-05 02CBB	01/22/79	15.7	714
C-03-05 02CBB	01/29/79	13.5	717
C-03-05 02CBB	02/05/79	13.1	717
C-03-05 02CBB	02/06/79	14.1	716
C-03-05 02CBB	02/16/79	12.9	717
C-03-05 02CBB	03/21/80	12.05	718
C-03-05 02CBB	01/28/81	15.3	715
C-03-05 02CBB	01/18/82	24.9	705
C-03-05 02CBB	01/24/83	40.6	689
C-03-05 02CBB	11/08/83	15	715
C-03-05 02CBB	01/26/84	14.52	715

WATER LEVELS FOR WELLS IN TOWNSHIP 3 SOUTH, RANGES 4, 5 WEST

WELL CADASTRAL LOCATION	WATER LEVEL MEASUREMENT DATE	DEPTH TO WATER (in feet bls)	WATER LEVEL ELEVATION (in feet amsl)
C-03-05 02CBB	02/27/84	19.8	710
C-03-05 02CBB	02/13/85	16.2	714
C-03-05 02CBB	02/11/86	22.98	707
C-03-05 02CBB	12/16/86	31.4	699
C-03-05 02CBB	06/11/87	51.6	678
C-03-05 02CBB	12/28/87	31.3	699
C-03-05 02CBB	06/13/88	63.8	666
C-03-05 02CBB	12/06/88	54	676
C-03-05 02CBB	12/05/89	39.4	691
C-03-05 02CBB	12/14/90	34.85	695
C-03-05 02CBB	12/12/91	39.51	690
C-03-05 02CBB	11/23/92	20.5	710
C-03-05 02CBB	03/02/93	10	720
C-03-05 02CBB	04/05/93	9.6	720
C-03-05 02CBB	04/16/93	9.8	720
C-03-05 02CBB	11/16/93	12	718
C-03-05 02CBB	11/07/94	14.5	716
C-03-05 02CBB	02/22/95	11.4	719
C-03-05 02CBB	03/13/95	7.4	723
C-03-05 02CBB	04/18/95	10.4	720
C-03-05 02CBB	11/27/95	12.5	718
C-03-05 02CBB	11/27/96	17.9	712
C-03-05 02CBB	10/24/97	19.5	711
C-03-05 02CBB	11/10/97	18.2	712
C-03-05 02CBB	12/21/98	15.3	715
C-03-05 02CBB	11/03/99	17.2	713
C-03-05 02CBB	11/27/00	21	709
C-03-05 02CBB	11/20/01	30.2	699
C-03-05 13BAC	06/23/67	131.7	591
C-03-05 13BAC	01/13/72	121.6	601
C-03-05 13BAC	02/16/73	128.1	595
C-03-05 13BAC	12/15/77	93	630
C-03-05 13BAC	01/04/79	76.25	647
C-03-05 13BAC	01/15/79	73.1	650
C-03-05 13BAC	01/22/79	69.2	654
C-03-05 13BAC	01/29/79	64.7	658
C-03-05 13BAC	02/05/79	62.7	660
C-03-05 13BAC	02/16/79	63.3	660
C-03-05 13BAC	08/04/79	73.9	649
C-03-05 13DAD	12/15/77	97	614
C-03-05 13DAD	11/16/93	36.1	675

Compiled from ADWR GWSI database

APPENDIX B

GROUNDWATER QUALITY ANALYTICAL DATA

Del Mar Analytical

2852 Alton Ave., Irvine, CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

URS
7720 N. 16th Street Suite 100
Phoenix, AZ 85020
Attention: Mark Murphy

Client Project ID E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01
Issued: 1/10/02

CASE NARRATIVE

LABORATORY NUMBER	SAMPLE DESCRIPTION	SAMPLE MATRIX
PKL0460-01	WELL-9	Water
PKL0460-01RE1	WELL-9	Water
PKL0460-01RE2	WELL-9	Water
PKL0460-02	Trip Blank	Water
PKL0460-02RE1	Trip Blank	Water

SAMPLE RECEIPT: Samples were received intact, on ice, and with chain of custody documentation.

HOLDING TIMES: Holding times were met.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis.

OBSERVATIONS: No significant observations were made.

SUBCONTRACTED: No analyses were subcontracted to an outside laboratory.

QA/QC CRITERIA: N2 - See Corrective Action Report.

EXPLANATION OF DATA QUALIFIERS:
D1 - Reporting limit raised due to high concentrations of non-target analytes.
L3 - Laboratory Control Sample recovery was above the method control limits. Analyte not detected, data not impacted.
N1 - The nitrate, nitrite, and fluoride results for sample PKL0460-01RE2 were reported for batch QC purposes only. See original analysis for final result.

DEL MAR ANALYTICAL, PHOENIX (AZ0426)

Nicole Beck
Nicole Beck
Project Manager

Del Mar Analytical

2852 Alton Ave., Irvine, CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-8596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

URS 7720 N. 16th Street Suite 100 Phoenix, AZ 85020 Attention: Mark Murphy	Client Project ID: E1-00001546.03 Report Number: PKL0460	Sampled: 12/27/01 Received: 12/27/01

CASE NARRATIVE

GC CALIBRATION CHECK CRITERIA
ORGANOCHLORINE PESTICIDES (EPA 3510C/8081A)

Per Method 8000B of SW-846, the percent recovery of the calibration checks for GC analyses must be within ± 15% from the true value for each individual compound or the average % recovery of all compounds in the calibration check solution must be within ± 15% recovery. Per Method 8000B, the end user is to be notified if the latter situation occurs.

The % recovery for the following individual compounds fell outside the ± 15% criteria, however the average % recovery of all compounds in the calibration check solution was within ± 15%, thus meeting the overall calibration check criteria.

Compound	Footnote	Calibration Check % Recovery	Lab Number	Batch
4,4'-DDD	1	119%	PKL0460-01	1IL2837

Footnotes:

1 The calibration demonstrated a high bias for this compound. Samples were flagged to indicate a possible high bias in the result for this compound.

2 The calibration demonstrated a low bias for this compound. Samples were flagged to indicate a possible low bias in the result for this compound.

Nicole Beck
Project Manager

Del Mar Analytical

2852 Alton Ave., Irvine, CA 92606 (949) 261-1022 FAX (949) 261-1228
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URS
7720 N. 16th Street Suite 100
Phoenix, AZ 85020
Attention: Mark Murphy

Client Project ID: E1-00001546.03

Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Benzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Bromobenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Bromochloromethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Bromodichloromethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Bromoform	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Bromomethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
2-Butanone (MEK)	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
n-Butylbenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
sec-Butylbenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
tert-Butylbenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Carbon Disulfide	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Carbon tetrachloride	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Chlorobenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Chloroethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Chloroform	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Chloromethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
2-Chlorotoluene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
4-Chlorotoluene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Dibromochloromethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2-Dibromo-3-chloropropane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
1,2-Dibromoethane (EDB)	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Dibromomethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2-Dichlorobenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,3-Dichlorobenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,4-Dichlorobenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Dichlorodifluoromethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
1,1-Dichloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2-Dichloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,1-Dichloroethene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
cis-1,2-Dichloroethene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
trans-1,2-Dichloroethene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2-Dichloropropane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,3-Dichloropropane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
2,2-Dichloropropane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,1-Dichloropropene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
cis-1,3-Dichloropropene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
trans-1,3-Dichloropropene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	L3
Ethylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Hexachlorobutadiene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
2-Hexanone	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
Iodomethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Isopropylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
p-Isopropyltoluene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	

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7720 N. 16th Street Suite 100
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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Methylene chloride	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
4-Methyl-2-pentanone (MIBK)	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
Methyl-tert-butyl Ether (MTBE)	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Naphthalene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	V1,L3
n-Propylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Styrene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,1,1,2-Tetrachloroethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
1,1,2,2-Tetrachloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	V1
Tetrachloroethene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Toluene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2,3-Trichlorobenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	V1,L3
1,2,4-Trichlorobenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	L3
1,1,1-Trichloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,1,2-Trichloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Trichloroethene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Trichlorofluoromethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
1,2,3-Trichloropropane	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
1,2,4-Trimethylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,3,5-Trimethylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Vinyl acetate	EPA 8260B	P2A0501	25	ND	1	1/5/02	1/5/02	
Vinyl chloride	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Xylenes, Total	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
Surrogate: Dibromofluoromethane (80-135%)				*102 %*				
Surrogate: Toluene-d8 (80-125%)				*107 %*				
Surrogate: 4-Bromofluorobenzene (75-125%)				*102 %*				

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01RE1 (WELL-9 - Water)								
Acetone	EPA 8260B	P2A0708	20	ND	1	1/7/02	1/7/02	
Surrogate: Dibromofluoromethane (80-135%)				*100 %*				
Surrogate: Toluene-d8 (80-125%)				*111 %*				
Surrogate: 4-Bromofluorobenzene (75-125%)				*104 %*				
Sample ID: PKL0460-02 (Trip Blank - Water)								
Benzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Bromobenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Bromochloromethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Bromodichloromethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Bromoform	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Bromomethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
2-Butanone (MEK)	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
n-Butylbenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
sec-Butylbenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
ert-Butylbenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Carbon Disulfide	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Carbon tetrachloride	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Chlorobenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Chloroethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Chloroform	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Chloromethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
2-Chlorotoluene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
4-Chlorotoluene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Dibromochloromethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2-Dibromo-3-chloropropane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
1,2-Dibromoethane (EDB)	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Dibromomethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2-Dichlorobenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,3-Dichlorobenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,4-Dichlorobenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Dichlorodifluoromethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
1,1-Dichloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2-Dichloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,1-Dichloroethene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
cis-1,2-Dichloroethene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
trans-1,2-Dichloroethene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2-Dichloropropane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,3-Dichloropropane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
2,2-Dichloropropane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,1-Dichloropropene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
cis-1,3-Dichloropropene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
trans-1,3-Dichloropropene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Ethylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	L3

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-02 (Trip Blank - Water)								
Hexachlorobutadiene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
2-Hexanone	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
Iodomethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Isopropylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
p-Isopropyltoluene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Methylene chloride	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
4-Methyl-2-pentanone (MIBK)	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
Methyl-tert-butyl Ether (MTBE)	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Naphthalene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	V1,L3
n-Propylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Styrene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,1,1,2-Tetrachloroethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
1,1,2,2-Tetrachloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	V1
Tetrachloroethene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Toluene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,2,3-Trichlorobenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	V1,L3
1,2,4-Trichlorobenzene	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	L3
1,1,1-Trichloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,1,2-Trichloroethane	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Trichloroethene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Trichlorofluoromethane	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
1,2,3-Trichloropropane	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
1,2,4-Trimethylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
1,3,5-Trimethylbenzene	EPA 8260B	P2A0501	2.0	ND	1	1/5/02	1/5/02	
Vinyl acetate	EPA 8260B	P2A0501	25	ND	1	1/5/02	1/5/02	
Vinyl chloride	EPA 8260B	P2A0501	5.0	ND	1	1/5/02	1/5/02	
Xylenes, Total	EPA 8260B	P2A0501	10	ND	1	1/5/02	1/5/02	
Surrogate: Dibromofluoromethane (80-135%)				*105 %*				
Surrogate: Toluene-d8 (80-125%)				*108 %*				
Surrogate: 4-Bromofluorobenzene (75-125%)				*100 %*				

Nicole Beck
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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-02RE1 (Trip Blank - Water)								
Acetone	EPA 8260B	P2A0708	20	ND	1	1/7/02	1/7/02	
Surrogate: Dibromofluoromethane (80-135%)				*97 %*				
Surrogate: Toluene-d8 (80-125%)				*100 %*				
Surrogate: 4-Bromofluorobenzene (75-125%)				*101 %*				

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

SEMI-VOLATILE ORGANICS BY GC/MS (EPA 8270C)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Acenaphthene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Acenaphthylene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Anthracene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Benzoic acid	EPA 8270C	P1L2811	50	ND	1	12/28/01	12/31/01	
Benz(a)anthracene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Benzo(b,k)fluoranthene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Benzo(g,h,i)perylene	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
Benzo(a)pyrene	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
Benzyl alcohol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Bis(2-chloroethoxy)methane	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Bis(2-chloroethyl)ether	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Bis(2-chloroisopropyl)ether	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Bis(2-ethylhexyl)phthalate	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
4-Bromophenyl phenyl ether	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
Butyl benzyl phthalate	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
4-Chloroaniline	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
2-Chloronaphthalene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
4-Chloro-3-methylphenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
2-Chlorophenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
4-Chlorophenyl phenyl ether	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Chrysene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Dibenz(a,h)anthracene	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
Dibenzofuran	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Di-n-butyl phthalate	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
1,3-Dichlorobenzene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
1,4-Dichlorobenzene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
1,2-Dichlorobenzene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
3,3-Dichlorobenzidine	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
2,4-Dichlorophenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Diethyl phthalate	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
2,4-Dimethylphenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Dimethyl phthalate	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
4,6-Dinitro-2-methylphenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
2,4-Dinitrophenol	EPA 8270C	P1L2811	30	ND	1	12/28/01	12/31/01	
2,4-Dinitrotoluene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
2,6-Dinitrotoluene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Di-n-octyl phthalate	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
1,2-Diphenylhydrazine/Azobenzen	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Fluoranthene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Fluorene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Hexachlorobenzene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Hexachlorobutadiene	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
Hexachlorocyclopentadiene	EPA 8270C	P1L2811	30	ND	1	12/28/01	12/31/01	

