GTHT - 1

PITS/PONDS

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey
Division Director
Oil Conservation Division

DECEMBER 17, 2013

Mr. David Janney
Lightning Dock Geothermal HI-01, LLC
819 Jefferson, NE
Albuquerque, NM 87113

RE: Lightning Dock Geothermal Project (GTHT-001): "Reserve Pit Closure Plan"
Lightning Dock Geothermal HI-01, LLC, Hidalgo County, New Mexico

Dear Mr. Janney:

The Oil Conservation Division (OCD) is in receipt of the Lightning Dock Geothermal HI-01, LLC (operator) Reserve Pit Closure Plan (plan) dated November 5, 2013. The operator is proposing to close reserve pits associated with LDG 45-7 and LDG 63-7.

OCD observes that the proposed temporary pit closures by the operator are not consistent with 19.15.17.13 NMAC. OCD notices that the operator is attempting to use 19.15.17.13 NMAC Table I (51 ft. – 100 ft.) as criteria for determining the quality of drill cuttings in the temporary pits in order to land apply drill cutting wastes onto the land surface as the final disposition of temporary pit waste. OCD notices that there was mention of sampling beneath the pit liner after drill cutting waste is removed, but the issue is the final disposition of the drill cuttings based on the plan. OCD notices that 19.15.17.13 NMAC Table II is used for burial trenches and waste left in place in temporary pits.

Therefore, OCD cannot approve the plan as proposed. Please review 19.15.17.13 NMAC for further insight on temporary pit closure methods that OCD could approve and resubmit a plan that meets the technical requirements of the above cited regulations. Additional information is provided below based on the plan.

Observations:

1) The levels of TPH, BTEX and Chlorides relative to the depth to water table based of pits was conducive to proposing to deposit the pit contents on the property west of Well 63-7 owned by the operator (appears to be the plant area?).

2) Cut or borrow from the field west of Well 45-7 would be used to fill pits to grade for reseeding.

3) Drill pit 47-7 is referred to as a "sump" in the plan. OCD requested to know on 12/13/2013 clarification of the significance of referring to the pit as a sump.

4) Composite testing within the temporary pits revealed that only the 63-7 pit contained one OCD parameter of concern at 1,100 ppm chlorides, which is below the 19.1.17.13 Table II limit for on-site closure.

5) The operator will reseed the land disturbed area above 45-7 and 63-7 closed pits in accordance with BLM regulations. This is acceptable to OCD.

Plan Information:

1) The plan lacks Figures: 2 – 4 and were requested by OCD on 12/13/2013. The operator indicated that the figures referenced in the plan would be sent ASAP.

2) The plan lacks the person responsible for the proposal in the plan. For example, AMEC indicates in Page 3 "Limitation" that assumes basically no responsibility for the plan as proposed. Who has responsibility for the plan and accepts responsibility for work completed and submitted with the plan?

3) Who owns the land beneath the temporary pit locations proposed for closure? Who owns the property west of LDG 45-7? There are notification requirements to landowners in 19.15.17.13 NMAC.

Conclusions:

1) The operator must obtain land owner permission for any corrective action, i.e., final disposition of drill cuttings, if land is not owned by the operator. Otherwise, drill cuttings must go off-site to an OCD approved facility for final disposition.

2) The operator must provide proof of waste facility disposal of plant related wastes, i.e., drill cuttings, drill pit liners, etc. to the OCD.

3) The operator shall address stormwater regulations in the area of cut/borrow/fill locations before filling in the temporary pits to grade. OCD recommends the operator follow Best Management Practices (BMPs) for sediment control until vegetation may be established over re-graded pits to control stormwater run-on at the facility.

4) OCD cannot approve a plan where the operator does not retain responsibility for the plan and submitted information therein. The operator shall restate the entity with responsibility for the plan, i.e., Lightning Dock Geothermal HI-01, LLC.

   If a plan has no credibility, OCD does not want to review such a plan.

If you have any questions, or need to request an extension on any required items above, please contact Carl Chavez of my staff at (505) 476-3490, mail at the address below, or email at CarlJ.Chavez@state.nm.us. Thank you for your cooperation in this matter.

Sincerely,

Scott Dawson
Deputy Director

SD/cjc

cc: Mr. Daniel Sanchez, OCD Santa Fe
Mr. Glenn von Gonten, OCD Santa Fe
OCD Artesia Office

Chavez, Carl J, EMNRD

From: Janney, David <david.janney@amec.com>
Sent: Tuesday, September 17, 2013 2:50 PM
To: VonGonten, Glenn, EMNRD; Chavez, Carl J, EMNRD
Cc: Chuck Smiley; Kacie Peterson
Subject: RE: Pond and Pit Stormwater Discharge
Attachments: Hall Lab Pit StormWater-Rpt_1309144.pdf; Figure 1_Proposed Reserve Pit Stormwater Land Application Areas_9 17 13.pdf; Pond and Pit Water Quality Results_NMWQCC MCLs_9 17 2013.xls; OCD Stormwater Discharge Letter 8-30-2013.pdf

Greetings Gentlemen:

Please find attached for your review a summary of the laboratory analytical results and the laboratory analytical sheets for the samples collected form reserve pits and the centralized pond at the Lightning Dock Geothermal Project. Also attached is an aerial photograph based figure showing the locations of the proposed discharges.

We are prepared to follow the conditions of your letter dated August 30, 2013 and close the reserve pits following draining when they have been sampled.

Please feel free to contact me with questions

David W. Janney, PG
Senior Geologist
AMEC Environment and Infrastructure
8519 Jefferson, NE
Albuquerque, NM 87113
505.821.1801 off
505.821.7371 fax
505.449.8457 cell

From: VonGonten, Glenn, EMNRD [mailto:Glenn.VonGonten@state.nm.us]
Sent: Friday, August 30, 2013 3:26 PM
To: Janney, David; Chavez, Carl J, EMNRD; Dawson, Scott, EMNRD; Sanchez, Daniel J., EMNRD
Subject: Stormwater discharge

David,

Here is OCD's approval with conditions to allow Los Lobos to discharge ponded stormwater at its ponds. We will need to talk about closing the reserve pits and modifying the run-on/run-off features at the central holding pond soon.

Glenn von Gonten
Senior Hydrologist
Environmental Bureau
Oil Conservation Division
Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505
505-476-3488
Fax-476-3462

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

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Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey
Division Director
Oil Conservation Division

AUGUST 30, 2013

Mr. David Janney
AMEC Environment & Infrastructure, Inc.
8519 Jefferson, NE
Albuquerque, New Mexico 87113

RE: Response to AMEC Environment & Infrastructure, Inc. August 28, 2013 Letter for the Lightning Dock Geothermal Power Project in Hidalgo County, New Mexico

Dear Mr. Janney:

The Oil Conservation Division (OCD) is in receipt of AMEC Environment & Infrastructure, Inc.'s (AMEC) letter dated August 28, 2013. AMEC provided a plan to remove stormwater from three reserve pits and the central holding pond at the Los Lobos geothermal power plant and discharge the stormwater to the surface. Los Lobos also committed to submitting a closure plan for the three reserve pits.

OCD hereby conditionally approves Los Lobos request. Los Lobos must comply with the following conditions.

1. Los Lobos shall independently sample each reserve pit and the central holding pond for the constituents specified in Table 4 of its discharge permit to determine if there are any exceedances of the WQCC Water Quality Standards. Los Lobos shall submit the environmental laboratory analytical data water quality results to OCD (following EPA QA/QC and DQOs) within 5-days of receipt from a NELAC Certified Laboratory. OCD will review the analytical data to confirm that Los Lobos' discharge will not contaminate ground water above the WQCC Water Quality Standards.

2. Los Lobos shall discharge the stormwater from the pits at locations that it will propose for OCD's prior approval at a discharge rate that will not cause erosion of the surface. OCD suggests that Los Lobos consider discharging to the agriculture field where the prior flow test discharge from Well 55-7 occurred. Los Lobos shall provide its proposed discharge point location(s) on an appropriate map.

3. Los Lobos shall use appropriate surface run-on and run-off controls to prevent the discharge of fluids into nearby arroyos and rip-rap areas as described in its discharge permit.

4. Los Lobos shall photo-document the discharge and provide before, during, and post-discharge photos to OCD.

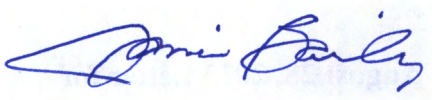
5. After the reserve pits and central hold pond have been emptied, Los Lobos shall remove and properly dispose of any drill cuttings.

6. Los Lobos shall inspect the pit liners and submit a report to OCD with photos documenting the condition of the pit liners within 30-days of emptying the stormwater.

7. Los Lobos shall complete its discharge and report to OCD within 60 days from OCD's approval.

If you have any questions, please contact Carl Chavez of my staff by phone at (505) 476-3490 or email at CarlJ.Chavez@state.nm.us. Thank you.

Sincerely,



Jami Bailey
Director

JB/cjc

Attachment: AMEC Letter with Attachments

cc: Daniel Sanchez, OCD Santa Fe
David Brooks, OCD Santa Fe
Glenn von Gonten, OCD Santa Fe
Carl J. Chávez, OCD Santa Fe
OCD Artesia Office

August 28, 2013 Project 1151700102

Mr. Carl Chavez, CHMM
New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Stormwater Contained in Reserve Pits and the Central Holding Pond, Los Lobos Renewable Energy, LLC, Hidalgo County, New Mexico

Dear Mr. Chavez:

As you may know, Los Lobos, along with the rest of Hidalgo County, experienced severe flooding on July 17, 2013. Los Lobos has been weekly tracking the water levels of three lined reserve pits (LDG 47-7, LDG 53-7, and LDG 63-7) in anticipation of closing the reserve pits.

Two of the reserve pits (53-7 and 63-7) were completely dry at the time of the heavy precipitation and reserve pit 47-7 was nearly dry. Additionally, the central holding pond immediately south of LDG 55-7 was likewise dry. Last month's heavy precipitation, however, partially or completely refilled these pits and pond with stormwater (see Attachment 1, "Photo Inventory of LDG Holding Pond/Reserve Pits").

With construction of our power plant about to start, we respectfully request permission to pump the stormwater from the holding pond and three reserve pits onto the surface of the Lightning Dock property. Prior to discharge, the water will be analyzed for the constituents listed in Table 4 of the Discharge Permit that includes dissolved metals and general chemistry. The dissolved metals list contains the metals in NMAC 20.6.2.3103 plus lithium, rubidium, tungsten. General chemistry includes calcium, magnesium, sodium, potassium, fluoride, chloride, bromide, phosphate, sulfate, nitrate/nitrite, alkalinity, electrical conductivity, and total dissolved solids. In addition, we will conduct sampling and analysis of the cuttings within the pits and submit a closure plan to you prior to closing the reserve pits.

Respectfully submitted,

David W. Janney, PG
Agent for Lightning Dock Geothermal HI 01, LLC

Cc: Mr. Chuck Smiley, Los Lobos Renewable Energy, LLC
Ms Michelle Henrie, Attorney for Los Lobos Renewable Energy, LLC
Mr. Glenn VonGonten, NMOCD
Mr. Randy Dade, NMOCD

ATTACHMENTS
Photographic Log of the Reserve Pits and Central Pond

AMEC Environment & Infrastructure, Inc.
8519 Jefferson, NE (505) 821-1801
Albuquerque, New Mexico 87113 FAX: (505) 821-7371
www.amec.com

ATTACHMENT 1

Photographic Log of Reserve Pits and Central Pond

LDG HOLDING POND

Looking to the South:

7-11-13

7-18-13

Looking to the SE:

7-11-13

7-18-13

LDG 47-7 RESERVE PIT

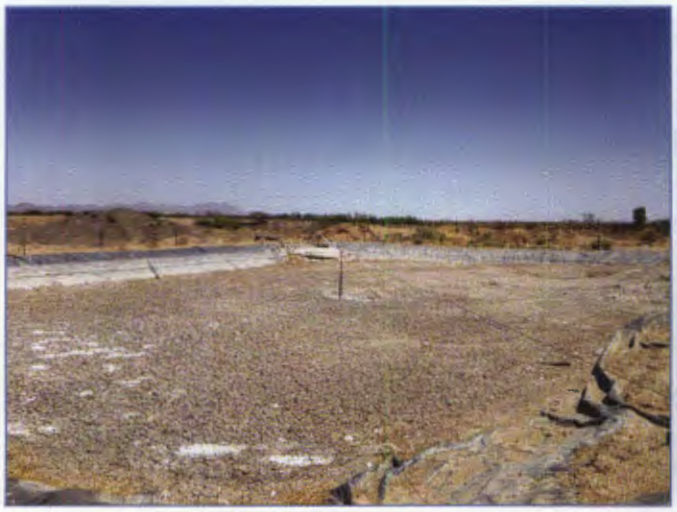
Looking to the North:

7-08-13

7-22-13

LDG 53-7 RESERVE PIT

Looking to the North:



5-16-13

7-18-13

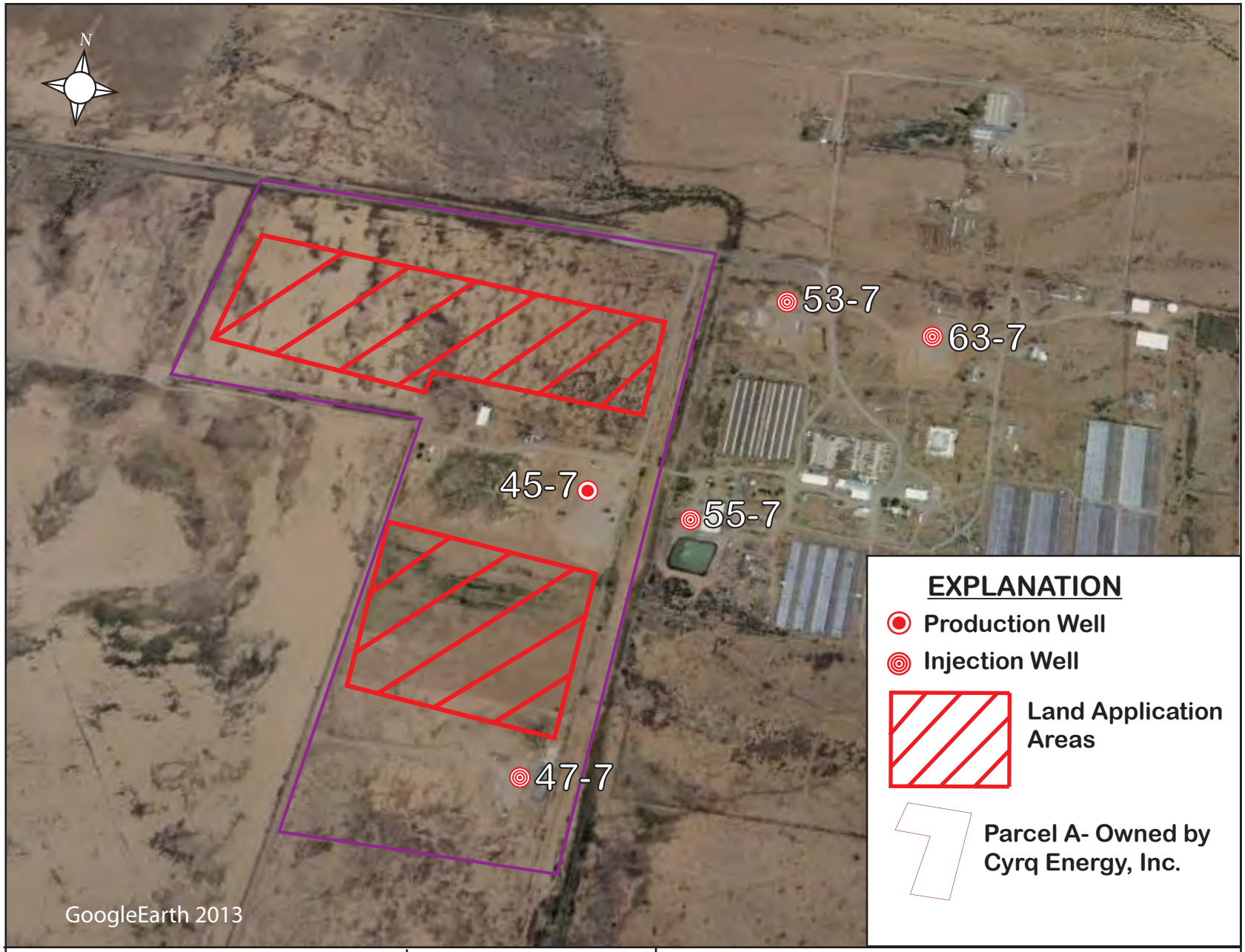
LDG 63-7 RESERVE PIT

Looking to the North:

6-10-13

7-22-13

glenn.vongonten@state.nm.us
http://www.emnrd.state.nm.us/ocd/



AMEC Environmental & Infrastructure
8519 Jefferson, NE
Albuquerque, NM 87113

Cyrq Lightning Dock geothermal

PROJECT: Lightning Dock Geothermal HI-01, LLC

TITLE: Proposed Reserve Pit Stormwater Land Application Areas

DWN BY: KP	DATUM:	DATE: 2013
CHK'D BY: DJ	REV. NO.:	CONTRACT NO.: 11517000102
PROJECTION:	SCALE: 1" ≈ 700'	FIGURE NO.: 1

	Analysis	WQCC Standard	55-7 Pond	53-7 Pit	47-7 Pit
A					
1	Arsenic (As)	0.1 mg/L	0.010 mg/L	0.033 mg/L	0.60 mg/L
2	Barium (Ba)	1.0 mg/L	0.069 mg/L	.075 mg/L	0.076 mg/L
3	Cadmium (Cd)	0.01 mg/L	ND	ND	ND
4	Chromium (Cr)	0.05 mg/L	ND	ND	ND
5	Cyanide (CN)	0.2 mg/L			
6	Fluoride (F)	1.6 mg/L	1.0 mg/L	.64 mg/L	52 mg/L
7	Lead (Pb)	0.05 mg/L	ND	0.0062 mg/L	ND
8	Total Mercury (Hg)	0.002 mg/L	ND	ND	ND
9	Nitrate (NO3 as N)	10.0 mg/L			
10	Selenium (Se)	0.05 mg/L	ND	ND	0.029 mg/L
11	Silver (Ag)	0.05 mg/L	ND	ND	ND
12	Uranium (U)	0.03 mg/L	ND	0.0013 mg/L	ND
B					
1	Chloride (Cl)	250.0 mg/L	73 mg/L	220 mg/L	2800 mg/L
2	Copper (Cu)	1.0 mg/L	ND	ND	ND
3	Iron (Fe)	1.0 mg/L	.12 mg/L	0.19 mg/L	.13 mg/L
4	Manganese (Mn)	0.2 mg/L	.18 mg/L	0.041 mg/L	0.015 mg/L
5	Phenols	0.005 mg/L			
6	Sulfate (SO4)	600.0 mg/L	330 mg/L	220 mg/L	8900 mg/L
7	Total Dissolved Solids (TDS)	1000.0 mg/L	849 mg/L	1140 mg/L	20500 mg/L
8	Zinc (Zn)	10.0 mg/L	0.026 mg/L	0.031 mg/L	0.017 mg/L
9	pH	between 6-9	8.98 pH units	8.98 pH units	9 pH units
D					
1	Bromide	None	0.26 mg/L	0.89 mg/L	8.1 mg/L
2	Phosphorus, Orthophosphate	None	ND	ND	ND
3	Calcium	None	40 mg/L	26 mg/L	19 mg/L
4	Magnesium	None	4.0 mg/L	4.8 mg/L	9.5 mg/L
5	Potassium	None	18 mg/L	17 mg/L	140 mg/L
6	Sodium	None	230 mg/L	350 mg/L	5900 mg/L
7	Conductivity	None	1300 µmhos/cm	1700 µmhos/cm	27000 µmhos/cm
8	Bicarbonate (As CaC03)	None	140 mg/L CaC03	290 mg/L CaC03	930 mg/L CaC03
9	Carbonate (As CaC03)	None	25 mg/L CaC03	48 mg/L CaC03	330 mg/L CaC03
10	Total Alkalinity (As CaC03)	None	170 mg/L CaC03	340 mg/L CaC03	1300 mg/L CaC03
11	Nitrogen, Nitrite (As N)	10.0 mg/L	.10 mg/L	ND	ND
12	Lithium	None	0.3 mg/L	ND	7.2 mg/L
13	Rubidium	None	0.01 mg/L	ND	0.14 mg/L
14	Tungsten	None	ND	ND	1.2 mg/L

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 13, 2013

Chuck Smiley

Cyrq Energy Inc
PO Box 86
Animas, NM 88020
TEL: (575) 548-0301
FAX

RE: Lightning Dock Geothermal OrderNo.: 1309144

Dear Chuck Smiley:

