

Certified Return Receipt: #7010 1670 0001 3141 0156

April 19, 2012



Mr. John Kieling, Chief
NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, NM 87505-6303

RE: Second Notice of Disapproval
Requirement to Resurvey Ground Water Monitoring Wells and
Recovery Wells
Western Refining Company, Southwest, Inc., Gallup Refinery
EPA ID #NMD000333211
HWB-WRG-11-003

Dear Mr. Kieling:

Western Refining Southwest, Gallup Refinery has prepared the following responses to the comments listed regarding the above referenced matter.

Comment 1

No response required.

Comment 2

DePauli Engineering & Surveying has re-submitted their survey report to address issues concerning survey point locations on each well. Copy of survey report is attached as "Attachment 1".

Comment 3

See response to Comment 2.

Comment 4

a) Under column labeled “Previous Ground Level Elevation (feet)” entries for OW-50, OW-52 and MW-2 have been corrected to reflect data from the Well Data Summary Table – 2009 Annual Ground Water Monitoring Report.

b) Under column labeled “Previous Well Casing Rim Elevation (feet)” entries for BW-2A, OW-50 and OW-52 have been corrected to reflect data from the Well Data Summary Table – 2009 Annual Ground Water Monitoring Report.

c) Discrepancies regarding 2011 Survey Total Well Depth and Screened Interval Depth to Bottom concerning wells BW-3B, OW-1, OW-12, OW-52, SMW-2, SMW-4, NAPIS-1, NAPIS-2 and KA-3. Screened intervals have been verified to the drilling logs and total well depth was verified by Gallup Refinery field technician. The fluctuation in ground water movement from the day to day and seasonal precipitation may have caused sediment to settle at the bottom of these wells. These wells were developed between 1980 and 2009.

d) In the “Notes” section, item number 5 has been added to read as follows: “Previous measurements and elevations are from the Well Data Summary Table from the 2009 Annual Ground Water Monitoring Report.”

e) In the “Notes” section, Note 3 has been revised to state “2011 Survey Well Casing Bottom Elevation is determined by subtracting the 2011 Survey Well Casing Rim Elevation from the 2011 Survey Total Well Depth Measurement.”

f) Revised table to include page numbers and title on all pages and submitted as “Attachment 2”.

Comment 5

Revised Note ** from the 2011 Well Elevation Summary Table for Artesian Wells, “176 feet of 24” surface casing steel”. Actual well casing for PW-4 is 12 inches. The 176 feet of 24 inch surface casing is the cemented support for the development of the well. In the notes section, item number 3 has been added to read as follows: “The actual total well depth is 1020 feet with an additional 56 feet x 7-7/8 inch diameter open exploratory hole which was accounted for as total depth of 1076 feet”. Under column heading “Total Well Depth (feet)” has also been revised to read 1020 feet referenced as Note 3. The 1076 feet included the open exploratory hole of 56 feet x 7-7/8” diameter hole. (Copy of drill log attached as “Attachment 3”.

Gallup Refinery also had Peregrine GeoConnect evaluate all the active wells to verify stratigraphic zones in which the wells were developed. A copy of the evaluation by Peregrine is included as “Attachment 4” and a new column was added to the 2011

Corrected Well Elevation Summary Table highlighted in yellow. All future ground water elevation maps submitted will reflect corrected elevation data resulting from the survey conducted by DePauli Engineering, evaluation of stratigraphic zone study conducted by Peregrine GeoConnect and the field verifications by Gallup Refinery environmental technician.

If you have any questions regarding Western's responses, please do not hesitate to contact Cheryl Johnson of my staff at (505) 722-0231.

Sincerely,



Ed Riege
Environmental Manager

cc: K. Van Horn, NMED HWB w/attach
C. Chavez, OCD w/attach
C. Johnson, Western-Gallup

ATTACHMENT 1



DePauli Engineering
& Surveying, LLC.

Civil Engineers and Land Surveyors

Phone: 505-863-5440 • Fax: 505-863-1919 • des@cnetco.com

102 W. Hill Avenue • Gallup, NM 87301
PO Box 876 • Gallup, NM 87305

April 12, 2012

Mr. Ed Riege, Environmental Manager
Western Refining-Gallup Refinery
Route 3 Box 7
Gallup, NM 87301

Re: Survey Gallup Refinery Monitoring Wells-Amendment

Dear Mr. Riege:

This Letter is in response to your request to amend our survey to include a report describing the work performed and to provide a table that includes all the survey points.

DePauli Engineering & Surveying, LLC completed the survey of the monitoring wells at Western Refining-Gallup Refinery on June 7, 2011. A total of 36 wells were surveyed. As requested, the wells were surveyed for the following parameter: ground level elevation, ground level elevation inside steel sleeve, center steel lid elevation, well casing rim elevation and corresponding measuring point description associated with each elevation. Survey conducted enlisted NM Surveyor in Training and a Technician from DePauli Engineering Surveying and one Gallup Refinery representative to assist with the location of the wells.

The instruments used to complete the survey consisted of a Leica 1200 GPS (Global Positioning System) Base and Rover GPS. The method used to survey the wells was Real-time Kinematic GPS Surveying (RTK). RTK Surveying requires that two or more receivers be operated simultaneously. The aspect of the procedure is a radio used to transmit a signal with corrections and observations to the roving receiver. The base (reference) station is a known position that produces the correction and the signal received by the Rover thence giving the Rover observation corrected values.

The horizontal and vertical positions of the top of the PVC casing (unless otherwise noted) and the vertical positions for the lid, ground elevation inside the steel casing, and the surrounding ground elevation is shown on the attached sheet labeled "Western Refining Monitoring Well 2011." The horizontal position is NAD 83 datum and the vertical positions are NGVD 1929. The description was revised to indicate location of survey point. (Revised 11/30/11). Elevation were taken using the concrete pad surrounding each well and locations noted on the report. Ground elevation was taken using the concrete pad surrounding each well

and locations shown on the report. In GWM-3 and BW-1B monitoring wells, the ground elevation was from the lowest point on the concrete pad surrounding the well and note referenced on the report. If there are no existing marks on the well casing the locations (descriptions) for each well is described in the report from where the measurement was determined. In OW-1 monitoring well, the top segment of the PVC casing was not connected to the coupling inside the casing. The elevation referenced in this well was taken from the top segment of the coupling inside the casing and noted on the report.

DePauli Engineering & Surveying LLC has also prepared a table which incorporates all the measurements taken from the survey, entitled "Table 1-2011 Western Refining Monitoring Well Survey." Gallup Refinery field Representative verified the casing diameter using a tape measure and also the total well depth was verified by Western Refining which is noted in Table 1.

The requested survey was complete on June 7, 2011 and in accordance with sections 500.1 through 500.12 of the Regulations and Rules of the Board of Registration for Professional Engineers and Surveyors Minimum Standards for Surveying in New Mexico; which horizontal positions were measured to the nearest 0.1-ft and vertical elevations were measured to an accuracy of 0.01-ft.