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

SEMI-VOLATILE ORGANICS BY GC/MS (EPA 8270C)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Hexachloroethane	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Indeno(1,2,3-cd)pyrene	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
Isophorone	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
2-Methylnaphthalene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
2-Methylphenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
4-Methylphenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Naphthalene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Nitrobenzene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
2-Nitrophenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
4-Nitrophenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
n-Nitrosodiphenylamine	EPA 8270C	P1L2811	30	ND	1	12/28/01	12/31/01	
n-Nitroso-di-n-propylamine	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Pentachlorophenol	EPA 8270C	P1L2811	20	ND	1	12/28/01	12/31/01	
Phenanthrene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Phenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Pyrene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
1,2,4-Trichlorobenzene	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
2,4,6-Trichlorophenol	EPA 8270C	P1L2811	10	ND	1	12/28/01	12/31/01	
Surrogate: 2-Fluorophenol (20-140%)				*67 %*				
Surrogate: Phenol-d6 (20-140%)				*72 %*				
Surrogate: 2,4,6-Tribromophenol (20-150%)				*86 %*				
Surrogate: Nitrobenzene-d5 (35-115%)				*80 %*				
Surrogate: 2-Fluorobiphenyl (40-125%)				*76 %*				
Surrogate: Terphenyl-d14 (70-115%)				*81 %*				

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

TOTAL RECOVERABLE METALS

Analyte	Method	Batch	Reporting Limit mg/l	Sample Result mg/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Antimony	EPA 200.7	P1L3114	0.050	ND	1	12/31/01	1/2/02	
Arsenic	EPA 200.7	P1L3114	0.050	ND	1	12/31/01	1/2/02	
Beryllium	EPA 200.7	P1L3114	0.0040	ND	1	12/31/01	1/2/02	
Cadmium	EPA 200.7	P1L3114	0.0050	ND	1	12/31/01	1/2/02	
Chromium	EPA 200.7	P1L3114	0.010	ND	1	12/31/01	1/2/02	
Copper	EPA 200.7	P1L3114	0.020	ND	1	12/31/01	1/2/02	
Lead	EPA 200.7	P1L3114	0.050	ND	1	12/31/01	1/2/02	
Mercury	EPA 245.1	P2A0217	0.00020	ND	1	1/2/02	1/2/02	
Nickel	EPA 200.7	P1L3114	0.050	ND	1	12/31/01	1/2/02	
Selenium	EPA 200.7	P1L3114	0.050	ND	1	12/31/01	1/2/02	
Silver	EPA 200.7	P1L3114	0.0050	ND	1	12/31/01	1/2/02	
Thallium	EPA 200.7	P1L3114	0.050	ND	1	12/31/01	1/2/02	
Zinc	EPA 200.7	P1L3114	0.050	0.31	1	12/31/01	1/2/02	

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Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

INORGANICS

Analyte	Method	Batch	Reporting Limit mg/l	Sample Result mg/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Phosphorus	EPA 365.3	P2A0308	0.050	ND	1	1/3/02	1/3/02	
Total Nitrogen	Calculation	P2A0816	0.50	2.0	1	1/8/02	1/8/02	
Sample ID: PKL0460-01RE1 (WELL-9 - Water)								
Fluoride	EPA 300.0	P2A0216	1.0	3.0	10	12/28/01	12/28/01	
Nitrate-N	EPA 300.0	P2A0216	1.0	13	10	12/28/01	12/28/01	
Nitrate/Nitrite-N	EPA 300.0	P2A0216	1.0	13	10	12/28/01	12/28/01	
Nitrite-N	EPA 300.0	P2A0216	10	ND	100	12/28/01	12/28/01	D1
Sample ID: PKL0460-01RE2 (WELL-9 - Water)								
Fluoride	EPA 300.0	P2A0216	1.0	3.0	10	12/28/01	12/28/01	N1,M1
Nitrate-N	EPA 300.0	P2A0216	1.0	13	10	12/28/01	12/28/01	N1
Nitrate/Nitrite-N	EPA 300.0	P2A0216	1.0	13	10	12/28/01	12/28/01	N1
Nitrite-N	EPA 300.0	P2A0216	1.0	ND	10	12/28/01	12/28/01	N1

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Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

ORGANOCHLORINE PESTICIDES (EPA 3510C/8081A)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Aldrin	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
alpha-BHC	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
beta-BHC	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
delta-BHC	EPA 3510C/8081A	I1L2837	0.20	ND	0.943	12/28/01	12/29/01	
gamma-BHC (Lindane)	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Chlordane	EPA 3510C/8081A	I1L2837	1.0	ND	0.943	12/28/01	12/29/01	N1
4,4'-DDD	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
4,4'-DDE	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
4,4'-DDT	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Dieldrin	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Endosulfan I	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Endosulfan II	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Endosulfan sulfate	EPA 3510C/8081A	I1L2837	0.20	ND	0.943	12/28/01	12/29/01	
Endrin	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Endrin aldehyde	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Endrin ketone	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Heptachlor	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Heptachlor epoxide	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Methoxychlor	EPA 3510C/8081A	I1L2837	0.10	ND	0.943	12/28/01	12/29/01	
Toxaphene	EPA 3510C/8081A	I1L2837	5.0	ND	0.943	12/28/01	12/29/01	
Surrogate: Tetrachloro-m-xylene (30-120%)				*64 %*				
Surrogate: Decachlorobiphenyl (30-120%)				*60 %*				

DEL MAR ANALYTICAL, IRVINE (AZ0428

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Client Project ID: E1-00001546.03

Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

INORGANICS

Analyte	Method	Batch	Reporting Limit mg/l	Sample Result mg/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Total Kjeldahl Nitrogen	SM4500-N-O,C	C2A0213	0.50	**0.70**	1	1/2/02	1/2/02	

DEL MAR ANALYTICAL, COLTON (AZ0062

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

POLYCHLORINATED BIPHENYLS (EPA 3510C/8082)

Analyte	Method	Batch	Reporting Limit ug/l	Sample Result ug/l	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: PKL0460-01 (WELL-9 - Water)								
Aroclor 1016	EPA 3510/8082	11L2837	1.0	ND	0.943	12/28/01	12/29/01	
Aroclor 1221	EPA 3510/8082	11L2837	1.0	ND	0.943	12/28/01	12/29/01	
Aroclor 1232	EPA 3510/8082	11L2837	1.0	ND	0.943	12/28/01	12/29/01	
Aroclor 1242	EPA 3510/8082	11L2837	1.0	ND	0.943	12/28/01	12/29/01	
Aroclor 1248	EPA 3510/8082	11L2837	1.0	ND	0.943	12/28/01	12/29/01	
Aroclor 1254	EPA 3510/8082	11L2837	1.0	ND	0.943	12/28/01	12/29/01	
Aroclor 1260	EPA 3510/8082	11L2837	1.0	ND	0.943	12/28/01	12/29/01	
Surrogate: Decachlorobiphenyl (30-120%)				*90 %*				

DEL MAR ANALYTICAL, IRVINE (AZ0428

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Client Project ID: E1-00001546.03

Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
Blank Analyzed: 01/05/02 (P2A0501-BLK1)										
Acetone	ND	20	ug/l							
Benzene	ND	2.0	ug/l							
Bromobenzene	ND	5.0	ug/l							
Bromochloromethane	ND	5.0	ug/l							
Bromodichloromethane	ND	2.0	ug/l							
Bromoform	ND	5.0	ug/l							
Bromomethane	ND	5.0	ug/l							
2-Butanone (MEK)	ND	10	ug/l							
n-Butylbenzene	ND	5.0	ug/l							
sec-Butylbenzene	ND	5.0	ug/l							
tert-Butylbenzene	ND	5.0	ug/l							
Carbon Disulfide	ND	5.0	ug/l							
Carbon tetrachloride	ND	5.0	ug/l							
Chlorobenzene	ND	2.0	ug/l							
Chloroethane	ND	5.0	ug/l							
Chloroform	ND	2.0	ug/l							
Chloromethane	ND	5.0	ug/l							
2-Chlorotoluene	ND	5.0	ug/l							
4-Chlorotoluene	ND	5.0	ug/l							
Dibromochloromethane	ND	2.0	ug/l							
1,2-Dibromo-3-chloropropane	ND	5.0	ug/l							
1,2-Dibromoethane (EDB)	ND	2.0	ug/l							
Dibromomethane	ND	2.0	ug/l							
1,2-Dichlorobenzene	ND	2.0	ug/l							
1,3-Dichlorobenzene	ND	2.0	ug/l							
1,4-Dichlorobenzene	ND	2.0	ug/l							
Dichlorodifluoromethane	ND	5.0	ug/l							
1,1-Dichloroethane	ND	2.0	ug/l							
1,2-Dichloroethane	ND	2.0	ug/l							
1,1-Dichloroethene	ND	5.0	ug/l							
cis-1,2-Dichloroethene	ND	2.0	ug/l							
trans-1,2-Dichloroethene	ND	2.0	ug/l							
1,2-Dichloropropane	ND	2.0	ug/l							

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
Blank Analyzed: 01/05/02 (P2A0501-BLK1)										
1,3-Dichloropropane	ND	2.0	ug/l							
2,2-Dichloropropane	ND	2.0	ug/l							
1,1-Dichloropropene	ND	2.0	ug/l							
cis-1,3-Dichloropropene	ND	2.0	ug/l							
trans-1,3-Dichloropropene	ND	2.0	ug/l							
Ethylbenzene	ND	5.0	ug/l							
Hexachlorobutadiene	ND	10	ug/l							
2-Hexanone	ND	2.0	ug/l							
Iodomethane	ND	2.0	ug/l							
Isopropylbenzene	ND	2.0	ug/l							
p-Isopropyltoluene	ND	5.0	ug/l							
Methylene chloride	ND	10	ug/l							
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l							
Methyl-tert-butyl Ether (MTBE)	ND	5.0	ug/l							V1
Naphthalene	ND	2.0	ug/l							
n-Propylbenzene	ND	2.0	ug/l							
Styrene	ND	5.0	ug/l							
1,1,1,2-Tetrachloroethane	ND	2.0	ug/l							V1
1,1,2,2-Tetrachloroethane	ND	2.0	ug/l							
Tetrachloroethene	ND	2.0	ug/l							
Toluene	ND	5.0	ug/l							V1
1,2,3-Trichlorobenzene	ND	5.0	ug/l							
1,2,4-Trichlorobenzene	ND	2.0	ug/l							
1,1,1-Trichloroethane	ND	2.0	ug/l							
1,1,2-Trichloroethane	ND	2.0	ug/l							
Trichloroethene	ND	5.0	ug/l							
Trichlorofluoromethane	ND	10	ug/l							
1,2,3-Trichloropropane	ND	2.0	ug/l							
1,2,4-Trimethylbenzene	ND	2.0	ug/l							
1,3,5-Trimethylbenzene	ND	25	ug/l							
Vinyl acetate	ND	5.0	ug/l							
Vinyl chloride	ND	10	ug/l							
Xylenes, Total	ND	10	ug/l							
Surrogate: Dibromofluoromethane	*26.9*		*ug/l*	*25.0*		*108*	*80-135*			

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
Blank Analyzed: 01/05/02 (P2A0501-BLK1)										
Surrogate: Toluene-d8	*28.0*		*ug/l*	*25.0*		*112*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.4*		*ug/l*	*25.0*		*106*	*75-125*			
LCS Analyzed: 01/05/02 (P2A0501-BS1)										
Acetone	25.6	20	ug/l	25.0		102	40-150			
Benzene	28.2	2.0	ug/l	25.0		113	80-120			
Bromobenzene	27.9	5.0	ug/l	25.0		112	80-120			
Bromochloromethane	26.0	5.0	ug/l	25.0		104	80-120			
Bromodichloromethane	26.4	2.0	ug/l	25.0		106	80-125			
Bromoform	29.0	5.0	ug/l	25.0		116	75-140			
Bromomethane	26.9	5.0	ug/l	25.0		108	80-135			
2-Butanone (MEK)	26.8	10	ug/l	25.0		107	55-140			
n-Butylbenzene	27.9	5.0	ug/l	25.0		112	80-125			
sec-Butylbenzene	26.9	5.0	ug/l	25.0		108	80-125			
tert-Butylbenzene	26.3	5.0	ug/l	25.0		105	80-130			
Carbon Disulfide	24.7	5.0	ug/l	25.0		99	70-125			
Carbon tetrachloride	26.7	5.0	ug/l	25.0		107	80-140			
Chlorobenzene	26.4	2.0	ug/l	25.0		106	80-120			
Chloroethane	26.5	5.0	ug/l	25.0		106	80-125			
Chloroform	25.3	2.0	ug/l	25.0		101	80-120			
Chloromethane	22.9	5.0	ug/l	25.0		92	60-125			
2-Chlorotoluene	26.9	5.0	ug/l	25.0		108	80-120			
4-Chlorotoluene	26.5	5.0	ug/l	25.0		106	80-120			
Dibromochloromethane	24.5	2.0	ug/l	25.0		98	80-130			
1,2-Dibromo-3-chloropropane	27.3	5.0	ug/l	25.0		109	55-125			
1,2-Dibromoethane (EDB)	28.1	2.0	ug/l	25.0		112	70-130			
Dibromomethane	27.4	2.0	ug/l	25.0		110	80-120			
1,2-Dichlorobenzene	26.0	2.0	ug/l	25.0		104	80-120			
1,3-Dichlorobenzene	25.9	2.0	ug/l	25.0		104	80-120			
1,4-Dichlorobenzene	26.2	2.0	ug/l	25.0		105	80-120			
Dichlorodifluoromethane	23.6	5.0	ug/l	25.0		94	55-155			
1,1-Dichloroethane	25.3	2.0	ug/l	25.0		101	80-120			
1,2-Dichloroethane	24.3	2.0	ug/l	25.0		97	70-120			
1,1-Dichloroethene	26.6	5.0	ug/l	25.0		106	80-125			
cis-1,2-Dichloroethene	26.7	2.0	ug/l	25.0		107	80-125			
trans-1,2-Dichloroethene	24.9	2.0	ug/l	25.0		100	80-120			

