California Regional Water Quality Control Board, Colorado River Basin
Prosecution Team Evidence
on the matter of
Administrative Civil Liability Complaint R7-2014-0041
Exhibit 33

HERON INNOVATORS
The Clear Advantage
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Mr. Doug Wylie, PE
Senior Water Resources Control Engineer
Colorado River Basin
Regional Water Quality Control Board
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

May 29, 2012

Dear Mr. Wiley

SUBJECT: NATIONAL BEEF CALIFORNIA, LP. REPORT OF WASTE DISCHARGE: RESPONSE TO RWQCB REQUEST FOR ADDITIONAL INFORMATION DATED JANUARY 26, 2012.

Pursuant to the California Regional Water Quality Control Board's (Board) letter dated, May 27, 2011, National Beef California, LP. Brawley (NBB) Submitted a Report of Waste Discharge (dated June 28, 2011). The ROWD detailed the following based on the Board's request:

- A complete wastewater flow diagram showing various process streams through the pre-treatment ponds including disposal of wastewater from the ponds through the City Sewage Collection System
- Physical, Chemical and Biological Characteristics of each waste stream
- Average and maximum daily flows and volumes of each waste stream
- Description of the site disposal methods for the above-mentions wastes including their design criteria

After review of the ROWD, the Board issued a letter dated, January 26, 2012, requesting additional information. The Request established a response deadline of February 29, 2012. Upon assessment of the scope required for response a request for extension to 5/31/12, was submitted to and approved by the RWQCB.

Enclosed are responses to those items detailed in your January letter. The Board's specific requests for additional information are numbered and provided in bold text, with National Beef's answer(s) following in normal text and attachments.

M. Dave Rickard

M. Dave Rickard PE
Registration Number C-24237

C: Brain Webb; General Manger– National Beef
Dave Kalscheur; VP Engineering – National Beef
Bud Ludwig; Director Environmental Affairs – National Beef
John Barsotti – Heron Innovators, Inc.

1. ***"National Beef Company (NBC) provided a flow diagram and identified the waste streams generated. However, it did not provide design criteria for any of the treatment units. NBC must provide the design criteria for all of the wastewater treatment units at your facility."***

Process Flow Sheets

The plant as configured prior to mid 2011 is shown in Figure 1 in block diagram.

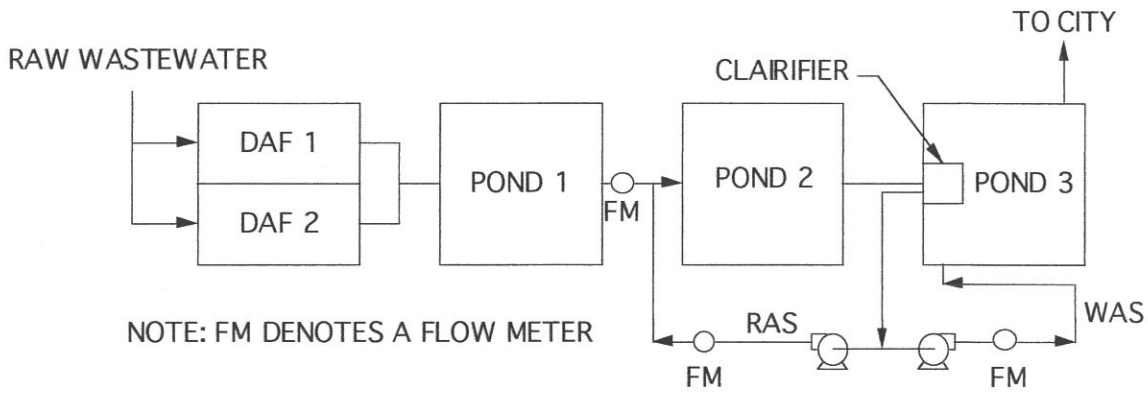


Figure 1
Previous Flow Schematic

Mixed liquor from aerated Pond 2 was discharged to a small clarifier inset into pond 3. Treated Effluent discharged to the City Collection System by overflowing a standpipe located in the southwest corner of Pond 3. The original design allowed for the disposal of Waste Activated Sludge (WAS) into the northwest corner of pond 3. Pond 3 basin was thought so large that it could absorb many years of WAS prior to being dredged. This practice proved unsustainable, and WAS storage in pond 3 began to impact water quality; resulting in elevated levels of BOD, suspended solids and ammonia being discharged to the city sewer system, often in excess of discharge standards.

A number of repairs to the system were completed by October of 2011 that largely corrected the situation with regard to Pond 3 as well as other parts of the system. The major changes include:

- The inset clarifier in Pond 3, was removed and replaced by sectioning off a portion of Pond 3 with sheet piling and installing a sludge removal header. WAS/RAS is now collected from the bottom of this "clarifier" called Pond 3A.
- The clarified outfall from Pond 3A is collected in another sectioned off part of the old Pond 3 called Pond 3B. The partially clarified water from Pond 3B is pumped to a flotation cell (Suspended Air® Flotation/SAF) for final treatment. The pump transferring water to the SAF is operated in a manner which allows for level control of ponds 1, 2, 3A, 3B.

- The SAF system polishes the clarified effluent from Pond 3B, removing the last of the Suspended Solids and Insoluble BOD.
- Solids from the SAF and WAS are pumped to a holding tank and fed to a belt press. The press increases the percent solids content from about ~1% to ~20%. These solids are hauled in a covered trailer and submitted for composting to a properly permitted facility, or taken to landfill.
- The remaining section of the old Pond 3 is called Pond 3C. It only receives filtrate water from the press and water is no longer discharged to the City Collection System via this pond; nor is WAS fed to the pond for storage.
- The line between Ponds 1 and 2 was increased from 8" to 12" to permit better control of the level of Pond 1.
- The flow meter between Ponds 1 and 2 has been bypassed and new meters installed which measure the flow into the DAF units and the flow exiting to the City sewer from the SAF unit.

A block diagram of the overall system as it is now configured is shown in Figure 2.

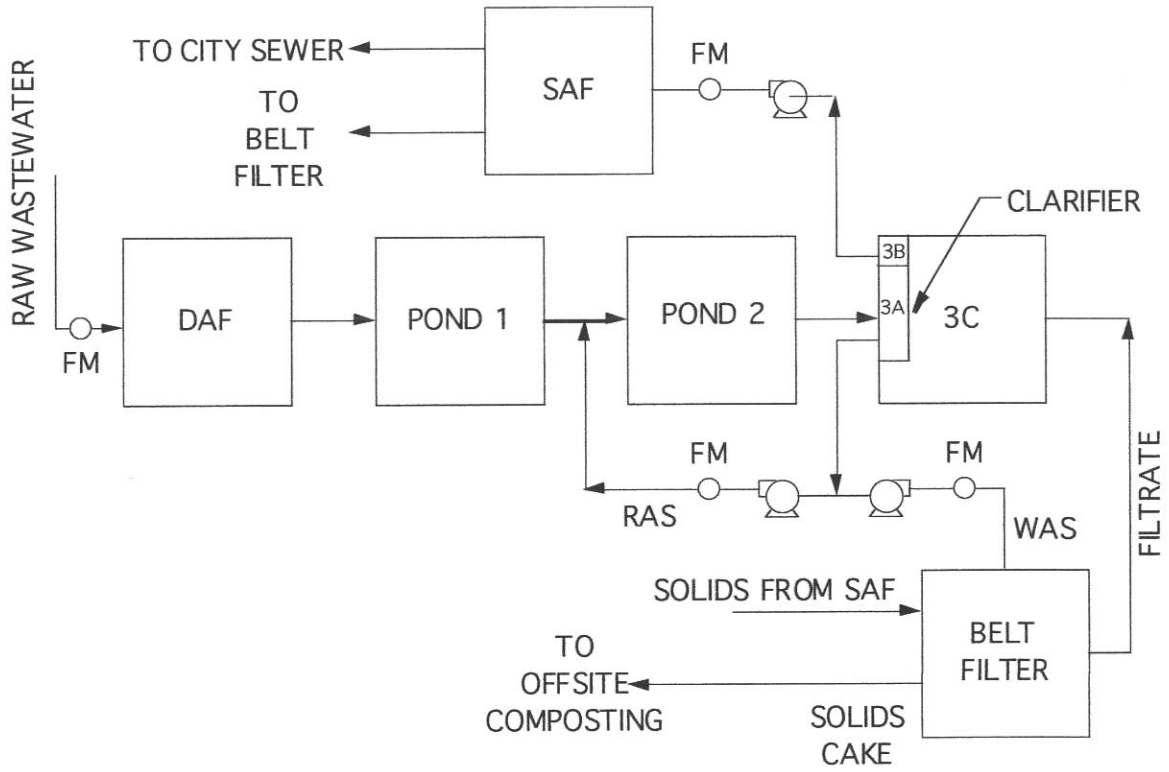


Figure 2
Current Configuration of the National Beef
Pretreatment system

Appended to this letter as Attachment I is a more detailed flow sheet for the Wastewater pre-treatment system as it is currently configured. Table 1 shows the impact of these repairs on the levels of BOD, suspended solids and ammonia released to the City Collection System.