Hall Environmental Analysis Laboratory received 3 sample(s) on 9/5/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1309144**
Date Reported: **9/13/2013**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Cyrq Energy Inc
Client Sample ID: 53-7 Reserve Pit
Project: Lightning Dock Geothermal
Collection Date: 9/4/2013 11:30:00 AM
Lab ID: 1309144-001 **Matrix:** AQUEOUS **Received Date:** 9/5/2013 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Fluoride	0.64	0.50		mg/L	5	9/5/2013 3:31:56 PM	R13125
Chloride	220	10		mg/L	20	9/5/2013 3:44:21 PM	R13125
Nitrogen, Nitrite (As N)	ND	0.50		mg/L	5	9/5/2013 3:31:56 PM	R13125
Bromide	0.89	0.50		mg/L	5	9/5/2013 3:31:56 PM	R13125
Nitrogen, Nitrate (As N)	ND	0.50		mg/L	5	9/5/2013 3:31:56 PM	R13125
Phosphorus, Orthophosphate (As P)	ND	2.5		mg/L	5	9/5/2013 3:31:56 PM	R13125
Sulfate	220	2.5		mg/L	5	9/5/2013 3:31:56 PM	R13125
EPA METHOD 200.7: DISSOLVED METALS						Analyst: **JLF**	
Barium	0.075	0.0020		mg/L	1	9/6/2013 5:26:47 PM	R13144
Cadmium	ND	0.0020		mg/L	1	9/6/2013 5:26:47 PM	R13144
Calcium	26	1.0		mg/L	1	9/6/2013 5:26:47 PM	R13144
Chromium	ND	0.0060		mg/L	1	9/6/2013 5:26:47 PM	R13144
Copper	ND	0.0060		mg/L	1	9/6/2013 5:26:47 PM	R13144
Iron	0.19	0.020		mg/L	1	9/6/2013 5:26:47 PM	R13144
Lead	0.0062	0.0050		mg/L	1	9/6/2013 5:26:47 PM	R13144
Magnesium	4.8	1.0		mg/L	1	9/6/2013 5:26:47 PM	R13144
Manganese	0.041	0.0020		mg/L	1	9/6/2013 5:26:47 PM	R13144
Potassium	17	1.0		mg/L	1	9/6/2013 5:26:47 PM	R13144
Silver	ND	0.0050		mg/L	1	9/6/2013 5:26:47 PM	R13144
Sodium	350	5.0		mg/L	5	9/10/2013 1:52:33 PM	R13275
Zinc	0.031	0.010		mg/L	1	9/9/2013 5:18:37 PM	R13244
EPA 200.8: DISSOLVED METALS						Analyst: **DBD**	
Arsenic	0.033	0.0010	*	mg/L	1	9/10/2013 5:28:39 PM	R13273
Selenium	ND	0.0050		mg/L	5	9/11/2013 3:28:41 PM	R13296
Uranium	0.0013	0.0010		mg/L	1	9/10/2013 5:28:39 PM	R13273
EPA METHOD 245.1: MERCURY						Analyst: **IDC**	
Mercury	ND	0.00020		mg/L	1	9/10/2013 5:38:26 PM	9241
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JML**	
Conductivity	1700	0.010		µmhos/cm	1	9/5/2013 5:58:57 PM	R13131
SM4500-H+B: PH						Analyst: **JML**	
pH	8.98	1.68	*H	pH units	1	9/5/2013 5:58:57 PM	R13131
SM2320B: ALKALINITY						Analyst: **JML**	
Bicarbonate (As CaCO3)	290	20		mg/L CaCO3	1	9/5/2013 5:58:57 PM	R13131
Carbonate (As CaCO3)	48	2.0		mg/L CaCO3	1	9/5/2013 5:58:57 PM	R13131
Total Alkalinity (as CaCO3)	340	20		mg/L CaCO3	1	9/5/2013 5:58:57 PM	R13131
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Cyrq Energy Inc
Client Sample ID: 53-7 Reserve Pit
Project: Lightning Dock Geothermal
Collection Date: 9/4/2013 11:30:00 AM
Lab ID: 1309144-001 **Matrix:** AQUEOUS **Received Date:** 9/5/2013 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	1140	40.0	*	mg/L	1	9/9/2013 5:59:00 PM	9204

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
E	Value above quantitation range
J	Analyte detected below quantitation limits
O	RSD is greater than RSDlimit
R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits
B	Analyte detected in the associated Method Blank
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
P	Sample pH greater than 2 for VOA and TOC only.
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Cyrq Energy Inc
Client Sample ID: 55-7 Holding Pond
Project: Lightning Dock Geothermal
Collection Date: 9/4/2013 10:36:00 AM
Lab ID: 1309144-002 **Matrix:** AQUEOUS **Received Date:** 9/5/2013 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Fluoride	1.0	0.10		mg/L	1	9/5/2013 3:56:45 PM	R13125
Chloride	73	10		mg/L	20	9/5/2013 4:09:09 PM	R13125
Nitrogen, Nitrite (As N)	ND	0.10		mg/L	1	9/5/2013 3:56:45 PM	R13125
Bromide	0.26	0.10		mg/L	1	9/5/2013 3:56:45 PM	R13125
Nitrogen, Nitrate (As N)	0.10	0.10		mg/L	1	9/5/2013 3:56:45 PM	R13125
Phosphorus, Orthophosphate (As P)	ND	0.50		mg/L	1	9/5/2013 3:56:45 PM	R13125
Sulfate	330	10		mg/L	20	9/5/2013 4:09:09 PM	R13125
EPA METHOD 200.7: DISSOLVED METALS						Analyst: **JLF**	
Barium	0.069	0.0020		mg/L	1	9/6/2013 5:41:38 PM	R13144
Cadmium	ND	0.0020		mg/L	1	9/6/2013 5:41:38 PM	R13144
Calcium	40	1.0		mg/L	1	9/6/2013 5:41:38 PM	R13144
Chromium	ND	0.0060		mg/L	1	9/6/2013 5:41:38 PM	R13144
Copper	ND	0.0060		mg/L	1	9/6/2013 5:41:38 PM	R13144
Iron	0.12	0.020		mg/L	1	9/6/2013 5:41:38 PM	R13144
Lead	ND	0.0050		mg/L	1	9/6/2013 5:41:38 PM	R13144
Magnesium	4.0	1.0		mg/L	1	9/6/2013 5:41:38 PM	R13144
Manganese	0.18	0.0020	*	mg/L	1	9/6/2013 5:41:38 PM	R13144
Potassium	18	1.0		mg/L	1	9/6/2013 5:41:38 PM	R13144
Silver	ND	0.0050		mg/L	1	9/6/2013 5:41:38 PM	R13144
Sodium	230	5.0		mg/L	5	9/10/2013 1:54:33 PM	R13275
Zinc	0.026	0.010		mg/L	1	9/9/2013 5:22:50 PM	R13244
EPA 200.8: DISSOLVED METALS						Analyst: **DBD**	
Arsenic	0.010	0.0010	*	mg/L	1	9/10/2013 5:31:18 PM	R13273
Selenium	ND	0.0050		mg/L	5	9/11/2013 3:31:20 PM	R13296
Uranium	ND	0.0010		mg/L	1	9/10/2013 5:31:18 PM	R13273
EPA METHOD 245.1: MERCURY						Analyst: **IDC**	
Mercury	ND	0.00020		mg/L	1	9/10/2013 5:40:14 PM	9241
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JML**	
Conductivity	1300	0.010		µmhos/cm	1	9/5/2013 6:18:59 PM	R13131
SM4500-H+B: PH						Analyst: **JML**	
pH	8.98	1.68	*H	pH units	1	9/5/2013 6:18:59 PM	R13131
SM2320B: ALKALINITY						Analyst: **JML**	
Bicarbonate (As CaCO3)	140	20		mg/L CaCO3	1	9/5/2013 6:18:59 PM	R13131
Carbonate (As CaCO3)	25	2.0		mg/L CaCO3	1	9/5/2013 6:18:59 PM	R13131
Total Alkalinity (as CaCO3)	170	20		mg/L CaCO3	1	9/5/2013 6:18:59 PM	R13131
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Cyrq Energy Inc
Client Sample ID: 55-7 Holding Pond
Project: Lightning Dock Geothermal
Collection Date: 9/4/2013 10:36:00 AM
Lab ID: 1309144-002 **Matrix:** AQUEOUS **Received Date:** 9/5/2013 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	849	20.0	*	mg/L	1	9/9/2013 5:59:00 PM	9204

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Cyrq Energy Inc
Client Sample ID: 47-7 Reserve Pit
Project: Lightning Dock Geothermal
Collection Date: 9/4/2013 11:52:00 AM
Lab ID: 1309144-003 **Matrix:** AQUEOUS **Received Date:** 9/5/2013 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **JRR**	
Fluoride	52	2.0	*	mg/L	20	9/5/2013 4:33:58 PM	R13125
Chloride	2800	100		mg/L	200	9/7/2013 4:38:05 AM	R13226
Nitrogen, Nitrite (As N)	ND	2.0		mg/L	20	9/5/2013 4:33:58 PM	R13125
Bromide	8.1	0.50		mg/L	5	9/5/2013 4:21:33 PM	R13125
Nitrogen, Nitrate (As N)	ND	0.50		mg/L	5	9/5/2013 4:21:33 PM	R13125
Phosphorus, Orthophosphate (As P)	ND	25	H	mg/L	50	9/9/2013 11:21:57 AM	R13232
Sulfate	8900	100		mg/L	200	9/7/2013 4:38:05 AM	R13226
EPA METHOD 200.7: DISSOLVED METALS						Analyst: **JLF**	
Barium	0.076	0.0020		mg/L	1	9/9/2013 5:27:16 PM	R13244
Cadmium	ND	0.0020		mg/L	1	9/9/2013 5:27:16 PM	R13244
Calcium	19	1.0		mg/L	1	9/9/2013 5:27:16 PM	R13244
Chromium	ND	0.0060		mg/L	1	9/9/2013 5:27:16 PM	R13244
Copper	ND	0.0060		mg/L	1	9/9/2013 5:27:16 PM	R13244
Iron	0.13	0.020		mg/L	1	9/9/2013 5:27:16 PM	R13244
Lead	ND	0.0050		mg/L	1	9/9/2013 5:27:16 PM	R13244
Magnesium	9.5	1.0		mg/L	1	9/9/2013 5:27:16 PM	R13244
Manganese	0.015	0.0020		mg/L	1	9/9/2013 5:27:16 PM	R13244
Potassium	140	5.0		mg/L	5	9/9/2013 5:29:42 PM	R13244
Silver	ND	0.0050		mg/L	1	9/9/2013 5:27:16 PM	R13244
Sodium	5900	100		mg/L	100	9/10/2013 2:08:46 PM	R13275
Zinc	0.017	0.010		mg/L	1	9/9/2013 5:27:16 PM	R13244
EPA 200.8: DISSOLVED METALS						Analyst: **DBD**	
Arsenic	0.60	0.020	*	mg/L	20	9/11/2013 3:36:40 PM	R13296
Selenium	0.029	0.020		mg/L	20	9/11/2013 3:36:40 PM	R13296
Uranium	ND	0.020		mg/L	20	9/11/2013 3:36:40 PM	R13296
EPA METHOD 245.1: MERCURY						Analyst: **IDC**	
Mercury	ND	0.00020		mg/L	1	9/10/2013 5:42:02 PM	9241
SM2510B: SPECIFIC CONDUCTANCE						Analyst: **JML**	
Conductivity	27000	0.10		µmhos/cm	10	9/6/2013 6:13:02 PM	R13145
SM4500-H+B: PH						Analyst: **JML**	
pH	9.00	1.68	*H	pH units	1	9/5/2013 6:32:46 PM	R13131
SM2320B: ALKALINITY						Analyst: **JML**	
Bicarbonate (As CaCO3)	930	50		mg/L CaCO3	2.5	9/6/2013 2:20:27 PM	R13145
Carbonate (As CaCO3)	330	5.0		mg/L CaCO3	2.5	9/6/2013 2:20:27 PM	R13145
Total Alkalinity (as CaCO3)	1300	50		mg/L CaCO3	2.5	9/6/2013 2:20:27 PM	R13145
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Cyrq Energy Inc
Client Sample ID: 47-7 Reserve Pit
Project: Lightning Dock Geothermal
Collection Date: 9/4/2013 11:52:00 AM
Lab ID: 1309144-003 **Matrix:** AQUEOUS **Received Date:** 9/5/2013 7:15:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	20500	400	*	mg/L	1	9/9/2013 5:59:00 PM	9204

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B13090455-001
Client Sample ID 1309144-001C, 53-7 Reserve Pit

Report Date: 09/11/13
Collection Date: 09/04/13 11:30
DateReceived: 09/06/13
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, DISSOLVED							
Lithium	ND	mg/L		0.1		E200.7	09/09/13 13:15 / rlh
Rubidium	ND	mg/L		0.01		E200.8	09/10/13 11:07 / jjw
Tungsten	ND	mg/L		0.1		E200.8	09/10/13 11:07 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B13090455-002
Client Sample ID 1309144-002C, 55-7 Holding Pond

Report Date: 09/11/13
Collection Date: 09/04/13 10:36
DateReceived: 09/06/13
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, DISSOLVED							
Lithium	0.3	mg/L		0.1		E200.7	09/09/13 13:37 / rlh
Rubidium	0.01	mg/L		0.01		E200.8	09/10/13 11:11 / jjw
Tungsten	ND	mg/L		0.1		E200.8	09/10/13 11:11 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B13090455-003
Client Sample ID 1309144-003C, Reserve Pit

Report Date: 09/11/13
Collection Date: 09/04/13 11:52
DateReceived: 09/06/13
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
METALS, DISSOLVED							
Lithium	7.2	mg/L		0.1		E200.7	09/09/13 13:41 / rlh
Rubidium	0.14	mg/L		0.01		E200.8	09/10/13 12:17 / jjw
Tungsten	1.2	mg/L		0.1		E200.8	09/10/13 12:17 / jjw

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Report Date: 09/11/13
Project: Not Indicated
Work Order: B13090455

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Analytical Run: ICP203-B_130909A	
Sample ID: ICV		Continuing Calibration Verification Standard							09/09/13 11:56	
Lithium		1.28	mg/L	0.10	102	95	105			
Method: E200.7									Batch: R211339	
Sample ID: MB-6500DIS130909A		Method Blank				Run: ICP203-B_130909A			09/09/13 12:19	
Lithium		ND	mg/L	0.0003						
Sample ID: LFB-6500DIS130909A		Laboratory Fortified Blank				Run: ICP203-B_130909A			09/09/13 12:23	
Lithium		1.02	mg/L	0.10	102	85	115			
Sample ID: B13090455-001AMS2		Sample Matrix Spike				Run: ICP203-B_130909A			09/09/13 13:23	
Lithium		9.98	mg/L	0.10	100	70	130			
Sample ID: B13090455-001AMSD2		Sample Matrix Spike Duplicate				Run: ICP203-B_130909A			09/09/13 13:26	
Lithium		10.1	mg/L	0.10	100	70	130	0.8	20	
Sample ID: B13090503-001BMS2		Sample Matrix Spike				Run: ICP203-B_130909A			09/09/13 14:04	
Lithium		2.00	mg/L	0.10	99	70	130			
Sample ID: B13090503-001BMSD2		Sample Matrix Spike Duplicate				Run: ICP203-B_130909A			09/09/13 14:08	
Lithium		1.99	mg/L	0.10	99	70	130	0.1	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Report Date: 09/11/13
Project: Not Indicated
Work Order: B13090455

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.8									Analytical Run: ICPMS203-B_130910A	
Sample ID: QCS	2	Initial Calibration Verification Standard								09/10/13 10:17
Rubidium		0.053	mg/L	0.010	105	90	110			
Tungsten		0.048	mg/L	0.10	96	90	110			
Method: E200.8										Batch: R211409
Sample ID: LFB	2	Laboratory Fortified Blank				Run: ICPMS203-B_130910A				09/10/13 10:29
Rubidium		0.048	mg/L	0.010	96	85	115			
Tungsten		0.046	mg/L	0.10	91	85	115			
Sample ID: LRB	2	Method Blank				Run: ICPMS203-B_130910A				09/10/13 11:00
Rubidium		ND		0.0006						
Tungsten		ND		1E-05						
Sample ID: B13090455-001AMS	2	Sample Matrix Spike				Run: ICPMS203-B_130910A				09/10/13 12:01
Rubidium		0.055	mg/L	0.010	110	70	130			
Tungsten		0.064	mg/L	0.10	128	70	130			
Sample ID: B13090455-001AMSD	2	Sample Matrix Spike Duplicate				Run: ICPMS203-B_130910A				09/10/13 12:05
Rubidium		0.055	mg/L	0.010	110	70	130			
Tungsten		0.066	mg/L	0.10	132	70	130			S

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R13144**	RunNo: **13144**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **375355** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.020								
Magnesium	ND	1.0								
Manganese	ND	0.0020								
Potassium	ND	1.0								
Silver	ND	0.0050								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **R13144**	RunNo: **13144**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **375356** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.52	0.0020	0.5000	0	103	85	115			
Cadmium	0.52	0.0020	0.5000	0	105	85	115			
Calcium	50	1.0	50.00	0	101	85	115			
Chromium	0.50	0.0060	0.5000	0	100	85	115			
Copper	0.51	0.0060	0.5000	0	102	85	115			
Iron	0.53	0.020	0.5000	0	105	85	115			
Magnesium	51	1.0	50.00	0	102	85	115			
Manganese	0.51	0.0020	0.5000	0	103	85	115			
Potassium	49	1.0	50.00	0	97.7	85	115			
Silver	0.091	0.0050	0.1000	0	91.0	85	115			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R13244**	RunNo: **13244**
Prep Date:	Analysis Date: **9/9/2013**	SeqNo: **376709** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	ND	0.0020								
Cadmium	ND	0.0020								
Calcium	ND	1.0								
Chromium	ND	0.0060								
Copper	ND	0.0060								
Iron	ND	0.020								
Lead	ND	0.0050								
Magnesium	ND	1.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R13244**	RunNo: **13244**
Prep Date:	Analysis Date: **9/9/2013**	SeqNo: **376709** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Manganese	ND	0.0020								
Potassium	ND	1.0								
Silver	ND	0.0050								
Zinc	ND	0.010								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **R13244**	RunNo: **13244**
Prep Date:	Analysis Date: **9/9/2013**	SeqNo: **376710** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Barium	0.49	0.0020	0.5000	0	99.0	85	115			
Cadmium	0.50	0.0020	0.5000	0	99.3	85	115			
Calcium	50	1.0	50.00	0	100	85	115			
Chromium	0.49	0.0060	0.5000	0	98.4	85	115			
Copper	0.48	0.0060	0.5000	0	95.9	85	115			
Iron	0.51	0.020	0.5000	0	103	85	115			
Lead	0.50	0.0050	0.5000	0	100	85	115			
Magnesium	50	1.0	50.00	0	100	85	115			
Manganese	0.50	0.0020	0.5000	0	99.5	85	115			
Potassium	49	1.0	50.00	0	98.1	85	115			
Silver	0.087	0.0050	0.1000	0	86.6	85	115			
Zinc	0.51	0.010	0.5000	0	102	85	115			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R13275**	RunNo: **13275**
Prep Date:	Analysis Date: **9/10/2013**	SeqNo: **377462** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	ND	1.0								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 200.7: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **R13275**	RunNo: **13275**
Prep Date:	Analysis Date: **9/10/2013**	SeqNo: **377463** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Sodium	50	1.0	50.00	0	101	85	115			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **R13273**	RunNo: **13273**
Prep Date:	Analysis Date: **9/10/2013**	SeqNo: **377406** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.027	0.0010	0.02500	0	106	85	115			
Uranium	0.027	0.0010	0.02500	0	106	85	115			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R13273**	RunNo: **13273**
Prep Date:	Analysis Date: **9/10/2013**	SeqNo: **377410** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.0010								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **R13296**	RunNo: **13296**
Prep Date:	Analysis Date: **9/11/2013**	SeqNo: **378164** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.026	0.0010	0.02500	0	105	85	115			
Selenium	0.026	0.0010	0.02500	0	103	85	115			
Uranium	0.025	0.0010	0.02500	0	101	85	115			

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **LCSW**	Batch ID: **R13296**	RunNo: **13296**
Prep Date:	Analysis Date: **9/11/2013**	SeqNo: **378165** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.027	0.0010	0.02500	0	106	85	115			
Selenium	0.025	0.0010	0.02500	0	98.7	85	115			
Uranium	0.025	0.0010	0.02500	0	101	85	115			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R13296**	RunNo: **13296**
Prep Date:	Analysis Date: **9/11/2013**	SeqNo: **378166** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								
Uranium	ND	0.0010								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA 200.8: Dissolved Metals**
Client ID: **PBW**	Batch ID: **R13296**	RunNo: **13296**
Prep Date:	Analysis Date: **9/11/2013**	SeqNo: **378167** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Selenium	ND	0.0010								
Uranium	ND	0.0010								

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID	**MB-9241**	SampType:	**MBLK**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**PBW**	Batch ID:	**9241**	RunNo:	**13278**					
Prep Date:	**9/10/2013**	Analysis Date:	**9/10/2013**	SeqNo:	**377673**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.00020								

Sample ID	**LCS-9241**	SampType:	**LCS**	TestCode:	**EPA Method 245.1: Mercury**					
Client ID:	**LCSW**	Batch ID:	**9241**	RunNo:	**13278**					
Prep Date:	**9/10/2013**	Analysis Date:	**9/10/2013**	SeqNo:	**377674**	Units:	**mg/L**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.0049	0.00020	0.005000	0	97.1	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374887** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.90	0.10	1.000	0	89.7	90	110			S
Chloride	4.6	0.50	5.000	0	91.3	90	110			
Nitrogen, Nitrite (As N)	1.9	0.10	2.000	0	95.1	90	110			
Bromide	4.5	0.10	5.000	0	90.4	90	110			
Nitrogen, Nitrate (As N)	2.8	0.10	3.000	0	94.4	90	110			
Phosphorus, Orthophosphate (As P	4.5	0.50	5.000	0	90.0	90	110			
Sulfate	12	0.50	12.50	0	95.0	90	110			

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374899** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.5	0.10	1.600	0	92.7	90	110			
Chloride	7.6	0.50	8.000	0	94.7	90	110			
Nitrogen, Nitrite (As N)	3.1	0.10	3.200	0	97.9	90	110			
Bromide	7.4	0.10	8.000	0	92.6	90	110			
Nitrogen, Nitrate (As N)	4.8	0.10	4.800	0	99.0	90	110			
Phosphorus, Orthophosphate (As P	7.5	0.50	8.000	0	93.8	90	110			
Sulfate	20	0.50	20.00	0	98.2	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374901** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	ND	0.10								
Chloride	ND	0.50								
Nitrogen, Nitrite (As N)	ND	0.10								
Bromide	ND	0.10								
Nitrogen, Nitrate (As N)	ND	0.10								
Phosphorus, Orthophosphate (As P	ND	0.50								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374902** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.47	0.10	0.5000	0	94.1	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374902** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	91.8	90	110			
Nitrogen, Nitrite (As N)	0.90	0.10	1.000	0	90.0	90	110			
Bromide	2.3	0.10	2.500	0	90.2	90	110			
Nitrogen, Nitrate (As N)	2.4	0.10	2.500	0	97.3	90	110			
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	95.1	90	110			
Sulfate	9.5	0.50	10.00	0	95.1	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374911** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.3	0.10	2.400	0	95.8	90	110			
Chloride	12	0.50	12.00	0	99.1	90	110			
Nitrogen, Nitrite (As N)	4.8	0.10	4.800	0	100	90	110			
Bromide	11	0.10	12.00	0	95.1	90	110			
Nitrogen, Nitrate (As N)	7.5	0.10	7.200	0	105	90	110			
Phosphorus, Orthophosphate (As P	12	0.50	12.00	0	98.1	90	110			
Sulfate	31	0.50	30.00	0	102	90	110			

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374923** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.93	0.10	1.000	0	93.2	90	110			
Chloride	4.6	0.50	5.000	0	91.5	90	110			
Nitrogen, Nitrite (As N)	1.9	0.10	2.000	0	95.9	90	110			
Bromide	4.6	0.10	5.000	0	91.1	90	110			
Nitrogen, Nitrate (As N)	2.8	0.10	3.000	0	94.7	90	110			
Phosphorus, Orthophosphate (As P	4.6	0.50	5.000	0	91.7	90	110			
Sulfate	12	0.50	12.50	0	94.8	90	110			

