COMPLIANCE / ENGINEERING / REMEDIATION

LT Environmental Inc.
4600 W. 60th Avenue
Arvada, Colorado 80003
T 303.433.9788 / F 303.433.1432

June 18, 2013

Mr. Alex Fischer
Environmental Supervisor
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, Colorado 80203

Re: Form 27 Update of the Subsurface Investigation
Walden Water Flood Facility
COGCC Facility ID 428915
SENW & NESW 2-T9N-R79W
Jackson County, Colorado

Dear Mr. Fischer:

On behalf of Bonanza Creek Operating Company, LLC, (Bonanza Creek), LT Environmental, Inc. (LTE) is pleased to submit this response to the Colorado Oil and Gas Conservation Commission (COGCC) comments dated May 17, 2013 concerning the Site Investigation Update Report for the Walden Water Flood Facility (Site). Each COGCC request/comment is listed below in italics followed by LTE's response.

A Form 27 providing an update of the subsurface investigation including soil boring logs, the local shallow groundwater characteristics, including potentiometric surface with groundwater flow direction, and proposed methods for addressing the free product as well as the hydrocarbon plume.

As discussed in LTE's April 5, 2013 Site Investigation Update Report, sixteen soil borings (SB01 through SB16) were advanced at the Site to assess subsurface soil and shallow groundwater for the presence of petroleum hydrocarbon impacts. The soil borings were continuously sampled and completed as monitoring wells MW01 through MW16, respectively. The soil boring logs are included as Attachment 1 and the monitoring well locations are shown on Figure 1.

The groundwater monitoring wells were professionally surveyed by North Park Engineering and Consulting, Inc. to determine precise vertical elevations and latitude/longitude coordinates for each monitoring well. The survey data was used to calculate the groundwater elevation in each well, map the potentiometric surface of the water table, and thereby determine the local groundwater flow direction at the Site.

The static groundwater level measurements collected on May 20, 2013 (Praxair wells) and May 21, 2013 (Bonanza Creek wells) were used to generate a groundwater elevation map (see Figure 1). During the May 2013 monitoring event, the depth to groundwater in

the Bonanza Creek monitoring wells ranged from 6.62 feet below ground surface (bgs) in monitoring well MW12 to 10.01 feet bgs in monitoring well MW06. Based on the groundwater elevation contour map, groundwater flow at the Site is predominantly to the northwest. The hydraulic gradient ranges from approximately 0.00035 feet per foot (ft/ft) across the northern half of the Site to approximately 0.00786 ft/ft across the southern half of the Site.

Free phase product was not detected in any of the monitoring wells during the May 2013 quarterly monitoring event. However, monitoring well MW03, which previously had measureable free product, was inadvertently destroyed prior to the monitoring event. Free phase product was detected in monitoring wells MW03 and MW08 during the November and February 2013 quarterly monitoring events. MW03 will be replaced prior to the next quarterly monitoring event, which is scheduled for August 2013, to verify the absence or presence of free phase product at this location. At this time no free phase product abatement is being conducted, though the feasibility of various product abatement approaches (e.g. product recovery via bailing, enhanced fluid recovery wells, passive solar-powered product sippers, etc.) are being evaluated in the event free phase product returns. If free phase product is present in the MW03 replacement well or any of the existing monitoring wells during the August 2013 quarterly sampling event, Bonanza Creek will select and implement a free phase product recovery remedial option at that time. The MW03 replacement well will be a 2-inch diameter well to facilitate any potential future product recovery effort in this well.

Four quarters of groundwater monitoring have been completed since the installation of the monitoring wells in August 2012. Groundwater samples are submitted for laboratory analysis of BTEX by EPA Method 8260B. Groundwater analytical results for the quarterly monitoring event conducted on May 21, 2013 are illustrated on Figure 2. The quarterly groundwater analytical results are also summarized in Table 1.

Along with the Form 27, provide documentation for the underground lines that have been tested (it is implied that Bonanza Creek has tested some lines) and a schedule for when the remaining lines are to be tested.

Bonanaza Creek conducted pressure testing on underground lines at the water flood facility on April 4 and April 5, 2013 for the DAK-LAK dump line, injection well 57 line, and the south 1 main injection line. All three lines passed their pressure test and showed no indication of a leak or loss in pressure. The locations of the underground lines are depicted on Figure 3 and the results of the pressure tests are presented in Figure 3 through Figure 6, respectively.

Bonanza Creek has indicated that the remaining underground lines that transect the petroleum hydrocarbon plume are pressurized lines that have shown no loss of pressure that would suggest they are leaking or have lost integrity. No additional testing is scheduled at this time.

The Form 27 shall include a compliance schedule of activities that Bonanza Creek will be taking to identify the sources(s) of free product as well as remediating the site.

No free phase product was encountered in any of the Bonanza Creek or Praxair monitoring wells during the most recent monitoring event. Free phase product was previously detected in monitoring wells MW03 and MW08 during the November 2012 and February 2013 quarterly monitoring events. As discussed above, MW03 will be replaced with a 2-inch well and the absence or presence of free phase product will be verified during the August 2013 quarterly monitoring event. The observation of any measurable quantity of product in any of the Site monitoring wells at that time will trigger the selection and implementation of a free phase product recovery/abatement approach.

Based on the groundwater analytical results to date, the magnitude of the dissolved phase petroleum hydrocarbon impacts has been determined and down-gradient points of compliance have been established (using a combination of Praxair and Bonanza Creek monitoring wells). There has been no detectable increase in the aerial extent of the dissolved phase plume or increasing trend in the magnitude of the BTEX concentrations since the onset of quarterly monitoring at the Site. Groundwater analytical results indicate there is a source area(s) in the vicinity of monitoring wells MW02, MW03, MW08, and MW09, which have had benzene detections in excess of 2,000 micrograms per liter (ug/L). However, petroleum hydrocarbon impacts in the vadose zone were not encountered in the investigation soil borings at these locations. At this time, Bonanza Creek believes the most likely source of the groundwater impact is a historical release or releases associated with historical pipeline repairs. BTEX concentrations in the Bonanza Creek wells over the first four sampling quarters have been static or decreasing. None of the wells show an increasing trend in BTEX concentrations. Based on the groundwater results and concentration trends and the pipeline pressure tests, there is no evidence of an active or ongoing release at the Site.

In addition to replacing MW03, Bonanza Creek will advance five additional investigation soil borings and complete them as monitoring wells in order to fully define the up-gradient extent of the dissolved phase plume and further delineate the potential source area identified above. The proposed soil boring/monitoring well locations are depicted on Figure 2. Installation of the new monitoring wells would be done concurrently with the replacement of MW03. New monitoring wells in the vicinity of the likely source area will also be constructed with 2-inch diameter PVC to facilitate product recovery in the event free phase product is later encountered in these wells.

The proposed soil borings/monitoring wells would be installed and additional quarterly monitoring events conducted prior to considering potential remedial options designed to address the dissolved phase hydrocarbon plume. LTE believes the additional data obtained from further sampling events and the additional investigation and monitoring points is necessary to evaluate potential remedial options.

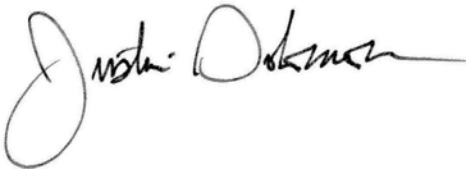
To get a better understanding of the seasonal effects of the shallow groundwater, the groundwater levels and free product amount shall be measured on a monthly basis with sampling on a quarterly basis.

Four quarters of groundwater monitoring and associated rounds of water level measurements have been completed. The average annual water level fluctuation in the Bonanza Creek wells is 1.6 feet for the first year of data. For wells MW05, MW11 and MW15 the first water level measurement collected on August 22, 2012 was discarded because the wells were completed that same day and as the water level was measured and the resulting measurements are outliers, and likely not representative of static conditions. The first year of water level data suggests there is no large seasonal fluctuation in water levels at the Site. As typically occurs, the occurrence of product in MW08 appears to correspond to a drop in the water level in the monitoring well.

If product is found in the MW03 replacement well or appears in any of the existing Site wells during the August quarterly monitoring event, Bonanza Creek proposes implementing monthly water/product level measurements at that time in conjunction with a free phase product recovery effort. Groundwater monitoring will continue on a quarterly basis with the next quarterly monitoring event scheduled for August 2013.

Thank you for your assistance in our efforts to remediate this Site. If you have any questions regarding this response, please contact our office at (303) 433-9788.

Sincerely,
LT ENVIRONMENTAL, INC.



