AP - 062

2010 AGWMR

09/08/2011

AP-062

R. T. HICKS CONSULTANTS, LTD.

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September 8, 2011

Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson Livestock "30" Reserve Pit, T21S, R35E, Section 30, Unit P;
NMOCD Case # AP-62

Dear Mr. Von Gonten:

Attached is the 2010 Annual Report for the above-referenced site. Please contact me if you have any questions or require additional information.

Samson will continue to monitor groundwater in all wells on an annual basis until directed otherwise.

Sincerely,
R.T. Hicks Consultants, Ltd.

Dale T Littlejohn
Geologist

Copy: Samson Investment Company

September 8, 2011

Samson Livestock "30" Reserve Pit
NMOCD Case #AP-62

2010 Annual Monitoring Report

Prepared by
R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, New Mexico 87104

Location: T-21-S, R-35-E, Sec 30, Unit P
Latitude: North 32° 26' 41.2"
Longitude: West 103° 24' 6.9"
NMOCD#: AP-62

1 Executive Summary

The Livestock "30" site, which is operated by Samson Resources Company (Samson), is located approximately 16 miles west of Eunice, New Mexico. The data presented in this 2010 Annual Monitoring Report permits us to conclude:

- The extent and magnitude of ground water impairment is stable with respect to the average chloride concentration. Changes in the TDS concentrations appear to be associated with water of higher salinity at the bottom of the aquifer with no evidence of down gradient migration.
- While pumping ground water from MW-3d is beneficial with respect to the removal of contaminant mass, monitoring data suggest meaningful improvement of ground water quality may not be achieved even with long-term pumping.
- The engineered ET infiltration barrier functions as designed; the chloride flux from the vadose zone to ground water is at or near zero.
- Based on the rate of ground water level decline identified since 2007 at the site (0.26 ft/yr) RT Hicks Consultants (Hicks Consultants) believes that the 24-foot thick shallow aquifer could decrease to less than 10-feet of saturation within 60 years. However, pre-1996 USGS water level data indicates that the declines observed at the site are not necessarily regional or historic.
- We believe that area where the shallow aquifer is currently impaired and a large area down gradient from the site is not "a place of withdrawal for present or reasonably foreseeable future use". Our rationale for this conclusion includes:
    - the area is not attractive for residential development due to the nearby oil production equipment
    - The area is not conducive for development of permanent water supplies due to the potential for flash flooding (see Appendix A). .
    - The future saturated thickness of the shallow aquifer at the site may not be sufficient to develop for a water supply
    - The windmill located less than ½ mile west (up gradient) from the site will supply water for stock and
    - Wells located less than ½ mile south of the site draw water from the underlying (and confined) Chinle Formation, and provide water for oilfield purposes

Because the ground water impact does not pose a threat to human health and there does not appear to be an engineered method for improving the water quality more efficiently than natural restoration, Samson respectfully requests that the regulatory file at this site be

considered for closure with no further corrective action. Monitoring and reporting have been conducted at the site for the past six years, however the NMOCD has not responded to any of the recommendations provided since May of 2008. Until further notice Samson will discontinue reporting on all activities associated with the former reserve pit but will continue ground water monitoring on an annual basis.

This report is consistent with the commitments made in the September 2006 Stage 1/Stage 2 Abatement Plan, Progress reports submitted in December 2006, May 2007, August 2007, the November 2007 Abatement Report, the 2008 Annual Ground Water Monitoring Report, and the 2009 Annual Ground Water Monitoring Report.

2 Work Elements Performed

Appendix A presents the chronology of events at the site followed by a brief description of all characterization and corrective action activities performed at the site. A Table of the historic gauging and laboratory results is also provided in Appendix A. The ground water monitoring laboratory reports and chain-of-custody documents are included in Appendix B, and Appendix C provides graphs that depict the historic ground water impairment for each monitoring well.

Since November 2009, site activities included the annual ground water sampling of the shallow and deep monitoring wells, and monitoring of the soil moisture below the ET Barrier.

3 Conclusions

3.1 ET Barrier Performing as Predicted

Soil moisture monitoring demonstrates that the moisture content within the ET Barrier is very low and has continued to decline over the past year. The adjacent table indicates that the lower portion of the ET barrier has dried more slowly than the upper portion. This is expected because the upper portion of the barrier loses water to evaporation to a larger extent than the lower portion of the barrier. This result confirms the performance expectations of the ET Barrier presented in the November 2007 Report.

	ET Cover Monitoring Port		
Vadose Zone Measurement Date	No. 1 West 2.8-foot	No.2 Center 5-foot	No. 3 East 9-foot
4/17/07	80	81	80
5/1/07	7	15	17
5/21/07	3	10	9
7/18/07	1	1	7
8/9/07	1	1	7
12/6/07	0	0	4
4/3/08	0	0	3
8/19/08	0	0	4
11/20/08	0	0	3
2/16/09	0	0	2
5/26/09	0	1	2
8/20/09	0	1	3
11/3/09	0	1	2
11/18/10	0	0	0

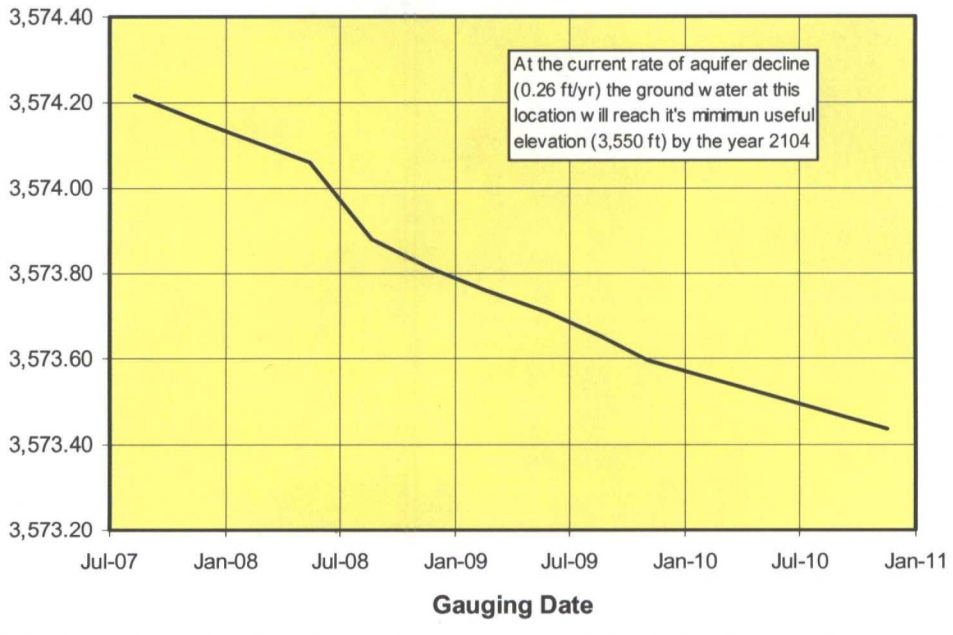
As discussed below, ground water monitoring results also demonstrate that

the chloride concentration of upper portion of the aquifer beneath the ET cover is stable or declining over time. This observation supports a conclusion that the flux of chloride from the vadose zone to ground water beneath the cover is very low or nil.

3.2 Ground Water Flow Direction is Constant, but the Water Levels are Decreasing

Hicks Consultants gauged and sampled each of the monitoring wells on November 18, 2010. The ground water gradient map (Plate 1) indicates essentially no change in the gradient from historic monitoring. Observations continue to support a flow rate of about 10 ft per 100 yrs as calculated and provided in the 2007 Abatement Report. While the ground water gradient remains unchanged, the average water level has continued to decrease as shown in Figure 1.

Figure 1
Average Ground Water Elevation



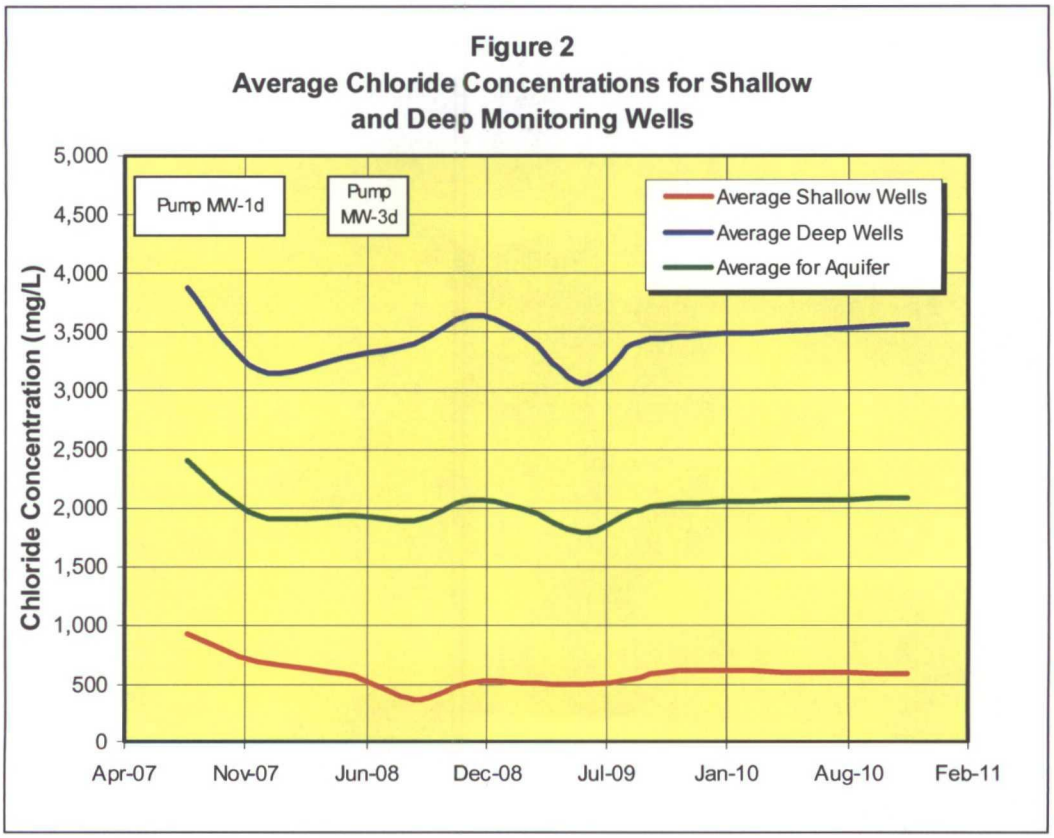
Historic water level data from ten nearby wells completed at elevations similar to the site monitoring wells is available from the USGS up to the year 1996. These wells are located from 2 to 7 miles north, west and south of the site and are identified as producing from the Ogallala formation or the alluvium (Bolson Deposits). Only one of these wells indicated a pre-1996 water level decline rate similar to what is currently observed at the site. It should be noted that there are no water wells within 6 miles east of the site that are completed in the shallow aquifer, however several wells produce from the deeper Triassic (Chinle formation) in this area.

3.3 Short-Term Pumping Is a Marginally Effective Abatement Strategy

A total of 494,000 gallons of impaired ground water (14.4 tons chloride / 24.2 tons TDS) have been removed from the site to date. Water removed from the aquifer could not be used and was sent to a disposal well. No ground water removal operations were conducted in 2010.

Plate 2 depicts the laboratory results for both the shallow and deep zones for the last four November or December sampling events. Figure 2 depicts the average chloride concentrations for both the shallow and deep ground water zones over time. In figure 2, the width of the text box describing the pumping is equivalent to the approximate duration of the pumping event.

Figure 2
Average Chloride Concentrations for Shallow and Deep Monitoring Wells



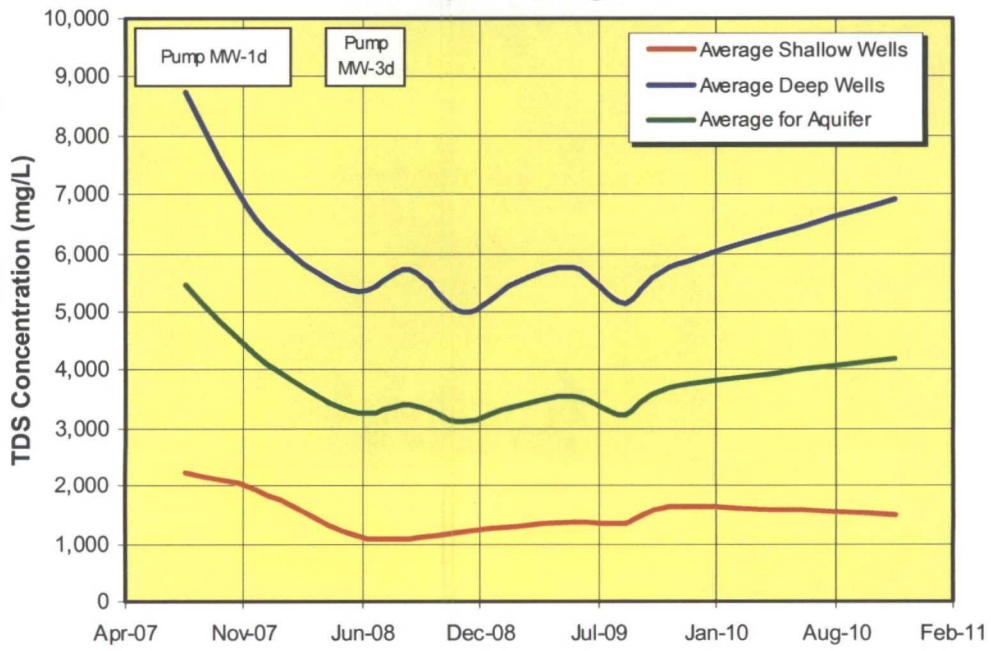
The data show the average site chloride concentrations in both the shallow and deep ground water zones decreased during the pumping that was performed from MW-1d (12/06 to 12/07). Because pumping occurred more than 2 years after the April 2004 flood event that damaged the liner (see Appendix A), we conclude that the pumping, not natural restoration, is primarily responsible for the observed decrease in chloride concentrations.