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374935** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	1.5	0.10	1.600	0	94.4	90	110			
Chloride	7.5	0.50	8.000	0	94.3	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/5/2013**	SeqNo: **374935** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrite (As N)	3.1	0.10	3.200	0	98.0	90	110			
Bromide	7.4	0.10	8.000	0	92.3	90	110			
Nitrogen, Nitrate (As N)	4.7	0.10	4.800	0	98.7	90	110			
Phosphorus, Orthophosphate (As P	7.6	0.50	8.000	0	94.5	90	110			
Sulfate	20	0.50	20.00	0	97.7	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **374947** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	2.3	0.10	2.400	0	95.3	90	110			
Chloride	12	0.50	12.00	0	98.1	90	110			
Nitrogen, Nitrite (As N)	4.8	0.10	4.800	0	99.8	90	110			
Bromide	11	0.10	12.00	0	92.8	90	110			
Nitrogen, Nitrate (As N)	7.5	0.10	7.200	0	104	90	110			
Phosphorus, Orthophosphate (As P	12	0.50	12.00	0	98.1	90	110			
Sulfate	30	0.50	30.00	0	101	90	110			

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13125**	RunNo: **13125**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **374958** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Fluoride	0.93	0.10	1.000	0	93.1	90	110			
Chloride	4.5	0.50	5.000	0	90.9	90	110			
Nitrogen, Nitrite (As N)	1.9	0.10	2.000	0	95.6	90	110			
Bromide	4.5	0.10	5.000	0	89.9	90	110			S
Nitrogen, Nitrate (As N)	2.8	0.10	3.000	0	94.5	90	110			
Phosphorus, Orthophosphate (As P	4.6	0.50	5.000	0	92.4	90	110			
Sulfate	12	0.50	12.50	0	95.1	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **376084** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	12	0.50	12.00	0	102	90	110			
Sulfate	30	0.50	30.00	0	101	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **376086** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								
Sulfate	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **376087** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.7	0.50	5.000	0	93.8	90	110			
Sulfate	9.2	0.50	10.00	0	91.9	90	110			

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **376096** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	5.0	0.50	5.000	0	100	90	110			
Sulfate	12	0.50	12.50	0	96.5	90	110			

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **376108** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	7.9	0.50	8.000	0	98.3	90	110			
Sulfate	20	0.50	20.00	0	98.3	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/6/2013**	SeqNo: **376120** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	12	0.50	12.00	0	103	90	110			
Sulfate	30	0.50	30.00	0	101	90	110			

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/7/2013**	SeqNo: **376144** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/7/2013**	SeqNo: **376144** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	7.7	0.50	8.000	0	96.6	90	110			
Sulfate	20	0.50	20.00	0	98.8	90	110			

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/7/2013**	SeqNo: **376156** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	12	0.50	12.00	0	102	90	110			
Sulfate	31	0.50	30.00	0	103	90	110			

Sample ID **A4**	SampType: **CCV_4**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13226**	RunNo: **13226**
Prep Date:	Analysis Date: **9/7/2013**	SeqNo: **376164** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	93.0	90	110			
Sulfate	12	0.50	12.50	0	95.6	90	110			

Sample ID **A5**	SampType: **CCV_5**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13232**	RunNo: **13232**
Prep Date:	Analysis Date: **9/9/2013**	SeqNo: **376248** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Orthophosphate (As P	7.3	0.50	8.000	0	91.5	90	110			

Sample ID **MB**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R13232**	RunNo: **13232**
Prep Date:	Analysis Date: **9/9/2013**	SeqNo: **376250** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Orthophosphate (As P	ND	0.50								

Sample ID **LCS**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSW**	Batch ID: **R13232**	RunNo: **13232**
Prep Date:	Analysis Date: **9/9/2013**	SeqNo: **376251** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Orthophosphate (As P	4.8	0.50	5.000	0	95.8	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID **A6**	SampType: **CCV_6**	TestCode: **EPA Method 300.0: Anions**
Client ID: **BatchQC**	Batch ID: **R13232**	RunNo: **13232**
Prep Date:	Analysis Date: **9/9/2013**	SeqNo: **376260** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Phosphorus, Orthophosphate (As P	12	0.50	12.00	0	96.8	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID	**mb-1**	SampType:	**mblk**	TestCode:	**SM2320B: Alkalinity**					
Client ID:	**PBW**	Batch ID:	**R13131**	RunNo:	**13131**					
Prep Date:		Analysis Date:	**9/5/2013**	SeqNo:	**374990**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID	**lcs-1**	SampType:	**lcs**	TestCode:	**SM2320B: Alkalinity**					
Client ID:	**LCSW**	Batch ID:	**R13131**	RunNo:	**13131**					
Prep Date:		Analysis Date:	**9/5/2013**	SeqNo:	**374991**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80	20	80.00	0	100	90	110			

Sample ID	**mb-1**	SampType:	**mblk**	TestCode:	**SM2320B: Alkalinity**					
Client ID:	**PBW**	Batch ID:	**R13145**	RunNo:	**13145**					
Prep Date:		Analysis Date:	**9/6/2013**	SeqNo:	**375295**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID	**lcs-1**	SampType:	**lcs**	TestCode:	**SM2320B: Alkalinity**					
Client ID:	**LCSW**	Batch ID:	**R13145**	RunNo:	**13145**					
Prep Date:		Analysis Date:	**9/6/2013**	SeqNo:	**375296**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80	20	80.00	0	100	90	110			

Sample ID	**mb-2**	SampType:	**mblk**	TestCode:	**SM2320B: Alkalinity**					
Client ID:	**PBW**	Batch ID:	**R13145**	RunNo:	**13145**					
Prep Date:		Analysis Date:	**9/6/2013**	SeqNo:	**375306**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	ND	20								

Sample ID	**lcs-2**	SampType:	**lcs**	TestCode:	**SM2320B: Alkalinity**					
Client ID:	**LCSW**	Batch ID:	**R13145**	RunNo:	**13145**					
Prep Date:		Analysis Date:	**9/6/2013**	SeqNo:	**375307**	Units:	**mg/L CaCO3**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Alkalinity (as CaCO3)	80	20	80.00	0	99.8	90	110			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits
- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1309144**

13-Sep-13

Client: Cyrq Energy Inc

Project: Lightning Dock Geothermal

Sample ID	**MB-9204**	SampType:	**MBLK**	TestCode:	**SM2540C MOD: Total Dissolved Solids**				
Client ID:	**PBW**	Batch ID:	**9204**	RunNo:	**13239**				
Prep Date:	**9/6/2013**	Analysis Date:	**9/9/2013**	SeqNo:	**376571**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID	**LCS-9204**	SampType:	**LCS**	TestCode:	**SM2540C MOD: Total Dissolved Solids**				
Client ID:	**LCSW**	Batch ID:	**9204**	RunNo:	**13239**				
Prep Date:	**9/6/2013**	Analysis Date:	**9/9/2013**	SeqNo:	**376572**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1040	20.0	1000	0	104	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2 for VOA and TOC only.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: CYRQ ENERGY INC Work Order Number: 1309144 RcptNo: 1

Received by/date: AT 09/05/13

Logged By: Anne Thorne 9/5/2013 7:15:00 AM Anne Thorne

Completed By: Anne Thorne 9/5/2013 Anne Thorne

Reviewed By: 09/05/13

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	FedEx		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: 9 (<2 or >12 unless noted)

Adjusted? _____

Checked by: AT 09/05/13

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.7	Good	Yes			

Chain-of-Custody Record

Client: Cyrq Energy, Inc.

Mailing Address: PO Box 86
Animas, NM 88020

Phone #: 575-548-0301

email or Fax#: Kacie.peterson@cyrqenergy.com

QA/QC Package:
☒ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
~~☒~~ Standard ~~☒~~ Rush 5 DAY TAT AT 09/05/13

Project Name: Lightning Dock Geothermal

Project #: .

Project Manager: Chuck Smiley

Sampler: Kacie Peterson

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.7

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

AT 09/05/13

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1309144	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cation/Anion Balance (Ca, Mg, Na, K, NH4, Cl, Br, F, Cl, NO2, NO3, PO4, SO4), pH, TDS	WQCC Dissolved metals	Dissolved Hg, Li, Rb, U	Air Bubbles (Y or N)
~~9/4/13~~	AT 09/05/13 IT																				
9/4/13	1130	Water	53-7 Reserve Pit	125ml plstc-3 500ml plstc-2	HNO3	-001												X	X	X	
9/4/13	1032	Water	55-7 Holding Pond	125ml plstc-3 500ml plstc-2	HNO3	-002												X	X	X	
9/4/13	1152	Water	47-7 Reserve Pit	125ml plstc-3 500ml plstc-2	HNO3	-003												X	X	X	

Date:	Time:	Relinquished by:	Received by:	Date	Time
9/4/13	2:57pm	Kacie L. Peterson		09/05/13	0715
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
per KP rush analysis
AT 09/05/13

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chavez, Carl J, EMNRD

From: Janney, David <david.janney@amec.com>
Sent: Friday, August 30, 2013 4:15 PM
To: VonGonten, Glenn, EMNRD
Cc: Chavez, Carl J, EMNRD; Chuck Smiley
Subject: RE: Stormwater discharge

Mr. von Gonten:

Thank you very much.

We hope to have storm water analytical results for you to review no later than September 10, perhaps sooner.

We have discussed the closures with Mr. Chavez and will follow the O&G pit closure requirements on sampling the cuttings and below the liner. We hope to sample the cuttings following the discharge of the storm water as soon as the surface is dry enough.

I believe we will remove all run-on issues when we close the 53-7 pit. The centralized pond is secure in this regard.

Have a relaxing weekend.

Regards,

David W. Janney, PG
Senior Geologist
AMEC Environment and Infrastructure
8519 Jefferson, NE
Albuquerque, NM 87113
505.821.1801 off
505.821.7371 fax
505.449.8457 cell

From: VonGonten, Glenn, EMNRD [mailto:Glenn.VonGonten@state.nm.us]
Sent: Friday, August 30, 2013 3:26 PM
To: Janney, David; Chavez, Carl J, EMNRD; Dawson, Scott, EMNRD; Sanchez, Daniel J., EMNRD
Subject: Stormwater discharge

David,

Here is OCD's approval with conditions to allow Los Lobos to discharge ponded stormwater at its ponds. We will need to talk about closing the reserve pits and modifying the run-on/run-off features at the central holding pond soon.

Glenn von Gonten
Senior Hydrologist
Environmental Bureau
Oil Conservation Division
Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

505-476-3488
Fax-476-3462
glenn.vongonten@state.nm.us
http://www.emnrd.state.nm.us/ocd/

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey
Division Director
Oil Conservation Division

AUGUST 30, 2013

Mr. David Janney
AMEC Environment & Infrastructure, Inc.
8519 Jefferson, NE
Albuquerque, New Mexico 87113

RE: Response to AMEC Environment & Infrastructure, Inc. August 28, 2013 Letter for the Lightning Dock Geothermal Power Project in Hidalgo County, New Mexico

Dear Mr. Janney:

The Oil Conservation Division (OCD) is in receipt of AMEC Environment & Infrastructure, Inc.'s (AMEC) letter dated August 28, 2013. AMEC provided a plan to remove stormwater from three reserve pits and the central holding pond at the Los Lobos geothermal power plant and discharge the stormwater to the surface. Los Lobos also committed to submitting a closure plan for the three reserve pits.

OCD hereby conditionally approves Los Lobos request. Los Lobos must comply with the following conditions.

1. Los Lobos shall independently sample each reserve pit and the central holding pond for the constituents specified in Table 4 of its discharge permit to determine if there are any exceedances of the WQCC Water Quality Standards. Los Lobos shall submit the environmental laboratory analytical data water quality results to OCD (following EPA QA/QC and DQOs) within 5-days of receipt from a NELAC Certified Laboratory. OCD will review the analytical data to confirm that Los Lobos' discharge will not contaminate ground water above the WQCC Water Quality Standards.

2. Los Lobos shall discharge the stormwater from the pits at locations that it will propose for OCD's prior approval at a discharge rate that will not cause erosion of the surface. OCD suggests that Los Lobos consider discharging to the agriculture field where the prior flow test discharge from Well 55-7 occurred. Los Lobos shall provide its proposed discharge point location(s) on an appropriate map.

3. Los Lobos shall use appropriate surface run-on and run-off controls to prevent the discharge of fluids into nearby arroyos and rip-rap areas as described in its discharge permit.

4. Los Lobos shall photo-document the discharge and provide before, during, and post-discharge photos to OCD.

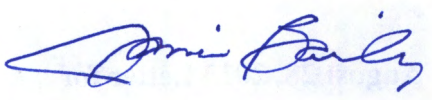
5. After the reserve pits and central hold pond have been emptied, Los Lobos shall remove and properly dispose of any drill cuttings.

6. Los Lobos shall inspect the pit liners and submit a report to OCD with photos documenting the condition of the pit liners within 30-days of emptying the stormwater.

7. Los Lobos shall complete its discharge and report to OCD within 60 days from OCD's approval.

If you have any questions, please contact Carl Chavez of my staff by phone at (505) 476-3490 or email at CarlJ.Chavez@state.nm.us. Thank you.

Sincerely,



Jami Bailey
Director

JB/cjc

Attachment: AMEC Letter with Attachments

cc: Daniel Sanchez, OCD Santa Fe
David Brooks, OCD Santa Fe
Glenn von Gonten, OCD Santa Fe
Carl J. Chávez, OCD Santa Fe
OCD Artesia Office

August 28, 2013 Project 1151700102

Mr. Carl Chavez, CHMM
New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Stormwater Contained in Reserve Pits and the Central Holding Pond, Los Lobos Renewable Energy, LLC, Hidalgo County, New Mexico

Dear Mr. Chavez:

As you may know, Los Lobos, along with the rest of Hidalgo County, experienced severe flooding on July 17, 2013. Los Lobos has been weekly tracking the water levels of three lined reserve pits (LDG 47-7, LDG 53-7, and LDG 63-7) in anticipation of closing the reserve pits.

Two of the reserve pits (53-7 and 63-7) were completely dry at the time of the heavy precipitation and reserve pit 47-7 was nearly dry. Additionally, the central holding pond immediately south of LDG 55-7 was likewise dry. Last month's heavy precipitation, however, partially or completely refilled these pits and pond with stormwater (see Attachment 1, "Photo Inventory of LDG Holding Pond/Reserve Pits").

With construction of our power plant about to start, we respectfully request permission to pump the stormwater from the holding pond and three reserve pits onto the surface of the Lightning Dock property. Prior to discharge, the water will be analyzed for the constituents listed in Table 4 of the Discharge Permit that includes dissolved metals and general chemistry. The dissolved metals list contains the metals in NMAC 20.6.2.3103 plus lithium, rubidium, tungsten. General chemistry includes calcium, magnesium, sodium, potassium, fluoride, chloride, bromide, phosphate, sulfate, nitrate/nitrite, alkalinity, electrical conductivity, and total dissolved solids. In addition, we will conduct sampling and analysis of the cuttings within the pits and submit a closure plan to you prior to closing the reserve pits.

Respectfully submitted,

David W. Janney, PG
Agent for Lightning Dock Geothermal HI 01, LLC

Cc: Mr. Chuck Smiley, Los Lobos Renewable Energy, LLC
Ms Michelle Henrie, Attorney for Los Lobos Renewable Energy, LLC
Mr. Glenn VonGonten, NMOCD
Mr. Randy Dade, NMOCD

ATTACHMENTS
Photographic Log of the Reserve Pits and Central Pond

AMEC Environment & Infrastructure, Inc.
8519 Jefferson, NE (505) 821-1801
Albuquerque, New Mexico 87113 FAX: (505) 821-7371 www.amec.com

ATTACHMENT 1

Photographic Log of Reserve Pits and Central Pond

LDG HOLDING POND

Looking to the South:

7-11-13

7-18-13

Looking to the SE:

7-11-13

7-18-13

LDG 47-7 RESERVE PIT

Looking to the North:

7-08-13

7-22-13

LDG 53-7 RESERVE PIT

Looking to the North:

5-16-13

7-18-13

LDG 63-7 RESERVE PIT

Looking to the North:

6-10-13

7-22-13

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Wednesday, November 07, 2012 8:06 AM
To: 'Janney, David'
Cc: Dade, Randy, EMNRD; Shapard, Craig, EMNRD
Subject: RE: Geothermal well pit closure

David:

I recently sent you Rules 17 and 36 closure requirements.....

Drill cuttings generally go to a land disposal facility, unless you can meet the technical requirements of Rule 17 Temporary Pit Rule Closure.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive, Santa Fe, New Mexico 87505
Office: (505) 476-3490
E-mail: CarlJ.Chavez@State.NM.US
Website: http://www.emnrd.state.nm.us/ocd/
"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

---

From: Janney, David [mailto:david.janney@amec.com]
Sent: Tuesday, November 06, 2012 5:07 PM
To: Chavez, Carl J, EMNRD
Cc: Dade, Randy, EMNRD; Shapard, Craig, EMNRD
Subject: RE: Geothermal well pit closure

Greetings Carl:

I know we have exchanged a few emails about this in the past but I need to pose the hypothetical question.

Assuming we sample the cuttings in the reserve pits and they are free of hydrocarbons, as I suspect they will be, and meet the chloride concentration requirements of less than 1,000 ppm will we be able to spread the cuttings on our 160 acres.

Regards,

David W. Janney, PG
Senior Geologist
AMEC Environment and Infrastructure
8519 Jefferson, NE
Albuquerque, NM 87113
505.821.1801 off
505.821.7371 fax

505.449.8457 cell

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Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Tuesday, October 30, 2012 8:58 AM
To: 'Janney, David'
Cc: Brooks, David K., EMNRD; Sanchez, Daniel J., EMNRD; VonGonten, Glenn, EMNRD; Shapard, Craig, EMNRD
Subject: RE: reserve pits

David:

Please find attached the OCD Online "GTHT-1" (Pits/Ponds Thumbnail) with information on pits and ponds to consider for the Lightning Dock Geothermal Project Facility. Please find below OCD Rules 17 and 36 with pit and/or pond regulatory requirements, which Los Lobos Renewable Power, LLC may consider for its facility pit/pond closure plan.

I believe the rationale for onsite burial requires some sort of sampling. Rule 36 seems straight forward. Rule 17 is more detailed and specific in my opinion to the temporary pit scenario with depth of waste to water table specification and sampling.

I recommend that your Closure Plan considers the above as a technical baseline for OCD's protection of surface and ground water under its Oil and Gas Regulations, but which should also be protective for produced water and drill cuttings from geothermal drilling activities.

Thank you.

TITLE 19 NATURAL RESOURCES AND WILDLIFE
CHAPTER 15 OIL AND GAS
PART 36 SURFACE WASTE MANAGEMENT FACILITIES
19.15.36.1 ISSUING AGENCY: Energy, Minerals and Natural Resources Department, Oil Conservation Division.
[19.15.36.1 NMAC - N, 2/14/2007; A, 12/1/08]

19.15.36.17 SPECIFIC REQUIREMENTS APPLICABLE TO EVAPORATION, STORAGE, TREATMENT AND SKIMMER PONDS:
A. Engineering design plan. An applicant for a surface waste management facility permit or modification requesting inclusion of a skimmer pit; an evaporation, storage or treatment pond; or a below-grade tank shall submit with the surface waste management facility permit application a detailed engineering design plan, certified by a registered profession engineer, including operating and maintenance procedures; a closure plan; and a hydrologic report that provides sufficient information and detail on the site's topography, soils, geology, surface hydrology and ground water hydrology to enable the division to evaluate the actual and potential effects on soils, surface water and ground water. The plan shall include detailed information on dike protection and structural integrity; leak detection, including an adequate fluid collection and removal system; liner specifications and compatibility; freeboard and overtopping prevention; prevention of nuisance and hazardous odors such as H2S; an emergency response plan, unless the pit is part of a surface waste management facility that has an integrated contingency plan; type of oil field waste stream, including chemical analysis; climatological factors, including freeze-thaw cycles; a monitoring and inspection plan; erosion control; and other pertinent information the division requests.

19.15.36.18 CLOSURE AND POST CLOSURE:
E. Pond and pit closure. The operator shall ensure that:
(1) liquids in the ponds or pits are removed and disposed of in a division-approved surface waste management facility;
(2) liners are disposed of in a division-approved surface waste management facility;
(3) equipment associated with the surface waste management facility is removed;
(4) the site is sampled, in accordance with the procedures specified in chapter nine of EPA publication SW-846, test methods for evaluating solid waste, physical/chemical methods for TPH, BTEX, metals and other inorganics listed in Subsections A and B of 20.6.2.3103 NMAC, in accordance with a gridded plat of the site containing at least four equal sections that the division has approved; and
(5) sample results are submitted to the environmental bureau in the division's Santa Fe office.
G. Alternatives to re-vegetation. If the landowner contemplates use of the land where a cell or surface waste management facility is located for purposes inconsistent with re-vegetation, the landowner may, with division approval, implement an alternative surface

treatment appropriate for the contemplated use, provided that the alternative treatment will effectively prevent erosion. If the division approves an alternative to re-vegetation, it shall not release the portion of the operator's financial assurance reserved for post-closure until the landowner has obtained necessary regulatory approvals and begun implementation of such alternative use.
[19.15.36.18 NMAC - Rp, 19.15.9.711 NMAC, 2/14/2007; A, 12/1/08]

TITLE 19 NATURAL RESOURCES AND WILDLIFE
CHAPTER 15 OIL AND GAS
PART 17 PITS, CLOSED-LOOP SYSTEMS, BELOW-GRADE TANKS AND SUMPS
19.15.17.1 ISSUING AGENCY: Energy, Minerals and Natural Resources Department, Oil Conservation Division.
[19.15.17.1 NMAC - N, 6/16/08]

19.15.17.9 PERMIT APPLICATION:
A. An operator shall use form C-144 to apply to the division for a permit to construct or use a pit, closed-loop system, below-grade tank or proposed alternative method to which 19.15.17 NMAC applies. The operator shall submit the form C-144 either separately or as an attachment to a permit application for a facility with which the pit, closed-loop system, below-grade tank or proposed alternative method will be associated. For upstream facilities, the operator may submit form C-144 separately or as an attachment to an application for a well permit (form C-101 or C-103).
B. The permit application shall include a detailed plan as follows.
(2) Temporary pits. The plan for a temporary pit shall use appropriate engineering principles and practices and follow applicable liner manufacturers' requirements. The plan shall include operating and maintenance procedures, a closure plan and hydrogeologic data that provides sufficient information and detail on the site's topography, soils, geology, surface hydrology and ground water hydrology to enable the appropriate division district office to evaluate the actual and potential effects on soils, surface water and ground water and compliance with the siting criteria of 19.15.17.10 NMAC. The plan for a temporary pit may incorporate by reference a standard design for multiple temporary pits that the operator files with the application or has previously filed with the appropriate division district office.