Justin Solomon
Project Environmental Scientist

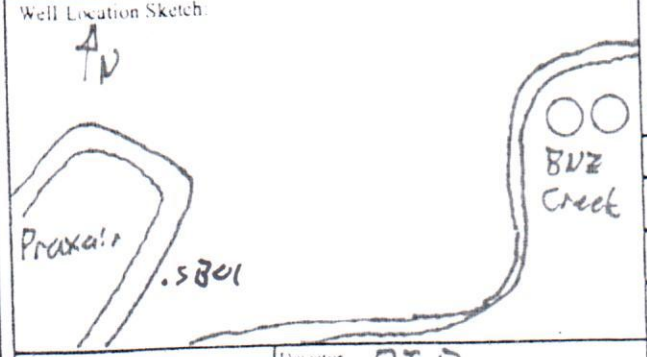
Reviewed by

John Cocroft
Client Manager

Attachments:
Soil Boring Logs
Figure 1 – Groundwater Elevation Map
Figure 2 – Groundwater Analytical Results
Figure 3 – Utility Location Map
Figure 4 – DAK-LAK Dump Line Pressure Test Results
Figure 5 – Injection Well 57 Pressure Test Results
Figure 6 – South 1 Main Injection Line Pressure Test Results
Table 1 – Groundwater Sample Analytical Data

SOIL BORING LOGS

Well Location Sketch:



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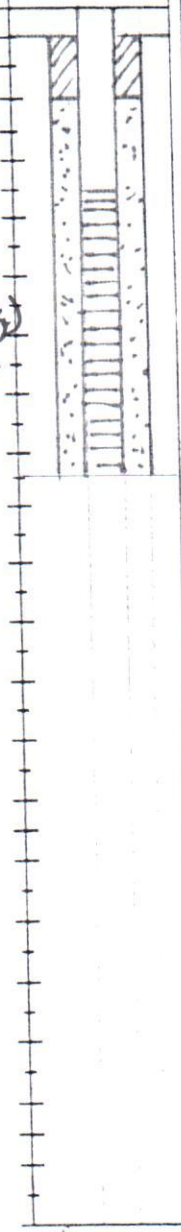
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB01	Project: Walden W.E.F. / Praxair AS.
Date: 8/21/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC — Diameter: 1" — Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC — Slot: 0.010 — Diameter: 1" — Length: 10'	Total Depth: 15' / Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low		0.0			0				0-1' Sandy silt red brn some pebbles
		0.7			2		100	CL	1-3' silty clays minor sands
					4				3-5' silty clays red brn
	moist	0.1			6			CL	5-8' " "
med		1430		SB01	8		100		8-10' red coarse sands w/ pebbles + cobbles (fragments)
		1200			10			SW	stained silty clay @ 9.5'-10'
		315			12				10'-15' red brown silty clays
					14		100	CL	
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch:

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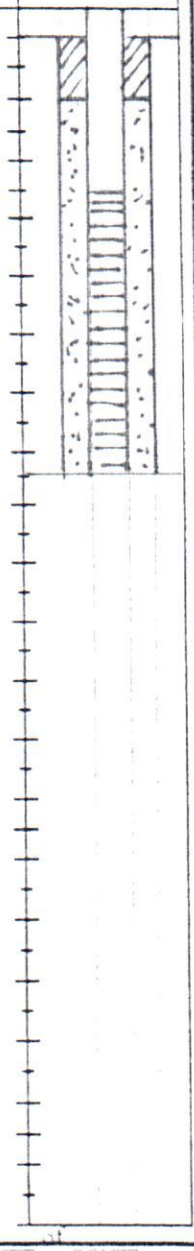
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

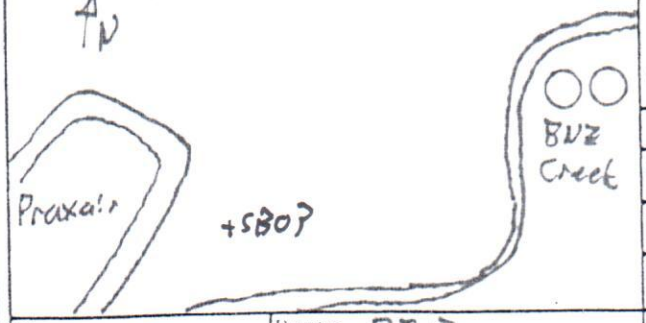
Boring/Well Number: SB02	Project: Walden W.E.F. / Praxair AS.
Date: 8/21/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC / Diameter: 1" / Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC / Slot: 0.010 / Diameter: 1" / Length: 10'	Total Depth: 15' / Depth to Water: ~9'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
		0.0			0			CL	0-5 Brn Sandy/Silty clays
		0.0			2		100	CL	5-9 " " w/ pebble stringers @ 8.5'
		2.7			4				
	moist				6			SC	9-12 wet grey pebbly Sands clay stringers @ 10 & 11' ~3" thickness wet brn
	wet	0.7			8		100		
					10				
		1390		SB02	12			CL	12-15' wet brn silty clays
		1187			14		100		
		5.2			16				
		0.5			18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch:



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BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB07	Project: Walden W.E.F. / Praxair AS.
Date: 8/21/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC — Diameter: 1" — Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC — Slot: 0.010 — Diameter: 1" — Length: 10'	Total Depth: 15' / Depth to Water: 9'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type
ow		0.0			0			
		↓			2			
					4		100	
					6			
		0.7			8		75	
mod	moist	20			10			
		1155		SB03	12		100	
		945			14			
		96			16			
					18			
					20			
					22			
					24			
					26			
					28			
					30			
					32			
					34			
					36			
					38			
					40			

Lithology/Remarks

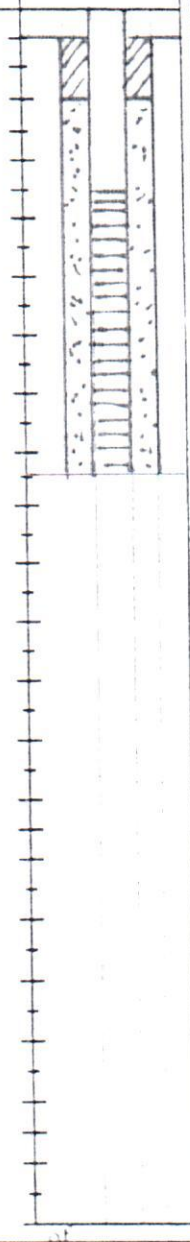
med brn sandy silts minor gravels 0-5'

5-8' " " " w/pebble stringers @ 5.5' + 6.0'

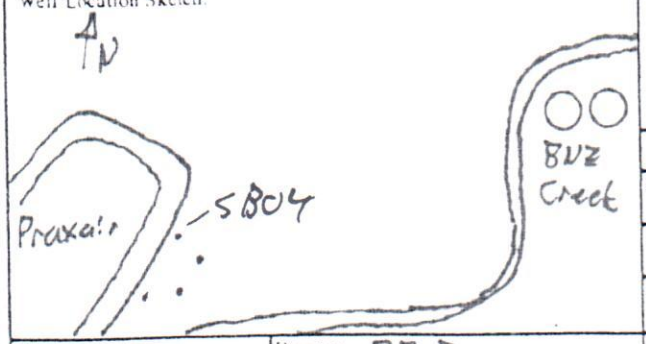
8-10' med brn silty clays grey/black staining @ 9-13'

10-15' med brn silty clays grading to lt. brn silty clay @ T.D.

Well Completion Diagram



Well Location Sketch:



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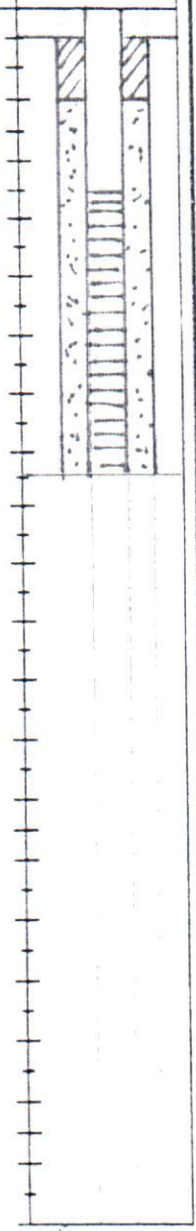
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

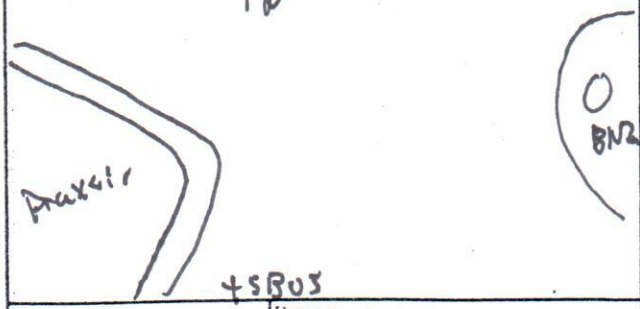
Boring Well Number: SB04	Project: Walden W.E.F. / Praxair AS.
Date: 8/21/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC / Diameter: 1" / Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC / Slot: 0.010 / Diameter: 1" / Length: 10'	Total Depth: 15' / Depth to Water: ~10'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low					0			SM	0-2 med brn silty sands
		0.7			2		90	SM	2-5 grey silty sands w/ minor pebbles
					4			SM	5-4 silty coarse grained sands med brn
		0.1			6				
		180			8		100	CL	9-10 med brn silty clays minor staining
med		1120		SB04	10				
	moist	240			12		100	CH	10-15' fat clays (silty) med brn grading to lt. tan @ T.D.
		66			14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch: N