Parameter	Limit	March 2011 – September 2011	October 2011 – April 9, 2012	Percent Removal
BOD – (Mg/L)	250	127.5	55.3	57
TSS – (Mg/L)	250	518.5	60.3	88
NH_3 – (Mg/L)	30	51.0	22.2	56

Table 1
Impact of System Improvements
On Performance

The system as now configured has greatly improved the quality of discharged water. The system is now meeting/exceeding City requirements regarding BOD and suspended solids and has experienced only a relatively few exceedances, nearly all for ammonia.

Next Steps

- The re-circulation of water from northwest/discharge end of pond 2 to the southeast /influent end of pond 2. This action will increase mixing and serve to average BOD loading rates across the pond.
- Filtrate from the Belt-press re-routed from Pond 3C to the SAF™.
- Pond 3 will be gradually dewatered via evaporation and using the excess capacity of the belt press. Once dry the pond will be cleared of all settled debris and used as a storage basin for the 20% solids waiting transport to approved disposal facilities.
- Initiate a design study to evaluate the need for increasing aeration/oxygen transfer in pond 2

Unit Process Design Criteria

Unit Process	Process Description
1. Dissolved Air Flotation o Number – 2 Units o Dimensions – 12' x 52' o Flotation Area – 1248 ft^2 ° Hydraulic Loading – 0.84 GPM/ ft^2 o Air to Solids Ratio – 0.02Lbs/Lbs	For removal of FOG and settle-able solids from the wastewater prior to entering the anaerobic digester. Primarily for the purpose of recovering tallow (Fats) from the wastewater.
2. Anaerobic Pond 1 o Bottom Dimensions – 200' x 600' o Side Slopes – 3:1 o Working Depth – 11' o Volume at Mean Depth – 12.1 MGal o Retention Time – 8.1 Days o Organic Loading – 15.1 Lbs (BOD)/1000ft^3	Provides for anaerobic digestion of organic materials. Generates Bio-gas for consumption in plant boilers.
3. Aerobic Pond 2 o Bottom Dimensions – 270' x 100' o Side Slopes – 3:1 o Working Depth – 11' o Volume at Mean Water Depth – 2.2 MGal o Hydraulic retention Time – 1.5 days o Organic Loading – 22.5 Lbs (BOD)/Kft^3 o MCRT – 8.3 days o Aerators – 13 total; 8-40HP / 5-75HP o Actual O_2 Transfer Rate (AOTR) – 312 Lbs/hr	Provides for aerobic digestion of organic materials. Systems for Returning Activated Sludge (RAS) and Wasting Activated Sludge (WAS) are used to manage solids levels in the pond. Adjustments are made utilizing daily process monitoring results for settle-able solids, Suspended Solids, Dissolved Oxygen, and Ammonia
4. Pond 3A o Dimensions – 50'x 29' o Hydraulic Loading – 380 gal/day/ ft^2 o Depth – 11' o Side Slope – 3:1	Clarifier for pond 2 discharge. Solids removed from the bottom using collection tubes. RAS/WAS rates adjusted daily based on Pond 2 parameters. WAS no longer sent to Pond 3, but to a belt press for thickening and subsequent disposal.
5. Pond 3B o Dimensions – 50'x 86' o Depth – 11' o Side Slope – 3:1	Receives clarified overflow from pond 3A. Water levels in Ponds 1, 2, 3A, & 3B are maintained via a pump removing water from 3B and sending for final polishing to the SAF™
6. Pond 3C o Dimensions – 333'x 333' o Bottom Dimensions – 267' x 267' o Depth – 11' o Side Slope – 3:1	Prior to the plant upgrade pond 3C received all the plant treated water, acted as a storage basin for WAS deposition and a settling basin for final clarification of water that had passed through an inset baffle clarifier. Water would overflow a stand tube located SE corner of the pond and be discharged to the Brawley POTW. Today only filtrate waters from the belt press enter this pond and evaporation rates are sufficient to not allow any discharge from the pond to the City. This pond will be totally abandoned soon and used solely for the temporary storage of solids generated after the belt press
7. Suspended Air® Flotation / (SAF™) o Dimensions – 15' Diameter o Flotation Area – 177 ft^2 o Hydraulic Loading Rate – 5.14 gpm/ ft^2 o Maximum Hydraulic Loading Rate – 10 gpm/ ft^2 o Air to Solids Ratio – 0.5 Lbs/Lbs	Used for final clarification of water pumped from Pond 3B. Filter Press Filtrate will be re-routed to this treatment process stopping all discharge to Pond 3C. Skimmed solids from this process are pumped to the belt press for final thickening. Treated water from the SAF™ discharges to the Brawley POTW.
8. Belt Press o Belt Width – 6' o Rated Flow Rate – 200 gpm o Solids Cake Solids – 20%	WAS and SAF™ solids are pumped to this operation and thickened to ~20% solids. Currently these solids are sent to a composter; an approved disposal facility or to landfill.

2. NBC provided some chemical data for the Dissolved Air Flotation (DAF) unit and Pond 1 (of 3 ponds). However, it did not provide wastewater analyses for the individual or composite waste streams (influent to the pre-treatment system). NBC must provide the typical physical, chemical, and biological characteristics of each waste stream generated by the plant.

Wastewater Characteristics

Wastewater characterization is an on-going activity at the National beef facility with approximately biweekly samples being taken for analysis at each of the sample points shown in Attachment I. The results of the analyses of these samples are shown in Attachment II. A summary of these results is given in Table I below (Average Concentrations shown in Mg/L). Note: "Raw Waste" and "SAF Effluent" are data from 24 hour composite samples; while data shown from other locations are from grab samples collected randomly during the day.

The composite samples should be representative of the actual daily waste production and discharge while the grab samples likely overstate constituent concentration(s) (this is due to all of the grab samples being collected during the workday where loadings are highest; nighttime conditions would normally show significantly lower loading).

Parameter	Raw Wastewater (Composite)	DAF Effluent (Grab)	Pond 1 Effluent (Grab)	Clarifier Effluent (Grab)	SAF™ Effluent[1] (Composite)
BOD	6009	5174	1476	250	49
sBOD	n/a	917	520	n/a	n/a
TOC	2589	1704	621	147	32
sTOC	n/a	518	240	26	23
TSS	2964	2177	737	414	48
VSS	n/a	2107	n/a	n/a	n/a
TDS	2082	n/a	n/a	n/a	n/a
TKN	133	151	120	n/a	32
Ammonia	91	111	103	n/a	27
O&G	708	696	34	9	8
VFA	599	460	548	n/a	n/a
Alkalinity	347	369	511	n/a	371

[1]Sample point downstream of the last wastewater treatment process and immediately upstream of the City Compliance Monitoring Point

Table 3
Average Concentrations of
Wastewater Constituents (Mg/L)

The total potable water usage by the facility during the period from November 2, 2011 through March 18, 2012 averaged 1,858,695 gallons per day (See Attachment III). A portion of this water would be used for sanitary facilities that are separately sewered, landscape irrigation, etc. and would not show up

as process wastes. Process wastewater flow, as monitored by flow meter A in attachment 1, for the same period averaged 1,343,558 gallons per day. A close inspection of the entire facility indicates a few other streams that discharge to the pond system without being monitored by the influent flow meter were identified as shown in Table 4.

