BASELINE DATA REPORT

Section 8.0

Surface Water

MAY 2013

Replacement Section

Submitted To:

New Mexico Mining and Minerals Division
&
U.S. Forest Service (Cibola National Forest)
&
New Mexico Environment Department

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Contents

Figures

Tables

Appendices

8.0 Surface Water

NMAC 19.10.6.602 D.13 (g)

Baseline data shall include, as applicable:

(g) Surface water information shall include the following:

(i) A map indicating the location of surface waters and the location and size of watersheds in and adjacent to the proposed permit area. The map shall depict all watercourses, lakes, reservoirs, springs, and riparian and wetland areas. Streams shall be classified as ephemeral, intermittent, or perennial. The map shall identify all watercourses, lakes, springs, and riparian and wetland areas into which surface or pit drainage will be discharged or may possibly be expected to reach.

(ii) A description of surface drainage systems sufficient to identify the seasonal variations in surface water quantity and quality within the proposed permit and affected areas to the extent possible.

(v) A determination of the probable hydrologic consequences of the operation and reclamation, on both the permit and affected areas, with respect to the hydrologic regime, quantity and quality of surface and ground water systems that may be affected by the proposed operations, including the dissolved and suspended solids under seasonal flow conditions.

8.1 Introduction

The RHR permit area lies within the middle portion of the watershed of San Mateo Creek, a small stream system that is tributary to the Rio San Jose, the Rio Puerco, and ultimately the Rio Grande (Figure 8-1). Because the stream is perennial only in its headwaters, and that flow is completely diverted for irrigation purposes, no permanent gaging station exists on the creek. The limited historical water quality and water quantity data for San Mateo Creek were collected either for the purpose of establishing baseline hydrologic conditions prior to development of the Gulf Mt. Taylor mine, or in response to subsequent mining and dewatering activities. These data include measurements from a stream flow gaging station that measured mine water discharge to San Mateo Creek above its confluence with Arroyo del Puerto (USGS gaging station 08342600), a short period of measurements for Arroyo del Puerto (USGS gaging station 08342700), water quality and quantity data collected in the middle and upper San Mateo Creek watershed by the New Mexico Environmental Institute (NMEI) in 1974, and streamflow gaging records for the Rio San Jose (USGS gaging station 08343000) just below its confluence with San Mateo Creek.

Since 2008, a significant amount of additional information concerning the surface water resources in the vicinity of the RHR permit area has been collected by RHR. RHR performed a Level 1 Stream Survey (SWQB, Hydrologic Protocol, 2011, p. 3.) of San Mateo Creek and classified the reaches of the creek as perennial, intermittent, and ephemeral. RHR has observed the creek for two years, and also collected water samples for chemical analysis from perennial and intermittent water within the stream basin and from stream bed sediments. The available data relevant to surface water are discussed in this section.

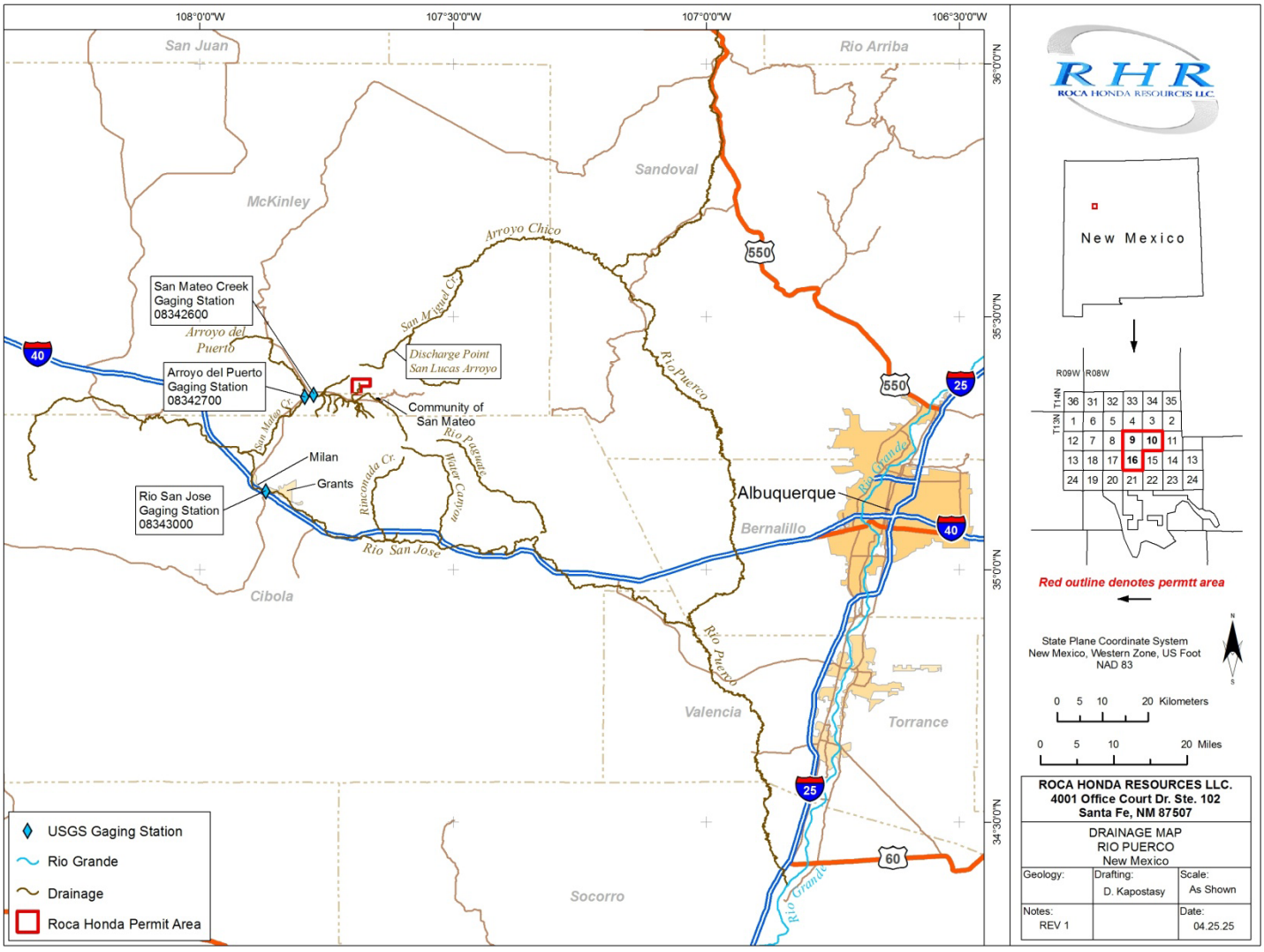

Figure 8-1. RHR Project Location within the Rio Puerco Basin

RHR's mine permit application and Discharge Plan application submitted to NM MMD and NMED, respectively, in 2009 proposed discharge of the treated effluent to San Mateo Creek. In response to agency comments and concerns RHR developed an alternative discharge location to allay those concerns. The discharge will occur on private property in the vicinity of Laguna Polvadera or into San Lucas Arroyo. At that location the water will be used for irrigating pasture land by the local rancher or may simply flow down the San Lucas Arroyo as a permitted discharge. Historical data exists for San Lucas Arroyo which is presented in Section 9, Appendix J of this BDR. RHR will conduct a Hydrology Protocol on the San Lucas Arroyo in accordance with the revised Protocol to determine ephemeral, intermittent, or perennial waters.

8.2 Regional Surface Water and Watersheds

The permit area lies within the middle portion of the San Mateo Creek Watershed. Figure 8-1 and Figure 8-2 identify the location of surface watercourses in and adjacent to the permit area and designate the location and size of the watersheds in and adjacent to the permit area. Watercourses in the vicinity of the RHR permit area are identified as ephemeral, intermittent or perennial in Figure 8-3.

San Mateo Creek is part of the Rio Grande drainage basin as a tributary of the Rio San Jose. The Rio San Jose joins the Rio Puerco west of the city of Las Lunas, and the Rio Puerco confluences with the Rio Grande near the community of Bernardo, south of the city of Belen.

The headwaters of San Mateo Creek are on the north flank of Mt. Taylor. One branch heads in San Mateo Canyon above the community of San Mateo and drains down San Mateo Canyon, while the other drains the San Mateo arch/Jesus mesa area via Marquez and Maruca canyons. Within the San Mateo Canyon branch, springs maintain a small perennial flow that is captured in San Mateo Reservoir, located above the community of San Mateo. Field investigations conducted by RHR during 2009 and 2010 have determined that from San Mateo downstream to a pond on the Lee Ranch, San Mateo Creek is an intermittent stream that has flow when water is being diverted from the reservoir for irrigation purposes and during high rainfall events. The creek is ephemeral downstream of the pond. *See* Appendix 8-A, "San Mateo Creek Level 1 Stream Survey."

During peak runoff from snow melt in the late spring or during heavy summer/fall rain storms, San Mateo Creek may flow west as far as a few miles beyond its confluence with Arroyo del Puerto, but according to previous investigators, flow rarely reached the Rio San Jose even thirty years ago. (Brod, 1979; Stone et al., 1983). Since that time, Homestake Mining Company diverted the channel of San Mateo Creek to the west and southwest around the Homestake Mill Superfund Site and directed it onto one of Homestake's center pivot irrigation areas. Field investigations determined that the channel of San Mateo Creek is presently indistinguishable from the surrounding countryside above its former confluence with the Rio San Jose and the creek may no longer join that stream except during very high flow events.[1]

The Rio San Jose is perennial in its upper reaches in the Zuni Mountains, but becomes ephemeral in the Malpais area of its lower reaches (Stone et al., 1983). It flows only occasionally above

[1] A local farmer who had lived in the area for over 70 years informed RHR field consultants that the lower reaches of San Mateo Creek had been plowed over many years ago.

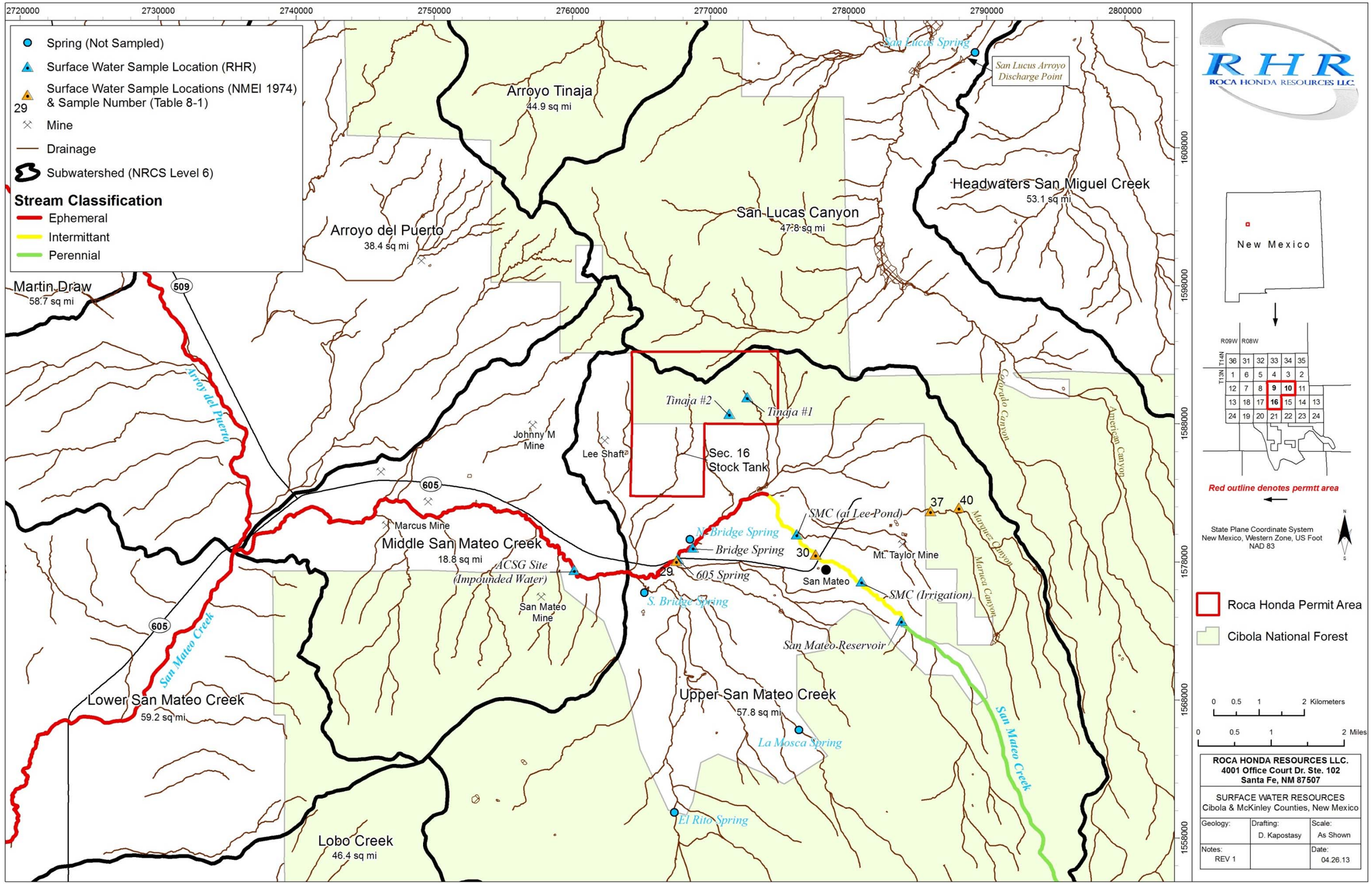

Figure 8-2. Permit Area Watershed and Water Resources

Grants. For years prior to 2003, the City of Grants discharged water from its wastewater treatment plant under Discharge Permit DP-695 into the Rio San Jose, augmenting the flow of the river. Discharge of wastewater into the river ceased in 2003; that treated water is now discharged to ponds on the City golf course.

According to Risser (1982), in pre-development times, the natural stream flow of the Rio San Jose at the western boundary of Acoma Pueblo was composed of water from runoff upstream of the pueblo, Horace Spring, and Ojo del Gallo Spring. Risser found that by 1980, the flow of Ojo del Gallo into the Rio San Jose had ceased, wastewater from the Grants municipal treatment augmented stream flow, and Horace Spring contributed the majority of the natural water entering the pueblo. He estimated that the flow of Horace Spring was about 3,600 acre-feet/year or 4.9 cfs, as calculated from records from 1959. Horace Spring still provides much of the perennial flow of the Rio San Jose. Neither San Mateo Creek nor the Rio San Jose contains Outstanding National Resource Water as defined in NMAC 20.6.4.

Although physically much wider and longer than the other water courses, the Rio Puerco is also an intermittent to ephemeral stream below the point where it is joined by the Rio San Jose, losing most if its water to the underlying alluvium except during periods of precipitation or snowmelt.

A surface water divide to the east and north of the San Mateo Creek watershed separates that watershed from the San Lucas Canyon watershed, which drains north into San Miguel Creek and then into Arroyo Chico, a tributary of the northern branch of the Rio Puerco. The San Lucas Canyon stream system includes the northward trending San Miguel Creek, and American, Colorado, Canones, and San Lucas canyons. These canyons and streams are for the most part ephemeral. After a rain, standing water can persist for a time in low areas of some short reaches. The Arroyo del Puerto watershed lies north of the western part of the San Mateo Creek watershed. Arroyo del Puerto, an ephemeral arroyo, drains into San Mateo Creek below the junction of State Highways 509 and 605.

A number of earthen tanks and reservoirs for watering of livestock or flood control exist outside the permit area. These hold water temporarily after rains. Field investigations conducted by RHR in 2010 found two man-made water impoundments in Canada de las Vacas, north of the permit area within the San Lucas watershed. Wetlands, springs, and perennial or intermittent stream flow were absent in that area. A shallow on-stream reservoir, San Mateo Reservoir, is present on upper San Mateo Creek above the community of San Mateo. The reservoir stores the small perennial flow of San Mateo Creek and runoff from precipitation events for irrigation purposes. Below the reservoir, the creek is intermittent for a few miles and then ephemeral.

Largely because of geologic controls, springs exist in the vicinity of the permit area during at least part of the year, though published reports and field investigations indicate that no springs are present within the permit area. Some springs flow from the volcanics and some at faults or the contact between two geologic formations. Figure 8-2 shows these surface water features. The volume of spring flow probably varies from year to year. Within the San Mateo Creek watershed (Figure 8-2), only the springs above San Mateo Reservoir and Bridge Spring flow perennially within San Lucas Canyon, only San Lucas Spring reportedly has perennial flow, measured at 0.04 cfs in 1973 (NMEI, 1974).

8.2.1 Permit Area Vicinity Surface Drainage Quantitative Characteristics

Data providing seasonal variation trends is available from gaging stations operated in the drainage path of the mine water discharge. Two USGS stream flow gaging stations that operated in the late 1970s and early 1980s provide historical flow data for San Mateo Creek and Arroyo del Puerto (which drains Ambrosia Lake Valley). The gaging stations, designated as San Mateo Creek near San Mateo, NM (Station 08342600) and Arroyo del Puerto near San Mateo, NM (Station 08342700), are approximately 1 mile apart. These locations are shown in Figure 8–1 on page 8-2. The San Mateo gaging station was located about 8 miles west of the community of San Mateo. It recorded daily flow of the creek from a watershed drainage area of 75.6 square miles from May 23, 1977 to October 7, 1982. Mean daily streamflow data for the 5-year operational period are shown on Figure 8-3. Mean monthly flow of San Mateo Creek is shown on Figure 8-4 for the same period. Elevated stream flows, which ranged from 2 to 12 cfs (900 to 5,400 gpm) prior to March 1978, reflect mine dewatering discharge during prior mining activities including the Johnny M mine and discharge during excavation of the Mt. Taylor mine shafts. Sporadic high flows of the creek after that period generally reflect high rainfall episodes during the summer/early fall and spring snowmelt runoff periods.

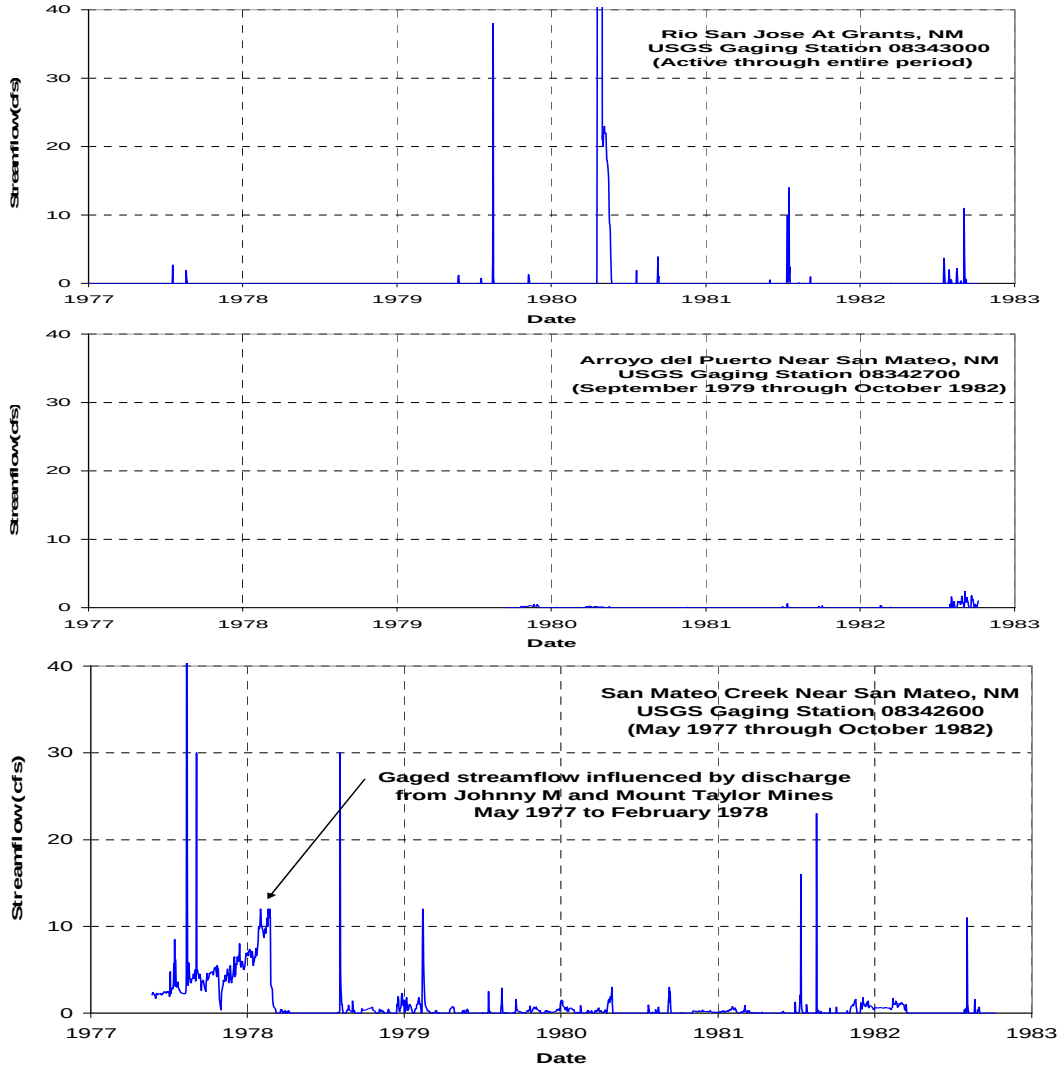

Figure 8-3. Mean Daily Stream Flow for San Mateo Creek, Arroyo del Puerto, and Rio San Jose 1977 through 1982

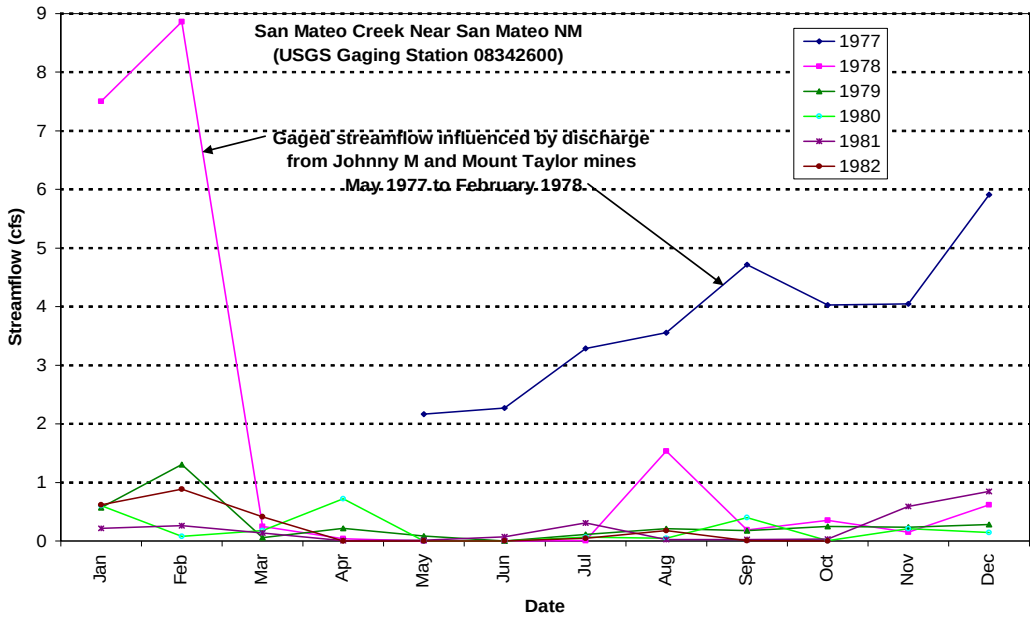

Figure 8-4. Mean Monthly Average Flow of San Mateo Creek

An investigation of the stream flow in San Mateo Creek was conducted in the early 1970s by the New Mexico Environmental Institute (NMEI) as part of the environmental baseline study of the Mt. Taylor area associated with the permitting of the proposed GMRC Mt. Taylor uranium mine by GMRC (NMEI 1974). Field data were collected during 1972 and 1973. Flow measurements were made in tributaries to San Mateo Canyon to determine the location and quantity of groundwater discharge into San Mateo Creek. Mean annual runoff of the creek was also calculated. NMEI concluded that the mean annual runoff of San Mateo Canyon was 1,800 ac-ft/yr, and that of this volume, about 0.5 cfs, or 360 ac-ft/yr, was contributed by spring and groundwater discharge, all of which entered San Mateo Creek in its upper watershed above San Mateo reservoir. The NMEI concluded that the perennial section of San Mateo Creek was limited to the reach above the reservoir (NMEI 1974).

The NMEI study distinguished between the characteristics of upper elevation (higher than 7,950 ft) and lower elevation locations within the watershed. The upper elevations generally contain snowpack for most of the winter and contributed snowmelt to the stream in late April and early May. Lower elevations receive runoff in mid to late March. Observing that three observed rainfall events of variable amounts (0.22 to 0.90 inch) caused stream flows of the same magnitude, the NMEI concluded that floods correlated with rainfall in time but not duration.

The Arroyo del Puerto gaging station was located about 0.1 mile north of the confluence of that drainage with San Mateo Creek. The station operated from mid September 1979 through early October 1982. Average daily streamflow data for this 3-year operational period are shown on Figure 8-3. Although the Arroyo del Puerto drains a large area, historical flows appear to mainly reflect discharge from prior mining activities in the Ambrosia Lake valley. The Arroyo del Puerto is presently ephemeral.

The Rio San Jose is gaged above and below Grants (Stations 08343000 and 08343500 respectively). The Rio San Jose was gaged below its confluence with San Mateo Creek at Grants over the period of October 1912 through September 2008. Mean daily stream flows are plotted for the 6-year period from 1977 through 1982 in Figure 8-3 and for the complete period of record in Figure 8-5. Elevated flow in this drainage generally reflects high rainfall episodes during the summer/early fall period. Mining discharge into San Mateo Creek from May 1977 to February 1978 had no apparent effect on flows in the Rio San Jose. It should also be noted that high peak flows of 30 to 40+ cfs at the San Mateo gaging station during the summers of 1977 and 1978 had little or no expression at the Rio San Jose Station.

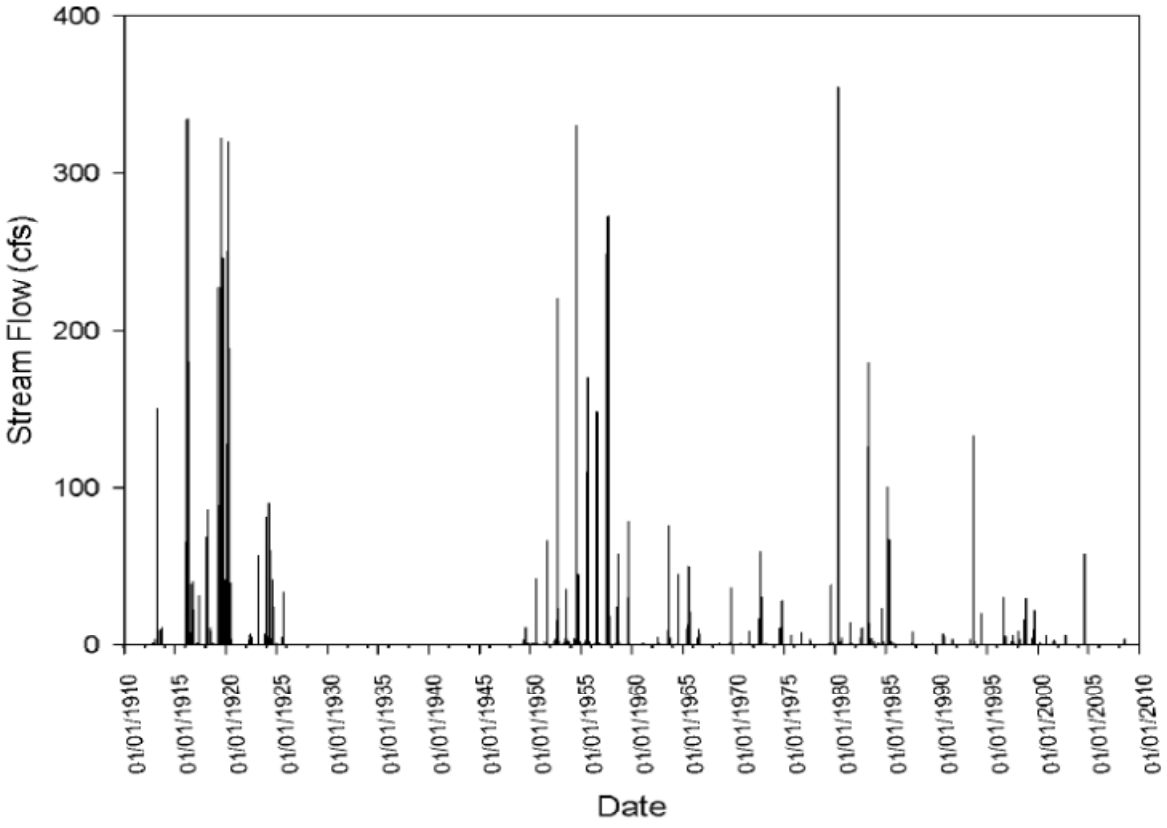

Figure 8-5. Daily Stream Flow from Rio San Jose at Grants (USGS Gaging Station 8343000)

The closest surface water gaging station to the San Lucas Arroyo discharge point is USGS gaging station 08340500, "Arroyo Chico Nr Guadalupe", located about 35 miles downstream of the discharge point immediately upstream of the confluence of Arroyo Chico and Rio Puerco. The gaging results are shown in Figure 5 of Section 9, Appendix J page 10.

8.2.2 Permit Area Vicinity Stream Drainage Surface Water Quality

The 1974 NMEI baseline study collected data on surface water chemistry in the vicinity of the Roca Honda permit area. Samples were collected from springs and the perennial upper reach of San Mateo Creek, and from ephemeral water sources during rain or spring runoff events. The historical study did not target all of the chemical constituents of interest for licensing purposes, but does provide general information on water quality. Surface water collected from higher elevations tended to be lower in total dissolved solids (TDS), but more acidic and higher in sulfate than water from lower elevations. Water from high elevation springs was of the calcium-sulfate bicarbonate type, and water from low elevation areas was of the calcium-bicarbonate type. Samples from some locations near the community of San Mateo, exhibited high levels of sodium. High levels of suspended solids were associated with high flow rates (NMEI 1974).

NMEI collected surface water samples from upper San Mateo Creek and the Marquez Canyon drainages within the upper San Mateo Creek watershed. Table 8-1 tabulates chemistry data for two locations along San Mateo Creek south of and closest to the permit area (locations 29 and 30 on Figure 8-2 on page 8-4) and two locations (Nos. 37 and 40 on Figure 8-2) in Marquez Canyon. Marquez Canyon is drained by an ephemeral stream that flows as a result of snowmelt or heavy rainfalls during the summer/early fall period. Water flowed only periodically at these locations due to upstream diversion of stream flow for irrigation and loss of water to the streambed alluvium. It was estimated that the drainage in Marquez Canyon had an annual discharge of 7.5 ac-ft/yr (NMEI 1974).

Table 8-1. Range of Constituents from San Mateo Creek and Marquez Canyon Sample (See Figure 8-2 for Sample Locations)

Constituent	San Mateo Creek at State Highway 605 Bridge (Loc. 29)	San Mateo Creek at Marquez Ranch (Loc. 30)	Marquez Canyon (Loc. 37, 2 Samples)	Junction with Maruca Canyon (Loc. 40)
pH	8.62–8.97	8.16–8.45	9.17–9.18	8.46–8.69
Specific conductance (µmhos)	650–1090	187–241	522–526	405–1180
Calcium (mg/L)	24.53–93.76	22.98–88.01	5.98	61.01–102.5
Magnesium (mg/L)	16.12–30.40	4.32–6.21	1.46–2.13	11.38–33.75
Potassium (mg/L)	3.85–204	3.93–5.65	3.63–4.42	9.40–28.93
Sodium (mg/L)	148–281	11.83–19.89	127.1–129.5	67.48–249.0
Chloride (mg/L)	16.7–41.4	2.4–7.0	3.4–3.8	13.3–130
Sulfate (mg/L)	42–250	6–23	2	37–352
Phosphate (mg/L)	0.02–0.38	0.28–0.53	0.07–0.18	0.20–0.39
Nitrate (mg/L)	0.33–1.71	0.20–1.64	0.32–0.33	0.76–1.26
Bicarbonate (mg/L)	369.2–550.8	78.8–134.8	244.2–249.0	288.2–387.2
Alkalinity ($CaCO_3$) (mg/L)	336.8–469.7	64.6–112.5	244.2–246	256.0–350.3
Total dissolved solids (mg/L)	535–2020	180–620	640–896	850–7450

Data from NMEI 1974.

From late 2008 through 2010, RHR conducted field surveys that investigated the presence of surface water in the vicinity of the RHR permit area. The first survey was conducted in the early fall, the time of year when surface water would be likely to be present. Standing water was

located in tinajas (seasonal water pockets in bedrock) along the eastern side of Section 10, ponded in San Mateo Creek, seeping from two springs along the creek, in San Mateo reservoir, and flowing in San Mateo Creek above the community of San Mateo. When these locations were revisited during different seasons, surface water was found only in the reservoir, as irrigation releases from the reservoir, and at Bridge spring. Appendix 8-B presents the water chemistry results for surface water in the vicinity of the RHR permit area. The sample locations are on Figure 8-2.

Jacobs Engineering drilled three hydrogeologic test wells across San Lucas Arroyo about a half a mile south of the point where the arroyo enters the north pond of Leopoldo Diversion Dam. One well was completed in the arroyo channel fill (SL-1), one in the Point Lookout Sandstone (SL-2), and one in the Menefee Formation (SL-3). A 24-hour aquifer test was conducted on all wells and samples were taken for quality analysis. A geologic cross-section is Figure 3 in Section 9, Appendix J and the chemistry data is Table 1 in Appendix J.

8.3 Permit Area Hydrologic Regime

The permit area is drained by a number of ephemeral arroyos which drain to San Mateo Creek. With the exception of a stock reservoir in Section 16 and seasonal tinajas on Section 10, no perennial or intermittent surface water systems, lakes, wetlands, reservoirs, or springs have been identified within the permit area. Field personnel have driven by the stock reservoir over a three-year period and have never observed standing water. A field survey found a number of tinajas within small, eastward draining arroyos on the east side of Section 10 to contain water in September of 2009, and water samples were later collected from the two largest. During the following summer the pools were dry.

8.3.1 General Monitoring Requirements for Drainages

The primary requirements for characterizing receiving drainages affected by discharges are identified in NMAC 20.6.4, which establishes water quality standards for surface waters and includes an anti-degradation policy. The general requirements for surveying the quality of the receiving drainage, including ephemeral, intermittent, and perennial water bodies, are established in NMAC 20.6.4.13 and include limits on the following:

- Suspended or settleable solids,
- Floating solids,
- Oil and grease,
- Color,
- Odor and taste of water,
- Concentrations of plant nutrients,
- Toxic pollutants,
- Radioactivity,
- Pathogens,
- Temperature,
- Turbidity,
- TDS, and
- Dissolved gases (nitrogen, oxygen, and ammonia)

8.3.2 Pollutant Requirements for Ephemeral Drainages

Ephemeral waters have designated uses of livestock watering, wildlife habitat, limited aquatic life, and secondary (human) contact. The standard for secondary (human) contact is a monthly geometric mean *Escherichia coli* (*E. coli*) bacterial concentration of 548 colony forming units (cfu)/100 mL and single sample of 2,507 cfu/100 mL. The acute requirements for aquatic habitats also include limits for ammonia and oxygen. The ammonia requirements are dependent on pH and temperature of the receiving drainage, and the dissolved oxygen requirements are dependent on elevation and temperature. Tables of both sets of values are included in NMAC 20.6.4.900 J, K, L, and M, and are not listed here.

8.3.3 Other Requirements for Intermittent and Perennial Surface Waters

The more stringent numerical criteria for intermittent and perennial receiving drainages require that they meet all standards for aquatic life, including chronic limits. The chronic limits are lower than the acute limits for 22 compounds, and the standards include one additional compound (polychlorinated biphenyls). The chronic criteria for aquatic habitats also include requirements for ammonia. The limits for ammonia are dependent on pH and temperature. There are no additional targeted analytes for intermittent or perennial waters, although the detection limits required are more stringent.

8.3.4 Pathway of Potential Discharge

Comments were voiced regarding potential negative impacts of discharge of water upon the San Mateo Creek drainage. In response, RHR committed to transporting the treated water to a location outside of the San Mateo Creek drainage for discharge. A pipeline will be positioned next to the haul road and the utility corridor in Sections 16, 15, 10 and 11. The pipeline will turn north along the road at the junction with the Section 11 haul road and proceed north for a distance of approximately six miles where the water will be discharged on private land as shown on Figure 8-6.

Surface water from the various arroyos that does not contact mine related activities will continue to San Mateo Creek. The remainder of this section provides baseline geology of the sub-cropping (underlying) bedrock units is shown in Figure 8–7. Normal faults affect the geologic units along the drainage pathway to the south through Section 16 and the NW¼ Section 21.

As the drainage continues southward into the SW¼ Section 21, sub-cropping geologic units are the Dalton Sandstone Member and the Gibson Coal Member of the Crevasse Canyon Formation. West of the confluence of the drainage with San Mateo Creek, the creek passes back over the Gibson Coal and Dalton Sandstone Members, crosses a fault, and passes over the increasingly older units of the Dilco Coal Member of the Crevasse Canyon Formation, Gallup Sandstone, and Mancos Shale.