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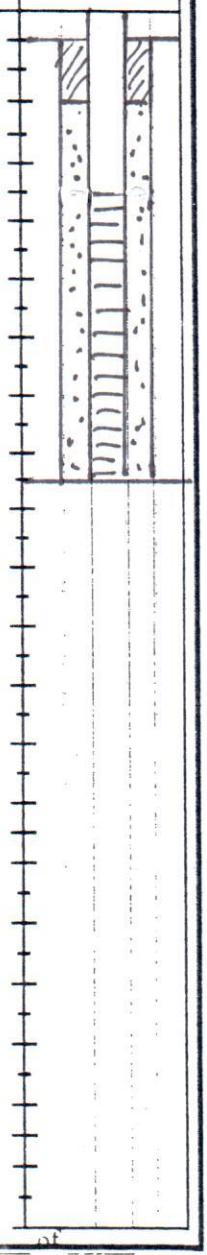
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB05	Project: Walden W.F.F/Praxair As.
Date: 8/21/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8700'	Detector: PID
Drilling Method: Direct push	Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips
Grout: N/A	
Casing Type: PVC	Diameter: 1" Length: 10'
Hole Diameter: 2.5"	Depth to Liquid:
Screen Type: PVC	Slot: 0.010
Diameter: 1" Length: 10'	Total Depth: 15'
Depth to Water: 12.5	

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low					0			CL	silty, clay loam 0-1
		0.0			2		100%	CL	1-3 lt tan fine silty clay,
		0.0			4				
					6			CM	3-8 pebbly gravels Q+z etc minor fines
	mod+	0.0			8				
mod		10.1		SB05	10		100%	SC	8-10 clayey sands lt staining
		0.8			12			CL	10-12 Sandy clay med brn
		0.0			14		100%	CH	12-15 Fat clay med br. No stain
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch

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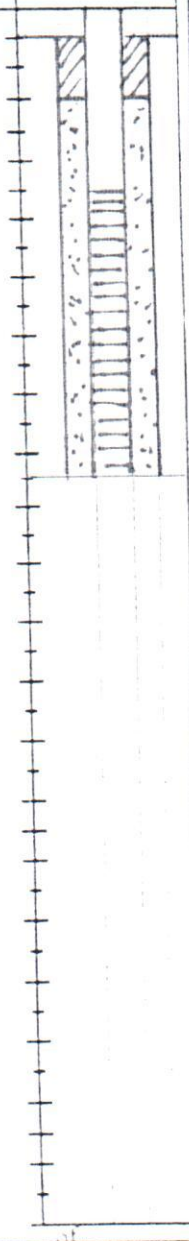
Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring Well Number: SB06		Project: Walden W.E.F. / Praxair AS.	
Date: 8/22/12		Project Number: 0345-12007	
Logged By: PH		Drilled By: ACI	
Elevation: ~8300'	Detector: PID	Drilling Method: Direct push	Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand		Seal: Bentonite chips	Grout: N/A
Casing Type: PVC		Diameter: 1" Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC	Slot: 0.010	Diameter: 1" Length: 10'	Total Depth: 15' / Depth to Water: ~9'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
					0				
			0.1		2		100%	CL	0-1 silty loam med brn
					4			CL	1-5 med brn silty sandy clays
			0.1		6		100%	CL	5-8 med brn sandy gravelly clays low plast.
			0.0		8			GW	8-9 gravelly sands, cobbles (fragments)
	moist		0.0		10		100%		
			140		12				
			355	SB06	14			CL	9-10 sandy clays med brn grading to grey
					16			CL	10-15 lt. grey sandy clay lt staining @ 13 - T.D
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch:

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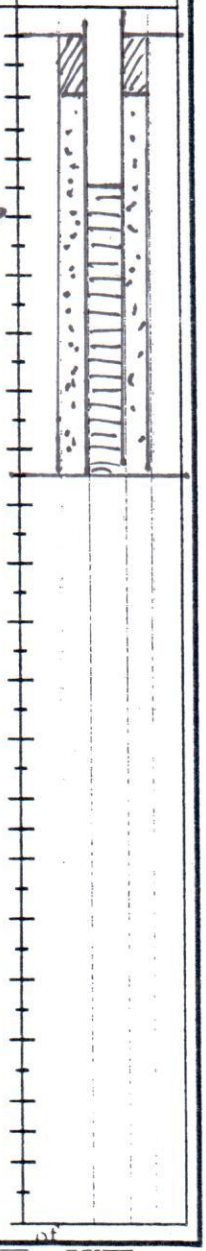
LT Environmental, Inc.
4600 W. 60th Avenue
Arvada, Colorado 80003

BORING LOG/MONITORING WELL COMPLETION DIAGRAM

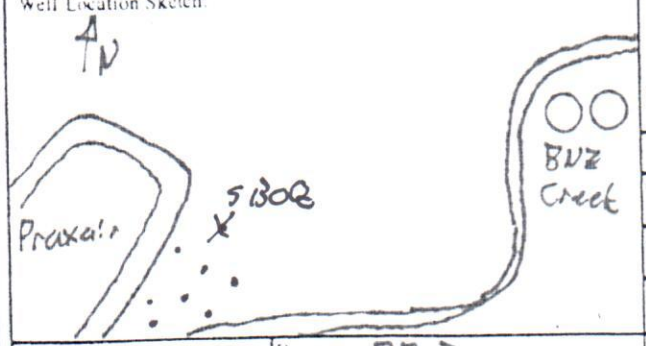
Boring/Well Number: SB07	Project: Walden W.F.F / Praxair As.
Date: 8/21/12	Project Number: 0343 12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC / Diameter: 1" / Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC / Slot: 0.010 / Diameter: 1" / Length: 10'	Total Depth: 15' / Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low		0.0	No		0				silty clays predominately
		0.0			2		100	CL	Sandy clays 0-5'
		0.0			4				med brn + lt tan
		0.0			6			SW	5-8.5 gravelly sand white/grey
	moist	0.0			8		100		lt tan → white ~~brn~~ gravels
med		0.0			10				
	wet							CL	8.5 → 10 grey green sandy clay
		0.7		SB07	12		100		
		0.0			14				10-12 " "
					16			SW	12-13' Sand gravel grey green with fines
					18				
					20			CL	13-15' sandy clay grey
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch:



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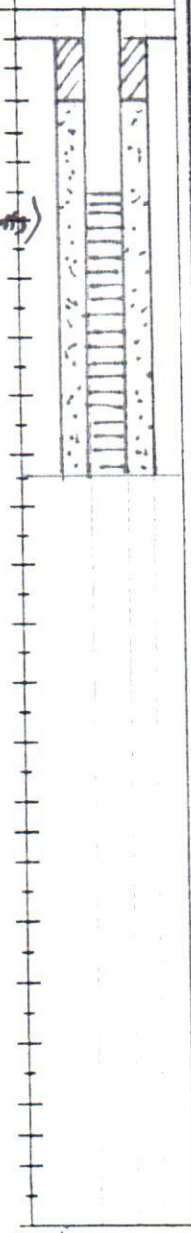
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring Well Number: SB08	Project: Walden W.E.F. / Praxair AS.
Date: 8/21/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC / Diameter: 1" / Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC / Slot: 0.010 / Diameter: 1" / Length: 10'	Total Depth: 15' / Depth to Water: ~10'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low		0.0			0			CL	0-3' silty clays med brn
					2		100	SW	3-5' coarse grained gravelly sands ≤ 2" dia
		0.1			4			CL	5-8 med grey/brn gravelly clays some cobbles (fragments)
		214			6				
med					8		100	CL	8-10' grey sandy clays staining 8 - 11.5'
	moist	1255		SB08	10				
		416			12		100	CL	10-15' silty clay grey grading to med brn @ T.D.
		856			14				
		332			16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



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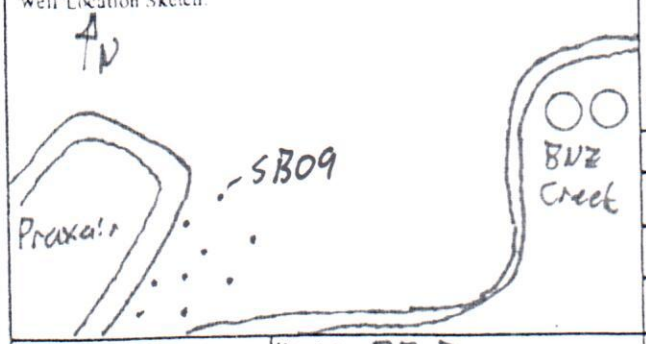

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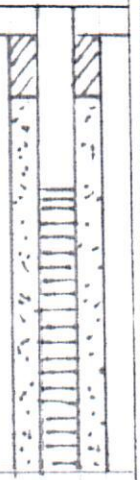
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring Well Number: SB09	Project: Walden W.F.F. / Praxair AS.
Date: 6/21/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC / Diameter: 1" / Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC / Slot: 0.010 / Diameter: 1" / Length: 10'	Total Depth: 15' / Depth to Water: ~9.0

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low		0.0			0			SM	0-5' med brn med/fine grained sands w/fines (silty)
		0.1			2		100		
					4				5-6' " "
		0.7			6			GM	6-8' Qtz gravels w/fines grading to grey sandy clay @ 8'
	moist				8		100	CL	
med		5.5			10			SW	8-10' Gravelly sands w/fines Qtz + grey fines
		1053		SB09	12		100		
		438							
		614			14			CL	10-15' Silty clays med brn w/ gravel stringers < 2" thickness @ 11 + 12.5'
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