If you have any questions concerning this survey please do not hesitate to contact our office.

Sincerely,

A handwritten signature in black ink that reads "Marc DePauli". The signature is written in a cursive style with a large, prominent 'M' and 'D'.

Marc DePauli, PE/PS

Western Refining Monitoring Well 2011

Well #	Northing	Easting	Elevation	Description
napi-1	1,634,587.37	2,545,700.47	6913.86	North edge PVC casing
			6914.23	Center steel lid
			6913.56	South side ground elev. inside steel sleeve
			6913.62	North East & South West corner of concrete pad
napi-3	1,634,589.71	2,545,645.25	6912.76	North edge PVC casing
			6913.12	Center steel lid
			6912.53	South side ground elev. inside steel sleeve
			6913.38	North East & South West corner of concrete pad
ka-3	1,634,583.87	2,545,645.66	6912.52	North edge PVC casing
			6912.87	Center steel lid
			6912.20	South side ground elev. inside steel sleeve
			6913.29	North West & South East corner of concrete pad
napi-2	1,634,564.93	2,545,647.46	6912.65	North edge PVC casing
			6913.26	Center steel lid
			6912.54	South side ground elev. inside steel sleeve
			6913.41	North West & South East corner of concrete pad
gwm-2	1,634,680.33	2,545,348.57	6913.09	North edge PVC casing
			6913.39	Center steel lid
			6908.05	West side ground elev. inside steel sleeve
			6910.32	South West & South East corner of concrete pad
gwm-1	1,634,686.36	2,545,346.90	6912.61	North edge PVC casing
			6912.93	Center steel lid
			6908.36	West side ground elev. inside steel sleeve
			6910.22	South West & North East corner of concrete pad
gwm-3	1,634,932.99	2,545,364.09	6910.25	North edge PVC casing
			6910.51	Center steel lid
			6905.48	West side ground elev. inside steel sleeve
			** 6907.35	Ground elev.
** Elevation is to the lowest concrete pad elevation surrounding the well				
ow-12	1,635,128.64	2,546,062.41	6940.69	North edge PVC casing
			6941.59	Center steel lid
			6939.04	West side ground elev. inside steel sleeve
			6939.57	South West & North East corner of concrete pad

Well #	Northing	Easting	Elevation	Description
rw-5	1,634,761.32	2,546,311.24	6943.57	West edge PVC casing **
			6943.78	Center steel lid
			6940.82	West side ground elev. inside steel sleeve
			6941.53	South West & North East corner of concrete pad **Exsiting mark on west edge of PVC casing used
rw-6	1,634,688.45	2,546,381.03	6944.01	North edge PVC casing
			6944.26	Center steel lid
			6941.49	West side ground elev. inside steel sleeve
			6941.96	North West & South East corner of concrete pad
rw-2	1,634,624.56	2,547,167.32	6928.53	North edge PVC casing
			6929.29	Center steel lid
			6925.02	West side ground elev. inside steel sleeve
			6926.40	North West & South East corner of concrete pad
rw-1	1,634,179.63	2,547,362.39	6946.06	North edge PVC casing
			6946.42	Center steel lid
			6941.25	West side ground elev. inside steel sleeve
			6942.86	Surrounding South ground elev.
ow-10	1,633,507.94	2,544,187.82	6874.91	North edge PVC casing
			6875.39	Center steel lid
			6872.59	West side ground elev. inside steel sleeve
			6873.67	South West & North East corner of concrete pad
ow-1	1,634,052.94	2,542,464.15	6866.62	North edge PVC Casing**
			6868.83	Center steel lid
			6866.44	West side ground elev. inside steel sleeve
			6866.32	North West & South East corner of concrete pad
** Top segment of pvc casing not connected to coupling, coupling is were elevation is referenced.				
mw-4	1,635,127.10	2,544,509.90	6881.63	North edge PVC casing
			6882.38	Center steel lid
			6879.34	West side ground elev. inside steel sleeve
			6879.89	South West & North East corner of concrete pad
smw-2	1,635,652.32	2,544,450.91	6883.97	North edge Aluminum casing
			6884.54	Center steel lid
			6879.07	West side ground elev. inside steel sleeve
			6881.63	South West & North East corner of concrete pad

Well #	Northing	Easting	Elevation	Description
mw-5	1,636,272.55	2,544,141.37	6882.83	North edge Aluminum casing
			6883.40	Center steel lid
			6881.77	South side ground elev. inside steel sleeve
			6880.20	North West & South West corner of concrete pad
mw-2	1,636,243.70	2,543,943.74	6880.30	North edge PVC Casing
			6880.57	Center steel lid
			6878.41	North side ground elev. inside steel sleeve
			6878.39	North West & South East corner of concrete pad
smw-4	1,636,213.12	2,543,883.04	6879.52	North edge PVC casing
			6880.63	Center steel lid
			6875.72	West side ground elev. inside steel sleeve
			6877.63	South West & North East corner of concrete pad
mw-1	1,636,171.89	2,543,811.84	6878.12	North edge PVC casing
			6878.85	Center steel lid
			6876.79	West side ground elev. inside steel sleeve
			6876.63	South West & North East corner of concrete pad
bw-3b	1,637,028.25	2,543,362.30	6878.59	North edge PVC casing
			6878.92	Center steel lid
			6875.41	West side ground elev. inside steel sleeve
			6876.16	North West & South East corner of concrete pad
bw-3a	1,637,035.46	2,543,363.75	6878.09	North edge PVC casing
			6878.39	Center steel lid
			6875.08	West side ground elev. inside steel sleeve
			6875.94	North West & South East corner of concrete pad
bw-3c	1,637,038.21	2,543,356.75	6877.95	North edge PVC casing
			6878.22	Center steel lid
			6875.27	West side ground elev. inside steel sleeve
			6875.72	North West & South East corner of concrete pad
bw-2c	1,636,859.87	2,542,467.18	6875.30	North edge PVC casing
			6875.78	Center steel lid
			6872.02	West side ground elev. inside steel sleeve
			6872.90	South West & South East corner of concrete pad