Nicole Beck
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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
LCS Analyzed: 01/05/02 (P2A0501-BS1)										
1,2-Dichloropropane	26.3	2.0	ug/l	25.0		105	75-120			
1,3-Dichloropropane	28.3	2.0	ug/l	25.0		113	80-120			
2,2-Dichloropropane	25.1	2.0	ug/l	25.0		100	75-135			
1,1-Dichloropropene	26.5	2.0	ug/l	25.0		106	80-120			
cis-1,3-Dichloropropene	26.9	2.0	ug/l	25.0		108	80-120			
trans-1,3-Dichloropropene	24.8	2.0	ug/l	25.0		99	80-120			
Ethylbenzene	28.2	2.0	ug/l	25.0		113	80-120			
Hexachlorobutadiene	28.8	5.0	ug/l	25.0		115	60-140			
Hexanone	26.4	10	ug/l	25.0		106	60-135			
Iodomethane	26.4	2.0	ug/l	25.0		106	60-145			
Isopropylbenzene	27.5	2.0	ug/l	25.0		110	80-120			
p-Isopropyltoluene	26.5	2.0	ug/l	25.0		106	75-120			
Methylene chloride	24.5	5.0	ug/l	25.0		98	75-120			
4-Methyl-2-pentanone (MIBK)	30.0	10	ug/l	25.0		120	70-130			
Methyl-tert-butyl Ether (MTBE)	27.4	5.0	ug/l	25.0		110	70-130			
Naphthalene	35.5	5.0	ug/l	25.0		142	70-130			V1,L3
n-Propylbenzene	28.2	2.0	ug/l	25.0		113	80-130			
Styrene	28.7	2.0	ug/l	25.0		115	70-120			
1,1,1,2-Tetrachloroethane	27.2	5.0	ug/l	25.0		109	80-130			
1,1,2,2-Tetrachloroethane	31.3	2.0	ug/l	25.0		125	70-125			V1
Tetrachloroethene	28.1	2.0	ug/l	25.0		112	80-130			
Toluene	28.0	2.0	ug/l	25.0		112	75-120			
1,2,3-Trichlorobenzene	31.7	5.0	ug/l	25.0		127	70-120			V1,L3
1,2,4-Trichlorobenzene	29.8	5.0	ug/l	25.0		119	75-120			
1,1,1-Trichloroethane	25.4	2.0	ug/l	25.0		102	80-125			
1,1,2-Trichloroethane	27.6	2.0	ug/l	25.0		110	75-120			
Trichloroethene	26.1	2.0	ug/l	25.0		104	80-120			
Trichlorofluoromethane	25.9	5.0	ug/l	25.0		104	70-140			
1,2,3-Trichloropropane	29.4	10	ug/l	25.0		118	70-125			
1,2,4-Trimethylbenzene	28.5	2.0	ug/l	25.0		114	80-120			
1,3,5-Trimethylbenzene	27.7	2.0	ug/l	25.0		111	80-120			
Vinyl acetate	27.2	25	ug/l	25.0		109	75-150			
Vinyl chloride	23.7	5.0	ug/l	25.0		95	80-130			
Xylenes, Total	84.6	10	ug/l	75.0		113	70-125			
Surrogate: Dibromofluoromethane	*25.0*		*ug/l*	*25.0*		*100*	*80-135*			

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
LCS Analyzed: 01/05/02 (P2A0501-BS1)										
Surrogate: Toluene-d8	*27.5*		*ug/l*	*25.0*		*110*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.2*		*ug/l*	*25.0*		*105*	*75-125*			
LCS Dup Analyzed: 01/05/02 (P2A0501-BSD1)										
Acetone	31.9	20	ug/l	25.0		128	40-150	22	20	R4
Benzene	27.7	2.0	ug/l	25.0		111	80-120	2	20	
Bromobenzene	28.5	5.0	ug/l	25.0		114	80-120	2	20	
Bromochloromethane	25.0	5.0	ug/l	25.0		100	80-120	4	20	
Bromodichloromethane	25.9	2.0	ug/l	25.0		104	80-125	2	20	
Bromoform	28.5	5.0	ug/l	25.0		114	75-140	2	20	
Bromomethane	26.2	5.0	ug/l	25.0		105	80-135	3	20	
2-Butanone (MEK)	26.2	10	ug/l	25.0		105	55-140	2	20	
n-Butylbenzene	27.8	5.0	ug/l	25.0		111	80-125	0.4	20	
sec-Butylbenzene	27.6	5.0	ug/l	25.0		110	80-125	3	20	
tert-Butylbenzene	26.8	5.0	ug/l	25.0		107	80-130	2	20	
Carbon Disulfide	24.3	5.0	ug/l	25.0		97	70-125	2	20	
Carbon tetrachloride	27.1	5.0	ug/l	25.0		108	80-140	1	20	
Chlorobenzene	27.1	2.0	ug/l	25.0		108	80-120	3	20	
Chloroethane	25.7	5.0	ug/l	25.0		103	80-125	3	20	
Chloroform	25.1	2.0	ug/l	25.0		100	80-120	0.8	20	
Chloromethane	22.6	5.0	ug/l	25.0		90	60-125	1	20	
2-Chlorotoluene	27.7	5.0	ug/l	25.0		111	80-120	3	20	
4-Chlorotoluene	27.2	5.0	ug/l	25.0		109	80-120	3	20	
Dibromochloromethane	24.6	2.0	ug/l	25.0		98	80-130	0.4	20	
1,2-Dibromo-3-chloropropane	25.2	5.0	ug/l	25.0		101	55-125	8	20	
1,2-Dibromoethane (EDB)	27.3	2.0	ug/l	25.0		109	70-130	3	20	
Dibromomethane	26.4	2.0	ug/l	25.0		106	80-120	4	20	
1,2-Dichlorobenzene	26.3	2.0	ug/l	25.0		105	80-120	1	20	
1,3-Dichlorobenzene	25.9	2.0	ug/l	25.0		104	80-120	0	20	
1,4-Dichlorobenzene	26.3	2.0	ug/l	25.0		105	80-120	0.4	20	
Dichlorodifluoromethane	22.3	5.0	ug/l	25.0		89	55-155	6	20	
1,1-Dichloroethane	24.7	2.0	ug/l	25.0		99	80-120	2	20	
1,2-Dichloroethane	23.2	2.0	ug/l	25.0		93	70-120	5	20	
1,1-Dichloroethene	26.1	5.0	ug/l	25.0		104	80-125	2	20	
cis-1,2-Dichloroethene	26.4	2.0	ug/l	25.0		106	80-125	1	20	
trans-1,2-Dichloroethene	24.3	2.0	ug/l	25.0		97	80-120	2	20	

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
LCS Dup Analyzed: 01/05/02 (P2A0501-BSD1)										
1,2-Dichloropropane	25.8	2.0	ug/l	25.0		103	75-120	2	20	
1,3-Dichloropropane	28.4	2.0	ug/l	25.0		114	80-120	0.4	20	
2,2-Dichloropropane	25.3	2.0	ug/l	25.0		101	75-135	0.8	20	
1,1-Dichloropropene	27.0	2.0	ug/l	25.0		108	80-120	2	20	
cis-1,3-Dichloropropene	27.0	2.0	ug/l	25.0		108	80-120	0.4	20	
trans-1,3-Dichloropropene	23.8	2.0	ug/l	25.0		95	80-120	4	20	
Ethylbenzene	30.9	2.0	ug/l	25.0		124	80-120	9	20	L3
Hexachlorobutadiene	28.5	5.0	ug/l	25.0		114	60-140	1	20	
2-Hexanone	26.0	10	ug/l	25.0		104	60-135	2	20	
Iodomethane	26.2	2.0	ug/l	25.0		105	60-145	0.8	20	
Isopropylbenzene	28.2	2.0	ug/l	25.0		113	80-120	3	20	
p-Isopropyltoluene	26.8	2.0	ug/l	25.0		107	75-120	1	20	
Methylene chloride	24.4	5.0	ug/l	25.0		98	75-120	0.4	20	
4-Methyl-2-pentanone (MIBK)	27.8	10	ug/l	25.0		111	70-130	8	20	
Methyl-tert-butyl Ether (MTBE)	25.4	5.0	ug/l	25.0		102	70-130	8	20	
Naphthalene	34.3	5.0	ug/l	25.0		137	70-130	3	20	V1,L3
n-Propylbenzene	29.0	2.0	ug/l	25.0		116	80-130	3	20	
Styrene	29.4	2.0	ug/l	25.0		118	70-120	2	20	
1,1,1,2-Tetrachloroethane	28.0	5.0	ug/l	25.0		112	80-130	3	20	
1,1,2,2-Tetrachloroethane	29.7	2.0	ug/l	25.0		119	70-125	5	20	V1
Tetrachloroethene	28.5	2.0	ug/l	25.0		114	80-130	1	20	
Toluene	28.0	2.0	ug/l	25.0		112	75-120	0	20	
1,2,3-Trichlorobenzene	32.2	5.0	ug/l	25.0		129	70-120	2	20	V1,L3
1,2,4-Trichlorobenzene	30.2	5.0	ug/l	25.0		121	75-120	1	20	L3
1,1,1-Trichloroethane	25.0	2.0	ug/l	25.0		100	80-125	2	20	
1,1,2-Trichloroethane	26.1	2.0	ug/l	25.0		104	75-120	6	20	
Trichloroethene	26.1	2.0	ug/l	25.0		104	80-120	0	20	
Trichlorofluoromethane	25.0	5.0	ug/l	25.0		100	70-140	4	20	
1,2,3-Trichloropropane	27.3	10	ug/l	25.0		109	70-125	7	20	
1,2,4-Trimethylbenzene	29.0	2.0	ug/l	25.0		116	80-120	2	20	
1,3,5-Trimethylbenzene	28.6	2.0	ug/l	25.0		114	80-120	3	20	
Vinyl acetate	ND	25	ug/l	25.0		98	75-150	11	20	
Vinyl chloride	23.9	5.0	ug/l	25.0		96	80-130	0.8	20	
Xylenes, Total	85.8	10	ug/l	75.0		114	70-125	1	20	
Surrogate: Dibromofluoromethane	*24.8*		ug/l	*25.0*		*99*	*80-135*			

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
LCS Dup Analyzed: 01/05/02 (P2A0501-BSD1)										
Surrogate: Toluene-d8	*27.4*		*ug/l*	*25.0*		*110*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*27.1*		*ug/l*	*25.0*		*108*	*75-125*			
Matrix Spike Analyzed: 01/05/02 (P2A0501-MS1)					**Source: PKL0440-01**					
Acetone	ND	20	ug/l	25.0	ND	71	25-150			
Benzene	26.6	2.0	ug/l	25.0	ND	106	70-125			
Bromobenzene	26.4	5.0	ug/l	25.0	ND	106	75-125			
Bromochloromethane	25.2	5.0	ug/l	25.0	ND	101	70-130			
romodichloromethane	25.7	2.0	ug/l	25.0	ND	103	70-130			
Bromoform	27.4	5.0	ug/l	25.0	ND	110	40-140			
Bromomethane	25.8	5.0	ug/l	25.0	ND	103	65-150			
2-Butanone (MEK)	21.7	10	ug/l	25.0	ND	87	20-160			
n-Butylbenzene	26.2	5.0	ug/l	25.0	ND	105	80-125			
sec-Butylbenzene	25.2	5.0	ug/l	25.0	ND	101	75-130			
tert-Butylbenzene	24.9	5.0	ug/l	25.0	ND	100	75-130			
Carbon Disulfide	23.4	5.0	ug/l	25.0	ND	94	50-150			
Carbon tetrachloride	24.9	5.0	ug/l	25.0	ND	100	70-150			
Chlorobenzene	24.7	2.0	ug/l	25.0	ND	99	80-130			
Chloroethane	24.8	5.0	ug/l	25.0	ND	99	70-130			
Chloroform	27.2	2.0	ug/l	25.0	2.6	98	80-135			
Chloromethane	21.6	5.0	ug/l	25.0	ND	86	50-130			
2-Chlorotoluene	26.0	5.0	ug/l	25.0	ND	104	75-130			
4-Chlorotoluene	25.5	5.0	ug/l	25.0	ND	102	75-130			
Dibromochloromethane	22.9	2.0	ug/l	25.0	ND	92	80-130			
1,2-Dibromo-3-chloropropane	26.6	5.0	ug/l	25.0	ND	106	60-120			
1,2-Dibromoethane (EDB)	25.6	2.0	ug/l	25.0	ND	102	75-125			
Dibromomethane	26.1	2.0	ug/l	25.0	ND	104	65-135			
1,2-Dichlorobenzene	25.1	2.0	ug/l	25.0	ND	100	75-120			
1,3-Dichlorobenzene	24.5	2.0	ug/l	25.0	ND	98	80-120			
1,4-Dichlorobenzene	24.7	2.0	ug/l	25.0	ND	99	80-120			
Dichlorodifluoromethane	22.2	5.0	ug/l	25.0	ND	89	50-155			
1,1-Dichloroethane	24.3	2.0	ug/l	25.0	ND	97	70-130			
1,2-Dichloroethane	22.9	2.0	ug/l	25.0	ND	92	70-120			
1,1-Dichloroethene	24.9	5.0	ug/l	25.0	ND	100	65-130			
cis-1,2-Dichloroethene	25.7	2.0	ug/l	25.0	ND	103	70-130			
trans-1,2-Dichloroethene	24.2	2.0	ug/l	25.0	ND	97	80-125			