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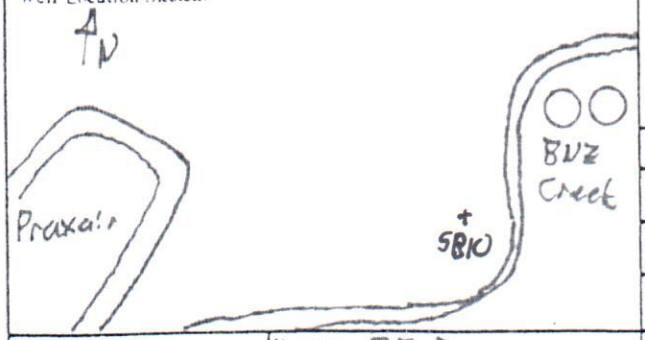

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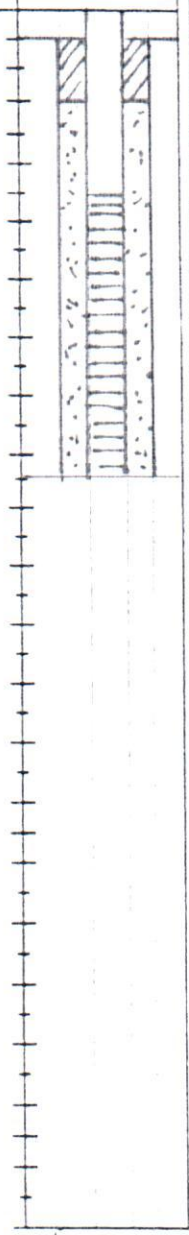
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB10	Project: Walden W.F.F. / Praxair AS.
Date: 8/22/12	Project Number: 0345-1207
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC / Diameter: 1" / Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC / Slot: 0.010 / Diameter: 1" / Length: 10'	Total Depth: 15' / Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low	0.0		NO		0			SM	0-4' med brn silty sand
	0.0				2		100%	CL	4- Drk brn sandy clay pebbles @ 4'
					4				
Hard					6			?	5-10' Rock in borings 5% recovery silty clay ?
		moist			8		5%		
					10				
Med					12		100%	CL	10-15' med brn silty clays
	0.4			SB10	14				
	0.3				16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch:

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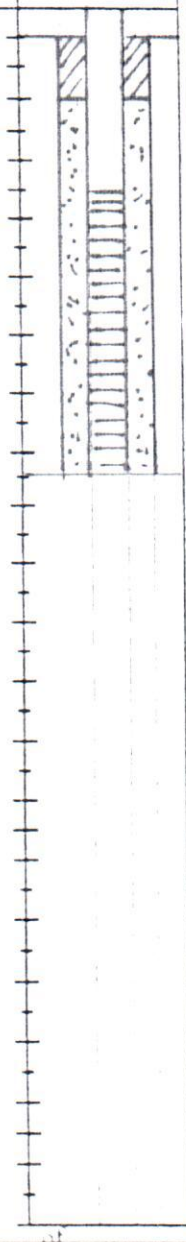
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB11	Project: Walden W.E.F. / Praxair AS.
Date: 8/22/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300' / Detector: PID	Drilling Method: Direct push / Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips / Grout: N/A
Casing Type: PVC / Diameter: 1" / Length: 10'	Hole Diameter: 2.5" / Depth to Liquid:
Screen Type: PVC / Slot: 0.010 / Diameter: 1" / Length: 10'	Total Depth: 15' / Depth to Water:

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low		0.0	NV		0				
		0.1			2		100%	CL	0-5' Drk brn sandy clay grading to lt tan silty clays w/ Qtz pebbles
		0.0			4				
					6			CH	5-8' tan/brn clays
					8		85%	SW	8-9.5' Orange coarse grained Pebbly sand.
med		0.3							
	moist	0.2		SB10	10			CH	9.5-10' lt. grey Sandy clay
		0.4			12		100%	CL	10-15' silty clays grey 10-13' Red/brown 13-15'
		0.0							
		0.0			14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



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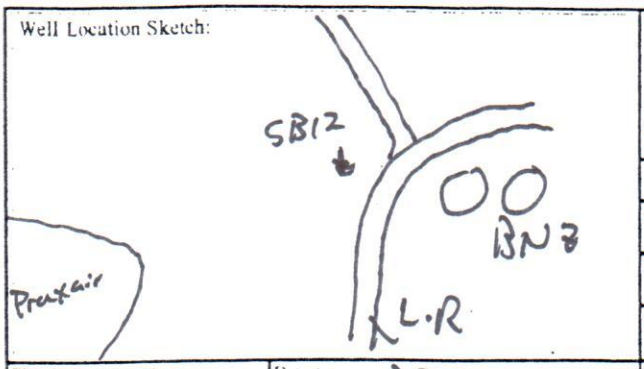

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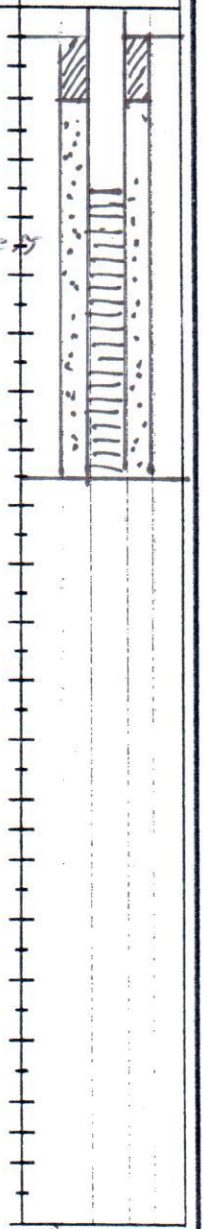
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB12	Project: Welder W.F.E / Praxair AS
Date: 8/22/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300	Detector: PID
Drilling Method: **Direct push**	Sampling Method: **Continuous**
Gravel Pack: **10-20 Silica sand**	Seal: **Bentonite chips**
Grout: N/A	
Casing Type: **PVC**	Diameter: **1"** Length: 10'
Hole Diameter: **2.5"**	Depth to Liquid:
Screen Type: **PVC**	Slot: **0.010** Diameter: **1"** Length: 10'
Total Depth: 15'	Depth to Water: ~9'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low		0.0	NC		0				med brn sandy silt 0-1
		0.0			2			CL	3-5 tan sandy clays
		0.0			4				5-7 " "
	moist	0.3			6			CL	8-9 Grey sandy clays
Med		1.0			8				some pebbles/sand stringers
		0.6		SB12	10			CH	9-10 orange/brn fat clay
		0.0			12			CH	10-15 Fat clays
		0.0			14				med brn to grey to red brown.
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch:

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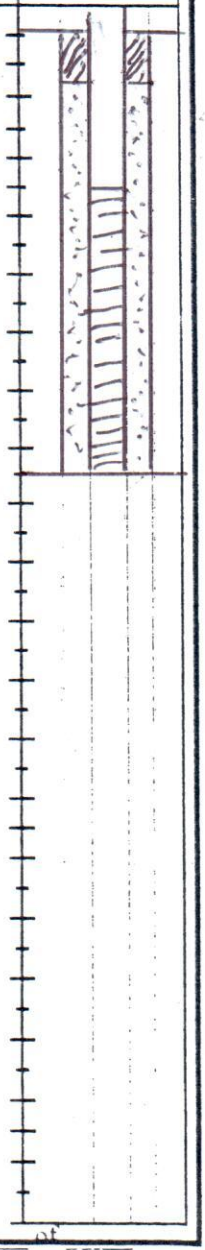
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB13	Project: Walden W.F.F / Praxair AS
Date: 8/22/12	Project Number: 0345-2007
Logged By: PH	Drilled By: ACI
Elevation:	Detector: PID
Drilling Method: Direct push	Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips
Grout: -N/A	
Casing Type: PVC	Diameter: 1" Length: 10'
Hole Diameter: 2.5"	Depth to Liquid:
Screen Type: PVC	Slot: 0.010 Diameter: 1" Length: 10'
Total Depth: 15'	Depth to Water: ~9'

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
Easy		0.0	No		0			SM	0-3' Dk brn silty sand
		0.1			2		100	SC	3-5' Orange brn pebbly sand minor fines
		0.0			4				5-9 " "
		0.0			6			CL	9-10 grey sandy pebbly clay
med	mst	0.0			8		NO	CH	10-15 brn/grey stiff clay grades to grey @ TD
		1.5		SB13	10				
		0.0			12		NO		
		0.3			14				
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



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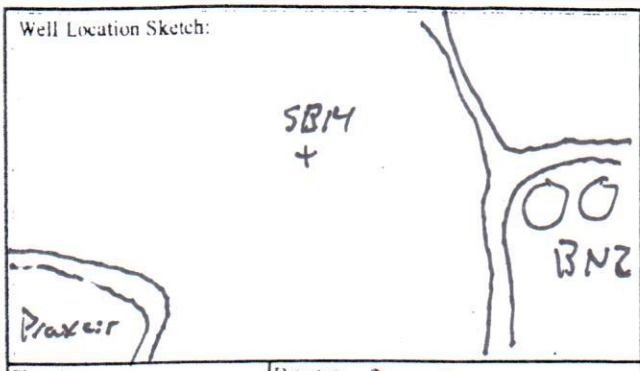