After passing over a subcrop of Mancos Shale for approximately 4 miles, the course of the creek crosses the sub-crop of Dakota Sandstone on the nose of a north-trending anticline. For a short distance, the creek bed crosses sub-crop of the Mancos Shale before crossing the San Mateo normal fault. West of the fault to its confluence with Arroyo del Puerto, the drainage is over sub-crop of the Morrison Formation. All of the sub-cropping units may contain groundwater,

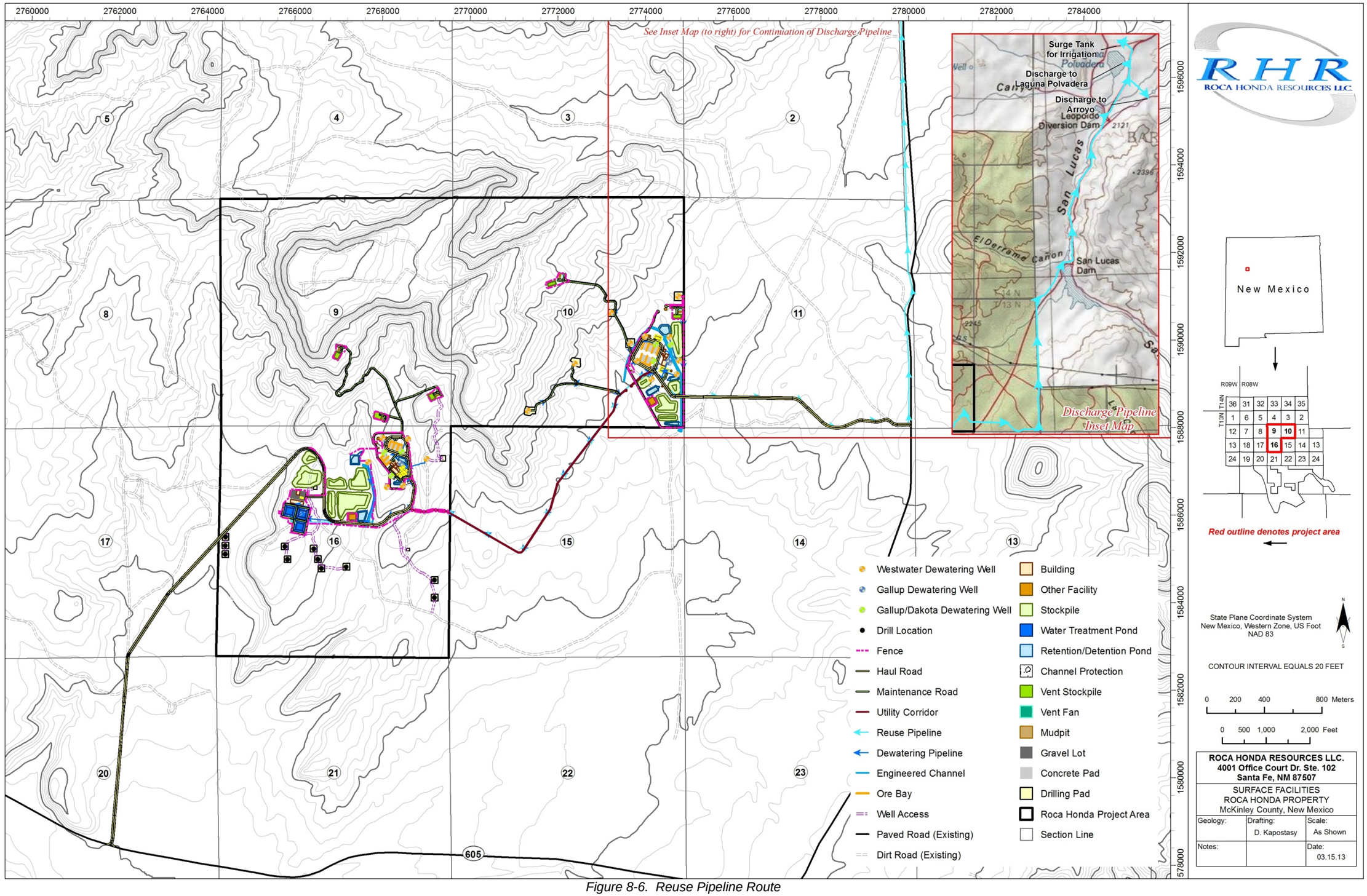

Figure 8-6. Reuse Pipeline Route

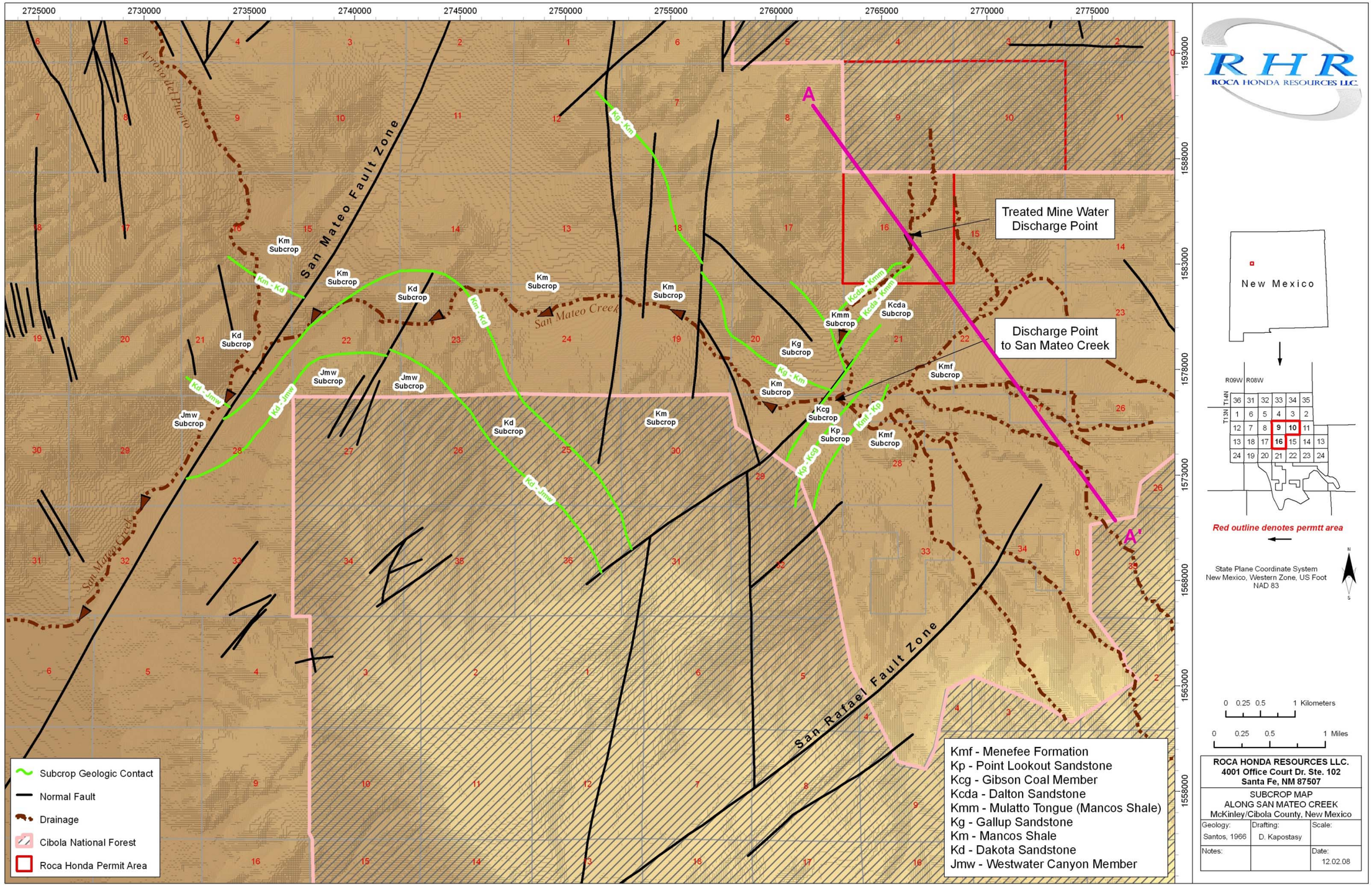

Figure 8-7. Subcrop Geology along the San Mateo Creek Draingage

although the Gibson Coal Member and the Mancos Shale are typically aquitards rather than aquifers, except where sandstone units occur in the Mancos Shale.

8.3.5 Sediments in Receiving Drainages

RHR determined the chemistry of sediments along the drainage from Section 16 and San Mateo Creek basin by collecting and analyzing sediment samples for a wide range of constituents. Sediment samples were also analyzed for grain size to help determine erosion potential and for correlation to chemical data. Figure 8-8 shows the sediment sampling locations. Appendix 8-C presents the results of chemical analysis on the eighteen samples collected along the drainage from Section 16 and San Mateo Creek. This data remains in this section as a baseline condition.

Increased flow in the Section 16 drainage and San Mateo Creek resulting from mine water discharge may increase the movement of sediments down-channel. Such movement depends on the grain size of the sediments, any existing and potential armoring of the stream bed, the quantity of water flowing under normal and flood conditions, and the slope of the stream bed. The slope of the stream bed is known from USGS topographic maps.

8.4 Baseline Springs Information

The NMEI (1974) identified three springs located in the San Mateo Creek watershed within a mile and a half southeast of the Roca Honda permit area: Bridge Spring, North Bridge Spring, and South Bridge Spring (Figure 8–2, page 8-4 and Table 8–2 below). In 2009, RHR field investigators walked the central channel of San Mateo Creek along the reach into which these springs discharged. They located Bridge Spring and also a perennial spring at the point where NM 605 crosses San Mateo Creek in the south central part of Section 21, T13N R8W (dubbed the “605 spring”). South Bridge Spring and North Bridge Spring are off-channel springs and have not yet been located. No other springs exist within two miles of the RHR permit area. NMEI reports that Bridge Spring gets its water from the Point Lookout Sandstone. Cross section A-A’, located on Figure 8-7, page 8-12 demonstrates that Bridge Spring and the spring at the bridge over San Mateo Creek are underlain by southeast-dipping bedrock of the lower part of the Menefee Formation (see Figure 8-9). No water rights claims are on file with the OSE for any springs in the vicinity of the permit area.

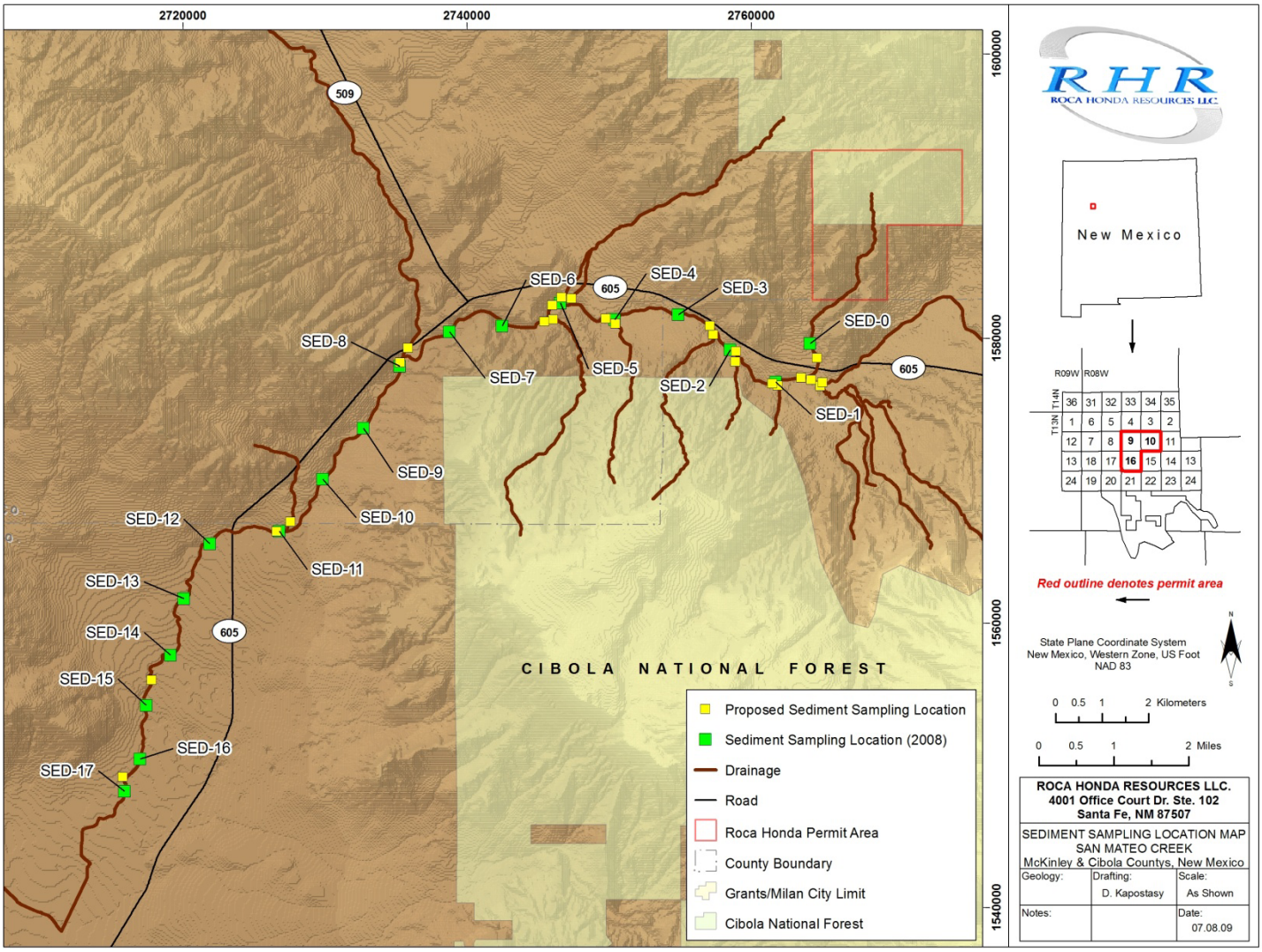

Figure 8-8. Sediment Sampling Locations along Receiving Drainages

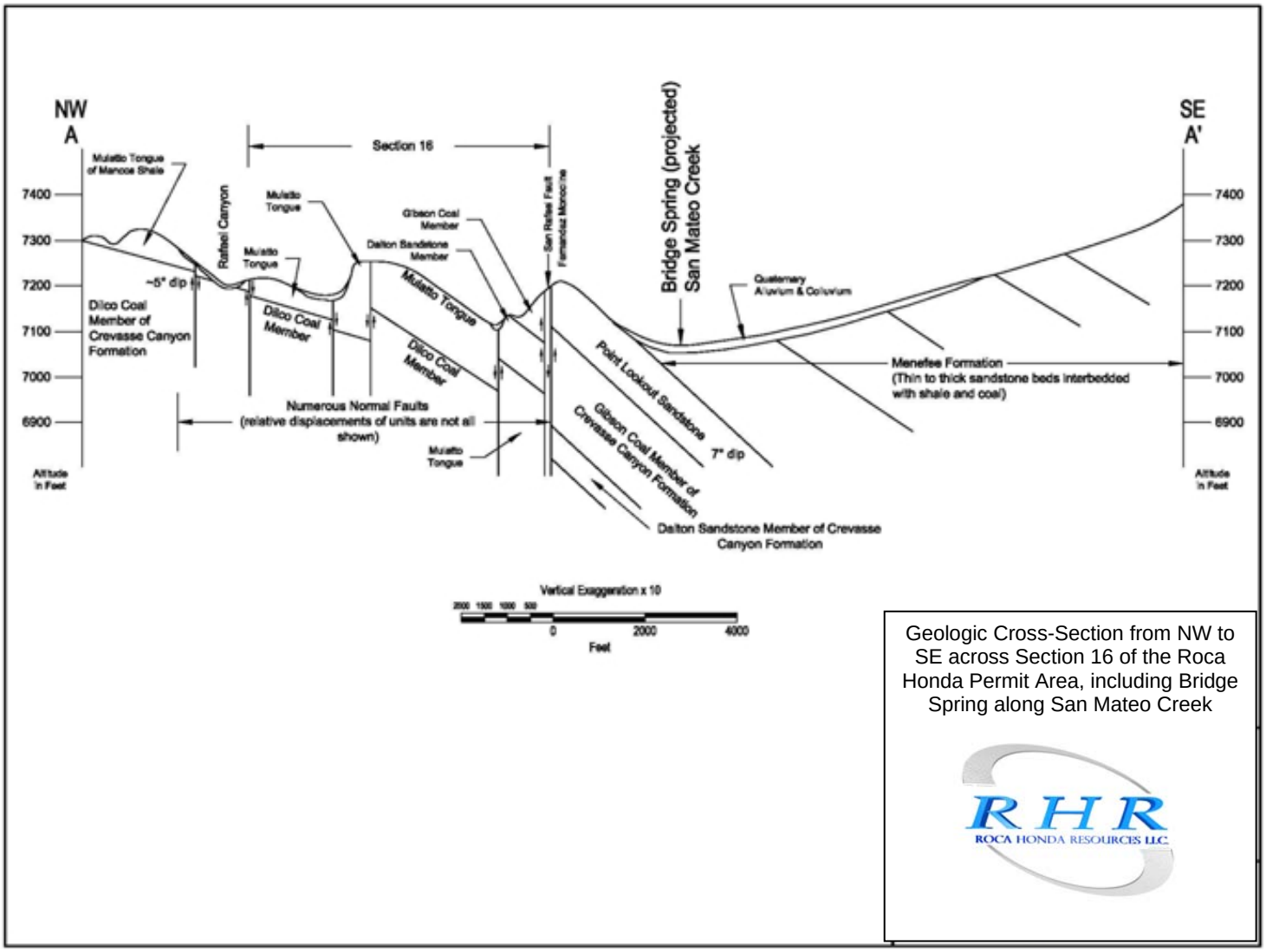

Figure 8-9. Geologic Cross-Section across Section 16 and San Mateo Creek

Table 8-2. Springs within 2 Miles of the Roca Honda Permit Area

Spring Designation	Northing*	Easting*	Watershed
Bridge Spring	1578077.9	2767354.4	Middle San Mateo Creek
North Bridge Spring	1579025.7	2767343.6	Middle San Mateo Creek
South Bridge Spring*	1575175.5	2764068.0	Middle San Mateo Creek

*NAD83 datum and State Plane New Mexico West projection.

Other springs are present within five miles of the RHR permit area, including El Rito and La Mosca Springs, but they get their water from volcanics of the north slope of Mt. Taylor across San Mateo Creek valley from the permit area (Figure 8-2). These springs are upgradient and outside of the drainage arroyo where the proposed mine water would discharge in Section 16, which is underlain mainly by the Mulatto Tongue of the Mancos Shale. Therefore, the discharge of mine water or dewatering operations will not have any surface impact on these springs.

Table 8–3 is a summary of the water chemistry data collected by the NMEI in October of 1974 from springs in the vicinity of the permit area. No springs have been identified within the permit area. It is clear from the limited available data that Bridge Spring and South Bridge Spring have their source from a very different groundwater system than do the other springs: the water is warmer, slightly more basic, and levels of all constituents except potassium are much higher. These differences in chemistry reflect the fact that the Bridge Spring gets it's source from the Mesa Verde Formation and has a longer residence time within siltstones and sandstones, whereas the La Mosca and El Rito Springs are probably water which entered the Mt. Taylor volcanics as precipitation and moved quickly through the rocks.

Table 8-3. Water Chemistry of Spring Samples (from NMEI, 1974, Table 7.7)

Constituent	Units	El Rito Spring	La Mosca Spring (a)	La Mosca Spring (b)	Bridge Spring	South Bridge Spring
pH		7.35	7.75	7.55	7.92	8.15
Specific conductance	µmhos	155	197	156	969	1252
Temperature	°C	13.2	11.0	12.5	20.2	
Calcium	mg/L	16.8	20.9	14.3	44.4	22.9
Magnesium	mg/L	4.5	4.6	2.4	23.9	22
Potassium	mg/L	4.1	5.0	3.2	5.0	6.9
Sodium	mg/L	8.3	14.0	14.0	168.0	268.0
Chloride	mg/L	6.0	8.0	8.0	33.0	40.0
Sulfate	mg/L	6.5	6.8	4.5	17.8	19.5
Nitrogen	mg/L	0.23	0.16	0.75	0.31	0.30
Bicarbonate	mg/L	90.3	117.1	73.2	608.0	749.0
Total solids	mg/L	213.7	267.6	208.6	940.5	940.5

RHR sampled the water of the "605 spring" on two occasions; the water chemistry results are presented in Appendix 8-B. The spring is located just north of a bridge that crosses NM 605 and contains accumulated debris that has accumulated over time including: a vacuum cleaner, a horse head, and various bottles and cans were noted by RHR field investigators. Effort was made to obtain water from the source of the spring, but the chemical results may be impacted by the presence of the trash. Bridge spring was sampled once: it was dry on all other occasions. The water chemistry results are presented in Appendix 8-B.

RHR attempted to sample San Lucas Spring but has not found water in the area where the spring is mapped by USGS. RHR staff will continue to search for the spring and grab a sample to establish baseline quality.

8.5 Existing Surface Water Rights within the San Mateo Creek Watershed

The Roca Honda permit area is located within the Rio Puerco drainage of the Rio Grande surface water basin. The area is included within the Bluewater Underground Water Basin as declared by the New Mexico State Engineer. Surface water rights on file with the OSE in the vicinity of the permit area within the San Mateo Creek watershed are limited to surface water rights from San Mateo Creek. No surface water rights are listed in the NMOSE WATERS data base as being associated with Bridge, South or North spring, or with any spring in the area of the proposed Roca Honda permit area.

The largest of the direct diversion surface water rights in the San Mateo Creek valley is SD 00966, a licensed water right originally filed in the name of the San Mateo Community Irrigation System to 960 ac-ft/yr for irrigation of 480 acres of land. This water right is sub-divided into individual sub-files SD 966-1 through SD 966-25. The point of diversion for this water right is San Mateo Creek near the community of San Mateo, several miles upstream of the proposed mine water discharge point. The direct diversion is supplemented with water from the San Mateo Reservoir, located in the same area, permitted by the OSE under SP-02528. Runoff from Mt. Taylor and spring flow are the sources of supply for these water rights. Discharge of mine water or dewatering operations will not have any impact on the availability of water to these water rights.

Fernandez Company has drilled well B-01442 into the Gallup Sandstone as a supplemental point of diversion to surface water diverted under sub-file SD-00966-13. This well is over 1,000 ft in depth and will not be impacted by discharge of mine water. Fernandez Company also holds water right SD 00971 for 353.4 ac-ft/yr, and SD 00972 for 184 ac-ft/yr. The diversion points for these water rights are located upstream of the proposed point of mine water discharge. Precipitation runoff is the source of supply for these water rights. Discharge of mine water or dewatering operations will not have any impact on these surface water rights.

RHR searched the Rio Puerco drainage basin as declared by the New Mexico State Engineer and found no surface water rights on file with the OSE from the discharge point to the Rio Grande.

8.6 Potential Impacts to the Hydrologic Regime

RHR will transport the treated mine water approximately eight miles northeast of the mine site to private land (see Figure 8-6). The 20 inch HDPE welded pipe will be laid on the surface. An estimated width of 20 feet was assumed to be disturbed during the placement of the pipeline for a distance of 28,919 feet which totals 13.3 acres, 2.5 acres on forest land and 10.8 acres on private land. The primary discharge point will be a large above ground steel tank which serves as a pump storage tank for the irrigation system. The secondary discharge point is the natural Laguna Polvadera which provides additional storage. The third discharge option would be the San Lucas Arroyo under an NPDES permit.

Impacts to the surface water hydrologic balance at the discharge point will depend on the use of the water. It is anticipated that the water will be used for irrigating pasture land by the local

rancher. In that case the water will be distributed onto aerable land to grow a food crop for cattle or to improve native grasses.

While the expectation is that all of the water will be used for irrigation some of the water may be allowed to flow down the otherwise ephemeral drainage. That water would recharge the shallow alluvial system or the various formations outcropping in the arroyo bed. It may also eventually reach the Rio Puerco drainage on the east side of Mt. Taylor. Whatever the ultimate disposition of the water, the impact to the hydrologic balance will be relatively short-term as the water will no longer be available for irrigation or recharge once mine dewatering ceases.

RHR estimates that dewatering of the proposed Roca Honda mine may result in a range from 2,500 to 4,500 gpm (5.6 to 10 cfs). The estimate of mine water discharge rate is based on experience at previous uranium mines that dewatered the Westwater Canyon Member of the Morrison Formation such as the Gulf Mt. Taylor mine, Kerr McGee's Ambrosia Lake mines, and the Nose Rock mine. For example, Rio Grande Resources Company (RGRC 1994) discharged groundwater at a rate of 5.6 to 11.1 cfs (2,500 to 5,000 gpm) from the Mt. Taylor mine when it was in operation. RHR performed an aquifer test of the Westwater Canyon Member in order to determine whether the hydrogeologic characteristics in the RHR permit area were similar to those calculated for that geologic unit in the area of other mines for which discharge rates were known. (The aquifer test and the analysis of the test data are discussed in Appendix 9-I of Section 9 of this revised BDR.) The results of that test indicated that the storage properties and transmissivity of the Westwater Canyon Member are in the mid-range of reported values, an indication that volumes of water similar to those produced by earlier mines can be expected at the RHR mine. The test values were also used to refine RHR's groundwater flow model and estimate the volume of mine discharge.

The discharge into San Lucas Arroyo may impact the morphology of the streambed by causing erosion. The Arroyo has been surveyed from the potential discharge location to a point 750 feet downstream. The longitudinal cross-section, 17 cross-sections and a plan view of the Arroyo are in Appendix 8-E to this section. This baseline description of the San Lucas Arroyo can be used to determine erosion over the life of the discharge and thereby establish reclamation needs if any. An engineered discharge structure to dissipate the energy of the discharge has been designed and may be found in the Mine Operations Plan, Section 5.6.

Mine dewatering will not reduce spring flow from springs within or outside of the permit area. Mine dewatering will occur in the Westwater Canyon Member of the Morrison Formation, over 2,200 ft below the surface. The geologic strata from which the springs get their source of water are the Mt. Taylor volcanics, the Menefee Formation and the Point Lookout Sandstone, all of which are unsaturated within the permit area. These strata are 1,000 to 1,800 ft above the geologic strata to be dewatered and are separated from them by 600 to 800 feet of Mancos Shale. Because the springs get their water 1) up-channel of the mine water discharge point; 2) from a shallow groundwater system that is absent in the area of the permit area; and 3) from a shallow groundwater system that is unconnected to the deep aquifers which will be dewatered and separated from them by hundreds of feet of shale, RHR considers it unlikely that the springs will be adversely impacted by mine dewatering operations. This conclusion is discussed further in Section 9.0, Groundwater, of this revised BDR. For the same reasons, groundwater withdrawal within the permit area will not affect the water quality of the springs. Additional information on hydrologic impacts may be found in Section 9 Appendix J.

During mine operations, surface water detention basins and/or retention ponds will capture surface runoff from the permit area facilities and control surface water flow into the area. The detention basins will be designed to capture and temporarily hold surface water runoff that will then be released in a controlled manner. Because they will be capturing water upgradient of the RHR facility and will be empty most of the time, the detention basins will not impact groundwater. The released water will not cross the operational areas and will not require treatment. This water will continue through the existing channels to San Mateo Creek. The detention basins and surrounding area will be reclaimed to match the surrounding area. The retention ponds will be located so as to capture whatever water and sediment might drain from the mine facilities. The ponds will be lined and monitored with groundwater wells and vadose instrumentation to ensure that captured water does not enter groundwater. The captured water will be pumped to the water treatment plant. During reclamation, the sludge in the bottom of the ponds and the liner will be removed for proper disposal. The evaporation ponds will then be re-contoured, graded and reclaimed.

8.7 References

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Appendix 8-A

San Mateo Creek Level 1 Stream Survey

SUMMARY OF SAN MATEO CREEK LEVEL 1 STREAM SURVEY

NOVEMBER, 2010

Prepared for

ROCA HONDA RESOURCES LLC

By

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Contents

Figures

Tables

Attachments

Completed Level 1 Stream Determination Field Sheets and photographs are available on CD upon request

1.0 Introduction

Roca Honda Resources, LLC (RHR) and Hydroscience Associates, Inc. (Hydroscience) has completed a Level 1 Stream Evaluation of San Mateo Creek (SMC) from the community of San Mateo to the point west of NM 605 where the course of the stream becomes indistinguishable from the surrounding countryside, approximately 14 miles downstream from the community. The Level 1 Stream Evaluation was completed according to the protocol provided by the Surface Water Quality Bureau (SWQB) of the New Mexico Environment Department (NMED) in the report "Hydrology Protocol for the Determination of Ephemeral, Intermittent, and Perennial Waters," (Hydrology Protocol) dated August, 2009. The main purpose of the stream evaluation was to classify sections of SMC channel as ephemeral, intermittent, or perennial. As is noted by SWQB, "the ability to make such determinations is often key to assuring that the appropriate water quality standards are applied to a water body." (SWQB, Hydrologic Protocol, 2009, p. 3.)

The protocol relies on hydrologic, geomorphic, and biologic indicators of the presence and persistence of water. The presence of these indicators is investigated in the field and the observed characteristics are ranked using a four-tiered numerical scoring system. The sum of the ratings provides an assessment of whether the surveyed stream has ephemeral, intermittent, or perennial flow. The Hydrologic Protocol relies on definitions of "ephemeral," "intermittent," and "perennial" recommended in 20.6.4.7 of the New Mexico Administrative Code (NMAC) of the NMED's Revised Triennial Review Petition of the water quality standards dated July 6, 2009. The definitions are:

Ephemeral means the water body contains water briefly only in direct response to precipitation; its bed is always above the water table of the adjacent region;

Intermittent means the water body contains water for extended periods only at certain times of the year, such as when it receives seasonal flow from springs or melting snow; and

Perennial means the water body contains water throughout the year except during periods of drought.

The Hydrologic Protocol was developed to respond to the United States Environmental Protection Agency's (USEPA)'s current water quality standards regulation that effectively establishes a rebuttable presumption that, at a minimum, all surface waters (ephemeral, intermittent and perennial) can support "fishable/swimmable" uses until additional supporting documentation can be provided to demonstrate that such uses are not attainable. *Ibid*, p. 22. According to the SWQB, although the USEPA does not expect the State of New Mexico to adopt uses for ephemeral or intermittent waters that cannot be attained, still 40 CFR 131.10(j)(1) requires the State to submit a use attainability analysis (UAA) to support a designated use that does not meet the CWA §101(a)(2) objective. The Hydrologic Protocol was designed to provide supporting documentation for the UAA process, especially for identifying attainable uses on ephemeral streams.

The Level 1 stream survey provided an initial assessment of the physical nature of the stream channel and the potential engineering issues that might arise if RHR discharges treated mine water into the channel. It also identified the locations of tributaries feeding into SMC and recorded existing conditions in the creek, including the presence of waste and trash materials.

The sections of SMC that were identified as vulnerable to erosion by discharge water were so noted in the field notes. This information will be used during the engineering phase of the Roca Honda project design. The information gathered will be valuable during design of the groundwater and surface water monitoring program.

1.1 Hydrologic Protocol Level 1 Stream Rankings

The SWQB recommends that a minimum total score of 9.0 be used to distinguish non-ephemeral channels from ephemeral ones unless aquatic macro-invertebrates and/or fish are present. Scores between 12.0 and 19.0 represent intermittent streams. A score of 22.0 or greater distinguishes perennial flow from non-perennial streams. Level 1 scores between 9 and 12 may be ephemeral but are considered intermittent until a Level 2 evaluation can determine that the stream is ephemeral. Level 1 scores between 19 and 22 may be intermittent but are considered perennial until further data are collected that indicate that the stream is intermittent.

2.0 San Mateo Creek

San Mateo Creek begins in San Mateo Canyon on the north flank of Mount Taylor. An in-channel reservoir located on the hillside just east of the community of San Mateo impounds and stores creek flow. Stream flow is released through a pipe at the bottom of the dam and directed into a channel at the upper end of San Mateo. The water flows through San Mateo and is eventually captured in private ponds. During the irrigation season it is diverted into acequias and used for irrigation purposes. SMC has perennial flow from its headwaters to the reservoir, intermittent flow from the reservoir to a pond on the Lee Ranch (two ponds in addition to the Lee Ranch pond exist in this section), and is ephemeral downstream from the pond except where the discharge from Bridge spring causes a small (30 square feet surface area) fairly permanent pool in the stream channel.

The RHR permit area is drained by ephemeral arroyos that in turn drain into SMC. The treated mine water from the proposed RHR mine will enter an arroyo in Section 16 of the permit area and flow south along the border of Sections 20 and 21, cross under Highway 605 and enter SMC in Section 29. The design flow of 4,000 gallons per minute would change the ephemeral nature of the creek temporarily to a perennial regime during mine operations. Records from a United States Geological Survey (USGS) stream flow gaging station located on SMC approximately one half mile from the junction of Highways 605 and 509 during 1977 through 1983 indicate that SMC flowed intermittently during that period due to mine water discharged from the Mount Taylor and Johnny M mines. These high flows were not detected at the Rio San Jose gaging station (approximately 10 miles south of the SMC gage) during the same period.

2.1 Level 1 Stream Survey

The Level 1 Stream Survey of SMC was performed in four reaches during the period of November, 2009 through November, 2010. The collected information was compiled and documented as representing four reaches of SMC:

Reach	Field Date	Start UTM 13S		Finish UTM 13S	
		Easting	Northing	Easting	Northing
1	11/5/09	0259735	3912935	0255690	3913597
2	11/23/09	0255690	3913597	0251148	3914905
3	3/10/10	0251206	3914911	0247231	3914822
4	6/23/10	0247230	3914805	243326	3910365
4	11/04/10	243326	3910360	241570	3909931

SMC was surveyed from the San Mateo Reservoir to where the channel became indistinguishable from the surrounding countryside in the NE ¼ of Section 1 in Township 12N, Range 10W, a distance of approximately 14 miles. Reach #1 was defined as the 3-mile reach of SMC which extends from the community of San Mateo, west through the Lee Ranch to the bridge where State Highway 605 crosses the stream channel in the SE ¼ of Section 21. Reach #2 started at the bridge on State Highway 605 and ended south of the Schmitt Ranch headquarters in the NW ¼ Section 24, T13N, R9W. Reach #3 started where Reach #2 ended and extended to the NW of the NE ¼ of Section 22. Reach #4 began where Reach #3 ended and extended about 6.5 miles downstream to the NE ¼ of Section 1 in Township 12N, Range 10W. Figures 1 through 4, included below in the individual discussions of the nature of the four reaches, show the locations of the sub-reaches.

2.2 Stream Survey Procedure

Hydroscience with RHR's assistance, performed the Level 1 Stream Survey of SMC, walking SMC, and completing a SWQB Level 1 Stream Determination Field Sheet for each 750 feet walked. Distances were measured by pacing. Field notes were also kept. Photographs of SMC were taken at the beginning and end of each sub-reach (750 feet) and at additional locations if unusual features or a change in the nature of the channel were noted. The data were later compiled in the office; i.e, photographs were labeled, the sub-reachs were located on a map, any missing entries on the field sheets were completed from field notes, and a summary memo for each reach that detailed the nature of each 750 foot sub-reach was written. The summary memoranda, maps, and completed field sheets were peer reviewed for accuracy and completeness. The completed field sheets and photographs are very extensive and are compiled on a CD that is available upon request. The reach summary memoranda are attached to this document as Attachments 1, 2, 3, and 4.

2.3 Summary of Level 1 Stream Determinations

The Level 1 Stream Determination survey found that the physical nature of the valley of SMC changes along its course, from where the stream is being used for irrigation purposes to where the channel is dry and lost among the grasses and four-winged salt brush, merging with the adjacent uplands. Along some sections, the channel of SMC fills the valley and is hundreds of feet wide and bounded by embankments of silt or bedrock tens of feet in height. In other areas the channel is a narrow cowpath that snakes through a broad grassed valley bounded by low banks. Over most of SMC, the streambed is used by cattle as a path to and from water and food and for shade. Except in a few areas where bedrock outcrops in the streambed, the bottom sediment is fine to coarse grained sand and silt. Sub-cropping bedrock units include the Westwater Canyon and Brushy Basin members of the Morrison Formation, the Mancos Shale, the Dakota Sandstone, members of the Crevasse Canyon Formation, the Point Lookout Sandstone, the Menefee Formation, and possibly the Gallup Sandstone. No perennial water was found below Reach #1.

2.3.1 Reach #1

The Level 1 Stream Determination of Reach #1 of SMC was performed on November 5, 2009. The reach extends from the community of San Mateo to approximately three-miles west where the stream channel passes under State Highway 605 and contained 19 sub-reaches each of approximately 750 feet in length. The reservoir had been visited previously on several occasions. Figure 1 shows the locations of Reach #1 and its sub-reaches (#1 through #19). Table 1 identifies each sub-reach location. Precipitation had last fallen in the area eight days earlier as snow (approximately two inches) which had mostly disappeared by the time of the survey, leaving the stream channel dry.