During pumping from MW-3d (5/12/08 to 7/30/08) the average chloride concentration in the shallow ground water zone decreased, albeit temporarily. The rate of increase for the average

chloride concentration in the deep ground water zone declined slightly during this same time. We conclude that the pumping of MW-3d temporarily caused fresh water from outside of the zone of impact to flow into the upper portion of the aquifer near the pumping well. In the lower portion of the aquifer, pumping removed chloride mass and caused a small decline in chloride concentrations in MW-1d, MW-3d and MW-5d. However, pumping MW-3d probably perturbed brine zones perched on the underlying red bed aquiclude, causing chloride concentrations to increase in MW-2d. After pumping ceased, dispersion and diffusion caused equilibration of chloride concentration between the upper and lower aquifer, resulting in a slight increase in chloride concentrations in the shallow wells. Despite the changes observed during pumping MW-3d, the average chloride concentration for the aquifer has remained stable at approximately 2,000 mg/L since the pumping of MW-1d was terminated.

Figure 3 depicts the average TDS concentrations for both the shallow and deep ground water zones over time.

Figure 3
Average TDS Concentrations for Shallow and Deep Monitoring Wells



The data demonstrate that average site TDS concentrations in both the shallow and deep ground water zones decreased during the pumping that was performed from MW-1d, but were not significantly affected by the pumping from MW-3d. A combination of both increasing TDS in the lower zone with decreasing TDS in the upper zone appears to indicate that the dissolved

solids are settling into the lower (less permeable) portion of the aquifer. This may have been enhanced by reducing the sampling frequency from quarterly to annually in 2010.

These results suggest that while the chloride (and TDS) mass/barrel removed from MW-3d (1.67 kg/bbl) was much greater than the chloride mass/barrel removed from MW-1d (0.96 kg/bbl), the removal of saline water from MW-3d has produced no permanent benefit to the overall quality of the ground water since much of the removed mass would have likely settled to the base of the aquifer and become isolated from natural migration.

3.4 The Chloride Plume is Stable

In the upper portion of the aquifer, chloride concentrations are essentially unchanged over the past three years. Chloride concentrations in the MW-1s have increased more than the other wells but this is likely a function of the dual completion attempted at this location which probably did not fully isolate the upper zone from the more impacted lower zone.

In the lower portion of the aquifer, MW-1d, MW-3d and MW-4d have exhibited stable chloride concentrations since January 2008. The increase in chloride concentrations in MW-2d and MW-5d are believed to be the result of molecular dispersion or a migration of high density water from the higher concentration area to the northeast. If chloride plume migration were occurring it is expected that an increase in chloride concentration greater than what was observed in MW-2d and MW-5d would be detected in MW-4d (down gradient well), but this has not occurred.

3.5 Options for Closing the Regulatory File Are Limited

We have identified two options for closure of the regulatory file. Of these, option No. 1 is the most appropriate for the site, based on future land use and available ground water resources.

1. File closure based upon a finding by NMOCD and the surface owner that the shallow aquifer at and down gradient of the Livestock site is not a place of withdrawal for present or reasonably foreseeable future use.
2. Continued monitoring for the next 60 years when water level decline renders the water zone effectively useless.

4 Recommendations

- Obtain a response from NMOCD regarding closure options.
- Continue to collect and analyze ground water samples on annual basis for chloride, TDS and field specific conductance.
- Submit ground water monitoring results to the NMOCD if requested.

Plates

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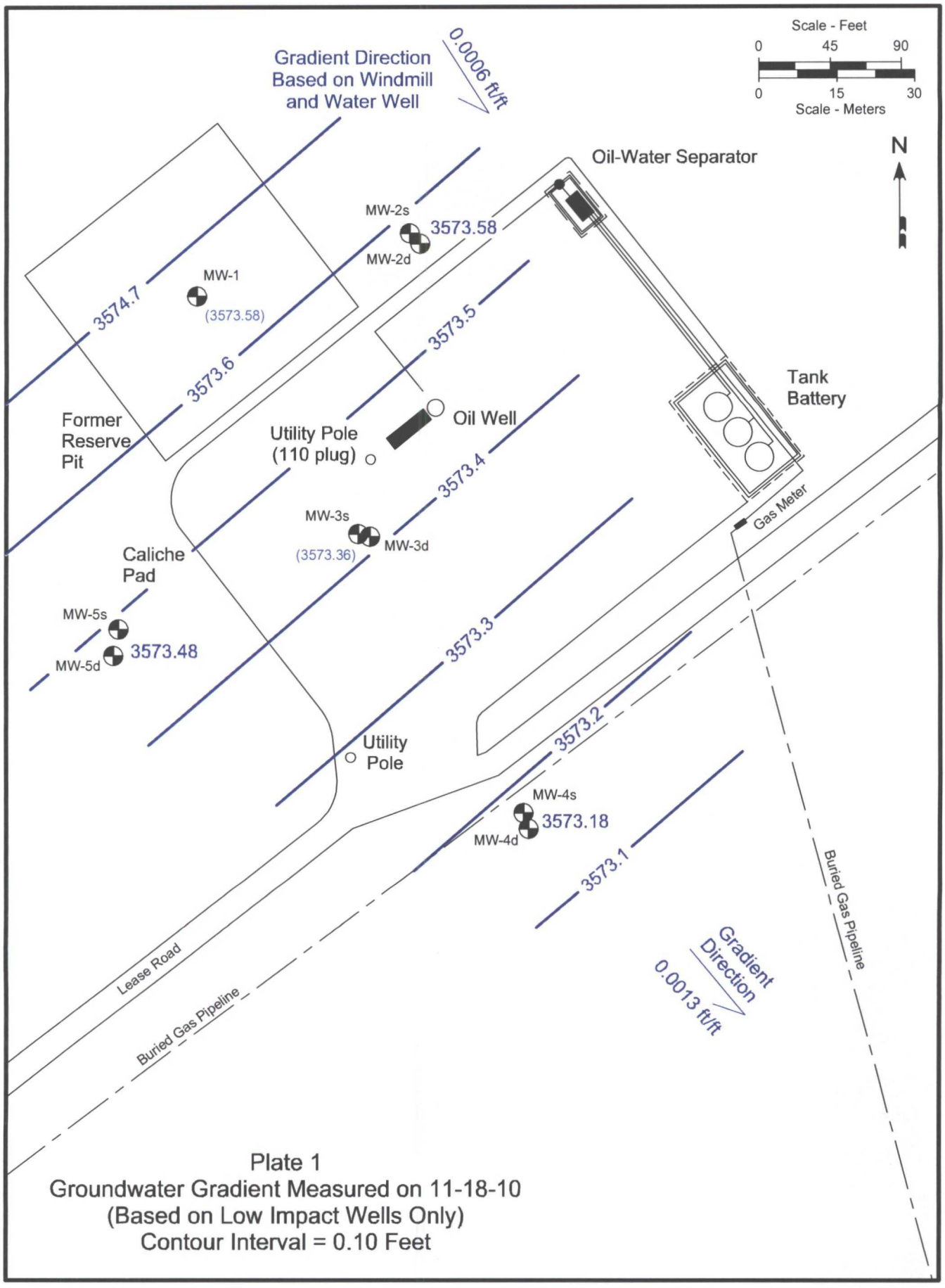

Plate 1
Groundwater Gradient Measured on 11-18-10
(Based on Low Impact Wells Only)
Contour Interval = 0.10 Feet

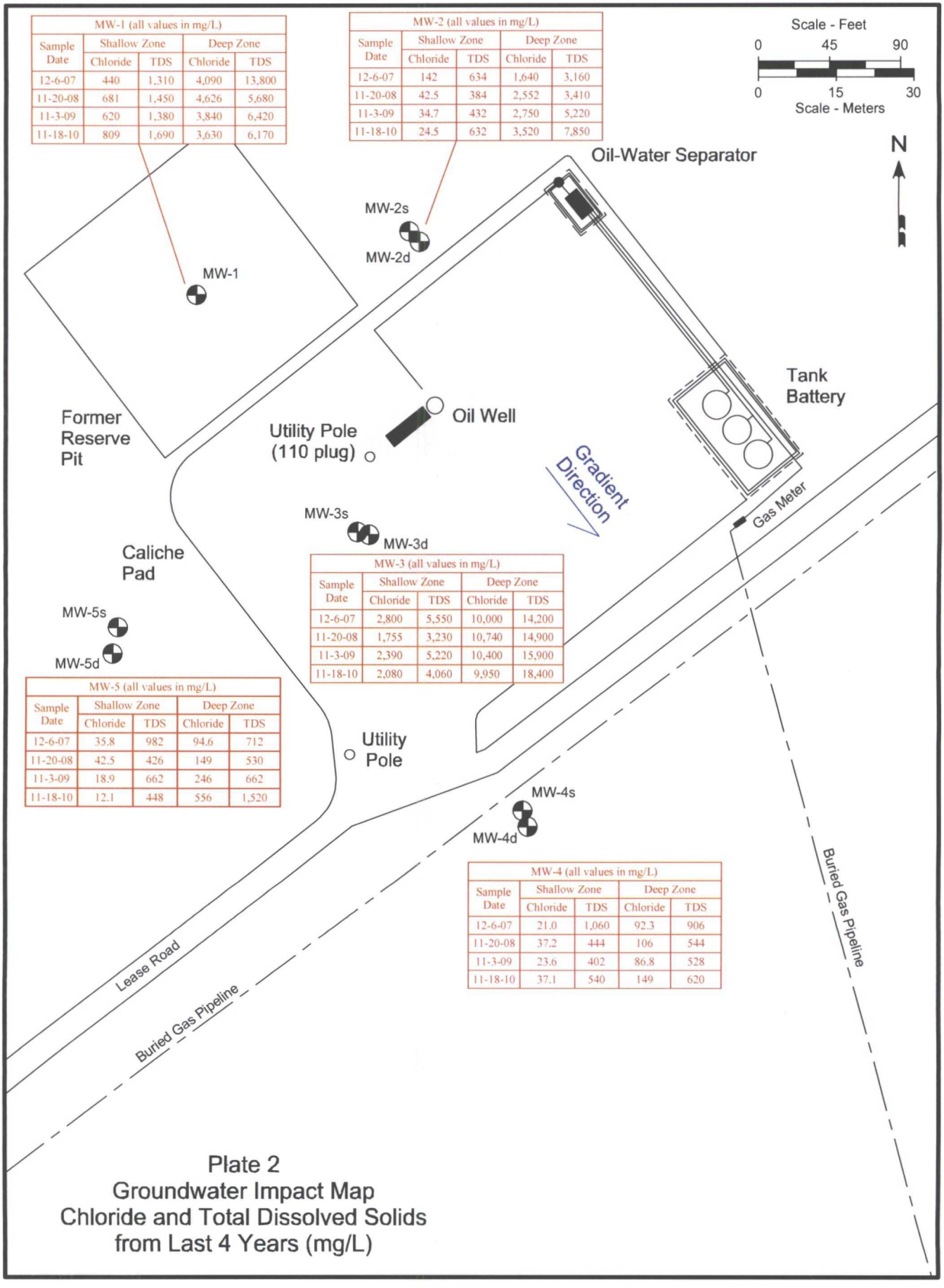

Plate 2
Groundwater Impact Map
Chloride and Total Dissolved Solids
from Last 4 Years (mg/L)

Appendix A

Chronology of Events

Table of Historic Data

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Appendix A
Chronology of Events

09-30-02: Following the installation of the reserve pit, drilling of the Livestock "30" State No. 1 gas well commenced. The well lies within the Grama Ridge Morrow East Field.

04/05/04: After the completion of the gas well, while the reserve pit was drying out in preparation for closure, a significant precipitation event flooded the reserve pit and damaged the liner. Rainwater probably flushed the chloride from the cuttings, flowed through the liner tears and caused the impact to the underlying soil and ground water.

05-11-05: Samson contracted for the removal of the cuttings and some underlying material to a centralized facility. Soil samples collected in the excavation indicated that the material underlying the pit contained chloride concentrations and diesel-range organics but there is no evidence that regulated hydrocarbons were present in soil.

09-16-05: Ocotillo Environmental installed nine hollow-stem auger holes within and surrounding the reserve pit. The data showed elevated chloride concentrations (>1,000 mg/kg) in at several locations from the base of the excavation to the water table (approximately 40 feet below ground surface.

09-19-05: A sample from a temporary monitoring well (TMW-1) in the center of the pit showed elevated chloride concentrations.

Undated: A report by Ocotillo included recommendations to over-excavate the reserve pit to a depth of 30-feet, install a 20-mil plastic liner, backfill the pit with clean soil, and install monitoring wells surrounding the area to delineate the chloride impact to ground water.