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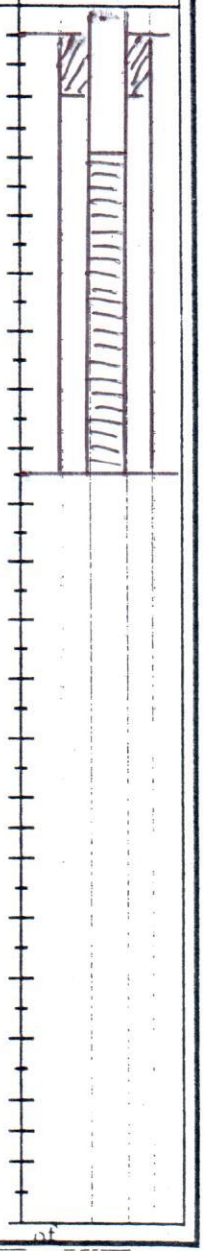
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

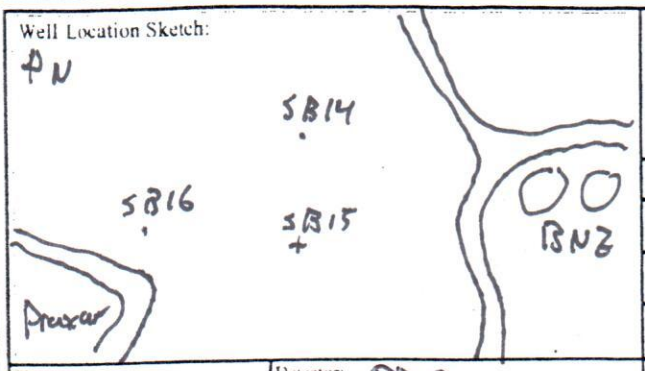
Boring/Well Number: SB14	Project: 0345 12007
Date: 8/22/12	Project Number: Welder W.E.F / Praxair Ag
Logged By: PH	Drilled By: ACT
Elevation:	Detector: PID
Drilling Method: **Direct push**	Sampling Method: **Continuous**
Gravel Pack: **10-20 Silica sand**	Seal: **Bentonite chips**
Grout: N/A	
Casing Type: **PVC**	Diameter: **1"** Length: 10'
Hole Diameter: **2.5"**	Depth to Liquid:
Screen Type: **PVC**	Slot: **0.010** Diameter: **1"** Length: 10'
Total Depth: 15'	Depth to Water: 8.5

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low			No		0			SM	0-1 Sandy loam
		0.0			2		100%	SM	1-5 tan silty sands some pebbles
		0.0			4				@ 4.5' 2" thick grey clay stringer
		0.4			6			CL	5-7' med brn silty clay
	moist	0.4			8		100%	CL	7-9' grey sandy clays Qtz Pebbles
med		0.5		SB14	10			CL	9-10 Orange brn silty clay
		0.2			12		100%	CL	10-15 brn silty clay grading
		0.0			14			CH	to grey silty fat clay
		0.0			16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



Well Location Sketch:



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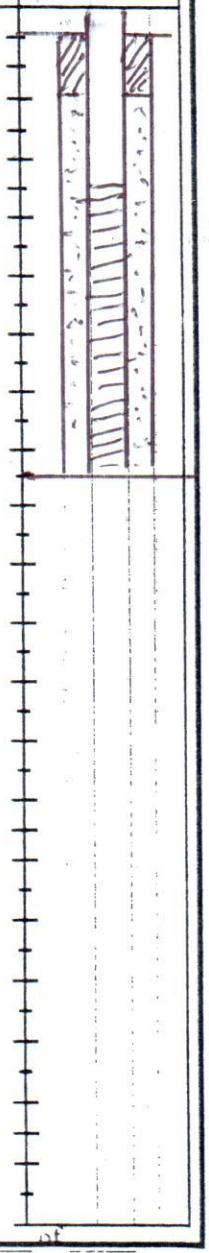
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB15	Project: Walden W.F.F./Praxair As.
Date: 8/22/12	Project Number: 0345 12007
Logged By: PH	Drilled By: ACT
Elevation: ~8300	Detector: PID
Drilling Method: **Direct push**	Sampling Method: **Continuous**
Gravel Pack: **10-20 Silica sand**	Seal: **Bentonite chips**
Grout: N/A	
Casing Type: **PVC**	Diameter: **1"** Length: 10'
Hole Diameter: **2.5"**	Depth to Liquid:
Screen Type: **PVC**	Slot: **0.010** Diameter: **1"** Length: 10'
Total Depth: 15'	Depth to Water:

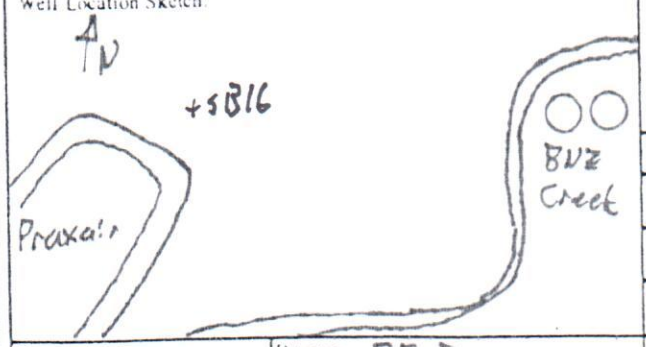
Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
		ND	0.0		0			SM	0-1 Sandy loam
					2		100%	ML	1-3 med brn sandy silt grading to lt. tan
			0.4		4				3-5 " " w/addition of pebbles < 2" dia
			0.1		6				
	Moist		0.6	SB15	8		100%		5-6 " "
			0.3		10			CW.	6-7 white quartz pebbles cobbles minor fines
			0.1		12			SW	7-10 Pebbly sands grading to sandy clay grey
					14		100%	CL	10-11 " "
					16				11-15' Sandy clays grey grading to med brn
					18			CL	Pebble stringers @ 12' + 13' 2" thickness
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



LITHOLOGIC LOG

Well Location Sketch:



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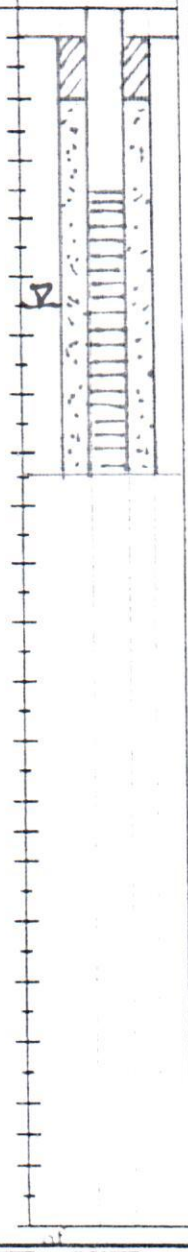
BORING LOG/MONITORING WELL COMPLETION DIAGRAM

Boring/Well Number: SB16	Project: Walden W.E.F. / Praxair AS.
Date: 8/22/12	Project Number: 0345-12007
Logged By: PH	Drilled By: ACI
Elevation: ~8300'	Detector: PID
Drilling Method: Direct push	Sampling Method: Continuous
Gravel Pack: 10-20 Silica sand	Seal: Bentonite chips
Grout: N/A	
Casing Type: PVC	Diameter: 1" Length: 10'
Hole Diameter: 2.5"	Depth to Liquid
Screen Type: PVC	Slot: 0.010 Diameter: 1" Length: 10'
Total Depth: 15'	Depth to Water: 8.5

Penetration Resistance	Moisture Content	Vapor (ppm)	Staining	Sample #	Depth (ft. bgs.)	Sample Run	Recovery	Soil/Rock Type	Lithology/Remarks
low		0.0	No		0				
		0.0			2		100	CL	0-1' Brn Sandy loam
		0.0			4				1-4' lt. tan clayey silt Pebble stringers @ 3'+4'
					6		100	SC	4-5' grey pebbly clayey sand
med	moist	0.3		SB16	8				5-11' " " "
		0.1			10		100	SP	11-12' orange brn coarse grained sand
		0.0			12				12'-15' Sandy silty clay orange grading to grey @ T.D.
					14			CL	
					16				
					18				
					20				
					22				
					24				
					26				
					28				
					30				
					32				
					34				
					36				
					38				
					40				