Source	Daily Flow gpd	Description
Iron Sponge Cooling Water	24,000	Cotains Sulfides, No Organics
Cattle Pen Wash Water	2,500	High BOD and Suspended Solids
R.O. Brine	42,000	Elevated TDS, No Organics
Boiler Blowdown	28,800	Contains Boiler Water Additives, No Oraganics
Centrifuge Wash Water	43,000	High BOD and Suspended Solids
DAF Wash Water	5,000	Low BOD and Suspended Solids
Hot Water Tank Overflow	100,000	Potable Water
Cattle Pen Misters	36,000	Similar to Cattle Pen Wash Water

Table 4
Additional Water Discharging to Pond 1

Contributions by these sources increased the reported flow to into Pond 1 to an average of 1,624,858 gallons per day.

3. The report details the quantity of sludge generated. Although the report states that about 1.5 MGD is discharged to the City of Brawley collection system, it does not quantify the individual internal waste streams. NBC must provide flow volume data for all internal waste streams generated from each process.

The flows internal to the wastewater treatment system are shown in Attachment IV.

4. Form 200:
ROWD was to address discharges to ponds. "Land Treatment Unit" and "Industrial Process Wastewater" should also be indicated.

Per our conversation, please make the appropriate changes to the Form 200 to reflect best, the current operation at National Beef, Brawley.

5. Form 200:
V. California Environmental Quality Act (CEQA). The City of Brawley is indentified as the Lead Agency. NBC states that a public agency has not determined the project to be exempt from CEQA and then on the next line states that "UPGRADE OF EXISTING TREATMENT SSYTEM" is the basis fro exemption. NBC must provide documentation that the project has been determined to be exempt from CEQA by the City of Brawley.

The original facility was constructed under a mitigated negative declaration prepared by the City of Brawley. This document has been furnished to the Board under separate cover and applies to the current Plant operation(s).

6. The ROWD is also required to contain a hydro-geologic analysis showing infiltration/evaporation rates, analysis of the soils beneath the waste disposal ponds, depth to groundwater, a water balance for the ponds and an analysis of the existing groundwater quality. Furthermore, State Water resources Control Board (State Water Board) Resolution No. 68-16 (Anti-degradation Policy) requires the Regional Water Board to demonstrate that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than as described in plans and policies. NBC is required to submit an anti-degradation analysis summarizing the affects of wastewater discharges from the facility on receiving waters.

In 2008, the Colorado River Basin Region WQCB issued Order No. R7-2008-0032 (Attachment V), which established waste discharge requirements for OR 17, LLC and documented the local hydro-geologic conditions of the Brawley area. This order established that the local groundwater is at a depth of 10' with flow to the northwest towards the Salton Sea. The reported TDS of this water was from 10,000 to 20,000 mg/l. Soil analysis during the construction of the existing Brawley facility reported that the soils, in the vicinity and beneath the ponds are a clay or stiff clay. This would indicate a low permeability and hence limited exchange of water between the ponds and the local groundwater (See water balance below).

The implemented repairs and those now being planned at the wastewater treatment plant, will not result in any change in wastewater production or quality. Nor will they change the potential for wastewater exchange with the local groundwater. Their major impact will be an improvement in the quality of the wastewater discharged to the City of Brawley sewerage system. This coupled with the apparent limited beneficial uses of the groundwater due to its salinity reported in the mentioned Board Order, indicates that no significant degradation of receiving waters will result.

Average monthly precipitation and pan evaporation data was obtained from Brawley Weather Station 2 as shown in Attachment VI. This Attachment also shows the calculations performed to determine the average water added to Pond 2 by rainfall and average water loss by evaporation during the months for which wastewater flow is presented in Attachment III

A water balance prepared from these data for Pond 2 follows:

- Metered process wastewater flow entering the system = 1,343,558 gallons/day
- Estimated non metered flow entering the system (Table 2) = 281,300 gallons/day
- Total wastewater to Ponds = 1,624,858 gallons/day

Net gain/loss from Evap./Prec. = 3,615 gallons/day (Attachment 5) gal/day

- Total Water to Ponds = 1,628,473 gal/day
- Total Water to City of Brawley = 1,615,716 gal/day
- Difference (Water loss) = 12,757gal/day = 8.8 gpm

The water balance provided above accounts for 99.2% of the water entering the system.

Note: that the reported accuracy of these flow meters at the average flow is between 1 and 1.5 percent or 9.33 and 13.9 gpm. The 8.8gpm calculated difference reported above between measured waters entering into the plant vs. that measured being discharged from the plant is well within the meter tolerance/error.