Form C-144 - pit, closed-loop system, below-grade tank or proposed alternative method permit or closure plan application;

19.15.17.10 SITING REQUIREMENTS:
A. Except as otherwise provided in 19.15.17 NMAC.
(1) An operator shall not locate a temporary pit or below-grade tank:
(a) where ground water is less than 50 feet below the bottom of the temporary pit or belowgrade tank, unless the operator is using a pit solely to cavitate a coal bed methane well and the appropriate division district office finds based upon the operator's demonstration that the operator's proposed operation will protect ground water during the temporary pit's use;
(b) within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole or playa lake (measured from the ordinary high-water mark), unless the appropriate division district office approves an alternative distance based upon the operator's demonstration that surface and ground water will be protected;
(c) within 300 feet from a permanent residence, school, hospital, institution or church in existence at the time of initial application;
(d) within 500 feet of a private, domestic fresh water well or spring used by less than five households for domestic or stock watering purposes, or within 1000 feet of any other fresh water well or spring, in existence at the time of initial application;
(e) within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended, unless the municipality specifically approves;
(f) within 500 feet of a wetland;
(g) within the area overlying a subsurface mine, unless the appropriate division district office specifically approves the proposed location based upon the operator's demonstration that the temporary pit's or below-grade tank's construction and use will not compromise the subsurface integrity;
(h) within an unstable area, unless the operator demonstrates that it has incorporated engineering measures into the design to ensure that the temporary pit's or below-grade tank's integrity is not compromised; or
(i) within a 100-year floodplain.
B. An emergency pit is exempt from the siting criteria of 19.15.17 NMAC.
C. An operator shall not implement an on-site closure method:
(1) where ground water is less than 50 feet below the bottom of the buried waste;
(2) where ground water is between 50 and 100 feet below the bottom of the buried waste, unless the operator buries the waste in-place and the treated or stabilized waste, which shall not be combined with soil or other material at a mixing ratio of more than 3:1 soil or other material to waste, does not exceed the criteria in Subparagraph (c) of Paragraph (2) of Subsection F of 19.15.17.13 NMAC;
(3) where ground water is more than 100 feet below the bottom of the buried waste, unless the

operator buries the waste in-place and the treated or stabilized waste, which shall not be combined with soil or other material at a mixing ratio of more than 3:1 soil or other material to waste, does not exceed the criteria in Subparagraph (d) of Paragraph (2) of Subsection F of 19.15.17.13 NMAC;
(4) where ground water is more than 100 feet below the bottom of the buried waste, unless the operator buries the waste in a trench and the treated or stabilized waste, which shall not be combined with soil or other material at a mixing ratio of more than 3:1 soil or other material to waste, does not exceed the criteria listed in Subparagraph (c) of Paragraph (3) of Subsection F of 19.15.17.13 NMAC;
(5) within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole or playa lake (measured from the ordinary high-water mark), unless the division approves an alternative distance based upon the operator's demonstration that surface and ground water will be protected;
(6) within 300 feet from a permanent residence, school, hospital, institution or church in existence at the time of initial application;
(7) within 500 feet of a private, domestic fresh water well or spring used by less than five households for domestic or stock watering purposes or within 1000 feet of any other fresh water well or spring, existing at the time the operator files the application for exception;
(8) within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended, unless the municipality specifically approves;
(9) within 500 feet of a wetland;
(10) within the area overlying a subsurface mine, unless the division specifically approves the proposed location based upon the operator's demonstration that subsurface integrity will not be compromised;
(11) within an unstable area, unless the operator demonstrates that it has incorporated engineering measures into the design to ensure that the on-site closure method will prevent contamination of fresh water and protect public health and the environment; or
(12) within a 100-year floodplain.
[19.15.17.10 NMAC - Rn, 19.15.2.50 NMAC & A, 6/16/08]

19.15.17.13 CLOSURE REQUIREMENTS:
F. On-site closure methods. The following closure requirements and standards apply if the operator proposes a closure method for a drying pad associated with a closed-loop system or a temporary pit pursuant to Paragraph (2) of Subsection D of 19.15.17.13 NMAC or Paragraph (2) of Subsection B of 19.15.17.13 NMAC that involves on-site burial, or an alternative closure method pursuant to Paragraph (3) of Subsection D of 19.15.17.13 NMAC or Paragraph (3) of Subsection B of 19.15.17.13 NMAC and Subsection B of 19.15.17.15 NMAC.
(1) General requirements.
(a) Any proposed on-site closure method shall comply with the siting criteria specified in Subsection C of 19.15.17.10 NMAC.
(b) The operator shall provide the surface owner notice of the operator's proposal of an on-site closure method. The operator shall attach the proof of notice to the permit application.
(c) The operator shall comply with the closure requirements and standards of Paragraphs (2) and (3), as applicable, of Subsection F of 19.15.17.13 NMAC if the proposed closure method for a drying pad associated with a closed-loop system or for a temporary pit involves on-site burial pursuant to Paragraph (2) of Subsection D of 19.15.17.13 NMAC or Paragraph (2) of Subsection B of 19.15.17.13 NMAC, or involves an alternative closure method pursuant to Paragraph (3) of Subsection D of 19.15.17.13 NMAC or Paragraph (3) of Subsection B of 19.15.17.13 NMAC and Subsection B of 19.15.17.15 NMAC.
(d) The operator shall place a steel marker at the center of an on-site burial. The steel marker shall be not less than four inches in diameter and shall be cemented in a three-foot deep hole at a minimum. The steel marker shall extend at least four feet above mean ground level and at least three feet below ground level. The operator name, lease name and well number and location, including unit letter, section, township and range, and that the marker designates an on-site burial location shall be welded, stamped or otherwise permanently engraved into the metal of the steel marker. A person shall not build permanent structures over an on-site burial without the appropriate division district office's written approval. A person shall not remove an on-site burial marker without the division's written permission.
(e) The operator shall report the exact location of the on-site burial on form C-105 filed with the division.
(f) The operator shall file a deed notice identifying the exact location of the on-site burial with the county clerk in the county where the on-site burial occurs.
(2) In-place burial.
(a) Where the operator meets the siting criteria specified in Paragraphs (2) or (3) of Subsection C of 19.15.17.10 NMAC and the applicable waste criteria specified in Subparagraphs (c) or (d) of Paragraph (2) of Subsection F of 19.15.17.13 NMAC, an operator may use inplace burial (burial in the existing temporary pit) for closure of a temporary pit or bury the contents of a drying pad associated with a closed-loop system in a temporary pit that the operator constructs in accordance with Paragraphs (1) through (6) and (10) of Subsection F of 19.15.17.11 NMAC for closure of a drying pad associated with a closed loop system.
(b) Prior to closing an existing temporary pit or to placing the contents from a drying pad associated with a closed-loop system into a temporary pit that the operator constructs for disposal, the operator shall stabilize or solidify the contents to a bearing capacity

sufficient to support the temporary pit's final cover. The operator shall not mix the contents with soil or other material at a mixing ratio of greater than 3:1, soil or other material to contents.
(c) Where ground water will be between 50 and 100 feet below the bottom of the buried waste, the operator shall collect at a minimum, a five point, composite sample of the contents of the drying pad associated with a closed-loop system or the contents of a temporary pit after treatment or stabilization, if treatment or stabilization is required, to demonstrate that benzene, as determined by EPA SW-846 method 8021 B or 8260B, does not exceed 0.2 mg/kg; total BTEX, as determined by EPA SW-846 method 8021 B or 8260B, does not exceed 50 mg/kg; TPH, as determined by EPA SW-846 method 418.1 or other EPA method approved that the division approves, does not exceed 2500 mg/kg; the GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg; and chlorides, as determined by EPA method
300.1, do not exceed 500 mg/kg or the background concentration, whichever is greater. The operator may collect the composite sample prior to treatment or stabilization to demonstrate that the contents do not exceed these concentrations. However, if the contents collected prior to treatment or stabilization exceed the specified concentrations the operator shall collect a second five point, composite sample of the contents after treatment or stabilization to demonstrate that the contents do not exceed these concentrations.
(d) Where the ground water will be more than 100 feet below the bottom of the buried waste, the operator shall collect at a minimum, a five point, composite sample of the contents of the drying pad associated with a closed-loop system or the contents of a temporary pit after treatment or stabilization, if treatment or stabilization is required, to demonstrate that benzene, as determined by EPA SW-846 method 8021B or 8260B, does not exceed 0.2 mg/kg; total BTEX, as determined by EPA SW-846 method 8021B or 8260B, does not exceed 50 mg/kg; the GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg; TPH, as determined by EPA method 418.1 or other EPA method that the division approves, does not exceed 2500 mg/kg; and chlorides, as determined by EPA method 300.1, do not exceed 1000 mg/kg or the background concentration, whichever is greater. The operator may collect the composite sample prior to treatment or stabilization to demonstrate that the contents do not exceed these concentrations. However, if the contents collected prior to treatment or stabilization exceed the specified concentrations the operator shall collect a second five point, composite sample of the contents after treatment or stabilization to demonstrate that the contents do not exceed these concentrations.
(e) Upon closure of a temporary pit, or closure of a temporary pit that the operator constructs for burial of the contents of a drying pad associated with a closed-loop system, the operator shall cover the geomembrane lined, filled, temporary pit with compacted, non-waste containing, earthen material; construct a division-prescribed soil cover; recontour and re-vegetate the site. The Division-prescribed soil cover,
recontouring and re-vegetation shall comply with Subsections G, H and I of 19.15.17.13 NMAC.
(f) For burial of the contents from a drying pad associated with a closed-loop system, the operator shall construct a temporary pit, in accordance with Paragraphs (1) through (6) and (10) of Subsection F of 19.15.17.11 NMAC, within 100 feet of the drying pad associated with a closed-loop system, unless the appropriate division district office approves an alternative distance and location. The operator shall use a separate temporary pit for closure of each drying pad associated with a closed-loop system.
(3) On-site trench burial:
(a) Where the operator meets the siting criteria in Paragraph (4) of Subsection C of 19.15.17.10 NMAC, an operator may use on-site trench burial for closure of a drying pad associated with a closed loop system or for closure of a temporary pit when the waste meets the criteria in Subparagraph (c) of Paragraph (3) of Subsection F of 19.15.17.13 NMAC, provided that the operator certifies to the division that it has given written notice to the surface owner that it intends to do so. The operator shall use a separate on-site trench for closure of each drying pad associated with a closed-loop system or each temporary pit.
(b) Prior to placing the contents from a drying pad associated with a closed-loop system or from a temporary pit into the trench, the operator shall stabilize or solidify the contents to a bearing capacity sufficient to support the final cover of the trench burial. The operator shall not mix the contents with soil or other material at a mixing ratio of greater than 3:1, soil or other material to contents.
(c) The operator shall collect at a minimum, a five point, composite sample of the contents of the drying pad associated with a closed-loop system or of the temporary pit to demonstrate that the TPH concentration, as determined by EPA method 418.1 or other EPA method that the division approves, does not exceed 2500 mg/kg. Using EPA SW-846 method 1312 or other EPA leaching procedure that the division approves, the operator shall demonstrate that (i) the chloride concentration, as determined by EPA method 300.1 or other EPA method that the division approves, does not exceed 3000 mg/l or the background concentration, whichever is greater, (ii) the concentrations of the inorganic water contaminants specified in Subsection A of 20.6.2.3103 NMAC as determined by appropriate EPA methods do not exceed the standards specified in
Subsection A of 20.6.2.3103 NMAC or the background concentration, whichever is greater, and (iii) the concentrations of the organic water contaminants specified in Subsection A of 20.6.2.3103 NMAC as determined by appropriate EPA methods do not exceed the standards specified in
Subsection A of 20.6.2.3103 NMAC, unless otherwise specified above. The operator may collect the composite sample prior to treatment or stabilization to demonstrate that the contents do not exceed these concentrations. However, if the contents collected prior to treatment or stabilization exceed the specified concentrations the operator shall collect a second five point, composite sample of the contents after treatment or stabilization to demonstrate that the contents do not exceed these concentrations.
(d) If the contents from a drying pad associated with a closed-loop system or from a temporary pit do not exceed the criteria in Subparagraph (c) of Paragraph (3) of Subsection F of 19.15.17.13 NMAC, the operator shall construct a trench lined with a geomembrane liner located within 100 feet of the drying pad associated with a closed-loop system or temporary pit, unless the appropriate division district office approves an alternative distance and location. The operator shall design and construct the lined

trench in accordance with the design and construction requirements specified in Paragraphs (1) through (8) of Subsection J of 19.15.17.11 NMAC.
(e) The operator shall close each drying pad associated with a closed-loop system or temporary pit by excavating and transferring all contents and synthetic pit liners or liner material associated with a closed-loop system or temporary pit to a lined trench. The excavated materials shall pass the paint filter liquids test (EPA SW-846, method 9095) and the closure standards specified in Subparagraph (c) of Paragraph (3) of Subsection F of 19.15.17.13 NMAC.
(f) The operator shall test the soils beneath the temporary pit after excavation to determine whether a release has occurred.

File: OCD Online "GTHT-1" (Pits/Ponds)

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive, Santa Fe, New Mexico 87505
Office: (505) 476-3490
E-mail: CarlJ.Chavez@State.NM.US
Website: http://www.emnrd.state.nm.us/ocd/
"Why Not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward With the Rest of the Nation?" To see how, please go to: "Pollution Prevention & Waste Minimization" at
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

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From: Janney, David [mailto:david.janney@amec.com]
Sent: Monday, October 29, 2012 4:22 PM
To: Chavez, Carl J, EMNRD
Cc: VonGonten, Glenn, EMNRD; Shapard, Craig, EMNRD
Subject: RE: reserve pits

Greetings:

Thank you for this Carl. I don't see anything below regarding actual geothermal drilling reserve pit closure requirements nor did I when I did my review of the regs. Have I missed it?

I have been through the O&G pit closure requirements in 19.15.17 and believe it would be possible to spread our cuttings on our own land providing the cuttings are free of contaminants as we believe them to be based on the analytical results we have for water from the reserve pits.

Do you have any thoughts on this?

We will soon prepare and submit our reserve pit closure plan. We would like to have it approved before the pits are dry in early January so that we can close them without delay.

Regards,

David W. Janney, PG
Senior Geologist
AMEC Environment and Infrastructure
8519 Jefferson, NE
Albuquerque, NM 87113
505.821.1801 off
505.821.7371 fax
505.449.8457 cell

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, October 10, 2012 4:42 PM
To: Janney, David

Cc: VonGonten, Glenn, EMNRD; Brooks, David K., EMNRD; Sanchez, Daniel J., EMNRD
Subject: RE: reserve pits

David:

Good afternoon. I am copying David and Glenn so that they may chime in based on your inquiry. The short answer is that the OCD recommends that you attempt to satisfy the technical pit closure requirements from recently promulgated regulations that are most current and represent a scientific basis for pit closure.

Current Geothermal related regulations to consider are:

19.14.1.9 WASTE PROHIBITED:
A. The production or handling of geothermal resources of any type or in any form, or the handling of products thereof, in such a manner or under such conditions or in such an amount as to constitute or result in waste is hereby prohibited.
B. All owners, operators, contractors, drillers, transporters, service companies, pipe pulling and salvage contractors and other persons shall at all times conduct their operations in the drilling, equipping, operating, producing, and plugging and abandoning of geothermal resource wells in a manner that will prevent waste of geothermal resources, and shall not wastefully utilize geothermal resources or allow leakage of such resources from a geothermal reservoir, or from wells, tanks, containers, or pipe, or other storage, conduit or operating equipment.
[Rule G-3; Recompiled 12/31/01]

19.14.1.10 PROTECTION OF LIFE, HEALTH AND THE ENVIRONMENT: All geothermal operations, exploratory, drilling and producing, shall be conducted in a manner that will afford maximum reasonable protection to human life and health and to the environment.
[Rule G-4; Recompiled 12/31/01]

19.14.25.8 DRILLING MUD AND MUD PITS:
A. In order to assure an adequate supply of drilling fluid to confine all natural fluids to their respective native strata and to prevent blowouts, each operator shall, prior to commencing drilling operations, provide a pit of adequate size to hold such drilling fluid and to receive drill cuttings, and such pit shall be so constructed and maintained to prevent contaminants from overflowing on the surface of the ground and/or entering any water course.
B. The temperature of the return mud shall be monitored continuously during the drilling of the surface casing hole, and in the case of a thermal gradient well, shall be monitored to total depth. Either a continuous temperature recording device shall be installed and maintained in good working condition, or the temperature shall be measured manually and recorded at least one time each hour.
[Recompiled 12/31/01]

19.14.51.9 WELL RECORDS: The owner or operator of any geothermal resources well shall keep, or cause to be kept, a careful and accurate well log and history of the drilling of any such well, including the lithologic characteristics and depth of formations encountered, and the depths, pressures and temperatures of water-bearing and steam-bearing strata. These data, as well as such other tests, surveys and logs which may be taken on the well including the temperatures, chemical compositions and physical characteristics of fluids encountered in the well, deviation, directional and temperature surveys, logs, including electrical logs, physical logs and core logs, and tests, including potential tests, shall be placed in the custody of the designated agent (see Rule G-100) [now 19.14.12.17 NMAC] of the owner or operator of the well and shall remain in such custody within the state of New Mexico until all required forms and attachments pertaining to the well have been filed with the division. These data shall be subject to inspection, during normal business hours, by the division or its representatives, and by the state engineer or his representatives.
[Recompiled 12/31/01]

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When the application from Los Lobos was submitted, the OCD Pit Rule (Rule 17: "Temporary and Permanent Pits") had not been promulgated. OCD deferred to the regulations before the Pit rule with recommendations to Los Lobos to follow the technical requirements of OCD Rule 36: "Evaporation Pond" and or Rule 17 later down the road when it get promulgated. However, you are correct, the geothermal regulations are not specific on closure in general and even Rules 17 and 36 may not apply as they are prescribed for oil and gas development.

Therefore, for reserve pit closure technical guidance, I would recommend that you review Rule 17 and any applicable forms and/or Rule 36 and any applicable forms to follow prescribed guidelines that may help the satisfy the regulatory aspects of your inquiry.

In addition, Los Lobos is aware of WQCC Regulations 20.6.2 et seq. NMAC and 20.6.4 et seq. NMAC. The Geothermal Regulations do not supersede other applicable federal, state and/or local regulations.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive, Santa Fe, New Mexico 87505
Office: (505) 476-3490
E-mail: CarlJ.Chavez@State.NM.US
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http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

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From: Janney, David [mailto:david.janney@amec.com]
Sent: Wednesday, October 10, 2012 3:56 PM
To: Chavez, Carl J, EMNRD
Subject: RE: reserve pits

Greetings:

Can you please point me to the reserve pit closure requirements in the geothermal regs? There don't appear to be any specific pit closure regs for geothermal.

Regards,

David

Chavez, Carl J, EMNRD

From: Janney, David <david.janney@amec.com>
Sent: Wednesday, October 10, 2012 4:47 PM
To: Chavez, Carl J, EMNRD
Subject: RE: reserve pits

Thanks:

As you indicate, there is nothing in 19.14 that applies directly to pit closure.

Will look at the O&G rules.

Apparently, BLM rules do not apply since it is private surface.

Regards,

David

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, October 10, 2012 4:42 PM
To: Janney, David
Cc: VonGonten, Glenn, EMNRD; Brooks, David K., EMNRD; Sanchez, Daniel J., EMNRD
Subject: RE: reserve pits

David:

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[Recompiled 12/31/01]

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[Recompiled 12/31/01]

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When the application from Los Lobos was submitted, the OCD Pit Rule (Rule 17: "Temporary and Permanent Pits") had not been promulgated. OCD deferred to the regulations before the Pit rule with recommendations to Los Lobos to follow the technical requirements of OCD Rule 36: "Evaporation Pond" and or Rule 17 later down the road when it get promulgated. However, you are correct, the geothermal regulations are not specific on closure in general and even Rules 17 and 36 may not apply as they are prescribed for oil and gas development.

Therefore, for reserve pit closure technical guidance, I would recommend that you review Rule 17 and any applicable forms and/or Rule 36 and any applicable forms to follow prescribed guidelines that may help the satisfy the regulatory aspects of your inquiry.

In addition, Los Lobos is aware of WQCC Regulations 20.6.2 et seq. NMAC and 20.6.4 et seq. NMAC. The Geothermal Regulations do not supersede other applicable federal, state and/or local regulations.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
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http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

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From: Janney, David [mailto:david.janney@amec.com]
Sent: Wednesday, October 10, 2012 3:56 PM
To: Chavez, Carl J, EMNRD
Subject: RE: reserve pits

Greetings:

Can you please point me to the reserve pit closure requirements in the geothermal regs? There don't appear to be any specific pits closure regs for geothermal.

Regards,

David

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, October 10, 2012 10:25 AM
To: Janney, David
Subject: RE: BLM Revised Order for LDG reserve pits

David:

You may view the letter under OCD Online "Gen. Correspondence 7/2012 – Present" thumbnail. The G-104 you will have to receive in the mail.

Thanks.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive, Santa Fe, New Mexico 87505
Office: (505) 476-3490
E-mail: CarlJ.Chavez@State.NM.US
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http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental

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From: Janney, David [mailto:david.janney@amec.com]
Sent: Wednesday, October 10, 2012 9:19 AM
To: Chavez, Carl J, EMNRD
Subject: RE: BLM Revised Order for LDG reserve pits

Good morning:

Thanks for the update, any chance we can get a pdf of these today? I did not see them online.

Regards,

David

From: Chavez, Carl J, EMNRD [mailto:CarlJ.Chavez@state.nm.us]
Sent: Wednesday, October 10, 2012 6:55 AM
To: Janney, David
Subject: RE: BLM Revised Order for LDG reserve pits

David:

An OCD response letter was mailed out last Friday. OCD did review your suggested revisions.

An OCD letter with an approved Well 63-7 G-104 with COAs was also mailed out the same day.

I expect that you should receive the letters today or tomorrow. Let me know if you don't receive the letters by Thursday.

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive, Santa Fe, New Mexico 87505
Office: (505) 476-3490
E-mail: CarlJ.Chavez@State.NM.US
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From: Janney, David [mailto:david.janney@amec.com]
Sent: Tuesday, October 09, 2012 4:08 PM
To: Chavez, Carl J, EMNRD
Subject: RE: BLM Revised Order for LDG reserve pits

Greetings:

I was wondering how things were going on OCD's revised COAs for the 45-7/55-7 testing>

Regards,

David

The information contained in this e-mail is intended only for the individual or entity to whom it is addressed.
Its contents (including any attachments) may contain confidential and/or privileged information.
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If you receive this e-mail in error, please notify the sender by reply e-mail and delete and destroy the message.