About 2/3 mile above the community of San Mateo the flow of the creek is completely blocked by a dam which creates San Mateo Reservoir, a small, cattail-filled lake with a surface area of less than 10 acres (Figure 1). The impounded water is used for irrigation. It is diverted from the reservoir though the bottom of the dam into a pipe, and then routed through pipes and open ditches for distribution to irrigated fields. Below the dam the only flow in the stream channel itself is minor seepage from beneath the dam. Irrigation water is discharged into the creek from a twelve inch diameter pipe open gate valve, which at the time of the stream survey was about ¾ mile below the dam where the pipe crosses under Candelaria Road. When the irrigation water is not discharged, the stream channel would be dry. Below the irrigation discharge point, the creek flows along a stream course which has in some areas been modified so that it resembles a ditch more than a natural creek. Fish and micro-invertebrates were absent in this area, although some algae were found on rocks in some areas.

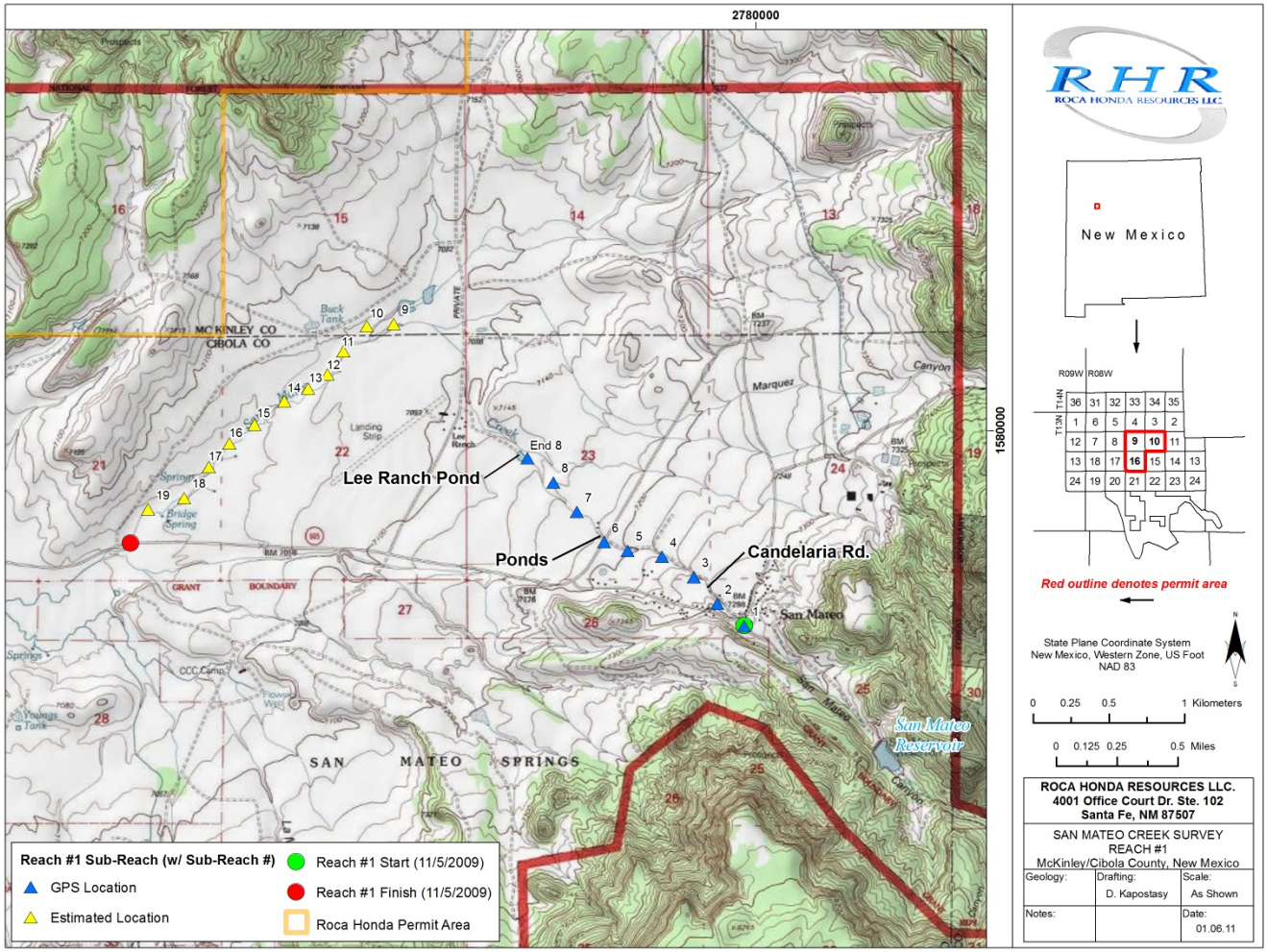

Figure 1. Location of Reach #1 Sub-reaches

Table 1. Sub-reach Locations and Total Level 1 Stream Determination Points for Reach #1

Sub-reach	Start UTM 13S East	Start UTM 13S North	End UTM 13S East	End UTM 13S North	Total Points
1	0259735	3912935	0259560	3913087	9.5
2	0259560	3913087	0259411	3913267	10.0
3	0259411	3913267	0259204	3913407	11.0
4	0259204	3913407	0258979	3913454	11.0
5	0258979	3913454	0258823	3913516	11.0
6	0258823	3913516	0258650	3913720	10.0
7	0258805	3913720	0258650	3913920	7.0
8	0258501	3913920	0258333	3914086	7.0
9	*0257475*	*3914998*	*257295*	*3914988*	6.0
10	*257295*	*3914988*	*257135*	*3914828*	7.0
11	*257135*	*3914828*	*257025*	*3914678*	7.0
12	*257025*	*3914678*	*256895*	*3914588*	7.0
13	*256895*	*3914588*	*256735*	*3914508*	7.0
14	*256735*	*3914508*	*256535*	*3914358*	7.0
15	*256535*	*3914358*	*256365*	*3914238*	5.0
16	*256365*	*3914238*	*256225*	*3914088*	4.0
17	*256225*	*3914088*	*256055*	*3913888*	5.0
18	*256055*	*3913888*	*255815*	*3913818*	7.5
19	*255815*	*3913818*	*255690*	*3913597*	7.5

Note: UTM coordinates in *italics* were estimated because the GPS unit stopped working mid-way in the reach survey.

On the downstream side of State Highway 605, where Candelaria Road intersects, the stream flows through a culvert into a 30 x 15 foot pool. Water spiders were present on the surface of the pond, but it was too murky to ascertain the presence of fish. The creek flowed out of the pond in a channel 1 foot wide and 4 inches deep, and continued about 450 feet to a man-made tank where it was split, with part of the flow going into the tank and part around it into a small channel below the tank. The flow was channelized into a small ditch that ultimately discharged into a pond on the Lee Ranch. The pond water appears to be used for irrigation purposes. There is no creek channel or flow below the Lee Ranch pond, and the main trunk of SMC effectively ends here, despite the fact that topographic maps show the channel of the stream heading north-northwest to join southwesterly trending tributary channels that drain out of Marquez Canyon. SMC was determined to be intermittent from the point where the irrigation water was discharged into the stream down to the Lee Ranch pond.

The stream survey team walked northwest from the Lee Ranch pond to intersect these Marquez Canyon tributaries. The northern tributaries of SMC are broad, sandy arroyos with high banks,

grassy bottoms, and thick stands of tamarisk. An earthen dam had been constructed across all channels to create a pond, but the dam was breeched. No flowing water was present. At the time of the survey, two small springs were present at the lower end of the surveyed reach. The northern spring appears on the USGS San Mateo topographic quadrangle as "Bridge Spring," while the other spring was named "605 spring" by the field team. Bridge Spring was a small seep. The 605 Spring appeared to be larger but full of trash, including such items as a vacuum cleaner and part of a horse carcass. Subsequent visits to the spring locations for the purpose of collecting water samples found that only the "605 Spring" is a permanent spring. The portion of SMC from below the Lee Ranch pond to just above the 605 Spring was determined to be ephemeral. The 605 Spring is probably perennial, but its flow rapidly disappears into the SMC channel.

Attachment #1 provides more detail regarding the Level 1 Stream Determination for Reach #1. The photographs and field sheets are available on CD.

2.3.2 Reach #2

The Level 1 Stream Determination of Reach #2 of SMC was performed on November 23, 2009. The survey reach extended from where the stream channel passes under Highway 605 in the SE ¼ of Section 21, T13N R8W, downstream four miles west to the Schmitt Ranch main house and contained 28 sub-reaches each of approximately 750 feet in length. Figure 2 shows the locations of Reach #2 sub-reaches (#20 through #47) and Table 2 identifies each sub-reach location. The work was accomplished during a clear, sunny day at the end of November. Precipitation had last fallen in the area several weeks earlier as snow (approximately two inches), but had almost entirely disappeared by the time of the survey, leaving the stream channel dry.

In general, the stream course was a wide arroyo with steep banks with a height to width ratio of approximately 1:3. Thick stands of tamarisk lined the sides of the arroyo and the bottom was grassy. The course of the occasional stream flow was confined to a narrow (1-2 feet) channel. Stream flow was absent. Ponded water was present in one sub-reach. Except for a 50-foot section of the channel in the NW ¼ of Section 29, T13N, R8W, the channel was dry. In this area, two small pools that proved to be temporary flood flow catchments were present. The pools were too murky for investigators to ascertain whether fish, micro-invertebrates, or algae were present. Later visits by RHR to the site of the pools found them dry. In general, the stream channel was a wide, high-banked, grassed arroyo cut in alluvial sands and silts. Thick stands of tamarisk, grass, and chamisa typically lined the sides. A narrow (1-2 feet in width), sandy or silty-bottomed, non-incised channel which was also a cow path snaked through the center of the arroyo and appeared to constitute the stream bed for any ephemeral flow. Short sections of the channel were cut into sandstone.

Reach #2 was determined to be ephemeral over its entire length. Attachment #2 provides more detail regarding the Level 1 Stream Determination for Reach # 2. The photographs and field sheets are available on CD.

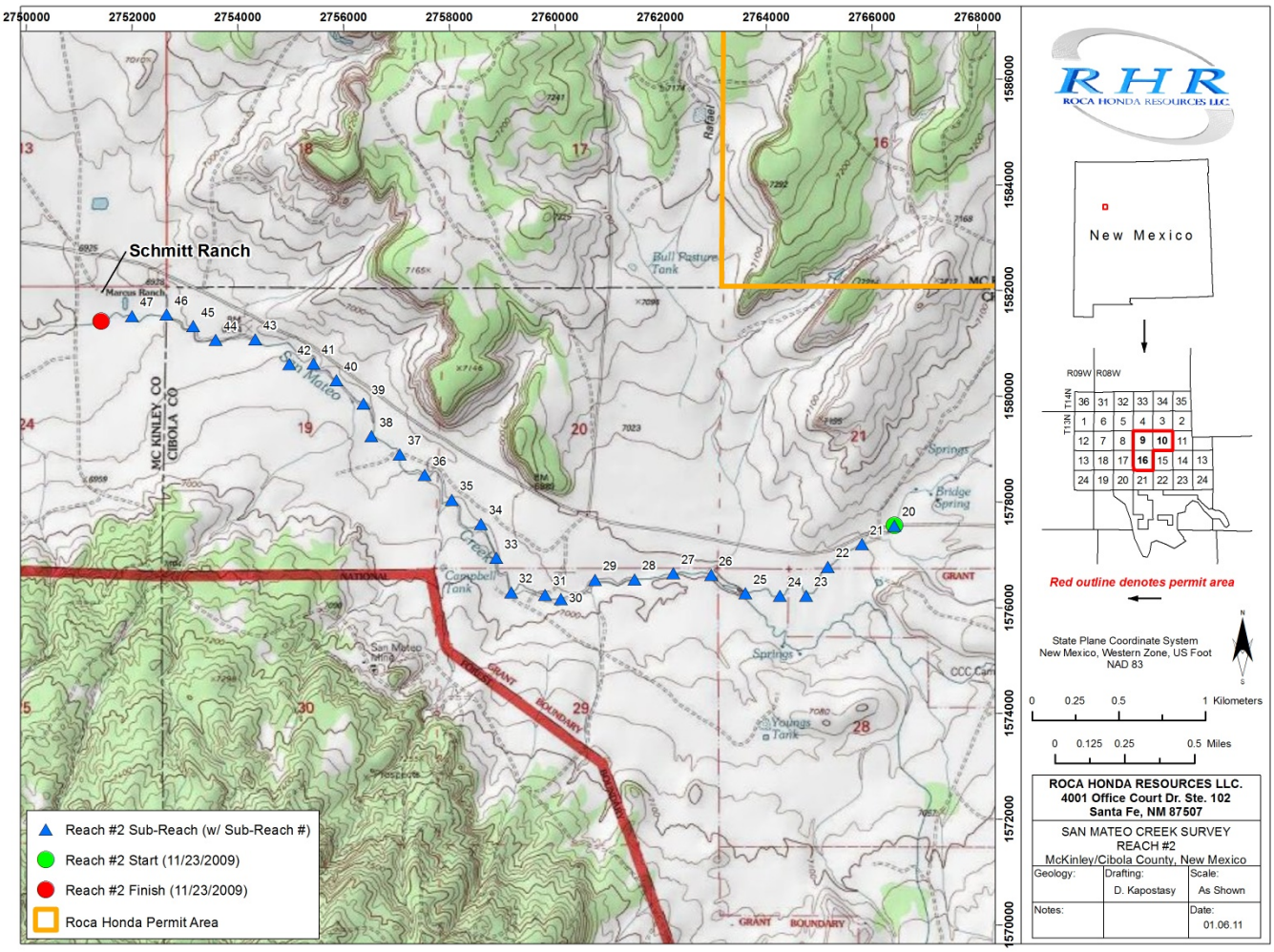

Figure 2. Location of Reach #2 Sub-reaches

Table 2. Sub-reach Locations and Total Level 1 Stream Distribution Points for Reach #2

Sub-reach	Start UTM 13S East	Start UTM 13S North	End UTM 13S East	End UTM 13S North	Total Points
20	0255690	3913597	0255501	3913495	6.0
21	0255501	3913495	0255301	3913370	6.0
22	0255301	3913370	0255170	3913208	6.0
23	0255170	3913208	0255018	3913211	6.0
24	0255018	3913211	0254819	3913231	6.0
25	0254819	3913231	0254625	3913343	7.5
26	0254625	3913343	0254407	3913358	6.0
27	0254407	3913358	0254182	3913330	6.0
28	0254182	3913330	0253956	3913334	3.0
29	0253956	3913334	0253754	3913228	3.0
30	0253754	3913228	0253665	3913256	3.0
31	0253665	3913256	0253469	3913276	2.0
32	0253469	3913276	0253389	3913477	6.5
33	0253389	3913477	0253305	3913675	3.0
34	0253305	3913675	0253142	3913819	3.0
35	0253142	3913819	0252989	3913966	3.0
36	0252989	3913966	0252849	3914089	3.0
37	0252849	3914089	0252688	3914199	3.0
38	0252688	3914199	0252649	3914388	4.5
39	0252649	3914388	0252495	3914527	4.5
40	0252495	3914527	0252366	3914628	4.5
41	0252366	3914628	0252228	3914628	3.0
42	0252228	3914628	0252034	3914776	3.0
43	0252034	3914776	0251806	3914779	2.0
44	0251806	3914779	0251679	3914862	2.0
45	0251679	3914862	0251526	3914934	2.0
46	0251526	3914934	0251328	3914931	1.0
47	0251328	3914931	0251148	3914905	3.0

2.3.3 Reach #3

The Level 1 Stream Determination of Reach #3 of SMC was performed on March 31, 2010. The surveyed stream section extended from the end of the Reach #2 survey at the Schmitt Ranch in the NE ¼ of Section 24 in T13N, R9W, west 3.5 stream miles down the channel to the point where San Mateo Creek exited a canyon carved in Dakota Sandstone outcrops NW of the NE ¼ of Section 22. Figure 3 shows the locations of the 25 sub-reaches which make up Reach #3 (#48 through #72) and Table 3 identifies each sub-reach location. The work was accomplished during a mostly clear, sunny, windy day. Precipitation had last fallen in the area several weeks earlier as snow, but had entirely disappeared by the time of the survey, leaving the stream channel dry.

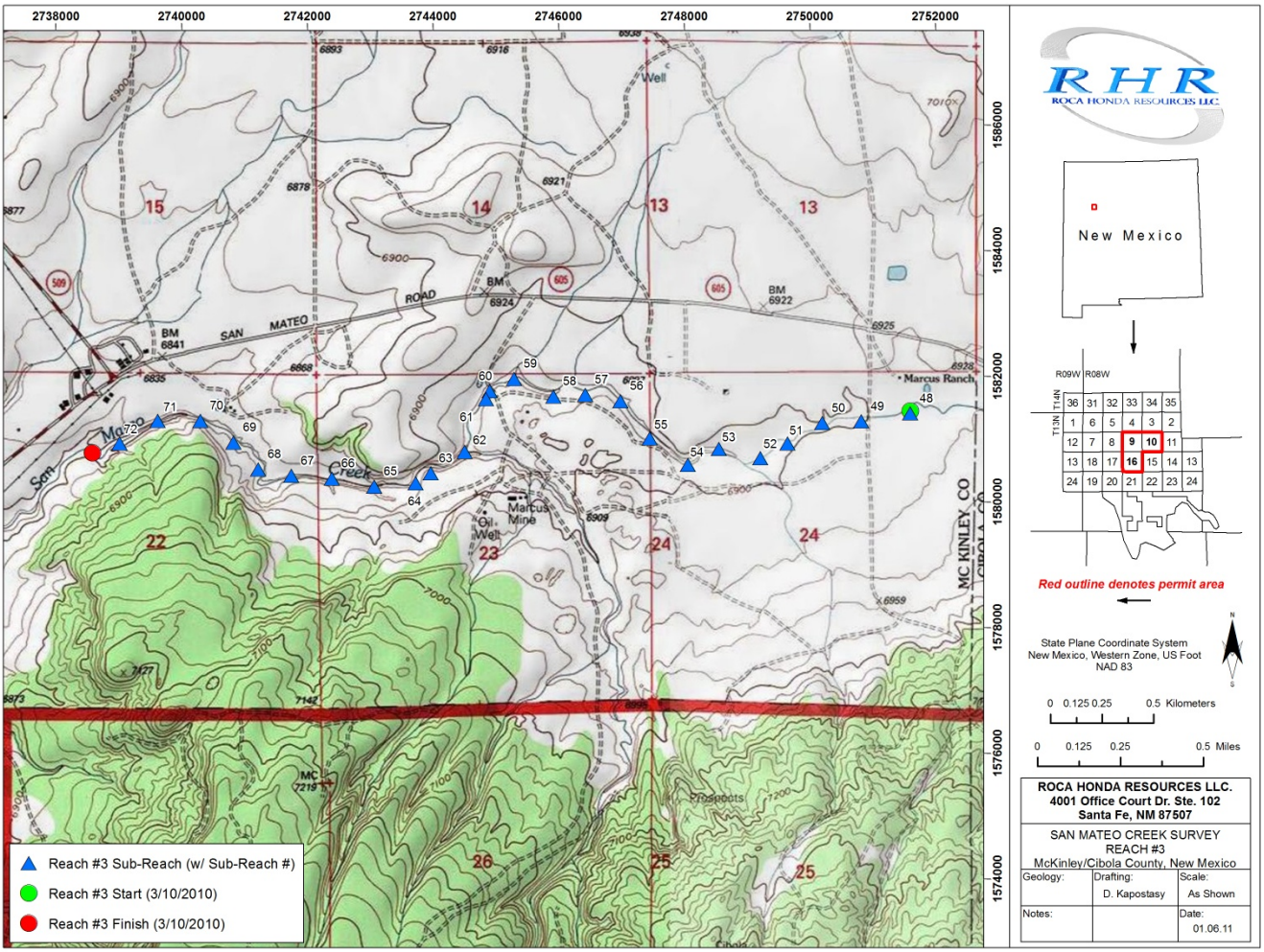

Figure 3. Location of Reach #3 Sub-reaches

Table 3. Sub-reach Locations and Total Level 1 Stream Determination Points for Reach #3

Sub-reach	Start UTM 13S East	Start UTM 13S North	End UTM 13S East	End UTM 13S North	Total Points
48	0251206	3914900	250966	3914868	4.0
49	250966	3914868	250777	3914865	5.0
50	250777	3914865	250606	3914771	6.5
51	250606	3914771	250472	3914704	6.0
52	250472	3914704	250272	3914754	5.0
53	250272	3914754	250120	3914681	5.0
54	250120	3914681	249938	3914814	4.0
55	249938	3914814	249802	3915000	6.5
56	249802	3915000	249631	3915036	6.5
57	249631	3915036	249477	3915032	7.5
58	249477	3915032	249289	3915123	4.5
59	249289	3915123	249169	3915066	7.0
60	249169	3915066	249150	3915028	6.0
61	249150	3915028	249038	3914775	4.0
62	249038	3914775	248871	3914677	4.0
63	248871	3914677	248796	3914630	5.0
64	248796	3914630	248595	3914620	3.0
65	248595	3914620	248391	3914664	3.0
66	248391	3914664	248194	3914683	3.0
67	248194	3914683	248034	3914719	4.0
68	248034	3914719	247918	3914853	4.0
69	247918	3914853	247760	3914963	4.0
70	247760	3914963	247552	3914968	5.0
71	247552	3914968	247364	3914865	3.0
72	247364	3914865	247231	3914622	5.0

In general, in the upper part of the stream reach the channel was a wide, high-banked arroyo cut into unconsolidated alluvial sands and silts. The channel bottom was covered with short grasses and tamarisks were scattered through the channel. A narrow (1-2 feet in width), sandy or silty-bottomed, very slightly incised channel which was also a cow path snaked through the center of the arroyo in some areas and appeared to constitute the stream bed for any ephemeral flow. The lower half of the reach was a broad, sandy-bottomed canyon cut deeply into Jurassic and Cretaceous rocks which formed the sides of the banks and often towered above them. Scattered

tamarisks and an occasional juniper were present in this area. Sandstone bedrock formed the channel bottom in several sub-reaches.

No water was encountered along the stream channel except at one site where a small tinaja of water was present between joint surfaces in the Dakota Sandstone. No flow water, fish, or other indication of perennial flow was found anywhere in the reach. Reach #3 was determined to be an ephemeral drainage over its entire length. Attachment #3 provides more detail regarding the Level 1 Stream Determination for Reach # 3. The photographs and field sheets are available on CD.

2.3.4 Reach #4

The Level 1 Stream Determination of Reach #4 of SMC was performed on June 23, 2010 and extended on November 4, 2010. Reach #4 began where Reach #3 ended, and extended westward approximately 6.5 stream miles to the NE ¼ of Section 1, Township 12 N, Range 9 W, at which point the channel of SMC was fairly indistinguishable from the surrounding country. Figure 4 shows the locations of the 45 sub-reaches which make up Reach #4 (#73 through #117) and Table 4 identifies the location of each sub-reach. The work was accomplished on dry, sunny days. No precipitation had fallen for several weeks prior to both field days. The second field day was necessary because of some confusion regarding the correct course for SMC at the lower end of Reach 4. Initially the narrow channel was walked from the end of sub-reach #107 for about another ½ mile south until it disappeared. The USGS map indicates SMC turns west from the end of sub-reach #107 and crosses under Highway 605 before it turns to the south. The survey team walked from the highway culverts along a constructed channel until it intersected with the original SMC channel near sub-reach #107. At this point the creek can continue either south until it changes to overland flow or continue westward via the constructed channel and flow through the culverts into a constructed channel on the west side of Highway 605. This portion of the channel directs any flow to the southwest for three sub-reaches (approximately 2000 feet) until it changes to overland flow.

No water was encountered along this reach of SMC. In general, the valley was a wide, low-banked arroyo cut into unconsolidated alluvial sands and silts. The “active” channel bottom ranged from very sandy, unvegetated, and up to 40 feet wide in the upper part of the reach, to covered with short grasses and four-wing salt brush and only slightly distinguishable from the main arroyo as a narrow cow path in the lower part of the reach. As the channel gradually became indistinguishable from the surrounding countryside in the lower part of the reach, the banks disappeared, the channel narrowed to a cow path, and vegetation grew within the channel. The arroyo and channel ranged from straight to broadly sinuous. Occasional clumps of tamarisk were found, but appeared to be unrelated to any regional high water table system. Figure 4 shows the locations of the 45 sub-reaches which make up Reach #4.

No flowing water, fish, or other indication of perennial flow was found anywhere in the reach. Reach #4 was determined to be an ephemeral drainage over its entire length. Attachment #4 provides more detail regarding the Level 1 Stream Determination for Reach # 4. The photographs and field sheets are available on CD.

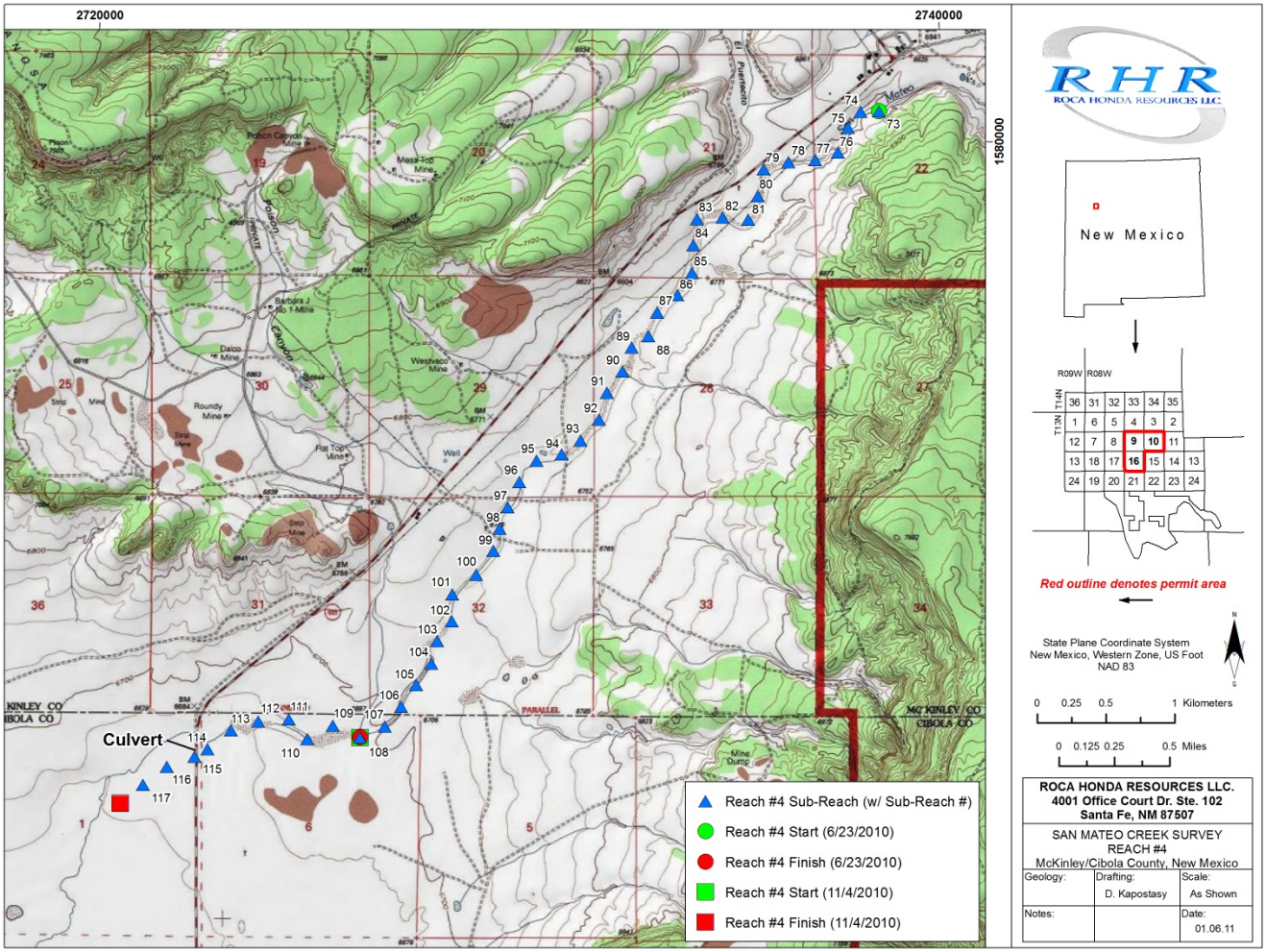

Figure 4. Location of Reach #4 Sub-reaches

Table 4. Sub-reach Locations and Total Level 1 Stream Determination Points for Reach #4

Sub-reach	Start UTM 13S East	Start UTM 13S North	End UTM 13S East	End UTM 13S North	Total Points
72 Repeat	0247357	3914860	247230	3914805	6
73	247230	3914805	247096	3914806	6.5
74	247096	3914806	247000	3914694	8.5
75	247000	3914694	246923	3914516	7.5
76	246923	3914516	246756	3914465	6.5
77	246756	3914465	246560	3914456	6.5
78	246560	3914456	246379	3914411	5.5
79	246379	3914411	246332	3914216	5.5
80	246332	3914216	246256	3914046	5.5
81	246256	3914046	246069	3914067	4.5
82	246069	3914067	245883	3914062	4.5
83	245883	3914062	245850	3913873	4.5
84	245850	3913873	245838	3913673	4.5
85	245838	3913673	245726	3913513	4.5
86	245726	3913513	245576	3913390	4.5
87	245576	3913390	245505	3913219	4.5
88	245505	3913219	245381	3913143	5.5
89	245381	3913143	245309	3912969	3.0
90	245309	3912969	245192	3912817	3.0
91	245192	3912817	245128	3912624	3.0
92	245128	3912624	244990	3912476	4.0
93	244990	3912476	244850	3912378	4.0
94	244850	3912378	244667	3912340	3.0
95	244667	3912340	244537	3912187	4.0
96	244537	3912187	244446	3912005	5.0
97	244446	3912005	244385	3911851	2.0
98	244385	3911851	244334	3911851	3.0
99	244334	3911851	244203	3911523	2.0
100	244203	3911523	244026	3911383	2.0
101	244026	3911383	244019	3911383	2.0
102	244019	3911383	243908	3911383	2.0

Sub-reach	Start UTM 13S East	Start UTM 13S North	End UTM 13S East	End UTM 13S North	Total Points
103	243908	3911383	243858	3910886	2.0
104	243858	3910886	243746	3910734	1.0
105	243746	3910734	243631	3910578	1.0
106	243631	3910578	243507	3910438	1.0
107	243507	3910438	2433326	3910365	1.0
108	2433326	3910365	0243129	3910456	2.0
109	0243129	3910456	0242943	3910364	2.0
110	0242943	3910364	0242811	3910511	2.0
111	0242811	3910511	0242588	3910501	4.0
112	0242588	3910501	0242390	3910441	5.0
113	0242390	3910441	0242214	3910309	4.0
114	0242214	3910309	0242118	3910259	3.0
115	0242118	3910259	0241915	3910192	5.0
116	0241915	3910192	0241737	3910066	4.0
117	0241737	3910066	0241570	3909931	3.0

3.0 References

SWQB of NMED, August 2009, “Hydrology Protocol for the Determination of Ephemeral, Intermittent, and Perennial Waters.”

ATTACHMENT #1

SUMMARY MEMORANDUM FOR REACH #1

HYDROSCIENCE ASSOCIATES, INC.
Consulting Hydrogeologists & Engineers

P.O. Box 21087 Albuquerque NM 87154 Tel/Fax (505) 867-1983 hydrosci@osogrande.com

MEMORANDUM

TO: RHR File

FROM: M. Wasiolek/K. Peil

RE: San Mateo Creek Field trip, Reach #1

DATE: November 19, 2009

INTRODUCTION: On November 5, 2009 engineer Kelly Peil and hydrogeologist Maryann Wasiolek performed a field survey of the section of San Mateo Creek which extends from the community of San Mateo to approximately three-miles west where the stream channel passes under State Highway 605. The purpose of the survey was to perform a Level 1 Stream Determination of SMC in accordance with criteria detailed in NMED's Draft Hydrologic Protocol for the purpose of classifying sections of the channel as ephemeral, intermittent, or perennial. In accordance with the Protocol, Peil and Wasiolek filled out Level 1 Stream Determination Field Sheets for 19 stream reaches each of approximately 750 feet in length. The work was accomplished during a clear, sunny day in early November, 2009. Precipitation had last fallen in the area eight days earlier as snow (approximately two inches) which had mostly disappeared by the time of the survey, leaving the stream channel dry.

SUMMARY OF SAN MATEO CREEK FLOW: SMC rises on the northern flanks of Mt. Taylor. The upper reaches of the creek have a perennial flow fed by springs that issue from the volcanics of the mountain. About 2/3 mile above the community of San Mateo the flow of the creek is completely blocked by a dam which creates San Mateo Reservoir, a small, cattail-filled lake with a surface area of less than 10 acres. The impounded water is used for irrigation. It is diverted from the reservoir though the bottom of the dam into a pipe, and then routed through pipes and open ditches for distribution to irrigated fields. Below the dam the only flow in the stream channel itself is minor seepage from beneath the dam. This flow disappears a few hundred feet west of San Mateo Road. Irrigation water is discharged from a twelve inch diameter pipe open gate valve into the creek, which at the time of the stream survey was about ¾ mile below the dam where the pipe crosses under Candelaria Road. When the irrigation water is not discharged, the stream channel would be dry. Below the irrigation discharge point, the creek flows along a stream course which has in some areas been modified so that it resembles a ditch

more than a natural creek. Fish and micro-invertebrates were absent; some algae was found on rocks in some areas. The stream finally discharges into a pond on the Lee Ranch. There is no creek channel or flow below the Lee Ranch pond. The northern tributaries to SMC are broad, sandy arroyos with high banks and thick stands of tamarisk and grassy bottoms. No flowing water was present. Two small springs are present at the lower end of the surveyed reach.

SUMMARY OF FIELD SHEETS #1 through #19: The stream survey was done by walking in or alongside the channel of San Mateo Creek in a downstream direction and observing channel conditions. Figure 1found in the summary section of this document shows the locations of the sub-reaches.

Site #1 sub-reach covered 750 feet, extending from 150 feet above the point where SMC crossed San Mateo Road, to 600 feet downstream of the road crossing to the point just above where an irrigation pipe which contained water diverted from San Mateo Reservoir discharged into the creek. Some water flowed in the creek at the upper end of the sub-reach, but that flow had disappeared above the point where the irrigation pipe discharged into the creek.

Site #2 sub-reach began where an irrigation pipe discharged into the dry stream channel and ended 750 feet downstream, at which point the stream was still flowing. Small cottonwood trees were scattered in the stream channel.

Site #3 sub-reach covered 750 feet over which the creek was a foot wide and 0.5 feet deep channelized, but sometimes flowing over a broad grassy area. Tamarisks and willow brush were present in the creek bottom.

Site #4 sub-reach covered 750 feet in length. Over this sub-reach the creek was un-channelized, flowing over a low, grassy area about 20 feet wide in which numerous scrub willows grew.

Site #5 sub-reach covered 500 feet, to the crossing of the creek under State Highway 605 through a culvert along Candelaria Road. The stream mostly flowed through grass but became channelized at the lower end of the sub-reach. Roughly the same amount of flow as had been discharged from the irrigation pipe was still present.

Site #6 sub-reach commenced on the downstream side of State Highway 605 where the stream flow through the culvert formed a 30 x 15 ft pool. Water spiders were present on the surface of the pond, but it

was too murky to ascertain the presence of fish. The creek flowed out of the pond in a channel 1 foot wide and 4 inches deep, and continued about 450 feet to a man-made tank where it was split, with part of the flow going into the tank and part around it into a small channel below the tank. This sub-reach ended at the Lee Ranch fence line, 675 feet from the road (605).

Site #7 sub-reach began at the Lee Ranch fence line in a copse of tamarisk. The flow moved through the tamarisk in 2 grassy channels, entering a small 5 x 10 ft pond and then flowing on into a narrow channel which appeared to have been enhanced by excavation. The flow gradually diminished though it was still flowing at 750 feet.

Site #8 sub-reach was characterized by 750 feet of a uniform, 1 foot wide ditch in grass which did not appear to be a natural stream channel, but rather a small ditch. The flow discharged into a large pond on the Lee Ranch. No channel or flow left the pond.

Site #9 sub-reach began at the breached constructed berm in the stream channel about 0.5 miles north-northeast of Site #8 and extended 775 feet downstream. Several arroyos draining areas from the north and east converged and exited the bermed area as the surveyed channel. The original SMC joined this channel downstream before SMC was damned and modified. The surveyed channel bottom was a dry, broad, steep-sided sandy arroyo with numerous tamarisks. No water was present and the arroyo bottom was dry.

Site #10 sub-reach was 750 feet in length and had the same physical characteristics as Site #9. No water was present and the arroyo bottom was dry.

Site #11 sub-reach was 750 feet in length and had the same physical characteristics as Site #9. No water was present and the arroyo bottom was dry.

Site #12 sub-reach was 750 feet in length. Over the sub-reach the channel became wider and shallower and though still characterized by a dry, sandy bottom, had fewer tamarisks and more grasses, chamisa and snakeweed. No water was present and the arroyo bottom was dry.

Site #13 sub-reach was 750 feet in length. The sub-reach was similar to Site #12, except that the tamarisks were again numerous. No water was present and the arroyo bottom was dry.