LIST OF ATTACHMENTS

I. Detailed Process Flow Sheet

II. Waste Water Characteristics

a) Untreated Process Water

b) DAF Discharge to Pond 1

c) Pond 1 Discharge to Pond 2

d) Clarifier (Pond 3B) Discharge to SAF™

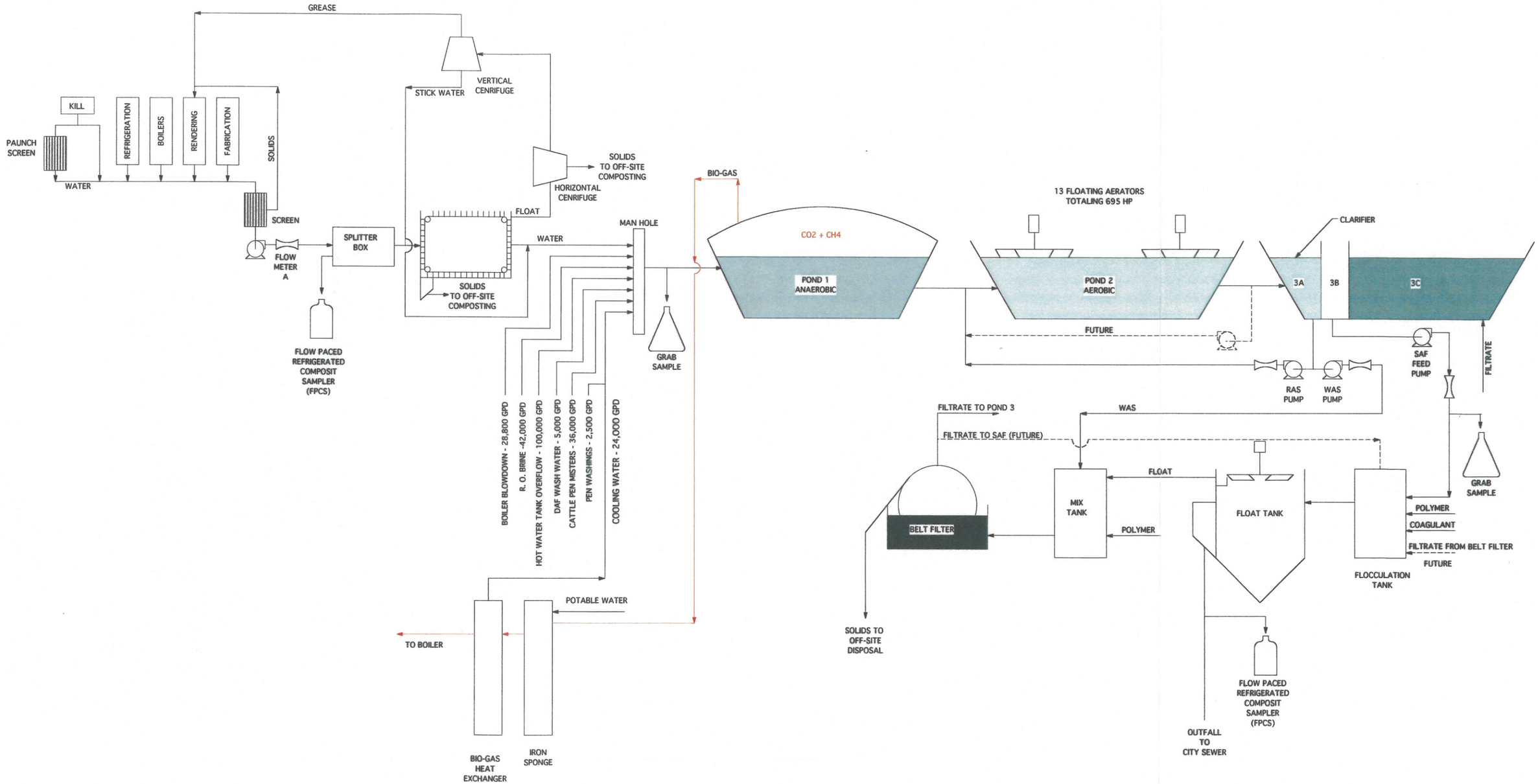
e) SAF™ Discharge to City

III. Water and Wastewater Production

IV. Wastewater Treatment System Internal Flows

V. Local Ground Water Quality

VI. Calculation of Precipitation and Evaporation from Pond 2



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ATTACHMENT 1
DETAILED PROCESS FLOW SHEET

NATIONAL BEEF
57 SHANK ROAD
BRAWLEY, CA

Attachment IIa - Waste Water Characteristics

Untreated Process Water

Date	BOD	TOC	TSS	TDS	TKN	NH4	O&G	TFA	Alk	pH
5/25/11	6675	876		1860	53.2	106.4	422	214	700	8.86
6/1/11	5700	2170		2048	80.64	39.2	499	536	600	7.01
6/22/11	3810	1630	1592	1820	212.8	78.4	731	454	300	9.05
6/29/11	11,000	3790	4750	1255	296	212.8	971	763	300	7.23
7/7/11	4410	3540	1754	1912	117.6	61.6	433	529	400	9.24
7/14/11	12,000	4170	3490	3208	140	78.4	935	1140	400	6.54
7/21/11	1380	2250	868	1756	78.4	44.8	291	407	300	8.91
7/28/11	3900	1050	1964	1510	218.4	117.6	226	813	300	8.04
8/4/11	4110	2000	2060	1742	162.4	95.2	271	606	1000	7.48
8/11/11	3070	1190	1316	2166	145.6	112	151	742	700	7.90
8/18/11	6000	1430	2504	1902	89.6	22.4	844	359	600	7.14
9/1/11	8100	4210	3224	3156	201.6	106.4	362	803	300	8.74
9/9/11	6810	6120	3990	2621	190.4	134.4	757	924	300	9.24
9/15/11	8400	1890	3570	2308	67.2	95.2	98.6	552	300	9.11
9/22/11	4500	2610	1730	2214	56	84	157	506	300	9.01
9/29/11	5400	6350	6710	1874	162.4	106.4	459	733	200	8.60
10/6/11	6000	4450	4598	4308	229.6	89.6	1730	841	300	9.42
10/13/11	6000	1280	1791	1333	61.6	33.6	459	341	200	7.76
10/20/11	5070	103	1108	791	53.76	15.68	244	300	200	9.24
10/27/11	4740	221	1822	1692	61.6	61.6	357	527	200	9.39
11/3/11	5100	1810	1666	1460	39.2	39.2	278	352	300	9.17
11/9/11	3120	1740	2312	3482	78.4	84	77.4	538	200	8.49
11/17/11	3600	1550	2864	1808	89.6	84	805	629	300	9.33
12/1/11	8400	2670	3730	1652	72.8	61.6	2390	273	300	9.52
12/8/11	8700	3710	2940	2702	257.6	168	1320	631	300	8.78
12/22/11	5100	2950	3024	2016	240.8	173.6	590	754	200	9.03
12/29/11	12600	2970	5752	2520	168	151.2	412	760	300	7.86
1/5/12	5700	2680	5792	1930	134.4	134.4	4050	835	300	7.62
1/12/12	3615	4240	3458	2678	134.4	145.6	543	734	200	7.04
1/26/12	7530	2560	1454	1606	128.8	50.4	680	345	300	8.80
2/2/12	5070	1270	3174	1688	140	44.8	825	483	300	8.93
2/23/12	6690	3370	3902	1616	100.8	72.8	272	622	200	9.15
Mean	**6009**	**2589**	**2964**	**2082**	**133**	**91**	**708**	**595**	**347**	
StD	**2568**	**1511**	**1482**	**713**	**69**	**47**	**780**	**215**	**181**	

Attachment IIb - Waste Water Characteristics

DAF Discharge to Pond 1

Date	BOD	sBOD	TOC	sTOC	TSS	VSS	TKN	NH4	O&G	VFA	Alk	pH
5/25/11	1920		1170	466	916	1540	140	145.6	94	355	800	9.32
6/1/11	2460		1840	573	1166	1950	115.4	28	484	470	700	9.66
6/9/11	4200		1870	856	2000	1890	128.2	84	373	215	800	9.29
6/22/11	3480	695	1550	492	1770	1650	168	123.2	1050	444	300	9.75
6/29/11	4110	578	1630	599	2270	2110	235	196	668	498	300	9.46
7/7/11	3480	600	1570	688	1400	1320	196	33.6	74	362	300	9.26
7/14/11	1860	780	1630	490	1840	1710	263	134.4	357	412	500	9.46
7/21/11	3600	675	1680	992	1200	1160	235.2	89.6	405	685	400	10.04
7/28/11	4500	11	1070	349	1360	1280	196	151.2	780	326	300	9.48
8/4/11	7800	990	1230	423	1670	1530	207.2	123.2	567	392	600	9.75
8/11/11	5250	785	979	600	1580	1520	184.8	196	546	435	500	10.37
8/18/11	5700	975	1680	462	3360	3200	168	145.6	251	528	500	10.14
8/25/11	5040	1056	1280	597	1320	1210	224	112	365	478	500	9.83
9/1/11	6000	865	2440	525	2450	2300	179.2	84	638	788	200	8.88
9/8/11	3900	845	1870	649	1420	1370	151.2	123.2	229	418	300	9.12
9/15/11	3660	725	1670	269	2800	2580	123.2	123.2	82	380	200	9.44
9/22/11	3510	795	3310	713	4860	4580	100.8	173.6	764	1230	300	10.35
9/29/11	15900	1185	2040	814	1770	1560	89.6	156.8	532	673	300	7.18
10/6/11	9900	1200	1000	546	632	566	184.8	106.4	280	88.9	300	10.52
10/13/11	14000	930	1580	458	1480	1380	28	179.2	327	666	200	6.4
10/20/11	2580	780	169	80.7	1540	1480	26.88	10.08	1450	173	300	10.94
10/27/11	3360	1230	195	82.1	2500	2140	72.8	151.6	514	403	300	7.56
11/3/11	4500	1440	974	356	1190	2050	134.4	84	370	305	300	9.96
11/9/11	6000	1065	4990	611	6060	5840	78.4	72.8	146	710	300	10.36
11/17/11	4290	1200	829	272	1130	1010	117.6	33.6	583	508	300	10.03
12/1/11	5580	960	2910	419	6410	6220	112	84	625	405	200	9.47
12/8/11	2100	840	2480	553	3350	3210	134.4	117.6	436	390	300	7.19
12/15/11	15300	1125	2130	441	3160	3010	218.4	67.2	7700	336	400	10.08
12/22/11	4860	630	1020	399	1320	1210	134.4	112	546	365	400	10.9
12/29/11	1180	900	1870	655	1950	1840	117.6	106.2	197	295	400	11.09
1/5/12	4350	1170	1140	437	1480	1430	201.6	112	964	223	400	9.79
1/12/12	4590	1290	1660	615	1890	1710	156.8	168	685	569	300	8.05
1/19/12	4140	680	2120	860	2770	2470	128.8	123.2	1270	626	200	8.73
1/26/12	4370	730	1710	595	1500	1340	168.8	100.8	162	280	300	9.96
2/2/12	4890	1125	2210	436	2840	2650	179.2	84	403	646	300	9.82
2/23/12	3900	1395	1830	319	2030	1850	140	67.2	134	470	300	9.3
Mean	**5174**	**917**	**1704**	**519**	**2177**	**2107**	**151**	**111**	**696**	**460**	**369**	
Std. D	**3440**	**286**	**857**	**197**	**1306**	**1228**	**55**	**46**	**1242**	**207**	**155**	