03-15-06: Samson contracted with RT Hicks Consultants, Ltd to re-evaluate the reserve pit site and determine the feasibility of an alternate remedy for closure.

03-30-06: TMW-1 was purged of 30 gallons of water using a disposable bailer prior to sampling to determine the concentrations of chloride and total dissolved solids. The results indicated that the chloride concentration at TMW-1 had decreased significantly from the sample recovered on 9-19-05 but remained above WQCC Standards. A water sample recovered from the windmill-equipped water well located 1,800 feet to the northwest of the site established background water quality for the area.

05-10-06: The first of three additional ground water samples was recovered from TMW-1 over a 2-month period. In each case the well was purged of approximately 400 gallons prior to sampling. Chloride concentrations from each sample were generally consistent with the sample recovered on March 30, 2006.

06-12-06: Hicks Consultants submitted a Corrective Action Plan (CAP) for the proposed pit closure at the Livestock "30" site to Mr. Glenn Von Gonten, with the NMOCD in Santa Fe. The CAP presented a design for an evapotranspiration (ET) cover and recommended installation of the barrier over the reserve pit area to control the migration of additional chloride into the ground water. The CAP proposed a "point-of-use" ground water remedy.

07-12-06: A solar-powered pump installed in the 2-inch monitoring well (TMW-1) withdrew water at a rate of 1-2 gpm in order to determine if more aggressive water recovery would significantly decrease the chloride concentration in the ground water below the pit. Water discharged to the produced water tank.

08-30-06: In a meeting with Mr. Glenn Von Gotten and David Sanchez at the NMOCD offices in Santa Fe, Hicks Consultants and Samson presented the June 12, 2006 CAP and results of the ground water purging/sampling feasibility test. The result of the meeting was a commitment to submit a Stage 1/Stage 2 Abatement Plan and to proceed with construction of the ET Infiltration Barrier in advance of NMOCD approval of the Abatement Plan.

09-22-06: Hicks Consultants submitted a Stage 1/Stage 2 Abatement Plan to the NMOCD. The plan made minor changes to the CAP and to the planned closure of the reserve pit. The plan included a proposal to abate the chloride-impacted ground water through a point-of-use water withdrawal program.

09-28-06: Hicks Consultants supervised closure of the former reserve pit according to the plan provided to the NMOCD on September 22, 2006.

10-23-06: Closure of the former reserve pit was complete and the final surface topography was shaped and mapped.

10-30-06: Hicks Consultants supervised the installation of a 4-inch monitoring/recovery well (MW-1) at the location of the former 2-inch temporary monitoring well (TMW-1). MW-1 included screened intervals at the vadose zone/ground water interface and at the base of the aquifer, above the lower confining Triassic red shale formation. In addition, three vadose zone moisture monitoring ports were installed into the backfilled pit material.

11-30-06: Following the development of MW-1, a solar-powered pump (Abyss No. 1), was installed at the base of the aquifer. A rubber packer was placed five feet above the pump to restrict flow from the upper portion of the aquifer. Each month, a ground water sampling program sampled chloride-impacted ground water from the lower screen (pump) and upper screen (bailer).

12-18-06: A progress report submitted to the NMOCD described the closure of the former reserve pit, provided information regarding the final ET cover and described the installation of MW-1 and vadose zone moisture monitoring ports. The proposed Abatement Plan public notice and a request to begin using the withdrawn water for use in drilling was part of this submittal.

04-17-07: Gypsum blocks were installed in the soil moisture ports and checked to verify that they were working properly. Ground water samples were recovered from the deep screen (pump) and shallow screen (bailer) of MW-1.

05-01-07: Replaced Abyss No. 1 with Abyss No. 2 in MW-1. Abyss No. 1 ran for approximately 3,600 hours.

05-21-07: Direct wired the MW-1 pump to the solar power control box to by-pass faulty plug. Ground water samples were recovered from the deep screen (pump) and shallow screen (bailer) of MW-1.

05-23-07: A progress report submitted to the NMOCD described the on-going ground water recovery and monitoring efforts. A recommendation for additional monitoring well installation was part of this submittal.

05-30-07: Hicks Consultants supervised the installation of monitoring wells MW-2(s), MW-2(d), MW-3(s), and MW-3(d) to delineate the dissolved chloride plume in the ground water. Field activities continued through June 1, 2007. MW-2(s) was fully developed and MW-2(d), MW-3(s), and MW-3(d) were partially developed. All of the new monitoring wells were surveyed to determine the casing elevations relative to MW-1.

06-13-07: All of the monitoring wells, nearest water well, and the North windmill well were gauged. The North windmill was shut in and the pump in MW-1 was turned off on June 12, 2007 to allow the static water levels to recover. MW-2(d) and MW-3(s) were fully developed and MW-3(d) was partially developed (poor producer). All of the monitoring wells, including MW-1 (deep and shallow) were sampled.

07-18-07: Replaced Abyss No. 2 pump after 1,800 hours of operation with Abyss No. 1R (rebuilt) pump. The monitoring well casing elevations were re-surveyed to verify the June 1, 2007 data.

08-02-07: A progress report submitted to the NMOCD described the on-going ground water recovery /monitoring efforts, and the results of the monitoring well installation and sampling conducted in May and June 2007. A recommendation for two additional monitoring well clusters was part of this submittal.

08-07-07: Monitoring wells MW-4(s), MW-4(d), MW-5(s), and MW-5(d) were installed to the southwest and southeast of the former reserve pit in order to complete the delineation of the dissolved chloride in the ground water. Each of the new wells were developed and surveyed to determine the casing elevations relative to the existing wells. Sediment in MW-3(d) was clean out using compressed air and the well was fully developed. All of the monitoring wells were sampled to determine the concentrations of chloride and total dissolved solids.

11-20-07: The Final Abatement Plan was submitted to Mr. Glenn Von Goten of the NMOCD by RT Hicks Consultants on behalf of Samson.

12-06-07: Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids. Removed Abyss No. 1R pump after approximately 3,300 hours of operation. Abyss No. 2R (rebuilt) pump was installed but failed immediately.

04-03-08: Each of the monitoring wells were gauged. MW-4(s) and MW-4(d) (down gradient) was sampled to determine the concentrations of chloride and total dissolved solids.

05-06-08: Installed 110-volt electric pump in MW-3(d), however the transformer for the on-site electric supply was too small to operate the 11.9-amp pump. Electrician installed new transformer and started pump at 1.5 gpm on 5/7/08.

05-12-08: Arrived on site and found pump in MW-3(d) operating at 1.2 gpm but the water level was at the pump depth. Approximately 5,500 gallons of water had been recovered in two frac tanks since the pumping operation began. A ground water sample was recovered from the pumping well and the flow rate was choked down to 1.15 gpm. Each of the other monitoring wells were gauged and MW-1, MW-2(s), MW-2(d), MW-3(s), MW-5(s), and MW-5(d) was sampled to determine the concentrations of chloride and total dissolved solids.

06-02-08: 650 bbls of water from MW-3(d) was transported by Lobo Trucking to the Samson Osudo 33 State Com. No. 1 well for use in the drilling reserve pit.

06-04-08: 110 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.

06-19-08: 120 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.

07-03-08: 240 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.

07-15-/08: 220 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.

07-18-08: Arrived on site and found pump in MW-3(d) operating at 1.25 gpm. A ground water sample was recovered from the pumping well but the flow rate was not adjusted.

07-23-08: 220 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.

07-30-08: 330 bbls of water from MW-3(d) was transported by Key Energy to the Atha SWD for disposal.

07-31-08: The pump in MW-3(d) was turned off, but left in the well. 660 bbls of water was transported by Key Energy to the Atha SWD for disposal. Both frac tanks were removed from the site.

08-19-08: Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.

11-20-08: Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.

01/30/09: RT Hicks Consultants submitted the 2008 Annual Monitoring Report to the NMOCD on behalf of Samson.

02-16-09: Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.

05-26-09: Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.

08-20-09: Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.

11/03/09: Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.

11/18/10: Each of the monitoring wells were gauged and sampled to determine the concentrations of chloride and total dissolved solids.

04/12/10: RT Hicks Consultants submitted the 2009 Annual Monitoring Report to the NMOCD on behalf of Samson.

Summary of Activities Completed to Date

Initial Assessment
Following the discovery of elevated chloride concentrations in the soil below the former reserve pit by Samson, Ocotillio Environmental installed nine soil borings to define the extent of the impact to the soil. One of the soil borings was converted into a temporary monitoring well (TMW-1) in order to verify the impact to ground water. Details concerning these activities were provided with the September 22, 2006 Stage 1/Stage 2 Abatement Plan.

Closure of the Former Reserve Pit
From September 28 to October 23, 2006 the reserve pit was backfilled. An evapotranspiration (ET) cover and surface run-off infiltration area were constructed during the backfill operations. Following completion of the ET cover MW-1 was installed as a replacement to TMW-1 and three soil moisture monitoring ports were installed to verify the effectiveness of the ET cover. Detailed information concerning these activities were provided in the December 18, 2006 Progress Report. Re-seeding of the ET cover and the installation of gypsum blocks into the moisture ports occurred in April 2006. Based on monitoring of the gypsum blocks performed through November 3, 2009 there is no indication that rain water is infiltrating the ET barrier.

Dissolved Chloride Plume Delineation
Two clusters of monitoring wells, which included a shallow well screened at the surface of the aquifer and a deep well screened at the base of the aquifer, were installed to provide delineation of the chloride-impacted ground water to the northeast (MW-2) and the southeast (MW-3) of the former reserve pit. Information concerning the remediation/monitoring activities and the installation of MW-2 and MW-3 were provided in the August 2, 2007 Progress Report.

From August 7, to August 9, 2007 two additional clusters of monitoring wells were installed at the site. MW-4(s) and MW-4(d) were placed approximately 300 feet southeast from the former reserve pit to verify the down gradient extent of the chloride-impacted ground water. MW-5(s)

and MW-5(d) were placed approximately 120 feet south of the former reserve pit in order to delineate the plume to the southwest of MW-3.

Following completion, each for the new wells were gauged, developed, and surveyed relative to the casing elevations of the existing monitoring wells. A site ground water gradient map was constructed using data from only MW-2, MW-4, and MW-5. Elevated dissolved solids in the ground water at the MW-1 and MW-3 locations increase the specific gravity of the water such that measured fluid levels do not accurately reflect the potentiometric energy of the aquifer. Information and lithologic logs concerning these activities were provided in the November 20, 2007 Final Abatement Report.

Ground Water Pumping (Source Removal)
A solar-powered pump was used to recover of brine water, released for the reserve pit, along with ground water from MW-1 at an average rate of 0.8 gallons per minute (gpm) from November 30, 2006 to December 6, 2007. Approximately 386,769 gallons of brine water were recovered from the deep screened interval of the well over 8,700 hours of operation. All of the removed water was discharged into the on-site 500-barrel fiberglass tank, mixed with produced water from the gas well, and periodically transferred to a disposal facility. Information concerning this activity was provided in the May 23, 2007 Progress Report and January 22, 2009 Annual Monitoring Report.

An additional 107,100 gallons of water was recovered from MW-3(d) using a 110-volt submersible pump. The recovered water was temporarily stored in two on-site frac tanks before being transferred to an oil well drilling operation for use in the reserve pit or transported to a disposal facility. Information concerning this activity was provided in the January 22, 2009 Annual Monitoring Report.

Activities Completed Since Previous Update

Ground Water Monitoring
On November 18, 2010, a ground water monitoring event was conducted to verify the plume stability.