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Attention: Mark Murphy

Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
Matrix Spike Analyzed: 01/05/02 (P2A0501-MS1)					Source: PKL0440-01					
1,2-Dichloropropane	25.2	2.0	ug/l	25.0	ND	101	70-120			
1,3-Dichloropropane	26.2	2.0	ug/l	25.0	ND	105	70-125			
2,2-Dichloropropane	23.2	2.0	ug/l	25.0	ND	93	65-155			
1,1-Dichloropropene	24.8	2.0	ug/l	25.0	ND	99	70-120			
cis-1,3-Dichloropropene	25.7	2.0	ug/l	25.0	ND	103	70-125			
trans-1,3-Dichloropropene	23.4	2.0	ug/l	25.0	ND	94	70-120			
~thylbenzene	26.2	2.0	ug/l	25.0	ND	105	75-135			
xachlorobutadiene	26.0	5.0	ug/l	25.0	ND	104	60-140			
2-Hexanone	21.4	10	ug/l	25.0	ND	86	20-140			
Iodomethane	25.0	2.0	ug/l	25.0	ND	100	50-150			
Isopropylbenzene	25.9	2.0	ug/l	25.0	ND	104	80-120			
p-Isopropyltoluene	24.6	2.0	ug/l	25.0	ND	98	70-130			
Methylene chloride	23.8	5.0	ug/l	25.0	ND	95	70-130			
4-Methyl-2-pentanone (MIBK)	27.6	10	ug/l	25.0	ND	110	20-165			
Methyl-tert-butyl Ether (MTBE)	26.2	5.0	ug/l	25.0	ND	105	60-140			
Naphthalene	35.0	5.0	ug/l	25.0	ND	140	35-135			V1,N2
n-Propylbenzene	26.7	2.0	ug/l	25.0	ND	107	80-130			
Styrene	20.7	2.0	ug/l	25.0	ND	83	65-130			
1,1,1,2-Tetrachloroethane	25.0	5.0	ug/l	25.0	ND	100	75-130			
1,1,2,2-Tetrachloroethane	29.6	2.0	ug/l	25.0	ND	118	70-125			V1
Tetrachloroethene	25.4	2.0	ug/l	25.0	ND	102	70-130			
Toluene	26.7	2.0	ug/l	25.0	ND	107	70-130			
1,2,3-Trichlorobenzene	31.4	5.0	ug/l	25.0	ND	126	50-120			V1,N2
1,2,4-Trichlorobenzene	29.0	5.0	ug/l	25.0	ND	116	60-120			
1,1,1-Trichloroethane	23.5	2.0	ug/l	25.0	ND	94	75-125			
1,1,2-Trichloroethane	26.3	2.0	ug/l	25.0	ND	105	75-120			
Trichloroethene	25.1	2.0	ug/l	25.0	ND	100	70-135			
Trichlorofluoromethane	24.3	5.0	ug/l	25.0	ND	97	70-145			
1,2,3-Trichloropropane	27.2	10	ug/l	25.0	ND	109	65-130			
1,2,4-Trimethylbenzene	27.0	2.0	ug/l	25.0	ND	108	75-120			
1,3,5-Trimethylbenzene	26.6	2.0	ug/l	25.0	ND	106	75-125			
Vinyl acetate	ND	25	ug/l	25.0	ND	92	50-165			
Vinyl chloride	21.4	5.0	ug/l	25.0	ND	86	70-150			
Xylenes, Total	77.8	10	ug/l	75.0	ND	104	70-125			
Surrogate: Dibromofluoromethane	*26.2*		*ug/l*	*25.0*		*105*	*80-135*			

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
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METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
Matrix Spike Analyzed: 01/05/02 (P2A0501-MS1)					**Source: PKL0440-01**					
Surrogate: Toluene-d8	*27.8*		*ug/l*	*25.0*		*111*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.5*		*ug/l*	*25.0*		*106*	*75-125*			
Matrix Spike Dup Analyzed: 01/05/02 (P2A0501-MSD1)					**Source: PKL0440-01**					
Acetone	ND	20	ug/l	25.0	ND	75	25-150	5	20	
Benzene	27.7	2.0	ug/l	25.0	ND	111	70-125	4	20	
Bromobenzene	27.7	5.0	ug/l	25.0	ND	111	75-125	5	20	
Bromochloromethane	25.7	5.0	ug/l	25.0	ND	103	70-130	2	20	
Bromodichloromethane	26.7	2.0	ug/l	25.0	ND	107	70-130	4	20	
Bromoform	28.9	5.0	ug/l	25.0	ND	116	40-140	5	20	
Bromomethane	25.8	5.0	ug/l	25.0	ND	103	65-150	0	20	
2-Butanone (MEK)	23.3	10	ug/l	25.0	ND	93	20-160	7	20	
n-Butylbenzene	27.4	5.0	ug/l	25.0	ND	110	80-125	4	20	
sec-Butylbenzene	26.7	5.0	ug/l	25.0	ND	107	75-130	6	20	
tert-Butylbenzene	26.0	5.0	ug/l	25.0	ND	104	75-130	4	20	
Carbon Disulfide	24.1	5.0	ug/l	25.0	ND	96	50-150	3	20	
Carbon tetrachloride	26.4	5.0	ug/l	25.0	ND	106	70-150	6	20	
Chlorobenzene	25.8	2.0	ug/l	25.0	ND	103	80-130	4	20	
Chloroethane	25.9	5.0	ug/l	25.0	ND	104	70-130	4	20	
Chloroform	28.0	2.0	ug/l	25.0	2.6	102	80-135	3	20	
Chloromethane	21.8	5.0	ug/l	25.0	ND	87	50-130	0.9	20	
2-Chlorotoluene	27.0	5.0	ug/l	25.0	ND	108	75-130	4	20	
4-Chlorotoluene	26.6	5.0	ug/l	25.0	ND	106	75-130	4	20	
Dibromochloromethane	24.0	2.0	ug/l	25.0	ND	96	80-130	5	20	
1,2-Dibromo-3-chloropropane	28.5	5.0	ug/l	25.0	ND	114	60-120	7	20	
1,2-Dibromoethane (EDB)	26.9	2.0	ug/l	25.0	ND	108	75-125	5	20	
Dibromomethane	27.5	2.0	ug/l	25.0	ND	110	65-135	5	20	
1,2-Dichlorobenzene	25.5	2.0	ug/l	25.0	ND	102	75-120	2	20	
1,3-Dichlorobenzene	25.2	2.0	ug/l	25.0	ND	101	80-120	3	20	
1,4-Dichlorobenzene	25.5	2.0	ug/l	25.0	ND	102	80-120	3	20	
Dichlorodifluoromethane	23.5	5.0	ug/l	25.0	ND	94	50-155	6	20	
1,1-Dichloroethane	24.8	2.0	ug/l	25.0	ND	99	70-130	2	20	
1,2-Dichloroethane	24.4	2.0	ug/l	25.0	ND	98	70-120	6	20	
1,1-Dichloroethene	26.2	5.0	ug/l	25.0	ND	105	65-130	5	20	
cis-1,2-Dichloroethene	26.7	2.0	ug/l	25.0	ND	107	70-130	4	20	
trans-1,2-Dichloroethene	24.8	2.0	ug/l	25.0	ND	99	80-125	2	20	

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
Matrix Spike Dup Analyzed: 01/05/02 (P2A0501-MSD1)					Source: PKL0440-01					
1,2-Dichloropropane	26.0	2.0	ug/l	25.0	ND	104	70-120	3	20	
1,3-Dichloropropane	27.3	2.0	ug/l	25.0	ND	109	70-125	4	20	
2,2-Dichloropropane	24.3	2.0	ug/l	25.0	ND	97	65-155	5	20	
1,1-Dichloropropene	26.2	2.0	ug/l	25.0	ND	105	70-120	5	20	
cis-1,3-Dichloropropene	26.5	2.0	ug/l	25.0	ND	106	70-125	3	20	
trans-1,3-Dichloropropene	24.5	2.0	ug/l	25.0	ND	98	70-120	5	20	
Ethylbenzene	27.4	2.0	ug/l	25.0	ND	110	75-135	4	20	
Hexachlorobutadiene	26.7	5.0	ug/l	25.0	ND	107	60-140	3	20	
2-Hexanone	22.5	10	ug/l	25.0	ND	90	20-140	5	20	
Iodomethane	26.0	2.0	ug/l	25.0	ND	104	50-150	4	20	
Isopropylbenzene	27.2	2.0	ug/l	25.0	ND	109	80-120	5	20	
p-Isopropyltoluene	25.8	2.0	ug/l	25.0	ND	103	70-130	5	20	
Methylene chloride	24.4	5.0	ug/l	25.0	ND	98	70-130	2	20	
4-Methyl-2-pentanone (MIBK)	29.7	10	ug/l	25.0	ND	119	20-165	7	20	
Methyl-tert-butyl Ether (MTBE)	26.9	5.0	ug/l	25.0	ND	108	60-140	3	20	
Naphthalene	36.5	5.0	ug/l	25.0	ND	146	35-135	4	20	V1,N2
n-Propylbenzene	27.9	2.0	ug/l	25.0	ND	112	80-130	4	20	
Styrene	20.5	2.0	ug/l	25.0	ND	82	65-130	1	20	
1,1,1,2-Tetrachloroethane	25.8	5.0	ug/l	25.0	ND	103	75-130	3	20	
1,1,2,2-Tetrachloroethane	31.2	2.0	ug/l	25.0	ND	125	70-125	5	20	V1
Tetrachloroethene	27.4	2.0	ug/l	25.0	ND	110	70-130	8	20	
Toluene	27.6	2.0	ug/l	25.0	ND	110	70-130	3	20	
1,2,3-Trichlorobenzene	31.9	5.0	ug/l	25.0	ND	128	50-120	2	20	V1,N2
1,2,4-Trichlorobenzene	29.6	5.0	ug/l	25.0	ND	118	60-120	2	20	
1,1,1-Trichloroethane	24.7	2.0	ug/l	25.0	ND	99	75-125	5	20	
1,1,2-Trichloroethane	27.4	2.0	ug/l	25.0	ND	110	75-120	4	20	
Trichloroethene	25.6	2.0	ug/l	25.0	ND	102	70-135	2	20	
Trichlorofluoromethane	25.1	5.0	ug/l	25.0	ND	100	70-145	3	20	
1,2,3-Trichloropropane	28.9	10	ug/l	25.0	ND	116	65-130	6	20	
1,2,4-Trimethylbenzene	28.0	2.0	ug/l	25.0	ND	112	75-120	4	20	
1,3,5-Trimethylbenzene	27.9	2.0	ug/l	25.0	ND	112	75-125	5	20	
Vinyl acetate	ND	25	ug/l	25.0	ND	89	50-165	3	20	
Vinyl chloride	22.7	5.0	ug/l	25.0	ND	91	70-150	6	20	
Xylenes, Total	81.0	10	ug/l	75.0	ND	108	70-125	4	20	
Surrogate: Dibromofluoromethane	*25.2*		*ug/l*	*25.0*		*101*	*80-135*			

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0501 Extracted: 01/05/02										
Matrix Spike Dup Analyzed: 01/05/02 (P2A0501-MSD1)					**Source: PKL0440-01**					
Surrogate: Toluene-d8	*27.7*		*ug/l*	*25.0*		*111*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.3*		*ug/l*	*25.0*		*105*	*75-125*			
Batch: P2A0708 Extracted: 01/07/02										
Blank Analyzed: 01/07/02 (P2A0708-BLK1)										
Acetone	ND	20	ug/l							
Surrogate: Dibromofluoromethane	*25.4*		*ug/l*	*25.0*		*102*	*80-135*			
Surrogate: Toluene-d8	*28.1*		*ug/l*	*25.0*		*112*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.2*		*ug/l*	*25.0*		*105*	*75-125*			
LCS Analyzed: 01/07/02 (P2A0708-BS1)										
Acetone	**23.3**	20	ug/l	25.0		93	40-150			
Surrogate: Dibromofluoromethane	*24.9*		*ug/l*	*25.0*		*100*	*80-135*			
Surrogate: Toluene-d8	*27.6*		*ug/l*	*25.0*		*110*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.6*		*ug/l*	*25.0*		*106*	*75-125*			
LCS Dup Analyzed: 01/07/02 (P2A0708-BSD1)										
Acetone	**21.6**	20	ug/l	25.0		86	40-150	8	20	
Surrogate: Dibromofluoromethane	*24.9*		*ug/l*	*25.0*		*100*	*80-135*			
Surrogate: Toluene-d8	*27.5*		*ug/l*	*25.0*		*110*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.5*		*ug/l*	*25.0*		*106*	*75-125*			
Matrix Spike Analyzed: 01/07/02 (P2A0708-MS1)					**Source: PKL0441-12**					
Acetone	ND	20	ug/l	25.0	ND	54	25-150			
Surrogate: Dibromofluoromethane	*25.4*		*ug/l*	*25.0*		*102*	*80-135*			
Surrogate: Toluene-d8	*27.2*		*ug/l*	*25.0*		*109*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.7*		*ug/l*	*25.0*		*107*	*75-125*			

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METHOD BLANK/QC DATA

VOLATILE ORGANICS BY GC/MS (EPA 8260B)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0708 Extracted: 01/07/02										
Matrix Spike Dup Analyzed: 01/07/02 (P2A0708-MSD1)					Source: PKL0441-12					
Acetone	ND	20	ug/l	25.0	ND	62	25-150	13	20	
Surrogate: Dibromofluoromethane	*25.6*		*ug/l*	*25.0*		*102*	*80-135*			
Surrogate: Toluene-d8	*27.8*		*ug/l*	*25.0*		*111*	*80-125*			
Surrogate: 4-Bromofluorobenzene	*26.0*		*ug/l*	*25.0*		*104*	*75-125*			