Attachment IIc - Waste Water Characteristics

Pond 1 Discharge to Pond 2

Date	BOD	sBOD	TOC	sTOC	TSS	TKN	NH4	O&G	VFA	Alk	pH
5/25/11	1470		376	224	742	95	128.8	45	478	800	6.65
6/1/11	1005		797	233	670	105	156.8	26.3	648	800	6.58
6/9/11	1500		888	314	1200	98	112	58	422	900	6.56
6/22/11	3600	765	676	218	992	129	117.6	42.3	732	400	6.55
6/29/11	1770	360	662	189	916	129	162.4	24.8	493	400	6.58
7/7/11	825	290	832	347	668	168	151.2	31.9	527	500	6.53
7/14/11	840	420	550	293	506	157	95.2	13.3	698	600	6.41
7/21/11	1050	390	854	334	846	218	95.2	44.2	658	500	6.52
7/28/11	900	380	439	217	496	179	117.6	19.2	664	400	6.52
8/4/11	990	960	364	324	340	112	75.2	29.1	649	500	6.48
8/11/11	1050	440	482	311	416	123	89.6	27.1	523	500	6.46
8/18/11	1215	840	515	280	584	106	123.2	18	616	500	6.43
8/25/11	1065	750	412	231	458	151	117.6	11.5	554	400	6.56
9/1/11	945	680	460	284	374	112	128.8	34.7	543	400	6.41
9/8/11	840	652.5	568	384	72	112	100.8	27.9	448	300	6.55
9/15/11	1470	517.5	554	229	844	95	140	20.7	491	300	6.67
9/22/11	1320	448.3	676	243	824	84	95.2	32.3	682	400	6.68
9/29/11	1695	667.5	746	260	656	146	134.4	41	657	500	6.50
10/6/11	750	610	783	304	636	470	106.4	25.4	397	500	6.51
10/13/11	1095	496.66	363	235	137	17	100.8	9.8	738	400	6.43
10/27/11	1920	57.6	104	23.9	1060	17	162.4	44	517	500	6.83
11/2/11	1300	40.25	768	226	966	56	89.6	35.3	387	500	6.44
11/9/11	1395	577.5	1030	239	968	67	72.8	59.6	496	400	6.76
11/17/11	1425	670	835	210	992	78	72.8	38	524	500	6.61
12/1/11	1590	552	827	228	1210	101	89.6	69.8	509	400	6.62
12/8/11	1350	465	669	249	928	129	78.4	53.2	531	500	6.62
12/15/11	1470	501.6	836	214	1130	129	95.2	44.2	491	600	6.56
12/22/11	1485	342.5	804	221	1040	90	61.6	46	565	700	6.56
12/29/11	1140	423	673	207	718	95	72.8	43.6	441	300	6.75
1/5/12	2400	550	564	170	700	106	95.2	46.4	392	600	6.54
1/12/12	585	701	655	218	860	106	112	39.2	478	500	6.57
1/19/12	3690	403	638	200	844	140	123.2	14.6	633	500	6.57
1/26/12	2100	335	549	269	380	101	61.6	23.2	478	500	6.68
2/2/12	3330	715	662	268	668	112	67.2	49.4	797	600	6.62
2/23/12	930	751	614	229	431	106	44.8	9.2	409	900	6.49
Mean	**1472**	**523**	**635**	**246**	**722**	**121**	**104**	**34**	**550**	**514**	
Std.D	**743**	**202**	**187**	**61**	**283**	**71**	**30**	**15**	**107**	**150**	

Attachment IId - Waste Water Characteristics

Clarifier (Pond 3B) Discharge to SAF(TM)

Date	BOD	sBOD	TOC	sTOC	TSS	TKN	NH4	O&G	VFA	Alk	pH
5/25/11	210	N/A	21	16	184			13			7.08
5/31/11	51			28	60			12			6.94
6/1/11	51			20	90			6			7.09
6/7/11	34.5		43	18	566			3			7.06
6/23/11	110		72	16	76			13			7.02
6/28/11	75		82	26	78			15			6.79
6/29/11	85.5		50	23	90			24			6.90
7/5/11	66		77	28	86			10			6.78
7/7/11	40.5		51	40	84			10			6.96
7/13/11	93		57	29	96			7			6.78
7/14/11	69		37	25	292			26			6.82
7/20/11	76.5		41	36	60			8			6.79
7/21/11	63		54	41	68			19			6.92
7/27/11	78		69	23	98			0			6.68
7/28/11	42		39	18	54			0			6.94
8/3/11	48		34	25	134			13			6.79
8/4/11	54		133	23	120			18			7.00
8/10/11	42		48	26	102			4			6.98
8/11/11	63.75		48	21	428			2			7.04
8/17/11	39		73	27	102			6			6.94
8/18/11	150			22	950			5			7.13
8/24/11	69		115	17	116			7			7.10
8/25/11	72		36	17	354			7			7.17
9/7/11	42		67	29	390			4			6.99
9/8/11	30.37		44	18	92			2			7.18
9/14/11	87.75		54	28	94			1			7.14
9/15/11	153		59	31	344			1			7.29
9/21/11	103.5		42	27	120			3			7.14
9/22/11	46.75		250	23	284			2			7.51
9/28/11	500		213	20	586			4			6.89
9/29/11	183		258	16	482			7			7.17
10/5/11	278		260	108	298			8			7.43
10/6/11	180			33	1450			14			7.18
10/12/11	520		4	24	1542			51			6.76
10/13/11	240		59	32	72			0			7.20
10/26/11	324		147	4	1378			21			6.70
10/27/11	330			4	1338			26			7.23
11/2/11	294		132	37	240			30			7.09
11/3/11	79.5		216	25	64			12			7.24
11/9/11	930		40	28	1116			3			6.88
11/10/11	273		367	27	574			10			7.09
11/16/11	1890		44	17	3126			0			6.52
11/17/11	163.5		108	30	114			0			7.10

Attachment IId - Waste Water Characteristics

Clarifier (Pond 3B) Discharge to SAF(TM)

11/23/11	1030		37	596	8	7.04
11/30/11	440	45	24	360	3	7.11
12/1/11	450	45	20	322	10	7.07
12/7/11	150	40	20	98	8	7.29
12/8/11	186	1100	17	84	0	7.21
12/14/11	122.1		24	76	7	7.16
12/15/11	336		24	188	16	7.29
12/21/11	660	106	38	1868	0	6.68
12/22/11	210	462		204		7.43
12/28/11	379		21	336	12	7.37
12/29/11	363	88	23	146	5	7.45
1/5/12	282	59	23	326	0	7.31
1/11/12	670	584	20	1226	10	7.05
1/12/12	60	TF	19	202	5	7.35
1/18/12	100	688	34	362	23	7.14
1/19/12	1375	210	TF	346		7.22
1/25/12	420	47	35	854	5	6.87
1/26/12	45		17	40	20	7.47
2/1/12	178	369	17	312	4	7.49
2/2/12	240	47	19	692	3	7.45
2/8/12	278	143	29	684	5	7.29
2/9/12	158	337	21	244	14	7.36
2/15/12	217	31	20	226	2	7.56
2/16/12	108	304	31	110	6	7.37
2/22/12	39	352	23	68	3	7.07
2/23/12	396	111	31	618	14	7.11
Mean	**250**	**150**	**26**	**414**	**9**	**7**
Std. D						