Chavez, Carl J, EMNRD

From: Janney, David [david.janney@amec.com]
Sent: Tuesday, February 07, 2012 4:19 PM
To: Chavez, Carl J, EMNRD; Dade, Randy, EMNRD
Cc: Michael Hayter; michelle@mhenrie.com; Ben Barker
Subject: RE: LDG 22-18 Well application for Lighting Dock Geothermal HI-01, LLC
Attachments: Retention Pond As-built Drawings.pdf

Good Afternoon Carl:

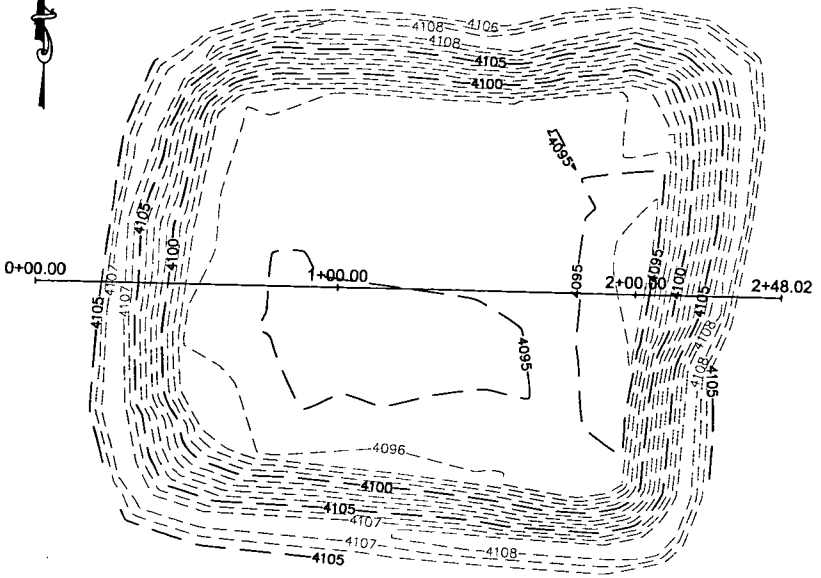
We realize the LDG 22-18 application was submitted before our teleconference of 1/19/2011and the operator will need to be changed to Los Lobos. We will resubmit the application in the near future.

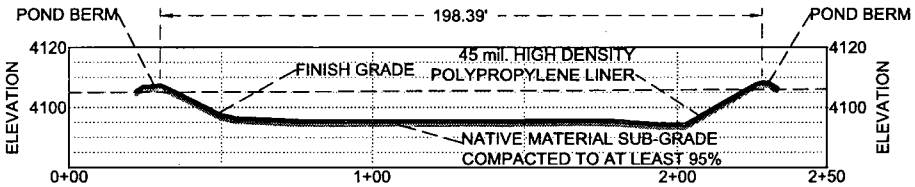
In addition, please find attached the as-built drawings of the centralized retention pond.

Please contact me with any questions you may have about either of these items.

Regards,

David W. Janney, PG
Senior Geologist
AMEC Environment and Infrastructure
8519 Jefferson, NE
Albuquerque, NM 87113
505.821.1801 off
505.821.7371 fax
505.449.8457 cell





Source of Topographic Survey: Native Renaissance, John F. Esquibel, Cell 602-758-7530 - Base 928-282-9776, 76 Sidney Lane - Sedona, Arizona 86336 (See Attached)

NOTE:
BTL LINER SPECIFICATIONS AND INSTALLATION PROCEDURES ARE ATTACHED.

0' 20' 40'
SCALE: 1"=40'

Cyrq energy

CLIENT: CYRQ ENERGY	DWN BY: BDP	PROJECT: LOS LOBOS RENEWABLE POWER, LLC	DATE: FEBRUARY 3, 2012
	CHK'D BY: –		CONTRACT NO: 1151700102
AMEC Environment & Infrastructure, Inc 8519 Jefferson, NE Albuquerque, NM 87113	DATUM: N/A	TITLE: CENTRALIZED EVAPORATION POND LIGHTNING DOCK GEOTHERMAL FIELD NW ¼ SECTION 7, TOWNSHIP 25S, RANGE 19W, N.M.P.M HIDALGO, COUNTY, NEW MEXICO	REV. NO.: -
	PROJECTION: N/A		FIGURE NO. 1
	SCALE: AS SHOWN		

NAMES:	TOPOGRAPHIC SURVEY
DRAWN: J.F.E.	
SHEET TITLE:	TOPOGRAPHIC MAP

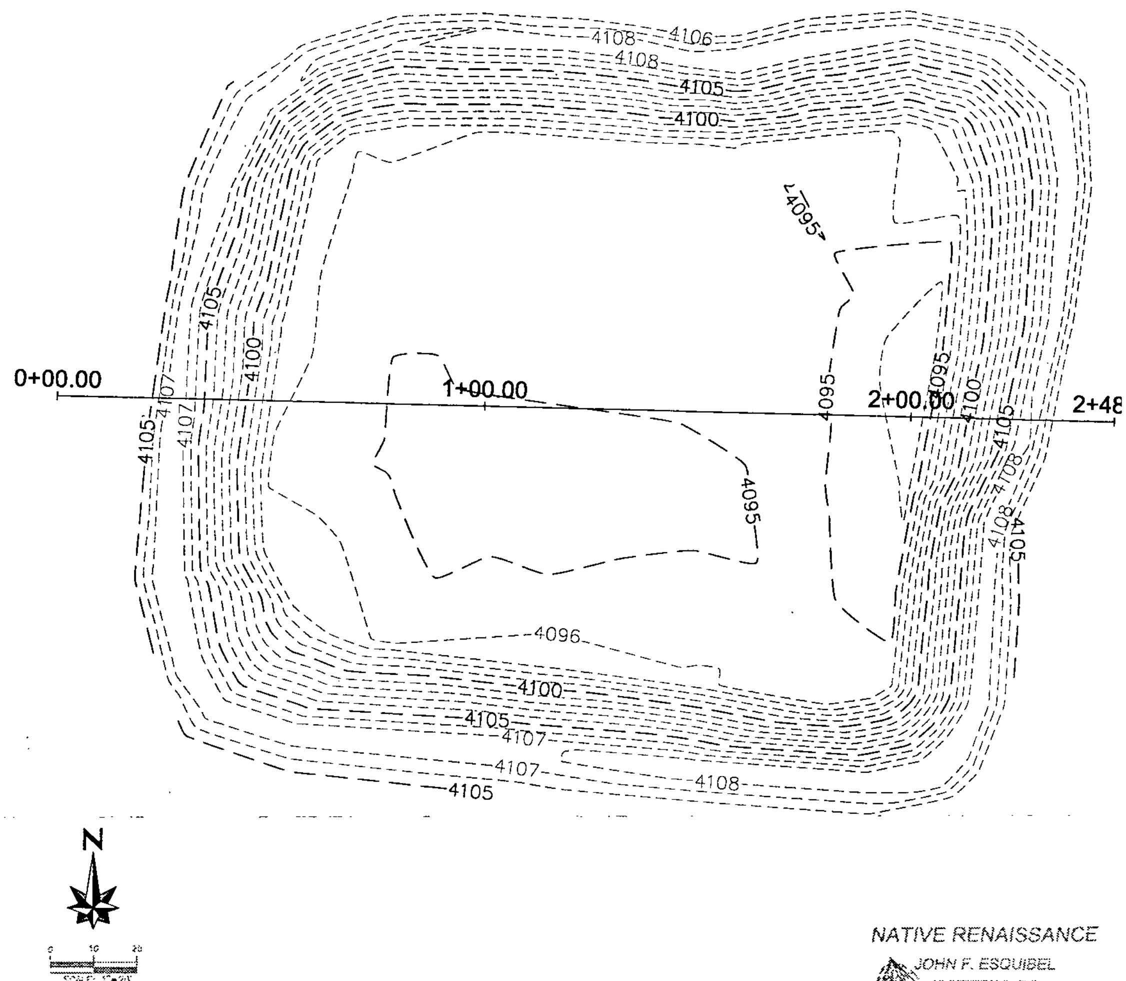
POND SURVEY

LOCATED IN THE NW 1/4 OF SW 1/4 OF NE 1/4 OF SECTION 7, TOWNSHIP 25 SOUTH, RANGE 19 WEST, N.M.P.M., HIDALGO COUNTY, NEW MEXICO.

DATE OF PLAT: SEPTEMBER 10, 2011

LEGEND

- INDICATES FOUND MONUMENT
- INDICATES SET "X" IN CONC
- MINOR-CONTOUR
- MAJOR-CONTOUR



NOTES:
1. RECORD MEASUREMENTS IN ITALICS
2. USE DRAWING SCALE TO DETERMINE MEASUREMENTS WHEN NOT LABELED.
3. HATCHED AREAS DENOTE CONCRETE.
4. BASIS OF BEARINGS IS WGS84 DATUM, GEODETIC NORTH IN GROUND DISTANCES BASED ON GPS OBSERVATIONS, OBLIQUE STEREOGRAPHIC PROJECTION WITH THE POINT OF ORIGIN AT 32° [illegible] 41.86" N, 108° 50' 13.56" W, GRID SCALE OF 1.00019[illegible]53.

NATIVE RENAISSANCE
JOHN F. ESQUIBEL

PP CONTAINMENT MEMBRANES

LONG TERM STORAGE/CONTAINMENT MEMBRANE

CONTAINMENT MEMBRANE QA\QC & INSTALLATION PROCEDURES

1.01 SCOPE OF WORK:

Furnish and install a flexible membrane lining as shown on engineering or contractor supplied drawings. All work shall be done in strict accordance with the drawings and related specifications and the membrane lining manufacturer's recommendations.

It is the intent of these specifications to insure a quality finished product as described on the plans and specifications and shall be the responsibility of the contractor to take whatever measures shall be deemed necessary to insure that this requirement shall have been met.

All interested governmental agencies shall provide inspection services throughout the installation procedure or provide written acceptance of the installation after final inspection.

1.02 PRODUCT:

The material supplied under these specifications shall be first quality goods specifically formulated and tested for the containment of the material(s) as set forth in the accompanying specifications.

Reinforced Polypropylene GeoMembrane is a heat-weldable polyester reinforced sheet designed for liners and floating covers. Polypropylene membranes are specifically formulated for long-term use in buried or exposed geomembrane applications. The membrane is based on a UV-stabilized polypropylene copolymer, which does not require either polymeric or liquid plasticizers to maintain flexibility.

Physical properties of the membrane are enhanced by a strong, polyester fabric (scrim) that is encapsulated between the polypropylene based top and bottom plies. The combination of the fabric and polypropylene coatings provides reinforced membranes with high breaking / tearing strength and puncture resistance. The relatively smooth surface of the production equipment provides total surface fusion\adhesion that creates a consistent, watertight monolithic sheet.

The membrane shall be manufactured from a composition of high quality ingredients, specifically compounded for use in hydraulic structures. Only domestic resins and additives shall be used. Reprocessed materials will not be acceptable other than clean rework materials of the same virgin ingredients generated from the manufacturer's own production.

The finished membrane liner shall consist of 10-13 mils of polypropylene coatings over a reinforced polyester scrim creating a 3 layer impermeable membrane with tremendous strength and resistance to environmental stress cracking, ozone, uv and oxidation. The finished thickness shall be plus or minus 10% based on the material type i.e. PP36, PPL45 etc.

1.021 ROLL SAMPLING:

Each roll upon delivery shall be visually inspected. Each roll shall be wrapped individually and each roll shall be clearly labeled with a roll number and lot number. Each load will be accompanied by a box of samples 6" x 12', for each roll delivered, for archiving and sampling.

Prior to placing the roll into production, the roll number and lot number will be recorded on the inside of the core with permanent marker. A 6" wide sample taken from the entire width of the roll will be removed and cut into 2 pieces 6" x 6'. long and welded together for sampling and material integrity testing. Peel testing of the sample shall be done to insure weldability and careful inspection at weld separation shall be checked for delamination. If delamination failure is present, retest as described above, after removing 15 feet from the roll. If failure is still apparent the roll shall be labeled as rejected and removed from the production area. These procedures apply to all new rolls and roll splice joints.

1-800-280-0712 • (541)447-0712 • FAX (541)447-0759
3451 SW Empire Dr • Prineville, OR 97754
info@btlliners.com • www.btlliners.com

Strength-Commitment-Guaranteed Containment

45 MIL POLYPROPYLENE

PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	VALUES
Gauge, Nominal (Mils)		45
Piles Reinforcing		1
Breaking Strength - Fabric, minimum (lbs.)	ASTM D751 Method A	300
Low Temperature Flexibility 1/8" Mandrel (°F)	ASTM D2136 4 hours	-50
Puncture Resistance	ASTM D4833	110
Tear Strength (2 in. / min strain rate)	ASTM D5884 lbf	160
Dimensional Stability (% Change Max.)	ASTM D1204 (180°F / 1hr)	1%
Hydrostatic Resistance minimum (psi)	ASTM D751 Method A, Procedure 1	450
Ply Adhesion minimum (lbs./in.)	ASTM D413	20
Water Absorption (% wt. change, max)	ASTM D471	.5%
UV Resistance	ASTM G155 Xenon Arc	>12,000 hours

****Polypropylene is available in Tan\Tan , Black\Black or Tan\Black in industrial or potable grades.****

****Availability and pricing may very dependent on stock.****

All roll tests are to be recorded in the test log.

1.03 FABRICATION:

The individual widths of the PP fabric shall be assembled into large sheets custom-designed for the specific project so as to minimize field seaming. All factory seams shall provide a bond between the sheet goods sufficiently strong to meet the test requirements of these specifications.

All machines used in the seaming process shall be tested daily, prior to any fabrication, by welding a 6'long test sample of the material and manually peel testing along the entire length. Each test must show film tear bonding along the length of the seam to be considered a "pass". All results shall be recorded in the test report log and must include Date, time, machine #, operator, temp and speed as well as pass\fail indication. If the sample fails the testing, make appropriate corrections to the equipment and retest as stated above.

Machines will be further requalified after the following: change of material, unexpected power loss, change of operator, or shutdowns of 45 minutes or longer.

The factory seaming shall be performed on thermal welding equipment with pressure wheels and shall consist of seams of 2" minimum width in the case of wedge welding, 1.5" width in the case of hot air welding, which will provide a film-tearing bond of 80% of the fabric tensile strength. All seams shall be visually inspected along there entire length, and destructive tested at an interval not to exceed 500 lineal feet of factory seam per machine.

1.04 PANEL PACKAGING AND HANDLING:

Factory fabricated panels shall be accordion folded during production to width of approximately 6' wide. Upon completion each bundle shall be folded or rolled by hand or machine based on the total square footage of the panel. Panels 10,000 sq.ft. or larger are rolled by machine and include a core and continuous unroll strap. Each roll shall be secured to a pallet or export container designed to be moved by a forklift or similar piece of equipment. Each factory-fabricated panel shall be prominently and permanently marked with the panel size and installation location as per factory drawings. Each panel will then be wrapped with its own protective wrap and marked again as to size and installation location. Packaged factory liner sections, which are delivered to a project site, shall be stored in their original shipping wrappers and stored in a dry area and protected from harsh weather elements when at all possible. The liner sections shall not be stacked.

1.05 INSTALLER:

The installer of the lining fabric shall be experienced in the installation of flexible membrane linings and shall be approved in writing by the fabricator and the manufacturer of the material.

1.06 LINING BASE MATERIAL:

A base shall be prepared on the bottom and slopes of the area to be lined. This base shall be free of all sharp objects, roots, grass and vegetation. Unsuitable material found during the pre-installation inspection by the installer shall be removed prior to the installation of the liner.

The base (subgrade) material shall be native materials or materials obtained from a borrow source compacted to a minimum 95% compaction or an approved construction fabric of at least 100 mils thickness, weighing 8 ozs. per square yard with a grab tensile strength of at least 275 lbs. per square inch and a Mullen burst strength of at least 450 pounds per square inch, which will provide a finished sub grade suitable for the flexible membrane lining.

Foreign materials, vegetation, protrusions, voids, cracks and other penetrating or raised sources shall by removed from the sloping areas as well as the base. Loose rocks, rubble and other foreign matter shall be collected and deposited in the appropriate site out of the area to be lined. The excavated and filled areas shall be trimmed to elevations and contours shown on the drawings and shall be smooth, uniform and free of all foreign matter, vegetation and sudden changes in grade.

A pre-installation inspection shall be called for and ALL interested parties, including governmental agencies, shall be present for this inspection. Any parties not participating in this inspection shall be construed as accepting the site preparation and will acknowledge this defacto acceptance in writing at the appropriate time.

1.07 FINAL SUBGRADE PREPARATION:

The sub grade shall be prepared immediately prior to the placing of the liner. The surface on which the liner is to be placed is to be firm, clean, dry and smooth. Anchor trench excavation and any structure seal preparation should be completed before the lining installation begins.

1.08 LINING INSTALLATION:

A continuous sheet of liner shall be installed throughout the installation site as according to the drawings. The lining shall be placed over the prepared surfaces to be lined in such a manner as to assure a minimum of handling. The sheets shall be of prescribed lengths and widths and shall be placed in such a manner as to minimize field seams. Only those pieces of fabric that can be installed and anchored in place during the workday shall be unpacked and placed in position.

Sandbags and or other suitable weights may be used as required to hold the lining in position during the installation. The weights shall not have any sharp edges, which may snag or otherwise penetrate the liner fabric. Care should be taken to keep the seam areas as clean as possible. It may be necessary to wipe down the edges prior to heat-sealing the panels together.

No materials or equipment shall be dragged across the face of the liner nor shall the workmen while installing the liner subject the liner to abuse. All installation party members shall wear soft-soled shoes or boots while working on the surface of the liner.

Lining sheets shall be closely fit around all penetrations through the liner. Lining to concrete seals shall be affected with mechanical anchors as shown on drawings. All piping, structures and irregular projections shall be sealed and flashed with the fabricated boots or other approved sealing methods.

A meeting of all interested parties shall proscribe the method of backfilling of the site with the appropriate materials. The lining installation manager prior to commencement of the backfilling program shall approve all actions undertaken to place the top cover material.

1.09 FIELD SEAMS:

All seaming shall be done with thermal heat-sealing equipment or with the adhesives of the lining fabric manufacturer's brand. Heat-sealing with automatic wedge welding is the preferred method of field seaming whenever possible.

Wedge welders for field seams shall be qualified prior to beginning field seaming. A 6' section of material, at current ambient temperature, shall be welded and manually torn apart to insure proper welding adhesion.

Lap joints require a minimum of *2.5"* overlap of the factory fabricated panels. The contact surfaces of the panels must be cleaned and all moisture and other foreign material must be removed prior to heat sealing.

If the sub-surface area is not capable of 95% compaction it may require the placement of a back board or rub sheet under the liner to give a firm, dry and clean welding surface.

Extreme caution should be taken throughout the installation to avoid wrinkling the edge of the liner. These "fish mouths" must be slit back sufficiently to remove them and the liner sealed to assure total integrity.

Any portion of the liner damaged or hurt for any reason shall be repaired or replaced by the installation crew before it departs. Normally the ends of the panels can be used for a patching source.

1.10 PATCHING:

Any repairs resulting from damage during installation shall be repaired with like fabric and heat sealing to ensure a secure lining. It is recommended that at least 2"- 4" of overlap be used on any penetrations. It is suggested that any major scuffing be replaced with undamaged liner.

1.11 INSPECTION:

A thorough inspection of the completed liner installation shall be undertaken by a representative of the installer and a representative of the owner or the engineer in charge of the project. All government agencies involved in the project should also have an inspector or designated representative on site during the installation and after completion of same so as to register any complaints at that time. Any and all discrepancies to the permit process or license shall be attended to at this time.

1.12 FIELD TESTING:

All field seams shall be visually inspected along their entire length for integrity. If required by contract seams and repairs may additionally require non destructive testing using the Air Lance method (ASTM D4437) as outlined:

A Installer will supply a compressor and air wand with a fixed nozzle tip with an opening approx. 3\4" wide x 1\8" high.

B Compressor shall be equipped with an output gauge and the ability to continuously supply 30 psi of air pressure.

C The non destructive test involves running the nozzle of air 1\4" to 1\2" away from the outside edge of the field seam for its entire length. If air penetrates the seam area the audible noise or visual puffing of the seam indicates an area of concern and should be marked and repaired accordingly.

1.13 SOIL COVER:

PP geomembranes may be covered by soil if desired. In areas of high traffic or areas with a high water table covering the entire liner is often recommended.

Care should be taken when covering the liner to prevent any damage to the geomembrane or geosynthetics. At no time will construction equipment be allowed to drive directly on the liner. Access roads for soil cover should be maintained to provide 6" minimum, 12" preferable, between the excavation equipment and liner at all times. Damage to the liner, shall be repaired prior to proceeding with cover. Costs associated with repairs are the contractor's responsibility.

**Cover material shall be 1\2" minus particles, clean rounded soils or gravels free of sharp edges, sticks, rubbish and debris or foreign materials. The cover material shall be placed as soon as practical, upon completion of the liner installation, or in conjunction with, as the installation progresses to minimize traffic.

Cover soils should be dumped and leveled over the liner and not pushed from one end to the other to minimize rolling of the geomembrane beneath the soils. Cover soil should always be placed from the base up on slopes never pushed from the top of the slope downwards. Equipment should be turned in long sweeping turns and not spun quickly to eliminate the chance of digging down to the liner thru the cover soil.

When covering or initially filling a liner it is important not to lock the liner into the perimeter anchor trench prior to covering. This can cause undue stress and tension on the liner slopes during the covering process. The anchor trench or perimeter shelf area should be the last area covered to complete the cover process.

** Site specific materials or sizes may be acceptable. It is recommended that the contractor receive prior written approval for acceptance of the cover materials, from a BTL representative, before covering the liner

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, January 19, 2012 10:49 AM
To: 'Janney, David'
Cc: Brooks, David K., EMNRD; Dade, Randy, EMNRD
Subject: RE: LDG 55-7 retention pond as-built drawing

David:

The pond appears to be a dirt pond. This does not adequately address NM's pond construction requirements for containing produced oilfield waste. If this is indeed the pond construction that Cyrq Energy, LLC is planning to submit to the OCD, please review OCD Regulations, i.e., Rule 36 "Evaporation Pond" and/or Rule 17 "Permanent Pit" language.

We can discuss at this afternoon's meeting. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/
"Why not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at:
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Janney, David [mailto:david.janney@amec.com]
Sent: Thursday, January 19, 2012 8:35 AM
To: Chavez, Carl J, EMNRD
Subject: LDG 55-7 retention pond as-built drawing

Good morning Carl:

Please find attached a document that includes a photograph and a topographic survey of the recently constructed retention pond. This photo was taken before the liner was installed. We are in the process of providing you with a document that includes a photograph with the liner installed.

Please contact me with any questions you may have about this aspect of the project.