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Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

SEMI-VOLATILE ORGANICS BY GC/MS (EPA 8270C)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P1L2811 Extracted: 12/28/01										
Blank Analyzed: 12/31/01 (P1L2811-BLK1)										
Acenaphthene	ND	10	ug/l							
Acenaphthylene	ND	10	ug/l							
Anthracene	ND	10	ug/l							
Benzoic acid	ND	50	ug/l							
Benz(a)anthracene	ND	10	ug/l							
Benzo(b,k)fluoranthene	ND	10	ug/l							
nzo(g,h,i)perylene	ND	20	ug/l							
nzo(a)pyrene	ND	20	ug/l							
Benzyl alcohol	ND	10	ug/l							
Bis(2-chloroethoxy)methane	ND	10	ug/l							
Bis(2-chloroethyl)ether	ND	10	ug/l							
Bis(2-chloroisopropyl)ether	ND	10	ug/l							
Bis(2-ethylhexyl)phthalate	ND	20	ug/l							
4-Bromophenyl phenyl ether	ND	20	ug/l							
Butyl benzyl phthalate	ND	10	ug/l							
4-Chloroaniline	ND	10	ug/l							
2-Chloronaphthalene	ND	10	ug/l							
4-Chloro-3-methylphenol	ND	10	ug/l							
2-Chlorophenol	ND	10	ug/l							
4-Chlorophenyl phenyl ether	ND	10	ug/l							
Chrysene	ND	10	ug/l							
Dibenz(a,h)anthracene	ND	20	ug/l							
Dibenzofuran	ND	10	ug/l							
Di-n-butyl phthalate	ND	10	ug/l							
1,3-Dichlorobenzene	ND	10	ug/l							
1,4-Dichlorobenzene	ND	10	ug/l							
1,2-Dichlorobenzene	ND	10	ug/l							
3,3-Dichlorobenzidine	ND	20	ug/l							
2,4-Dichlorophenol	ND	10	ug/l							
Diethyl phthalate	ND	10	ug/l							
2,4-Dimethylphenol	ND	10	ug/l							
Dimethyl phthalate	ND	10	ug/l							
4,6-Dinitro-2-methylphenol	ND	10	ug/l							

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

SEMI-VOLATILE ORGANICS BY GC/MS (EPA 8270C)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P1L2811 Extracted: 12/28/01										
Blank Analyzed: 12/31/01 (P1L2811-BLK1)										
2,4-Dinitrophenol	ND	30	ug/l							
2,4-Dinitrotoluene	ND	10	ug/l							
2,6-Dinitrotoluene	ND	10	ug/l							
Di-n-octyl phthalate	ND	20	ug/l							
1,2-Diphenylhydrazine/Azobenzene	ND	10	ug/l							
Fluoranthene	ND	10	ug/l							
Fluorene	ND	10	ug/l							
Hexachlorobenzene	ND	10	ug/l							
Hexachlorobutadiene	ND	20	ug/l							
Hexachlorocyclopentadiene	ND	30	ug/l							
Hexachloroethane	ND	10	ug/l							
Indeno(1,2,3-cd)pyrene	ND	20	ug/l							
Isophorone	ND	20	ug/l							
2-Methylnaphthalene	ND	10	ug/l							
2-Methylphenol	ND	10	ug/l							
4-Methylphenol	ND	10	ug/l							
Naphthalene	ND	10	ug/l							
Nitrobenzene	ND	10	ug/l							
2-Nitrophenol	ND	10	ug/l							
4-Nitrophenol	ND	10	ug/l							
n-Nitrosodiphenylamine	ND	30	ug/l							
n-Nitroso-di-n-propylamine	ND	10	ug/l							
Pentachlorophenol	ND	20	ug/l							
Phenanthrene	ND	10	ug/l							
Phenol	ND	10	ug/l							
Pyrene	ND	10	ug/l							
1,2,4-Trichlorobenzene	ND	10	ug/l							
2,4,6-Trichlorophenol	ND	10	ug/l							
Surrogate: 2-Fluorophenol	*69.8*		*ug/l*	*100*		*70*	*20-140*			
Surrogate: Phenol-d6	*74.1*		*ug/l*	*100*		*74*	*20-140*			
Surrogate: 2,4,6-Tribromophenol	*78.7*		*ug/l*	*100*		*79*	*20-150*			
Surrogate: Nitrobenzene-d5	*42.5*		*ug/l*	*50.0*		*85*	*35-115*			
Surrogate: 2-Fluorobiphenyl	*38.4*		*ug/l*	*50.0*		*77*	*40-125*			
Surrogate: Terphenyl-d14	*40.0*		*ug/l*	*50.0*		*80*	*70-115*			

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URS
7720 N. 16th Street Suite 100
Phoenix, AZ 85020
Attention: Mark Murphy

Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

SEMI-VOLATILE ORGANICS BY GC/MS (EPA 8270C)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P1L2811 Extracted: 12/28/01										
LCS Analyzed: 12/31/01 (P1L2811-BS1)										
Acenaphthene	40.7	10	ug/l	50.0		81	30-130			
4-Chloro-3-methylphenol	40.7	10	ug/l	50.0		81	40-135			
2-Chlorophenol	38.4	10	ug/l	50.0		77	20-135			
1,4-Dichlorobenzene	37.8	10	ug/l	50.0		76	20-120			
2,4-Dinitrotoluene	46.7	10	ug/l	50.0		93	45-140			
4-Nitrophenol	39.0	10	ug/l	50.0		78	40-145			
n-Nitroso-di-n-propylamine	44.2	10	ug/l	50.0		88	20-130			
ntachlorophenol	45.6	20	ug/l	50.0		91	35-150			
henol	34.0	10	ug/l	50.0		68	20-135			
Pyrene	49.1	10	ug/l	50.0		98	60-120			
1,2,4-Trichlorobenzene	40.1	10	ug/l	50.0		80	20-125			
Surrogate: 2-Fluorophenol	*64.9*		*ug/l*	*100*		*65*	*20-140*			
Surrogate: Phenol-d6	*68.7*		*ug/l*	*100*		*69*	*20-140*			
Surrogate: 2,4,6-Tribromophenol	*75.8*		*ug/l*	*100*		*76*	*20-150*			
Surrogate: Nitrobenzene-d5	*36.4*		*ug/l*	*50.0*		*73*	*35-115*			
Surrogate: 2-Fluorobiphenyl	*37.2*		*ug/l*	*50.0*		*74*	*40-125*			
Surrogate: Terphenyl-d14	*39.3*		*ug/l*	*50.0*		*79*	*70-115*			
LCS Dup Analyzed: 12/31/01 (P1L2811-BSD1)										
Acenaphthene	43.1	10	ug/l	50.0		86	30-130	6	20	
4-Chloro-3-methylphenol	42.2	10	ug/l	50.0		84	40-135	4	20	
2-Chlorophenol	40.0	10	ug/l	50.0		80	20-135	4	20	
1,4-Dichlorobenzene	38.9	10	ug/l	50.0		78	20-120	3	20	
2,4-Dinitrotoluene	47.5	10	ug/l	50.0		95	45-140	2	20	
4-Nitrophenol	41.6	10	ug/l	50.0		83	40-145	6	20	
n-Nitroso-di-n-propylamine	44.3	10	ug/l	50.0		89	20-130	0.2	20	
Pentachlorophenol	47.3	20	ug/l	50.0		95	35-150	4	20	
Phenol	38.4	10	ug/l	50.0		77	20-135	12	20	
Pyrene	49.7	10	ug/l	50.0		99	60-120	1	20	
1,2,4-Trichlorobenzene	42.6	10	ug/l	50.0		85	20-125	6	20	
Surrogate: 2-Fluorophenol	*69.0*		*ug/l*	*100*		*69*	*20-140*			
Surrogate: Phenol-d6	*73.8*		*ug/l*	*100*		*74*	*20-140*			
Surrogate: 2,4,6-Tribromophenol	*79.1*		*ug/l*	*100*		*79*	*20-150*			
Surrogate: Nitrobenzene-d5	*37.2*		*ug/l*	*50.0*		*74*	*35-115*			
Surrogate: 2-Fluorobiphenyl	*40.9*		*ug/l*	*50.0*		*82*	*40-125*			
Surrogate: Terphenyl-d14	*41.1*		*ug/l*	*50.0*		*82*	*70-115*			

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URS
7720 N. 16th Street Suite 100
Phoenix, AZ 85020
Attention: Mark Murphy

Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

SEMI-VOLATILE ORGANICS BY GC/MS (EPA 8270C)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P1L2811 Extracted: 12/28/01										
Matrix Spike Analyzed: 12/31/01 (P1L2811-MS1)					**Source: PKL0453-02**					
Acenaphthene	40.0	10	ug/l	50.0	ND	80	25-120			
4-Chloro-3-methylphenol	19.3	10	ug/l	50.0	ND	39	15-120			
2-Chlorophenol	15.5	10	ug/l	50.0	ND	31	20-120			
1,4-Dichlorobenzene	34.3	10	ug/l	50.0	ND	69	20-120			
2,4-Dinitrotoluene	44.2	10	ug/l	50.0	ND	88	30-130			
4-Nitrophenol	39.5	10	ug/l	50.0	ND	79	20-165			
-Nitroso-di-n-propylamine	37.8	10	ug/l	50.0	ND	76	20-120			
ntachlorophenol	28.4	20	ug/l	50.0	ND	57	20-155			
Phenol	10.5	10	ug/l	50.0	ND	21	20-140			
Pyrene	46.1	10	ug/l	50.0	ND	92	35-130			
1,2,4-Trichlorobenzene	37.2	10	ug/l	50.0	ND	74	20-120			
Surrogate: 2-Fluorophenol	*10.0*		*ug/l*	*100*		*10*	*20-140*			*S6*
Surrogate: Phenol-d6	*14.8*		*ug/l*	*100*		*15*	*20-140*			*S6*
Surrogate: 2,4,6-Tribromophenol	*14.5*		*ug/l*	*100*		*14*	*20-150*			*S6*
Surrogate: Nitrobenzene-d5	*34.4*		*ug/l*	*50.0*		*69*	*35-115*			
Surrogate: 2-Fluorobiphenyl	*37.8*		*ug/l*	*50.0*		*76*	*40-125*			
Surrogate: Terphenyl-d14	*38.8*		*ug/l*	*50.0*		*78*	*70-115*			
Matrix Spike Dup Analyzed: 12/31/01 (P1L2811-MSD1)					**Source: PKL0453-02**					
Acenaphthene	40.7	10	ug/l	50.0	ND	81	25-120	2	20	
4-Chloro-3-methylphenol	18.9	10	ug/l	50.0	ND	38	15-120	2	20	
2-Chlorophenol	16.4	10	ug/l	50.0	ND	33	20-120	6	20	
1,4-Dichlorobenzene	38.1	10	ug/l	50.0	ND	76	20-120	10	20	
2,4-Dinitrotoluene	45.6	10	ug/l	50.0	ND	91	30-130	3	20	
4-Nitrophenol	40.3	10	ug/l	50.0	ND	81	20-165	2	20	
n-Nitroso-di-n-propylamine	40.2	10	ug/l	50.0	ND	80	20-120	6	20	
Pentachlorophenol	30.7	20	ug/l	50.0	ND	61	20-155	8	20	
Phenol	13.3	10	ug/l	50.0	ND	27	20-140	24	20	R4
Pyrene	47.7	10	ug/l	50.0	ND	95	35-130	3	20	
1,2,4-Trichlorobenzene	39.8	10	ug/l	50.0	ND	80	20-120	7	20	
Surrogate: 2-Fluorophenol	*12.3*		*ug/l*	*100*		*12*	*20-140*			*S6*
Surrogate: Phenol-d6	*18.4*		*ug/l*	*100*		*18*	*20-140*			*S6*
Surrogate: 2,4,6-Tribromophenol	*16.7*		*ug/l*	*100*		*17*	*20-150*			*S6*
Surrogate: Nitrobenzene-d5	*34.5*		*ug/l*	*50.0*		*69*	*35-115*			
Surrogate: 2-Fluorobiphenyl	*38.0*		*ug/l*	*50.0*		*76*	*40-125*			
Surrogate: Terphenyl-d14	*39.5*		*ug/l*	*50.0*		*79*	*70-115*			

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URS
7720 N. 16th Street Suite 100
Phoenix, AZ 85020
Attention: Mark Murphy

Client Project ID: E1-00001546.03

Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

TOTAL RECOVERABLE METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P1L3114 Extracted: 12/31/01										
Blank Analyzed: 01/02/02 (P1L3114-BLK1)										
Antimony	ND	0.050	mg/l							
Arsenic	ND	0.050	mg/l							
Beryllium	ND	0.0040	mg/l							
Cadmium	ND	0.0050	mg/l							
Chromium	ND	0.010	mg/l							
Copper	ND	0.020	mg/l							
ad	ND	0.050	mg/l							
ckel	ND	0.050	mg/l							
Selenium	ND	0.050	mg/l							
Silver	ND	0.0050	mg/l							
Thallium	ND	0.050	mg/l							
Zinc	ND	0.050	mg/l							
LCS Analyzed: 01/02/02 (P1L3114-BS1)										
Antimony	0.912	0.050	mg/l	1.00		91	85-115			
Arsenic	1.03	0.050	mg/l	1.00		103	85-115			
Beryllium	0.992	0.0040	mg/l	1.00		99	85-115			
Cadmium	0.990	0.0050	mg/l	1.00		99	85-115			
Chromium	0.981	0.010	mg/l	1.00		98	85-115			
Copper	1.02	0.020	mg/l	1.00		102	85-115			
Lead	0.975	0.050	mg/l	1.00		98	85-115			
Nickel	0.976	0.050	mg/l	1.00		98	85-115			
Selenium	1.03	0.050	mg/l	1.00		103	85-115			
Silver	0.0519	0.0050	mg/l	0.0500		104	85-115			
Thallium	0.890	0.050	mg/l	1.00		89	85-115			
Zinc	1.04	0.050	mg/l	1.00		104	85-115			
LCS Dup Analyzed: 01/02/02 (P1L3114-BSD1)										
Antimony	0.931	0.050	mg/l	1.00		93	85-115	2	20	
Arsenic	1.05	0.050	mg/l	1.00		105	85-115	2	20	
Beryllium	1.01	0.0040	mg/l	1.00		101	85-115	2	20	
Cadmium	1.01	0.0050	mg/l	1.00		101	85-115	2	20	
Chromium	1.00	0.010	mg/l	1.00		100	85-115	2	20	
Copper	1.04	0.020	mg/l	1.00		104	85-115	2	20	
Lead	0.986	0.050	mg/l	1.00		99	85-115	1	20	
Nickel	0.997	0.050	mg/l	1.00		100	85-115	2	20	