Attachment IIe - Waste Water Characteristics

SAF(TM) Discharge to City

Date	BOD	sBOD	TOC	sTOC	TSS	TKN	NH4	O&G	VFA	Alk	pH
5/25/11	140		27.5	16.1	156		70	9.6		1200	7.91
5/31/11	90		23	25.2	30		76.16	8.2			7.13
6/1/11	42		25.2	17.3	58		61.6	2.6		1100	7.77
6/7/11	30		36.6	21.1	38		33.6	7			7.55
6/22/11										300	
6/23/11	57		19.9	16.5	30	49.38	42.56	10.4			7.45
6/28/11	38		25.5	20.9	34	14.56	29.68	14.3			7.22
6/29/11	41		27.3	20.1	34	19.6	30.8	15.3		300	7.39
7/5/11	40		54.8	39.2	32	48.16	39.96	11.3			7.51
7/7/11	22		47	37.7	30	21.28	20.76	8.6		300	7.08
7/13/11	43		37.2	26.7	36	44.8	29.68	10.7			7.29
7/14/11	36		30	23.6	20	49.84	30.24	9.5		300	7.43
7/20/11	45		44.9	33.1	22	15.12	29.68	5.3			7.27
7/21/11	48		67	34.1	14	31.36	30.8	8.8		400	7.51
7/27/11	35		30.7	22.8	32	39.76	38.08	8.6			7.20
7/28/11	32		23	17.5	26	42.56	32.48	<1.0		300	7.39
8/3/11	36		27.6	22.5	28	34.16	40.88	5.6			7.28
8/4/11	43		23.5	20.7	18	43.12	36.96	6.6		500	7.43
8/10/11	25		26.3	24.2	18	41.55	30.24	4.8			7.19
8/11/11	27		22.1	19.9	12	28.52	25.2	6.5		400	7.38
8/17/11	11		23.5	19	28	23.5	22.96	<1.0			7.09
8/18/11	22		25.5	21.9	22	23.32	21.84	<1.0		500	7.26
8/24/11	34		21.4	17.6	20	60.48	31.36	<1.0			7.55
8/25/11	27		23.4	17.5	30	68.32	49	<1.0		500	7.53
9/7/11	9		31.3	26.5	14	46.48	29.68	2.8			7.30
9/8/11	16		17.7	15.5	42	43.68	34.72	8.4		200	7.37
9/14/11	21		28.7	22.3	42	21.84	49.84	<1.0			7.35
9/15/11	66		34.5	34.6	38	23.52	49.84	<1.0		300	7.48
9/21/11	63		34.7	24.6	44	31.92	24.08	1.1			7.39
9/22/11	135		32.4	22.3	62	5.6	0.56	<1.0		200	7.32
9/28/11	32		25.5	20	30	33.6	55.44	<1.0			7.23
9/29/11	20		22.6	18.8	40	2.8	2.8	<1.0		300	7.70
10/5/11	15		25.9	24.6	56	3.92	1.68	<1.0			7.81
10/6/11	39		24.3	22.7	44	2.24	2.24	28.8		200	7.95
10/12/11	59		32.1	24	60	7.28	5.04	<1.0			7.34
10/13/11	54		28.4	22	44	12.32	3.92	<1.0		300	7.85
10/26/11	59		4.3	3.2	68	3.36	3.92	4.1			6.90
10/27/11	53		32.7	20.6	66	3.36	0.56	3		300	7.74
11/2/11	38		32.5	20.4	64	3.36	1.12	4.7		400	7.54
11/3/11	11		96	85.6	32	2.24	0.56	<1.0			8.09
11/4/11	18		18.6	14.1	20	1.68	1.12	<1.0			9.27
11/9/11	82		28.8	21.3	48	20.72	16.8	<1.0		300	6.97
11/10/11	93		29.6	21	98	14.56	8.4	45.1			7.17

Attachment IIe - Waste Water Characteristics

SAF(TM) Discharge to City

11/15/11	49	25.9	16.8	34	16.8	18.48	3.1		7.09
11/16/11	51	23.9	16.7	42	3.92	3.92	<1.0		7.11
11/17/11	41	19.6	17.6	28	22.96	20.72	<1.0	400	7.06
11/18/11	45	23.4	16.7	20	21.84	27.44	3.3		7.55
11/23/11	174	40.2	19.4	56	25.4	20.16	65.2		7.52
11/30/11	60	24.6	19	38	39.78	39.2	<1.0		7.31
12/1/11	330	29.9	19.3	276	27.44	38.08	4.5	200	7.28
12/2/11	72	32.4	21.6	84	28	48.16	<1.0		7.38
12/7/11	80	22.4	19.2	30	27.44	39.2	<1.0		7.69
12/8/11	73	36.5	20.3	54	22.4	19.04	1	200	7.18
12/14/11	67	24.5	19	26	42.56	31.36	1.8		7.39
12/15/11	53	30.4	20.6	44	48.72	48.16	6	300	7.22
12/21/11	86	37.9	22.9	70	19.04	16.8	<1.0		7.52
12/22/11	72			46		35.84	3.3	400	7.45
12/23/11	83	148	125	86	39.2	38.06	2.5		7.88
12/28/11	78	25.4	17.4	58	33.6	30.8	<1.0		7.40
12/29/11	107	105	20.1	48	44.8	31.36	1.4	400	7.35
1/5/12	53	35.4	23.2	42	39.2	17.92	1.1	300	7.88
1/6/12	28	21.1	17.1	58	61.6	37.52	2.5		7.37
1/11/12	45	21.7	17.5	54	44.8	22.96	1.6		7.40
1/12/12	15	24.6	15.7	166	56	20.16	<1.0	300	7.30
1/13/12	24	20.1	19.3	38	50.4	24.08	TF		7.68
1/18/12	45	45.9	21.9	74	44.8	30.24	TF		7.18
1/19/12	29	TF	TF	50	56	20.72	2	300	7.82
1/20/12	32	TF	TF	44	84	43.12	<1.0		7.80
1/25/12	12	22.3	16.5	4	44.8	26.88	4		7.60
1/26/12	7	17.6	14	42	28	26.32	<1.0	300	7.36
2/1/12	14	19.7	16.7	44	39.2	35.84	<1.0		7.80
2/2/12	14	21.1	19.3	28	44.8	38.08	<1.0	400	8.10
2/3/12	26	29.9	17.4	114	44.8	39.2	3.6		8.09
2/8/12	28	29	21.2	60	44.8	31.92	4.1		7.64
2/9/12	46	25.8	20	46	50.4	40.88	1.7		7.32
2/10/12	43	2.6	25.4	158	39.2	35.84	<1.0		7.63
2/15/12	28	24.1	20.1	28.41	33.6	5.04	<1.0		7.68
2/16/12	24	25	19.7	46	61.6	31.36	<1.0		7.29
2/17/12	28	24.4	17.9	48	39.2	29.68	3.09		7.98
2/22/12	25	34.2	27.3	48	28	2.8	<1.0		7.61
2/23/12	50	35.7	23.9	74	44.8	3.92	<1.0	400	7.08
Mean	**49**	**32**	**23**	**48**	**32**	**27**	**8**	**353**	
Std. D	**43**	**20**	**14.9**	**38**	**18**	**16**	**12**	**161**	