Regards,

David W. Janney, PG
Senior Geologist
AMEC Environment and Infrastructure
8519 Jefferson, NE
Albuquerque, NM 87113
505.821.1801 off
505.821.7371 fax
505.449.8457 cell

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Thursday, January 19, 2012 8:36 AM
To: 'Janney, David'
Subject: RE: LDG 55-7 retention pond as-built drawing

OCD expects an "As Built" Engineering Diagram(s) of the centralized evaporation pond. Thanks.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3490
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/
"Why not Prevent Pollution; Minimize Waste; Reduce the Cost of Operations; & Move Forward with the Rest of the Nation?" To see how, go to "Pollution Prevention & Waste Minimization" at:
http://www.emnrd.state.nm.us/ocd/environmental.htm#environmental)

From: Janney, David [mailto:david.janney@amec.com]
Sent: Thursday, January 19, 2012 8:35 AM
To: Chavez, Carl J, EMNRD
Subject: LDG 55-7 retention pond as-built drawing

Good morning Carl:

Please find attached a document that includes a photograph and a topographic survey of the recently constructed retention pond. This photo was taken before the liner was installed. We are in the process of providing you with a document that includes a photograph with the liner installed.

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Regards,

David W. Janney, PG
Senior Geologist
AMEC Environment and Infrastructure
8519 Jefferson, NE
Albuquerque, NM 87113
505.821.1801 off
505.821.7371 fax
505.449.8457 cell

SCALE: N/A	TOPOGRAPHIC SURVEY
CREW: J.F.E., A.G., B.G.	CLIENT: / FILE NAME:
SHEET TITLE:	TOPOGRAPHIC MAP

REVISION DATE	DESCRIPTION	NAME

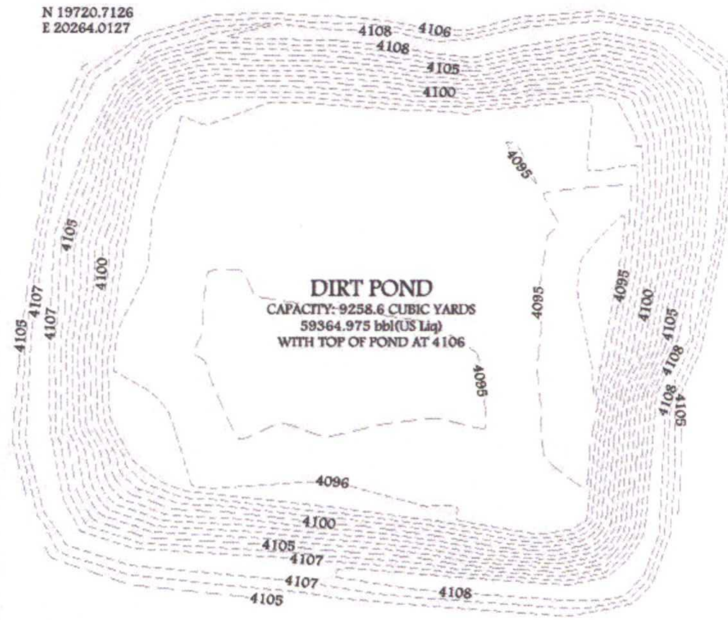
POND SURVEY

LOCATED IN THE NW 1/4 OF SW 1/4 OF NE 1/4 OF SECTION 7,
TOWNSHIP 25 SOUTH, RANGE 19 WEST, N.M.P.M., HIDALGO COUNTY, NEW MEXICO.

DATE OF PLAT: SEPTEMBER 10, 2011

LEGEND
- INDICATES FOUND MONUMENT
- INDICATES SET "X" IN CONC
- MINOR-CONTOUR
- MAJOR-CONTOUR

View from NW corner to SE



N

NOTES:

NATIVE RENAISSANCE
JOHN F. ESQUIBEL

Chavez, Carl J, EMNRD

From: Chavez, Carl J, EMNRD
Sent: Friday, July 25, 2008 11:20 AM
To: 'Jay Hamilton'; Jim Rosser
Cc: Price, Wayne, EMNRD; Gum, Tim, EMNRD
Subject: FW: Power Point w/ some info. to consider for Lightening Dock
Attachments: 30 cjc Pit Rule Final.ppt

Jay and Jim:

As a follow-up to the permit application (see e-mail msg. below), the NMOCD needs a schematic diagram(s) of the surface facility as finally proposed. You may recall that we have verbally grappled with surface layout of a drill pit(s), evaporation pond(s) and proposed cooling tower blow-down pit (lined vs. unlined). On May 6, 2008, the NMOCD sent you a power point presentation with a message (see below) based on the thermal nature of the water, liner considerations, and were requesting a diagram(s) of surface features as a final proposal to understand the engineering design proposed in the application. There are issues about how many evaporation ponds would be needed, their dimensions, especially because of the anticipated high volume of water used in drilling, testing, and storing; the ergonomics influencing the number of ponds, etc..; and their engineering design, construction and mointoring. Would there be multiple drilling pits, one for each well that could be converted to an evaporation pond(s). Would the facility be able to house the gigantic pond(s) on its premises. Unlined blow-down pits were discouraged and you were consulting with your engineering group to see how they could handle the blow-down without infiltration, how they could address the types of chemicals used at the cooling tower to minimize impacts to surface and ground water and even possibly scrap the blow-down pit and reinject or implement other engineering controls or designs to address the cooling tower blow-down discharge to a pit, etc. You were also going to look into implementing closed-loop drilling at the site.

Based on the above, the NMOCD is requesting:

1) An updated diagram(s) of the location of any pit or evaporation pond. This shall include design drawings of any pit or pond construction.

2) A monitoring plan with chemicals of concern, sampling protocol, monitor location and design to address any discharges to surface and ground water and ensure that WQCC Water Quality Standards are not exceeded.

3) GPS coordinates (decimal) of all production/development wells, injection wells and the center of any discharge pit are needed to compare distances to other operators in the area. You had sent some GPS coordinates, but the OCD Internet system must have prevented me from receiving the information. This information is crucial to assessing the proximity of your wells to nearby operators in the area.

4) A detailed evaluation of the chemicals that are proposed for the cooling tower and scientific/engineering explanation of why they are the most suitable chemicals to use at the site given the location of the nursery and fish farm immediately downgradient from the cooling tower blow-down discharge area and the contaminant hydrogeology considerations that prove no adverse impact(s) would result to surface water, ground water, wildlife, fresh water, etc. in the area. The NMOCD had requested that you check into Chemical Companies with chemical products that have undergone Whole Effluent Toxicity (WET) Testing and have been proven to be environmentally friendly products to control scale. Companies like Nalco, Betz, etc. all have chemical products that are pollution prevention friendly products that will accomplish the same goal while protecting water resources and wildlife. The NMOCD had provided a website in Michigan with a listing of environmentally friendly cleaning products used at refineries, oil and gas treatment facilities, etc. The discharge permit has language that discharges cannot exceed the WQCC WQSs. As I recall, you sent the chemicals that Nevada allowed you to use in Nevada without assessing products that are environmentally friendly. The NMOCD may regard any blow-down pit to be a UIC Class V Well that will require pre-treatment before allowing any discharge?

Please submit this information to me as an addendum to the application. This information will be required as we move forward to permit the facility. Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3491
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Chavez, Carl J, EMNRD
Sent: Tuesday, May 06, 2008 8:41 AM
To: 'Jay Hamilton'
Cc: Gum, Tim, EMNRD; Price, Wayne, EMNRD
Subject: Power Point w/ some info. to consider for Lightening Dock

Jay:

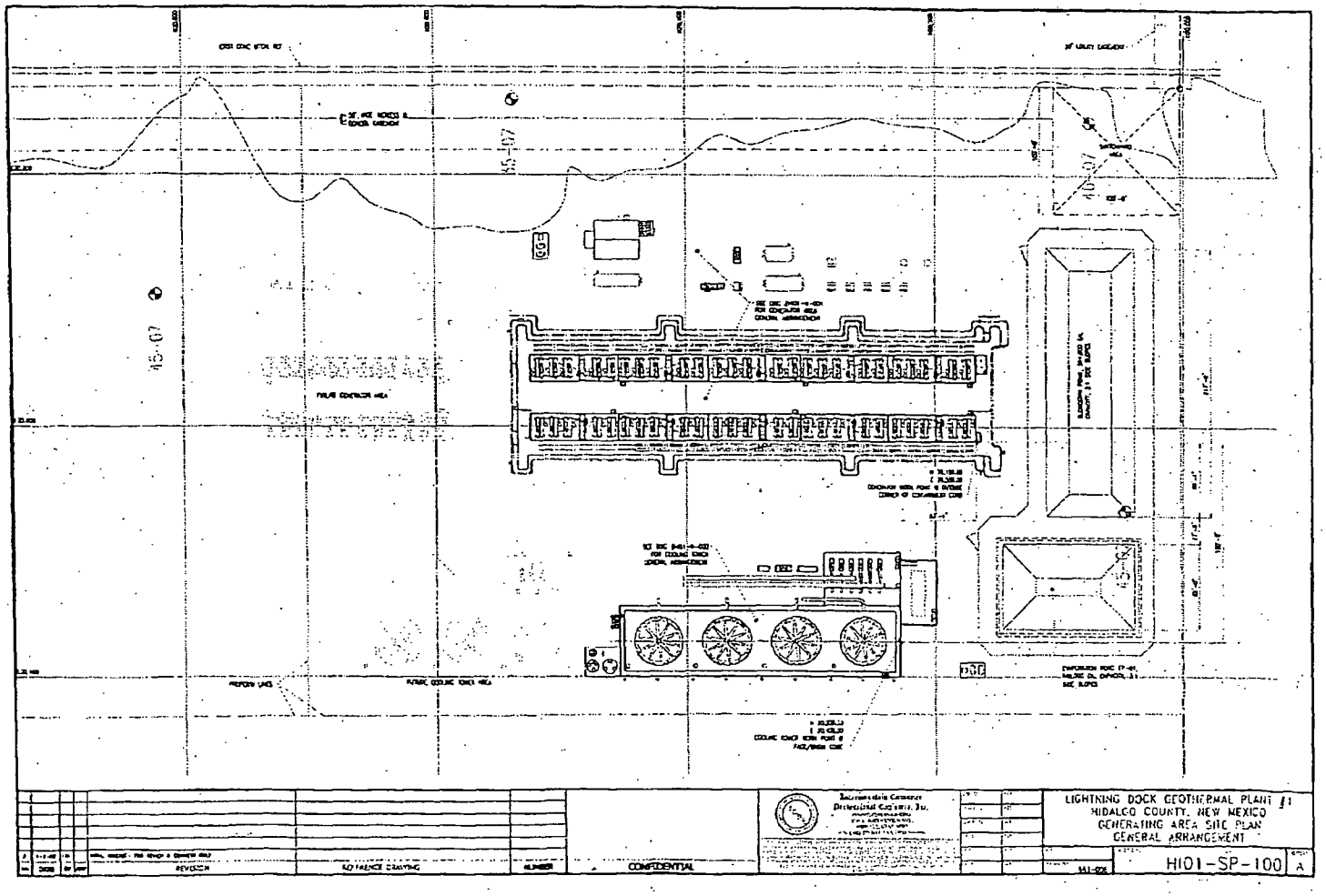
Please find attached a power point with some info. on liners, construction methods, etc. for you to consider for Lightening Dock Geothermal No. HI-01. Mr. Tim Gum of OCD District 2 will provide any guidance on the evaporation ponds, drilling pit onsite or offsite disposal requirements, etc. As discussed, the OCD would prefer that closed loop drilling systems be used and cuttings be disposed off-site if there is a RCRA Subtitle D Landfill (i.e., Deming) that has "Special Waste" designation. Please contact Tim (contact info. provided below) to learn more about field requirements.

FYI, liners with excellent thermal properties are: Chlorosulfonated Polyethylene- Reinforced (CSPE-R), Ethylene Propylene Diene Monomer (EPDM), and Flexible Polypropylene (FPP).

Thank you.

Tim Gum - District Supervisor
Phone extension: 102
Mobile: (575) 626-0824

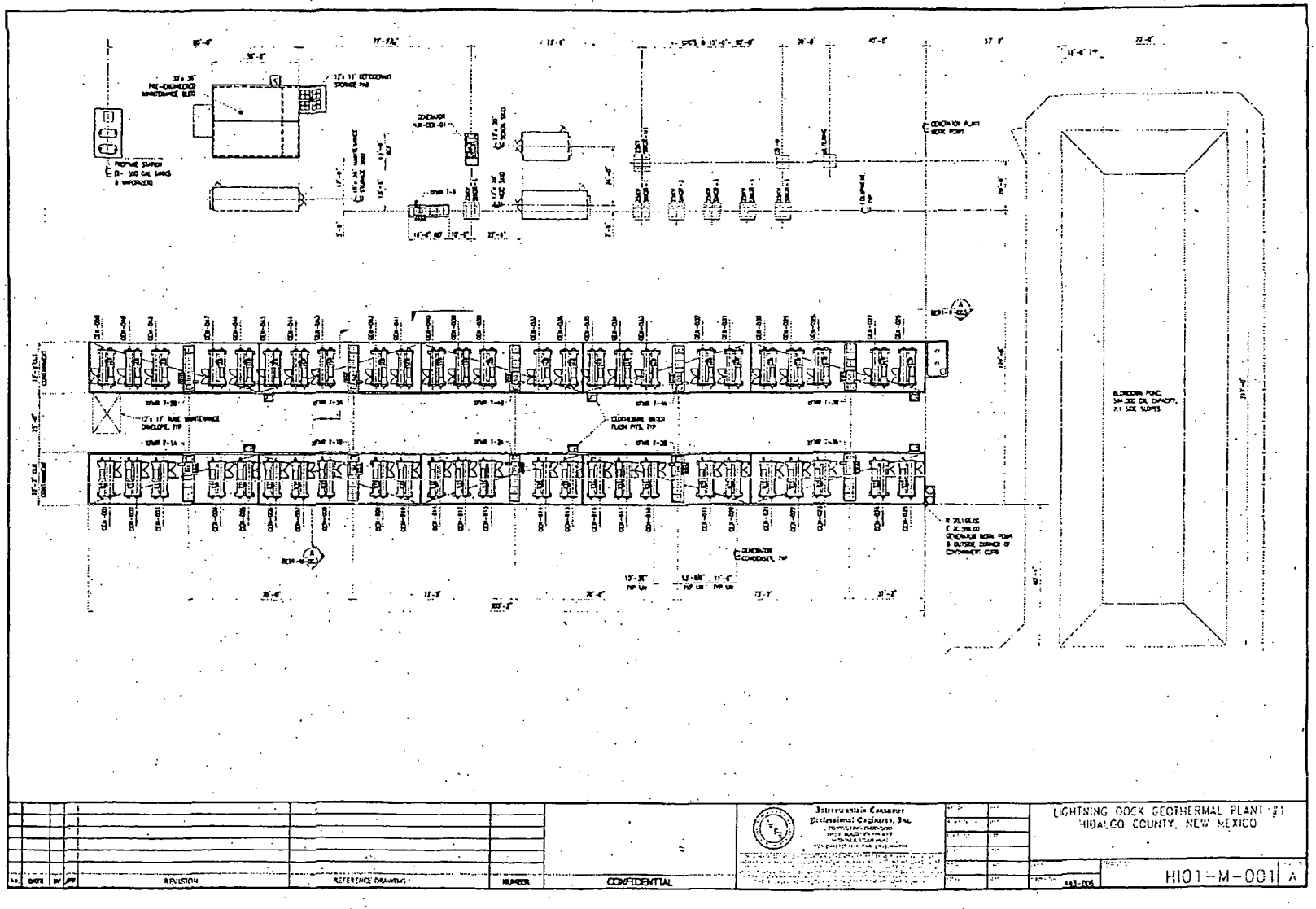
Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3491
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")



CONFIDENTIAL

LIGHTNING DOCK GEOTHERMAL PLANT #1
HIDALGO COUNTY, NEW MEXICO
GENERATING AREA SITE PLAN
GENERAL ARRANGEMENT

HI01-SP-100 A



NO.	DATE	BY	APP	REVISION	REFERENCE DRAWING	NUMBER

CONFIDENTIAL

Intermountain Geothermal Engineers, Inc.

LIGHTNING DOCK GEOTHERMAL PLANT #1
HIDALGO COUNTY, NEW MEXICO

443-004

HI01-M-001 A

3.0 COOLING TOWER WATER TREATMENT, MONITORING AND REINJECTION

The Geothermal Water System is intended to consist of up-to five (5) Production and three (3) Reinjection Wells and a Closed Piping System that circulates through the Geothermal Energy Generators which produce Electrical Energy via the Binary Rankin Cycle. The Geothermal Water is circulated at various flows (based upon the Resource Temperature) from about 11,000GPM to 13,000GPM. This Power Generation Process also requires a Cooling Water System to complete the Rankin Cycle process to heat and cool the Cycle Media/Refrigerant. The Cooling Water system will draw water from either Plant Wells or an Existing Local Source and circulate through the Generators and a Cooling Tower at varying Flow-Rates of about 46,000GPM to 50,000GPM.

The inherent designed Mechanical/Physical cooling characteristics of the Cooling Tower evaporate approximately 2% to 4% of the Cooling Water flow (1,000GPM to 2,000GPM), dependant mainly upon local weather conditions at any point in time. This evaporation tends to concentrate the Cooling Water; therefore, at any level of water chemistry/quality from potable to non-potable, the constant evaporation of the Cooling Tower will concentrate water to levels which are not acceptable for the Generation Equipment, Cooling Tower, and/or the piping of which contain the water itself in the closed system. To offset this concentration "Fresh" Cooling Water can be added to the cooling loop at a rate of double, triple, or more than the evaporation rate. To decrease the amount of additional water needed, the Cooling Water Loop can be Chemically or Mechanically Treated to allow for higher levels of compatibility with the Equipment and Piping Materials. In either of these two cases, some water will need to be discharged in a form of a Blow-Down Stream consisting of concentrated Dissolved and Suspended Solids that were originally present in the Cooling Water Source.

To maintain the Project Zero Discharge, Minimal Evaporation, and Minimal Water Consumption characteristics, this Blowdown Stream will be injected into the Geothermal Reinjection Well Stream. To assure that the Quality of this Cooling Water Blowdown water and to assure that any Chemical Addition of the Water Treatment System does not exceed the "original chemistry" of the Geothermal Water Stream, a Geothermal Water / Cooling Tower Blowdown Water Quality Monitoring System will be included in the Design. This System will employ real-time monitoring equipment capable of on-line monitoring and recording of Water Chemistry for both Historical and Reporting requirements. This data collection and reporting will also include the reporting to the Plant PLC Controller which will adjust not only the Cooling Water and Chemical Injection Systems; but, will also be able to administratively (1) Limit the amount of Blowdown Flow, (2) divert some or all flow to the Plant Evaporation Pond, or (3) take other steps to limit and/or stop Cooling Tower Blowdown Flow to the Geothermal Water Reinjection; up-to and including a total Plant Shut-Down until such time as the Chemistry of the Injection Flow is within acceptable Range. This "Acceptable Range" can be set and/or regulated administratively, as stipulated in/by Permit; however, the Chemistry of the Geothermal Reinjection Flow shall not exceed those levels as found in the Production/Reinjection Well Stream.

3.1 Proposed Cooling Tower Chemicals

The proposed chemicals to be used in the cooling tower will include bleach for primary biocide control, sulfuric acid for pH control, Nalco 3DT189 for scale and corrosion control, along with Nalco 960 as required for supplemental biocide. Nalco 7408 - As a precautional measure, a Nalco 7408 feed

edge of the Paleozoic cratonic region of North America (Chang et al, 199; Corbitt and Woodward 1973, and Woodward and Duchene, 1981). Elston, et al, (1983) give a good overview of the geology and provide a thorough geochemical analysis of the water of the Lightning Dock KGRA.

According to Blackwell and Wisian (2001), gravity data illustrates the basement and fault structures of Animas Valley. North-trending, range-bounding faults define the valley on the west and east. An east-northeast-trending fault with a right-lateral component appears to cut across the valley through the production area. Blackwell and Wisian also filtered and inverted the gravity data to produce a depth-to basement map that highlights the northeast-southwest structure trend across the Animas Valley.

Rocks exposed in the bordering mountain ranges include Precambrian granodiorite, Paleozoic and Mesozoic sedimentary rocks. Tertiary/Cretaceous volcanic rocks, Tertiary intrusive rocks, Tertiary conglomerate, Quaternary/Tertiary basalt flows, and Quaternary/Tertiary conglomerate (O'Brien and Stone, 1984). The Pyramid Mountains, composed of rocks primarily of Cretaceous age and younger (Flege, 1959), form a complex volcanic sequence known as the Muir cauldron (Deal and others, 1978, and Elston et al, 1983). In contrast, the Peloncillo Mountains consist of a Precambrian granite core, a complete Paleozoic section, Cretaceous sedimentary rocks, and Tertiary intrusive and eruptive rock (Gillerman, 1958, Dane and Bachman, 1961, and Dane and Bachman, 1965).

Lubricants (Motor Oil, Compressor Oil)	1,000 gals	55 gal drums
Hydraulic fluid	200 gals	55 gal drums
Anti-Freeze (Ethylene Glycol)	100 gals	55 gal drums
Liquid Polymer Emulsion (partially hydrolyzed polyacrylamide / polyacrylate (PHPA) copolymer)	100 gals	5 gal buckets

Table 2:Materials and Chemicals Commonly Used During Power Plant Operations

Substance	Size	Function
R-245fa	4-50 Gallon containers	Working Fluid
SAE 5W-30 Synthetic Motor Oil	49 Gallons	General lubricant and oil for emergency generator
Propane Tank	2-500 Gallon Tanks	Emergency Generator
SAE 5W-10 Synthetic Turbine Oil	5 Gallons	High Grade Oil For Refrigeration Pumps
Multi-Purpose Grease	5 Gallons	Lubricating Machinery
Teflon synthetic Grease	5 Gallons	Lubricating Machinery
pH - Chemicals - Depending on production water	Totes	Control pH in Cooling Towers

Well workover operations may involve placing a dilute mixture of hydrochloric (muriatic) and hydrofluoric acids down the well. The amount of dilute acid placed in the well bore (which can vary from 10,000 gallons to 50,000 gallons or more) is determined by calculating the amount of each type of mineral to be dissolved. Concentrated (35%) hydrochloric acid and 40% ammonium fluoride solution (to make the hydrofluoric acid) are trucked to the site and mixed on site with water by experienced contractors. The dilute acid mixture is placed in the cased well bore, followed by water to push the mixture into the geothermal reservoir. After dissolving the minerals in the geothermal reservoir, the water and spent acids are flowed back through the well to the surface where they are tested, neutralized if necessary (using sodium hydroxide or crushed limestone or marble) and discharged to the reserve pit.

VI. Transfer, Storage and Disposal of Fluids and Solids

A. The Lightning Dock Geothermal drilling procedures and plant operation will not be using toxic or hazardous substances. The geothermal fluids will be extracted and the heat removed and re-injected back into the ground in a closed loop system. The working fluid is a non-hazardous substance (R-245fa, see enclosed Material Safety Data Sheet) and is also a closed loop system. Water used in the cooling towers is groundwater supplemented with non-hazardous compounds to control corrosion (see Plant Schematics).