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URS 7720 N. 16th Street Suite 100 Phoenix, AZ 85020 Attention: Mark Murphy	Client Project ID: E1-00001546.03 Report Number: PKL0460	Sampled: 12/27/01 Received: 12/27/01

METHOD BLANK/QC DATA

TOTAL RECOVERABLE METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P1L3114 Extracted: 12/31/01										
LCS Dup Analyzed: 01/02/02 (P1L3114-BSD1)										
Selenium	1.05	0.050	mg/l	1.00		105	85-115	2	20	
Silver	0.0530	0.0050	mg/l	0.0500		106	85-115	2	20	
Thallium	0.916	0.050	mg/l	1.00		92	85-115	3	20	
Zinc	1.06	0.050	mg/l	1.00		106	85-115	2	20	
Matrix Spike Analyzed: 01/02/02 (P1L3114-MS1)					Source: PKL0450-01					
Antimony	0.953	0.050	mg/l	1.00	ND	95	70-130			
senic	1.07	0.050	mg/l	1.00	ND	107	70-130			
ryllium	0.991	0.0040	mg/l	1.00	ND	99	70-130			
Cadmium	0.935	0.0050	mg/l	1.00	ND	94	70-130			
Chromium	0.966	0.010	mg/l	1.00	ND	96	70-130			
Copper	1.04	0.020	mg/l	1.00	ND	104	70-130			
Lead	0.910	0.050	mg/l	1.00	ND	91	70-130			
Nickel	0.934	0.050	mg/l	1.00	ND	93	70-130			
Selenium	1.06	0.050	mg/l	1.00	ND	106	70-130			
Silver	0.0532	0.0050	mg/l	0.0500	ND	106	70-130			
Thallium	0.888	0.050	mg/l	1.00	ND	89	70-130			
Zinc	1.04	0.050	mg/l	1.00	ND	100	70-130			
Matrix Spike Dup Analyzed: 01/02/02 (P1L3114-MSD1)					Source: PKL0450-01					
Antimony	0.958	0.050	mg/l	1.00	ND	96	70-130	0.5	20	
Arsenic	1.09	0.050	mg/l	1.00	ND	109	70-130	2	20	
Beryllium	0.988	0.0040	mg/l	1.00	ND	99	70-130	0.3	20	
Cadmium	0.951	0.0050	mg/l	1.00	ND	95	70-130	2	20	
Chromium	0.983	0.010	mg/l	1.00	ND	98	70-130	2	20	
Copper	1.06	0.020	mg/l	1.00	ND	106	70-130	2	20	
Lead	0.929	0.050	mg/l	1.00	ND	93	70-130	2	20	
Nickel	0.950	0.050	mg/l	1.00	ND	95	70-130	2	20	
Selenium	1.09	0.050	mg/l	1.00	ND	109	70-130	3	20	
Silver	0.0537	0.0050	mg/l	0.0500	ND	107	70-130	0.9	20	
Thallium	0.922	0.050	mg/l	1.00	ND	92	70-130	4	20	
Zinc	1.04	0.050	mg/l	1.00	ND	100	70-130	0	20	

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7720 N. 16th Street Suite 100
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Attention: Mark Murphy

Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

TOTAL RECOVERABLE METALS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0217 Extracted: 01/02/02										
Blank Analyzed: 01/02/02 (P2A0217-BLK1)										
Mercury	ND	0.00020	mg/l							
LCS Analyzed: 01/02/02 (P2A0217-BS1)										
Mercury	0.00503	0.00020	mg/l	0.00500		101	85-115			
LCS Dup Analyzed: 01/02/02 (P2A0217-BSD1)										
Mercury	0.00501	0.00020	mg/l	0.00500		100	85-115	0.4	20	
Matrix Spike Analyzed: 01/02/02 (P2A0217-MS1)					Source: PKL0409-01RE1					
Mercury	0.00521	0.00020	mg/l	0.00500	ND	104	85-115			
Matrix Spike Dup Analyzed: 01/02/02 (P2A0217-MSD1)					Source: PKL0409-01RE1					
Mercury	0.00533	0.00020	mg/l	0.00500	ND	107	85-115	2	20	

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URS
7720 N. 16th Street Suite 100
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Attention: Mark Murphy

Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0216 Extracted: 12/28/01										
Blank Analyzed: 12/28/01 (P2A0216-BLK1)										
Fluoride	ND	0.10	mg/l							
Nitrate-N	ND	0.10	mg/l							
Nitrate/Nitrite-N	ND	0.10	mg/l							
Nitrite-N	ND	0.10	mg/l							
LCS Analyzed: 12/28/01 (P2A0216-BS1)										
Fluoride	2.47	0.10	mg/l	2.50		99	90-110			
Nitrate-N	2.48	0.10	mg/l	2.50		99	90-110			
Nitrite-N	2.49	0.10	mg/l	2.50		100	90-110			
LCS Dup Analyzed: 12/28/01 (P2A0216-BSD1)										
Fluoride	2.50	0.10	mg/l	2.50		100	90-110	1	20	
Nitrate-N	2.46	0.10	mg/l	2.50		98	90-110	0.8	20	
Nitrite-N	2.49	0.10	mg/l	2.50		100	90-110	0	20	
Matrix Spike Analyzed: 12/28/01 (P2A0216-MS1)					**Source: PKL0460-01RE2**					
Fluoride	6.14	1.0	mg/l	2.50	3.0	126	80-120			M1
Nitrate-N	15.3	1.0	mg/l	2.50	13	92	80-120			
Nitrite-N	2.25	1.0	mg/l	2.50	ND	90	80-120			
Matrix Spike Dup Analyzed: 12/28/01 (P2A0216-MSD1)					**Source: PKL0460-01RE2**					
Fluoride	5.27	1.0	mg/l	2.50	3.0	91	80-120	15	20	
Nitrate-N	15.7	1.0	mg/l	2.50	13	108	80-120	3	15	
Nitrite-N	2.34	1.0	mg/l	2.50	ND	94	80-120	4	20	
Batch: P2A0308 Extracted: 01/03/02										
Blank Analyzed: 01/03/02 (P2A0308-BLK1)										
Phosphorus	ND	0.050	mg/l							

Nicole Beck
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URS
7720 N. 16th Street Suite 100
Phoenix, AZ 85020
Attention: Mark Murphy

Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: P2A0308 Extracted: 01/03/02										
LCS Analyzed: 01/03/02 (P2A0308-BS1)										
Phosphorus	0.551	0.050	mg/l	0.500		110	80-120			
Matrix Spike Analyzed: 01/03/02 (P2A0308-MS1)					Source: PKL0460-01					
Phosphorus	0.577	0.050	mg/l	0.500	ND	112	75-125			
Matrix Spike Dup Analyzed: 01/03/02 (P2A0308-MSD1)					Source: PKL0460-01					
Phosphorus	0.582	0.050	mg/l	0.500	ND	113	75-125	0.9	15	

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URS 7720 N. 16th Street Suite 100 Phoenix, AZ 85020 Attention: Mark Murphy	Client Project ID: E1-00001546.03 Report Number: PKL0460	Sampled: 12/27/01 Received: 12/27/01

METHOD BLANK/QC DATA

INORGANICS

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: C2A0213 Extracted: 01/02/02										
Blank Analyzed: 01/02/02 (C2A0213-BLK1)										
Total Kjeldahl Nitrogen	ND	0.50	mg/l							
LCS Analyzed: 01/02/02 (C2A0213-BS1)										
Total Kjeldahl Nitrogen	9.94	0.50	mg/l	10.0		99	85-120			
Matrix Spike Analyzed: 01/02/02 (C2A0213-MS1)					Source: CKL0301-01					
Total Kjeldahl Nitrogen	11.1	0.50	mg/l	10.0	ND	107	65-125			
Matrix Spike Dup Analyzed: 01/02/02 (C2A0213-MSD1)					Source: CKL0301-01					
Total Kjeldahl Nitrogen	11.1	0.50	mg/l	10.0	ND	107	65-125	0	15	

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Client Project ID: E1-00001546.03

Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 3510C/8081A)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: I1L2837 Extracted: 12/28/01										
Blank Analyzed: 12/29/01 (I1L2837-BLK1)										
Aldrin	ND	0.10	ug/l							
alpha-BHC	ND	0.10	ug/l							
beta-BHC	ND	0.10	ug/l							
delta-BHC	ND	0.20	ug/l							
gamma-BHC (Lindane)	ND	0.10	ug/l							
Chlordane	ND	1.0	ug/l							
4,4'-DDD	ND	0.10	ug/l							
4,4'-DDE	ND	0.10	ug/l							
4,4'-DDT	ND	0.10	ug/l							
Dieldrin	ND	0.10	ug/l							
Endosulfan I	ND	0.10	ug/l							
Endosulfan II	ND	0.10	ug/l							
Endosulfan sulfate	ND	0.20	ug/l							
Endrin	ND	0.10	ug/l							
Endrin aldehyde	ND	0.10	ug/l							
Endrin ketone	ND	0.10	ug/l							
Heptachlor	ND	0.10	ug/l							
Heptachlor epoxide	ND	0.10	ug/l							
Methoxychlor	ND	0.10	ug/l							
Toxaphene	ND	5.0	ug/l							
Surrogate: Tetrachloro-m-xylene	*0.299*		*ug/l*	*0.500*		*60*	*30-120*			
Surrogate: Decachlorobiphenyl	*0.443*		*ug/l*	*0.500*		*89*	*30-120*			
LCS Analyzed: 12/29/01 (I1L2837-BS1)										
Aldrin	0.487	0.10	ug/l	0.500		97	42-115			
alpha-BHC	0.460	0.10	ug/l	0.500		92	37-115			
beta-BHC	0.454	0.10	ug/l	0.500		91	45-115			
delta-BHC	0.452	0.20	ug/l	0.500		90	45-130			
gamma-BHC (Lindane)	0.486	0.10	ug/l	0.500		97	40-115			
4,4'-DDD	0.458	0.10	ug/l	0.500		92	55-120			
4,4'-DDE	0.448	0.10	ug/l	0.500		90	50-115			
4,4'-DDT	0.456	0.10	ug/l	0.500		91	55-115			
Dieldrin	0.500	0.10	ug/l	0.500		100	50-115			
Endosulfan I	0.489	0.10	ug/l	0.500		98	45-115			
Endosulfan II	0.477	0.10	ug/l	0.500		95	50-115			

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 3510C/8081A)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: I1L2837 Extracted: 12/28/01										
LCS Analyzed: 12/29/01 (I1L2837-BS1)										
Endosulfan sulfate	0.485	0.20	ug/l	0.500		97	65-120			
Endrin	0.490	0.10	ug/l	0.500		98	45-115			
Endrin aldehyde	0.460	0.10	ug/l	0.500		92	45-115			
Endrin ketone	0.491	0.10	ug/l	0.500		98	55-140			
Heptachlor	0.514	0.10	ug/l	0.500		103	35-115			
Heptachlor epoxide	0.490	0.10	ug/l	0.500		98	40-115			
Methoxychlor	0.448	0.10	ug/l	0.500		90	55-120			
Surrogate: Tetrachloro-m-xylene	*0.429*		*ug/l*	*0.500*		*86*	*30-120*			
Surrogate: Decachlorobiphenyl	*0.461*		*ug/l*	*0.500*		*92*	*30-120*			
LCS Dup Analyzed: 12/29/01 (I1L2837-BSD1)										
Aldrin	0.452	0.10	ug/l	0.500		90	42-115	7	20	Q8
alpha-BHC	0.407	0.10	ug/l	0.500		81	37-115	12	20	Q8
beta-BHC	0.455	0.10	ug/l	0.500		91	45-115	0.2	20	Q8
delta-BHC	0.460	0.20	ug/l	0.500		92	45-130	2	20	Q8
gamma-BHC (Lindane)	0.447	0.10	ug/l	0.500		89	40-115	8	20	Q8
4,4'-DDD	0.485	0.10	ug/l	0.500		97	55-120	6	20	Q8
4,4'-DDE	0.477	0.10	ug/l	0.500		95	50-115	6	20	Q8
4,4'-DDT	0.489	0.10	ug/l	0.500		98	55-115	7	20	Q8
Dieldrin	0.496	0.10	ug/l	0.500		99	50-115	0.8	20	Q8
Endosulfan I	0.478	0.10	ug/l	0.500		96	45-115	2	20	Q8
Endosulfan II	0.494	0.10	ug/l	0.500		99	50-115	4	20	Q8
Endosulfan sulfate	0.492	0.20	ug/l	0.500		98	65-120	1	20	Q8
Endrin	0.491	0.10	ug/l	0.500		98	45-115	0.2	20	Q8
Endrin aldehyde	0.450	0.10	ug/l	0.500		90	45-115	2	20	Q8
Endrin ketone	0.491	0.10	ug/l	0.500		98	55-140	0	20	Q8
Heptachlor	0.438	0.10	ug/l	0.500		88	35-115	16	20	Q8
Heptachlor epoxide	0.469	0.10	ug/l	0.500		94	40-115	4	20	Q8
Methoxychlor	0.456	0.10	ug/l	0.500		91	55-120	2	20	Q8
Surrogate: Tetrachloro-m-xylene	*0.369*		*ug/l*	*0.500*		*74*	*30-120*			*Q8*
Surrogate: Decachlorobiphenyl	*0.471*		*ug/l*	*0.500*		*94*	*30-120*			*Q8*