Well Completion Diagram



FIGURES & TABLES

TABLE 1
GROUNDWATER SAMPLE ANALYTICAL DATA
WALDEN WATER FLOOD FACILITY
BONANZA CREEK ENERGY OPERATING COMPANY LLC

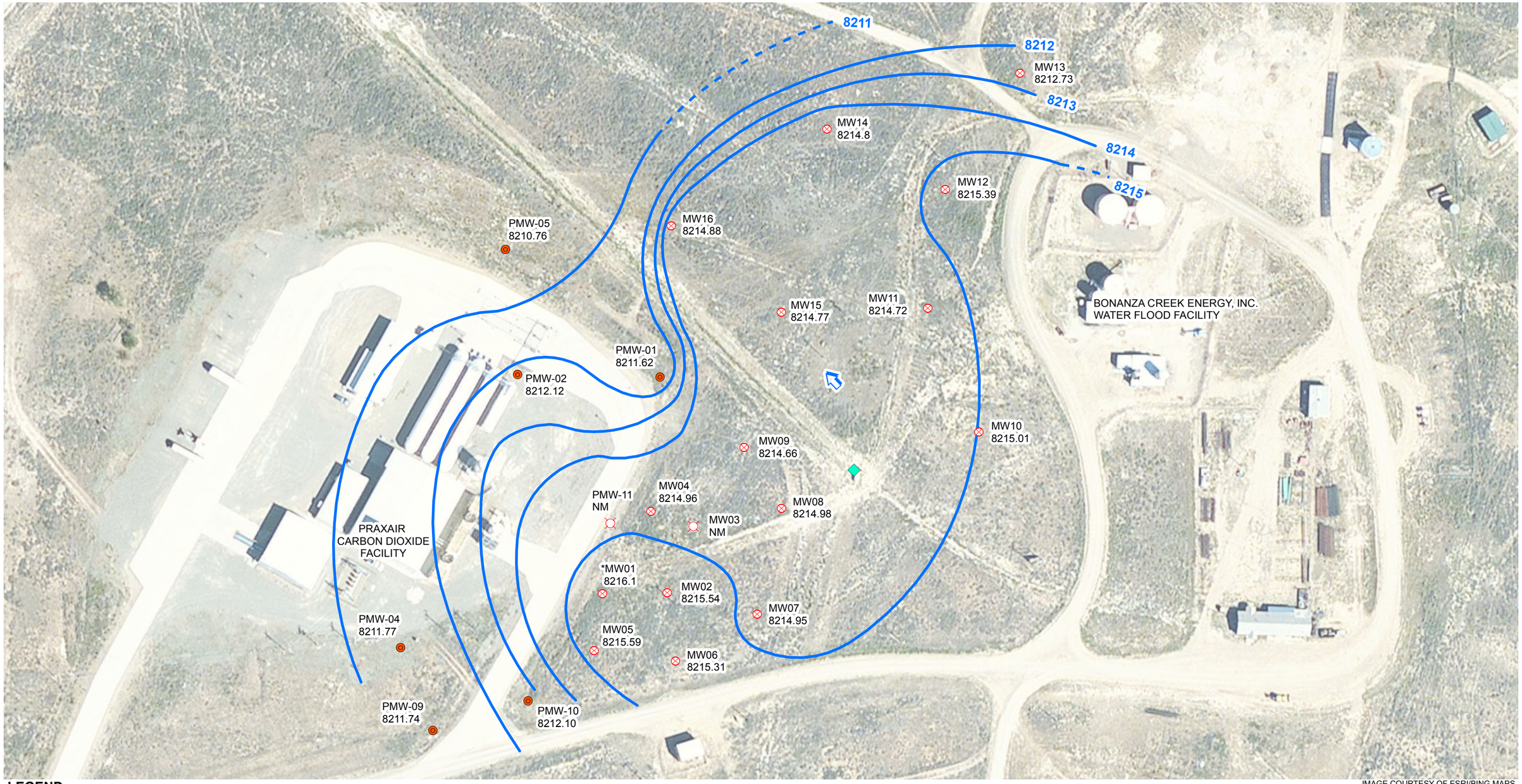
SAMPLE ID	SAMPLE DATE	DTW (feet bgs)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYLBENZENE (ug/L)	XYLENES (Total) (ug/L)
MW01	8/22/2012	9.03	**810**	1.3	400	840
	11/7/2012	10.30	**810**	<1.0	160	910
	2/28/2013	10.16	**790**	<1.0	210	570
	5/21/2013	8.96	**620**	<1.0	160	440
MW02	8/22/2012	9.46	**2,100**	1.7	670	**5,400**
	11/7/2012	10.00	**2,400**	<1.0	**700**	**5,400**
	2/28/2013	10.15	**3,200**	<1.0	**740**	**4,300**
	5/21/2013	9.33	**790**	<1.0	**150**	**960**
MW03	8/22/2012	8.96	**560**	100	480	**2,500**
	11/7/2012	9.84	**Product**	**Product**	**Product**	**Product**
	2/28/2013	Frozen	-	-	-	-
	5/21/2013	Destroyed	-	-	-	-
MW04	8/22/2012	9.13	**6.6**	7.9	200	410
	11/7/2012	10.50	2.5	<1.0	62	60
	2/28/2013	9.85	4.1	<1.0	66	58
	5/21/2013	8.88	<1.0	<1.0	6.4	6.1
MW05	8/22/2012	14.13	<1.0	<1.0	<1.0	2.2
	11/7/2012	8.00	<1.0	<1.0	<1.0	<1.0
	2/28/2013	10.18	<1.0	<1.0	<1.0	<1.0
	5/21/2013	9.40	<1.0	<1.0	<1.0	<1.0
MW06	8/22/2012	10.16	**1,200**	4.9	300	1,200
	11/7/2012	10.72	**9.8**	1.6	200	540
	2/28/2013	10.76	**1,100**	1.2	170	360
	5/21/2013	10.01	**1,300**	3.0	210	710
MW07	8/22/2012	9.74	1.5	1.2	4.6	33
	11/7/2012	9.90	2.0	<1.0	1.2	8.7
	2/28/2013	10.44	2.3	<1.0	<1.0	<1.0
	5/21/2013	9.77	2.8	<1.0	1.0	5.4
MW08	8/22/2012	10.09	**7,000**	**13,000**	**830**	**7,800**
	11/7/2012	10.43	**Product**	**Product**	**Product**	**Product**
	2/28/2013	10.66	**Product**	**Product**	**Product**	**Product**
	5/21/2013	9.76	**8,000**	**11,000**	440	**6,700**
MW09	8/22/2012	9.47	**1,400**	**1,700**	200	**1,700**
	11/7/2012	11.41	**4,100**	**4,600**	430	**3,500**
	2/28/2013	10.01	**7,200**	**6,700**	680	**5,100**
	5/21/2013	9.09	**5,100**	**5,000**	440	**3,900**
MW10	8/22/2012	7.88	**100**	<1.0	3.5	14
	11/7/2012	8.66	**120**	5.2	5.1	30
	2/28/2013	10.75	**120**	<1.0	2.0	<1.0
	5/21/2013	7.38	**70**	2.6	<1.0	3.0
MW11	8/22/2012	14.18	<1.0	<1.0	<1.0	<1.0
	11/7/2012	9.75	<1.0	<1.0	<1.0	<1.0
	2/28/2013	6.87	**10**	<1.0	2.8	16
	5/21/2013	6.63	<1.0	<1.0	<1.0	<1.0
MW12	8/22/2012	Dry	Dry	Dry	Dry	Dry
	11/7/2012	7.42	<1.0	<1.0	<1.0	<1.0
	2/28/2013	7.52	<1.0	<1.0	<1.0	<1.0
	5/21/2013	6.62	<1.0	<1.0	<1.0	<1.0

TABLE 1
GROUNDWATER SAMPLE ANALYTICAL DATA
WALDEN WATER FLOOD FACILITY
BONANZA CREEK ENERGY OPERATING COMPANY LLC

MW13	8/22/2012	Dry	Dry	Dry	Dry	Dry
	11/7/2012	9.01	<1.0	<1.0	<1.0	<1.0
	2/28/2013	9.27	<1.0	<1.0	<1.0	<1.0
	5/21/2013	7.86	<1.0	1.2	<1.0	<1.0
MW14	8/22/2012	Dry	Dry	Dry	Dry	Dry
	11/7/2012	10.12	1.1	<1.0	<1.0	<1.0
	2/28/2013	10.01	<1.0	<1.0	<1.0	<1.0
	5/21/2013	7.74	<1.0	<1.0	<1.0	<1.0
MW15	8/22/2012	10.51	4.7	<1.0	<1.0	<1.0
	11/7/2012	8.37	**16**	<1.0	<1.0	<1.0
	2/28/2013	9.04	**19**	<1.0	<1.0	<1.0
	5/21/2013	7.79	**5.9**	<1.0	<1.0	<1.0
MW16	8/22/2012	8.67	<1.0	<1.0	<1.0	<1.0
	11/7/2012	9.16	2.9	<1.0	<1.0	<1.0
	2/28/2013	8.99	2.6	<1.0	<1.0	<1.0
	5/21/2013	7.87	2.1	<1.0	<1.0	<1.0
The Basic Standards for Groundwater			5	560	700	1,400

Notes:
DTW - Depth to Water
ug/L - Micrograms per liter
bgs - below ground surface

Results noted in bold exceed Colorado Department of Public Health and Environment (CDPHE)-Water Quality Control Commission (WQCC) Regulation 41-The Basic Standards for Groundwater