Well #	Northing	Easting	Elevation	Description
bw-2a	1,636,848.27	2,542,473.25	6874.69	North edge PVC casing
			6875.20	Center steel lid
			6870.45	West side ground elev. inside steel sleeve
			6871.88	South West & South East corner of concrete pad
bw-2b	1,636,836.81	2,542,481.15	6874.50	North edge PVC casing
			6874.85	Center steel lid
			6870.06	West side ground elev. inside steel sleeve
			6871.66	South West & South East corner of concrete pad
bw-1a	1,635,367.32	2,542,393.40	6876.68	North edge PVC casing
			6877.09	Center steel lid
			6872.30	West side ground elev. inside steel sleeve
			6874.10	North West & South East corner of concrete pad
bw-1c	1,635,366.60	2,542,398.24	6876.78	North edge PVC casing
			6877.11	Center steel lid
			6872.28	West side ground elev. inside steel sleeve
			6873.95	South West & North East corner of concrete pad
bw-1b	1,635,368.46	2,542,404.18	6876.94	North edge PVC casing
			6877.28	Center steel lid
			6876.26	West side ground elev. inside steel sleeve
			** 6874.13	Ground elev.
** Elevation is to the lowest concrete pad elevation surrounding the well				
ow-50	1,636,295.73	2,547,393.72	6914.21	North edge PVC casing
			6914.47	Center steel lid
			6911.46	West side ground elev. inside steel sleeve
			6912.63	South West & North East corner of concrete pad
ow-52	1,636,497.52	2,546,917.71	6907.68	North edge PVC casing
			6908.28	Center steel lid
			6905.31	West side ground elev. inside steel sleeve
			6906.53	North West & South East corner of concrete pad
ow-29	1,635,940.11	2,547,227.40	6917.00	North edge PVC casing
			6917.25	Center steel lid
			6912.09	West side ground elev. inside steel sleeve
			6913.89	South West & North East corner of concrete pad

Well #	Northing	Easting	Elevation	Description
ow-30	1,635,431.14	2,547,552.67	6924.69	North edge PVC casing
			6924.96	Center steel lid
			6919.84	West side ground elev. inside steel sleeve
			6921.81	North West & South East corner of concrete pad
ow-14	1,635,059.64	2,547,178.60	6926.65	North edge PVC casing
			6927.71	Center steel lid
			6924.40	West side ground elev. inside steel sleeve
			6924.55	South West & North East corner of concrete pad
ow-13	1,635,445.53	2,546,668.91	6920.07	North edge PVC casing
			6920.23	Center steel lid
			6915.33	West side ground elev. inside steel sleeve
			6918.95	South West & North East corner of concrete pad
ow-11	1,632,247.50	2,546,078.73	6923.51	North edge PVC casing
			6923.97	Center steel lid
			6921.80	West side ground elev. inside steel sleeve
			6922.05	South West & North East corner of concrete pad

Notes:

- 1) Date of Survey: June 7, 2011
- 2) Instrument: Leica 1200 GPS - Base & Rover
- 3) The method used to survey the wells was GPS-RTK

The horizontal and vertical positions of the top of the PVC casing (unless otherwise noted) and the vertical positions for the lid, ground elevation inside the steel casing, and the surrounding ground elevation is shown above. The horizontal position are NAD 83 datum and the vertical positions are NGVD 1929. The description were revised to indicate location of survey point. (revised 11/30/2011)

Marc DePauli

 Marc DePauli PS13606

11/30/2011

 Date



2011 Survey - Western Refining Monitoring Well

Well ID Number	Survey Measurement date	Casing Diameter ¹ (Inch)	Northing (feet)	Easting (feet)	Center Steel Lid (feet)	Ground level Elevation inside Steel Sleeve (feet)	Measuring Point Description for Ground Level Elevation inside steel sleeve	Survey Ground Level Elevation (feet)	Measuring Point Description for Ground Level Elevation	Survey Well Casing Rim Elevation (feet)	Measuring Point Description for Well Casing Rim Elevation	Survey Total Well Depth (feet) ²
BW-1A	6/7/2011	2.00	1,635,367.32	2,542,393.40	6877.09	6872.30	West side ground elevation	6,874.10	NW & SE Corner of concrete pad	6,876.68	North edge PVC casing	37.62
BW-1B	6/7/2011	2.00	1,635,368.46	2,542,404.18	6877.28	6876.26	West side ground elevation	6,874.13	SW Corner of concrete pad	6,876.94	North edge PVC casing	67.45
BW-1C	6/7/2011	2.00	1,635,366.60	2,542,398.24	6877.11	6872.28	West side ground elevation	6,873.95	SW & NE Corner of concrete pad	6,876.78	North edge PVC casing	136.39
BW-2A	6/7/2011	2.00	1,636,848.27	2,542,473.25	6875.20	6870.45	West side ground elevation	6,871.88	SW & SE Corner of concrete pad	6,874.69	North edge PVC casing	67.57
BW-2B	6/7/2011	2.00	1,636,836.81	2,542,481.15	6874.85	6880.06	West side ground elevation	6,871.66	SW & SE Corner of concrete pad	6,874.50	North edge PVC casing	92.26
BW-2C	6/7/2011	2.00	1,636,859.87	2,542,467.18	6875.78	6872.02	West side ground elevation	6,872.90	SW & SE Corner of concrete pad	6,875.30	North edge PVC casing	152.84
BW-3A	6/7/2011	2.00	1,637,035.46	2,543,363.75	6878.39	6875.08	West side ground elevation	6,875.94	NW & SE Corner of concrete pad	6,878.09	North edge PVC casing	52.35
BW-3B	6/7/2011	2.00	1,637,028.25	2,543,362.30	6878.92	6875.41	West side ground elevation	6,876.16	NW & SE Corner of concrete pad	6,878.59	North edge PVC casing	69.40
BW-3C	6/7/2011	2.00	1,673,038.21	2,543,356.75	6878.22	6875.27	West side ground elevation	6,875.72	NW & SE Corner of concrete pad	6,877.95	North edge PVC casing	154.55
OW-1	6/7/2011	4.00	1,634,052.94	2,542,464.15	6868.83	6866.44	West side ground elevation	6,866.32	NW & SE Corner of concrete pad	6,866.62	North edge PVC casing**	94.55
OW-10	6/7/2011	4.00	1,633,507.94	2,544,187.82	6875.39	6872.59	West side ground elevation	6,873.67	SW & NE Corner of concrete pad	6,874.91	North edge PVC casing	60.33
OW-11	6/7/2011	4.00	1,632,247.50	2,546,078.73	6923.97	6921.80	West side ground elevation	6,922.05	SW & NE Corner of concrete pad	6,923.51	North edge PVC casing	65.79
OW-12	6/7/2011	4.00	1,635,128.64	2,546,062.41	6941.59	6939.04	West side ground elevation	6,939.57	SW & NE Corner of concrete pad	6,940.69	North edge PVC casing	128.85
OW-13	6/7/2011	4.00	1,635,445.53	2,546,668.91	6920.23	6915.33	West side ground elevation	6,918.95	SW & NE Corner of concrete pad	6,920.07	North edge PVC casing	99.15
OW-14	6/7/2011	4.00	1,635,059.64	2,547,178.60	6927.71	6924.40	West side ground elevation	6,924.55	SW & NE Corner of concrete pad	6,926.65	North edge PVC casing	46.52