Site #14 sub-reach was 750 feet in length. Half-way down the sub-reach a small, shallow puddle was present and the tamarisk had decreased to a scattering. No water was present and the arroyo bottom was dry.

Site #15 sub-reach was 750 feet in length and very similar to Site #14. No water was present and the arroyo bottom was dry.

Site #16 sub-reach was 750 feet in length. By this point the bottom of the arroyo was grassed and there was no defined arroyo channel. The arroyo was 40 feet wide, 6 feet high with scattered tamarisk. No water was present and the arroyo bottom was dry.

Site #17 sub-reach was 750 feet in length and very similar to Site #16. No water was present and the arroyo bottom was dry.

Site #18 sub-reach was 750 feet in length and physically similar to Site #17. A boggy area with high grass (possibly North Spring on the USGS topographic map) was present from 120 to 150 ft downstream of the end of Site #17. No water was present and the arroyo bottom was dry over the rest of the sub-reach.

Site #19 sub-reach was 800 feet in length, and where SMC passed under State Highway 605. The arroyo was narrower, grassy, with tamarisks within the channel. No water was present and the arroyo bottom was dry over most of the sub-reach. A shallow, opaque pool was present at the bridge (probably Bridge Spring as designated on the USGS topographic map).

ATTACHMENT #2

SUMMARY MEMORANDUM FOR REACH #2

HYDROSCIENCE ASSOCIATES, INC.
Consulting Hydrogeologists & Engineers

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MEMORANDUM

TO: RHR File

FROM: M. Wasiolek/K. Peil/D. Kapostasy

RE: San Mateo Creek Field trip, Reach #2

DATE: December 10, 2009

INTRODUCTION: On November 23, 2009 engineer Kelly Peil and hydrogeologist Maryann Wasiolek performed the second phase of the field survey of San Mateo Creek. The purpose of the survey was to describe the reaches of SMC and classify them as ephemeral, intermittent, or perennial according to criteria detailed in NMED's Draft Hydrologic Protocol. The survey reach extended from where the stream channel passes under highway 605 in the SE ¼ of Section 21, T13N R8W, four miles west of the Schmitt Ranch. In accordance with the Protocol, Peil and Wasiolek filled out Level 1 Stream Determination Field Sheets for 28 stream sub-reaches, each of approximately 750 feet in length. The work was accomplished during a clear, sunny day at the end of November, 2009. Precipitation had last fallen in the area several weeks earlier as snow (approximately two inches), but had almost entirely disappeared by the time of the survey, leaving the stream channel dry. No water was encountered along the stream channel except at one site where two small pools of water were present at an outcrop. This portion of the stream survey began at the lower end of the Reach #1 survey, described in a previous memorandum.

SUMMARY OF SAN MATEO CREEK FLOW: SMC rises on the northern flanks of Mt. Taylor. The upper reaches of the creek have a perennial flow fed by springs that issue from the volcanics of the mountain. About 2/3 mile above the community of San Mateo the flow of the creek is completely blocked by a dam which creates San Mateo Reservoir, a small, cattail-filled lake with a surface area of less than 10 acres. The impounded water is used for irrigation. The water is diverted from the reservoir though the bottom of the dam into a pipe, and then routed through pipes and open ditches for distribution to irrigated fields. SMC has perennial flow from its headwaters to the reservoir, intermittent flow from the reservoir to a pond on the Lee Ranch, and is ephemeral downstream from the pond except where the discharge from Bridge spring causes ponding for approximately fifty feet.

Reach #1 was defined as the 3-mile reach of SMC which extends from the community of San Mateo, east through the Lee Ranch to the bridge where State Highway 605 crosses the stream channel in the SE ¼ of Section 21. This section of the channel is discussed in a previous memorandum. Reach #2 started at the bridge on State Highway 605 mentioned above and ended south of the Schmitt Ranch headquarters in the NW ¼ of Section 24, T13N, R9W.

Except for a 50 foot section of the channel in the NW ¼ of Section 29, T13N, R8W, the channel was dry. In this area, two small pools that proved to be temporary flood flow catchments were present.[1] The pools were too murky for investigators to ascertain whether fish, micro-invertebrates, or algae were present. In general, the stream channel was a wide, high-banked, grassed arroyo cut in alluvial sands and silts. Thick stands of tamarisk, grass, and chamisa typically lined the sides. A narrow (1-2 feet in width), sandy or silty-bottomed, non-incised channel which was also a cow path snaked through the center of the arroyo and appeared to constitute the stream bed for any ephemeral flow. Short sections of the channel are cut into sandstone.

SUMMARY OF FIELD SHEETS #20 through #47: The stream survey was done by walking in the channel of SMC in a downstream direction and observing channel conditions. The sites described below represent sections of the SMC stream channel of approximately 750 feet in length that are sequentially numbered in a downstream direction. The surveyed reach began at the point where SMC passed under State Highway 605 in the SE ¼ of Section 21, T13N, R8W. In general, the stream course was a wide arroyo with steep banks with a height to width ratio of approximately 1:3. Thick stands of tamarisk lined the sides of the arroyo and the bottom was grassy. The course of the occasional stream flow was apparently confined to a narrow (1-2 feet) channel. Stream flow was absent. Ponded water was present in one reach. Figure 2 found in the summary section of this document shows the locations of the sub-reaches. The entry location into SMC of the arroyo draining from the north that will be used for the treated mine water discharge will be identified during another survey.

Site #20 sub-reach began where SMC passed under State Highway 605 and extended 750 feet downstream (west). The arroyo was much wider than the active part of the channel: approximately 35 feet wide with 6 foot banks, whereas the portion of the channel which appeared to occasionally carry water was a few feet in width. The channel bottom had been muddy at some time previously, but was dry at the time of the survey. No water was present and there was no evidence of recent flow. Tamarisks were present on either side of the channel and the bottom of the arroyo was grassy.

[1] Later visits by RHR to the site of the pools found them dry.

Site #21 sub-reach covered 750 feet. Over the length of the sub-reach the stream channel narrowed to about 20 feet with 6 foot high banks. The channel was grassy and lined with tamarisk. A large culvert connected a small arroyo with the main channel. No water was present and there was no evidence of recent flow.

Site #22 sub-reach covered 750 feet. The arroyo was 30 feet wide with 6 foot high banks. Tamarisks were present on either side of the channel and the bottom of the arroyo was grassy. No water was present and there was no evidence of recent flow.

Site #23 sub-reach covered 750 feet. The arroyo was 30 feet wide with 5 foot high banks. Grass and chamisa dominated, with scattered tamarisks. The channel bottom was of dried mud. A geologic contact, probably within the Cretaceous Menefee Formation (Kmf) may have been crossed at UTM 13S 0255018 3913211. No water was present and there was no evidence of recent flow.

Site #24 sub-reach covered 750 feet. Conditions were similar to Site #23. Cows had worn a trail in the center of the broad, grass- and chamisa-lined arroyo. The central channel was about 18 inches in width and silty. A thin coating of salt was present on the banks of the arroyo. No water was present and there was no evidence of recent flow.

Sites #25 and #26 each covered 750 feet. Conditions were similar to Site #24, though the channel in #25 had been incised into the arroyo bottom probably because cows were using it as a path. Chamisa were denser and tamarisk scattered. A geologic contact possibly between the Cretaceous Menefee (Kmf) and the Point Lookout Sandstone (Kpl)) appears to have been crossed at UTM 13S 254712 3913279. No water was present and there was no evidence of recent flow.

Site #27 sub-reach covered 750 feet. The arroyo widened; banks were 10 feet high. Grasses dominated on the arroyo bottom although chamisa and some tamarisks were present. No flowing water was present and there was no evidence of recent flow, though a small pool of snowmelt was present beneath the south embankment.

Site #28 sub-reach covered 750 feet. An arroyo entered the main channel from the south at the bottom of the sub-reach. Both channels had grassy bottoms and thick chamisa. Arroyo banks were 7 to 8 feet high. No water was present and there was no evidence of recent flow.

Site #29 sub-reach covered 750 feet. The channel was 20 to 40 feet wide, 8 to 10 feet high grassy arroyo with a sandy bottom. A few tamarisk and chamisa were present with a few junipers on the banks. A buried soil was evident in the north bank 20 feet DS of the beginning of the sub-reach. A small arroyo entered the main channel near the bottom of the sub-reach. A small, slightly incised channel (also a cow path) ran down the arroyo bottom. No water was present and there was no evidence of recent flow.

Site #30 sub-reach covered 300 feet. The first 300 feet of this sub-reach were similar to #29, with the channel a tan silty course. The sub-reach was terminated at some old disconnected and mostly buried concrete culvert pipe sections downstream of which a tan sandstone outcropped across the creek bed. A geologic map of the area indicates that the sandstone is probably the Cretaceous Gallup Sandstone (Kg). Near this point erosion has exposed pebbles and cobbles associated with the surface of an old alluvial fan. No water was present and there was no evidence of recent flow.

Site #31 sub-reach covered 750 feet. Erosion has exposed pebbles and cobbles associated with the surface of an old alluvial fan at a couple places along the sub-reach. At 600 feet a tan sandstone outcropped in the channel; outcrops of orange-tan medium-grained sandstone appeared at 675 feet and, and the channel continued on bedrock from this point to the end of the sub-reach. A medium-grained gray fossiliferous sandstone was also present. The arroyo narrowed to 20 feet, cutting down into the sandstone so that sandstone outcropped at times in the arroyo sides. The geologic map indicates that the sandstones should be within the Cretaceous Mancos Shale, but they were physically more similar to Kg sands. No water was present and there was no evidence of recent flow.

Site #32 sub-reach covered 700 feet. The first 485 feet were characterized by a 30 foot wide dry, rocky channel with steep banks. Outcrops were absent and the channel material was silty. A prominent sandstone outcrop was present from 485 feet to the end of the sub-reach. Two pools of water were present in this portion of the sub-reach. On the geologic map a NNE-trending fault up-thrown on the south side is indicated just to the south of the area. The presence of the pools is probably related in some way to this fault, the fractured sandstones, and the presence of the underlying Mancos Shale. Tamarisks are present in abundance around and below the pools. These pools probably represent perennial water, but the rest of the sub-reach was dry and there was no indication of recent water.

Site #33 sub-reach was characterized by 675 feet of wide, silty channel with thick stands of tamarisks in the upper section which gradually gave way to grass with some tamarisk in the lower part. The steep

arroyo banks were up to 10 feet high on the north side. No water was present and there was no evidence of recent flow.

Site #34 sub-reach was a very wide (to 75 feet) sandy-bottomed channel with a thick cover of grass, chamisa and scattered tamarisk along the banks. A major arroyo entered the main channel from the south at 260 feet. No water was present and there was no evidence of recent flow in either the main channel or the tributary arroyo.

Site #35 sub-reach was 750 feet in length and had the same physical characteristics as Site #34, except that the bottom sediments seemed more silty than sandy. No water was present and the arroyo bottom was dry. There was no evidence of recent flow.

Site #36 sub-reach was 750 feet in length and had the same physical characteristics as Site # 35. A thin stand of scrub willow was present under the high south bank from 300 feet for 100 feet. No water was present and there was no evidence of recent flow; the arroyo bottom was dry.

Site #37 sub-reach was 750 feet in length and very similar to Site #36 sub-reach to 700 feet. The lowest 50 feet of the sub-reach was characterized by thick tamarisks. No water was present and the arroyo bottom was dry.

Site #38 sub-reach was 750 feet in length. Over much of the sub-reach an incised channel 5 feet deep and wide ran down the center of the main, wide arroyo. The arroyo bottom was dry and silty with dense chamisa, tamarisks and grass. No water was present and the arroyo bottom was dry.

Site #39 sub-reach was 750 feet in length and similar to Site #38 sub-reach except that the inner channel was wider and shallower and sandy. No water was present and the arroyo bottom was dry.

Site #40 sub-reach was 750 feet in length and very similar to Site #39. At a bend in the channel at 450 feet the water channel under-cut the bank. An inner channel 5 feet high and 9 feet wide was incised in the main 40-foot wide arroyo. The inner channel was cut in sandy-silty sediments and was without vegetation; the main arroyo was well-grassed with tamarisk and chamisa on the banks. No water was present and the arroyo and channel bottoms were dry.

Site #41 sub-reach was 750 feet in length. A non-incised 18inch sandy track snaked along the bottom of a 15 to 40 foot wide arroyo. The arroyo was thickly grassed with chamisa and scattered tamarisk. No water was present and the arroyo bottom was dry.

Site #42 sub-reach was 750 feet in length. The arroyo gradually widened downstream and bank height became lower. The area was heavily grassed except for a narrow (18 inch, sandy/silty channel that ran down the center of the wide arroyo. Scattered tamarisk and chamisa were present. No water was present and the arroyo bottom was dry.

Site #43 sub-reach was 750 feet in length and physically similar to Site #42, although shallower. A power line crossed the creek at 400 feet and an arroyo entered from the north at 575 feet. No water was present and the arroyo bottom was dry.

Site #44 sub-reach was 750 feet in length. No distinct channel was present; the arroyo was 30 feet wide with a 5 to 8 foot bank, silty and grassed. Fewer tamarisk and chamisa were present. No water was present and the arroyo bottom was dry.

Site #45 sub-reach was 650 feet in length, to the property fence between the Lee Ranch (upstream) and the Schmitts (downstream). The sub-reach was similar to Site #44 sub-reach. No water was present and the arroyo bottom was dry.

Site #46 sub-reach was 750 feet in length. Grazed grass covered the silty bottom and sides of the broad, shallow arroyo. Scattered tamarisk and chamisa were present. No water was present and the arroyo bottom was dry.

Site #47 sub-reach was 750 feet in length, 25 feet wide and 15 feet deep. The silty channel was characterized by a few scrub willows and much grazed grass. The channel was slightly sinuous. No water was present and the arroyo bottom was dry.

ATTACHMENT #3

SUMMARY MEMORANDUM FOR REACH #3

HYDROSCIENCE ASSOCIATES, INC.
Consulting Hydrogeologists & Engineers

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MEMORANDUM

TO: RHR File

FROM: M. Wasiolek/K. Peil/D. Kapostasy

RE: San Mateo Creek Field trip, Reach #3

DATE: May 11, 2010

INTRODUCTION: On March 31, 2010 engineer Kelly Peil, hydrogeologist Maryann Wasiolek, and geologist Dan Kapostasy performed a field survey of Reach #3 of San Mateo Creek. The surveyed stream section extended from the Schmitt Ranch in the NE ¼ of Section 24 in T13N, R9W, west down the channel to the NW of the NE ¼ of Section 22. The purpose of the survey was to perform a Level 1 Stream Determination of SMC in accordance with criteria detailed in NMED's Draft Hydrologic Protocol for the purpose of classifying sections of the channel as ephemeral, intermittent, or perennial. A secondary purpose of the stream survey was to do an initial assessment of the physical nature of the stream channel and the potential engineering issues that might arise if RHR discharges treated mine water into the channel. In accordance with the Protocol, Peil, Wasiolek, and Kapostasy filled out Level 1 Stream Determination Field Sheets for 25 stream sub-reaches, each of approximately 750 feet in length, and took at least two photographs per sub-reach. . The work was accomplished during a mostly clear, sunny, windy day at the end of March, 2010. Precipitation had last fallen in the area several weeks earlier as snow, but had entirely disappeared by the time of the survey, leaving the stream channel dry. No water was encountered along the stream channel except at one site where a small tinaja of water was present between joint surfaces in the Dakota Sandstone. This section of the stream survey began at the lower end of the Reach #2 survey, described in a previous memorandum.

SUMMARY OF SAN MATEO CREEK FLOW: SMC rises on the northern flanks of Mt. Taylor. The upper reaches of the creek have a perennial flow fed by springs that issue from the volcanics of the mountain. About 2/3 mile above the community of San Mateo the flow of the creek is completely blocked by a dam which creates San Mateo Reservoir, a small, cattail-filled lake with a surface area of less than 10 acres. The impounded water is used for irrigation. The water is diverted from the reservoir though the bottom of the dam into a pipe, and then routed through pipes and open ditches for distribution

to irrigated fields. SMC has perennial flow from its headwaters to the reservoir, intermittent flow from the reservoir to a pond on the Lee Ranch, and is ephemeral downstream from the pond except where the discharge from Bridge spring causes ponding for approximately fifty feet.

Reach #1 was defined as the 3 mile reach of SMC which extends from the community of San Mateo, west through the Lee Ranch to the bridge where State Highway 605 crosses the stream channel in the SE ¼ of Section 21. Reach #2 started at the bridge on State Highway 605 and ended south of the Schmitt Ranch headquarters in the NW ¼ Section 24, T13N, R9W. These sections of the channel are discussed in previous memoranda.

SUMMARY OF SUB-REACHES #48 through #72: Reach #3 began on the Schmitt Ranch where Reach #2 ended, and extended westward approximately 3.5 stream miles to the point where SMC exited a canyon carved in Dakota Sandstone outcrops in the NW ¼ of the NE ¼ of Section 22 in T13N, R9W. Except for a small tinaja formed by jointing planes in the Dakota Sandstone, no water was encountered along the channel. In general, in the upper part of the stream reach the channel was a wide, high-banked arroyo cut into unconsolidated alluvial sands and silts. The channel bottom was covered with short grasses and tamarisks were scattered through the channel. A narrow (1-2 feet in width), sandy or silty-bottomed, very slightly incised channel which was also a cow path snaked through the center of the arroyo in some areas and appeared to constitute the stream bed for any ephemeral flow. The lower half of the reach was a broad, sandy-bottomed canyon cut deeply into Jurassic and Cretaceous rocks which formed the sides of the banks and often towered above them. Scattered tamarisks and an occasional juniper were present in this area. Sandstone bedrock formed the channel bottom in several sub-reaches.

No flow water, fish, or other indication of perennial flow was found anywhere in the reach. Reach #3 was determined to be an ephemeral drainage over its entire length. Figure 3 found in the summary section of this document shows the locations of the sub-reaches that make up Reach #3.

Sub-reach #48 began on the Schmitt Ranch where Reach #2 ended, and extended 750 feet downstream (west). No water was present in the arroyo, and there was no evidence of recent flow. The channel was about 6 feet wide and 6 feet deep at the upper end of the reach but widened to 30 feet wide and 15 feet deep farther down. The channel was slightly sinuous and moderately entrenched; water had under-cut the silty banks at one spot. The channel bottom was silty and grass-covered, with tamarisks of various sizes scattered along it. Two 54” culverts passed under a dirt road near the bottom of the sub-reach. Five photos were taken.

Sub-reach #49 covered 750 feet. No water was present in the arroyo, and there was no evidence of recent flow. At some distance below the culverts noted in Sub-reach #48, the channel became wide and entrenched, with wide loops of sinuosity. At 450 feet from the start of the sub-reach, a pile of discarded debris which included 55 gallon drums, stoves, a washer & dryer, a refrigerator and other material was found on the north embankment. The channel was wide with high banks, silty-bottomed and grass-covered. Scattered tamarisks were present. Three photos were taken.

Sub-reach #50 covered 750 feet. No water was present in the arroyo, and there was no evidence of recent flow. The arroyo was 30 feet wide with 6-foot high banks. Tamarisks were present on either side of the channel and the bottom of the arroyo was grassy. A piece of culvert was in the channel at 240 ft. At 444 ft. there was an abrupt but small change in stream gradient. Five photos were taken.

Sub-reach #51 covered 750 feet. No water was present and there was no evidence of recent flow. The arroyo was 60 feet wide with up to 8-foot high banks. The bottom of the channel was covered with short grass. Tamarisks lined the channel at reach start, but soon thinned to scattered plants. Trash and debris had been dumped on top and down the north embankment for about 210 feet in the middle of the reach. The embankment was very erodible, and it might be necessary to re-route the channel so as to prevent under-cutting of the embankment and erosion of the debris. Five photos were taken.

Sub-reach #52 covered 750 feet. Conditions were similar to sub-reach #51, except for the lack of trash. No water was present and there was no evidence of recent flow. The channel was broad and covered with short grass, with a very small cow path/channel in the center. Banks were high and erodible, and the potential exists for erosion of the banks at channel bends. The channel material was silty sand. Four photos were taken.

Sub-reach #53 covered 750 feet. No water was present and there was no evidence of recent flow. Conditions were similar to sub-reach 52. The channel was very wide, with high, silty, erodible banks, particularly on the north side of the arroyo. Short grass, covered the channel bottom and the occasional tamarisk was present. A very slightly incised cow path/channel ran through the main arroyo bottom. Four photos were taken.

Sub-reach #54 covered 750 feet. No water was present and there was no evidence of recent flow. The arroyo widened and the channel width to bank height ratio increased. The channel material was a silty sand covered with short grass; the occasional tamarisk was present. Two photos were taken.

Sub-reach #55 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was wide and very shallow, with an occasional 4-5 foot outcrop/bank. The channel was heavily grassed with no tamarisks. Two photos were taken.

Sub-reach #56 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was 30 to 50 feet wide, with 6-8 foot high, silty, highly erodible embankments over part of the reach. The channel bottom was grassed, silty/sandy with widely scattered tamarisks but no riparian zone. A small, slightly incised channel (also a cow path) ran down the arroyo bottom. Two photos were taken.

Sub-reach #57 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was heavily grassed with a couple scattered tamarisks. A narrow (1-2 feet) channel was incised in the wide main channel and cut close to the erodible banks. The channel made a couple wide bends. An abandoned tank was present at the start of the reach. Three photos were taken.

Sub-reach #58 covered 750 feet. No water was present and there was no evidence of recent flow. The sub-reach was similar to sub-reach #57, except that the channel gradually became less incised and the embankments flattened. Two photos were taken.

Sub-reach #59 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was heavily grassed with scattered tamarisks. The channel made four major curves; at the curve bends the embankments were under-cut. Bank material was silty and erodible; banks were 6-7 feet high and the channel 15-30 feet wide. Five photos were taken.

Sub-reach #60 covered 750 feet. No water was present and there was no evidence of recent flow. Dakota Sandstone (Kd) outcropped in the bottom of the channel 20 feet from the beginning of the reach. A large pile of debris and a piece of culvert were present on the north side of the channel 50 feet from the start of the reach. The Whitewater Tongue of the Mancos Shale (Km) directly overlies the Kd in this area. At 75 feet from reach beginning, the channel makes a sharp curve to the south. (Photo R60DS from 75feet). Kd outcropped in the channel bed to 210 feet. The channel bed was 150 feet wide to this point. At 210 feet channel bed alluvium buried the bedrock and the 10-15 feet high silty, erodible channel banks derived from Km were present. (Photo R60DS at 210feet). Bank undercutting was occurring at 230 feet where the channel turned abruptly west. Between 330 and 375 feet Kd again outcropped in the channel bottom. At 375feet the channel turned to the southwest, and at 750 feet it turned again. When it was not on

bedrock, the channel was developed within sandy/silty Km-derived materials, was somewhat grassed, and had scattered tamarisks. Channel banks were 6 to 12 feet high and highly erodible. Seven photographs were taken.

Sub-reach #61 covered 750 feet. There was no evidence of recent flow. A small pocket of water was found trapped in an open joint of a Kd outcrop (Photo R61 water at 60 feet). The first 1/3 of the sub-reach was on Kd bedrock with a high silty embankment on the south side (See photo R61DS at 0 feet) and a more gradual slope into the channel from the north. In the lower 2/3 of the reach the channel was 20-30 feet wide, with a sandy/silty bottom and silty embankments. Grasses were present along the sides of the channel. A few junipers were present and a few tamarisks. Four photos were taken.

Sub-reach #62 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was very wide and sandy with little vegetation except bunches of grass. For most of the length of the channel the north side embankment was a 30 foot high cliff of Kd. An arroyo that drained by the old Marquez mine joined the channel about 30 feet below the start of the sub-reach. Along the middle section of the channel, a narrow remnant stream terrace was present between the channel and the Kd cliffs. Black and white pottery was present on this terrace, and a collapsed rock and mud structure was noted. Nine photos were taken.

Sub-reach #63 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was wide (150-200 feet at end of sub-reach) and sandy. Over much of the sub-reach a 50 foot high cliff of massive Dakota Sandstone bounded the northern side of the channel. Greenish shales of the Brushy Basin underlay the Dakota and outcropped along the channel. (See photos). The channel made a couple wide bends. Scattered grass and 4-winged salt bush with a couple tamarisk and junipers were present. Five photos were taken.

Sub-reach #64 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was wide (150 feet) and sandy with vertical silty embankments 10-15 feet high. Grasses and chamisa were present along the sides of the wide, sandy channel. Two photos were taken.

Sub-reach #65 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The channel was wide (150 feet) and sandy with vertical silty embankments 10-15 feet high. Cliffs of Dakota Sandstone bounded the

inset embankments. Grasses and chamisa were present along the sides of the wide, sandy channel. Three photos were taken.

Sub-reach #66 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The channel was wide (150 feet) and sandy with vertical silty embankments 10-15 feet high. Cliffs of Dakota Sandstone bounded the inset embankments. Grasses and chamisa were present along the sides of the wide, sandy channel. Two photos were taken.

Sub-reach #67 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The channel was wide (150feet) and sandy with vertical silty embankments 10-15feet high. Cliffs of Dakota Sandstone bounded the inset embankments. Grasses and chamisa were present along the sides of the wide, sandy channel. By the end of the reach the Kd cliffs were no longer present. Two photos were taken.

Sub-reach #68 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. Two photos were taken.

Sub-reach #69 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. Three photos were taken. Note the water tank next to the Sandoval well sampled by RHR in the first photo. At 270 feet trash was present on the north bank. Three photos were taken.

Sub-reach #70 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was about 60 feet wide and sandy, bounded by high banks of silty material. The old USGS stream flow gage was located 18 feet downstream of the start of the sub-reach. Patches of tamarisk were present, as were a number of healthy junipers trees. Vehicle tracks in the sand indicate frequent travel in the arroyo. Three photos were taken.

Sub-reach #71 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was similar to sub-reach 70. Juniper, 4-winged salt bush, and a few tamarisk were present along the sides of the channel. Two photos were taken.

Sub-reach #72 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was moderately wide, very sandy, with a high silty embankment on the south side. Scattered patches of tamarisk, over-grazed grass, and chamisa were present. Four photos were taken.

ATTACHMENT #4

SUMMARY MEMORANDUM FOR REACH #4

HYDROSCIENCE ASSOCIATES, INC.
Consulting Hydrogeologists & Engineers

P.O. Box 1994 Corrales NM 87048 Tel (505) 312-8140 mwhydrosci@yahoo.com

MEMORANDUM

TO: RHR File

FROM: M. Wasiolek/K. Peil

RE: San Mateo Creek Field trip, Reach #4

DATE: November 15, 2010

INTRODUCTION: On June 23, 2010 engineer Kelly Peil and hydrogeologist Maryann Wasiolek performed a field survey of Reach #4 of San Mateo Creek (SMC). The surveyed stream section extended from the NW of the NE ¼ of Section 22 downstream to NE ¼ of Section 6, Township 12N, Range 9W and contained 42 sub-reaches, each of 750 feet in length. Because SMC did not appear to have a defined channel within the last 6 sub-reaches, on November 4, 2010 Peil and Wasiolek re-walked this section of SMC and determined that SMC had been deliberately moved at some time in the past. The last six sub-reaches were re-surveyed and the survey was extended to the NE ¼ of Section 1, Township 12N, Range 10W where the stream channel became indistinguishable from the surrounding countryside. A total of 45 sub-reaches -#73 through #117 are included in the final Reach #4 survey described here.

The purpose of the survey was to perform a Level 1 Stream Determination of SMC in accordance with criteria detailed in NMED's Draft Hydrologic Protocol for the purpose of classifying sections of the channel as ephemeral, intermittent, or perennial. A secondary purpose of the stream survey was to do an initial assessment of the physical nature of the stream channel and the potential engineering issues that might arise if RHR discharges treated mine water into the channel. In accordance with the Protocol, Peil and Wasiolek filled out Level 1 Stream Determination Field Sheets for 45 stream sub-reaches, each of approximately 750 feet in length and took at least two photographs per sub-reach. The work was accomplished during clear, sunny days on June 23, 2010 and November 4. No precipitation had last fallen in the area for several weeks prior to each field trip. No water was encountered along the stream channel on either date. This section of the stream survey began at the lower end of the Reach #3 survey, described in a previous memorandum, and covers sub-reaches Nos. 73 through 117.

SUMMARY OF SAN MATEO CREEK FLOW: SMC rises on the northern flanks of Mt. Taylor. The upper reaches of the creek have a perennial flow fed by springs that issue from the volcanics of the mountain. About 2/3 mile above the community of San Mateo the flow of the creek is completely blocked by a dam which creates San Mateo Reservoir, a small, cattail-filled lake with a surface area of less than 10 acres. The impounded water is used for irrigation. The water is diverted from the reservoir though the bottom of the dam into a pipe, and then routed through pipes and open ditches for distribution to irrigated fields. SMC has perennial flow from its headwaters to the reservoir, intermittent flow from the reservoir to a pond on the Lee Ranch (two ponds in addition to the Lee Ranch pond exist in this section), and is ephemeral downstream from the pond except where the discharge from Bridge Spring causes pooling in the stream channel for approximately fifteen feet during the dry part of the year.

Reach #1 was defined as the 3-mile reach of SMC which extends from the community of San Mateo, west through the Lee Ranch to the bridge where State Highway 605 crosses the stream channel in the SE ¼ of Section 21. Reach #2 started at the bridge on State Highway 605 and ended south of the Schmitt Ranch headquarters in the NW ¼ Section 24, T13N, R9W. Reach #3 started where Reach #2 ended and extended to the NW of the NE ¼ of Section 22. These sections of the channel are discussed in previous memoranda. Reach #4 began where Reach #3 ended and extended about 6.5 miles downstream to the NE ¼ of Section 1 in Township 12N, Range 10W.

SUMMARY OF SUB-REACHES #73 through #117: Reach #4 began where Reach #3 ended, and extended westward approximately 6.5 stream miles to the NE ¼ of Section 1, Township 12 N, Range 10W, at which point the channel of SMC was fairly indistinguishable from the surrounding country.[2] No water was encountered along this reach of SMC. In general, the valley was a wide, low-banked arroyo cut into unconsolidated alluvial sands and silts. The "active" channel bottom ranged from very sandy, unvegetated, and up to 40 feet wide in the upper part of the reach, to covered with short grasses and four-wing salt brush and only slightly distinguishable from the main arroyo as a narrow cow path in the lower part of the reach. As the channel gradually became indistinguishable from the surrounding countryside in the lower part of the reach, the banks disappeared, the channel narrowed to a cow path, and vegetation grew within the channel. The arroyo and channel ranged from straight to broadly sinuous. Occasional clumps of tamarisk were found, but appeared to be unrelated to any regional high water table system. Figure 4 found in the summary section of this document shows the locations of the sub-reaches.

[2] A subsequent survey (San Mateo Creek Reach #5 survey) determined that at the point where Reach #4 ended, SMC had been rechanneled many years ago. Under high flow conditions the water can presently flow either west in the constructed channel or southwest until it spreads into overland flow.

No flowing water, fish, or other indication of perennial flow was found anywhere in the reach. Reach #4 was determined to be an ephemeral drainage over its entire length.

Sub-reach #73 covered 750 feet. No water was present in the arroyo, and there was no evidence of recent flow. The channel is moderately wide, with a very sandy/silty bottom and high (15 ft) silty embankments. At 210 feet there is under-cutting under the north bank (photo). At 670 feet there is a large dump of mostly glass over the right bank (photo). The channel has a broad sinuosity. Grass, four wing salt bush, and scattered bunches of tamarisk are present out of the channel. Four photos were taken.

Sub-reach #74 covered 750 feet. No water was present and there was no evidence of recent flow. The arroyo was broad, with the active channel 10 feet wide. SMC makes a 90 degree turn to the west at 450 feet and at 750 feet turns back to the south. Another channel enters from the SE at 375 feet. The channel bottom was sandy and lined with 4-wing salt brush, grass, and scattered tamarisk. A large stand of tamarisk grows at the end of the reach. Two photos were taken.

Sub-reach #75 covered 750 feet. No water was present in the arroyo, and there was no evidence of recent flow. This sub-reach was very similar to the previous one, with high banks and a sandy/silty-bottomed channel. An extensive stand of tamarisk was present along the first half of the reach. Trash was present on the west bank at several locations. Two photos were taken.

Sub-reach #76 covered 750 feet. No water was present and there was no evidence of recent flow. The "active" channel was about 15 feet wide and sandy. The entire valley was broad and flat and bounded by high, erodible banks. The potential exists for erosion of the banks at channel bends. An extensive trash dump stabilized the north bank for about 300 feet, centered at 375 feet. Salt cedar and grass dominated; tamarisks disappeared. Three photos were taken.

Sub-reach #77 covered 750 feet. No water was present and there was no evidence of recent flow. The valley was very wide (100 feet) and vegetated with grass and chamisa, with the "active" channel moderately entrenched and sandy. Banks were 8 feet high. Two photos were taken.

Sub-reach #78 covered 750 feet. No water was present and there was no evidence of recent flow. Conditions were very similar to sub-reach #77. The embankments were heavily vegetated with grass, 4-wing salt bush and other scrub plants. The stream channel was very sandy with small dunes and wind-caused ripples. Two photos were taken.

Sub-reach #79 covered 750 feet. No water was present and there was no evidence of recent flow. Sub-reach #79 is similar to previous sub-reach. SMC valley was 100 feet wide; the channel 10 feet wide, and the embankment 12 feet in height. The valley and channel were very sandy with some grass, scrub, and scattered tamarisk. At the end of the sub-reach a power line crosses and a small trash dump is present on the right (facing downstream). Two photos were taken.

Sub-reach #80 covered 750 feet. No water was present and there was no evidence of recent flow. SMC broadened to 150 feet with an "active" channel 12 to 15 feet in width. Embankments were about 10 to 15 feet high. The channel was very sandy and turned to the southwest. Grass, scrub plants and occasional tamarisk grew between the bank and the edge of the channel. Two photos were taken.

Sub-reach #81 covered 750 feet. No water was present and there was no evidence of recent flow. SMC was broad but closing to 75 feet in width, straight, and with a 20 foot high south embankment. The central channel was 10 feet in width and 2 feet deep and very sandy. Grass, scrub plants and occasional tamarisk grew between the bank and the edge of the channel. Two photos were taken.

Sub-reach #82 covered 750 feet. No water was present and there was no evidence of recent flow. Sub-reach #82 was similar to the previous sub-reach, with a very sandy channel lined with small dunes on one side, a broad valley and scattered tamarisk, chamisa, and grass growing between the channel and the embankment. Arroyo del Puerto enters SMC near the end of the sub-reach. Three photos were taken.

Sub-reach #83 covered 750 feet. No water was present and there was no evidence of recent flow. SMC valley turned to the south and the embankment gradually flattened and became grass-covered. The central channel was 20-25 wide and extremely sandy with small dunes. Two photos were taken.

Sub-reach #84 covered 750 feet. No water was present and there was no evidence of recent flow. The main arroyo was very wide (to 200 feet) with a central sandy channel 10-12 feet wide. The right bank was almost gone; the left bank 8 feet high. Low sand dunes were present. Low grasses, very scattered tamarisk, and chamisa were present. A few pottery shards were present in the channel at 100 feet. Two photos were taken.

Sub-reach #85 covered 750 feet. No water was present and there was no evidence of recent flow. The sub-reach was similar to #84. The main arroyo was broad, grassed, and sandy with a 5-6 foot central sandy channel. Two photographs were taken.

Sub-reach #86 covered 750 feet. There was no evidence of recent flow. The arroyo swings wide to the north and is broad, grassed, and sandy. The left (downstream-facing) bank is 15 feet tall; the right bank is a grassy slope. The central channel was five feet wide, 2 feet deep and sandy. Scattered pottery shards were present. At the end of the sub-reach tamarisk stands were present. Two photos were taken.

Sub-reach #87 covered 750 feet. No water was present and there was no evidence of recent flow. The stream course and channel were similar to #86. The canyon was to 150 feet wide, grassed on the banks and sandy. The main channel was five feet wide, 2 feet deep and sandy. A stand of tamarisks was present at the beginning of the sub-reach. Scattered pottery shards were present in the channel. Two photos were taken.

Sub-reach #88 covered 750 feet. No water was present and there was no evidence of recent flow. SMC trended west and then bent to the south, opening wider (to 180-210feet) and becoming silty/sandy. The main channel also widened and became shallower and siltier. Scattered tamarisk were present, but thin grass dominated. Two photos were taken.

Sub-reach #89 covered 750 feet. No water was present and there was no evidence of recent flow. SMC trended basically south. From bank to bank SMC was 90 feet wide with banks from 6 to 10 feet. The central channel narrowed and disappeared, with grasses and scattered rooted bushes growing from bank to bank. Pottery shards were found in the channel at 100 feet. Two photos were taken.

Sub-reach #90 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The channel was wide (120feet) and silty/sandy with vertical banks. The main channel was ill-defined and the entire area between the banks was heavily grassed. Two photos were taken.

Sub-reach #91 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The main SMC was 120 feet wide and bounded by 6 foot banks. The central channel was entrenched and undefined. Short, over-grazed grass and very scattered tamarisk were present. Two photos were taken.

Sub-reach #92 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The main SMC was 120 feet

wide and bounded by 6 foot banks. The central channel was entrenched and undefined. Short, over-grazed grass and very scattered tamarisk were present. Two photos were taken.