Table 1
Laboratory Results Summary - Groundwater Samples

Sample Date / Location	DTW (csg)	GW Elevation (ft)	Recv. Vol (gal)	Field Cond.	Sample Depth	Chloride (mg/L)	TDS (mg/L)
TMW-1 Casing Elev.=		**3607.11**					
9/19/05	No Data	--	--	--	Shallow	**3,999**	--
3/30/06	31.65	3575.46	30	7.49	Shallow	**2,240**	**4,520**
5/10/06	31.74	3575.37	450	7.51	Shallow	**2,580**	**3,900**
6/7/06	31.86	3575.25	830	5.93	Shallow	**2,150**	**4,080**
6/27/06	31.83	3575.28	1,230	7.70	Shallow	**2,520**	**4,160**
8/22/06	31.99	3575.12	6,830	5.52	Shallow	**1,930**	**3,720**
					Deep	**1,880**	**3,570**
MW-1 Casing Elev.=		**3616.06**					
11/6/06	41.28	3574.78	765	11.00	Deep	**5,520**	**9,240**
11/30/06	41.32	3574.74	837	6.03	Shallow	**1,030**	**2,280**
				11.19	Deep	**4,390**	**5,870**
12/12/06	43.03	3573.03	13,209	12.01	Deep	**5,210**	**9,600**
1/9/07	43.02	3573.04	42,609	4.80	Shallow	**1,870**	**2,940**
				12.25	Deep	**5,840**	**8,670**
2/20/07	43.12	3572.94	87,609	5.46	Shallow	**2,130**	**3,120**
				12.92	Deep	**6,690**	**7,680**
3/20/07	43.37	3572.69	121,881	4.94	Shallow	**2,110**	**3,930**
				11.99	Deep	**7,820**	**9,030**
4/17/07	43.44	3572.62	154,137	5.54	Shallow	**2,050**	**3,510**
				13.07	Deep	**6,350**	**11,400**
5/21/07	41.60	3574.46	194,529	3.91	Shallow	**1,400**	**2,490**
				11.88	Deep	**6,360**	**10,400**
6/13/07	41.65	3574.41	218,289	5.68	Shallow	**1,620**	**3,180**
				15.89	Deep	**6,770**	**13,000**
7/18/07	41.64	3574.42	253,929	--	--	--	--
8/9/07	41.75	3574.31	277,689	5.60	Shallow	**1,650**	**3,150**
				14.62	Deep	**6,810**	**12,000**
12/6/07	41.72	3574.34	386,769	2.41	Shallow	**440**	**1,310**
				11.38	Deep	**4,090**	**13,800**
4/3/08	41.80	3574.26	386,769	--	--	--	--
5/12/08	41.85	3574.21	386,871	2.24	Shallow	**745**	**1,160**
				9.99	Deep	**4,254**	**6,490**
8/19/08	42.02	3574.04	386,946	2.46	Shallow	**470**	**1,150**
				9.33	Deep	**3,960**	**6,200**
11/20/08	42.06	3574.00	387,018	2.75	Shallow	**681**	**1,450**
				9.18	Deep	**4,626**	**5,680**
2/16/09	42.12	3573.94	387,090	3.51	Shallow	**680**	**1,680**
				10.76	Deep	**3,850**	**6,140**
5/26/09	42.16	3573.90	387,162	2.28	Shallow	**482**	**1,250**
				9.48	Deep	**3,420**	**5,550**
8/20/09	42.21	3573.85	387,234	2.66	Shallow	**533**	**1,280**
				11.71	Deep	**3,560**	**5,380**
11/3/09	42.29	3573.77	387,306	2.92	Shallow	**620**	**1,380**
				11.53	Deep	**3,840**	**6,420**
11/18/10	42.48	3573.58	387,375	3.12	Shallow	**809**	**1,690**
				11	Deep	**3,630**	**6,170**
MW-2s Casing Elev.=		**3616.26**					
6/13/07	41.83	3574.43	113	1.27	Shallow	348	**1,260**
7/18/07	41.83	3574.43	--	--	--	--	--
8/9/07	41.89	3574.37	119	0.93	Shallow	213	624
12/6/07	41.93	3574.33	124	0.82	Shallow	142	634
4/3/08	41.98	3574.28	124	--	--	--	--
5/12/08	42.07	3574.19	132	0.76	Shallow	53.2	314
8/19/08	42.22	3574.04	139	0.64	Shallow	7.90	360
11/20/08	42.27	3573.99	145	0.77	Shallow	42.5	384

Table 1
Laboratory Results Summary - Groundwater Samples

Sample Date / Location	DTW (csg)	GW Elevation (ft)	Recv. Vol (gal)	Field Cond.	Sample Depth	Chloride (mg/L)	TDS (mg/L)
2/16/09	42.33	3573.93	150	0.75	Shallow	17.7	418
5/26/09	42.37	3573.89	158	0.59	Shallow	18.5	408
8/20/09	42.42	3573.84	163	0.68	Shallow	19.5	436
11/3/09	42.50	3573.76	169	0.70	Shallow	34.7	432
11/18/10	42.68	3573.58	175	0.73	Shallow	24.5	632
MW-2d Casing Elev.=		**3615.92**					
6/13/07	41.44	3574.48	320	4.59	Deep	**1,460**	**3,810**
7/18/07	41.46	3574.46	--	--	--	--	--
8/9/07	41.50	3574.42	405	3.63	Deep	**1,380**	**3,180**
12/6/07	41.55	3574.37	511	4.41	Deep	**1,640**	**3,160**
4/3/08	41.63	3574.29	511	--	--	--	--
5/12/08	41.69	3574.23	616	5.65	Deep	**1,170**	**2,200**
8/19/08	41.85	3574.07	704	5.48	Deep	**2,190**	**4,080**
11/20/08	41.91	3574.01	770	5.70	Deep	**2,552**	**3,410**
2/16/09	41.98	3573.94	833	6.91	Deep	**2,350**	**5,100**
5/26/09	42.04	3573.88	896	6.60	Deep	**2,390**	**5,300**
8/20/09	42.08	3573.84	959	8.23	Deep	**2,640**	**4,220**
11/3/09	42.15	3573.77	1,022	8.28	Deep	**2,750**	**5,220**
11/18/10	42.35	3573.57	1,082	8.56	Deep	**3,520**	**7,850**
MW-3s Casing Elev.=		**3616.80**					
6/13/07	42.57	3574.23	148	8.77	Shallow	**4,480**	**10,600**
7/18/07	42.58	3574.22	--	--	--	--	--
8/9/07	42.62	3574.18	201	7.67	Shallow	**2,710**	**6,330**
12/6/07	42.68	3574.12	236	7.58	Shallow	**2,800**	**5,550**
4/3/08	42.75	3574.05	236	--	--	--	--
5/12/08	42.97	3573.83	266	5.43	Shallow	**2,021**	**3,470**
8/19/08	42.96	3573.84	294	3.88	Shallow	**1,330**	**2,870**
11/20/08	43.02	3573.78	322	5.31	Shallow	**1,755**	**3,230**
2/16/09	43.08	3573.72	346	5.77	Shallow	**1,820**	**3,220**
5/26/09	43.13	3573.67	378	6.07	Shallow	**1,990**	**4,280**
8/20/09	43.18	3573.62	402	7.80	Shallow	**2,140**	**4,000**
11/3/09	43.25	3573.55	426	7.97	Shallow	**2,390**	**5,220**
11/18/10	43.44	3573.36	450	7.16	Shallow	**2,080**	**4,060**
MW-3d Casing Elev.=		**3616.70**					
6/13/07	42.55	3574.15	97	16.65	Deep	**6,670**	**24,100**
7/18/07	42.53	3574.17	--	--	--	--	--
8/9/07	42.62	3574.08	242	>20.00	Deep	**11,000**	**27,400**
12/6/07	42.64	3574.06	294	>20.00	Deep	**10,000**	**14,200**
4/3/08	42.81	3573.89	294	--	--	--	--
5/12/08	63.00	3553.70	5,775	26.0	Deep	**10,850**	**17,200**
7/18/08	--	--	112,875	23.8	Deep	**10,100**	**17,600**
8/19/08	43.00	3573.70	112,925	19.2	Deep	**10,700**	**17,200**
11/20/08	43.03	3573.67	112,979	20.0	Deep	**10,740**	**14,900**
2/16/09	43.11	3573.59	113,033	20.0	Deep	**11,000**	**15,100**
5/26/09	43.16	3573.54	113,087	16.9	Deep	**9,270**	**16,700**
8/20/09	43.21	3573.49	113,138	20.0	Deep	**10,500**	**14,800**
11/3/09	43.29	3573.41	113,188	20.0	Deep	**10,400**	**15,900**
11/18/10	43.48	3573.22	113,238	20.0	Deep	**9,950**	**18,400**
MW-4s Casing Elev.=		**3616.89**					
8/9/07	42.85	3574.04	18	0.72	Shallow	21.7	434
12/6/07	42.93	3573.96	25	0.66	Shallow	21.0	**1,060**
4/3/08	43.00	3573.89	29	0.69	Shallow	18.7	450
8/19/08	43.21	3573.68	33	0.70	Shallow	13.0	472
11/20/08	43.28	3573.61	37	0.72	Shallow	37.2	444
2/16/09	43.33	3573.56	42	0.85	Shallow	21.3	474
5/26/09	43.37	3573.52	46	0.61	Shallow	18.4	414

Table 1
Laboratory Results Summary - Groundwater Samples

Sample Date / Location	DTW (csg)	GW Elevation (ft)	Recv. Vol (gal)	Field Cond.	Sample Depth	Chloride (mg/L)	TDS (mg/L)
8/20/09	43.45	3573.44	50	0.70	Shallow	19.3	432
11/3/09	43.51	3573.38	56	0.70	Shallow	23.6	402
11/18/10	43.71	3573.18	62	0.71	Shallow	37.1	540
MW-4d Casing Elev.=		**3617.13**					
8/9/07	47.12	3570.01	12	0.92	Deep	88.2	576
12/6/07	43.17	3573.96	32	0.92	Deep	92.3	906
4/3/08	43.25	3573.88	53	0.95	Deep	83.4	590
8/19/08	43.44	3573.69	74	0.99	Deep	75.9	616
11/20/08	43.52	3573.61	95	0.99	Deep	106	544
2/16/09	43.58	3573.55	116	1.16	Deep	73.7	544
5/26/09	43.62	3573.51	137	0.87	Deep	79.5	552
8/20/09	43.68	3573.45	158	0.99	Deep	78.0	442
11/3/09	43.73	3573.40	179	0.98	Deep	86.8	528
11/18/10	43.94	3573.19	200	1.12	Deep	149	620
MW-5s Casing Elev.=		**3616.43**					
8/9/07	42.10	3574.33	22	0.69	Shallow	43.0	470
12/6/07	42.18	3574.25	27	0.82	Shallow	35.8	982
4/3/08	42.26	3574.17	27	--	--	--	--
5/12/08	42.30	3574.13	32	0.85	Shallow	58.5	382
8/19/08	42.49	3573.94	37	0.72	Shallow	12.4	488
11/20/08	42.55	3573.88	43	0.74	Shallow	42.5	426
2/16/09	42.60	3573.83	48	0.85	Shallow	21.1	550
5/26/09	42.65	3573.78	53	0.62	Shallow	18.5	486
8/20/09	42.70	3573.73	58	0.72	Shallow	17.0	560
11/3/09	42.77	3573.66	63	0.69	Shallow	18.9	662
11/18/10	42.97	3573.46	69	0.67	Shallow	12.1	448
MW-5d Casing Elev.=		**3616.19**					
8/9/07	41.85	3574.34	96	0.80	Deep	112	502
12/6/07	41.93	3574.26	78	0.82	Deep	94.6	712
4/3/08	42.01	3574.18	78	--	--	--	--
5/12/08	42.05	3574.14	96	1.03	Deep	117	460
8/19/08	42.25	3573.94	117	0.97	Deep	113	476
11/20/08	42.30	3573.89	135	1.03	Deep	149	530
2/16/09	42.35	3573.84	153	1.24	Deep	155	548
5/26/09	42.40	3573.79	171	1.02	Deep	156	606
8/20/09	42.46	3573.73	189	1.27	Deep	203	832
11/3/09	42.52	3573.67	207	1.38	Deep	246	662
11/18/10	42.71	3573.48	225	2.23	Deep	**556**	**1,520**
N. Windmill Csg. Elev.=		**3609.13**					
3/30/06	--	--	NA	--	--	33.6	644
6/27/06	34.25	3574.88	--	--	--	--	--
6/13/07	33.65	3575.48	NA	0.89	Unkn	62.8	500
Water Well Csg. Elev.=		**3615.58**					
6/27/06	40.40	3575.18	--	--	--	--	--
6/13/07	40.73	3574.85	--	--	--	--	--
NMWQCC Standards						**250**	**1,000**

* Bold text indicates values exceed NMWQCC Standards

c:\Samson\Livestock 30\Project Data

Appendix B

Groundwater Monitoring

Laboratory Reports

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

Analytical Report 397852

for

RT Hicks Consultants Ltd. (Midland)

Project Manager: Dale Littlejohn

Samson Livestock 30

L-124-1110

23-NOV-10

Celebrating 20 Years of commitment to excellence in Environmental Testing Services

12600 West I-20 East Odessa, Texas 79765

Xenco-Houston (EPA Lab code: TX00122):
Texas (T104704215-10-6-TX), Arizona (AZ0738), Arkansas (08-039-0), Connecticut (PH-0102), Florida (E871002)
Illinois (002082), Indiana (C-TX-02), Iowa (392), Kansas (E-10380), Kentucky (45), Louisiana (03054)
New Hampshire (297408), New Jersey (TX007), New York (11763), Oklahoma (9218), Pennsylvania (68-03610)
Rhode Island (LAO00312), USDA (S-44102)

Xenco-Atlanta (EPA Lab Code: GA00046):
Florida (E87429), North Carolina (483), South Carolina (98015), Utah (AALI1), West Virginia (362), Kentucky (85)
Louisiana (04176), USDA (P330-07-00105)

Xenco-Miami (EPA Lab code: FL01152): Florida (E86678), Maryland (330)
Xenco-Tampa Mobile (EPA Lab code: FL01212): Florida (E84900)
Xenco-Odessa (EPA Lab code: TX00158): Texas (T104704400-TX)
Xenco-Dallas (EPA Lab code: TX01468): Texas (T104704295-TX)
Xenco-Corpus Christi (EPA Lab code: TX02613): Texas (T104704370)
Xenco-Boca Raton (EPA Lab Code: FL01273):
Florida(E86240),South Carolina(96031001), Louisiana(04154), Georgia(917)
North Carolina(444), Texas(T104704468-TX), Illinois(002295), Florida(E86349)

Xenco Phoenix (EPA Lab Code: AZ00901):
Arizona(AZ0757), California(06244CA), Texas(104704435-10-2), Nevada(NAC-445A), DoD(65816)
Xenco-Phoenix Mobile (EPA Lab code: AZ00901): Arizona (AZM757)
Xenco Tucson (EPA Lab code:AZ000989): Arizona (AZ0758)