Well ID Number	Survey Measurement date	Casing Diameter ¹ (Inch)	Northing (feet)	Easting (feet)	Center Steel Lid (feet)	Ground level Elevation inside Steel Sleeve (feet)	Measuring Point Description for Ground Level Elevation inside steel sleeve	Survey Ground Level Elevation (feet)	Measuring Point Description for Ground Level Elevation	Survey Well Casing Rim Elevation (feet)	Measuring Point Description for Well Casing Rim Elevation	Survey Total Well Depth (feet) ²
OW-29	6/7/2011	4.00	1,635,940.11	2,547,227.40	6917.25	6912.09	West side ground elevation	6,913.89	SW & NE Corner of concrete pad	6,917.00	North edge PVC casing	51.08
OW-30	6/7/2011	4.00	1,635,431.14	2,547,552.67	6924.96	6919.84	West side ground elevation	6,921.81	NW & SE Corner of concrete pad	6,924.69	North edge PVC casing	49.90
OW-50	6/7/2011	2.00	1,636,295.73	2,547,393.72	6914.47	6911.46	West side ground elevation	6,912.63	SW & NE Corner of concrete pad	6,914.21	North edge PVC casing	64.00
OW-52	6/7/2011	2.00	1,636,497.52	2,546,917.71	6908.28	6905.31	West side ground elevation	6,906.53	NW & SE Corner of concrete pad	6,907.68	North edge PVC casing	77.74
MW-1	6/7/2011	5.00	1,636,171.89	2,543,811.84	6878.85	6876.79	West side ground elevation	6,876.63	SW & NE Corner of concrete pad	6,878.12	North edge PVC casing	130.83
MW-2	6/7/2011	5.00	1,636,243.70	2,543,943.74	6880.57	6878.41	North side ground elevation	6,878.39	NW & SE Corner of concrete pad	6,880.30	North edge PVC casing	137.48
MW-4	6/7/2011	5.00	1,635,127.10	2,544,509.90	6882.38	6879.34	West side ground elevation	6,879.89	SW & NE Corner of concrete pad	6,881.63	North edge PVC casing	121.72
MW-5	6/7/2011	4.00	1,636,272.55	2,544,141.37	6883.40	6881.77	South side ground elevation	6,880.20	NW & SW Corner of concrete pad	6,880.30	North edge Aluminum casing	130.83
RW-1	6/7/2011	4.00	1,634,179.63	2,547,362.39	6946.42	6941.25	West side ground elevation	6,942.86	Surrounding South Ground elev.	6,946.06	North edge PVC casing	43.04
RW-2	6/7/2011	4.00	1,634,624.56	2,547,167.32	6929.29	6925.02	West side ground elevation	6,926.40	NW & SE Corner of concrete pad	6,928.53	North edge PVC casing	39.80
RW-5	6/7/2011	4.00	1,634,761.32	2,546,311.24	6943.78	6940.82	West side ground elevation	6,941.53	SW & NE Corner of concrete pad	6,882.82	West Edge PVC Casing (Existing Mark)	39.59
RW-6	6/7/2011	4.00	1,634,688.45	2,546,381.03	6944.26	6941.49	West side ground elevation	6,941.96	NW & SE Corner of concrete pad	6,944.01	North edge PVC casing	40.90
SMW-2	6/7/2011	2.00	1,635,652.32	2,544,450.91	6884.54	6879.07	West side ground elevation	6,881.63	SW & NE Corner of concrete pad	6,883.97	North edge Aluminum casing	52.80
SMW-4	6/7/2011	2.00	1,636,213.12	2,543,883.04	6880.63	6875.72	West side ground elevation	6,877.63	SW & NE Corner of concrete pad	6,879.52	North edge PVC casing	69.68
GWM-1	6/7/2011	2.00	1,634,686.36	2,545,346.90	6912.93	6908.36	West side ground elevation	6,910.22	SW & NE Corner of concrete pad	6,912.61	North edge PVC casing	26.20
GWM-2	6/7/2011	2.00	1,634,680.33	2,545,348.57	6913.39	6908.05	West side ground elevation	6,910.32	SW & SE Corner of concrete pad	6,913.09	North edge PVC casing	18.81
GWM-3	6/7/2011	2.00	1,634,932.99	2,545,364.09	6910.51	6905.48	West side ground elevation	6,907.35	SE Corner of Concrete pad	6,910.25	North edge PVC casing	17.80

Well ID Number	Survey Measurement date	Casing Diameter ¹ (Inch)	Northing (feet)	Easting (feet)	Center Steel Lid (feet)	Ground level Elevation inside Steel Sleeve (feet)	Measuring Point Description for Ground Level Elevation inside steel sleeve	Survey Ground Level Elevation (feet)	Measuring Point Description for Ground Level Elevation	Survey Well Casing Rim Elevation (feet)	Measuring Point Description for Well Casing Rim Elevation	Survey Total Well Depth (feet) ²
NAPIS-1	6/7/2011	2.00	1,634,587.37	2,545,700.47	6914.23	6913.56	South side ground elevation	6,913.62	NE & SW Corner of Concrete pad	6,913.86	North edge PVC casing	13.53
NAPIS-2	6/7/2011	2.00	1,634,564.93	2,545,647.46	6913.26	6912.54	South side ground elevation	6,913.41	NW & SE Corner of concrete pad	6,912.65	North edge PVC casing	13.61
NAPIS-3	6/7/2011	2.00	1,634,589.71	2,545,645.25	6913.12	6912.53	South side ground elevation	6,913.38	SW & NE Corner of concrete pad	6,912.76	North edge PVC casing	30.42
KA-3	6/7/2011	2.00	1,634,583.87	2,545,645.66	6912.87	6912.20	South side ground elevation	6,913.29	NW & SE Corner of concrete pad	6,912.52	North edge PVC casing	23.20

NOTES:

** Top segment of pvc casing not connected to coupling. Coupling is where elevation is referenced.

1) Field verified using a tape measure by Gallup Refinery field technician.

2) Total well depth measured using a bottom sensing meter, Testwell Water level meter with bottom sensing indicator. Field verified by Gallup Refinery field technician.