Sub-reach #93 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The small channel was grassed and entrenched. Two photos were taken.

Sub-reach #94 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. From bank to bank SMC was 60 feet wide with 2 foot banks. The central channel was entrenched and grassed, with a few rooted bushes. A dry tank was present just above the end of the sub-reach. Scattered painted pottery shards were present in the channel. Two photos were taken.

Sub-reach #95 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was about 120 feet wide, silty/sandy, heavily grassed and bounded by high banks of silty material. Tamarisk stands were present near where an arroyo from the NW joins SMC. The central channel was entrenched and grassed. Two photos were taken.

Sub-reach #96 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was similar to sub-reach 95. SMC was wide and grassed. The main channel was entrenched, grassed, and almost indistinguishable. Grass, 4-winged salt bush, and a few tamarisk were present along the channel. At 600 feet, where the channel made a 90 degree turn west, a man-made dam was present in the channel. Three photos were taken.

Sub-reach #97 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was mostly entrenched and vegetated with grass, 4 wing sand bush and a few tamarisk. Where defined, it was 2-5 feet wide and moved from side to side, across the broad course of SMC. An apparent prospect pit was present near the beginning of the reach. A stand of scrub willow was present at the lower end of the sub-reach. An old home and windmill were located to the west at the end of the reach. Two photos were taken.

Sub-reach #98 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was similar to sub-reach 96-97. SMC was wide and grassed. The main channel was entrenched, grassed, and almost indistinguishable. Grass, 4-winged salt bush, and a few tamarisk were present along

the channel. The channel bends west near the end of the reach and then back south again. Trash was present on the right bank at 750 feet. Two photos were taken.

Sub-reach #99 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was similar to sub-reaches 96-98, with a shallow, broad streambed with low embankments, and a small central channel, where present. SMC was wide and grassed. The main channel was entrenched, grassed, and almost indistinguishable in most areas, although at the beginning of the reach it was 3 feet wide and downcut. In this area the right side of the channel embankment was undercut. Grass, 4-winged salt bush, and a few tamarisk were present along the channel. Short sections of tamarisk were present. Two photos were taken.

Sub-reach #100 covered 750 feet. No water was present and there was no evidence of recent flow. The channel was similar to sub-reaches 96-99, with a shallow, broad streambed with low embankments, and a small central channel, where present. SMC was 75 feet wide and grassed up the sloping embankments. The main channel was entrenched, grassed, and almost indistinguishable in most areas, and in some 2 feet wide and 1-2 feet deep. Grass, 4-winged salt bush, and a few tamarisk were present along the channel. Two photos were taken.

Sub-reach #101 covered 750 feet. No water was present and there was no evidence of recent flow. SMC arroyo is flattening even more and blending with the surrounding countryside. The central channel was a grassy indentation. Grasses and 4 wing salt bush dominated. The area is silty/sandy. At 354 feet a fence crossed the sub-reach. Two photos were taken.

Sub-reach #102 covered 750 feet. No water was present and there was no evidence of recent flow. SMC was a broad, shallow valley that was heavily vegetated with grasses and four-wing salt bush. The valley blended into the surrounding countryside. The central channel was a grassy, sandy cow path. Two photos were taken.

Sub-reach #103 covered 750 feet. No water was present and there was no evidence of recent flow. SMC was a broad, shallow valley that was heavily vegetated with grasses and four-wing salt bush. The valley blended into the surrounding countryside. The central channel was a grassy, sandy cow path. Two photos were taken.

Sub-reach #104 covered 750 feet. No water was present and there was no evidence of recent flow. SMC was a broad, shallow valley that was heavily vegetated with grasses and four-wing salt bush. The valley blended into the surrounding countryside except that along one side of the valley was a low, eroded embankment. The central channel ranged from 2 feet wide to non-existent. The entire valley was covered in grass and four winged salt brush. Two photos were taken.

Sub-reach #105 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. Two photos were taken.

Sub-reach #106 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. Two photos were taken.

Sub-reach #107 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. Two photos were taken.

Sub-reach #108 covered 750 feet. No water was present and there was no evidence of recent flow. Sub-reach #108 is the first reach walked on 11/04/2010 and replaces a sub-reach walked on June, 23, 2010 that continued south until the channel disappeared into overland flow. Sub-reach begins where SMC was split with a man-made diversion structure that is now greatly eroded and difficult to see. The course of the re-routed SMC turns to northwest. At the beginning of sub-reach #108 the channel is a sandy, entrenched, grassy cow path overgrown with snakeweed and four winged salt brush. Five photos were taken.

Sub-reach #109 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The channel has slight sinuosity. The main valley (re-channeled) is 100 feet wide. Grasses and snakeweed, and four-winged salt brush fill the channel and surrounding area. Two photos were taken.

Sub-reach #110 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The channel has slight sinuosity. The main valley (re-channeled) is 125 feet wide. Grasses and snakeweed, and four-winged salt brush fill the channel and surrounding area. Prairie dog holes were present in the channel. Two photos were taken.

Sub-reach #111 covered 750 feet. No water was present and there was no evidence of recent flow. The man-made nature of the channel is more obvious. The valley was 100 feet wide and bounded by tamarisk-covered, man-made embankments. The bottom of the valley was grassy and sandy with a few snake week and four-winged salt brush. The central channel was flat and sandy. Two photos were taken.

Sub-reach #112 covered 750 feet. No water was present and there was no evidence of recent flow. The channel continued to run through a water course defined by man-made embankments about 5 feet high and 50 feet wide. Tamarisk grew on the embankments; the valley was heavily grassed and silty with scattered four winged salt brush.

Sub-reach #113 covered 750 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The valley bottom was very sandy, grassy, with scattered tamarisks. The low banks were covered with grass and four winged salt brush. Two photos were taken.

Sub-reach #114 covered 375 feet. No water was present and there was no evidence of recent flow. The physical attributes of this reach were similar to that of the previous reach. The low embankments were eroded and grassed. The sub-reach ended at the east side of three large culverts that passed under NM 605. Two photos were taken.

Sub-reach #115 covered 750 feet. No water was present and there was no evidence of recent flow. This sub-reach began with the width of NM 605 and the three culverts. The channel appeared to be constructed to direct the flow to the southwest. The valley bottom was very sandy, grassy, with tamarisks lining the shallow valley. A central channel was not present. One photo, facing downstream from the start of the sub-reach, was taken.

Sub-reach #116 covered 750 feet. No water was present and there was no evidence of recent flow. The valley bottom was very sandy, grassy, with scattered tamarisks throughout the shallow valley. The constructed channel was evident at the beginning and the banks decreased in height as the sub-reach continued. A central channel was not present. Two photos were taken.

Sub-reach #117 covered 750 feet. No water was present and there was no evidence of recent flow. The valley bottom was very sandy, grassy and blended in with the surrounding countryside until it changed to overland flow. A central channel was not present. Two photos were taken.

Appendix 8-B

Chemistry of Surface Water and Springs in RHR area

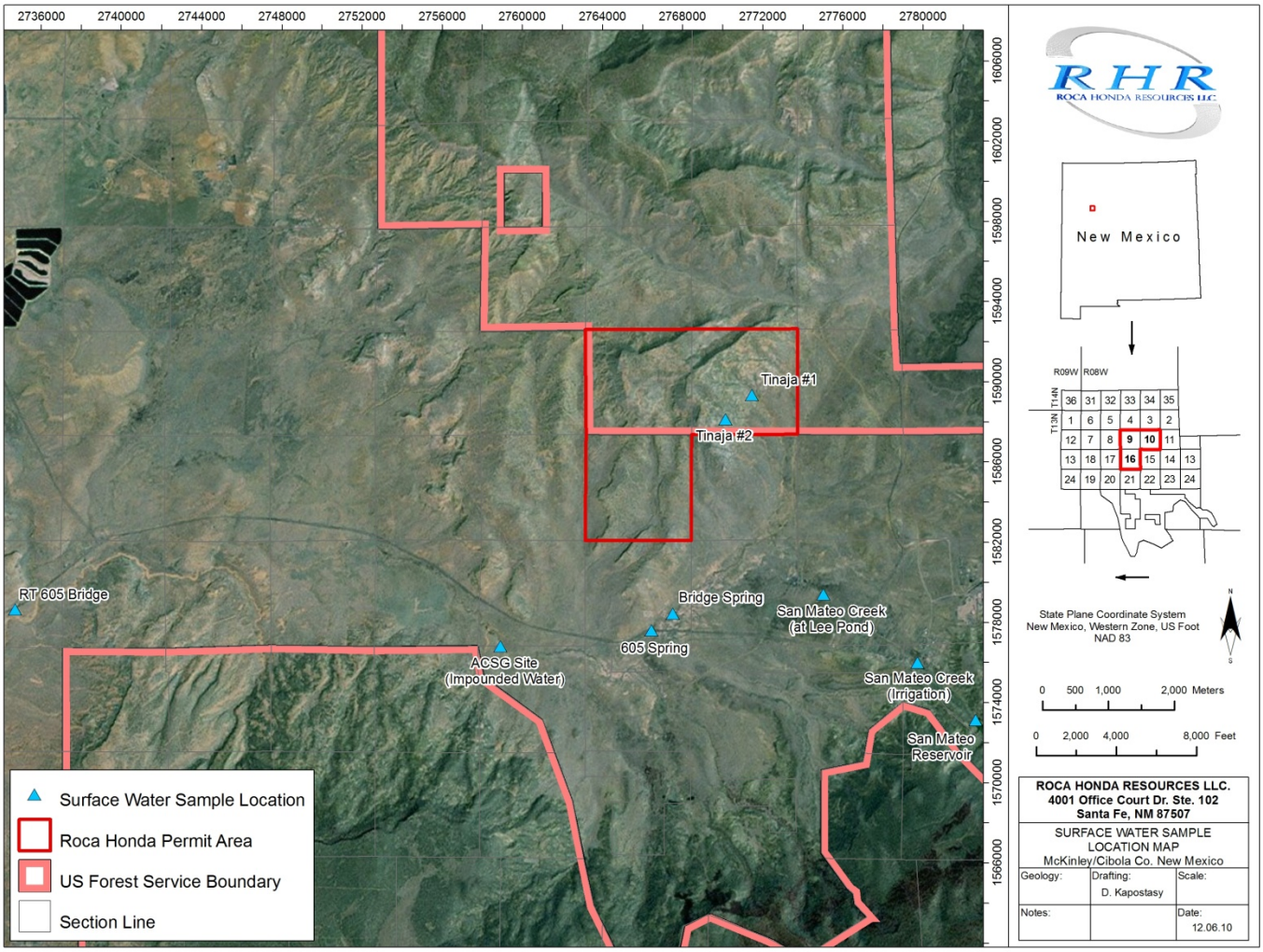

Figure 8-B-1. Surface Water Sampling Locations

Table B-1. Surface Water Sampling Results (Page 1 of 7)

Location Name	RT 605 Bridge	San Mateo Reservoir		San Mateo Creek (Irrigation)		San Mateo Creek (at Lee Pond)		ACSG Site (Impounded Water)		605 Spring		Bridge Spring		Sec. 10 Tinaja #1		Sec. 10 Tinaja #2		UNITS	R.L.	METHOD
Date	9/16/2008	5/6/2010	10/7/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/25/2010	5/6/2010	10/7/2010	5/6/2010	10/7/2010			
Sample ID	605 Bridge SW1	RH10-SW-0001	RH10-SW-0006	RH10-SW-0005	RH10-SW-0009	No Sample	No Sample	No Sample	RH10-SW-0008	RH10-SW-0004	RH10-SW-0007	No Sample	RH10-SW-0010	RH10-SW-0002	No Sample	RH10-SW-0003	No Sample			
Condition (Wet/Dry)	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Wet	Wet	Wet	Dry	Wet	Wet	Dry	Wet	Dry			
FIELD MEASUREMENTS																				
pH	-	7.92	7.65	8.24	8.27	-	-	-	7.30	9.22	8.86	-	8.38	8.30	-	8.31	-	s.u.	HANNA Multi-meter	
Conductivity	-	169	229	181	147	-	-	-	1076	1800	1149	-	585	95	-	91	-	umhos/cm	HANNA Multi-meter	
Temperature	-	51.47	48.31	51.81	52.29	-	-	-	50.42	40.31	52.92	-	47.70	48.14	-	56.56	-	degrees F	HANNA Multi-meter	
Dissolved Oxygen	-	31.1	8.2	41.6	34	-	-	-	19.7	40	38.7	-	100.3	37.7	-	42.7	-	%	HANNA Multi-meter	
Total Dissolved Solids, TDS	-	85	115	91	73	-	-	-	538	900	575	-	293	47	-	46	-	mg/l	HANNA Multi-meter	
Salinity	-	-	0.11	0.09	0.07	-	-	-	0.54	0.91	0.58	-	0.29	-	-	0.04	-	%	HANNA Multi-meter	
Turbidity	-	16.57	189	19.19	17.63	-	-	-	>1000	78	84	-	757	15.73	-	26.39	-	t.u.	HANNA Multi-meter	
MICROBIOLOGICAL																				
Bacteria, E-Coli Coliform	-	<1	860	20.1	27.5	-	-	-	>4839.2	195.6	-	-	2176	<1	-	<1	-	MPN/100mL	1.0	A9223 B
Bacteria, Total Coliform	-	1553	>24196	>2419.6	>2419.6	-	-	-	>4839.2	365.4	-	-	>12098	613.1	-	>2419.6	-	MPN/100mL	1.0	A9223 B
MAJOR IONS																				
Alkalinity, Phenolphthalein as CaCO3	-	ND	ND	ND	ND	-	-	-	ND	31	6	-	ND	ND	-	ND	-	mg/L	5	A2320 B
Alkalinity, Total as CaCO3	260	87	142	99	81	-	-	-	520	542	356	-	206	37	-	43	-	mg/L	5	A2320 B
Carbonate as CO3	-	ND	ND	ND	ND	-	-	-	ND	37	7	-	ND	ND	-	ND	-	mg/L	5	A2320 B
Bicarbonate as HCO3	-	106	173	120	98	-	-	-	634	587	419	-	252	46	-	52	-	mg/L	5	A2320 B
Calcium	72	17	34	22	15	-	-	-	78	43	43	-	13	14	-	16	-	mg/L	1	E200.7
Chloride	-	2	3	2	2	-	-	-	47	160	66	-	25	1	-	ND	-	mg/L	1	E300.0
Fluoride	-	0.2	0.3	0.2	0.2	-	-	-	0.9	2.0	1.2	-	1.2	ND	-	ND	-	mg/L	0.1	A4500-F C
Magnesium	14	4	6	5	3	-	-	-	19	20	12	-	4	1	-	1	-	mg/L	1	E200.7
Nitrogen, Kjeldahl, Total as N	2.0	0.6	5.5	ND	ND	-	-	-	18	1.4	1.8	-	8	0.6	-	0.7	-	mg/L	0.5	E351.2
Nitrogen, Nitrate as N	-	ND	ND	ND	ND	-	-	-	ND	ND	-	-	ND	ND	-	ND	-	mg/L	0.1	E353.2
Nitrogen, Nitrate + Nitrite as N	ND	ND	ND	ND	0.01	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.1	E353.2
Nitrogen, Nitrite as N	ND	ND	ND	ND	ND	-	-	-	ND	ND	-	-	ND	ND	-	ND	-	mg/L	0.1	A4500-NO2 B
Phosphate, Total	-	0.580	5.06	0.583	0.140	-	-	-	43.8	1.32	0.555	-	19.3	0.205	-	0.258	-	mg/L	0.003	Calc.
Phosphorus, Total as P	0.26	0.189	1.65	0.190	0.040	-	-	-	14.3	0.43	0.181	-	6.3	0.067	-	0.084	-	mg/L	0.005	E365.1
Potassium	11	5	6	4	3	-	-	-	15	8	6	-	5	2	-	2	-	mg/L	1	E200.7
Sulfate	39	2	4	6	2	-	-	-	74	207	183	-	85	7	-	4	-	mg/L	1	E300.0
NON-METALS																				
Cyanide, Total	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.005	Kelada mod
PHYSICAL PROPERTIES																				
Color	5.0	50.0	20.0	10.0	10.0	-	-	-	60.0	200	-	-	100.0	30.0	-	50.0	-	c.u.	5.0	A2120 B
Conductivity	-	166	261	191	147	-	-	-	1160	1770	1190	-	609	93	-	92	-	umhos/cm	1	A2510 B
Hardness as CaCO3	235	58	108	75	51	-	-	-	273	190	157	-	51	41	-	45	-	mg/L	1	A2340 B
Odor	NOO	2	8	NOO	NOO	-	-	-	50	NOO	-	-	NOO	NOO	-	NOO	-	T.O.N	1	A2150 B
pH	8.10	7.00	7.40	7.75	8.22	-	-	-	7.77	8.75	8.46	-	8.25	7.33	-	7.42	-	s.u.	0.01	A4500-H B
Solids, TDS @ 180 C	-	110	166	147	126	-	-	-	787	1170	882	-	496	36	-	62	-	mg/L	10	A2540 C
Solids, Total Settleable	-	1.5	-	ND	ND	-	-	-	72.0	ND	ND	-	110	1.0	-	ND	-	mL/L	0.5	A2540 F

Table B-1. Surface Water Sampling Results (Page 2 of 7)

Location Name	RT 605 Bridge	San Mateo Reservoir		San Mateo Creek (Irrigation)		San Mateo Creek (at Lee Pond)		ACSG Site (Impounded Water)		605 Spring		Bridge Spring		Sec. 10 Tinaja #1		Sec. 10 Tinaja #2		UNITS	R.L.	METHOD
Date	9/16/2008	5/6/2010	10/7/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/25/2010	5/6/2010	10/7/2010	5/6/2010	10/7/2010			
Sample ID	605 Bridge SW1	RH10-SW-0001	RH10-SW-0006	RH10-SW-0005	RH10-SW-0009	No Sample	No Sample	No Sample	RH10-SW-0008	RH10-SW-0004	RH10-SW-0007	No Sample	RH10-SW-0010	RH10-SW-0002	No Sample	RH10-SW-0003	No Sample			
Condition (Wet/Dry)	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Wet	Wet	Wet	Dry	Wet	Wet	Dry	Wet	Dry			
METALS-DISSOLVED																				
Aluminum	ND	ND	0.1	ND	ND	-	-	-	0.1	ND	0.2	-	1.2	ND	-	0.2	-	mg/L	0.1	E200.8
Antimony	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.05	E200.8
Arsenic	0.011	0.001	0.013	0.001	0.001	-	-	-	0.016	0.013	0.003	-	0.015	ND	-	0.001	-	mg/L	0.001	E200.8
Barium	0.1	ND	0.1	ND	ND	-	-	-	0.2	ND	ND	-	ND	ND	-	ND	-	mg/L	0.1	E200.8
Beryllium	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.01	E200.8
Boron	0.1	ND	ND	ND	ND	-	-	-	0.1	0.3	0.2	-	0.1	ND	-	ND	-	mg/L	0.1	E200.7
Cadmium	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.01	E200.8
Chromium	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.05	E200.8
Cobalt	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.01	E200.8
Copper	ND	ND	ND	ND	ND	-	-	-	ND	0.02	ND	-	0.02	ND	-	ND	-	mg/L	0.01	E200.8
Iron	ND	ND	0.08	ND	0.06	-	-	-	0.10	0.12	0.12	-	1.41	0.07	-	0.13	-	mg/L	0.03	E200.7
Lead	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.05	E200.8
Manganese	0.02	ND	0.09	ND	ND	-	-	-	0.90	ND	ND	-	0.02	ND	-	ND	-	mg/L	0.01	E200.8
Molybdenum	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.1	E200.8
Nickel	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.05	E200.8
Silver	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.01	E200.8
Thallium	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.1	E200.8
Uranium	0.0087	ND	0.0035	ND	0.0005	-	-	-	0.0256	0.0325	0.0174	-	0.0071	ND	-	ND	-	mg/L	0.0003	E200.8
Vanadium	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	0.1	E200.8
Zinc	0.01	ND	ND	0.01	ND	-	-	-	ND	0.01	ND	-	0.01	ND	-	ND	-	mg/L	0.01	E200.8
METALS-TOTAL																				
Mercury	ND	ND	ND	ND	ND	-	-	-	0.0008	ND	ND	-	0.0004	ND	-	ND	-	mg/L	0.0001	E245.1
Uranium	-	ND	0.0016	ND	0.0003	-	-	-	0.0614	0.0324	0.0189	-	0.0226	0.0003	-	ND	-	mg/L	0.0003	E200.8
METALS-TOTAL RECOVERABLE																				
Selenium	0.002	ND	ND	ND	ND	-	-	-	0.008	0.003	ND	-	0.0040	ND	-	ND	-	mg/L	0.001	E200.8

Table B-1. Surface Water Sampling Results (Page 3 of 7)

Location Name	RT 605 Bridge	San Mateo Reservoir		San Mateo Creek (Irrigation)		San Mateo Creek (at Lee Pond)		ACSG Site (Impounded Water)		605 Spring		Bridge Spring		Sec. 10 Tinaja #1		Sec. 10 Tinaja #2		UNITS	R.L.	METHOD
Date	9/16/2008	5/6/2010	10/7/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/25/2010	5/6/2010	10/7/2010	5/6/2010	10/7/2010			
Sample ID	605 Bridge SW1	RH10-SW-0001	RH10-SW-0006	RH10-SW-0005	RH10-SW-0009	No Sample	No Sample	No Sample	RH10-SW-0008	RH10-SW-0004	RH10-SW-0007	No Sample	RH10-SW-0010	RH10-SW-0002	No Sample	RH10-SW-0003	No Sample			
Condition (Wet/Dry)	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Wet	Wet	Wet	Dry	Wet	Wet	Dry	Wet	Dry			
RADIONUCLIDES-TOTAL																				
Gross Alpha	-	-0.3	-0.7	-0.5	-2.0	-	-	-	24.2	46.3	12.8	-	12.1	1.1	-	2.9	-	pCi/L		E900.0
Gross Alpha precision (+/-)	-	1.1	8.9	1.1	1.2	-	-	-	15.4	7.9	5.0	-	4.9	1	-	1.1	-	pCi/L		E900.0
Gross Alpha MDC	-	1.9	15.1	2.0	2.3	-	-	-	23.6	8.6	7.3	-	7.0	1.5	-	1.5	-	pCi/L		E900.0
Radium 226	-	-0.09	1.4	-0.2	-0.10	-	-	-	0.93	0.24	0.11	-	1.20	0.06	-	-0.007	-	pCi/L		E903.0
Radium 226 precision (+/-)	-	0.06	0.29	0.09	0.06	-	-	-	0.20	0.17	0.11	-	0.25	0.09	-	0.08	-	pCi/L		E903.0
Radium 226 MDC	-	0.14	0.21	0.21	0.16	-	-	-	0.15	0.22	0.16	-	0.19	0.15	-	0.15	-	pCi/L		E903.0
Radium 228	-	0.2	2.3	0.16	-0.2	-	-	-	2.1	0.70	0.55	-	2.2	0.22	-	0.17	-	pCi/L		RA-05
Radium 228 precision (+/-)	-	0.52	0.92	0.62	0.60	-	-	-	0.87	0.68	0.61	-	0.77	0.56	-	0.55	-	pCi/L		RA-05
Radium 228 MDC	-	0.89	1.4	1.0	1.0	-	-	-	1.3	1.1	0.99	-	1.1	0.93	-	0.92	-	pCi/L		RA-05
Radium 226+Radium 228	-	-0.3	3.6	0.007	-0.3	-	-	-	3.1	0.9	0.7	-	3.4	0.3	-	0.2	-	pCi/L		A7500-RA
Radium 226+Radium 228 precision (+/-)	-	0.3	0.5	0.3	0.3	-	-	-	0.4	0.3	0.3	-	0.4	0.3	-	0.3	-	pCi/L		A7500-RA
Radium 226+Radium 228 MDC	-	0.9	1.4	1.1	1.0	-	-	-	1.3	1.1	1.0	-	1.1	0.9	-	0.9	-	pCi/L		A7500-RA
Radon 222	-	191	65.3	291	49.9	-	-	-	45.5	152	33.6	-	3	-80.7	-	256	-	pCi/L	100	D5072-92
Radon 222 precision (+/-)	-	72.9	39.9	86.8	38.3	-	-	-	38.8	84.7	79.7	-	47.5	66.8	-	73.1	-	pCi/L		D5072-92
Strontium 90	1.1	-0.1	-0.8	0.4	-0.2	-	-	-	0.8	0.4	0.6	-	0.8	0.6	-	-0.1	-	pCi/L		E905.0
Strontium 90 precision (+/-)	2.7	0.9	2.1	0.9	1.5	-	-	-	2.3	0.9	2.3	-	4.5	0.9	-	0.9	-	pCi/L		E905.0
Strontium 90 MDC	-	1.2	3.0	1.2	2.1	-	-	-	3.3	1.1	4.0	-	6.8	1.1	-	1.1	-	pCi/L		E905.0
Thorium 228	-0.1	0.03	0.4	0.2	0.03	-	-	-	0.3	0.3	0.08	-	0.07	0.09	-	0.1	-	pCi/L		E907.0
Thorium 228 precision (+/-)	0.2	0.1	0.2	0.2	0.07	-	-	-	0.2	0.2	0.09	-	0.1	0.1	-	0.1	-	pCi/L		E907.0
Thorium 228 MDC	-	0.3	0.2	0.3	0.1	-	-	-	0.2	0.2	0.1	-	0.2	0.2	-	0.2	-	pCi/L		E907.0
Thorium 230	0.2	-0.2	0.05	0.1	-0.1	-	-	-	0.1	0.09	0.02	-	0.08	-0.03	-	0.01	-	pCi/L		E907.0
Thorium 230 precision (+/-)	0.1	0.2	0.2	0.2	0.1	-	-	-	0.2	0.2	0.1	-	0.2	0.1	-	0.1	-	pCi/L		E907.0
Thorium 230 MDC	-	0.4	0.2	0.3	0.1	-	-	-	0.2	0.3	0.1	-	0.3	0.2	-	0.2	-	pCi/L		E907.0
Thorium 232	0.0	-0.04	0.07	0.03	0.03	-	-	-	0.05	0.3	0.05	-	0.07	0.06	-	-0.003	-	pCi/L		E907.0
Thorium 232 precision (+/-)	0.1	0.1	0.1	0.1	0.06	-	-	-	0.1	0.2	0.09	-	0.1	0.09	-	0.08	-	pCi/L		E907.0
Thorium 232 MDC	-	0.3	0.2	0.3	0.1	-	-	-	0.3	0.3	0.1	-	0.2	0.1	-	0.2	-	pCi/L		E907.0
Tritium	-69.5	42.8	-361.5	68.9	-210.4	-	-	-	381.2	-530	-310.4	-	-531.6	-9.5	-	19	-	pCi/L	1200	E906.0
Tritium precision (+/-)	720	480	280	480	310.0	-	-	-	320.0	460	300	-	320.0	480	-	480	-	pCi/L		E906.0
DATA QUALITY																				
A/C Balance (+/- 5)	-	-3.12	-4.29	1.74	-7.06	-	-	-	-3.57	1.24	-2.63	-	-1.14	-0.654	-	0.541	-	%		Calc.
Anions	-	1.85	3.03	2.16	1.72	-	-	-	13.3	19.8	12.8	-	6.68	0.937	-	0.970	-	meq/L		Calc.
Cations	-	1.74	2.78	2.23	1.50	-	-	-	12.4	20.3	12.2	-	6.53	0.925	-	0.981	-	meq/L		Calc.
Solids, Total Dissolved Calc.	-	156	195	172	1.49	-	-	-	707	1150	733	-	401	53.0	-	54.0	-	mg/L		Calc.
TDS Balance (0.80 - 1.20)	-	0.710	0.850	0.850	0.850	-	-	-	1.11	1.02	1.20	-	1.24	0.680	-	1.15	-			Calc.

Table B-1. Surface Water Sampling Results (Page 4 of 7)

Location Name	RT 605 Bridge	San Mateo Reservoir		San Mateo Creek (Irrigation)		San Mateo Creek (at Lee Pond)		ACSG Site (Impounded Water)		605 Spring		Bridge Spring		Sec. 10 Tinaja #1		Sec. 10 Tinaja #2		UNITS	R.L.	METHOD
Date	9/16/2008	5/6/2010	10/7/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/25/2010	5/6/2010	10/7/2010	5/6/2010	10/7/2010			
Sample ID	605 Bridge SW1	RH10-SW-0001	RH10-SW-0006	RH10-SW-0005	RH10-SW-0009	No Sample	No Sample	No Sample	RH10-SW-0008	RH10-SW-0004	RH10-SW-0007	No Sample	RH10-SW-0010	RH10-SW-0002	No Sample	RH10-SW-0003	No Sample			
Condition (Wet/Dry)	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Wet	Wet	Wet	Dry	Wet	Wet	Dry	Wet	Dry			
VOLATILE ORGANIC COMPOUNDS																				
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,1-Dichloroethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,1-Dichloroethene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,1-Dichloropropene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,2-Dibromoethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,2-Dichloroethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,2-Dichloropropane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,3-Dichloropropane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
2,2-Dichloropropane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
2-Chlorotoluene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
4-Chlorotoluene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Acetone	ND	ND	ND	ND	ND	-	-	-	53.6	ND	ND	-	ND	ND	-	ND	-	ug/L	20.0	E624
Acetonitrile	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10.0	E624
Acrolein	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10.0	E624
Acrylonitrile	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10.0	E624
Benzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Bromobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Bromochloromethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Bromodichloromethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Bromoform	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Bromomethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Carbon disulfide	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Carbon tetrachloride	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Chlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Chlorodibromomethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Chloroethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Chloroform	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Chloromethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Dibromomethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Dichlorodifluoromethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Ethylbenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
m+p-Xylenes	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624

Table B-1. Surface Water Sampling Results (Page 5 of 7)

Location Name	RT 605 Bridge	San Mateo Reservoir		San Mateo Creek (Irrigation)		San Mateo Creek (at Lee Pond)		ACSG Site (Impounded Water)		605 Spring		Bridge Spring		Sec. 10 Tinaja #1		Sec. 10 Tinaja #2		UNITS	R.L.	METHOD
Date	9/16/2008	5/6/2010	10/7/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/25/2010	5/6/2010	10/7/2010	5/6/2010	10/7/2010			
Sample ID	605 Bridge SW1	RH10-SW-0001	RH10-SW-0006	RH10-SW-0005	RH10-SW-0009	No Sample	No Sample	No Sample	RH10-SW-0008	RH10-SW-0004	RH10-SW-0007	No Sample	RH10-SW-0010	RH10-SW-0002	No Sample	RH10-SW-0003	No Sample			
Condition (Wet/Dry)	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Wet	Wet	Wet	Dry	Wet	Wet	Dry	Wet	Dry			
VOLATILE ORGANIC COMPOUNDS (Continued)																				
Methyl ethyl ketone	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	20.0	E624
Methyl isobutyl ketone	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	20.0	E624
Methyl tert-butyl ether (MTBE)	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	2.00	E624
Methylene chloride	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Naphthalene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
o-Xylene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Styrene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Tetrachloroethene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Toluene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Trichloroethene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Trichlorofluoromethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Vinyl acetate	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Vinyl chloride	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Xylenes, Total	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	1.00	E624
Surr: 1,2-Dichlorobenzene-d4	106	105	134	105	135	-	-	-	118	106	134	-	103	105	-	106	-	% REC	80-120	E624
Surr: Dibromofluormethane	128	113	94.0	111	92.0	-	-	-	94.0	109	94.0	-	96	110	-	105	-	% REC	80-120	E624
Surr: p-Bromofluorobenzene	100	110	115	118	114	-	-	-	98.0	119	114	-	105	111	-	110	-	% REC	80-120	E624
Surr: Toluene-d8	100	101	97.0	106	95.0	-	-	-	97.0	107	96.0	-	102	101	-	101	-	% REC	80-120	E624
ORGANIC CHARACTERISTICS																				
Oil & Grease (HEM)	-	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	mg/L	10	E1664A
SYNTHETIC ORGANIC COMPOUNDS																				
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2,4-Dichlorophenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2,4-Dimethylphenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2,4-Dinitrophenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2-Chloronaphthalene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2-Chlorophenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
2-Nitrophenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
4,6-Dinitro-2-methylphenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	50	E625
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
4-Chloro-3-methylphenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
4-Nitrophenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	50	E625

Table B-1. Surface Water Sampling Results (Page 6 of 7)

Location Name	RT 605 Bridge	San Mateo Reservoir		San Mateo Creek (Irrigation)		San Mateo Creek (at Lee Pond)		ACSG Site (Impounded Water)		605 Spring		Bridge Spring		Sec. 10 Tinaja #1		Sec. 10 Tinaja #2		UNITS	R.L.	METHOD
Date	9/16/2008	5/6/2010	10/7/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/25/2010	5/6/2010	10/7/2010	5/6/2010	10/7/2010			
Sample ID	605 Bridge SW1	RH10-SW-0001	RH10-SW-0006	RH10-SW-0005	RH10-SW-0009	No Sample	No Sample	No Sample	RH10-SW-0008	RH10-SW-0004	RH10-SW-0007	No Sample	RH10-SW-0010	RH10-SW-0002	No Sample	RH10-SW-0003	No Sample			
Condition (Wet/Dry)	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Wet	Wet	Wet	Dry	Wet	Wet	Dry	Wet	Dry			
SYNTHETIC ORGANIC COMPOUNDS (Continued)																				
Acenaphthene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Acenaphthylene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Anthracene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Azobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Benzidine	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	20	E625
Benzo(a)anthracene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Benzo(a)pyrene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Benzo(k)fluorathene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
bis(-2-chloroethoxy)Methane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
bis(-2-chloroethyl)Ether	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
bis(2-chloroisopropyl)Ether	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
bis(2-ethylhexyl)Phthalate	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Butylbenzylphthalate	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Chrysene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Diethyl phthalate	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Dimethyl phthalate	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Di-n-butyl phthalate	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Di-n-octyl phthalate	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Fluoranthene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Fluorene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Hexachlorobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Hexachlorobutadiene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Hexachloroethane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Ideno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Isophorone	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Naphthalene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Nitrobenzene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
n-Nitrosodimethylamine	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
n-Nitroso-di-n-propylamine	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
n-Nitrosodiphenylamine	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Pentachlorophenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	50	E625
Phenanthrene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Phenol	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Pyrene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	10	E625
Surr: 2,4,6-Tribromophenol	86.0	33.0	43.0	45.0	43.0	-	-	-	35.0	44.0	46.0	-	49.0	44.0	-	38.0	-	% REC	26-116	E625
Surr: 2-Fluorobiphenyl	72.0	30.0	32.0	46.0	38.0	-	-	-	26.0	45.0	40.0	-	40.0	40.0	-	38.0	-	% REC	25-94	E625
Surr: 2-Fluorophenol	48.0	21.0	28.0	24.0	23.0	-	-	-	21.0	26.0	27.0	-	27.0	21.0	-	21.0	-	% REC	11-67	E625
Surr: Nitrobenzene-d5	71.0	26.0	41.0	42.0	45.0	-	-	-	30.0	49.0	41.0	-	46.0	37.0	-	37.0	-	% REC	19-102	E625
Surr: Phenol-d5	39.0	18.0	24.0	22.0	21.0	-	-	-	23.0	21.0	23.0	-	23.0	17.0	-	18.0	-	% REC	15-54	E625
Surr: Terphenyl-d14	39.0	27.0	15.0	28.0	39.0	-	-	-	17.0	28.0	24.0	-	17.0	41.0	-	37.0	-	% REC	39-106	E625

Table B-1. Surface Water Sampling Results (Page 7 of 7)

Location Name	RT 605 Bridge	San Mateo Reservoir		San Mateo Creek (Irrigation)		San Mateo Creek (at Lee Pond)		ACSG Site (Impounded Water)		605 Spring		Bridge Spring		Sec. 10 Tinaja #1		Sec. 10 Tinaja #2		UNITS	R.L.	METHOD
Date	9/16/2008	5/6/2010	10/7/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/18/2010	5/11/2010	10/14/2010	5/11/2010	10/25/2010	5/6/2010	10/7/2010	5/6/2010	10/7/2010			
Sample ID	605 Bridge SW1	RH10-SW-0001	RH10-SW-0006	RH10-SW-0005	RH10-SW-0009	No Sample	No Sample	No Sample	RH10-SW-0008	RH10-SW-0004	RH10-SW-0007	No Sample	RH10-SW-0010	RH10-SW-0002	No Sample	RH10-SW-0003	No Sample			
Condition (Wet/Dry)	Wet	Wet	Wet	Wet	Wet	Dry	Dry	Dry	Wet	Wet	Wet	Dry	Wet	Wet	Dry	Wet	Dry			
PESTICIDES																				
4,4'-DDD	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
4,4'-DDE	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
4,4'-DDT	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Aldrin	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
alpha-BHC	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
alpha-Chlordane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
beta-BHC	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Chlordane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
delta-BHC	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Dieldrin	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Endosulfan I	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Endosulfan II	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Endosulfan sulfate	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Endrin	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Endrin aldehyde	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Endrin Ketone	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
gamma-BHC (Lindane)	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
gamma-Chlordane	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Heptachlor	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Heptachlor epoxide	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Methoxychlor	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.050	E608
Toxaphene	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	2.5	E608
Aroclor 1016	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Aroclor 1221	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Aroclor 1232	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Aroclor 1242	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Aroclor 1248	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Aroclor 1254	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Aroclor 1260	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Aroclor 1262	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Aroclor 1268	ND	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	ug/L	0.50	E608
Surr: Decachlorobiphenyl	64.0	104	60.0	85.0	89.0	-	-	-	72.0	80.0	49.0	-	48.0	102	-	101	-	% REC	44-119	E608
Surr: Tetrachloro-m-xylene	61.0	86.0	63.0	75.0	87.0	-	-	-	78.0	63.0	64.0	-	78.0	82.0	-	82.0	-	% REC	40-120	E608
DIOXIN																				
2,3,7,8-TCDD	-	ND	ND	ND	ND	-	-	-	ND	ND	ND	-	ND	ND	-	ND	-	pg/L	5.0	1613B