LEGEND

- LTE MONITORING WELL
- PRAXAIR MONITORING WELL
- INJECTION WELL
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION CONTOUR
  DASHED WHERE INFERRED
  CONTOUR INTERVAL = 1 FOOT
  *MW01 NOT USED TO GENERATE CONTOURS

IMAGE COURTESY OF ESRI/BING MAPS

0 100 200
Feet

N

FIGURE 1
GROUNDWATER ELEVATION MAP
MAY 2013
WALDEN WATER FLOOD FACILITY
SENW & NESW SEC 2-T9N-R79W
JACKSON COUNTY, COLORADO
BONANZA CREEK ENERGY OPERATING COMPANY LLC

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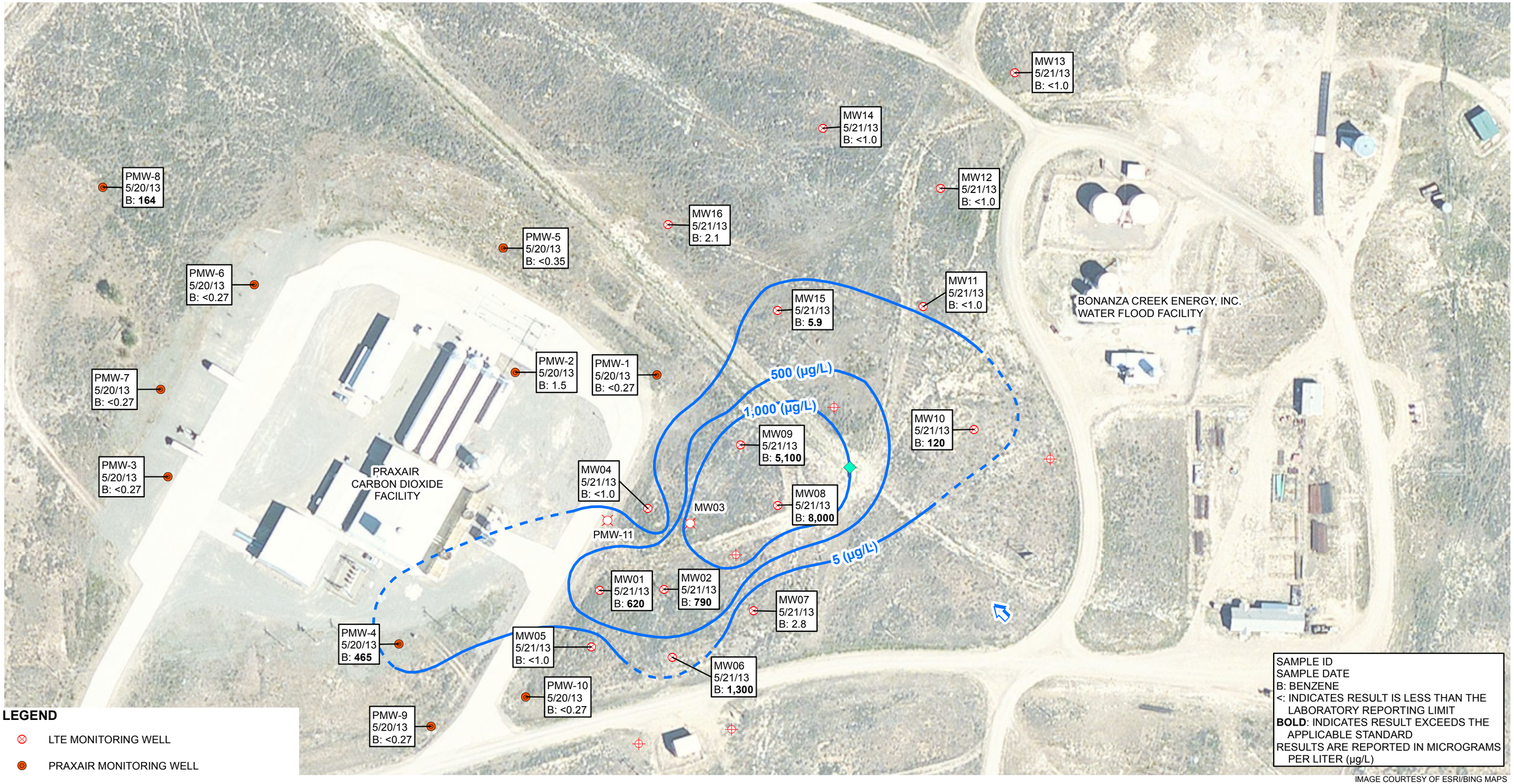

LEGEND

- LTE MONITORING WELL
- PRAXAIR MONITORING WELL
- DESTROYED MONITORING WELL
- PROPOSED SOIL BORING/MONITORING WELL
- INJECTION WELL
- GROUNDWATER FLOW DIRECTION
- BENZENE ISOCONCENTRATION CONTOUR (µg/L)
- DASHED WHERE INFERRED

SAMPLE ID
SAMPLE DATE
B: BENZENE
<: INDICATES RESULT IS LESS THAN THE LABORATORY REPORTING LIMIT
BOLD: INDICATES RESULT EXCEEDS THE APPLICABLE STANDARD
RESULTS ARE REPORTED IN MICROGRAMS PER LITER (µg/L)

IMAGE COURTESY OF ESRI/BING MAPS

0 100 200
Feet

N

FIGURE 2
GROUNDWATER ANALYTICAL RESULTS
MAY 2013
WALDEN WATER FLOOD FACILITY
SENW & NESW SEC 2-T9N-R79W
JACKSON COUNTY, COLORADO
BONANZA CREEK ENERGY OPERATING COMPANY LLC

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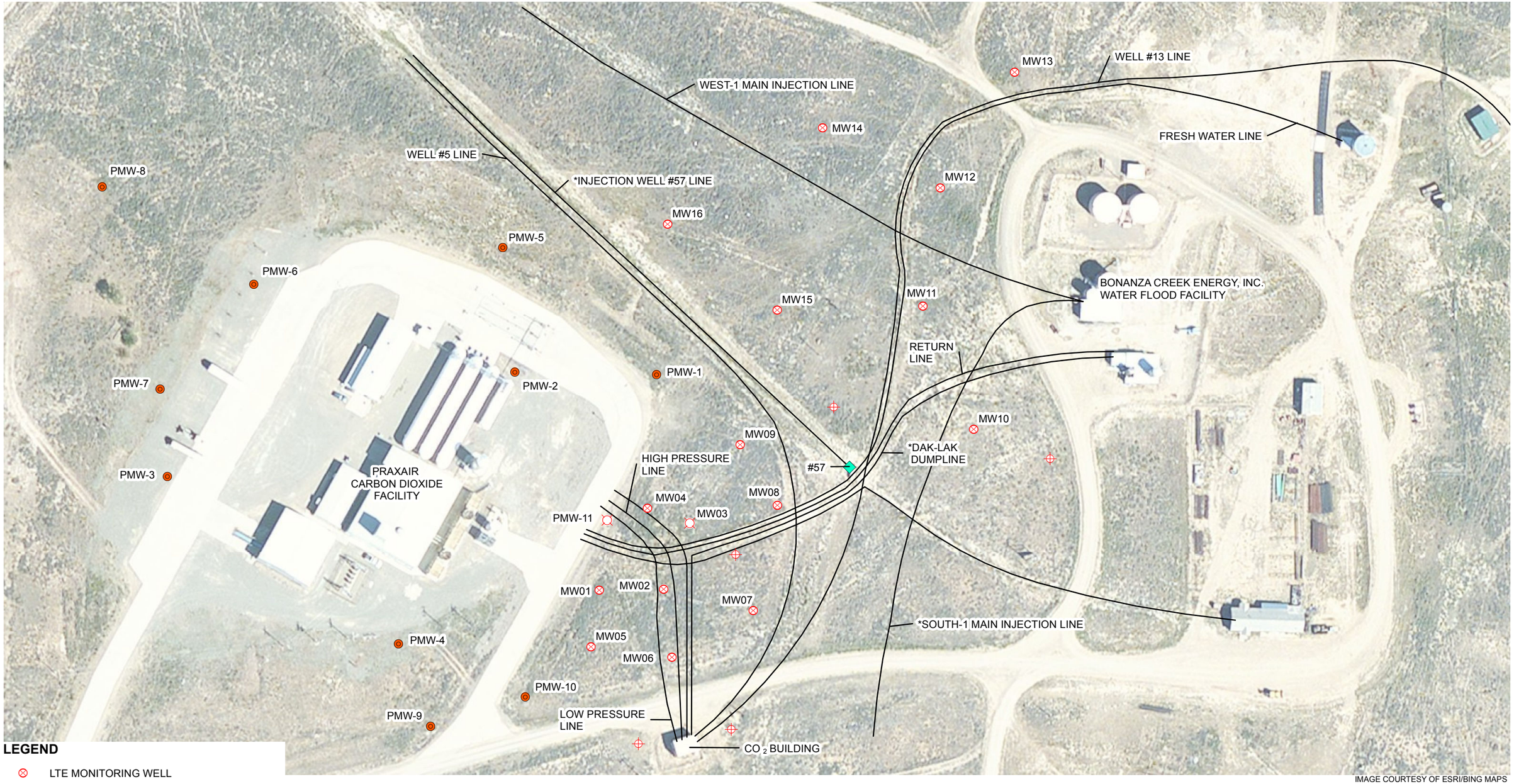

LEGEND

- LTE MONITORING WELL
- PRAXAIR MONITORING WELL
- DESTROYED MONITORING WELL
- PROPOSED SOIL BORING/MONITORING WELL
- INJECTION WELL
- UNDERGROUND UTILITY LINE
- *PRESSURE TESTED LINE

IMAGE COURTESY OF ESRI/BING MAPS

0 100 200
Feet

N

FIGURE 3
UTILITY LOCATION MAP
WALDEN WATER FLOOD FACILITY
SENW & NESW SEC 2-T9N-R79W
JACKSON COUNTY, COLORADO
BONANZA CREEK ENERGY OPERATING COMPANY LLC

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FIGURE 4
DAK-LAK DUMP LINE
PRESSURE TEST
WALDEN WATER FLOOD FACILITY
BONANZA CREEK ENERGY INC.