Attachment III
Water and Waste Water Production

Date	Water Used	Wastewater to DAF	Effluent to City
11/2/11	2,630,000.00	1,750,301	1,721,131
11/3/11	2,450,000.00	1,742,538	1,602,890
11/4/11	2,230,000.00	1,706,013	1,617,967
11/5/11	920,000.00	1,736,117	1,358,470
11/6/11	1,280,000.00	734,831	1,347,844
11/7/11	2,320,000.00	511,369	1,564,038
11/8/11	2,230,000.00	1,750,073	1,420,712
11/9/11	2,650,000.00	1,825,027	2,032,661
11/10/11	2,310,000.00	1,858,976	2,132,126
11/11/11	970,000.00	1,718,401	2,117,233
11/12/11	830,000.00	695,556	2,113,220
11/13/11	1,210,000.00	538,332	2,056,361
11/14/11	2,670,000.00	448,256	1,055,518
11/15/11	2,010,000.00	1,643,473	1,345,934
11/16/11	2,310,000.00	1,811,321	1,483,992
11/17/11	2,120,000.00	1,810,004	1,173,931
11/18/11	2,240,000.00	1,772,298	2,043,924
11/19/11	1,040,000.00	1,799,095	2,102,611
11/20/11	1,280,000.00	673,678	2,103,017
11/21/11	2,380,000.00	589,477	1,766,142
11/22/11	2,440,000.00	1,784,070	1,451,614
11/23/11	2,430,000.00	1,788,198	1,626,757
11/24/11	770,000.00	1,785,733	1,703,791
11/25/11	2,390,000.00	689,275	1,911
11/26/11	2,170,000.00	1,827,864	1,880,897
11/27/11	1,250,000.00	1,749,466	1,934,425
11/28/11	2,310,000.00	660,825	1,509,645
11/29/11	2,730,000.00	1,783,794	1,927,285
11/30/11	2,470,000.00	1,796,236	2,166,274
12/1/11	2,370,000.00	1,923,294	2,160,655
12/2/11	2,230,000.00	1,809,603	1,834,282
12/3/11	1,180,000.00	1,830,411	2,148,412
12/4/11	1,340,000.00	729,274	981,519
12/5/11	2,460,000.00	297,408	1,322,815
12/6/11	2,260,000.00	1,794,270	1,663,326
12/7/11	2,760,000.00	1,771,352	1,723,070
12/8/11	2,090,000.00	1,790,909	1,975,222
12/9/11	2,090,000.00	1,806,103	1,883,687
12/10/11	850,000.00	1,784,051	2,247,927
12/11/11	1,240,000.00	518,665	1,881,053
12/12/11	2,380,000.00	321,644	2,289,750
12/13/11	2,190,000.00	1,696,161	2,122,692

Attachment III

Water and Waste Water Production

12/14/11	2,540,000.00	1,788,834	2,181,919
12/15/11	2,230,000.00	1,826,923	2,138,946
12/16/11	2,060,000.00	1,724,322	2,017,487
12/17/11	1,470,000.00	1,712,903	1,703,119
12/18/11	700,000.00	596,186	1,692,584
12/19/11	2,640,000.00	515,960	1,882,064
12/20/11	2,250,000.00	1,739,944	1,697,715
12/21/11	2,490,000.00	1,862,930	1,704,970
12/22/11	2,360,000.00	1,826,131	1,427,935
12/23/11	1,910,000.00	1,792,982	1,928,757
12/24/11	440,000.00	1,515,996	1,406,608
12/25/11	480,000.00	403,360	194,215
12/26/11	1,060,000.00	160,773	586,085
12/27/11	2,330,000.00	301,534	1,224,153
12/28/11	2,530,000.00	1,778,865	2,008,518
12/29/11	2,350,000.00	1,836,526	2,109,877
12/30/11	1,880,000.00	1,835,666	1,597,323
12/31/11	620,000.00	1,400,480	1,540,161
1/1/12	490,000.00	666,580	1,238,120
1/2/12	930,000.00	283,940	818
1/3/12	2,410,000.00	288,366	1,163,603
1/4/12	2,220,000.00	1,663,747	1,847,430
1/5/12	2,270,000.00	1,842,960	1,724,763
1/6/12	2,370,000.00	1,832,639	1,716,985
1/7/12	1,650,000.00	1,710,625	1,721,311
1/8/12	1,240,000.00	1,422,309	173,724
1/9/12	2,290,000.00	542,967	1,936,624
1/10/12	2,320,000.00	1,689,279	1,809,666
1/11/12	2,170,000.00	1,701,794	1,827,604
1/12/12	2,100,000.00	1,694,758	1,662,574
1/13/12	2,160,000.00	1,757,818	1,752,380
1/14/12	1,130,000.00	1,656,850	1,538,748
1/15/12	1,120,000.00	619,508	1,724,059
1/16/12	2,530,000.00	418,250	1,788,667
1/17/12	1,890,000.00	1,513,883	1,760,701
1/18/12	1,870,000.00	1,698,800	1,633,857
1/19/12	1,320,000.00	1,764,579	1,487,545
1/20/12	1,060,000.00	877,660	1,490,867
1/21/12	730,000.00	803,625	1,694,418
1/22/12	1,390,000.00	474,124	1,775,896
1/23/12	2,310,000.00	625,118	1,514,957
1/24/12	2,310,000.00	1,650,830	1,584,045
1/25/12	2,260,000.00	1,754,668	1,663,519
1/26/12	2,330,000.00	1,822,676	1,589,618
1/27/12	850,000.00	1,797,788	1,688,793
1/28/12	650,000.00	189,444	1,666,814

Attachment III

Water and Waste Water Production

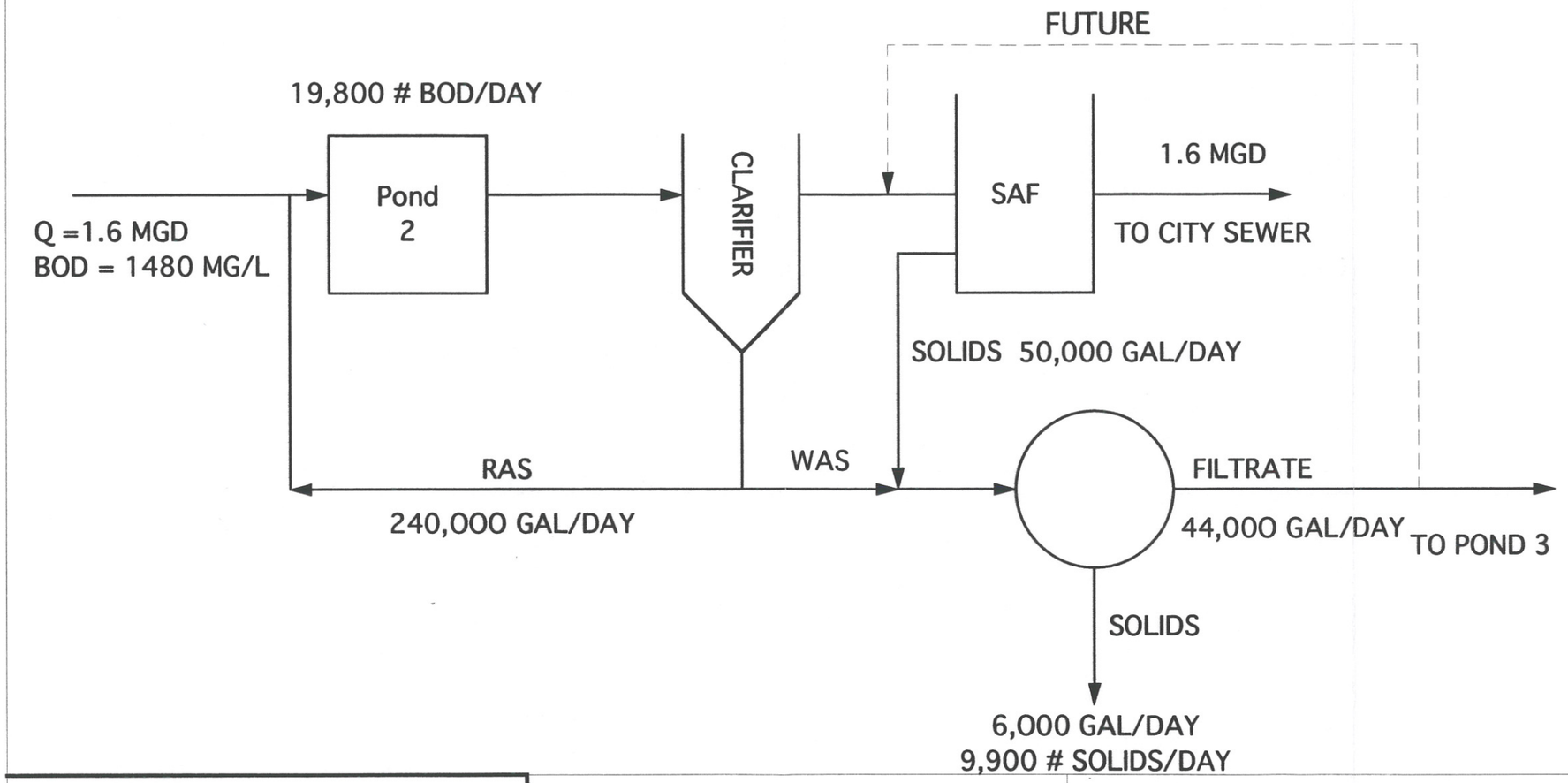
1/29/12	1,010,000.00	274,562	917,071
1/30/12	2,450,000.00	296,015	975,749
1/31/12	2,290,000.00	1,730,103	1,497,784
2/1/12	2,660,000.00	1,707,644	1,756,974
2/2/12	2,050,000.00	1,777,998	1,837,838
2/3/12	680,000.00	1,764,917	1,991,591
2/4/12	840,000.00	679,144	1,462,458
2/5/12	1,000,000.00	394,795	615,969
2/6/12	2,330,000.00	402,281	355,180
2/7/12	2,210,000.00	1,660,946	1,333,810
2/8/12	2,310,000.00	1,687,863	1,504,790
2/9/12	2,210,000.00	1,740,671	1,867,712
2/10/12	2,240,000.00	1,667,171	1,305,660
2/11/12	760,000.00	1,755,975	1,821,717
2/12/12	910,000.00	517,851	1,820,593
2/13/12	2,340,000.00	395,852	1,977,949
2/14/12	2,310,000.00	1,582,955	1,668,648
2/15/12	1,920,000.00	1,639,249	1,756,800
2/16/12	2,470,000.00	1,705,309	1,742,987
2/17/12	2,170,000.00	1,815,913	1,233,258
2/18/12	890,000.00	1,788,034	1,446,099
2/19/12	1,070,000.00	652,321	2,077,492
2/20/12	2,210,000.00	381,096	949,472
2/21/12	2,360,000.00	1,782,754	1,470,741
2/22/12	2,220,000.00	1,646,043	1,790,295
2/23/12	2,180,000.00	1,728,886	1,874,529
2/24/12	2,140,000.00	1,783,158	1,867,718
2/25/12	800,000.00	1,725,183	1,688,016
2/26/12	1,010,000.00	541,167	1,853,277
2/27/12	2,330,000.00	347,917	222,754
2/28/12	2,580,000.00	1,762,612	1,567,670
2/29/12	2,120,000.00	1,674,290	1,722,586
3/1/12	2,250,000.00	1,788,348	1,723,932
3/2/12	2,180,000.00	1,686,301	2,009,542
3/3/12	960,000.00	1,727,116	1,911,986
3/4/12	970,000.00	524,710	1,905,591
3/5/12	2,540,000.00	412,310	600,897
3/6/12	2,530,000.00	1,791,907	1,236,612
3/7/12	2,130,000.00	1,800,568	1,937,691
3/8/12	2,440,000.00	1,781,852	1,891,442
3/9/12	2,390,000.00	1,761,606	1,718,486
3/10/12	870,000.00	1,852,675	1,724,258
3/11/12	920,000.00	409,777	1,999,013
3/12/12	2,650,000.00	429,497	1,309,346
3/13/12	2,460,000.00	1,784,670	688,267
3/14/12	2,340,000.00	1,866,076	1,750,068