ATTACHMENT 2

2011 CORRECTED WELL ELEVATION SUMMARY TABLE

Revision 2 - April 19, 2012

Date of Installation	Well ID Number	2011 Survey Measurement date ¹	Previous Casing Diameter (Inch)	2011 Verified Casing Diameter ² (Inch)	Previous Ground Level Elevation (feet)	2011 Survey Ground Level Elevation ¹ (feet)	Previous Well Casing Rim Elevation (feet)	2011 Survey Well Casing Rim Elevation ¹ (feet)	2011 Measuring Point Description ¹	2011 Ground Elevation Inside Steel Sleeve ¹ (feet)	Previous Stick-up length (feet)	2011 Survey Stick-up length ¹ (feet)	Previous Well Casing Bottom Elevation (feet)	2011 Survey Well Casing Bottom Elevation ³ (feet)	Previous Total Well Depth (feet)	2011 Survey Total Well Depth ⁴ (feet)	Screened Interval Depth Top to Bottom ⁶ (feet)	Previous Stratigraphic unit in which screen exists	2012 Re-Evaluated Stratigraphic unit in which screen exists ⁷
11/10/2003	BW-1A	6/7/2011	2.00	2.00	6,876.73	6,874.10	6,876.73	6,876.68	North edge PVC casing	6,872.30	4.37	4.38	6,836.73	6,839.06	40.00	37.62	30 - 35	Chinle/Alluvium	Upper Sand
10/28/2003	BW-1B	6/7/2011	2.00	2.00	6,876.91	6874.13*	6,876.91	6,876.94	North edge PVC casing	6,876.26	2.38	0.68	6,811.71	6,809.49	67.55	67.45	54.6 - 64.6	Chinle/Alluvium	Chinle/Alluvium Interface
11/10/2003	BW-1C	6/7/2011	2.00	2.00	6,876.75	6,873.95	6,876.75	6,876.78	North edge PVC casing	6,872.28	4.51	4.50	6,719.75	6,740.39	157.00	136.39	125 - 135	sonsela Sandstone	Sonsela
11/10/2003	BW-2A	6/7/2011	2.00	2.00	6,874.72	6,871.88	6,874.72	6,874.69	North edge PVC casing	6,870.45	4.26	4.24	6,809.22	6,807.12	65.50	67.57	55 - 65	Upper sand wells	Upper Sand
10/28/2003	BW-2B	6/7/2011	2.00	2.00	6,874.58	6,871.66	6,874.58	6,874.50	North edge PVC casing	6,870.06	4.49	4.44	6,784.08	6,782.24	90.50	92.26	80 - 90	Chinle/Alluvium	Chinle/Alluvium Interface
10/28/2003	BW-2C	6/7/2011	2.00	2.00	6,875.40	6,872.90	6,875.40	6,875.30	North edge PVC casing	6,872.02	2.97	3.28	6,724.40	6,722.46	151.00	152.84	139.5 - 149.5	Sonsela sandstone	Sonsela
6/15/2004	BW-3A	6/7/2011	2.00	2.00	6,878.22	6,875.94	6,878.22	6,878.39	North edge PVC casing	6,875.08	2.99	3.31	6,828.22	6,826.04	52.60	52.35	39.5 - 49.5	Upper sand wells	Upper Sand
10/15/2003	BW-3B	6/7/2011	2.00	2.00	6,878.79	6,876.16	6,878.79	6,878.59	North edge PVC casing	6,875.41	3.14	3.18	6,803.79	6,809.19	75.00	69.40	63 - 73	Chinle/alluvium	Chinle/Alluvium Interface
7/20/2004	BW-3C	6/7/2011	2.00	2.00	6,878.08	6,875.72	6,878.08	6,877.95	North edge PVC casing	6,875.27	2.68	2.68	6,723.08	6,723.40	155.00	154.55	144.5 - 154.5	Sonsela sandstone	Sonsela
1/5/1981	OW-1	6/7/2011	4.00	4.00	6,868.00	6,866.32	6,868.45	6,866.62	North edge PVC casing**	6,866.44	1.91	0.18	6,773.96	6,772.07	94.04	94.55	89.3 - 99.3	Sonsela sandstone	Sonsela
11/25/1980	OW-10	6/7/2011	4.00	4.00	6,872.00	6,873.67	6,875.12	6,874.91	North edge PVC casing	6,872.59	1.59	2.32	6,804.00	6,814.58	68.00	60.33	40 - 60	Sonsela sandstone	Sonsela
9/25/1981	OW-11	6/7/2011	4.00	4.00	6,923.89	6,922.05	6,923.51	6,923.51	North edge PVC casing	6,921.80	2.08	1.71	6,857.27	6,857.72	66.62	65.79	43 - 65	Chinle/alluvium	Sonsela
12/15/1980	OW-12	6/7/2011	4.00	4.00	6,940.43	6,939.57	6,940.43	6,940.69	North edge PVC casing	6,939.04	1.87	1.65	6,795.43	6,811.84	145.00	128.85	117.8 - 137.8	Sonsela sandstone	Sonsela
12/10/1980	OW-13	6/7/2011	4.00	4.00	6,920.12	6,918.95	6,920.12	6,920.07	North edge PVC casing	6,915.33	4.79	4.74	6,820.12	6,820.92	100.00	99.15	78.2 - 98.2	Sonsela sandstone	Sonsela
12/17/1980	OW-14	6/7/2011	4.00	4.00	6,926.64	6,924.55	6,926.64	6,926.65	North edge PVC casing	6,924.40	2.25	2.25	6,881.64	6,880.13	45.00	46.52	35 - 45	Chinle/alluvium	Chinle/Alluvium Interface
8/23/1996	OW-29	6/7/2011	4.00	4.00	6,913.50	6,913.89	6,913.50	6,917.00	North edge PVC casing	6,912.09	3.87	4.91	6,864.50	6,865.92	49.00	51.08	37.5 - 47.5	Chinle/alluvium	Chinle/Alluvium Interface
8/28/1996	OW-30	6/7/2011	4.00	4.00	6,921.60	6,921.81	6,921.60	6,924.69	North edge PVC casing	6,919.84	4.85	4.85	6,873.20	6,874.79	48.40	49.90	37.9 - 47.9	Chinle/alluvium	Chinle/Alluvium Interface
10/5/2009	OW-50	6/7/2011	2.00	2.00	6,914.37	6,912.63	6,914.37	6,914.21	North edge PVC casing	6,911.46	2.70	2.75	6,847.63	6,850.21	63.00	64.00	48 - 63	Chinle/alluvium	Chinle/Alluvium Interface
10/5/2009	OW-52	6/7/2011	2.00	2.00	6,906.26	6,906.53	6,907.68	6,907.68	North edge PVC casing	6,905.31	2.20	2.37	6,828.53	6,829.94	79.00	77.74	64 - 79	Chinle/alluvium	Chinle/Alluvium Interface
10/14/1981	MW-1	6/7/2011	5.00	5.00	6,878.52	6,876.63	6,878.15	6,878.12	North edge PVC casing	6,876.79	1.25	1.33	6,746.50	6,747.29	132.02	130.83	117.72 - 127.72	Sonsela sandstone	Sonsela
10/15/1981	MW-2	6/7/2011	5.00	5.00	6,878.40	6,878.39	6,880.84	6,880.30	North edge PVC casing	6,878.41	1.82	1.89	6,741.90	6,742.82	140.24	137.48	112 - 122	Sonsela sandstone	Sonsela
10/16/1981	MW-4	6/7/2011	5.00	5.00	6,882.54	6,879.89	6,882.20	6,881.63	North edge PVC casing	6,879.34	2.31	2.29	6,760.40	6,759.91	122.14	121.72	101 - 121	Sonsela sandstone	Sonsela
7/21/1986	MW-5	6/7/2011	4.00	4.00	6,883.32	6,880.20	6,882.93	6,882.83	North edge aluminum casing	6,881.77	2.02	1.06	6,750.30	6,752.00	133.02	130.83	115 - 125	Sonsela sandstone	Sonsela
3/28/1995	RW-1	6/7/2011	4.00	4.00	6,943.50	6,942.86	6,943.50	6,946.06	North edge PVC casing	6,941.25	4.41	4.81	6,900.50	6,903.02	43.00	43.04	25 - 40	Chinle/alluvium	Chinle/Alluvium Interface
3/29/1995	RW-2	6/7/2011	4.00	4.00	6,927.20	6,926.40	6,927.20	6,928.53	North edge PVC casing	6,925.02	3.58	3.51	6,889.20	6,888.73	38.00	39.80	26.1 - 36.1	Chinle/alluvium	Chinle/Alluvium Interface
8/27/1997	RW-5	6/7/2011	4.00	4.00	6,942.50	6,941.53	6,942.50	6,943.57	West Edge PVC Casing (Existing Mark)	6,940.82	2.92	2.75	6,902.50	6,903.98	40.00	39.59	29.5 - 39.5	Chinle/alluvium	Chinle/Alluvium Interface
8/27/1997	RW-6	6/7/2011	4.00	4.00	6,972.60	6,941.96	6,972.60	6,944.01	North edge PVC casing	6,941.49	2.58	2.52	6,933.80	6,903.11	38.80	40.90	28.5 - 38.5	Chinle/alluvium	Chinle/Alluvium Interface
9/26/1985	SMW-2	6/7/2011	2.00	2.00	6,884.44	6,881.63	6,884.11	6,883.97	North edge aluminum casing	6,879.07	4.54	4.90	6,827.10	6,831.17	57.34	52.80	34.31 - 54.31	Upper sand wells	Chinle/Alluvium Interface and Upper Sand
9/25/1985	SMW-4	6/7/2011	2.00	2.00	6,882.54	6,877.63	6,882.73	6,879.52	North edge aluminum casing	6,875.72	3.83	3.80	6,760.40	6,809.84	72.20	69.68	51.7 - 71.7	Upper sand wells	Chinle/Alluvium Interface
7/8/2004	GWM-1	6/7/2011	2.00	2.00	6,912.65	6,910.22	6,912.65	6,912.61	North edge PVC casing	6,908.36	3.87	4.25	6,888.95	6,886.41	23.70	26.20	17.5 - 23.5	Chinle/alluvium	Chinle/Alluvium Interface
9/25/2005	GWM-2	6/7/2011	2.00	2.00	6,913.17	6,910.32	6,913.17	6,913.09	North edge PVC casing	6,908.05	4.75	5.04	6,896.97	6,894.28	18.97	18.81	3.2 - 16.2	Chinle/alluvium	Chinle/Alluvium Interface
9/25/2005	GWM-3	6/7/2011	2.00	2.00	6,912.65	6,907.35	6,912.65	6,910.25	North edge PVC casing	6,905.48	4.85	4.77	6,896.15	6,892.45	17.94	17.80	3 - 15	Chinle/alluvium	Chinle/Alluvium Interface
3/14/2008	NAPIS-1	6/7/2011	2.00	2.00	6,918.43	6,913.62	6,918.43	6,913.86	North edge PVC casing	6,913.56	0.29	0.30	6,904.40	6,900.33	14.00	13.53	3.7 - 13.7	Chinle/alluvium	Chinle/Alluvium Interface