Appendix 8-C

Baseline Sediment Chemistry from Receiving Drainage
Section 16
And San Mateo Creek

Table C-1. Baseline Sediment Chemistry – Receiving Drainage (Sec. 16 and San Mateo Creek) – 1st Sample Set[2]
(Page 1 of 6)

Sample ID	SED-0a	SED-1a	SED-2a	SED-3a	SED-4a	SED-5a	SED-6a	SED-7a	SED-8a	SED-9a	SED-10a	SED-11a	SED-12a	SED-13a	SED-14a	SED-15a	SED-16a	SED-17a	**Units**	**Method**
Collection Date	9/11/2008	9/11/2008	9/11/2008	9/11/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/15/2008	9/15/2008	9/15/2008	9/15/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008		
Collection Time	14:49	15:38	16:20	17:01	9:43	10:51	11:50	12:39	14:26	15:04	15:53	16:49	12:52	19:20	16:05					
AGRONOMIC PROPERTIES																				
pH, sat. paste	7.6	8.1	8.0	7.8	7.2	7.4	7.3	7.4	7.8	7.3	7.3	7.4	7.4	7.6	7.3	7.5	7.7	7.6	s.u.	ASAM 10-3.2
Moisture	5.4	12.3	20.1	6.8	7.3	4.3	0.9	0.5	ND	1.0	13.8	4.4	0.9	4.0	6.7	4.1	2.7	2.3	%	USDA26
Total Kjeldahl Nitrogen	948	1020	702	601	786	585	396	394	449	566	1620	1290	848	1180	2040	993	748	803	mg/kg-dry	ASA31-3
PARTICLE SIZE ANALYSIS/TEXTURE																				
Sand	67	29	73	69	47	63	88	88	89	70	12	22	70	12	20	4	32	50	%	ASA15-5
Silt	13	37	9	11	15	13	2	2	1	12	18	28	18	32	28	24	22	12	%	ASA15-5
Clay	20	34	18	20	38	24	10	10	10	18	70	50	12	56	52	72	46	38	%	ASA15-5
Texture	SL-SCL	CL	SL	SL-SCL	SC	SCL	LS	LS	LS	SL	C	C	SL	C	C	C	C	SC		ASA15-5
METALS – TOTAL																				
Aluminum	5480	17600	6070	8670	13700	8000	2480	1860	2430	4380	25200	16100	6800	21500	11600	25900	18200	11200	mg/kg-dry	SW6010B
Antimony	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8	ND	ND	ND	mg/kg-dry	SW6020
Arsenic	4.2	5.0	3.1	3.1	4.6	3.0	1.9	2.0	2.3	3.9	9.0	6.4	3.1	6.3	6.5	9.1	6.4	3.9	mg/kg-dry	SW6020
Barium	64.9	159	59.5	75.0	110	72.7	30.4	23.9	29	89.1	237	229	95.6	202	171	200	146	103	mg/kg-dry	SW6020
Beryllium	0.7	0.9	ND	ND	0.7	ND	ND	ND	ND	0.6	1.6	1.2	ND	1.2	1.2	1.2	0.7	0.5	mg/kg-dry	SW6020
Boron	13.8	11.6	ND	ND	7.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg-dry	SW6010B
Cadmium	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.9	ND	ND	ND	mg/kg-dry	SW6020
Calcium	5380	12000	7480	5670	8520	5430	2440	2370	2300	6760	16000	17600	7440	16000	8210	16800	11600	7860	mg/kg-dry	SW6010B
Chromium	4.7	12.4	5.1	6.8	10.3	6.2	2.0	1.6	2.3	5.3	17.0	11.4	4.4	12.1	12.3	16.1	11.4	7.7	mg/kg-dry	SW6020
Cobalt	4.3	6.9	2.9	3.9	6.0	3.6	1.0	0.9	1.4	3.3	9.3	7.5	2.8	6.0	7.9	9.0	6.1	4.5	mg/kg-dry	SW6020
Copper	6.4	15.1	5.3	7.6	11.7	6.8	1.4	1.4	2.0	5.4	16.9	13.5	5.1	16.3	16.8	18.9	11.7	8.8	mg/kg-dry	SW6020
Iron	10900	21500	9720	11500	17200	10700	3540	3510	3720	8620	27700	16800	8510	24100	13500	27300	18000	12300	mg/kg-dry	SW6010B
Lead	7.5	14.1	5.7	7.4	12.3	7.2	2.4	2.4	3.0	7.2	22.3	17.8	7.2	18.0	18.3	20.1	12.8	9.6	mg/kg-dry	SW6020
Magnesium	2050	6040	2170	2730	4180	2470	799	581	763	1930	6030	4750	2390	6610	4020	7790	5730	3520	mg/kg-dry	SW6010B
Manganese	147	325	152	179	253	162	64.1	70.8	49.7	165	354	444	155	300	364	372	285	211	mg/kg-dry	SW6010B
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg-dry	SW7471A
Molybdenum	0.5	0.7	ND	ND	0.5	ND	ND	ND	ND	ND	0.7	0.9	ND	0.9	1.1	0.8	1.0	1.4	mg/kg-dry	SW6020
Nickel	5.3	11.2	4.6	5.7	9.5	5.6	1.6	1.4	2.0	4.9	15.0	10.8	4.4	13.1	12.0	15.3	10.2	7.2	mg/kg-dry	SW6020
Potassium	1570	3630	1360	1890	3110	1760	506	388	482	1260	4510	3520	1740	5570	4250	5660	4790	3160	mg/kg-dry	SW6010B
Selenium	0.8	0.6	ND	ND	ND	ND	ND	ND	ND	0.6	0.8	1.1	ND	1.1	1.5	0.5	ND	0.6	mg/kg-dry	SW6020
Silver	0.8	ND	ND	ND	ND	ND	ND	ND	0.6	ND	ND	ND	ND	ND	0.7	ND	ND	ND	mg/kg-dry	SW6020
Sodium	ND	952	162	232	180	ND	ND	ND	ND	ND	431	ND	ND	120	101	375	193	217	mg/kg-dry	SW6010B
Thallium	0.7	ND	ND	ND	ND	ND	ND	ND	0.6	ND	ND	ND	ND	ND	1	ND	ND	ND	mg/kg-dry	SW6020
Uranium	1.0	1.1	1.1	0.7	1.1	0.7	ND	ND	1.2	1.1	2.1	4.9	1.8	7.9	5.1	4.0	2.1	4.2	mg/kg-dry	SW6020
Vanadium	12.7	30.0	14.9	17.8	20.8	14.6	6.1	6.9	5.9	13.1	31.0	29.5	14.7	28.0	28.3	32.7	24.7	17.9	mg/kg-dry	SW6020
Zinc	34.8	69.4	23.7	32.9	46.8	30.0	8.1	8.0	9.9	23.8	75.1	54.7	24.7	67.0	66.5	80.2	49.6	38.7	mg/kg-dry	SW6020

[2] Surface sediments (0-2") were collected from several areas within each sample location and composited into a single sample representing each sample location. These composited samples are identified with an "a" after the Sample ID number (i.e., Sample ID SED-0a).

Sample ID	SED-0a	SED-1a	SED-2a	SED-3	SED-4a	SED-5a	SED-6a	SED-7a	SED-8a	SED-9a	SED-10a	SED-11a	SED-12a	SED-13a	SED-14a	SED-15a	SED-16a	SED-17a	**Units**	**Method**
Collection Date	9/11/2008	9/11/2008	9/11/2008	9/11/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/15/2008	9/15/2008	9/15/2008	9/15/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008		
Collection Time	14:49	15:38	16:20	17:01	9:43	10:51	11:50	12:39	14:26	15:04	15:53	16:49	12:52	19:20	16:05					
RADIONUCLIDES - TOTAL																				
Gross Alpha	3.4	8.4	8.3	4.2	9.2	7.1	2.5	6.7	1.6	2.7	22.4	16.7	6.9	25.1	14.4	18.3	12.6	7.4	pCi/g-dry	E900.0
Gross Alpha precision (+/-)	0.6	0.7	0.7	0.6	0.7	0.7	0.5	0.7	0.7	0.7	1.1	1	0.8	1.1	0.9	1.0	0.9	0.8	pCi/g-dry	E900.0
Gross Alpha minus Rn & U	0.7	2.1	2.1	1.0	3.2	2.3	0.9	1.1	0.7	1.2	3.7	4.3	2.1	6.98	6.3	5.2	3.4	2.8	pCi/g-dry	E900.1
Gross Alpha minus Rn & U precision (+/-)	0.2	0.4	0.4	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.4	0.4	0.3	0.573	0.5	0.5	0.4	0.4	pCi/g-dry	E900.1
Gross Alpha minus Rn & U MDC	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.168	0.2	0.2	0.2	0.2	pCi/g-dry	E900.1
Gross Beta	27.7	39.6	23.3	21.5	32.8	26.9	15.0	17.2	13.3	12.1	27.3	35.4	21.4	50.8	35.2	35.5	29.1	25.5	pCi/g-dry	E900.0
Gross Beta precision (+/-)	1	1.1	1	0.9	1.0	1	0.9	0.9	0.9	0.9	1.0	1.1	1	1.2	1.1	1.1	1.0	1.0	pCi/g-dry	E900.0
Radium 226	0.3	1.1	0.8	0.6	1.0	0.7	0.3	0.1	-0.06	0.4	1.5	2.6	1.6	4.2	4.2	2.8	1.7	1.6	pCi/g-dry	E903.0
Radium 226 precision (+/-)	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.06	0.09	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	pCi/g-dry	E903.0
Radium 226 MDC	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.07	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	pCi/g-dry	E903.0
Radium 228	0.9	1.2	0.7	0.3	1.7	1.5	1.6	0.6	0.3	1.5	1.3	1.1	0.1	1.0	2.3	1.2	0.8	1.2	pCi/g-dry	RA-05
Radium 228 precision (+/-)	0.7	0.7	0.7	0.7	0.8	0.7	1	0.4	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	pCi/g-dry	RA-05
Radium 228 MDC	1.2	1.2	1.1	1.2	1.2	1.1	1.5	0.6	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	pCi/g-dry	RA-05
Strontium 90	-0.4	-0.5	-0.2	0.0	0.0	0.3	-0.2	0.2	0.2	-0.2	0.8	0.0	0.1	-0.2	-0.3	0.1	0.0	0.0	pCi/g-dry	E905.0
Strontium 90 precision (+/-)	0.5	0.5	0.5	0.6	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.5	0.383	0.4	0.4	0.4	0.4	pCi/g-dry	E905.0
Thorium 228	0.4	1.1	0.5	0.4	0.8	0.4	0.1	0.2	0.2	0.5	1.2	1.2	0.5	0.9	0.6	1	0.9	0.4	pCi/g-dry	E907.0
Thorium 228 precision (+/-)	0.2	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.2	0.3	0.3	0.3	0.2	pCi/g-dry	E907.0
Thorium 230	0.3	0.8	1.2	0.6	0.8	0.9	0.3	0.3	-0.6	0.5	1.3	2.7	2.0	2.7	3.6	0.7	0.9	0.4	pCi/g-dry	E907.0
Thorium 230 precision (+/-)	0.03	0.04	0.05	0.03	0.04	0.04	0.03	0.03	0.03	0.05	0.06	0.07	0.06	0.07	0.08	0.05	0.06	0.05	pCi/g-dry	E907.0
Thorium 232	0.4	0.7	0.4	0.3	0.6	0.5	0.1	0.1	0.2	0.3	0.8	0.6	0.6	1.2	0.7	1.0	1	0.5	pCi/g-dry	E907.0
Thorium 232 precision (+/-)	0.03	0.04	0.03	0.02	0.04	0.03	0.009	0.02	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.04	0.04	0.03	pCi/g-dry	E907.0
VOLITILE ORGANIC COMPOUNDS																				
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B

Sample ID	SED-0a	SED-1a	SED-2a	SED-3a	SED-4a	SED-5a	SED-6a	SED-7a	SED-8a	SED-9a	SED-10a	SED-11a	SED-12a	SED-13a	SED-14a	SED-15a	SED-16a	SED-17a	**Units**	**Method**
Collection Date	9/11/2008	9/11/2008	9/11/2008	9/11/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/15/2008	9/15/2008	9/15/2008	9/15/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008		
Collection Time	14:49	15:38	16:20	17:01	9:43	10:51	11:50	12:39	14:26	15:04	15:53	16:49	12:52	19:20	16:05					
VOLITILE ORGANIC COMPOUNDS (Continued)																				
Acrolein	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
m+p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Methyl ethyl ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Methyl isobutyl ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Xylenes, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Surr: 1,2-Dichlorobenzene-d4	97.0	97.0	100	99.0	101	99.0	102	103	98.0	98.0	98.0	99.0	100	104	105	102	103	103	%REC	SW8260B
Surr: Dibromofluoromethane	88.0	92.0	94.0	94.0	102	99.0	101	107	90.0	90.0	94.0	96.0	104	93.0	118	109	114	113	%REC	SW8260B
Surr: p-Bromofluorobenzene	99.0	99.0	100	100	99.0	101	100	102	101	100	99.0	100	102	97.0	105	101	102	101	%REC	SW8260B
Surr: Toluene-d8	98.0	98.0	98.0	98.0	98.0	99.0	100	100	99.0	86.0	98.0	98.0	116	97.0	100	98.0	98.0	100	%REC	SW8260B

Sample ID **Collection Date** **Collection Time**	SED-0a 9/11/2008 14:49	SED-1a 9/11/2008 15:38	SED-2a 9/11/2008 16:20	SED-3a 9/11/2008 17:01	SED-4a 9/12/2008 9:43	SED-5a 9/12/2008 10:51	SED-6a 9/12/2008 11:50	SED-7a 9/12/2008 12:39	SED-8a 9/15/2008 14:26	SED-9a 9/15/2008 15:04	SED-10a 9/15/2008 15:53	SED-11a 9/15/2008 16:49	SED-12a 9/16/2008 12:52	SED-13a 9/16/2008 19:20	SED-14a 9/16/2008 16:05	SED-15a 9/16/2008	SED-16a 9/16/2008	SED-17a 9/16/2008	**Units**	**Method**
ORGANIC CHARACTERISTICS																				
Diesel Range Organics (DRO)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8015M
Total Extractable Hydrocarbons	37	10	14	14	28	16	15	ND	ND	14	14	22	23	25.0	36	15	21	14	mg/kg	SW8015M
Surr: o-Terphenyl	101	93.0	99.0	98.0	89.0	93.0	102	94.0	95.0	92.0	100	95.0	105	98.0	102	101	96.0	97.0	%REC	SW8015M
SYNTHETIC ORGANIC COMPOUNDS																				
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
1-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4,6-Dinitro-2-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Chloro-3-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Azobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(k)fluorathene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
bis(-2-chloroethoxy)Methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
bis(-2-chloroethyl)Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
bis(2-chloroisopropyl)Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
bis(2-ethylhexyl)Phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C

Sample ID	SED-0a	SED-1a	SED-2a	SED-3a	SED-4a	SED-5a	SED-6a	SED-7a	SED-8a	SED-9a	SED-10a	SED-11a	SED-12a	SED-13a	SED-14a	SED-15a	SED-16a	SED-17a	**Units**	**Method**
Collection Date	9/11/2008	9/11/2008	9/11/2008	9/11/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/15/2008	9/15/2008	9/15/2008	9/15/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008		
Collection Time	14:49	15:38	16:20	17:01	9:43	10:51	11:50	12:39	14:26	15:04	15:53	16:49	12:52	19:20	16:05					
SYNTHETIC ORGANIC COMPOUNDS (Continued)																				
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
m+p-Cresols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
n-Nitrosodimethylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
n-Nitroso-di-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
n-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
o-Cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Pyridine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Surr: 2,4,6-Tribromophenol	106	107	107	116	91.0	95.0	86.0	88.0	82.0	91.0	81.0	76.0	88.0	80.0	84.0	85.0	88.0	88.0	%REC	SW8270C
Surr: 2-Fluorobiphenyl	75.0	79.0	81.0	82.0	82.0	72.0	78.0	81.0	82.0	87.0	85.0	79.0	76.0	73.0	74.0	76.0	75.0	77.0	%REC	SW8270C
Surr: 2-Fluorophenol	78.0	76.0	84.0	88.0	78.0	74.0	75.0	82.0	92.0	89.0	80.0	84.0	83.0	76.0	81.0	69.0	74.0	79.0	%REC	SW8270C
Surr: Nitrobenzene-d5	82.0	76.0	79.0	86.0	75.0	71.0	84.0	84.0	83.0	79.0	80.0	78.0	74.0	81.0	85.0	86.0	86.0	89.0	%REC	SW8270C
Surr: Phenol-d5	86.0	86.0	86.0	91.0	96.0	73.0	80.0	91.0	88.0	92.0	77.0	82.0	76.0	84.0	84.0	72.0	77.0	76.0	%REC	SW8270C
Surr: Terphenyl-d14	91.0	91.0	94.0	98.0	92.0	81.0	95.0	89.0	129	100	106	100	87.0	87.0	79.0	87.0	94.0	86.0	%REC	SW8270C

Sample ID **Collection Date** **Collection Time**	SED-0a 9/11/2008 14:49	SED-1a 9/11/2008 15:38	SED-2a 9/11/2008 16:20	SED-3a 9/11/2008 17:01	SED-4a 9/12/2008 9:43	SED-5a 9/12/2008 10:51	SED-6a 9/12/2008 11:50	SED-7a 9/12/2008 12:39	SED-8a 9/15/2008 14:26	SED-9a 9/15/2008 15:04	SED-10a 9/15/2008 15:53	SED-11a 9/15/2008 16:49	SED-12a 9/16/2008 12:52	SED-13a 9/16/2008 19:20	SED-14a 9/16/2008 16:05	SED-15a 9/16/2008	SED-16 9/16/2008	SED-17a 9/16/2008	**Units**	**Method**
ORGANOCHLORINE PESTICIDES																				
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
alpha-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
gamma-BHC (Lindane)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
gamma-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Surr: Decachlorobiphenyl	94.0	97.0	96.0	89.0	92.0	97.0	97.0	108	103	95.0	91.0	92.0	93.0	52.0	90.0	94.0	99.0	94.0	%REC	SW8081A
Surr: Tetrachloro-m-xylene	79.0	80.0	74.0	70.0	68.0	73.0	75.0	98.0	91.0	84.0	79.0	75.0	84.0	43.0	71.0	79.0	90.0	83.0	%REC	SW8081A
POLYCHLORINATED BIPHENYLS (PCBs)																				
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Surr: Decachlorobiphenyl	79.0	84.0	82.0	78.0	87.0	88.0	87.0	77.0	74.0	72.0	69.0	74.0	73.0	79.0	71.0	75.0	79.0	74.0	%REC	SW8082
Surr: Tetrachloro-m-xylene	65.0	71.0	72.0	62.0	60.0	63.0	59.0	82.0	80.0	75.0	71.0	69.0	66.0	68.0	66.0	70.0	80.0	75.0	%REC	SW8082
DIOXINS																				
2,3,7,8-TCDD	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ng/kg	8290

Table C-2. Baseline Sediment Chemistry – Receiving Drainages (Sec. 16 and San Mateo Creek) - 2nd Sample Set[3]
(Page 1 of 6)

Sample ID	SED-0b	SED-1b	SED-2b	SED-3b	SED-4b	SED-5b	SED-6b	SED-7b	SED-8b	SED-9b	SED-10b	SED-11b	SED-12b	SED-13b	SED-14b	SED-15b	SED-16b	SED-17b	**Units**	**Method**
Collection Date	9/11/2008	9/11/2008	9/11/2008	9/11/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/15/2008	9/15/2008	9/15/2008	9/15/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008		
Collection Time	14:49	15:38	16:20	17:01	9:43	10:51	11:50	12:39	14:26	15:04	15:53	16:49	12:52	19:20	16:05					
AGRONOMIC PROPERTIES																				
pH, sat. paste	7.8	8.1	8.0	7.7	7.3	7.4	7.3	7.4	7.5	7.3	7.3	7.4	7.5	7.5	7.3	7.7	7.7	7.6	s.u.	ASAM 10-3.2
Moisture	4.5	14.1	7.9	7.4	7.6	4.1	1.0	0.5	0.2	0.9	11.4	5.1	0.7	4.3	2.4	3.6	2.4	1.5	%	USDA26
Total Kjeldahl Nitrogen	939	978	608	605	1270	643	453	394	449	565	1450	1240	734	1180	1660	930	746	683	mg/kg-dry	ASA31-3
PARTICLE SIZE ANALYSIS/TEXTURE																				
Sand	59	23	71	73	45	73	91	92	91	76	10	24	62	10	22	8	34	51	%	ASA15-5
Silt	17	39	9	11	19	9	1	ND	5	10	20	26	14	30	26	18	16	15	%	ASA15-5
Clay	24	38	20	16	36	18	8	8	4	14	70	50	24	60	52	74	50	34	%	ASA15-5
Texture	SCL	CL	SL-SCL	SL	CL-SC	SL	S	S	S	SL	C	C	SCL	C	C	C	C	SCL		ASA15-5
METALS - TOTAL																				
Aluminum	6060	25900	6760	6260	12600	8390	2840	1890	1610	3770	ND	18300	6330	22100	13400	25600	18400	11800	mg/kg-dry	SW6010B
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg-dry	SW6020
Arsenic	4.1	5.1	3.2	2.8	4.6	3.6	2.0	1.8	2.0	3.1	9.8	5.9	2.7	6.0	6.8	8.4	4.9	3.8	mg/kg-dry	SW6020
Barium	77.6	260	62.1	70.8	107	79.9	34.5	22.8	36.1	80.4	248	206	89.3	202	170	217	155	97.6	mg/kg-dry	SW6020
Beryllium	0.5	1.2	ND	ND	0.6	ND	ND	ND	ND	ND	1.6	1.1	ND	1.0	0.9	1.1	0.7	0.7	mg/kg-dry	SW6020
Boron	ND	18.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg-dry	SW6010B
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg-dry	SW6020
Calcium	5880	17400	8190	4130	8030	5670	3150	1840	2100	5540	ND	19200	7990	16400	8080	16500	11500	8020	mg/kg-dry	SW6010B
Chromium	5.3	16.8	4.9	6.3	9.8	6.6	2.3	1.8	2.3	4.6	17.9	10.7	4.3	12.5	12.4	18.1	10.5	7.2	mg/kg-dry	SW6020
Cobalt	5.3	8.9	3.3	3.1	5.5	3.8	1.1	1.1	1.2	2.7	9.7	6.9	2.7	6.2	7.6	9.4	5.8	4.2	mg/kg-dry	SW6020
Copper	7.8	20.0	5.7	5.7	10.9	7.5	1.7	1.6	1.6	4.5	17.8	12.3	4.9	17.0	16.5	20.1	11.3	8.1	mg/kg-dry	SW6020
Iron	11500	26500	10500	10800	15900	12000	4070	3770	3400	7320	ND	18800	7910	24200	15600	26700	18100	12400	mg/kg-dry	SW6010B
Lead	8.6	18.4	6.2	5.9	11.2	8.0	2.8	2.6	2.7	6.1	23.9	16.5	6.7	18.3	17.8	21.3	12.8	9.1	mg/kg-dry	SW6020
Magnesium	2260	8320	2500	1960	3840	2640	952	562	673	1720	ND	5310	2260	6800	4520	7680	5720	3810	mg/kg-dry	SW6010B
Manganese	182	368	163	155	237	165	74.9	64.2	54.9	138	370	410	154	307	366	376	279	183	mg/kg-dry	SW6010B
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	mg/kg-dry	SW7471A
Molybdenum	ND	ND	ND	ND	0.5	ND	ND	ND	ND	ND	0.7	0.8	ND	1.1	0.9	1	1.0	4.1	mg/kg-dry	SW6020
Nickel	6.3	14.0	4.7	4.6	8.9	5.9	1.9	1.6	1.8	4.2	15.9	10.1	4.2	13.5	11.8	16.4	9.6	7.1	mg/kg-dry	SW6020
Potassium	1860	5100	1450	1400	2950	1880	567	395	427	1090	ND	3960	1640	5770	4170	5600	4890	3350	mg/kg-dry	SW6010B
Selenium	ND	0.5	ND	ND	ND	ND	ND	ND	ND	ND	0.9	0.9	0.6	0.9	1	ND	ND	ND	mg/kg-dry	SW6020
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg-dry	SW6020
Sodium	ND	1320	184	120	102	ND	ND	ND	ND	ND	ND	ND	ND	292	146	306	194	211	mg/kg-dry	SW6010B
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg-dry	SW6020
Uranium	0.7	1.1	1.7	0.6	1	0.9	ND	ND	0.8	1.1	2.1	4.6	1.9	8.2	4.3	4.3	2.1	3.7	mg/kg-dry	SW6020
Vanadium	14.3	38.7	14.0	16.3	20.3	15.7	6.6	6.8	7.2	11.8	32.5	27.5	13.4	28.7	28.0	36.5	22.8	17.6	mg/kg-dry	SW6020
Zinc	34.3	83.4	27.1	25.0	43.6	35.1	9.5	8.7	8.6	20.3	78.8	50.9	22.9	69.3	66.2	85.7	48.6	37.5	mg/kg-dry	SW6020

[3] A second set of surface sediments (0-2") was collected from several areas within each sample location (not the same areas as for the 1st set of samples summarized in Table 8-C-1) and composited into a single sample representing each sample location. This second set of composited samples is identified with a "b" after the Sample ID number (i.e., Sample ID SED-0b).

Sample ID	SED-0b	SED-1b	SED-2b	SED-3b	SED-4b	SED-5b	SED-6b	SED-7b	SED-8b	SED-9b	SED-10b	SED-11b	SED-12b	SED-13b	SED-14b	SED-15b	SED-16b	SED-17b	**Units**	**Method**
Collection Date	9/11/2008	9/11/2008	9/11/2008	9/11/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/15/2008	9/15/2008	9/15/2008	9/15/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008		
Collection Time	14:49	15:38	16:20	17:01	9:43	10:51	11:50	12:39	14:26	15:04	15:53	16:49	12:52	19:20	16:05					
RADIONUCLIDES - TOTAL																				
Gross Alpha	4.2	6.7	5.5	2.9	8.8	10.8	2.9	1.6	1.8	7.3	16.5	14.8	14.9	18.0	16.8	14.9	14.5	9.2	pCi/g-dry	E900.0
Gross Alpha precision (+/-)	0.6	0.7	0.6	0.5	0.7	0.8	0.5	0.5	0.7	0.8	1.0	0.9	0.9	0.9	1	0.9	0.9	0.8	pCi/g-dry	E900.0
Gross Alpha minus Rn & U	1.1	2.7	1.6	1.7	3.4	2.3	1.6	0.5	0.7	1.3	3.9	4.7	2.4	6.17	6.9	5.0	3.3	2.5	pCi/g-dry	E900.1
Gross Alpha minus Rn & U precision (+/-)	0.3	0.4	0.3	0.3	0.5	0.4	0.3	0.2	0.2	0.2	0.4	0.4	0.3	0.536	0.6	0.5	0.4	0.3	pCi/g-dry	E900.1
Gross Alpha minus Rn & U MDC	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.166	0.2	0.2	0.2	0.2	pCi/g-dry	E900.1
Gross Beta	25.6	36.1	19.0	17.1	29.3	29.5	21.8	12.7	13.4	16.2	27.7	39.9	28.7	49.0	43.5	29.3	31.4	25.6	pCi/g-dry	E900.0
Gross Beta precision (+/-)	1	1	0.9	0.9	1.0	1.0	0.9	0.9	0.9	0.9	1.0	1.1	1.0	1.1	1.1	1.0	1.0	1.0	pCi/g-dry	E900.0
Radium 226	0.7	0.9	0.8	0.4	1.2	0.8	0.3	0.2	0.2	0.6	1.7	3.0	1.3	4.4	5.0	2.8	1.7	1.6	pCi/g-dry	E903.0
Radium 226 precision (+/-)	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.3	0.3	0.2	0.4	0.5	0.4	0.3	0.3	pCi/g-dry	E903.0
Radium 226 MDC	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	pCi/g-dry	E903.0
Radium 228	0.6	1.5	0.8	1.6	2.3	1.4	1.5	0.4	0.5	0.9	1.6	1	0.4	0.9	0.9	1.1	0.4	0.3	pCi/g-dry	RA-05
Radium 228 precision (+/-)	0.7	0.7	0.7	0.8	0.8	0.7	0.9	0.7	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	pCi/g-dry	RA-05
Radium 228 MDC	1.2	1.1	1.1	1.2	1.2	1.1	1.5	1.2	1.0	1.1	1.0	1.1	1.1	0.9	0.9	0.9	0.9	0.9	pCi/g-dry	RA-05
Strontium 90	0.0	0.2	-0.2	-0.4	-0.1	-0.1	0.0	-0.3	-0.1	-0.2	0.0	0.6	0.3	-0.2	0.3	0.3	-0.2	0.4	pCi/g-dry	E905.0
Strontium 90 precision (+/-)	0.5	0.6	0.5	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.377	0.4	0.4	0.4	0.4	pCi/g-dry	E905.0
Thorium 228	0.4	1.1	0.4	0.1	1.3	0.7	0.2	0.1	0.1	0.5	1.3	1	0.3	1.1	0.5	1.0	0.9	0.5	pCi/g-dry	E907.0
Thorium 228 precision (+/-)	0.2	0.2	0.2	0.04	0.5	0.3	0.2	0.1	0.1	0.2	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.2	pCi/g-dry	E907.0
Thorium 230	0.7	0.6	0.8	0.1	0.6	0.5	0.2	0.2	-0.3	0.2	0.8	2.7	1.2	2.5	2.5	0.9	0.8	0.5	pCi/g-dry	E907.0
Thorium 230 precision (+/-)	0.04	0.04	0.04	0.009	0.05	0.04	0.03	0.03	0.03	0.04	0.05	0.08	0.06	0.07	0.08	0.06	0.05	0.05	pCi/g-dry	E907.0
Thorium 232	0.4	0.7	0.4	0.0	0.6	0.7	0.1	0.1	0.1	0.4	0.9	0.8	0.2	0.8	0.6	1.0	0.9	0.6	pCi/g-dry	E907.0
Thorium 232 precision (+/-)	0.03	0.03	0.03	0.009	0.04	0.04	0.02	0.02	0.02	0.03	0.04	0.04	0.02	0.04	0.03	0.04	0.04	0.03	pCi/g-dry	E907.0
VOLITILE ORGANIC COMPOUNDS																				
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B

Sample ID	SED-0b	SED-1b	SED-2b	SED-3b	SED-4b	SED-5b	SED-6b	SED-7b	SED-8b	SED-9b	SED-10b	SED-11b	SED-12b	SED-13b	SED-14b	SED-15b	SED-16b	SED-17b	**Units**	**Method**
Collection Date	9/11/2008	9/11/2008	9/11/2008	9/11/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/15/2008	9/15/2008	9/15/2008	9/15/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008		
Collection Time	14:49	15:38	16:20	17:01	9:43	10:51	11:50	12:39	14:26	15:04	15:53	16:49	12:52	19:20	16:05					
VOLITILE ORGANIC COMPOUNDS (Continued)																				
Acrolein	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chlorodibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Iodomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
m+p-Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Methyl ethyl ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Methyl isobutyl ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Xylenes, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8260B
Surr: 1,2-Dichlorobenzene-d4	96.0	100	100	99.0	99.0	101	99.0	102	100	100	99.0	100	102	103	102	103	102	104	%REC	SW8260B
Surr: Dibromofluoromethane	92.0	96.0	100	98.0	102	102	99.0	102	93.0	94.0	98.0	94.0	106	89.0	132	103	108	110	%REC	SW8260B
Surr: p-Bromofluorobenzene	100	100	101	102	100	101	101	100	102	100	102	102	103	97.0	102	102	102	103	%REC	SW8260B
Surr: Toluene-d8	100	99.0	100	100	99.0	100	100	100	99.0	98.0	98.0	84.0	82.0	98.0	115	100	100	100	%REC	SW8260B

Sample ID	SED-0b	SED-1b	SED-2b	SED-3b	SED-4b	SED-5b	SED-6b	SED-7b	SED-8b	SED-9b	SED-10b	SED-11b	SED-12b	SED-13b	SED-14b	SED-15b	SED-16b	SED-17b	**Units**	**Method**
Collection Date	9/11/2008	9/11/2008	9/11/2008	9/11/2008	9/12/2008	9/12/2008	9/12/2008	9/12/2008	9/15/2008	9/15/2008	9/15/2008	9/15/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008	9/16/2008		
Collection Time	14:49	15:38	16:20	17:01	9:43	10:51	11:50	12:39	14:26	15:04	15:53	16:49	12:52	19:20	16:05					
ORGANIC CHARACTERISTICS																				
Diesel Range Organics (DRO)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8015M
Total Extractable Hydrocarbons	12	11	15	16	16	23	ND	ND	ND	14	15	22	16	17.0	39	13	12	ND	mg/kg	SW8015M
Surr: o-Terphenyl	99.0	94.0	100	91.0	98.0	98.0	96.0	106	99.0	100	100	96.0	101	97.0	99.0	96.0	95.0	100	%REC	SW8015M
SYNTHETIC ORGANIC COMPOUNDS																				
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
1-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4,6-Dinitro-2-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Chloro-3-methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Azobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(a)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(a)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(b)fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Benzo(k)fluorathene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
bis(-2-chloroethoxy)Methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
bis(-2-chloroethyl)Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
bis(2-chloroisopropyl)Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
bis(2-ethylhexyl)Phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C

Sample ID **Collection Date** **Collection Time**	SED-0b 9/11/2008 14:49	SED-1b 9/11/2008 15:38	SED-2b 9/11/2008 16:20	SED-3b 9/11/2008 17:01	SED-4b 9/12/2008 9:43	SED-5b 9/12/2008 10:51	SED-6b 9/12/2008 11:50	SED-7b 9/12/2008 12:39	SED-8b 9/15/2008 14:26	SED-9b 9/15/2008 15:04	SED-10b 9/15/2008 15:53	SED-11b 9/15/2008 16:49	SED-12b 9/16/2008 12:52	SED-13b 9/16/2008 19:20	SED-14b 9/16/2008 16:05	SED-15b 9/16/2008	SED-16b 9/16/2008	SED-17b 9/16/2008	**Units**	**Method**
SYNTHETIC ORGANIC COMPOUNDS (Continued)																				
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
m+p-Cresols	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
n-Nitrosodimethylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
n-Nitroso-di-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
n-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
o-Cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Phenanthrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Pyridine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8270C
Surr: 2,4,6-Tribromophenol	102	100	111	111	85.0	107	91.0	80.0	68.0	87.0	91.0	86.0	92.0	86.0	76.0	86.0	86.0	95.0	%REC	SW8270C
Surr: 2-Fluorobiphenyl	73.0	78.0	79.0	74.0	71.0	83.0	86.0	75.0	70.0	77.0	77.0	73.0	79.0	74.0	67.0	80.0	76.0	81.0	%REC	SW8270C
Surr: 2-Fluorophenol	71.0	71.0	79.0	74.0	73.0	83.0	80.0	73.0	78.0	87.0	88.0	77.0	79.0	66.0	72.0	92.0	72.0	85.0	%REC	SW8270C
Surr: Nitrobenzene-d5	78.0	77.0	83.0	85.0	73.0	86.0	82.0	69.0	62.0	85.0	86.0	83.0	90.0	86.0	77.0	92.0	86.0	90.0	%REC	SW8270C
Surr: Phenol-d5	80.0	83.0	85.0	79.0	86.0	85.0	82.0	84.0	75.0	81.0	91.0	75.0	75.0	64.0	74.0	93.0	74.0	81.0	%REC	SW8270C
Surr: Terphenyl-d14	86.0	92.0	88.0	94.0	93.0	90.0	97.0	84.0	99.0	92.0	80.0	93.0	92.0	87.0	71.0	82.0	86.0	83.0	%REC	SW8270C

Sample ID **Collection Date** **Collection Time**	SED-0b 9/11/2008 14:49	SED-1b 9/11/2008 15:38	SED-2b 9/11/2008 16:20	SED-3b 9/11/2008 17:01	SED-4b 9/12/2008 9:43	SED-5b 9/12/2008 10:51	SED-6b 9/12/2008 11:50	SED-7b 9/12/2008 12:39	SED-8b 9/15/2008 14:26	SED-9b 9/15/2008 15:04	SED-10b 9/15/2008 15:53	SED-11b 9/15/2008 16:49	SED-12b 9/16/2008 12:52	SED-13b 9/16/2008 19:20	SED-14b 9/16/2008 16:05	SED-15b 9/16/2008	SED-16b 9/16/2008	SED-17b 9/16/2008	**Units**	**Method**
ORGANOCHLORINE PESTICIDES																				
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
alpha-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
gamma-BHC (Lindane)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
gamma-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8081A
Surr: Decachlorobiphenyl	92.0	102	97.0	91.0	98.0	98.0	102	98.0	94.0	94.0	93.0	96.0	92.0	87.0	97.0	95.0	96.0	93.0	%REC	SW8081A
Surr: Tetrachloro-m-xylene	77.0	73.0	76.0	78.0	79.0	80.0	79.0	88.0	76.0	80.0	88.0	86.0	73.0	75.0	86.0	84.0	75.0	67.0	%REC	SW8081A
POLYCHLORINATED BIPHENYLS (PCBs)																				
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	mg/kg	SW8082
Surr: Decachlorobiphenyl	79.0	84.0	79.0	83.0	90.0	88.0	90.0	65.0	68.0	73.0	73.0	81.0	84.0	71.0	76.0	75.0	71.0	73.0	%REC	SW8082
Surr: Tetrachloro-m-xylene	66.0	63.0	65.0	67.0	70.0	71.0	62.0	70.0	66.0	72.0	79.0	78.0	80.0	68.0	79.0	80.0	68.0	60.0	%REC	SW8082
DIOXINS																				
2,3,7,8-TCDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ng/kg	8290

Appendix 8-D

Riparian Assessment Report

ROCA HONDA MINE SITE
RIPARIAN ASSESSMENT REPORT

Submitted to:

STRATHMORE MINERALS CORP.
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Submitted by:

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Project No. 17642

November 2011

TABLE OF CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

This document describes methods and findings of the riparian assessment of the proposed Roca Honda Mine in McKinley County, New Mexico. Roca Honda Resources, LLC (RHR) retained SWCA Environmental Consultants (SWCA) to conduct wetland delineations and a riparian survey to determine if the project site contains jurisdictional wetlands regulated by the U.S. Army Corps of Engineers (USACE).