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Client Project ID: E1-00001546.03
Report Number: PKL0460

Sampled: 12/27/01
Received: 12/27/01

METHOD BLANK/QC DATA

POLYCHLORINATED BIPHENYLS (EPA 3510C/8082)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: I1L2837 Extracted: 12/28/01										
Blank Analyzed: 12/29/01 (I1L2837-BLK1)										
Aroclor 1016	ND	1.0	ug/l							
Aroclor 1221	ND	1.0	ug/l							
Aroclor 1232	ND	1.0	ug/l							
Aroclor 1242	ND	1.0	ug/l							
Aroclor 1248	ND	1.0	ug/l							
Aroclor 1254	ND	1.0	ug/l							
Aroclor 1260	ND	1.0	ug/l							
Surrogate: Decachlorobiphenyl	*0.428*		*ug/l*	*0.500*		*86*	*30-120*			
LCS Analyzed: 12/29/01 (I1L2837-BS2)										
Aroclor 1016	3.17	1.0	ug/l	4.00		79	45-115			
Aroclor 1260	3.51	1.0	ug/l	4.00		88	55-115			
Surrogate: Decachlorobiphenyl	*0.480*		*ug/l*	*0.500*		*96*	*30-120*			
LCS Dup Analyzed: 12/29/01 (I1L2837-BSD2)										
Aroclor 1016	3.15	1.0	ug/l	4.00		79	45-115	0.6	25	Q8
Aroclor 1260	3.37	1.0	ug/l	4.00		84	55-115	4	20	Q8
Surrogate: Decachlorobiphenyl	*0.453*		*ug/l*	*0.500*		*91*	*30-120*			*Q8*

Nicole Beck
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URS 7720 N. 16th Street Suite 100 Phoenix, AZ 85020 Attention: Mark Murphy	Client Project ID: E1-00001546.03 Report Number: PKL0460	Sampled: 12/27/01 Received: 12/27/01

METHOD BLANK/QC DATA

DATA QUALIFIERS AND DEFINITIONS

D1	Sample required dilution due to matrix interference. See case narrative.
L3	The associated blank spike recovery was above method acceptance limits. See case narrative.
M1	Matrix spike recovery was high, the method control sample recovery was acceptable.
M2	Matrix spike recovery was low, the method control sample recovery was acceptable.
N1	See case narrative.
N2	See corrective action report.
Q8	Insufficient sample received to meet method QC requirements. QC requirements satisfy ADEQ policies 0154 and 0155.
R4	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.
S6	Surrogate recovery was below laboratory and method acceptance limits. Re-extraction and/or reanalysis confirms low recovery caused by matrix effect.
V1	CCV recovery was above method acceptance limits. This target analyte was not detected in the sample.
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not reported.
RPD	Relative Percent Difference

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CORRECTIVE ACTION REPORT

Department:	GC/MS	Method:	8260B
Date:	01/05/2002	Matrix:	Water
Batch:	P2A0501		
Samples:	PKL0440-01 – PKL0440-08 & PKL0460-01 – PKL0460-02		

Identification and Definition of Problem:

Naphthalene and 1,2,4-Trichlorobenzene recovered high and outside of acceptance limits in the Continuing Calibration Verification Standard (CCV), Laboratory Control Sample (LCS), Laboratory Control Sample Duplicate (LCSD), Matrix Spike (MS) and Matrix Spike Duplicate (MSD). The LCSD also recovered high and outside of acceptance limits for Ethylbenzene.

Determination of the Cause of the Problem:

A definitive cause for the high recoveries could not be determined, however it is suspected that the system had gained sensitivity for these compounds.

Corrective Action:

The associated samples were non-detect for the above compounds and therefore should not be significantly impacted by the high recoveries. The associated QC and samples have been flagged "V1" for Naphthalene and 1,2,4-Trichlorobenzene. The LCS, LCSD and associated samples have been flagged "L3" for Naphthalene and 1,2,4-Trichlorobenzene. The LCSD and associated samples have been flagged "L3" for Ethylbenzene. The MS and MSD have also been flagged "N2" to indicate the high recoveries.

Elizabeth C. Wueschner: Elizabeth C. Wueschner Date: 1/12/2002
Quality Assurance Manager

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CHAIN OF CUSTODY FORM

Client Name/Address: URS 7720 N. 16TH ST, STE. 100 PHX, AZ 85020

Project/PO Number: E1-00001546.03

Project Manager: MARK MURPHY

Phone Number: 602-371-1100

Sampler: CINDY MATTINGLY

Fax Number: 602-371-1615

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	EPA 8260 VOC's	EPA 8082/8081 PEST/PCBS	F, NO2, NO3, TP	EPA 8270 SVOC's	13 PRIORITY METALS * 6000/7000	TKN, TN				Special Instructions
WELL-9	GW	VARIOUS	10	12/27/01	1105	VARIOUS	X	X	X	X	X	X	PKL0460		-01	* Sb, As, Be, Cd,
TRIP BLANK	DI	40mL	1	NA	NA	HCl	X							-	02	Cr, Cu, Pb, Hg,
																Ni, Se, Ag, Tl, Zn
																PER QUOTE CONSTITUENTS FOR DETECTION MONITORING

Cindy Mattingly

Relinquished By:	Date/Time:	Received by:	Date/Time:
Cindy Matt	12/27/01 1410		
Relinquished By:	Date/Time:	Received by:	Date/Time: 12-27-01
Relinquished By:	Date/Time: 12-27-01	Received in Lab by:	Date/Time: 12/27/01 1410

Turnaround Time: (Check)
same day ____ 72 hours ____
24 hours ____ 5 days X
~~48 hours~~ ____ normal ____

Sample Integrity: (Check)
intact ✓ on ice ✓

Note: By relinquishing samples to Del Mar Analytical, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 d[illegible] from the date of invoice. Sample(s) will be disposed of after 30 days.

APPENDIX C

CONSTITUENTS FOR GROUNDWATER MONITORING

GROUNDWATER MONITORING CONSTITUENTS FOR DETECTION MONITORING
As Specified in 40 CFR- Chapter 1- Part 258, Appendix I

pH
Temperature
Chemical oxygen demand
Chloride
Sodium
Ammonia

Inorganic Constituents:

Antimony	
Arsenic	Lead
Barium	Nickel
Beryllium	Selenium
Cadmium	Silver
Chromium	Thallium
Cobalt	Vanadium
Copper	Zinc

Organic Constituents:

Acetone	trans-1,3-Dichloropropene
Acrylonitrile	2-Hexanone
Acenaphthene	Methyl bromide
Benzene	Methyl chloride
Bromochloromethane	Methylene bromide
Bromodichloromethane	Methylene chloride
Bromoform	Methyl ethyl ketone
Carbon disulfide	Methyl iodide
Chlorobenzene	4-Methyl-2-pentanone
Chloroethane	Styrene
Chloroform	1,1,1,2-Tetrachloroethane
Dibromocholormethane	1,1,2,2-Tetrachloroethane
1,2-Dibromo-3-chloropropane	Tetrachloroethylene
1,2-Dibromoethane	Toluene
o-Dichlorobenzene	1,1,1-Trichloroethane
p-Dichlorobenzene	1,1,2-Trichloroethane
trans-1,4-Dichloro-2-butene	Trichloroethylene
1,2-Dichloroethane	Trichlorofluoromethane
1,1-Dichloroethylene	1,2,3-Trichloropropane
cis-1,2-Dichloroethylene	Vinyl acetate
trans-1,2-Dichloroethylene	Vinyl chloride
1,2-Dichloropropane	Xylenes
cis-1,3-Dichloropropene	

GROUNDWATER MONITORING CONSTITUENTS FOR ASSESSMENT MONITORING
As specified in 40 CFR- Chapter 1 - Part 258, Appendix II

pH
Temperature
Chemical oxygen demand
Chloride
Sodium
Ammonia

Acenaphthene
Acenaphthylene
Acetone;2-Propanone
Acetonitrile
Acetophenone
2-Acetylaminoflourene
Acrolein
Acrylonitrile
Aldrin
Allyl chloride
4-Aminobiphenyl
Anthracene
Antimony
Arsenic
Barium
Benzene
Benzo[a]anthracene
Benzo[b]flouranthene
Benzo[k]flouranthene
Benzo[ghi]perylene
Benzo[a]pyrene
Benzyl alcohol
Beryllium
alpha-BHC
beta-BHC
delta-BHC
Lindane
bis(2-Chloroethoxy)methane
bis(2-Chloroethyl
bis-(2-Chloro-1-methylethyl
bis(2-Ethylhexyl
Bromochloromethane
Bromodichloromethane
Bromoform
4-Bromophenyl phenyl ether
Butyl benzyl phthalate
Cadmium
Carbon disulfide
Carbon tetrachloride
Chlordane
p-Chloroaniline
Chlorobenzene
Chlorobenzilate
p-Chloro-m-Cresol

Chloroethane
Chloroform
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chloroprene
Chromium
Chrysene
Cobalt
Copper
m-Cresol
o-Cresol
p-Cresol
Cyanide

2,4-D
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Dibromocholormethane
1,2-Dibromo-3-chloropropane
1,2-Dibromoethane
Di-n-butyl phthalate
o-Dichlorobenzene
m-Dichlorobenzene
p-Dichlorobenzene
3,3'-Dichlorobenzidine
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
cis-1,2-Dichloroethylene
trans-1,2-Dichloroethylene
2,4-Dichlorophenol
2,6-Dichlorophenol
1,2-Dichloropropane
1,3-Dichloropropane
2,2-Dichloropropane
1,1-Dichloropropene
cis-1,3-Dichloropropene

trans-1,3-Dichloropropene
Dieldrin
Diethyl phthalate
Dimethoate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidene
2,4-Dimethylphenol
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Dinoseb
Di-n-octyl phthalate
Diphenylamine
Disulfoton

Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethylbenzene
Ethyl methacrylate
Ethyl methanesulfonate

Famphur
Flouranthene
Flourene

Heptachlor
Heptachlor epoxide
Hexachorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Hexachloropropene
2-Hexanone

GROUNDWATER MONITORING CONSTITUENTS FOR ASSESSMENT MONITORING
As specified in 40 CFR- Chapter 1 - Part 258, Appendix II

Indeno(1,2,3-cd)pyrene
Isobutyl alcohol;2-Methyl-1-propanol
Isodrin
Isophorone
Isosafrole

Kepone

Lead

Mercury
Methacrylonitrile
Methapyrilene
Methoxychlor
Methyl bromide
Methyl chloride
3-Methylcholanthrene
Methyl ethyl ketone
Methyl iodide
Methyl methacrylate
Methyl methanesulfonate
2-Methylnaphthalene
Methyl parathion
4-Methyl-2-pentanone
Methylene bromide
Methylene chloride

Naphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
Nickel
o-Nitroaniline
m-Nitroaniline
p-Nitroaniline
Nitrobenzene
o-Nitrophenol
p-Nitrophenol
N-Nitrosodi-n-butylamine
N-Nitrosodiethylamine
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
N-Nitrosodipropylamine
N-Nitrosomethylethalamine
N-Nitrsopiperidine
N-Nitrosopyrrolidine
5-Nitro-o-toluidine

Parathion
Pentachlorobenzene
Pentachloronitrobenzene
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Phorate
Polychlorinated biphenyls
Pronamide
Propionitrile

Silver
Silvex
Styrene
Sulfide

2,4,5-T
1,2,4,5-Tetrachlorobenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethene
2,3,4,6-Tetrachlorophenol
Thallium
Thionazin
Tin
Toluene
o-Toluidine
Toxaphene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Trichlorofluoromethane
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
1,2,3-Trichloropropane
o,o,o-Triethyl phosphorothioate
sym-Trinitrobenzene

Vanadium

Vinyl acetate
Vinyl chloride

Xylene (total)

Zinc

APPENDIX D

GROUNDWATER SAMPLING AND ANALYSIS PROGRAM

GROUNDWATER SAMPLING AND ANALYSIS

INTRODUCTION

The City of Phoenix (City) Public Works Department, in order to maintain compliance with state and federal regulations, has established a groundwater monitoring program to monitor the water quality of the groundwater at the boundaries of the City's landfills. The objectives of the Public Works Department Groundwater Monitoring Program are to:

- Monitor the quality of the groundwater at the boundary of City landfills in a manner that data is representative of the actual site conditions in the uppermost aquifer.
- Monitor the static water level in the monitor wells to determine the direction of the regional groundwater flow beneath the City landfills.

This Groundwater Sampling and Analysis Program provides the field-sampling plan for the SR 85 Landfill (Landfill). It provides detailed information for conducting sampling for the Landfill in order to meet state and federal permitting requirements and to ensure the reliability of analytical results.

In order to assess and maximize data quality, a quality assurance/quality control (QA/QC) program will be implemented as an integral part of Sampling Plan activities. The objective of a QA/QC Plan is twofold: first, to provide a mechanism for ongoing control and evaluation of the sampling and analysis procedures throughout the course of the project; and second, to quantify data precision and accuracy for use in future data interpretation processes. A strict system of QA/QC will be followed in all phases of field sampling, laboratory analysis, and data review/reporting.