2011 CORRECTED WELL ELEVATION SUMMARY TABLE

Revision 2 - April 19, 2012

Date of Installation	Well ID Number	2011 Survey Measurement date ¹	Previous Casing Diameter (Inch)	2011 Verified Casing Diameter ² (Inch)	Previous Ground Level Elevation (feet)	2011 Survey Ground Level Elevation ¹ (feet)	Previous Well Casing Rim Elevation (feet)	2011 Survey Well Casing Rim Elevation ¹ (feet)	2011 Measuring Point Description ¹	2011 Ground Elevation Inside Steel Sleeve ¹ (feet)	Previous Stick-up length (feet)	2011 Survey Stick-up length ¹ (feet)	Previous Well Casing Bottom Elevation (feet)	2011 Survey Well Casing Bottom Elevation ³ (feet)	Previous Total Well Depth (feet)	2011 Survey Total Well Depth ⁴ (feet)	Screened Interval Depth Top to Bottom ⁶ (feet)	Previous Stratigraphic unit in which screen exists	2012 Re-Evaluated Stratigraphic unit in which screen exists ⁷
3/14/2008	NAPIS-2	6/7/2011	2.00	2.00	6,917.27	6,913.40	6,917.27	6,912.65	North edge PVC casing	6,912.54	0.10	0.11	6,902.80	6,899.04	14.50	13.61	4.2 - 14.2	Chinle/alluvium	Chinle/Alluvium Interface
3/14/2008	NAPIS-3	6/7/2011	2.00	2.00	6,917.31	6,913.38	6,917.31	6,912.76	North edge PVC casing	6,912.53	0.29	0.23	6,886.60	6,882.34	30.70	30.42	25.4 - 30.4	Chinle/alluvium	Chinle/Alluvium Interface
6/11/2007	KA-3	6/7/2011	2.00	2.00	6,917.17	6,913.29	6,917.17	6,912.52	North edge PVC casing	6,912.20	0.17	0.32	6,892.40	6,889.32	25.00	23.20	15 - 25	Chinle/alluvium	Chinle/Alluvium Interface

NOTES:

* Ground elevation is to the lowest concrete pad elevation surrounding the well

** Top segment of pvc casing not connected to coupling. Coupling is where elevation is referenced.

- 1) Surveyed by DePauli Engineering & Surveying, LLC on June 7, 2011 at request of NMED due to discrepancies on well casing and ground level elevations.
- 2) Field verified using a tape measure by Gallup Refinery field technician.
- 3) 2011 Survey Well Casing Bottom Elevation is determined by subtracting the 2011 Survey Well Casing Rim Elevation from the 2011 Survey Total Well Depth Measurement.
- 4) Total well depth was determined using a bottom sensing meter, Testwell Water level meter with bottom sensing indicator.
- 5) Previous measurements and elevations are from the Well Data Summary Table from the 2009 Annual Ground Water Monitoring Report.
- 6) Screened interval for each well was verified to the well boring logs. Settlement may have occurred since installation of well which is why total well depth is higher or equal to the screened interval levels.
- 7) Stratigraphic interpretation conducted by Peregrine Geoconnect to re-evaluate the named zones they produce water from. Tables were updated to reflect correct stratigraphic zone. (See attached report from Peregrine Geoconnect in Attachment 3)