23-NOV-10

Project Manager: **Dale Littlejohn**
RT Hicks Consultants Ltd. (Midland)
P.O. Box 7624

Midland, TX 79708

Reference: XENCO Report No: **397852**
Samson Livestock 30
Project Address: Lea Co., NM

Dale Littlejohn:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 397852. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 397852 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II
Odessa Laboratory Manager

XENCO Laboratories

Sample Cross Reference 397852

RT Hicks Consultants Ltd. (Midland), Midland, TX

Samson Livestock 30

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
MW-1(s)	W	Nov-18-10 09:40		397852-001
MW-1(d)	W	Nov-18-10 09:35		397852-002
MW-2(s)	W	Nov-18-10 10:45		397852-003
MW-2(d)	W	Nov-18-10 10:38		397852-004
MW-3(s)	W	Nov-18-10 08:40		397852-005
MW-3(d)	W	Nov-18-10 08:18		397852-006
MW-4(s)	W	Nov-18-10 11:28		397852-007
MW-4(d)	W	Nov-18-10 11:31		397852-008
MW-5(s)	W	Nov-18-10 12:25		397852-009
MW-5(d)	W	Nov-18-10 12:18		397852-010

CASE NARRATIVE

XENCO Laboratories

Client Name: RT Hicks Consultants Ltd. (Midland)
Project Name: Samson Livestock 30

ACCREDITED IN ACCORDANCE WITH nelac

Project ID:	*L-124-1110*	*Report Date:*	*23-NOV-10*
Work Order Number:	*397852*	*Date Received:*	*11/19/2010*

Sample receipt non conformances and Comments:

None

Sample receipt Non Conformances and Comments per Sample:

None

Certificate of Analysis Summary 397852

RT Hicks Consultants Ltd. (Midland), Midland, TX

Project Name: Samson Livestock 30

Project Id: L-124-1110
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: Fri Nov-19-10 08:39 am
Report Date: 23-NOV-10
Project Manager: Brent Barron, II

Analysis Requested													
	Lab Id:	397852-001		397852-002		397852-003		397852-004		397852-005		397852-006	
	Field Id:	MW-1(s)		MW-1(d)		MW-2(s)		MW-2(d)		MW-3(s)		MW-3(d)	
	Depth:												
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	Sampled:	Nov-18-10 09:40		Nov-18-10 09:35		Nov-18-10 10:45		Nov-18-10 10:38		Nov-18-10 08:40		Nov-18-10 08:18	
Anions by E300	*Extracted:*												
	Analyzed:	Nov-22-10 09:13		Nov-22-10 09:13		Nov-22-10 09:13		Nov-22-10 09:13		Nov-22-10 09:13		Nov-22-10 09:13	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Chloride		809	12.5	3630	100	24.5	5.00	3520	50.0	2080	25.0	9950	250
TDS by SM2540C	*Extracted:*												
	Analyzed:	Nov-22-10 16:00		Nov-22-10 16:00		Nov-22-10 16:00		Nov-22-10 16:00		Nov-22-10 16:00		Nov-22-10 16:00	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Total dissolved solids		1690	5.00	6170	5.00	632	5.00	7850	5.00	4060	5.00	18400	5.00

Brent Barron, II
Odessa Laboratory Manager

Final 1.000

Certificate of Analysis Summary 397852

RT Hicks Consultants Ltd. (Midland), Midland, TX

Project Name: Samson Livestock 30

Project Id: L-124-1110
Contact: Dale Littlejohn
Project Location: Lea Co., NM

Date Received in Lab: Fri Nov-19-10 08:39 am
Report Date: 23-NOV-10
Project Manager: Brent Barron, II

Analysis Requested											
	Lab Id:	397852-007		397852-008		397852-009		397852-010			
	Field Id:	MW-4(s)		MW-4(d)		MW-5(s)		MW-5(d)			
	Depth:										
	Matrix:	WATER		WATER		WATER		WATER			
	Sampled:	Nov-18-10 11:28		Nov-18-10 11:31		Nov-18-10 12:25		Nov-18-10 12:18			
Anions by E300	*Extracted:*										
	Analyzed:	Nov-22-10 09:13		Nov-22-10 09:13		Nov-22-10 09:13		Nov-22-10 09:13			
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL		
Chloride		37.1	5.00	149	5.00	12.1	5.00	556	10.0		
TDS by SM2540C	*Extracted:*										
	Analyzed:	Nov-22-10 16:00		Nov-22-10 16:00		Nov-22-10 16:00		Nov-22-10 16:00			
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL		
Total dissolved solids		540	5.00	620	5.00	448	5.00	1520	5.00		

Brent Barron, II
Odessa Laboratory Manager

Final 1.000

XENCO Laboratories

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the MQL and above the SQL.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit

PQL Practical Quantitation Limit

* Outside XENCO's scope of NELAC Accreditation.

XENCO Laboratories

BS / BSD Recoveries

Project Name: Samson Livestock 30

Work Order #: 397852 **Project ID:** L-124-1110

Analyst: LATCOR **Date Prepared:** 11/22/2010 **Date Analyzed:** 11/22/2010

Lab Batch ID: 833007 **Sample:** 833007-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Anions by E300 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	ND	10.0	9.24	92	10	10.6	106	14	80-120	20	

Analyst: WRU **Date Prepared:** 11/22/2010 **Date Analyzed:** 11/22/2010

Lab Batch ID: 833176 **Sample:** 833176-1-BKS **Batch #:** 1 **Matrix:** Water

Units: mg/L

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TDS by SM2540C Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Total dissolved solids	ND	1000	990	99	1000	1010	101	2	80-120	30	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

XENCO Laboratories

Form 3 - MS Recoveries

Project Name: Samson Livestock 30

Work Order #: 397852
Lab Batch #: 833007
Project ID: L-124-1110
Date Analyzed: 11/22/2010
Date Prepared: 11/22/2010
Analyst: LATCOR
QC- Sample ID: 397626-001 S
Batch #: 1
Matrix: Water
Reporting Units: mg/L

Inorganic Anions by EPA 300	MATRIX / MATRIX SPIKE RECOVERY STUDY					
Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	%R [D]	Control Limits %R	Flag
Chloride	18700	10000	29400	107	80-120	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference [E] = 200*(C-A)/(C+B)
All Results are based on MDL and Validated for QC Purposes

BRL - Below Reporting Limit

Sample Duplicate Recovery

Project Name: Samson Livestock 30

Work Order #: 397852

Lab Batch #: 833007 **Project ID:** L-124-1110

Date Analyzed: 11/22/2010 **Date Prepared:** 11/22/2010 **Analyst:** LATCOR

QC- Sample ID: 397626-001 D **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

Anions by E300	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Chloride	18700	19000	2	20	

Lab Batch #: 833176

Date Analyzed: 11/22/2010 **Date Prepared:** 11/22/2010 **Analyst:** WRU

QC- Sample ID: 397852-001 D **Batch #:** 1 **Matrix:** Water

Reporting Units: mg/L

TDS by SM2540C	SAMPLE / SAMPLE DUPLICATE RECOVERY				
Analyte	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Total dissolved solids	1690	1810	7	30	

Spike Relative Difference RPD 200 * | (B-A)/(B+A) |
All Results are based on MDL and validated for QC purposes.
BRL - Below Reporting Limit

Xenco Laboratories

12600 West I-20 East
Odessa, Texas 79765
Phone: 432-563-1800
Fax: 432-563-1713

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Dale Littlejohn
Company Name: RT Hicks Consultants Ltd
Company Address: P.O. Box 7624
City/State/Zip: Midland, Texas 79708
Telephone No: (432) 528-3878
Fax No: (432) 689-4578 (Fax)
Sampler Signature: Dale T. Littlejohn

Project Name: Samson Livestock 30
Project #: L-124-1110
Project Loc: Lea Co., NM
PO #:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative: Ice	HNO_3	HCl	NaOH	H_2SO_4	None	Other (Specify)	Matrix: Water	Sludge	Soil	Other (specify)	Analyze For: TCLP: TPH: 418.1 8015M 1005 1006	TOTAL: TPH: 418.1 8015M 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 8021B/5030 or BTEX 8260	RCI	N.O.R.M.	Chloride	Bromide	Total Dissolved Solids		RUSH TAT (Pre-Schedule)	Standard TAT
397852	MW-1(s)	11/18/10	0940	1	X					X		X															X		X			X
	MW-1(d)	11/18/10	0935	1	X					X		X															X		X			X
	MW-2(s)	11/18/10	1045	1	X					X		X															X		X			X
	MW-2(d)	11/18/10	1038	1	X					X		X															X		X			X
	MW-3(s)	11/18/10	0840	1	X					X		X															X		X			X
	MW-3(d)	11/18/10	0818	1	X					X		X															X		X			X
	MW-4(s)	11/18/10	1128	1	X					X		X															X		X			X
	MW-4(d)	11/18/10	1131	1	X					X		X															X		X			X
	MW-5(s)	11/18/10	1225	1	X					X		X															X		X			X
	MW-5(d)	11/18/10	1218	1	X					X		X															X		X			X

Special Instructions: Send Invoice to RT Hicks Consult. 901 Rio Grande Blvd. NW, Suite F-142, Albuquerque, NM 87104; Send results to Dale Littlejohn at the adress above.

Sample Containers Intact? (Y) N
Temperature Upon Receipt: -2.1
Laboratory Comments:
1L plastic

Relinquished by:	Date	Time	Received by:	Date	Time
Dale T. Littlejohn	11/19/10	839			
Relinquished by:	Date	Time	Received by ELOT:	Date	Time
			Lisa Murdock	11-19-10	8:39

Prelogin / Nonconformance Report - Sample Log-In

Client: RT Hicks Consultants Ltd
Date/Time: 11-19-10 8:39
Lab ID #: 397852
Initials: KM

Sample Receipt Checklist

1. Samples on ice?	Blue	(Water)	No	
2. Shipping container in good condition?	(Yes)	No	None	
3. Custody seals intact on shipping container (cooler) and bottles?	Yes	No	(N/A)	
4. Chain of Custody present?	(Yes)	No		
5. Sample instructions complete on chain of custody?	(Yes)	No		
6. Any missing / extra samples?	Yes	(No)		
7. Chain of custody signed when relinquished / received?	(Yes)	No		
8. Chain of custody agrees with sample label(s)?	(Yes)	No		
9. Container labels legible and intact?	(Yes)	No		
10. Sample matrix / properties agree with chain of custody?	(Yes)	No		
11. Samples in proper container / bottle?	(Yes)	No		
12. Samples properly preserved?	(Yes)	No	N/A	
13. Sample container intact?	(Yes)	No		
14. Sufficient sample amount for indicated test(s)?	(Yes)	No		
15. All samples received within sufficient hold time?	(Yes)	No		
16. Subcontract of sample(s)?	Yes	(No)	N/A	
17. VOC sample have zero head space?	Yes	(No)	N/A	

18. Cooler 1 No.		Cooler 2 No.		Cooler 3 No.		Cooler 4 No.		Cooler 5 No.	
lbs	-2.1 °C	lbs	°C	lbs	°C	lbs	°C	lbs	°C

Nonconformance Documentation

Contact:_____ Contacted by:_____ Date/Time:_____

Regarding: _____

Corrective Action Taken: _____

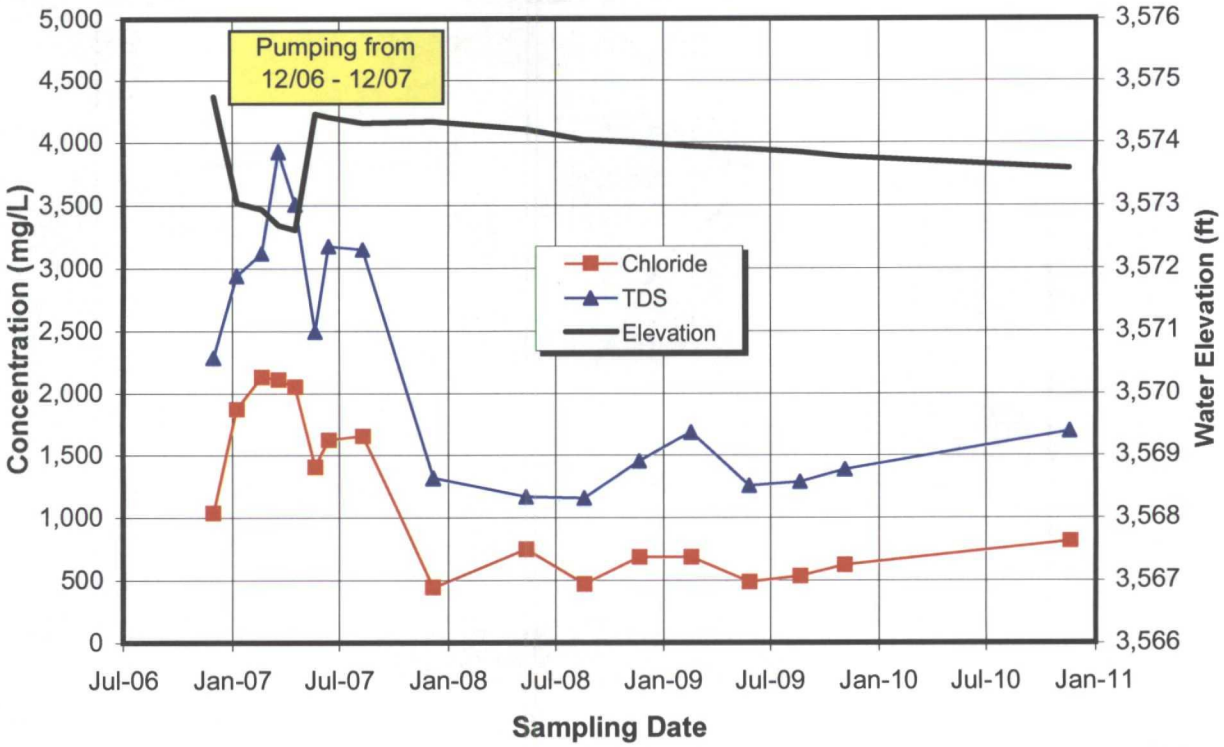
Check all that apply:
- ☐ Cooling process has begun shortly after sampling event and out of temperature condition acceptable by NELAC 5.5.8.3.1.a.1.
- ☐ Initial and Backup Temperature confirm out of temperature conditions
- ☐ Client understands and would like to proceed with analysis