Data Collection Report

Gauge Information	
Serial Number	264417
Model	3KPSIXP2I
Message Store	----------
Units	PSI

Run Info	
Start Time	4/4/13 8:52:48 AM
Stop Time	4/4/13 9:07:12 AM
Logging Interval	10

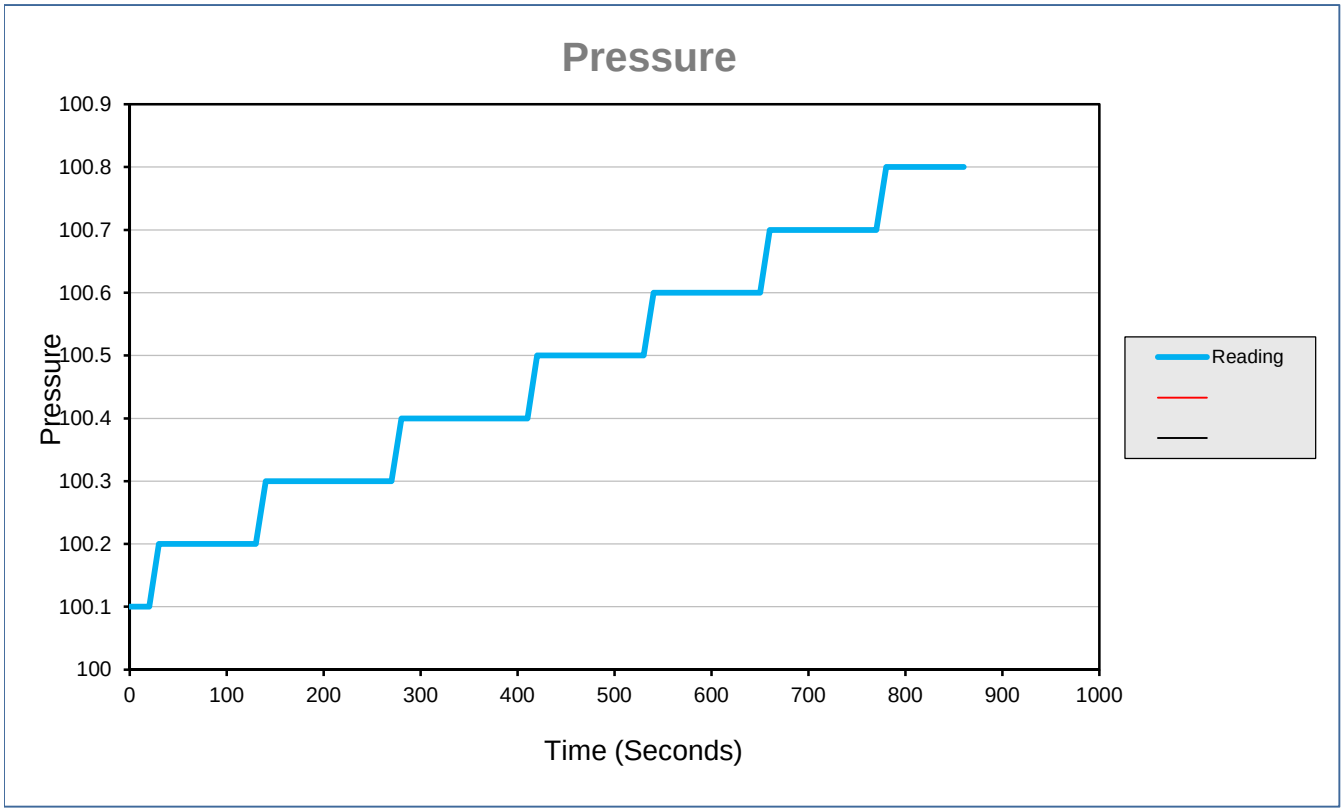

FIGURE 5
INJECTION WELL #57
PRESSURE TEST
WALDEN WATER FLOOD FACILITY
BONANZA CREEK ENERGY INC.

Data Collection Report

Gauge Information	
Serial Number	264417
Model	3KPSIXP2I
Message Store	----------
Units	PSI

Run Info	
Start Time	4/5/13 10:20:33 AM
Stop Time	4/5/13 10:44:47 AM
Logging Interval	10

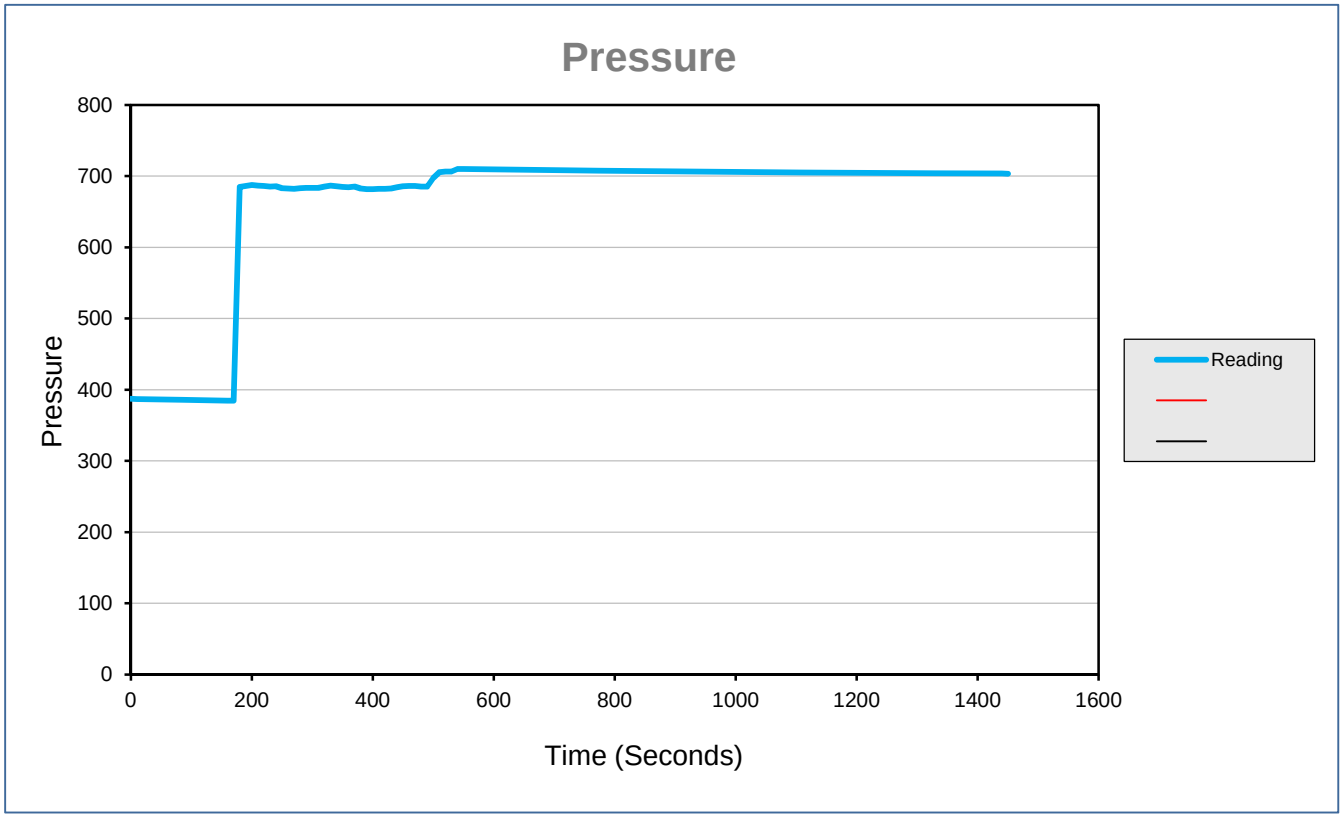

FIGURE 6
SOUTH 1 MAIN INJECTION LINE
PRESSURE TEST
WALDEN WATER FLOOD FACILITY
BONANZA CREEK ENERGY INC.

Data Collection Report

Gauge Information	
Serial Number	264417
Model	3KPSIXP2I
Message Store	----------
Units	PSI

Run Info	
Start Time	4/4/13 9:25:28 AM
Stop Time	4/4/13 9:46:46 AM
Logging Interval	10