2011 WELL ELEVATION SUMMARY TABLE FOR ARTESIAN WATER WELLS

Revision #2 - March 21, 2012

Date of Installation	Well ID Number	Submersible pump depth (feet)	Casing Diameter (Inch)	Well Head Elevation Mark* (North) (feet)	Well Head Elevation Mark* (West) (feet)	Well Head Elevation Mark* (Z) (feet)	Measuring Point Description	Total Well Depth (feet)	Well Casing Bottom Elevation ¹ (feet)	Stratigraphic unit	Aquifer
9/24/1956	PW-2	800	16.0	3,300.40	4,694.28	162.78	1st Discharge tee or elbow	1,075.00	2,225.40	Chinle	San Andreas/Yeso Aquifer
April 1979	PW-3	900	14.0	2,932.83	1,387.79	248.00	1st Discharge tee or elbow	1,030.00	1,902.83	Chinle	San Andreas/Yeso Aquifer
11/12/1999	PW-4	750	12.0 ²	1,895.73	2,979.78	178.51	1st Discharge tee or elbow	1,020.00 ³	819.73	Chinle	San Andreas/Yeso Aquifer

NOTES:

* Basis of survey Refinery Control Point at 1000W, 2575N, plant elevation = 254.87 feet and MSL elevation = 6959.41 feet.

- 1) Well casing bottom elevation using Well Head Elevation Mark (North) as reference point.
- 2) Actual well casing diameter is 12 inches. The 176 feet of 24 inch steel casing is the actual cemented support for development of the well.
- 3) The actual total well depth is 1020 feet with additional 56 feet x 7-7/8 inch diameter open exploratory hole which was accounted for as total well depth of 1076 feet.

At the time of the survey by DePauli Engineering the artesian wells were not included as these wells have never been listed on the summary table or had questionable elevations. These wells are sampled every three years and are not required to be gauged when sampling. A copy of an original survey dated February 13, 2003 conducted by DePauli Engineering is attached for reference.

ATTACHMENT 3

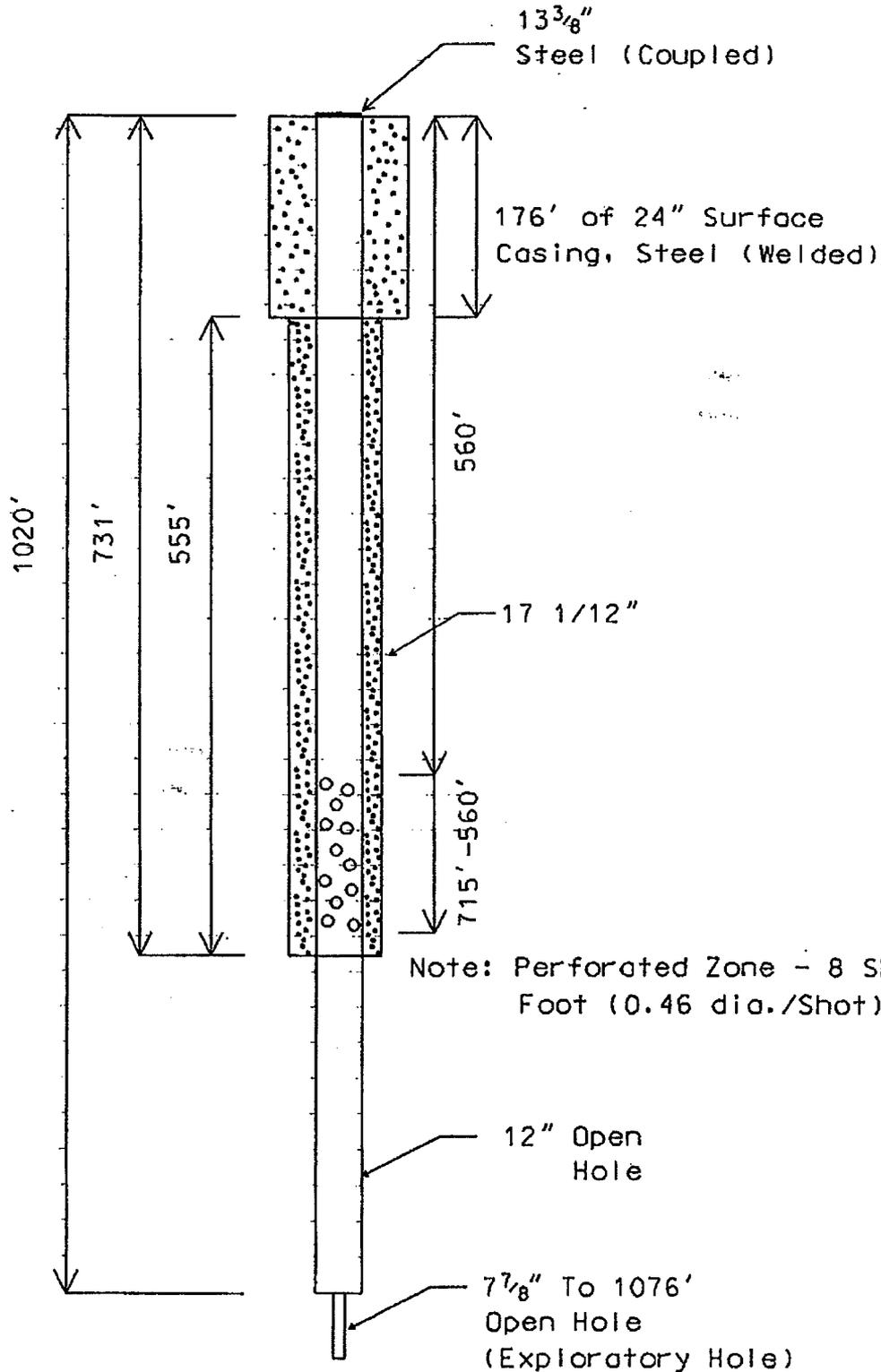


CINIZA REFINERY

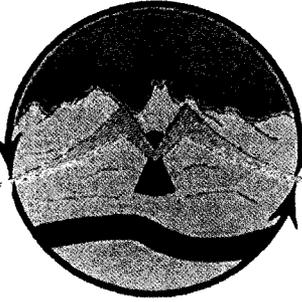
COMPLETION DIAGRAM

CINIZA WELL #4

Note: All Elevations From
Kelly Bushing



ATTACHMENT 4



Peregrine GeoConnect

P.O. BOX 422 • LAS CRUCES, NM 88004

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March 21, 2012

Ms. Cheryl Johnson
Environmental Specialist
Western Refining – Gallup Refinery
Route 3 Box 7
Gallup, New Mexico 87301

Re: Stratigraphic Interpretation, Western Refining, Inc., Ciniza Refinery
File No. 12-001

Cheryl,

Peregrine GeoConnect, Inc. has performed an evaluation of the wells you requested. The wells were studied to determine the named zones they produce water from. The wells all produce water from various relatively shallow aquifers that represent different depositional sequences that are below the property.