Appendix C

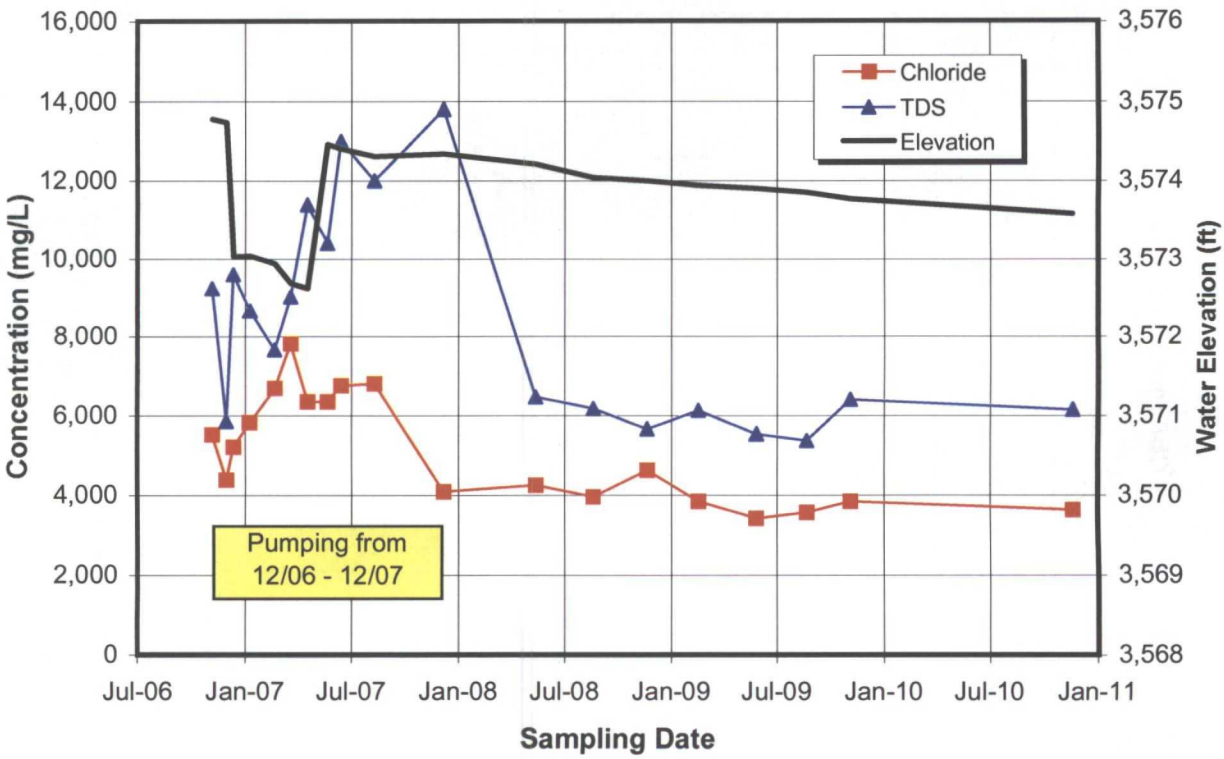
Graphs – Historic Groundwater Data

R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

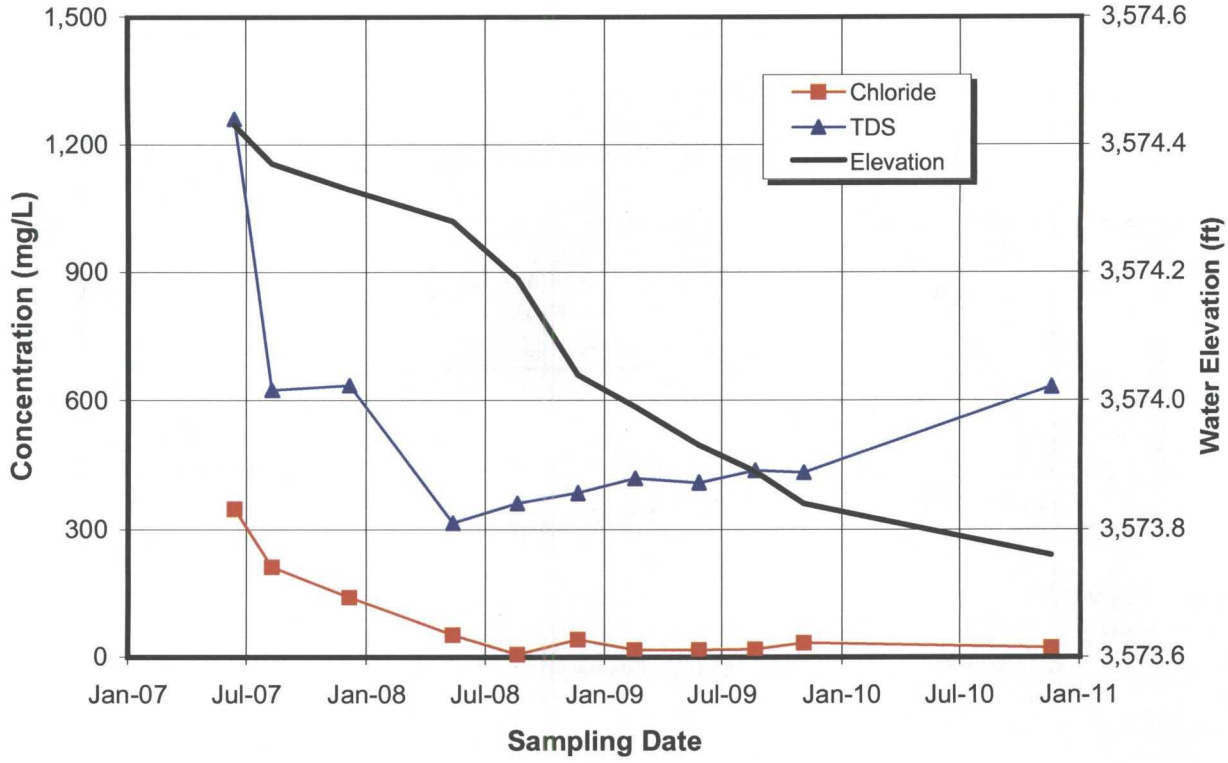
MW-1(Shallow)
Dissolved Solids vs Elevation



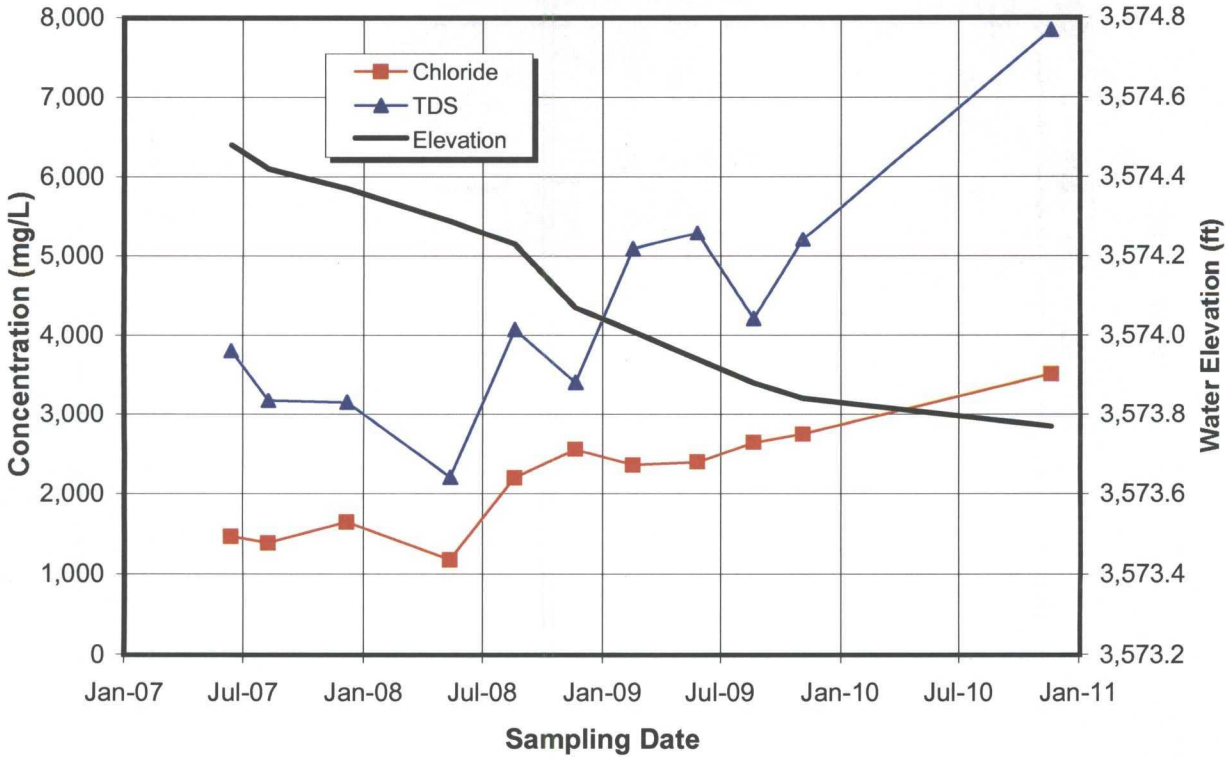
MW-1(Deep)
Dissolved Solids vs Elevation