1.0 FIELD SAMPLING PLAN

This plan describes the procedures that the City, contractor, and subcontractors will use to assure that appropriate and high quality groundwater quality information is obtained. The groundwater sampling and analysis procedures described below comply with 40 CFR Part 264.97(d) and (e) in that they are designed to ensure that monitoring results provide a reliable indication of groundwater quality below the site and are appropriate to accurately measure constituents in groundwater samples.

1.1 Field Sampling Procedures

The sampling procedures described in this section involve the following elements:

- A detailed list of all sampling materials and supplies will be prepared and reviewed prior to sampling staff leaving for the field.

- All sample collection meters will be checked and properly calibrated prior to sample collection. Batteries on equipment will also be checked.

- Clean sample containers, preservatives, and coolers will be provided by the laboratory.

- On arrival at the well, the condition of the well vault and surface seal should be examined to see if any evidence of cracks or vandalism are observed; such observations will be recorded in the field notebook.

- Wells to be sampled that have not been equipped with a dedicated pump will be purged with a single non-dedicated pump, and groundwater samples will be collected from the pump discharge hose. Non-dedicated equipment will be decontaminated before being used at the site and after use in each well.

- Prior to purging each well, the water level will be measured and recorded. Water level measurements are needed to estimate the amount of water to be pumped from the well prior to sample collection. In addition, water level information is useful in interpreting hydrogeologic conditions.

- A minimum of three well volumes of water will be purged from each well to be sampled using a submersible pump or low flow purge method. The flow rate of the pump will be controlled to minimize turbulent flow within the well.

- For the Low-Flow Purge Method (requires a variable-speed pump): start the pump at its lowest speed setting and slowly increase the speed until discharge occurs. Check the water level in the well. Adjust pump speed until there is little or no water level drawdown (less than 0.3 foot). If the minimal drawdown that can be achieved exceeds 0.3 foot but remains stable, continue purging until indicator field parameters stabilize.

- During well purging, the following indicator parameters will be monitored and recorded every three to five minutes: pH, temperature, and specific conductance.

- Powderless, disposable gloves will be worn by sampling staff at all times during water sample collection. (Latex gloves are appropriate when sampling for inorganics; nitrile gloves are appropriate for organics.)

- Stabilization is considered to be achieved when three consecutive readings, taken at three to five minute intervals, are within the following limits: specific conductance 3%, pH 0.1 unit, and temperature 3%.

- Groundwater samples to be analyzed for metals will not be field-filtered. (The Maximum Contaminant Levels and Aquifer Water Quality Standards are based on total metals.)

1.2 Field QA/QC Samples

State QA/QC guidance requires the collection of equipment blank, field blank, and duplicate samples. These samples are used to check the quality of decontamination, collection, and handling procedures to verify that they have not affected sample-water quality. The number, type and handling of QA/QC samples should be clearly specified in the sampling plan. A general discussion of relevant field QA/QC samples for this Sampling Plan follows.

Field Equipment Blanks

Equipment blanks consist of containers filled with the final rinse water from equipment decontamination. Once analyzed, they reveal the effectiveness of cleaning of field equipment. Collect equipment blanks after sampling the surface water or ground water station with the highest contamination. One per day of sampling is sufficient. Distilled water will be run through the sampling equipment and placed in a sample bottle (blank).

Duplicate Samples

Duplicate samples are used to check the precision of field collection or laboratory analyses. Duplicates are collected at the same time as the water quality sample at a rate of one in every ten or 10 percent per day, whichever is greater. The duplicate sample should be collected from the well that is believed to have elevated levels of a particular compound.

Field (or Trip) Blanks

Field blanks are containers of deionized water that are filled at the sampling location, then labeled, packaged, sealed, and shipped to the laboratory like other samples. They check for contamination in the laboratory and for cross-contamination during the collection and shipment of the samples. The laboratory requires one field blank for each day of sampling.

1.3 Sample Preservation

Samples will be contained in pre-preserved bottles for shipment to an Arizona Department of Health Services (ADHS)-certified laboratory. A chain-of-custody form will be kept as a record of the submitted samples and to track sample test results.

1.4 Sample Custody

For each groundwater sample collected, an entry will be made on a chain-of-custody form supplied by the laboratory. The information to be recorded includes the sampling date and time, sample identification number, matrix sampled, requested analytes and methods, preservatives, and sampler(s) name. Sampling team members will maintain custody of the samples until they are relinquished to laboratory personnel or sample courier. The chain-of-custody form will accompany the samples from the time of collection until they are received by the laboratory. Each party in possession of the samples (except a professional courier service) will sign the chain-of-custody form signifying receipt. A copy of the original completed form will be provided by the laboratory along with the report of results. If a professional courier service delivers the samples to the laboratory, the chain-of-custody form will be placed in a plastic bag and shipped with samples inside the cooler. After the samples, ice, and chain-of-custody forms are packed in the coolers, custody seals will be placed on the lid of each cooler before the cooler is relinquished to the professional courier service. Custody seals provide assurance that the samples are not tampered with during transportation to the laboratory. The seals will be signed and dated by the sample team member that prepared the package.

1.5 Documentation

The following information will be recorded on field report forms: samplers' name, well identifier, date and time of sampling, site location, static water level, pumping rate, indicator parameter values, clock times, calculated or measured purge volume, and time of each sample collection. In addition, weather conditions, unusual field observations, and any problems will be recorded.

2.0 LABORATORY STANDARD OPERATING PROCEDURES

The samples will be submitted to the appropriate laboratory to be analyzed for the predetermined parameters. For water, sediment, and surface soil samples, the laboratory must be certified by the ADHS. Laboratories will be required to submit a QA plan/manual to City prior to the receipt of samples. The QA plan/manual must detail laboratory-specific standard operation procedures (SOPs) that conform to the QC requirements presented in this Sampling Plan.

Laboratory QA/QC Samples

Under the laboratory QA program, various QA/QC samples will be used as applicable to the analysis of metals. A general discussion of relevant laboratory QA/QC samples follows.

Method Blanks

Laboratory method (or preparation) blanks are analyzed to evaluate the existence and magnitude of contamination problems. Method blanks will be prepared with deionized water and will be required to be analyzed at a frequency determined by the analytical method.

Laboratory Control Samples

Laboratory control samples (LCSs) are "clean," well-characterized samples used to monitor the laboratory's day-to-day performance of routine analytical methods. LCSs will be prepared by spiking samples of a "clean" matrix with known amounts of target analytes and then processing the sample in the same fashion as all other samples. LCSs will be used to monitor the accuracy and precision of the analytical process independent of matrix effects. The accuracy of the analytical process will be evaluated using the calculated percent recoveries (%Rs) of the spiked analytes. When LCSs are prepared in duplicate, the duplicate results will be compared to each other by means of a relative percent difference (RPD) and used to evaluate the precision of the analytical process.

Matrix Spike

A matrix spike is an analysis of an extra portion of a field sample into which known amounts of target analytes are spiked prior to sample preparation. The matrix spike results, expressed as, %R of the spiked analytes, will be used to assess affects of the general sample matrix on the accuracy of the analysis.

Laboratory Duplicate

A laboratory duplicate sample is a split of a homogenized environmental sample prepared and analyzed by the laboratory in a manner identical to that of the original sample. The duplicate results will be compared to each other by means of an RPD between analytical results for the duplicate and the original sample. The duplicate sample analysis results will be used to evaluate the precision of the laboratory analyses.

APPENDIX E

U.S. ENVIRONMENTAL PROTECTION AGENCY ASSESSMENT MONITORING PROGRAM

40 CFR 258.55 Assessment monitoring program.

(a) Assessment monitoring is required whenever a statistically significant increase over background has been detected for one or more of the constituents listed in the appendix I to this partor in the alternative list approved in accordance with §258.54(a)(2).

(b) Within 90 days of triggering an assessment monitoring program, and annually thereafter, the owner or operator must sample and analyze the ground water for all constituents identified in appendix II to this part. A minimum of one sample from each downgradient well must be collected and analyzed during each sampling event. For any constituent detected in the downgradient wells as a result of the complete appendix IIanalysis, a minimum of four independent samples from each well (background and downgradient) must be collected and analyzed to establish background for the constituents. The Director of an approved State may specify an appropriate subset of wells to be sampled and analyzed for appendix II constituents during assessment monitoring. The Director of an approved State may delete any of the appendix IImonitoring parameters for a MSWLF unit if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.

(c) The Director of an approved State may specify an appropriate alternate frequency for repeated sampling and analysis for the full set of appendix IIconstituents required by §258.55(b) of this part, during the active life (including closure) and post-closure care of the unit considering the following factors:

(1) Lithology of the aquifer and unsaturated zone;

(2) Hydraulic conductivity of the aquifer and unsaturated zone;

(3) Ground-water flow rates;

(4) Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel);

(5) Resource value of the aquifer; and

(6) Nature (fate and transport) of any constituents detected in response to this section.

(d) After obtaining the results from the initial or subsequent sampling events required in paragraph (b) of this section, the owner or operator must:

(1) Within 14 days, place a notice in the operating record identifying the appendix II constituents that have been detected and notify the State Director that this notice has been placed in the operating record;

(2) Within 90 days, and on at least a semiannual basis thereafter, resample all wells specified by §258.51(a) conduct analyses for all constituents in appendix I to this part or in the alternative list approved in accordance with §258.54(a)(2), and for those constituents in appendix II to this part that are detected in response to paragraph (b) of this section, and record their concentrations in the facility operating record. At least one sample from each well (background and downgradient) must be collected and analyzed during these sampling events. The Director of an approved State may specify an alternative monitoring frequency during the active life (including closure) and the post-closure period for the constituents referred to in this paragraph. The alternative frequency for appendix I constituents, or the alternative list approved in accordance with §258.54(a)(2), during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the factors specified in paragraph (c) of this section;

(3) Establish background concentrations for any constituents detected pursuant to paragraph (b) or (d)(2) of this

section; and

(4) Establish ground-water protection standards for all constituents detected pursuant to paragraph (b) or (d) of this section. The ground-water protection standards shall be established in accordance with paragraphs (h) or (i) of this section.

(e) If the concentrations of all appendix II constituents are shown to be at or below background values, using the statistical procedures in §258.53(g), for two consecutive sampling events, the owner or operator must notify the State Director of this finding and may return to detection monitoring.

(f) If the concentrations of any appendix II constituents are above background values, but all concentrations are below the groundwater protection standard established under paragraphs (h) or (i) of this section, using the statistical procedures in §258.53(g), the owner or operator must continue assessment monitoring in accordance with this section.

(g) If one or more appendix IIconstituents are detected at statistically significant levels above the groundwater protection standard established under paragraphs (h) or (i) of this section in any sampling event, the owner or operator must, within 14 days of this finding, place a notice in the operating record identifying the appendix II constituents that have exceeded the ground-water protection standard and notify the State Director and all appropriate local government officials that the notice has been placed in the operating record. The owner or operator also:

(1) (i) Must characterize the nature and extent of the release by installing additional monitoring wells as necessary;

(ii) Must install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with §258.55(d)(2);

(iii) Must notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site if indicated by sampling of wells in accordance with §258.55(g)(1); and

(iv) Must initiate an assessment of corrective measures as required by §255.56 of this part within 90 days; or

(2) May demonstrate that a source other than a MSWLF unit caused the contamination, or that the SSI increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in ground-water quality. A report documenting this demonstration must be certified by a qualified ground-water scientist or approved by the Director of an approved State and placed in the operating record. If a successful demonstration is made the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to §258.55, and may return to detection monitoring if the appendix IIconstituents are at or below background as specified in §258.55(e). Until a successful demonstration is made, the owner or operator must comply with §258.55(g) including initiating an assessment of corrective measures.

(h) The owner or operator must establish a ground-water protection standard for each appendix II constituent detected in the ground-water. The ground-water protection standard shall be:

(1) For constituents for which a maximum contaminant level (MCL) has been promulgated under section 1412 of the Safe Drinking Water Act (codified) under 40 CFR part 141, the MCL for that constituent;

(2) For constituents for which MCLs have not been promulgated, the background concentration for the constituent established from wells in accordance with §258.51(a)(1); or

(3) For constituents for which the background level is higher than the MCL identified under paragraph (h)(1) of this section or health based levels identified under §258.55(i)(1); the background concentration.

(i) The Director of an approved State may establish an alternative ground-water protection standard for constituents for which MCLs have not been established. These ground-water protection standards shall be appropriate health based levels that satisfy the following criteria:

(1) The level is derived in a manner consistent with Agency guidelines for assessing the health risks of environmental pollutants (51 FR 33992, 34006, 34014, 34028, Sept. 24, 1986);

(2) The level is based on scientifically valid studies conducted in accordance with the Toxic Substances Control Act Good Laboratory Practice Standards (40 CFR part 792) or equivalent;

(3) For carcinogens, the level represents a concentration associated with an excess lifetime cancer risk level (due to continuous lifetime exposure) with the 1×10^{-4} to 1×10^{-6} range; and

(4) For systemic toxicants, the level represents a concentration to which the human population (including sensitive subgroups) could be exposed to on a daily basis that is likely to be without appreciable risk of deleterious effects during a lifetime. For purposes of this subpart, systemic toxicants include toxic chemicals that cause effects other than cancer or mutation.

(j) In establishing ground-water protection standards under paragraph (i) of this section, the Director of an approved State may consider the following:

(1) Multiple contaminants in the ground water;

(2) Exposure threats to sensitive environmental receptors; and

(3) Other site-specific exposure or potential exposure to ground water.