As you are aware there are three basic zones that are monitored on the site. The uppermost zone has been locally named the Alluvial Sands Zone. This zone represents relatively young soils that are derived from the older formations to the south and east. These soils are primarily of fluvial (stream or river) deposition. The material was eroded from the Chinle Group formations forming the highlands to the south and east of the site and carried into the low valley where they were deposited as a result of intermittent fluviation. Earlier work at the site defined the sandy materials as a single large sand body and was locally named the Ciniza Sand. No formal naming process was given to the sands, however, reports from the 1980's and early 1990's refer these sands as the Ciniza Sand. Later, improved sampling technology allowed for more detailed stratigraphic evaluation of the materials and it was determined that rather than a large sand body the sands represented multiple channel deposits from intermittent stream development; likely generated as a result of storm water and seasonal runoff from the highlands to the south. The source of the material has been speculated to be from the Sonsela Sandstone in the Four Mile Canyon and/or Six Mile Canyon areas, although there has been no reason to study the area in detail as the information does not significantly impact the understanding of the conditions at the site. What

differentiates these sands from others in the area is that they are sinuous, lenticular, and occasionally isolated bodies located within clays deposited in the valley area as a result of erosion of the sandstones, siltstones, and claystones of the Chinle Group. The sands are often buff to orange or very light red. The Alluvial Sands exhibit morphology and stratigraphy of recent erosional valley fill and should not be classified as part of the Chinle Group. Also the sands show no cementation that would be typical of the sands within the Chinle Group. One other distinguishing attribute the Alluvial Sands have is that they do not tend to follow the regional dip of the Chinle Group bedrock. The Chinle Group bedding at the site tends to dip downward northwesterly across the site at an angle of approximately ten (10) degrees. The Alluvial Sands tend to fan out across the valley in a relatively horizontal zone typically encountered at a depth of about thirty (30) feet and terminating on the order of forty five (45) to fifty (50) feet below the ground surface. These characteristics were used to identify the zones screened in the Alluvial Sand.

The second zone monitored at the site is locally called the Chinle Interface Zone. This second zone is the interface between the upper erosional soil fill material carried into the valley as a result of alluviation from the highlands to the south and the contact of the relatively unweathered Chinle Group sandstones, siltstones, and mudstones. The zone is distinguished by the presence of a gravelly or relatively clean sandy zone that lies directly on top of the relatively unweathered erosional surface of the Petrified Forest Formation within the Chinle Group. The sands and gravels form a very distinguishable marker bed on the relatively undisturbed shaley materials of the Petrified Forest Formation. The marker sands and gravels form the aquifer which lies on top of the relatively impervious shales and immediately below relatively impervious clays of the valley fill. As a result, the water confined in the sands and gravels is somewhat artesian in most wells screened in this zone. Typically the zone ranges in thickness from approximately eight (8) inches to about two (2) feet. It is not unusual to see the zone thin and become somewhat finer to the north. This zone follows the regional dip of the Chinle Group across the site (ten (10) degrees) and because of the amount of data available the depth of the top of the zone can be estimated using data from other site wells and borings from earlier investigations. Although easily identified, because of the similar densities of the alluvial clay soils above and the upper shaley materials of the Petrified Forest formation below, as well as the limited thickness of the zone, continuous sampling techniques are normally required to identify the exact zone contacts. Earlier work lumped this zone with the Upper Sands and although there is some evidence there could be communication between the zones, it is currently believed they are geomorphically distinct.

The third water producing zone that is monitored on the site is the Sonsela Sandstone. The Sonsela is a named member of the Petrified Forest Formation within the Chinle Group of Triassic Age. The Sonsela tends to also follow the local dip of approximately ten (10) degrees to the north-northwest. The member can be seen on the surface in the extreme southeast area of the property and south of Interstate 40 in both Four Mile and Six Mile Canyons. The sandstone at the site is white to very light brown or grey, may be massive to very thin bedded with low angle cross bedding. The sandstone is generally medium to coarse grained and comprised of quartz, feldspar and, in the lower portion, abundant mica. At this site the zone is ten (10) to twenty (20) feet in thickness and has a relatively thin shale bed separating the upper and lower portions of the unit. The sandstone unit is located within the Petrified Forest Formation of the Chinle Group and separates the Petrified Forest formation into the upper and lower members. When dry, the sandstone glistens in sunlight and is easily distinguished from finer and much thinner sandstone beds higher in the Upper Petrified Forest section. Because of the confining materials at the site above and below the sandstone, the water in the aquifer is artesian. Water in this aquifer is typically more artesian than the water in the Interface Zone and can aid in defining the production unit. The Sonsela Sandstone member is densely cemented and easily identified within the Petrified Forest Formation.

Using the information provided above, historic knowledge of the area, correlations from 220 borings and wells drilled at the site, as well as reports from earlier studies of the geologic conditions regionally and at the site, the following list of wells and the stratigraphic units they are monitoring (screened across) for water has been generated.

Well Identification	Stratigraphic Unit Screen Is Placed In
BW-1A	Upper Sand
BW-1B	Chinle-Alluvium Interface
BW-1C	Sonsela
BW-2A	Upper Sand
BW-2B	Chinle-Alluvium Interface
BW-2C	Sonsela
BW-3A	Upper Sand
BW-3B	Chinle-Alluvium Interface
BW-3C	Sonsela

Well Identification	Stratigraphic Unit Screen Is Placed In
OW-1	Sonsela
OW-10	Sonsela
OW-11	Sonsela
OW-12	Sonsela
OW-13	Sonsela
OW-14	Chinle-Alluvium Interface
OW-29	Chinle-Alluvium Interface
OW-30	Chinle-Alluvium Interface
OW-50	Chinle-Alluvium Interface
OW-52	Chinle-Alluvium Interface
MW-1	Sonsela
MW-2	Sonsela
MW-4	Sonsela
MW-5	Sonsela
RW-1	Chinle-Alluvium Interface
RW-2	Chinle-Alluvium Interface
RW-5	Chinle-Alluvium Interface
RW-6	Chinle-Alluvium Interface
SMW-2	Chinle-Alluvium Interface and Upper Sand
SMW-4	Chinle-Alluvium Interface
GWM-1	Chinle-Alluvium Interface
GWM-2	Chinle-Alluvium Interface
GWM-3	Chinle-Alluvium Interface
NAPIS-1	Chinle-Alluvium Interface
NAPIS-2	Chinle-Alluvium Interface
NAPIS-3	Chinle-Alluvium Interface
KA-3	Chinle-Alluvium Interface

If you have specific questions concerning any of the wells or how they were interpreted please contact our office. We will discuss the matter to your satisfaction.

Sincerely,
 Peregrine GeoConnect, Inc.

William H. Kingsley, PE