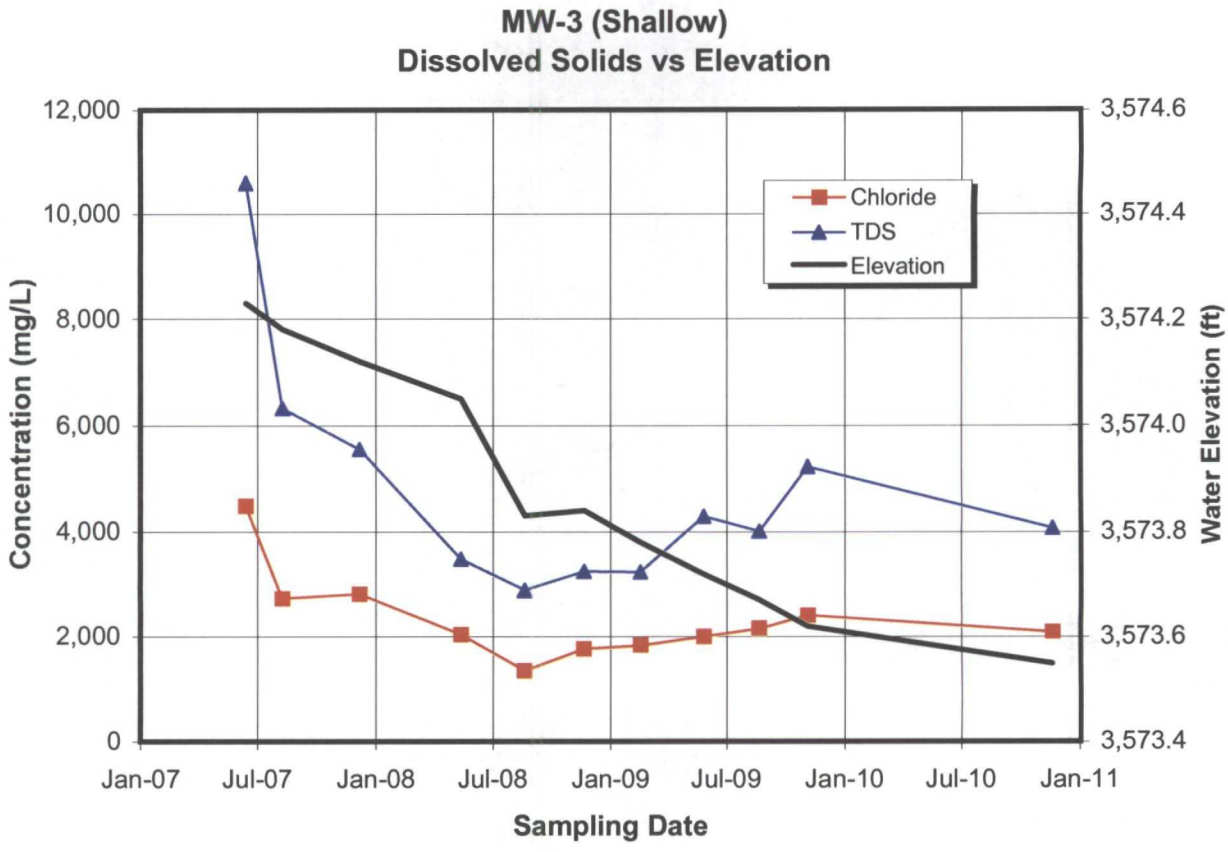


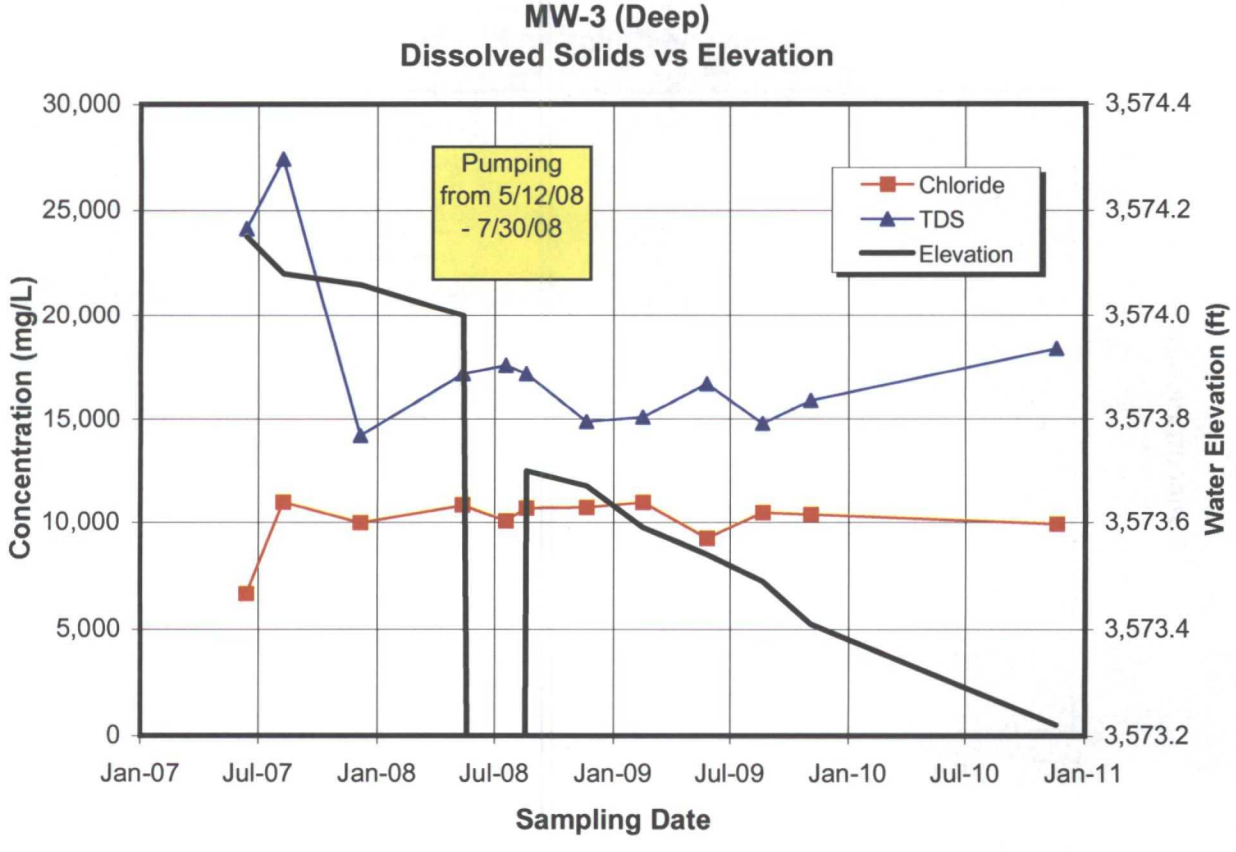
MW-2 (Shallow)
Dissolved Solids vs Elevation

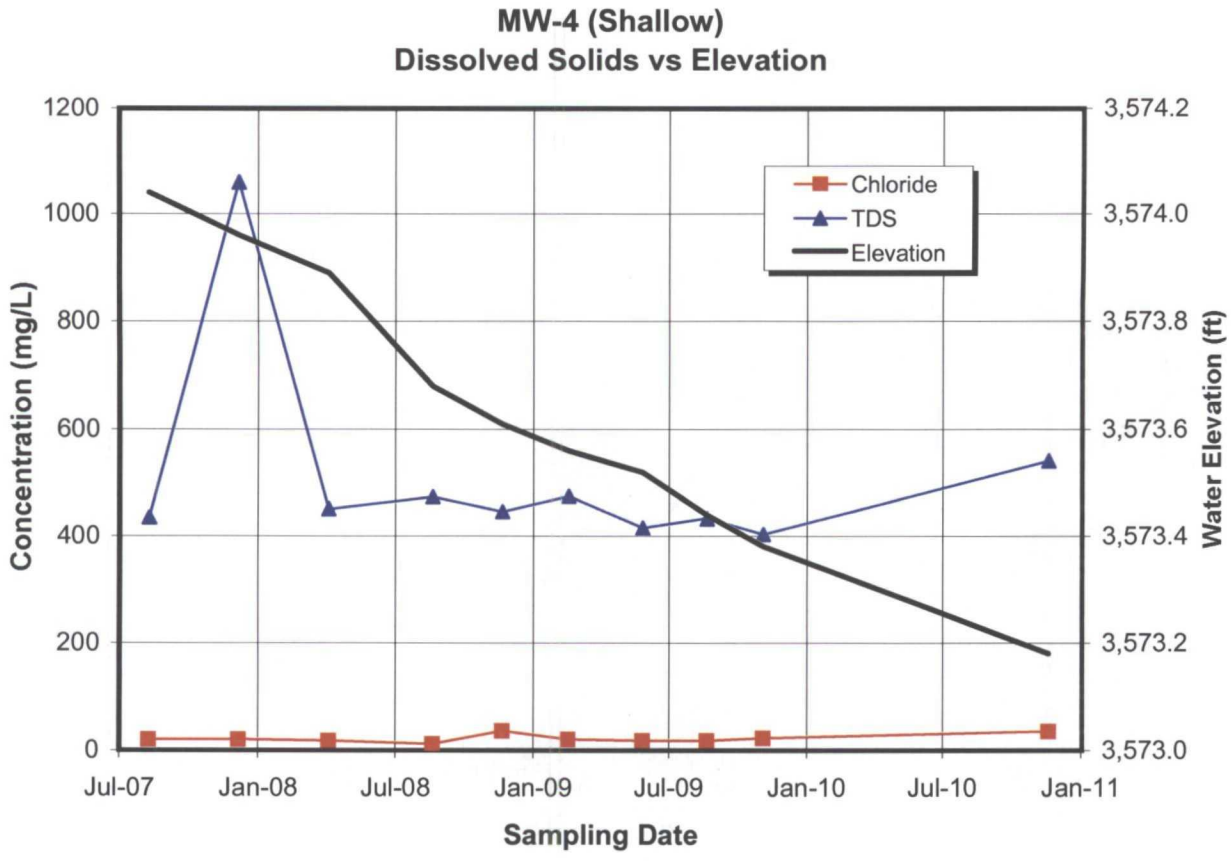


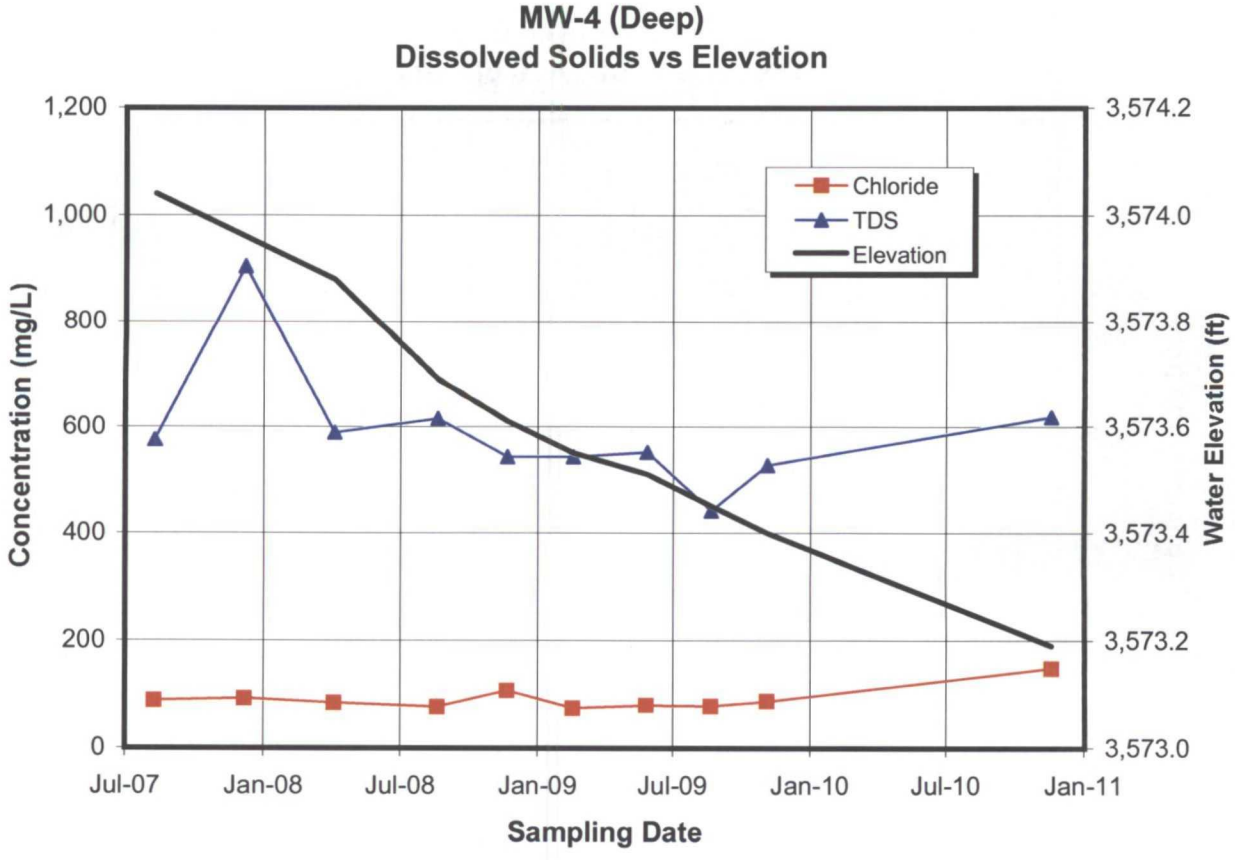
MW-2 (Deep)
Dissolved Solids vs Elevation