The proposed Roca Honda Mine is located in Sections 9, 10, and 16, Township 13 North, Range 8 West, encompassing approximately 2.9 square miles in area and situated approximately 16 miles northeast of Grants, New Mexico (Figure 1). The project area is composed of upper mesa tops and large arroyo drainage systems that drain the site. The majority of the Roca Honda site feeds into San Mateo Creek to the south. A small portion of the site feeds to Canada la Varcas (Figure 2) and then to San Miguel Creek. San Mateo Creek flows west-southwest from the project area and connects to the Rio San Jose. The Rio San Jose drains into the Rio Puerco, which drains into the Rio Grande. San Miguel Creek drains into the Rio Puerco, which drains into the Rio Grande.

2.0 METHODS

Prior to fieldwork, major drainages within the Roca Honda Mine Site were identified with an ArcGIS streams layer and 2009 aerial imagery (New Mexico Office of State Engineer 2011). SWCA biologists conducted fieldwork on July 21, 2011, by walking along these pre-identified drainages and assessed the area for any other drainages or wetlands. The biologists identified riparian characteristics and performed wetland delineations during the survey. The characteristics noted within each drainage included the presence or absence of an ordinary high water mark (OHWM), surface water, and wetland obligate plant species or riparian plant species; hydrological characteristics (presence of water, mud cracks, salt crusts); stream bank characteristics (stream bank height, width, and slope); dominant vegetation; and a general description of the drainage (direction, substrate, sheetflow, continuous). The OHWM is a defining element for identifying the lateral limits of non-wetland waters. In dry-land fluvial systems typical of the arid west, a clear natural scour line impressed on the bank, recent bank erosion, destruction of native terrestrial vegetation, and the presence of litter and debris are the most commonly used physical characteristics to indicate the OHWM (Lichvar and McColley 2008).

Photographs were taken at the upstream, midstream, and downstream locations of each drainage. The location of the photograph within each drainage is indicated in Figure 2. The biologists also identified drainages at the site that were not previously identified using the ArcGIS streams layer. Drainages were classified as unnamed primary ephemeral drainages and were numbered 1-9. Appendix A provides riparian assessment survey datasheets.

3.0 RESULTS

Figure 2 depicts the drainages identified in the vicinity of the Roca Honda Mine Site. Nine locations (two on San Mateo Creek) were identified and described individually. All observed drainages were classified as ephemeral. One potential wetland was also identified (Bridge Spring).

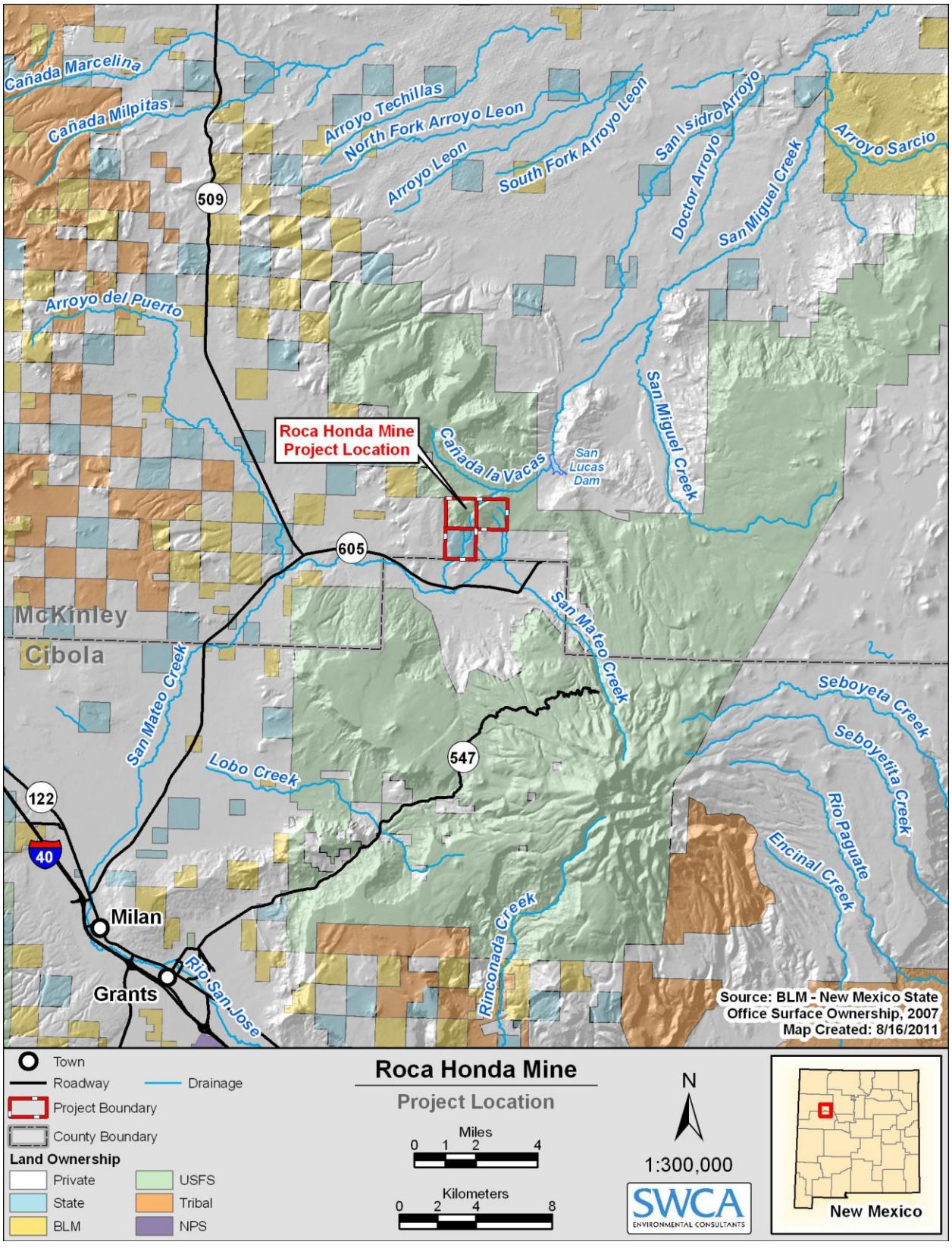


Figure 1. Project location and surrounding drainages.

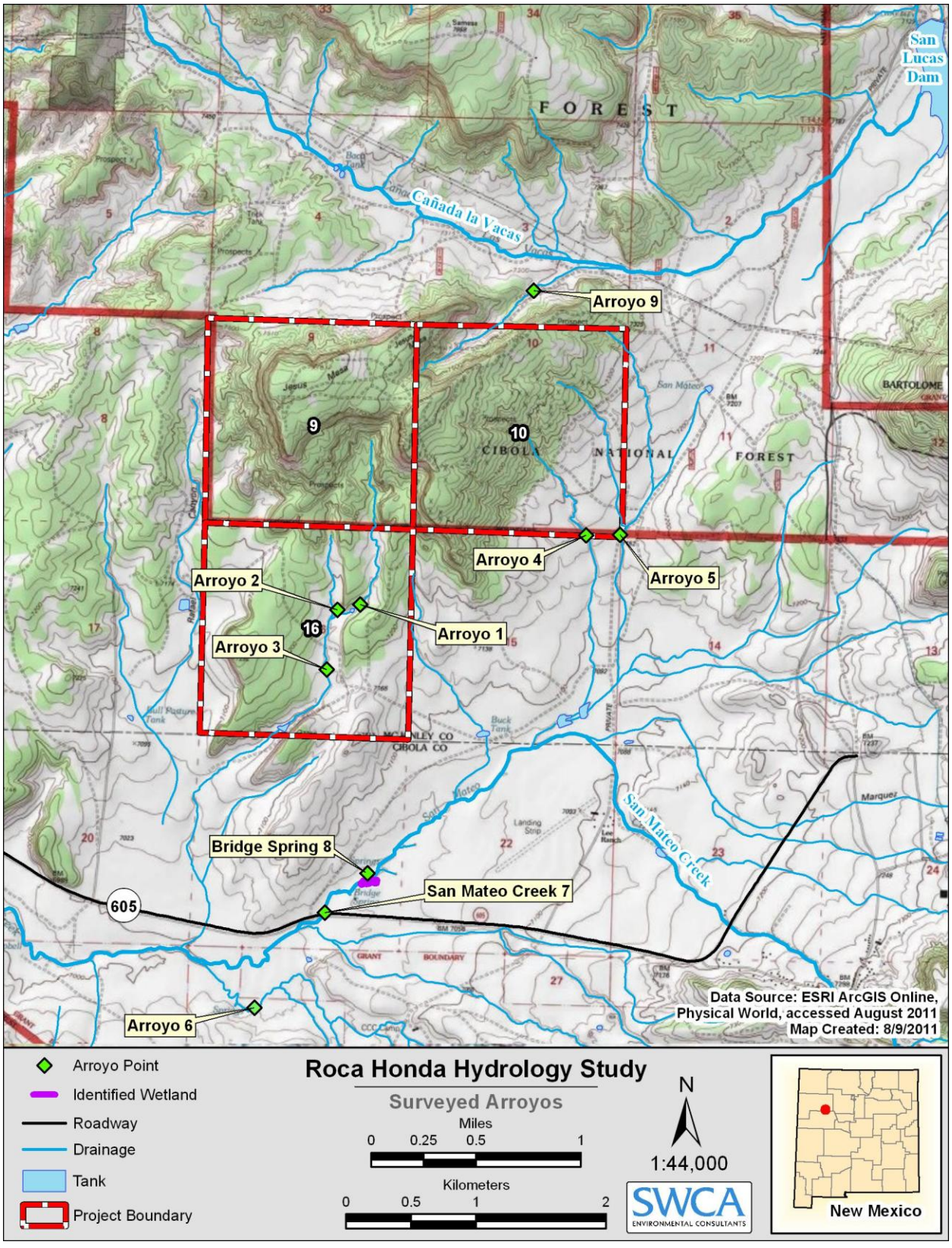


Figure 2. Drainages from the Roca Honda Mine Site.

3.1 DRAINAGE ARROYO 1 AND 2

Arroyos 1 and 2 are ephemeral drainages in the north eastern portion of Section 16. The Arroyo 1 is a deeply incised channel, approximately 20 feet wide and 20 feet deep (Figure 3 and Figure 4). It originates as storm runoff from nearby hillsides in the southeast quarter of Section 9. The Arroyo 2 has smaller incised channels and is somewhat braided. It is approximately 20 feet wide and 6 feet deep (Figure 5 and Figure 6). It originates as sheet flow from nearby hillsides in Section 9, which come together to create the Arroyo 2. These two ephemeral drainages merge in front of a rock formation (Figure 7) and flow south to a man-made impoundment. Arroyo 3 is south of the impoundment. Neither arroyo has an OHWM and no other hydrological characteristics were observed in either arroyo. Dominant plant species include blue grama and fourwing saltbush.

Figure 3. Unnamed Arroyo 1 Looking Up-Arroyo (Northeast).

Figure 4. Unnamed Arroyo 1 Looking Down-Arroyo (South).

Figure 5. Unnamed Arroyo 2 Looking Down-Arroyo (Southwest).

Figure 6. Unnamed Arroyo 2 Looking Up-Arroyo at Ground Level (South).

Figure 7. Area Where Arroyos 1 and 2 Merge Looking Down-Arroyo (Southwest).

3.2 DRAINAGE ARROYO 3

Arroyo 3 is an ephemeral drainage that is approximately 40–50 feet wide and 30 feet deep in Section 16. This arroyo combines the flows from Arroyos 1 and 2 and continues toward San Mateo Creek. The observation point was south of a man-made impoundment which retained water for cattle. Arroyo 3 flows in a southerly direction and meets San Mateo Creek, south of the project boundary (Figure 8 and Figure 9). There is no OHWM and no other hydrological characteristics were observed. Dominant plant species include fourwing saltbush and pale wolfberry (*Lycium pallidum*).

Figure 8. Unnamed Arroyo 3 Looking Up-Arroyo (North).

Figure 9. Unnamed Arroyo 3 Looking Down-Arroyo (South).

3.3 DRAINAGE ARROYO 4

Arroyo 4 is a deep ephemeral drainage that is approximately 50–75 feet wide and 20–30 feet deep (Figure 10 and Figure 11). It originates in Section 10 and flows south. The arroyo meets San Mateo Creek south of the project boundary after flowing through two small tanks. It is heavily incised. There is no OHWM and no other hydrological characteristics were observed. Dominant plant species include alkali sacaton, Indian ricegrass (*Achnatherum hymenoides*), and fourwing saltbush.

Figure 10. Unnamed Arroyo 4 Looking Up-Arroyo (Northwest).

Figure 11. Unnamed Arroyo 4 Looking Down-Arroyo (South).

3.4 DRAINAGE ARROYO 5

Arroyo 5 is an ephemeral drainage that originates in the northeastern portion of Section 10 and flows south toward the southeastern corner of Section 10. The drainage flow change to sheet flow approximately 200 yards until it reaches small incised cuts (approximately 10 feet wide), and then flows into an incised drainage/dirt road at the corner of Section 10 (Figure 12 and Figure 13). The arroyo flows into a tributary of San Mateo Creek outside the project area. There is no OHWM and no other hydrological characteristics were observed. Dominant plant species include alkali sacaton, blue grama, and fourwing saltbush.

Figure 12. Unnamed Arroyo 5 Looking Down-Arroyo (Southeast).

Figure 13. Unnamed Arroyo 5 Looking Down-Arroyo (South).

3.5 DRAINAGE ARROYO 9

Arroyo 9 is an ephemeral drainage that originates in the northwest portion of Section 10 and flows northeasterly into Cañada la Vacas. Cañada la Vacas drains into San Lucas Dam, which connects to San Miguel Creek. This location was selected because a small portion of the permit area drains to this unnamed arroyo. The arroyo is approximately 15–20 feet wide with banks less than 2 feet high (Figure 14 and Figure 15). The channel is somewhat incised. There is no OHWM and no other hydrological characteristics were observed. The dominant plant species is fourwing saltbush (*Atriplex canescens*).

Figure 14. Unnamed Arroyo 9 Looking Up-Arroyo (South).

Figure 15. Unnamed Arroyo 9 Looking Down-Arroyo (North).

3.6 DRAINAGE ARROYO 6

Arroyo 6 is an ephemeral drainage on the Lee property that flows in a northwesterly direction into San Mateo Creek, south of the project boundary. It is approximately 35 feet wide and 10–12 feet deep (Figure 16 and Figure 17). This location was selected because the USGS maps indicate South Spring is located here. Also, RHR staff have sampled surface water at the location.Cattle tracks were observed in this arroyo. There is no apparent ordinary high water mark (OHWM). Hydrological characteristics include a few surface soil cracks in areas where ponding has occurred from recent rainfall. Dominant plant species include alkali sacaton (*Sporobolus airoides*), blue grama (*Bouteloua gracilis*), saltcedar (*Tamarix ramosissima*), and greasewood (*Sarcobatus vermiculatus*).

Figure 16. Unnamed Arroyo 6 Looking Up-Arroyo (East).

Figure 17. Unnamed Arroyo 6 Looking Down-Arroyo (West).

3.7 LOCATION 7 WITHIN SAN MATEO CREEK

Location 7 is a potential spring immediately north of Highway 605 within San Mateo Creek. The area has held water for months and other times it is dry. It is located downstream of Bridge Spring and south of the project boundary in Section 21. The location is approximately 30 feet wide and 10 feet deep (Figure 18 and Figure 19). The channel widens upstream, toward Bridge Spring. There is no OHWM and no other hydrological characteristics were observed. Dominant vegetation includes saltcedar and saltgrass (*Distichlis spicata*).

Figure 18. San Mateo Creek at Location 7 Looking Up-Arroyo (North).

Figure 19. San Mateo Creek at Location 7 Looking Down-Arroyo (South).

3.8 SAN MATEO CREEK AT LOCATION 8-BRIDGE SPRING

Location 8, Bridge Spring is a spring-fed wetland area north of Highway 605 within the San Mateo Creek drainage (Figure 20 and Figure 21). It is located south of the project boundary in Section 21. The wetland area is approximately 0.56 acre. This part of San Mateo Creek is ephemeral, but likely flows during storm events. These flows probably also help sustain the wetland. Hydrological characteristics include surface water, wetland obligate plant species, and salt crusts. Dominant plant species include saltcedar, sedges (*Carex* sp), rushes (*Juncus* sp), and bulrush (*Schoenoplectus* sp).

Figure 20. Bridge Spring Looking Down-Arroyo (Southwest).

Figure 21. Bridge Spring Looking Up-Arroyo (Northeast).

4 CONCLUSION

The riparian assessment at the Roca Honda Mine Site identified nine surface water drainage locations. All of these drainages, except for Arroyo 9, flow into San Mateo Creek, which runs roughly east-west south of the project area. Surface water then flows south eventually reaching the Rio San Jose through primary and secondary drainages (approximately 24 miles). The Rio San Jose drains east into the Rio Puerco (approximately 84 miles), and the Rio Puerco drains into the Rio Grande (approximately 61 miles].

Arroyo 9 flows into Cañada la Vacas and then into San Lucas Dam northeast of the project area. San Lucas Dam drains into San Miguel Creek, which flows into the Rio Puerco (approximately 56 miles). The Rio Puerco drains into the Rio Grande (approximately 147 miles). All observed drainages at the Roca Honda Mine Site were classified as ephemeral and no wetland hydrological indicators (i.e., obligate plants species or hydric soils) were observed within these drainages.

Three of the nine locations were potential spring areas. Arroyo 6 was surveyed because South Spring may be evident during wet seasons but the area does not remain wet long enough to develop wetland characteristics. Location 7 in San Mateo Creek at a 605 bridge was also found dry and no wetland characteristics. Location 8 was selected for the survey because Bridge Spring has been identified on USGS maps. This location was found to be a spring-fed wetland within San Mateo Creek. This wetland area is south of the Roca Honda Permit Area.

5 LITERATURE CITED

Lichvar, R.W. and S.M. McColley. 2008. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States, A Delineation Manual. Pp.43.

New Mexico Office of State Engineer. 2011. New Mexico Office of the State Engineer Homepage (geodatabase: ose_nmbase_hydrog) (streams, water bodies, water body reaches, surface water basins). Available at: http://www.ose.state.nm.us. Accessed July 14, 2011.

APPENDIX A
RIPARIAN ASSESSMENT SURVEY DATASHEETS

Strathmore Riparian Assessment
Spring 2011

Assess each arroyo present on Strathmore Roca Honda Mine Site. Number each arroyo on maps and describe accordingly in the data sheets. Photograph the arroyos from the upstream, downstream and center. Describe characteristics including plants identified, hydrological characteristics, stream bank characteristics including incised widths, etc.

Date 7-21-11

Observers PD, JM, MM

Arroyo # 9

Photo #'s 1–5

Check all that apply:

X Ephemeral

– Water present

– High water mark

– Riparian veg present

– Wetland OBL veg present

– Wetland delin. performed

Describe Arroyo characteristics: N of Section 10

T:T = 15–20 ft; < 2-ft stream banks

No OHWM

Somewhat incised upstream and downstream

Only has water during rainfall events

Comments:

Recent rainfall

Common plant species found in arroyo

Scientific name	**Common name**
Atriplex canescens	Fourwing saltbush
Lycium pallidum	Wolfberry
Salsola sp.	Russian thistle
Dimorphocarpa wislizeni	Touristplant (spectacle pod)
Cleome multicaulis	Slender spiderflower (beeplant)
Gutierrezia sarothrae	Broom snakeweed
Artemisia sp.	Sagebrush
Bassia scoparia	Burningbush

Strathmore Riparian Assessment
Spring 2011

Assess each arroyo present on Strathmore Roca Honda Mine Site. Number each arroyo on maps and describe accordingly in the data sheets. Photograph the arroyos from the upstream, downstream and center. Describe characteristics including plants identified, hydrological characteristics, stream bank characteristics including incised widths, etc.

Date: 7-21-11

Observers: PD, JM, MM

Arroyo #: 5

Photo #'s: 6–9, 19 (5a)

Describe Arroyo characteristics: Ephemeral

At section corner. Rainfall runs as sheet flow until it reaches small cuts (~10 ft wide) then flows into road/drainage at corner (gate) where it is incised

Check all that apply:

No OHWM

X Ephemeral

– Water present

– High water mark

– Riparian veg present

– Wetland OBL veg present

– Wetland delin. performed

Comments:

Recent rainfall

Common plant species found in arroyo

Scientific name	**Common name**
Abronia fragrans	Snowball sand verbena
Achnatherum hymenoides	Indian ricegrass
Artemisia sp.	Sagebrush
Atriplex canescens	Fourwing saltbush
Bassia scoparia	Burningbush
Bouteloua gracilis	Blue grama
Chamaesyce sp.	sandmat
Dimorphocarpa wislizeni	Touristplant (spectacle pod)
Ericameria sp.	Rabbitbush
Erigeron divergens	Spreading fleabane

Scientific name	**Common name**
Gutierrezia sarothrae	Broom snakeweed
Heterotheca villosa	Hairy false goldenaster
Hymenopappus filifolius	Fineleaf hymenopappus
Juniperus monosperma	Oneseed juniper
Linum sp.	Flax
Lycium pallidum	Wolfberry
Mentzelia sp.	Blazingstar
Opuntia polyacantha	Hairspine pricklypear
Pinus edulis	Twoneedle pinyon
Salsola sp.	Russian thistle
Sphaeralcea incana	Gray globemallow
Sporobolus airoides	Alkali sacaton
Thelesperma megapotamicum	Hopi tea greenthread

Strathmore Riparian Assessment
Spring 2011

Assess each arroyo present on Strathmore Roca Honda Mine Site. Number each arroyo on maps and describe accordingly in the data sheets. Photograph the arroyos from the upstream, downstream and center. Describe characteristics including plants identified, hydrological characteristics, stream bank characteristics including incised widths, etc.

Date: 7-21-11

Observers: PD, JM, MM

Arroyo #: 4

Photo #'s: 10–18

Describe Arroyo characteristics: Ephemeral

T:T = 50–75 ft wide; 20–30 ft deep

No OHWM

Heavily incised channel

Check all that apply:

X Ephemeral

– Water present

– High water mark

– Riparian veg present

– Wetland OBL veg present

– Wetland delin. performed

Comments:

Recent rainfall

Common Species found in arroyo

Scientific name	**Common name**	**Scientific name**	**Common name**
Achnatherum hymenoides	Indian ricegrass	*Mentzelia* sp.	Blazingstar
Atriplex canescens	Fourwing saltbush	*Muhlenbergia minutissima*	Annual muhly
Bouteloua gracilis	Blue grama	*Muhlenbergia* sp.	Muhly grass
Cercocarpus sp.	Mountain mahogany	*Oenothera* sp.	Evening primrose
Dimorphocarpa wislizeni	Touristplant (spectacle pod)	*Pinus edulis*	Twoneedle pinyon
Gutierrezia sarothrae	Broom snakeweed	*Quercus gambelii*	Gambel oak
Heterotheca villosa	Hairy false goldenaster	*Salsola* sp.	Russian thistle
Hymenopappus filifolius	Fineleaf hymenopappus	*Sphaeralcea incana*	Gray globemallow
Juniperus monosperma	Oneseed juniper	*Sporobolus airoides*	Alkali sacaton

Strathmore Riparian Assessment
Spring 2011

Assess each arroyo present on Strathmore Roca Honda Mine Site. Number each arroyo on maps and describe accordingly in the data sheets. Photograph the arroyos from the upstream, downstream and center. Describe characteristics including plants identified, hydrological characteristics, stream bank characteristics including incised widths, etc.

Date 7-21-11

Observers PD, JM, MM

Arroyo # #1 and #2

Photo #'s 31–34, 40–41, 38–39, 42–45

Check all that apply:

X Ephemeral

– Water present

– High water mark

– Riparian veg present

– Wetland OBL veg present

– Wetland delin. Performed

Describe Arroyo characteristics: Ephemeral #**1**: Incised channel; T:T = 20 ft wide, 20 ft deep; Ephemeral channel from storms and drainages by nearby hillsides. #**2**: diminutive incisions; T:T = 20 ft wide, 6 ft deep; Ephemeral = sheet flow in small valley flows down and forms #2 drainage. 1 and 2 ephemeral drainages merge in front of rock formations (ph 35–36) and flow south to man-made impoundment. Drainage 3 is south of impoundment.Water from recent storms in tinajas/ huecos on top of rock formation between #1 and #2 channels. No OHWM for either #1 or 2Arroyos .

Comments:

Recent rainfall

Common Species found in Arroyo East/West

Scientific name	Common name
#1	
Artemisia sp.	Sagebrush
Atriplex canescens	Fourwing saltbush
Bassia scoparia	Burningbush
Bouteloua gracilis	Blue grama
Cercocarpus sp.	Mountain mahogany
Chenopodium sp.	Goosefoot
Dimorphocarpa wislizeni	Touristplant (spectacle pod)
Erigeron divergens	Spreading fleabane
Eriogonum alatum	Winged buckwheat
Eriogonum rotundifolium	Roundleaf buckwheat
Gutierrezia sarothrae	Broom snakeweed
Heterotheca villosa	Hairy false goldenaster
Juniperus monosperma	Oneseed juniper
Lycium pallidum	Wolfberry
Mentzelia sp.	Blazingstar
Mirabilis multiflora	Colorado four o'clock
Opuntia polyacantha	Hairspine pricklypear
Penstemon barbatus	Beardlip penstemon
Penstemon virgatus	Upright blue beardtongue
Pinus edulis	Twoneedle pinyon
Salsola sp.	Russian thistle
Schoenocrambe sp.	Plainsmustard
Sphaeralcea incana	Gray globemallow
Sporobolus airoides	Alkali sacaton
#2	
Atriplex canescens	Fourwing saltbush
Bassia scoparia	Burningbush
Dimorphocarpa wislizeni	Touristplant (spectacle pod)
Elymus sp.	Squirreltail?
Gutierrezia sarothrae	Broom snakeweed
Heterotheca villosa	Hairy false goldenaster
Hymenopappus filifolius	Fineleaf hymenopappus
Juniperus monosperma	Oneseed juniper
Mentzelia sp.	Blazingstar
Mirabilis multiflora	Colorado four o'clock
Pascopyron sp.	Wheatgrass
Salsola sp.	Russian thistle
Sporobolus airoides	Alkali sacaton

Strathmore Riparian Assessment
Spring 2011

Assess each arroyo present on Strathmore Roca Honda Mine Site. Number each arroyo on maps and describe accordingly in the data sheets. Photograph the arroyos from the upstream, downstream and center. Describe characteristics including plants identified, hydrological characteristics, stream bank characteristics including incised widths, etc.

Date: 7-21-11

Observers: PD, JM, MM

Arroyo #: 3

Photo #'s: 28–30

Check all that apply:

X Ephemeral

– Water present

– High water mark

– Riparian veg present

– Wetland OBL veg present

– Wetland delin. performed

Describe Arroyo characteristics: Ephemeral

T:T = 40–50 ft wide, 30+ ft deep

No OHWM

Starts south of man-made impoundment. The impoundment backs up any rainfall/storm events east and from Arroyo West, to the north.

Comments:

Recent rainfall

Common Species found in arroyo

Scientific name	**Common name**
Atriplex canescens	Fourwing saltbush
Cryptantha sp.	Cryptantha
Eriogonum rotundifolia	Roundleaf buckwheat
Gutierrezia sarothrae	Broom snakeweed
Hymenopappus filifolius	Fineleaf hymenopappus
Lycium pallidum	Wolfberry
Mentzelia sp.	Blazingstar
Opuntia polyacantha	Hairspine pricklypear
Salsola sp.	Russian thistle
Sporobolus airoides	Alkali sacaton

Strathmore Riparian Assessment
Spring 2011

Assess each arroyo present on Strathmore Roca Honda Mine Site. Number each arroyo on maps and describe accordingly in the data sheets. Photograph the arroyos from the upstream, downstream and center. Describe characteristics including plants identified, hydrological characteristics, stream bank characteristics including incised widths, etc.

Date 7-21-11

Observers PD, JM, MM

Arroyo # 8: San Mateo Creek

(Bridge Spring)

Photo #'s 52–59 (50–51)

Describe Arroyo characteristics: Spring-fed wetland

Mix of OBL, FACW, FACU species.

Wetland is within an ephemeral arroyo

The arroyo flows during runoff events. These flows probably help sustain the wetland.

Check all that apply:

X Ephemeral

X Water present

– High water mark

X Riparian veg present

X Wetland OBL veg present

– Wetland delin. performed

Cattle tracks and scat throughout the wetland.

Flows into Horsehead Arroyo.

Comments: Photos 50 and 51 are downstream of spring and upstream of Horsehead Arroyo.
Recent rainfall

Common Plant Species found in Arroyo

Scientific name	**Common name**	**Scientific name**	**Common name**
Atriplex canescens	Fourwing saltbush	*Juncus* sp. (*baltica*?)	Rush
Bromus sp.	Brome	*Lactuca serriola*	Prickly lettuce
Carex sp.	Sedge	*Pascopyron* sp.	Wheatgrass
Distichlis spicata	Saltgrass	*Sarcobatus vermiculatus*	Greasewood
Ericameria sp.	Rabbitbush	*Rumex crispus*	Curlydock
Grindelia sp.	Gumweed	*Schoenoplectus* sp.	Bulrush
Gutierrezia sarothrae	Broom snakeweed	*Sporobolus airoides*	Alkali sacaton
Heterotheca villosa	Hairy false goldenaster	*Tamarix ramosissima*	Saltcedar
Hordeum sp.	Foxtail		

Strathmore Riparian Assessment
Spring 2011

Assess each arroyo present on Strathmore Roca Honda Mine Site. Number each arroyo on maps and describe accordingly in the data sheets. Photograph the arroyos from the upstream, downstream and center. Describe characteristics including plants identified, hydrological characteristics, stream bank characteristics including incised widths, etc.

Date 7-21-11

Observers PD, JM, MM

Arroyo # 7 (Within San Mateo Creek)

Photo #'s 46–49

Describe Arroyo characteristics: Ephemeral

T:T = 30 ft wide, ~10 ft deep

No OHWM

Channel widens upstream

#8 San Mateo Creek (Bridge Spring) is upstream

Check all that apply:

X Ephemeral

– Water present

– High water mark

– Riparian veg present

– Wetland OBL veg present

– Wetland delin. performed

Comments: Recent rainfall

Common Plant Species found in Arroyo

Scientific name	**Common name**
Atriplex canescens	Fourwing saltbush
Rumex crispus	Curlydock
Carex sp.	Sedge
Bromus sp.	Brome
Sarcobatus vermiculatus	Greasewood
Gutierrezia sarothrae	Broom snakeweed
Sporobolus airoides	Alkali sacaton
Juncus sp. (*baltica*?)	Rush
Distichlis spicata	Saltgrass
Ericameria sp.	Rabbitbush
Tamarix ramosissima	Saltcedar
Pascopyron sp.	Wheatgrass
Lactuca serriola	Prickly lettuce
Schoenoplectus sp.	Bulrush
Grindelia sp.	Gumweed
Hordeum sp.	Foxtail
Elymus sp.	squirreltail
Heterotheca villosa	Hairy false goldenaster

Strathmore Riparian Assessment
Spring 2011

Assess each arroyo present on Strathmore Roca Honda Mine Site. Number each arroyo on maps and describe accordingly in the data sheets. Photograph the arroyos from the upstream, downstream and center. Describe characteristics including plants identified, hydrological characteristics, stream bank characteristics including incised widths, etc.