1. Tankage and Chemical Storage Areas

Storage tanks for fluids other than fresh water will be bermed to contain a volume one-third more than the largest tank. If the tanks are interconnected, the berm will be designed to contain a volume one-third more than the total volume of the interconnected tanks. Chemical and drum storage areas will be paved, curbed and drained such that spills or leaks from drums are contained on the pads.

2. Surface Impoundments

The proposed date of the construction of the ponds is August 17, 2008 (see Construction Schedule).

The ponds will be earth-constructed with a 4:1 slope with a 45 mil liner. Each pond will be monitored with a level control alarm system.

Drilling Activities:

Reserve Pits would be constructed in accordance with the applicable Best Engineer Management Practices. The reserve pit(s) would be fenced with an enclosure fence on three sides, and then fenced on the fourth side once drilling has been completed to prevent access by persons, wildlife or livestock. The fence would remain in place until pit(s) reclamation begins.

Reserve pits would be constructed on each pad for the containment and temporary storage of geothermal fluid, drill cuttings and waste drilling mud during drilling operations. Each reserve pit would be approximately 200 feet long by 100 feet wide by 15 feet deep. The pit will be constructed with a 4:1 slope. They would each hold roughly 277,000 gallons, with a three foot freeboard. Reserve pits will be lined with a 45 (mil) material. The following liners have been selected to be used on the site because of their thermal properties: Chlorosulfonated Polyethylene-reubfirced (CSPE-R), Ethylene Propylene Diene Monomer (EPDM) and Flexible Polypropylene (FPP). No

other liners will be selected unless approved by the Division.

Where possible the liners will be seamless. Where seaming is performed, the seams will be hot-wedge w/double track weld with a 4-6 in overlap. The seaming will be preformed by a qualified individual.

Power Plant Operations:

During operation of the power plant, up to approximately 2,200 acre-feet of water would be consumed per year for the facility cooling tower operation. Water would be pumped from one or more groundwater wells proposed on private land. Water from the wells would be delivered to the power plant via a buried pipeline adjacent to the access road.

For the operation of the power plant the following two ponds will be constructed:

STRUCTURE	SIZE	FUNCTION
Blowdown Pond (Lined)	250' x 100' x 4' (750,000 gallons)	Retention of Excess Geothermal Water
Evaporation Pond (Lined)	100' x 50' x 4' (150,000 gallons)	Retention of Excess Water

Design and construction of the ponds will be overseen by a Professional Engineer.

3. Leach Fields

There will be no leach fields on the property.

4. Solids Disposal

Drilling mud stored in the reserve pit during the drilling operations will be dried and analytically tested before being buried or hauled to an approved off-site disposal facility. It is not anticipated that drilling mud will have toxic or contaminated constituents. All other solids including sands, sludges, filter, containers, cans and drums will be stored in an on site dumpster and disposed as needed to the local approved solid waste facility. If the geothermal fluid produces a buildup of solids they will be analytically tested and disposed of according to local, state and federal regulations.

CONTAINMENT POND LINERS

No pit dimensions Specified

Approval: BN

Original Issue Date: 04/15/08

Current Revision Date: 08/28/08

PART 1 - GENERAL

1.1. DESCRIPTION

A. Scope of Work:

1. This Specification covers: Part 1 – General, Part 2 – Products, engineering, design, fabrication, inspection, testing, and shipping, and Part 3 – Execution installation of linings may be offered by the Vendor.

B. Definitions:

1. Capacity: US gallons
2. Pressure: Pounds per square inch (PSIG)
3. Buyer: Lightning Dock #1 LLC
4. Owner: Lightning Dock #1, LLC
5. Seller: Vendor, Supplier, Manufacturer, Fabricator or Bidder as hereinafter referred to as Seller. Seller will supply the specified items as required by Part 1 –General and Part 2 – Products of this specification.
6. Contractor: The Owner will provide a Contractor to provide the installation services and interconnecting piping as required in Part 3 – Execution of this specification.

C. Operating conditions:

1. Ponds PP-01, PP-02, PP-03, PP-04, EP-01, RP-01, RP-02, RP-03, RP-04.
   - Number of ponds: Nine
   - Dimensions: Refer to Drawings
   - Capacity: Refer to Drawings
   - Water Temperature: 266 degrees F.
     300 degrees F Spike (upset condition)
   - Use: Receives Geothermal well water. A pond liner is required for each listed pond.

1.2. DESIGN CONDITIONS

A. Refer to specification section 01010 for Project Site Conditions.

1.3. SUBMITTALS

A. Product Data: Include specifications, samples, and reference installations.

B. Installation Detail: For the type of liners proposed.

C. Maintenance Data: For the type of liners proposed.

1.4. QUALITY ASSURANCE

A. In accordance with ASTM tests for thickness, breaking strength, flexibility, tear strength, UV resistance, and adhesions.

1.5. DELIVERY, STORAGE, AND HANDLING

A. Retain shipping protective covers and protective coatings during storage.

B. Protect units against damage during shipment.

C. Comply with manufacturer's rigging instructions for handling.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Lange Containment
2. Watersaver Company, Inc.
3. Firestone
4. Or approved equal.

2.2. GENERAL

A. The liner material shall be:
1. UV resistant
2. Tear resistant
3. Puncture resistant
4. Suitable for water temperatures specified
5. Maintain flexibility in cold weather (-20°F)

B. The minimum liner thickness shall be 60 mil.

C. Provide a geotextile underlayment for the sloped sides of each pond. Side slopes shall be 3 feet (horizontal) to 1 foot (vertical).

D. Where possible the liners will be seamless. Where seaming is performed, the seams will be hot-wedge with double track weld with a 4-6 inch overlap. The seaming will be performed by a qualified individual.

E. The factory assembled units shall be folded and rolled on coves not to exceed a width of 10' 8".

F. Provide an installation plan for each pond lining and label each roll with the membrane type, thickness, dimensions, and an arrow indicating the direction for unrolling.

G. Include the requirements for perimeter anchor trenches. Backfill will be provided by others. The manufacturer shall recommend any intermediate slope anchoring, toe of slope anchoring and/or bottom ballast requirements.

H. Include all adhesives and primers necessary for the installation of the liners.

I. Include the services of a field representative to supervise and provide instruction during the installation and inspection of the linings.

2.3. MATERIALS

A. The following liners have been selected to be used on the site because of their thermal properties: Chlorosulfonated Polyethylene-Reinforced (CSPE-R), Ethylene Propylene Diene Monomer (EPDM) and Flexible Polypropylene (PPF). No other liners will be selected unless approved.

2.4. WORK BY OTHERS

A. Site preparation, including soil compaction, and backfill.

B. Removal of all vegetation.

C. Underlay installation

D. Lining installation including lap seaming

E. Anchoring including ballast, and any recommended intermediate and/or toe slope anchors.

F. Chain link perimeter fencing.

PART 3 - EXECUTION

3.1. INSTALLATION

A. Follow manufacturer's written instructions for written instructions for laying, seam welds and perimeter details, for underlayment and linings.

B. Prepare the pond surfaces to be smooth, dry, free of rocks, roots, vegetation and any foreign material.

C. Survey the ponds prior to the start of installation.

D. Use sand bags as required to hold down the liners in windy conditions.

3.2. ADDITIONAL SPECIFICATIONS

Work shall conform to the appropriate sections of the following specifications.

- 02100 – Site Preparation and Earthwork

END OF SPECIFICATION 443-006-15252

B. Removal of all vegetation.

C. Underlay installation

D. Lining installation including lap seaming

E. Anchoring including ballast, and any recommended intermediate and/or toe slope anchors.

F. Chain link perimeter fencing.

PART 3 - EXECUTION

3.1. INSTALLATION

A. Follow manufacturer's written instructions for written instructions for laying, seam welds and perimeter details, for underlayment and linings.

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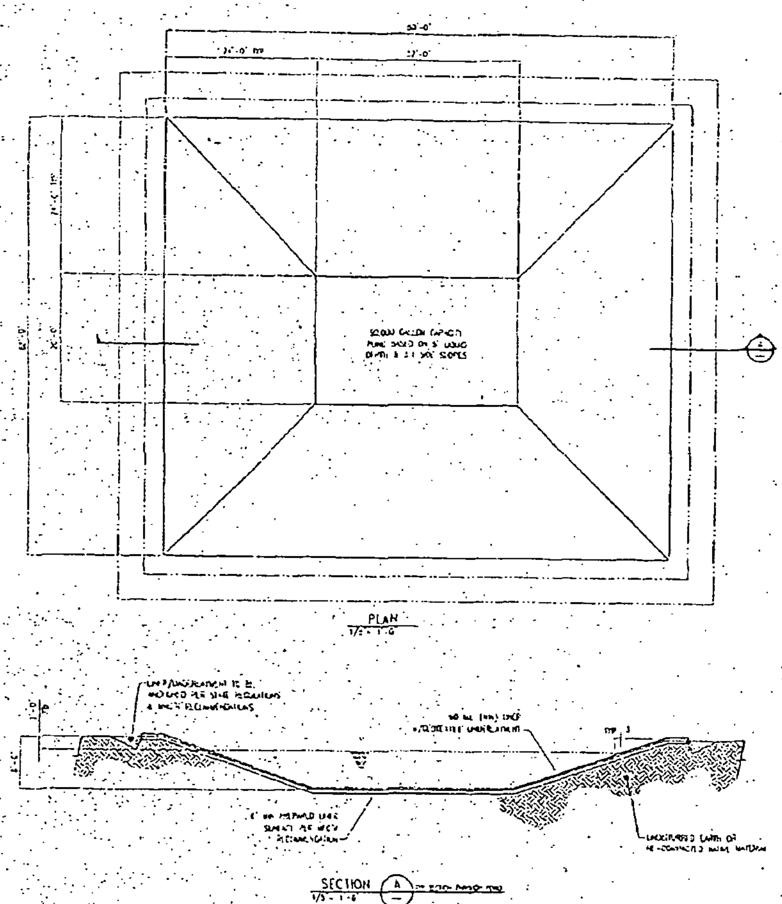
END OF SPECIFICATION 443-006-15252



Cool Tower Daily Oper. Flow Rates:

46,000 GPM – 50,000 GPM

~ 2-4% evap / Cool Tower

66,240,000 gpd – 72,000,000 gpd

1,577,142.86 bbl/d – 1,714,285.7 bbl/d

Project Map pit Dimensions:

Well pits: 80' X 100'

Reserve pits: 250' X 100'

* OCD w/ Concurrence of Operators / Action: Well Test pit to Contain 1 M gal on 5/6/2008. Also, fresh water demand ~1500 gpm & Cool Tower Blowdown ~425 gpm.

NOTES:
1. [illegible]

REVISION	REFERENCE DRAWING	NUMBER	CONFIDENTIAL	

THERMO GEOTHERMAL GENERATING PLANT #1
BEAVER COUNTY, UTAH
90,000 GAL CAP. CONTAINMENT POND
PLAN & SECTION

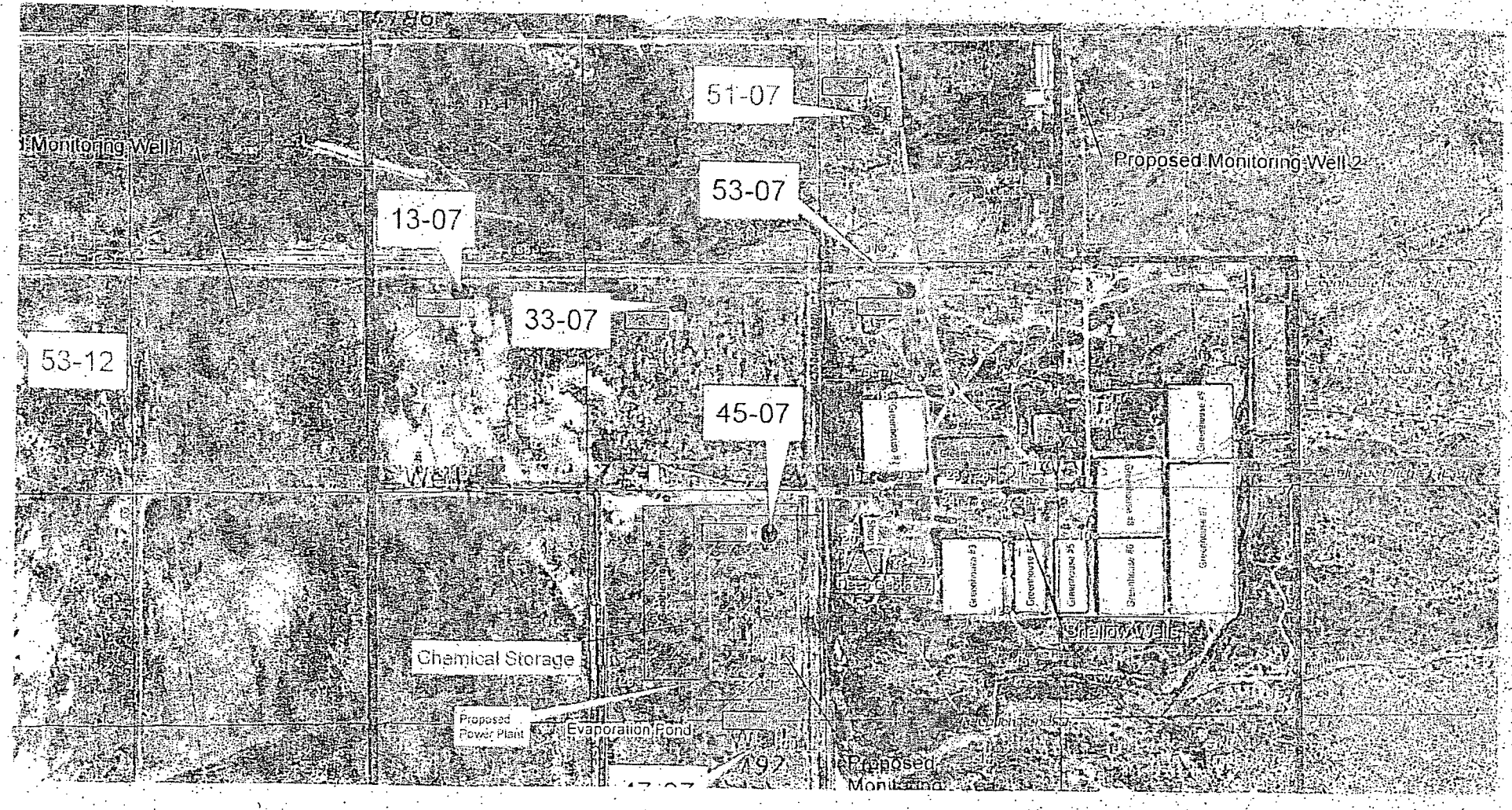
1/8" = 1'-0"

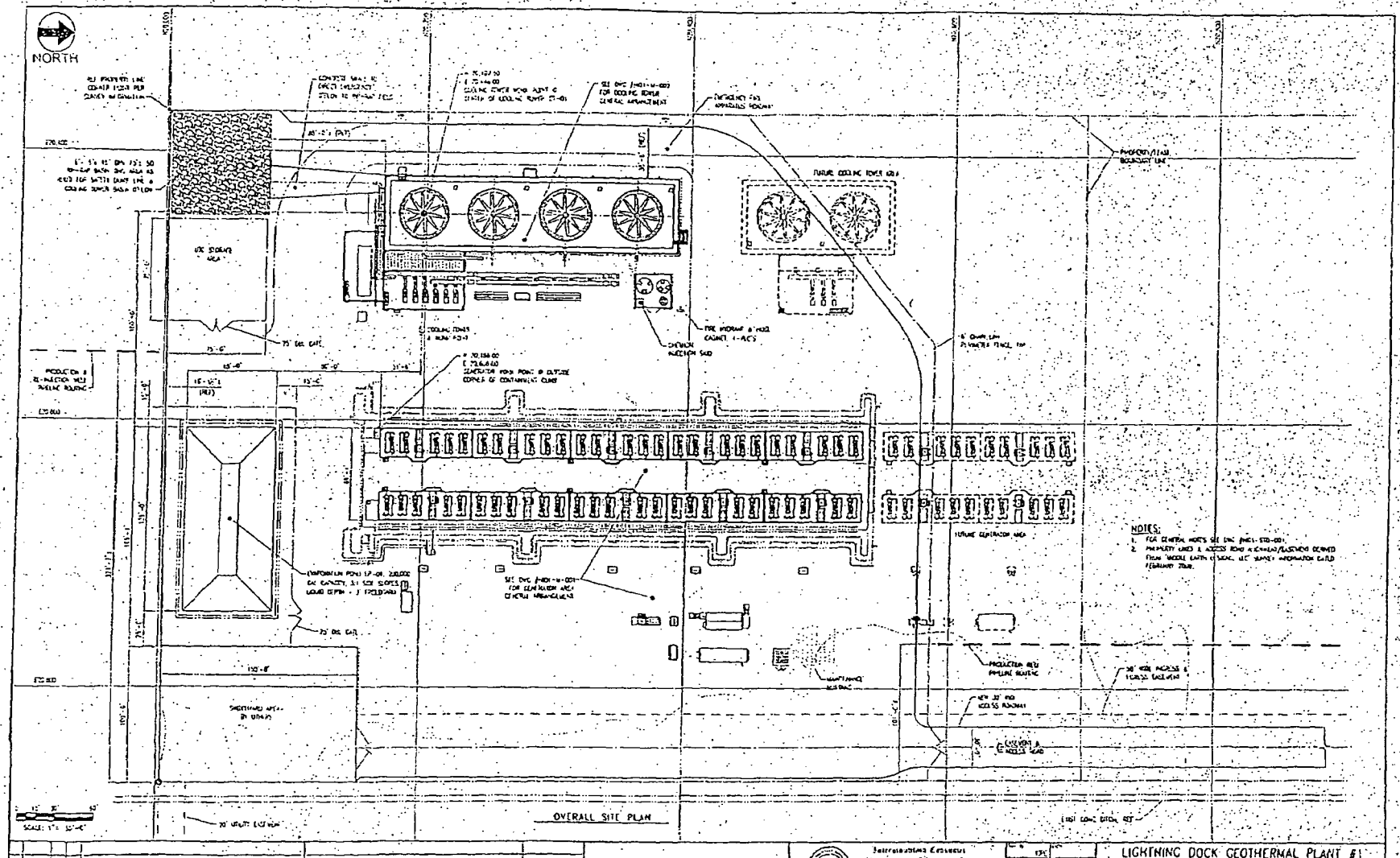
BE01-CV-102 A

TABLE 3
SURFACE WATER MONITORNG SITES

ID#	NAME	UTM Zone 12 NAD27 EASTING"	UTM Zone 12 NAD27 Northing	CHEMISTRY LEVEL I	CHEMISTRY LEVEL II	STRUCTURAL INTEGRITY
13-07	13-07 Well Pit	703484	3558684	Q (while in use)	A (30 days after use)	A
33-07	33-07 Well Pit	703849	3558668	Q (while in use)	A (30 days after use)	A
53-07	53-07 Well Pit	704245	3558698	Q (while in use)	A (30 days after use)	A
45-07	45-07 Well Pit	703987	3558296	Q (while in use)	A (30 days after use)	A
47-07	47-07 Well Pit	704025	3557969	Q (while in use)	A (30 days after use)	A
42-18	42-18 Well Pit	703977	3557204	Q (while in use)	A (30 days after use)	A
53-12	53-12 Well Pit	702640	3558638	Q (while in use)	A (30 days after use)	A
51-07	51-07 Well Pit	704183	3559081	Q (while in use)	A (30 days after use)	A
	Greenhouse Holding Pond #1	704864	3558753			
	Greenhouse Holding Pond #2	704867	3558601			
	Drainage Ditch #1 (East)	704832	3558413			
	Retention Pond #1	704265	3558101			
	Bermed Canal #1	704096	3558570			

FREQUENCY: S = Semi-annually, A = Annually, Q = Quarterly
Monitor Canals at beginning of irrigation season in May and near end in September/October
Monitor Drains quarterly so there are two measurments during irrigation season and two during non-irrigtion season
Monitor Well Pits while in use and within 30 after Pit has been empied


Monitoring Well 1
51-07
Proposed Monitoring Well 2
53-07
13-07
33-07
53-12
45-07
Chemical Storage
Proposed Power Plant
Evaporation Pond
Proposed