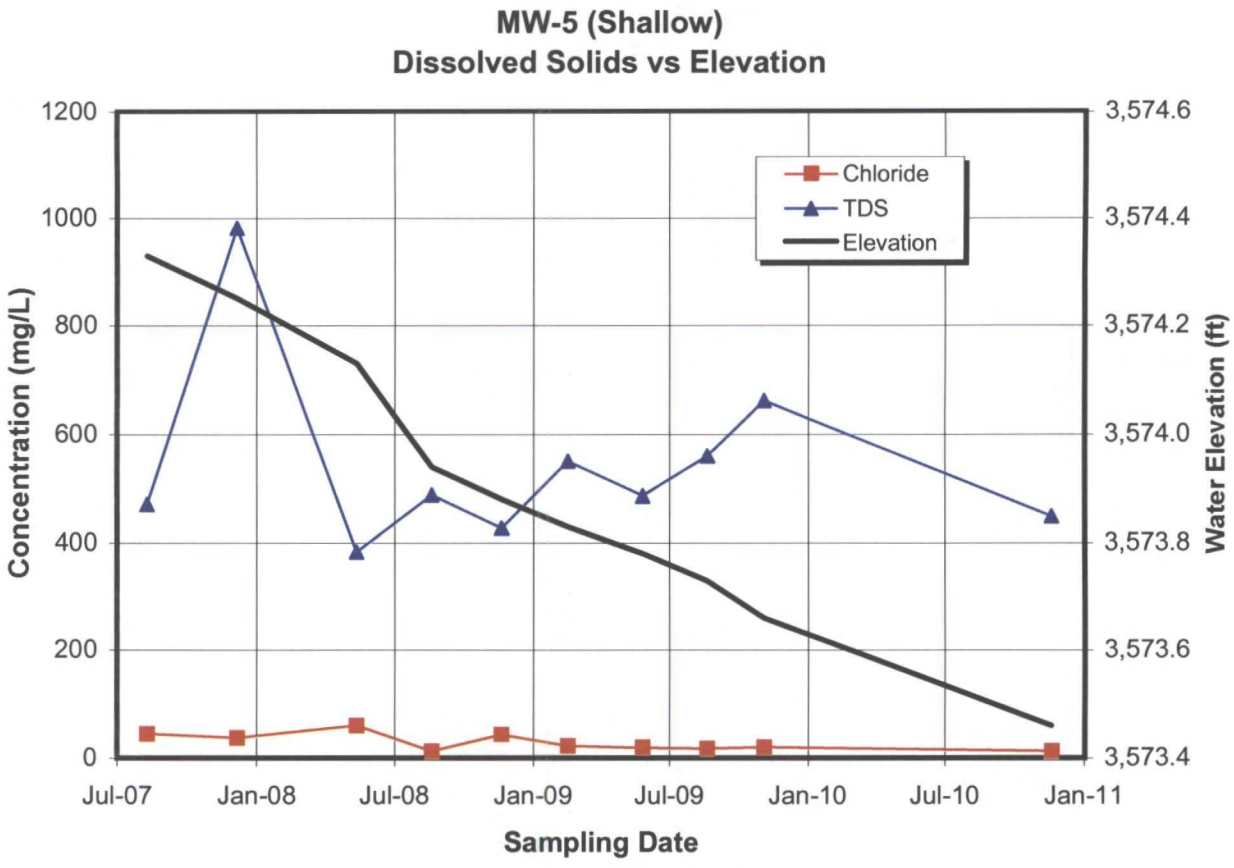


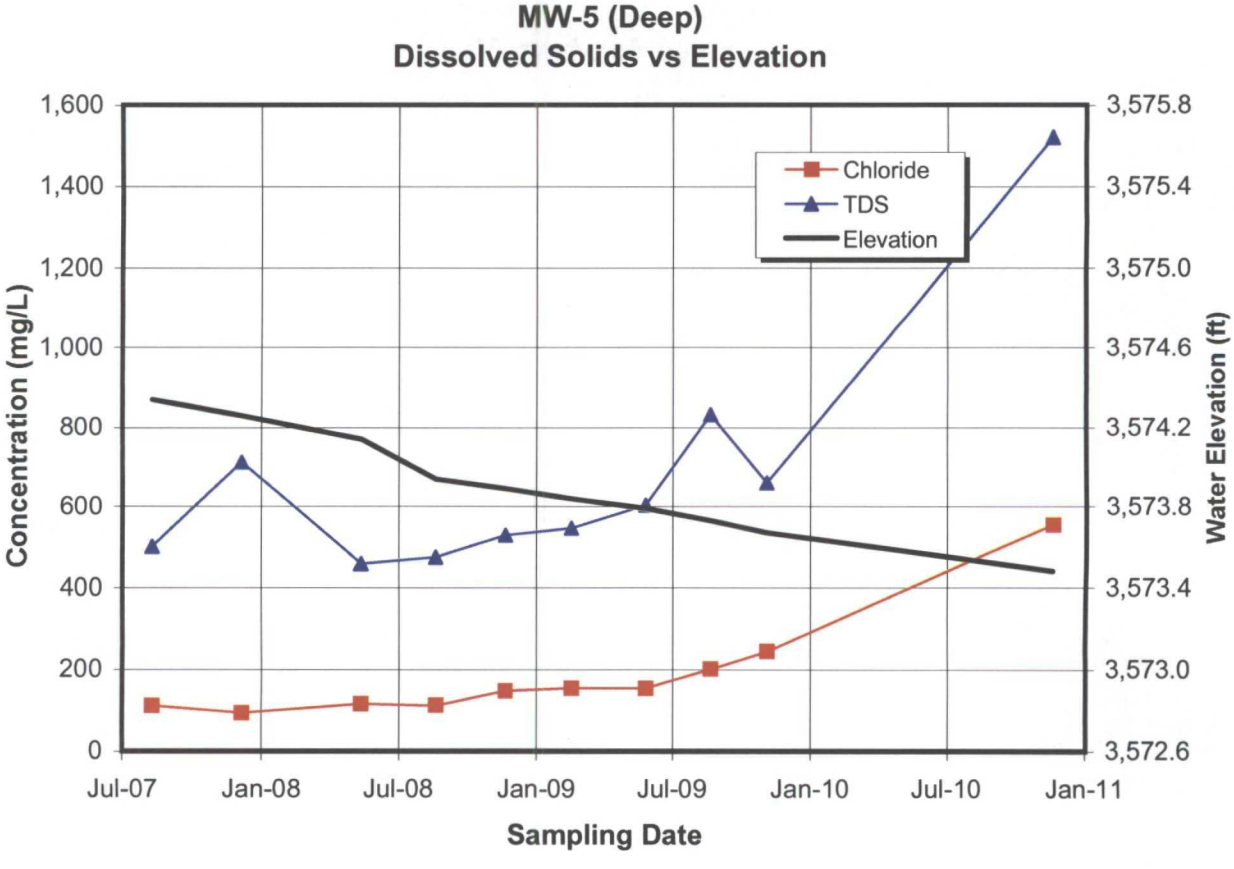

MW-3 (Shallow)
Dissolved Solids vs Elevation
12,000
10,000
8,000
6,000
4,000
2,000
0
Concentration (mg/L)
3,574.6
3,574.4
3,574.2
3,574.0
3,573.8
3,573.6
3,573.4
Water Elevation (ft)
Chloride
TDS
Elevation
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Sampling Date


MW-3 (Deep)
Dissolved Solids vs Elevation
30,000
25,000
20,000
15,000
10,000
5,000
0
Concentration (mg/L)
3,574.4
3,574.2
3,574.0
3,573.8
3,573.6
3,573.4
3,573.2
Water Elevation (ft)
Pumping
from 5/12/08
- 7/30/08
Chloride
TDS
Elevation
Jan-07
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11
Sampling Date

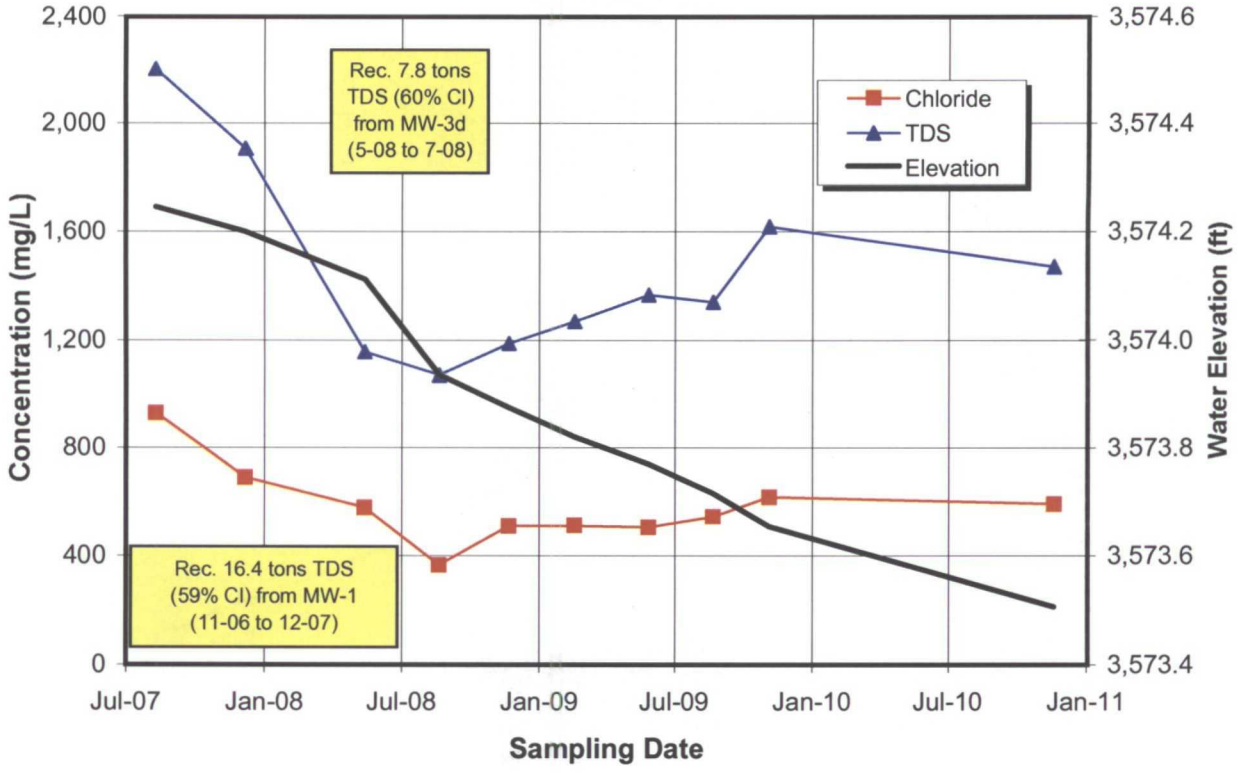

MW-4 (Shallow)
Dissolved Solids vs Elevation
Concentration (mg/L)
Water Elevation (ft)
Sampling Date
Chloride
TDS
Elevation
1200
1000
800
600
400
200
0
3,574.2
3,574.0
3,573.8
3,573.6
3,573.4
3,573.2
3,573.0
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11


MW-4 (Deep)
Dissolved Solids vs Elevation
Concentration (mg/L)
Water Elevation (ft)
Sampling Date
Chloride
TDS
Elevation
1,200
1,000
800
600
400
200
0
3,574.2
3,574.0
3,573.8
3,573.6
3,573.4
3,573.2
3,573.0
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11

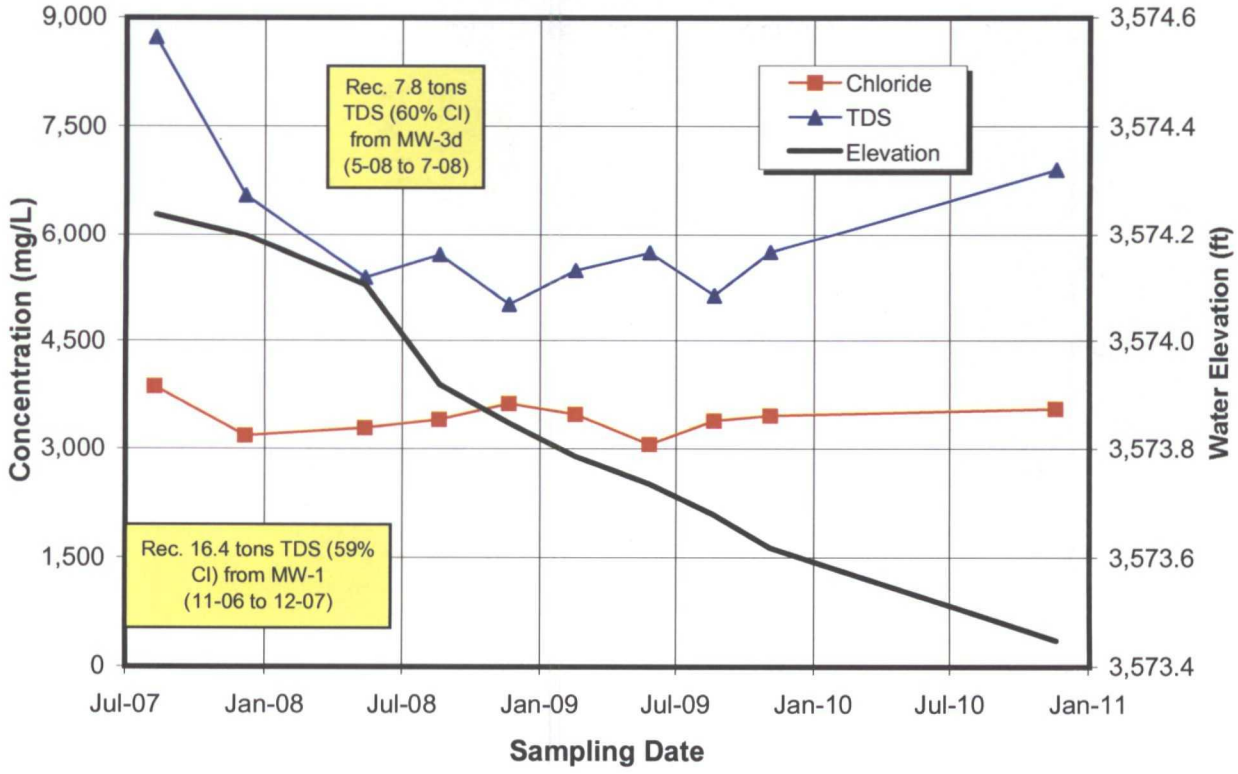

MW-5 (Shallow)
Dissolved Solids vs Elevation
Chloride
TDS
Elevation
Concentration (mg/L)
Water Elevation (ft)
Sampling Date
0
200
400
600
800
1000
1200
3,573.4
3,573.6
3,573.8
3,574.0
3,574.2
3,574.4
3,574.6
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11


MW-5 (Deep)
Dissolved Solids vs Elevation
Chloride
TDS
Elevation
Concentration (mg/L)
Water Elevation (ft)
Sampling Date
0
200
400
600
800
1,000
1,200
1,400
1,600
3,572.6
3,573.0
3,573.4
3,573.8
3,574.2
3,574.6
3,575.0
3,575.4
3,575.8
Jul-07
Jan-08
Jul-08
Jan-09
Jul-09
Jan-10
Jul-10
Jan-11

Average Values of Shallow Wells
Dissolved Solids vs Elevation



Average Values of Deep Wells
Dissolved Solids vs Elevation



R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

September 8, 2011

Glenn Von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson State BD No. 4 Reserve Pit, T12S, R33E, Section 2, Unit H;
NMOCD Case # 1RP-474-0

Dear Mr. Von Gonten:

Attached is the 2010 Annual Report for the above-referenced site. Please contact me if you have any questions or require additional information.

Samson will continue to monitor groundwater in selected wells on an annual basis until directed otherwise.

Sincerely,
R.T. Hicks Consultants, Ltd.

Dale T Littlejohn
Geologist

Copy: Samson Investment Company