Date: 7-21-11

Observers: PD, JM, MM

Arroyo #: 6 (On Lee Property)

Photo #'s: 60–64

Check all that apply:

X Ephemeral

– Water present

– High water mark

– Riparian veg present

– Wetland OBL veg present

– Wetland delin. performed

Describe Arroyo characteristics: Ephemeral

T:T = ~35 ft wide, ~10–12 ft deep

No OHWM

On Lee property –flows NW into San Mateo Creek

Cattle impacted arroyo

Drains into San Mateo Creek

Comments:

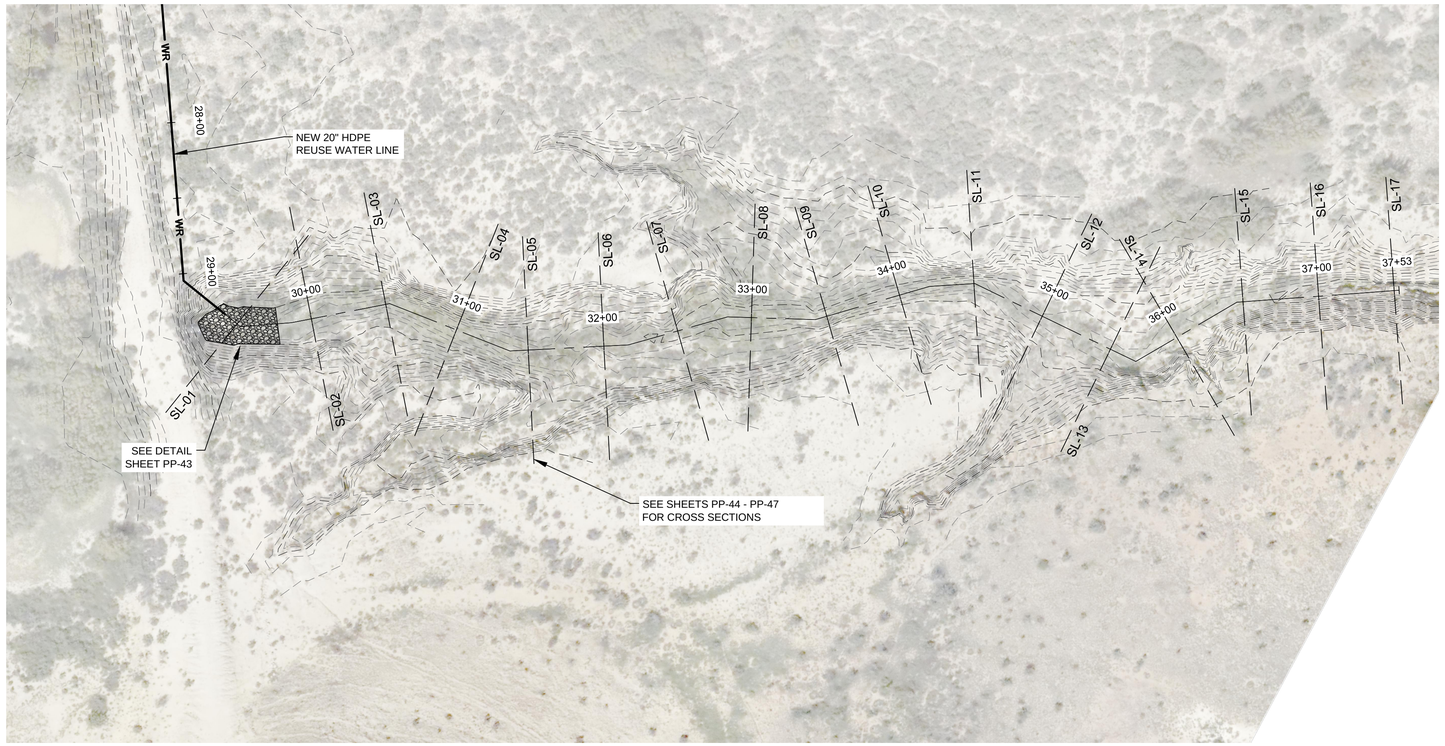
Recent rainfall

Common Plant Species found in arroyo

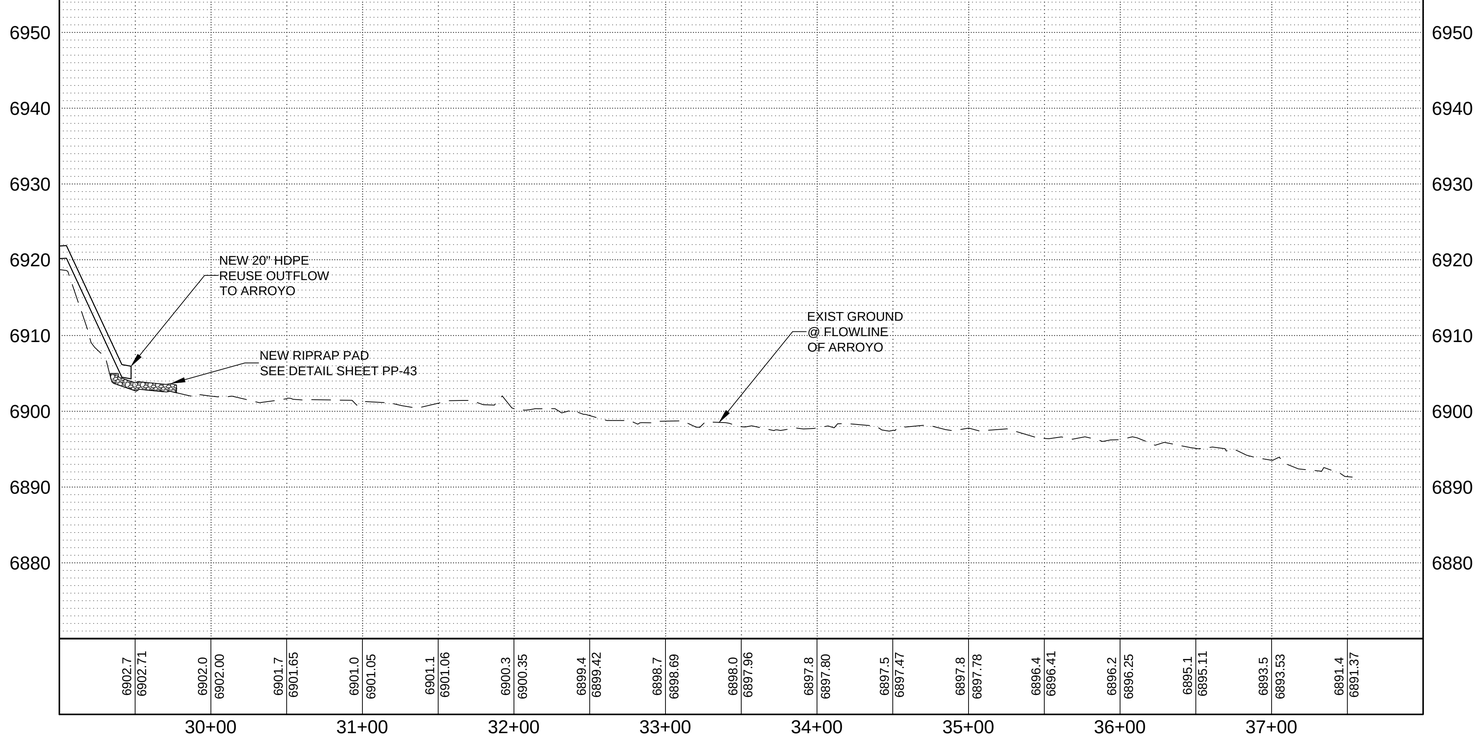
Scientific name	**Common name**
Sporobolus airoides	Alkali sacaton
Juncus sp.	Rush
Distichlis spicata	Saltgrass
Ericameria sp.	Rabbitbush
Tamarix ramosissima	Saltcedar
Bouteloua gracilis	Blue grama
Sarcobatus vermiculatus	Greasewood

Appendix 8-E

Baseline Survey of San Lucas Arroyo



SCALE:
HORZ: 1" = 50'
VERT: 1" = 10'



Roca Honda Resources LLC.
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Phone: (505) 348-4000

SEAL

60% SUBMITTAL
NOT FOR
CONSTRUCTION

PROJECT NAME
STRATHMORE MINERALS
ROCA HONDA RESOURCES, LLC
MINE WATER DISCHARGE
OUTFALL DETAIL
SAN LUCAS ARROYO

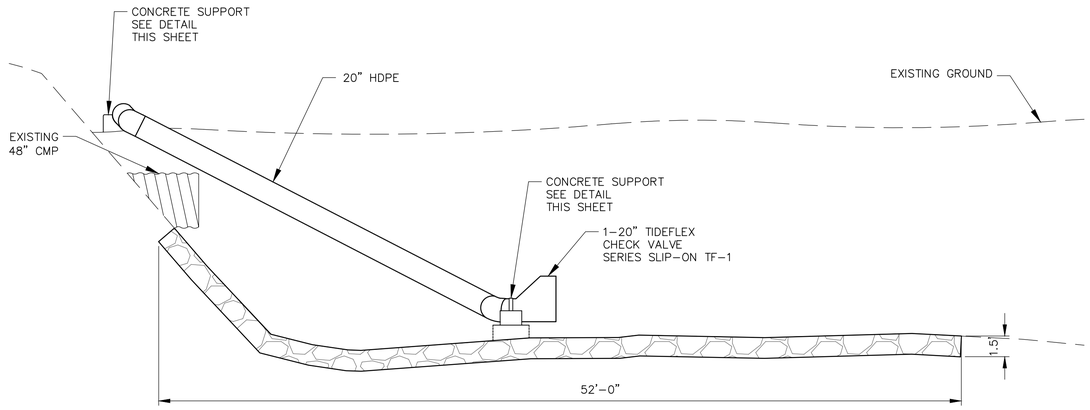
	BY	DESCRIPTION	DATE	REV.

PROJECT NO:	1160001900
DESIGNED BY:	JDB
DRAWN BY:	STAFF
CHECKED BY:	JDB
DATE:	JUNE, 2012

SHEET TITLE
REUSE PIPELINE
PLAN AND PROFILE

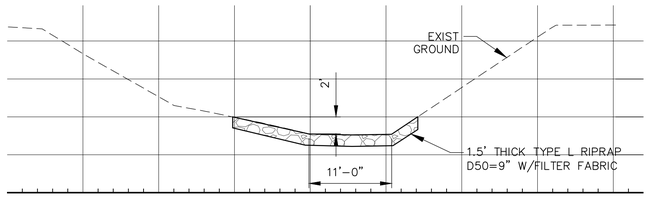
SHEET NO:
PP-42

M:\FS\11-600-019-00\CADD\SHEETS\SECTION 16\REUSE PNP FINAL\REUSE-OUTFLOW-FINAL - (1).DWG
2/16/12



A–A SECTION AT ARROYO

NOT TO SCALE



B–B SECTION AT ARROYO

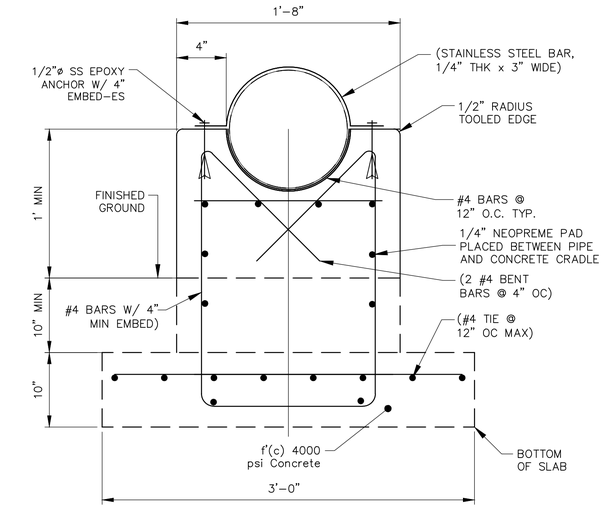
NOT TO SCALE

NOTES:

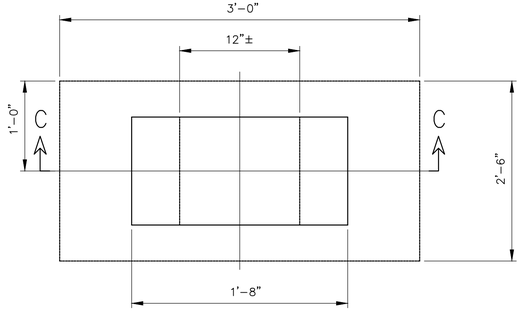
1. ABOVE GROUND FLXFL CONNECTIONS SHALL HAVE RING FLANGE–TYTE GASKET.
2. RIP RAP STONE PAD SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 109 RIPRAP STONE AND SECTION 603 RIPRAP SURFACE TREATMENT OF THE NEW MEXICO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2006 EDITION, AS PUBLISHED BY THE NEW MEXICO CHAPTER OF APWA. ALL REQUIREMENTS OF SECTIONS 109 AND 603 SHALL APPLY EXCEPT:

   A). ONLY RIPRAP STONE MEETING THE SPECIFICATIONS OF THESE PLANS, OR AS APPROVED BY THE ENGINEER SHALL BE ACCEPTABLE;

   B). STONE PAD CONSTRUCTION SHALL MEET THE DETAILS AS DESCRIBED ON THESE PLAN DRAWINGS.



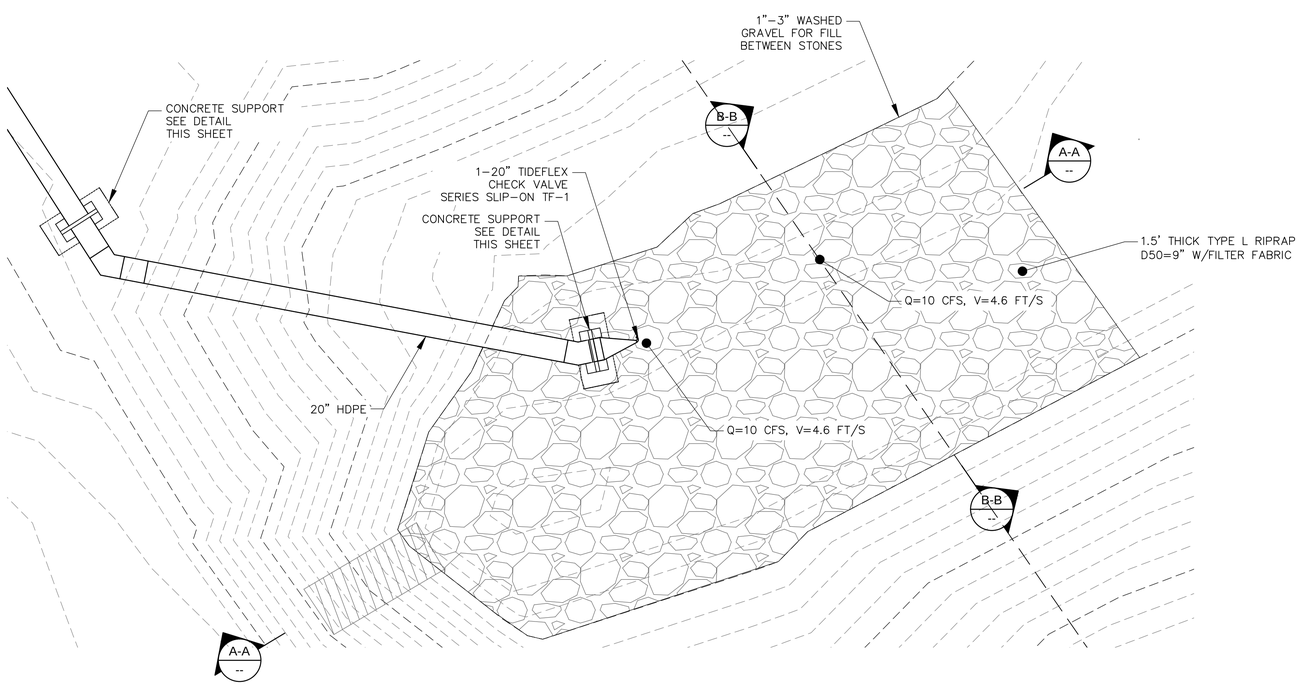
SECTION C–C



PLAN VIEW

CONCRETE PIPE SUPPORT AT ARROYO

NOT TO SCALE



PLAN VIEW AT ARROYO

NOT TO SCALE

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Santa Fe, NM 87507

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Albuquerque, NM 87109
Phone: (505) 348-4000

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SEAL

PROJECT NAME

STRATHMORE MINERALS
ROCA HONDA RESOURCES, LLC
MINE WATER DISCHARGE
OUTFALL DETAIL
SAN LUCAS ARROYO

REV.	DATE	DESCRIPTION	BY

PROJECT NO:	1160001900
DESIGNED BY:	DMD
DRAWN BY:	STAFF
CHECKED BY:	DMD
DATE:	JANUARY, 2012

SHEET TITLE

ARROYO
DISCHARGE
DETAILS

SHEET NO:

PP-43

M:\IFS\11-600-019-00\CADD\SHEETS\SECTION 16\WWW-DETAILS\ARROYO DETAIL.DWG

9/27/11

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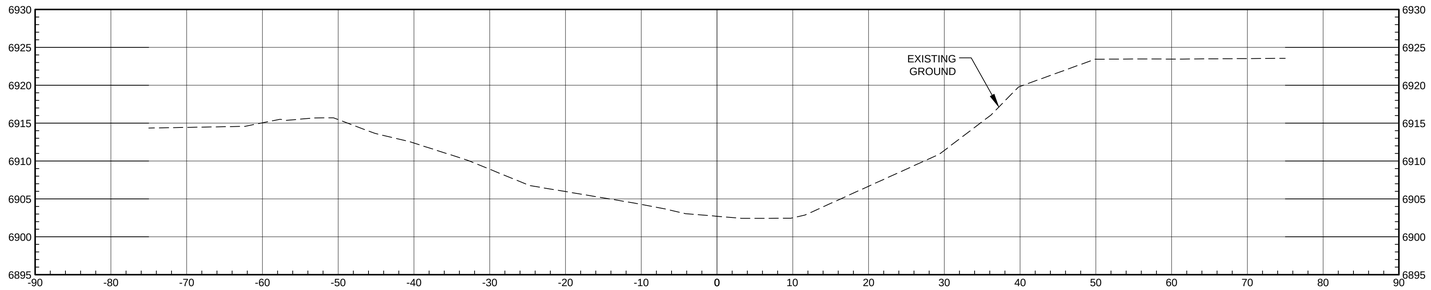

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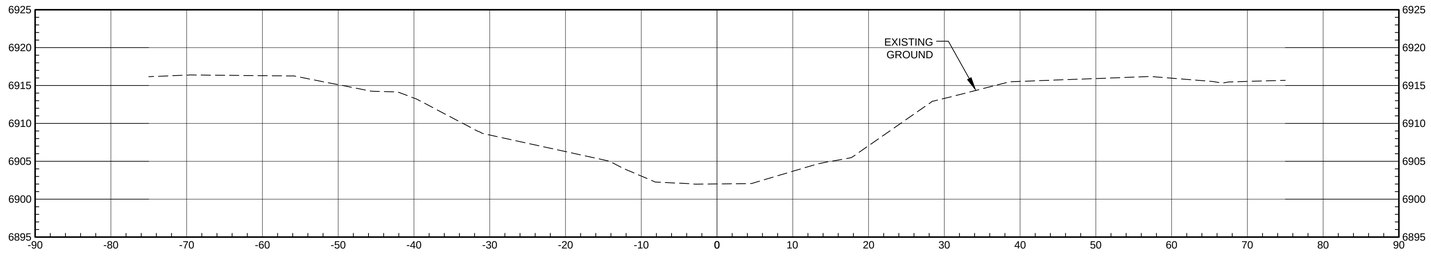

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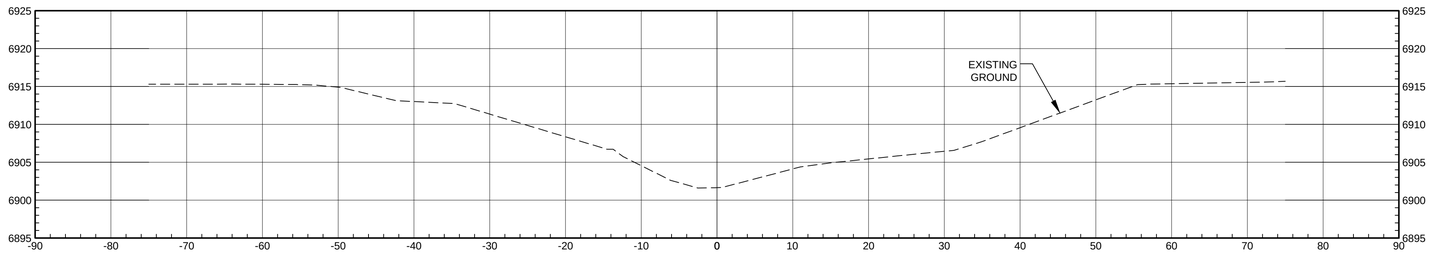

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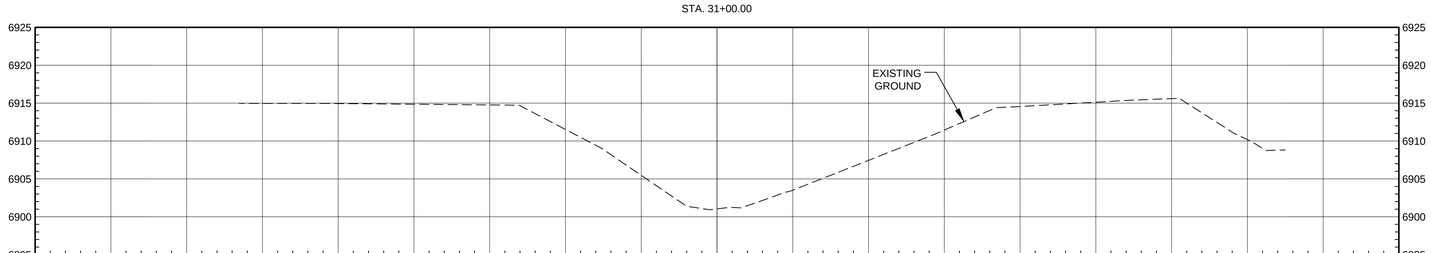

0 5' 10'

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PROJECT NAME

STRATHMORE MINERALS
ROCA HONDA RESOURCES, LLC
MINE WATER DISCHARGE
OUTFALL DETAIL
SAN LUCAS ARROYO

REV.	DATE	DESCRIPTION	BY

PROJECT NO:	1160001900
DESIGNED BY:	DMD
DRAWN BY:	STAFF
CHECKED BY:	DMD
DATE:	JANUARY, 2012

SHEET TITLE

OUTFLOW ARROYO SECTIONS - I

SHEET NO:

PP-44

9/27/11 M:\FS\11-600-019-00\CADD\SHEETS\SECTION 16\REUSE PNP FINAL\REUSE-OUTFLOW-FINAL - (1).DWG

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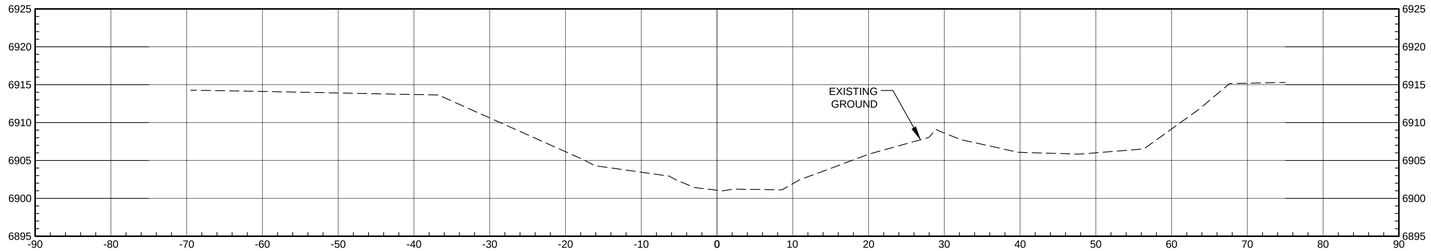

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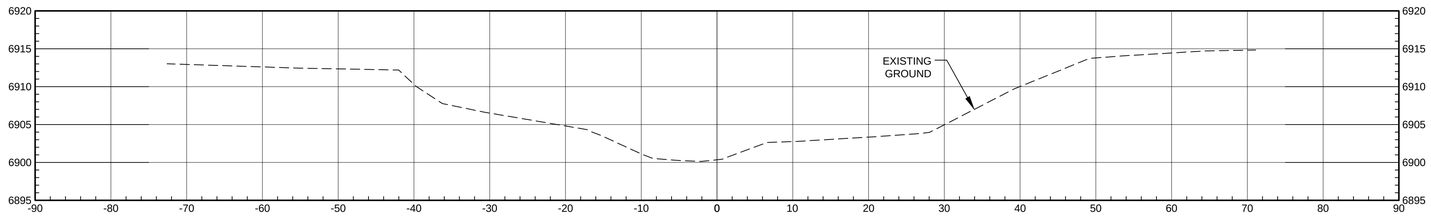

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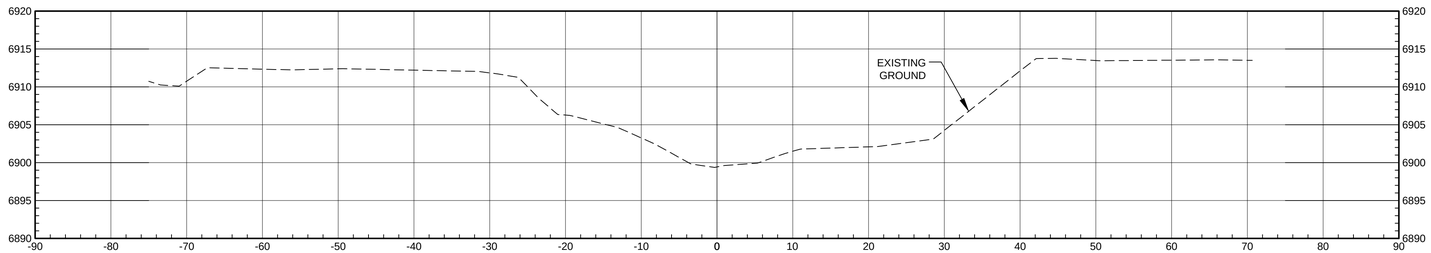

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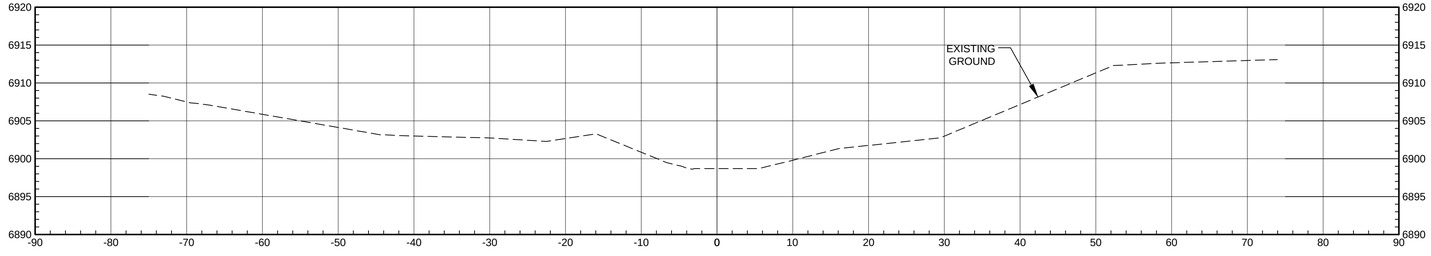

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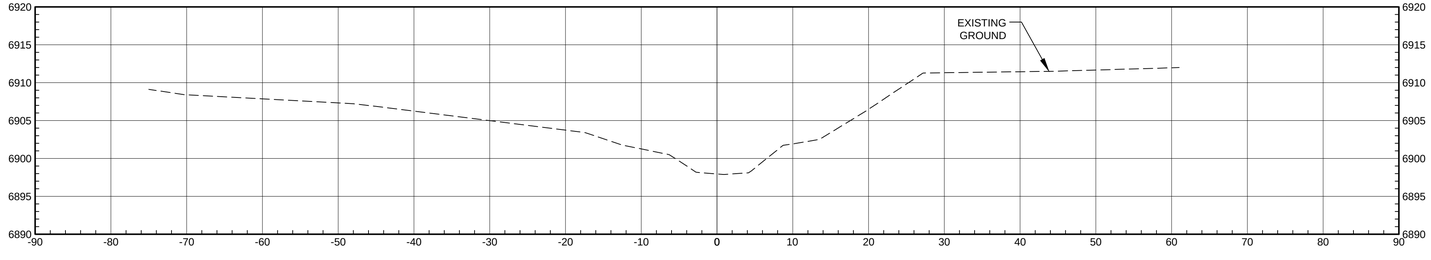

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PROJECT NAME
STRATHMORE MINERALS
ROCA HONDA RESOURCES, LLC
MINE WATER DISCHARGE
OUTFALL DETAIL
SAN LUCAS ARROYO

REV.	DATE	DESCRIPTION	BY

PROJECT NO:	1160001900
DESIGNED BY:	DMD
DRAWN BY:	STAFF
CHECKED BY:	DMD
DATE:	JANUARY, 2012

SHEET TITLE

OUTFLOW ARROYO SECTIONS - II

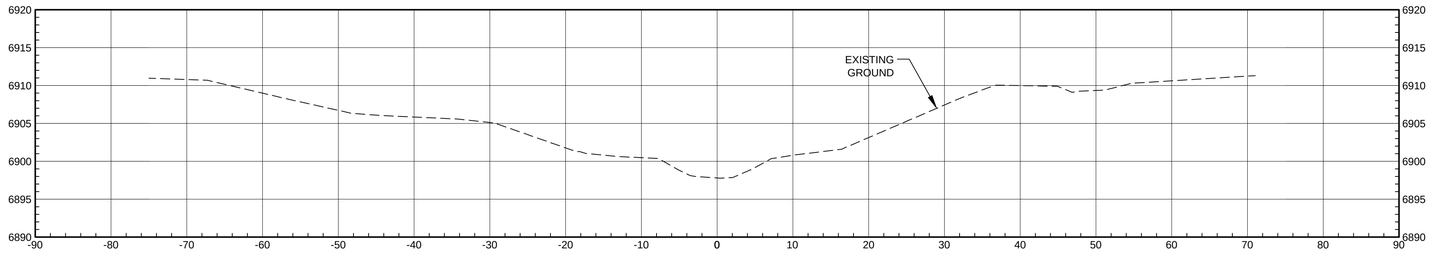
SHEET NO:

PP-45

0 5' 10'

9/27/11 M:\FS\11-600-019-00\CADD\SHEETS\SECTION 16\REUSE PNP FINAL\REUSE-OUTFLOW-FINAL - (1).DWG

STA. 34+00.00



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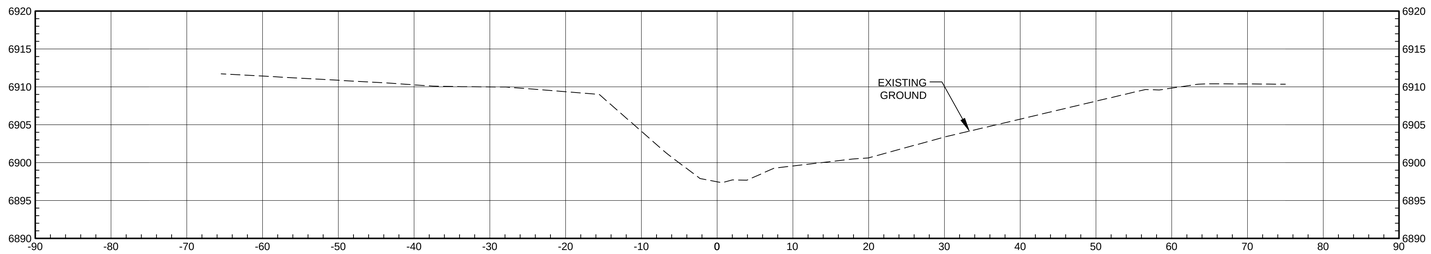

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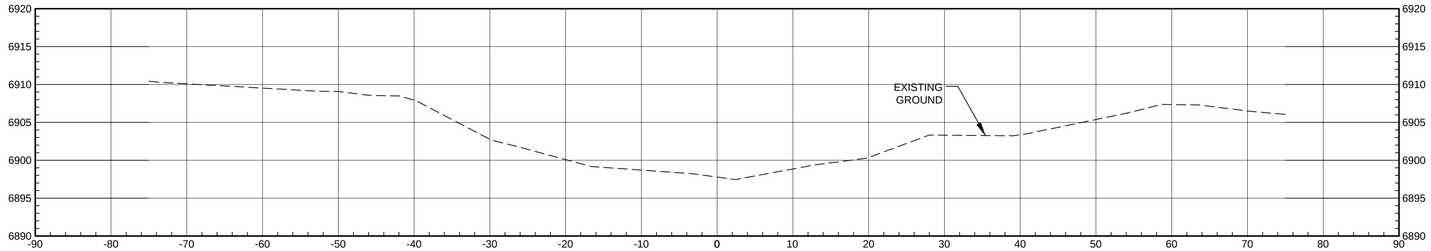

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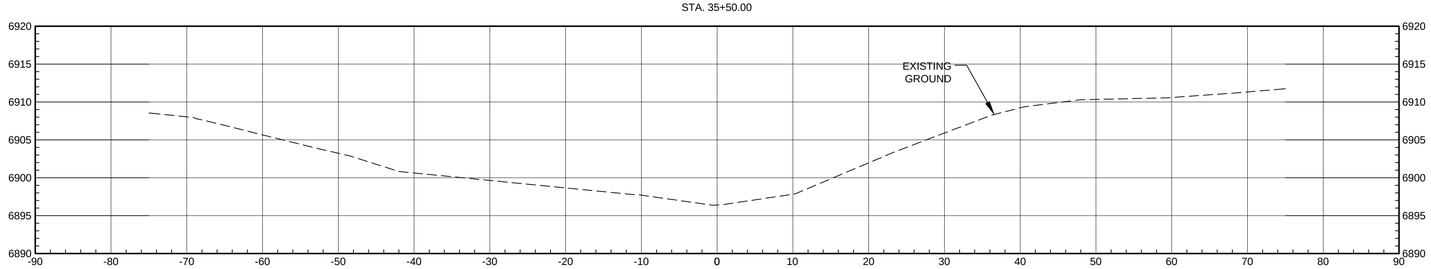

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PROJECT NAME
STRATHMORE MINERALS
ROCA HONDA RESOURCES, LLC
MINE WATER DISCHARGE
OUTFALL DETAIL
SAN LUCAS ARROYO

REV.	DATE	DESCRIPTION	BY

PROJECT NO:	1160001900
DESIGNED BY:	DMD
DRAWN BY:	STAFF
CHECKED BY:	DMD
DATE:	JANUARY, 2012

SHEET TITLE

OUTFLOW ARROYO SECTIONS - III

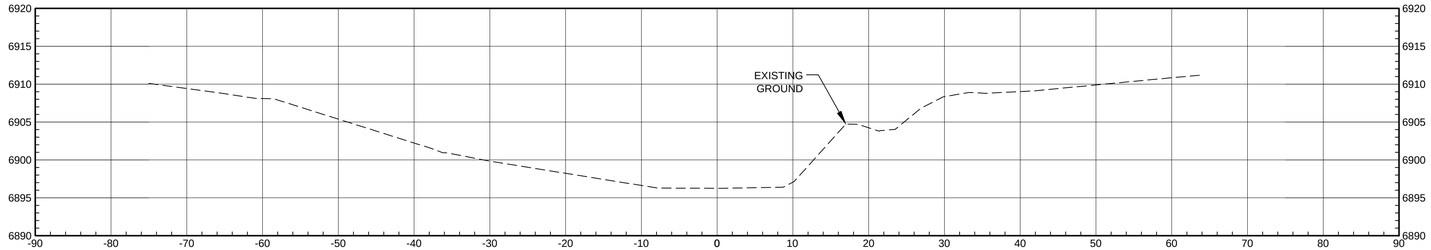
SHEET NO:

PP-46

0 5' 10'

9/27/11 M:\FS\11-600-019-00\CADD\SHEETS\SECTION 16\REUSE PNP FINAL\REUSE-OUTFLOW-FINAL - (1).DWG

STA. 36+00.00



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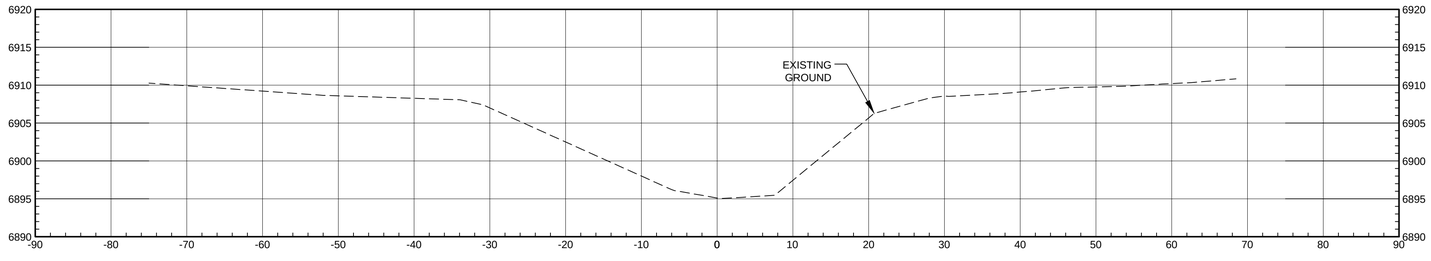

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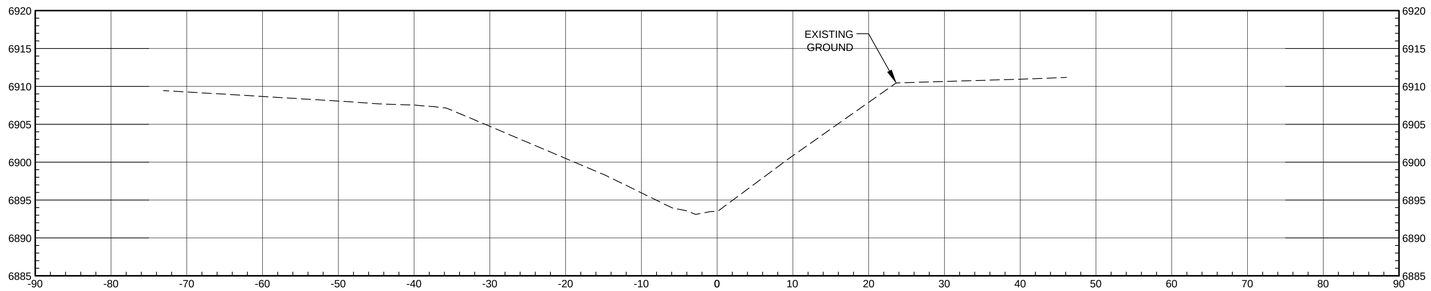

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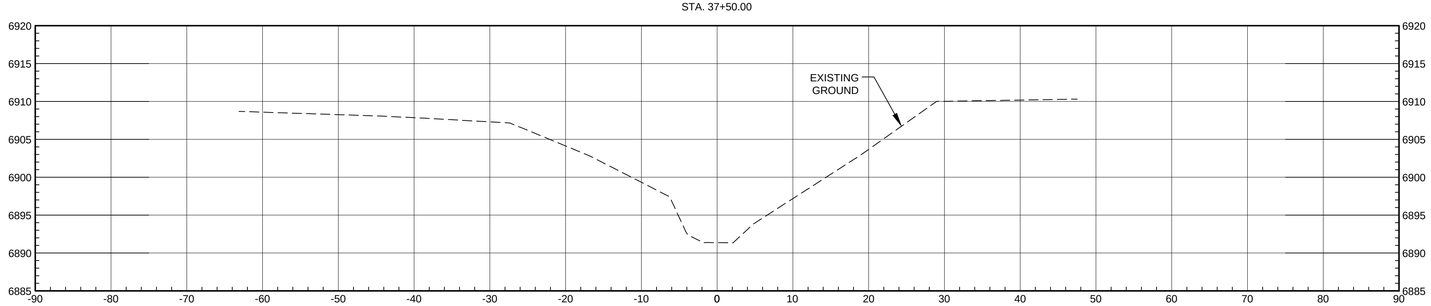

0 5' 10'

Roca Honda Resources LLC.
4001 Office Court Drive Suite 102
Santa Fe, NM 87507

WILSON & COMPANY
4900 Lang Avenue Ne
Albuquerque, NM 87109
Phone: (505) 348-4000

60% SUBMITTAL
NOT FOR CONSTRUCTION

SEAL

PROJECT NAME
STRATHMORE MINERALS
ROCA HONDA RESOURCES, LLC
MINE WATER DISCHARGE
OUTFALL DETAIL
SAN LUCAS ARROYO

REV.	DATE	DESCRIPTION	BY

PROJECT NO:	1160001900
DESIGNED BY:	DMD
DRAWN BY:	STAFF
CHECKED BY:	DMD
DATE:	JANUARY, 2012

SHEET TITLE

OUTFLOW ARROYO SECTIONS - IV

SHEET NO:

PP-47

9/27/11 M:\FS\11-600-019-00\CADD\SHEETS\SECTION 16\REUSE PNP FINAL\REUSE-OUTFLOW-FINAL - (1).DWG