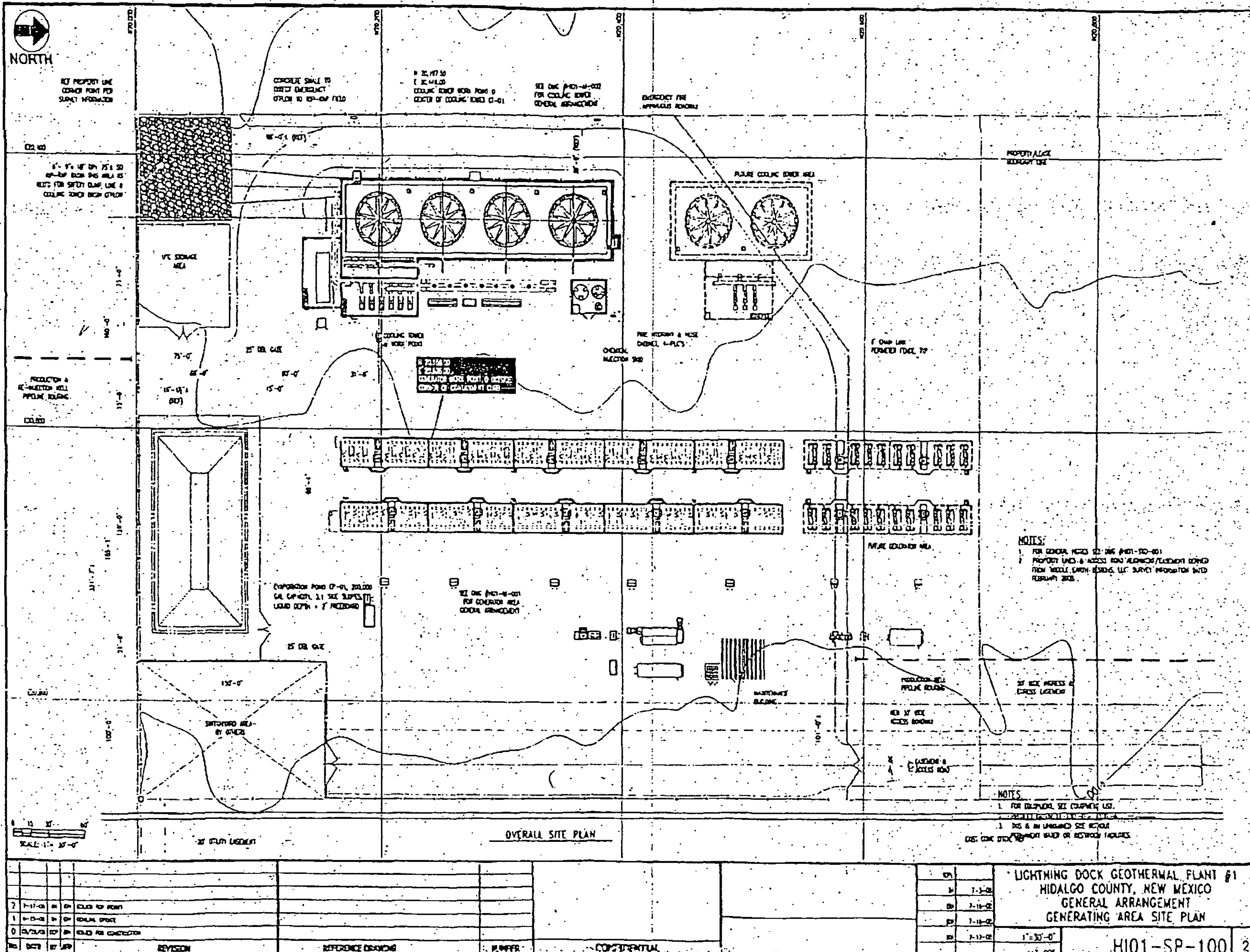


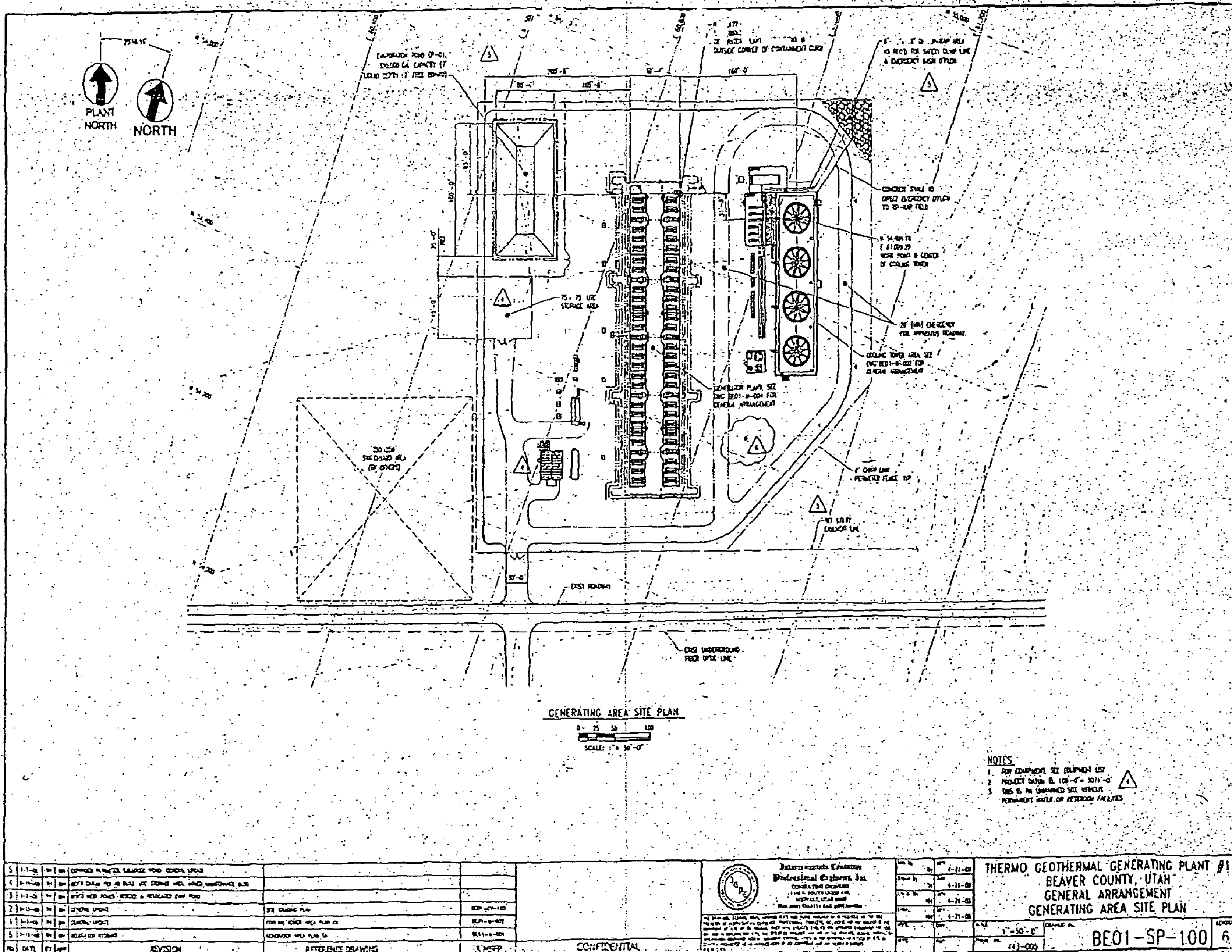
REVISION	REFERENCE DRAWING	NUMBER	CONFIDENTIAL

Intermountain Consultants
Environmental Engineers, Inc.

LIGHTNING DOCK GEOTHERMAL PLANT #1
HIDALGO COUNTY, NEW MEXICO
GENERAL ARRANGEMENT
GENERATING AREA SITE PLAN

HI01-SP-100 | 2


NORTH
OVERALL SITE PLAN
NOTES:
NOTES
LIGHTNING DOCK GEOTHERMAL PLANT #1
HIDALGO COUNTY, NEW MEXICO
GENERAL ARRANGEMENT
GENERATING AREA SITE PLAN
H101-SP-100
2
REVISION
REFERENCE DRAWINGS
CONFIDENTIAL


PLANT NORTH
NORTH
GENERATING AREA SITE PLAN
SCALE: 1" = 50'-0"
NOTES
CONFIDENTIAL
REVISION
REFERENCE DRAWING
THERMO GEOTHERMAL GENERATING PLANT #1
BEAVER COUNTY, UTAH
GENERAL ARRANGEMENT
GENERATING AREA SITE PLAN
BE01-SP-100
6

Chavez, Carl J, EMNRD

From:	Jay Hamilton [hamiltonenviro@yahoo.com]
Sent:	Thursday, December 11, 2008 11:32 AM
To:	Chavez, Carl J, EMNRD; Price, Wayne, EMNRD; Fesmire, Mark, EMNRD
Cc:	Steve Brown; Michael Hayter; Jim Rosser; Brent Cook
Subject:	Re: Lightning Dock - Solid Wastes

Carl,

Thanks, for the information.

Regarding the Reserve and Well pits. It is the intent of Raser to have the smallest footprint as possible for the pits. During the drilling process the Reserve Pit needs to be approximately 250' X 100'. After the drilling and testing has been completed soil samples will be collected of the waste at the bottom of the pit. Raser will dispose of these wastes by meeting all local, state and federal regulations. Depending on the well at each location the Reserve Pit may be modified to meet the dimensions of the proposed Well Pits 100' x 80'. It may become necessary to cover the Reserve Pit because of site conditions and excavate a Well Pit for the site specific needs of the completed well. Please keep in mind Carl the the liner specifications are different for the Reserve and Well Pits. The liner in the Well Pits needs to have a life of 30 years. The final footprint of Well Pit at each location will be 100' x 80' for the life of the well.

On December 5, 2008 an email was forward to Mike Hayter about the OCD's request for a meeting with the geologist. I talked to Mike on Monday or Tuesday of this week, he said that he had called Wayne but did not make contact. He said he would follow-up on calling and talking to Wayne.
I know that Mike considers this meeting extremely important. He will be getting a hold of Wayne in the next couple of days if his has not already.

Please, if there other concerns than the geology make a list and I will address them immediately.

Thanks,

Jay

From: "Chavez, Carl J, EMNRD" <CarlJ.Chavez@state.nm.us>
To: Jay Hamilton <hamiltonenviro@yahoo.com>; "Price, Wayne, EMNRD" <wayne.price@state.nm.us>; "Fesmire, Mark, EMNRD" <mark.fesmire@state.nm.us>; "VonGonten, Glenn, EMNRD" <Glenn.VonGonten@state.nm.us>
Cc: Steve Brown <steve.brown@rasertech.com>; Michael Hayter <Michael.Hayter@rasertech.com>; Brent Cook <Brent.Cook@rasertech.com>
Sent: Wednesday, December 10, 2008 4:40:43 PM
Subject: RE: Lightning Dock - Solid Wastes

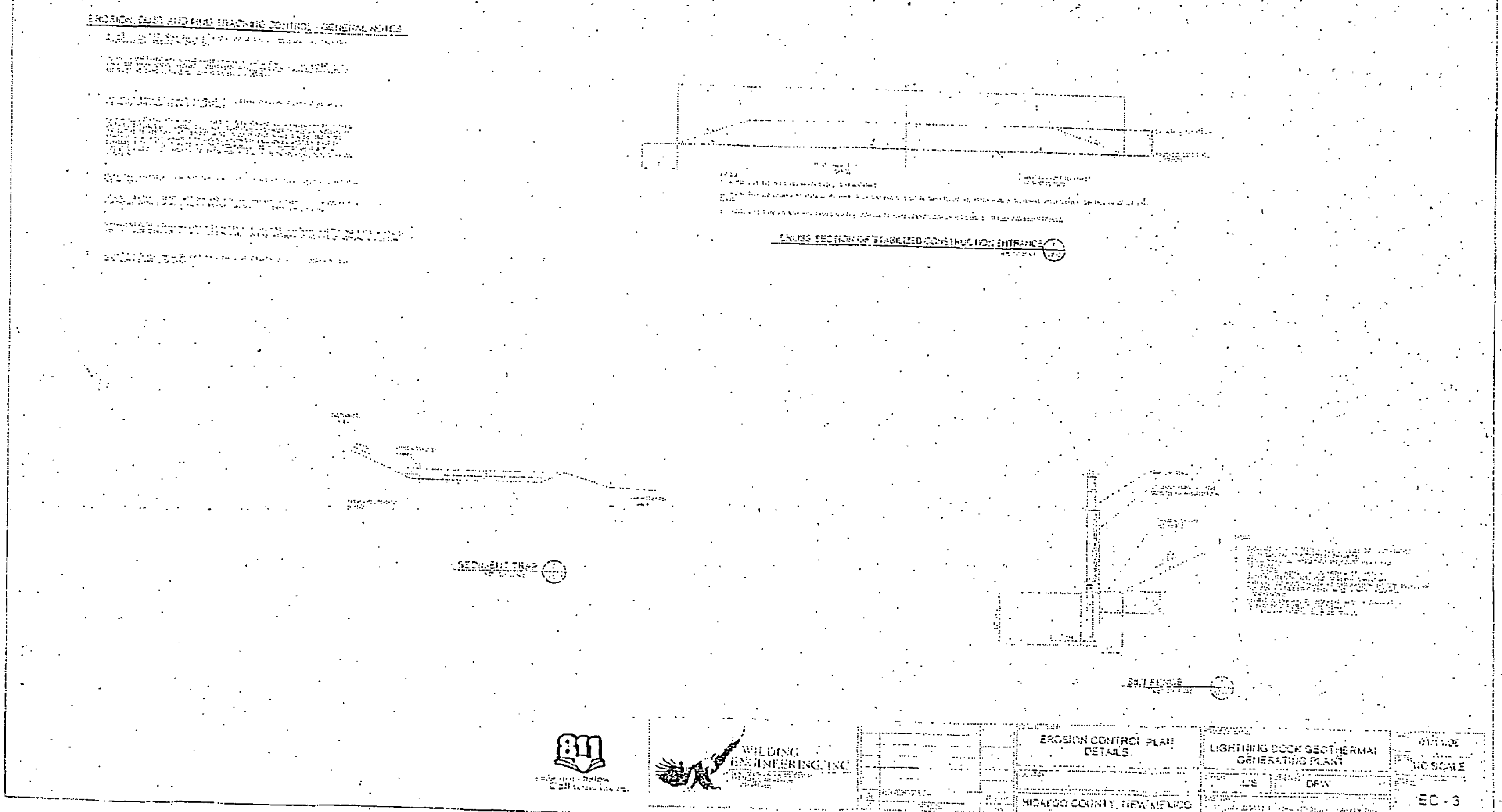
Jay:

Thanks for the clarification on OCD waste concerns. This information was provided to Mr. Nelson (NMED- Solid Waste Bureau) to determine which facilities may accept waste from your facility.

Regarding the reserve pit vs. well pit. I was under the impression one reserve pit would be constructed and used for annual well testing, etc. too. If Raser thinks 2 pits at each well location are needed, this is ok; however, you would reduce your footprint by constructing only 1 pit. Of course, drill cuttings would likely need to be removed from the reserve pit within 6 months of well completion in order to be reused. Think about it.

LIGHTNING DOCK GEOTHERMAL GENERATING PLANT

EROSION CONTROL PLAN DETAILS



I have drafted a list of items from the hearing that the OCD needs to discuss with Raser's and AmeriCulture's experts. Mr. Wayne Price sent out an e-mail requesting a meeting to discuss the facility with our Senior Hydrologist, Mr. Glenn von Gonten. Wayne will be back next week, but he was hoping to hear back from Raser and AmeriCulture to facilitate a meeting to discuss draft items in an agenda and any hydrologic details that Mr. von Gonten raises. Let me know if I need to resend Wayne's e-mail from last week requesting a meeting. If not, please respond to the e-mail with a proposed date and time for meeting where we can meet in person to discuss here in Santa Fe or perhaps and telephone conference call may suffice?

Thank you.

Carl J. Chavez, CHMM
New Mexico Energy, Minerals & Natural Resources Dept.
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Dr., Santa Fe, New Mexico 87505
Office: (505) 476-3491
Fax: (505) 476-3462
E-mail: CarlJ.Chavez@state.nm.us
Website: http://www.emnrd.state.nm.us/ocd/index.htm
(Pollution Prevention Guidance is under "Publications")

From: Jay Hamilton [mailto:hamiltonenviro@yahoo.com]
Sent: Wednesday, December 10, 2008 2:15 PM
To: Chavez, Carl J, EMNRD; Price, Wayne, EMNRD; Fesmire, Mark, EMNRD
Cc: Steve Brown; Michael Hayter; Brent Cook
Subject: Fw: Lightning Dock - Solid Wastes

Carl

Thanks, for your input regarding OCD's concerns with the handling of solid wastes that may be generated at the Lightning Dock facility.

Please refer to the original submission of the Plan of Operations dated February 1, 2008, where Raser Technologies outlined "Methods of Waste Materials" and April 21, 2008 when the "Discharge Plan Application for Brine Extraction" was submitted to the OCD. Refer to the following sections in the Discharge Plan Application for details:

- Type and Quantities of Fluids Stored or Used at the Facility
- Transfer, Storage and Disposal of Fluids and Solids
- Solid Disposal
- Off-site Disposal

I believe this information should address your concerns.

A local waste contractor will provide a disposal container and serve the disposal needs for Lightning Dock. After construction of the facility, the plant will generate very limited amounts of solid waste in the form of paper, rubbish, etc. The plant will be in operation 24/7 but will be manned by only 2-4 employees.

We believe as does OCD the possibility exists that some some geothermal waste may need to be hauled off-site and disposed of according to local, state and federal regulations and with the approval of OCD (see "Discharge Plan Application for Brine Extraction"). Raser understands some solid wastes may need to be hauled to an

adjoining county or state. Raser will identify a landfill that will fulfill their disposal needs and meet local, state and federal regulations.

At each site where Raser Technologies has completed geothermal drilling, geothermal reservoirs have had varied fluid chemistry. At each location drill cuttings and geothermal fluids have been dried, tested and met local, state and federal regulation and were approved to be closed in place with no hauling required.

Raser understands at the Lightning Dock site geothermal fluids chemistry has not yet been determined at the proposed drilling depths.

As stated in the previous documents, Raser will collect geothermal fluids at the appropriate depths and have them analyzed for the chemical constituents of concern. Raser will then dispose of the drill cuttings and geothermal fluids in a manner that meets local, state and federal regulations and only with the approval of the OCD.

In the large site map presented to OCD the Lightning Dock site shows a Reserve Pit and Well Pit at each well location. The Reserve Pit (approx. 250' x 100') is used during the drilling and testing process and will be closed after the process is completed. The Well Pit (100' x 80') is used to supplement the operation of the well. If during maintenance, testing or replacement of well components the well needs to shut down it may be necessary to drain the piping into the Well Pit. The Well Pits will be monitored during the life of the well. The Reserve and Well Pits will be constructed and lined according to the pond construction detail and pond liner specifications as presented to OCD in the supplemental information dated August 1, 2008.

Carl, I talked to Mike and he mentioned that during the hearing OCD stated there were some concerns they would like to have addessed before the final permit approval. Would you gather those concerns in a list and forward them on to me. I will get the information to you in the next week.

Thanks,

Jay

Chavez, Carl J, EMNRD

From: Gum, Tim, EMNRD
Sent: Tuesday, May 06, 2008 2:28 PM
To: Chavez, Carl J, EMNRD
Cc: Price, Wayne, EMNRD; Gum, Tim, EMNRD
Subject: RE: APDs & OCD Approval Lightening Dock Geothermal No. HI-01 (Hidalgo County)

Carl,

We have not received any APD's as of this date.

Has there been a change in procedure ? District II has never approved Geothermal wells up to this point.

Please advise.

TWG

From: Chavez, Carl J, EMNRD
Sent: Tuesday, May 06, 2008 9:11 AM
To: Gum, Tim, EMNRD
Cc: Price, Wayne, EMNRD; Jones, William V., EMNRD; Jay Hamilton; Phillips, Dorothy, EMNRD
Subject: APDs & OCD Approval Lightening Dock Geothermal No. HI-01 (Hidalgo County)

Tim:

Good morning. I inspected the power plant facility location on 5/1/08 w/ Jay Hamilton (Los Lobos) & Jim Rosser (Raser Geothermal Engineer). Jay informed me that the APDs for the wells were mailed to you at the facility. Lightening Dock needs to register very soon as an operator in NM at http://www.emnrd.state.nm.us/ocd/FAQs.htm#OpHow to receive an OGRID number for bond tracking, etc. from Dorothy Phillips (Bond Coordinator) at (505) 476-3461 for the geothermal development or production wells. Dorothy please create note in file that geothermal wells can only be authorized to be plugged by the Environmental Bureau in Santa Fe. It is an online process. Once the APDs are approved and API#s are issued, the previously discussed bonds (WQCC) for the injection wells will need to be procured by the owner/operator and submitted to me in Santa Fe. The bonds (single & multi-well) for the development or production wells may also be sent to me and I will coordinate with Dorothy to file and track bonds for geothermal development/production wells. Remember that API# should be referenced on the bonds and the OCD should only receive the original or duplicate original of the bonds for our files.

OCD AOR & Well Info. for APDs for your consideration of the APDs below.

Development/Production Well (5) Flow Rates ~ 3000 gpm per well (estimated total ~15,000 gpm)
Injection Well (3) Rates ~ Unknown at the time of the inspection (Raser contends that injection pressure regulation is a moot point for fractured reservoirs). OCD estimates ~ 5500 gpm per well (estimated 16,500 gpm)
Fresh Water Demand ~ 1500 gpm
Cooling Tower Blowdown ~ 425 gpm

The OCD's Area or Review of ½ mile radius from all proposed geothermal resource wells conducted by the OCD Engineering Bureau concluded that no wells exist that lack cement in the proposed geothermal reservoir. Based on the facility (20 acre x 20 acre) location and geologic information provided by Los Lobos (see attachment), the OCD Environmental Bureau is deferring to OCD District 2 (Artesia) approval with any conditions for the 3 injection wells and 5 development or production wells set in the Horquilla Formation (suspected fractured limestone between intrusive volcanics) to an estimated depth of 3400 ft. bgl. with reservoir temperatures at 250 – 300 F. However, I am a little puzzled by page 5 of the attachment, which displays multiple production zones from 2500 – 3100 ft. and from 3600 – 4008 ft. bgl. During the inspection, I was under the impression that the geothermal

reservoir was the Horquilla Formation? Jay could you please respond to this? Based on page 5, the production wells appear to open to formations above and below the Horquilla Formation.

Los Lobos and Raser were informed that cement would be required from top to bottom and they are planning to pressure up on all drilling strings during the course of drilling operations to test integrity during the well construction process. There may be an issue with the structural integrity of the formations based on structural integrity of lithologies, potential blow-outs and detection of H2S during and after drilling, and Los Lobos is aware of this. The question of where to set the casing shoe came up? I think the casing shoe should be set above any fractured zones near the geothermal reservoir, but it is OCD District 2 decision on approval of APDs with conditions. Tim could you please send me the signed APDs for the online file when or if you approve the APDs? Raser explained that regulation of injection pressure is a moot point for highly fractured reservoirs that are required for geothermal reservoirs. Consequently, the EPA 5 Yr. MIT at minimum 600 psig for 30 minutes and after workovers is planned for the OCD discharge permit.

Other Issues:

Large evaporation ponds for conducting geothermal well tests (liners with good thermal characteristics should be considered). A presentation on pits rule suggestions was e-mailed out to Los Lobos earlier this morning for consideration. Los Lobos had proposed a couple of ponds in the facility process area (one was for cooling tower blow down ~425 gpm), but since the cooling tower is not closed-loop and chemicals are needed to prevent scaling of the unit, Los Lobos is looking at options (i.e., biodegradable chemicals, treatment before injection, injection into the geothermal reservoir, and disposal into a deeper formation). If Los Lobos drills with reserve pits, the land disturbance will be much greater. Then they will still need a very large pit(s) (> 1 M gallons for well testing). They had not considered this in their process area diagram.

Onsite/Offsite Disposal of Drill Cuttings?

Los Lobos is working to procure water well drilling rights to consider installing a freshwater well within its facility process area. Although, there are several freshwater wells that are already drilled that could be upgraded to provide freshwater at the site; however, are located outside of its facility process area.

Tim, Los Lobos Contact Info. is provided below.

Jay Hamilton

Hamilton Environmental, L.L.C.

485 West 1400 North

Orem, Utah 84057

Office (801) 224-4585

Fax (801) 224-1893

Cell (801) 361-2102

e-mail hamiltonenviro@yahoo.com

I am working on a final e-mail with action items for the "Administrative Completeness" determination and other issues identified during the facility inspection. I hope to send this out Wednesday, but it appears that much of the info. discussed during the facility inspection was submitted by Los Lobos. There will need to be some revisions to the reports to include H2S for equipment, emergencies, etc., binary cycle power plant specs in the equipment list, etc. Please contact me if you have questions. Thank you.

5/21/2008