Attachment III

Water and Waste Water Production

3/15/12	2,830,000.00	1,917,174	1,900,724
3/16/12	1,990,000.00	1,954,959	1,943,144
3/17/12	920,000.00	1,843,036	2,017,689
3/18/12	870,000.00	628,142	1,907,709
MEANS	1,858,695.65	1,343,558	1,615,716
ST. DEV	672,987	601,761	460,324

ATTACHMENT IV



HERON INNOVATORS
The Clear Advantage
1025 Nichols Drive
Rocklin CA 95765
Office 408-6601 / Fax 408-6691

WASTEWATER
TREATMENT SYSTEM
INTERNAL FLOWS

NATIONAL BEEF
57 Shank Road
Brawley, CA

Attachment V
Local Ground Water Quality

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
COLORADO RIVER BASIN REGION
ORDER NO. R7-2008-0004
WASTE DISCHARGE REQUIREMENTS (REVISION 1)
FOR
ORNI 17, LLC. WELL FIELD OWNER, ORNI 18, LLC, POWER PLANT OWNER
ORMAT NEVADA INC., FACILITY OPERATOR
NORTH BRAWLEY GEOTHERMAL PROJECT
WELLFIELD MUD SUMPS/CONTAINMENT BASINS
North Brawley Known Geothermal Resource Area (KGRA) - Imperial County
The California Regional Water Quality Control Board, Colorado River Basin Region, finds that:
1. Board Order No. R7-2007-0012 is being revised to address the handling and disposal of
drilling wastes generated during installation of geothermal production wells and geothermal injection wells on private land within the North Brawley Known Geothermal Resource Area (KGRA).
2. The KGRA is located north of the town of Brawley in Imperial County. The address for Ormat Nevada Inc., ORNI 17, LLC., and ORNI 18 LLC. is 6225 Neil Road, Suite 300, Reno, Nevada 89511.
3. ORNI 17, LLC, Well Field Owner, ORNI 18, LLC, Power Plant Owner, Ormat Nevada, Inc., Facility Operator, Victor V. & Janet D. Veysey Trust, Landowner, John Robert Benson, Landowner, Barbara Meyer, Landowner, Jack Bros, Inc., Landowner, Daniel H. and R.J. Lillywhite, Landowners, and Brawley Development Group c/o Tierra Management, Landowner are hereinafter collectively referred to as "Dischargers."
4. Board Order No. R7-2008-0004 regulates the handling and disposal of drilling wastes generated by Ormat Nevada Inc. during well drilling, testing, and maintenance of geothermal production wells and geothermal injection wells installed within the North Brawley KGRA. The location of the North Brawley KGRA is shown on Attachment A.
5. To gather scientific information on the geothermal resource and its power generating potential, Ormat Nevada Inc. installed five (5) of the six (6) geothermal exploration wells permitted by Board Order No. R7-2007-0012. Based on data collected, Ormat Nevada Inc. intends to construct a 49.9 megawatt binary power plant in the area.
6. The binary power plant will be a "zero discharge" facility. All wastewaters generated within the facility will be reinjected into the geothermal resource.
7. Including the five (5) geothermal exploration wells, Ormat Nevada Inc. will install a maximum of twenty to twenty-six (20-26) production wells and a maximum of fourteen to twenty (14-20) injection wells in the North Brawley KGRA. The five (5) exploration wells will be converted to either production or injection wells such that the maximum number of both production and injection wells for the project will not exceed forty (40).

8. All geothermal well drilling performed by Ormat Nevada within the North Brawley KGRA
will be regulated under this Order. Locations of the proposed production and injection wells are shown on Attachment B.
9. Ormat Nevada Inc. submitted a new Report of Waste Discharge dated June 29, 2007 for
the North Brawley Geothermal Project.
10. The project will consist of well pad construction, geothermal well drilling and geothermal
waste handling/disposal. A typical well pad is shown on Attachment C.
11. The discharger has enrolled in the construction stormwater program, General Permit 99-

08 DWQ, and has submitted a stormwater pollution prevention plan for project construction.
12. Definition of terms used in this Board Order:
a. **Facility** – The entire parcel of property where Ormat Nevada Inc. or related geothermal industrial and drilling activities are conducted.
b. **Waste Management Unit (WMUs)** – Mud sumps/containment basins are WMUs.
c. Discharger – Any person who discharges waste that could affect the quality of the waters of the State, and includes any person who owns the land, waste management unit, or who is responsible for the operation of a waste management unit.
Geothermal Drilling Wastes
13. The following wastes are generated during construction, operation, and maintenance of
geothermal wells:
a. **Geothermal brine** - The Discharger reports geothermal brines in the area of the North Brawley KGRA are hot saline solutions that contain Total Dissolved Solids (TDS) ranging from 12,000 to 60,000 mg/L. Based on the results from the five (5) exploration wells, nearby geothermal projects, major constituents of the brine are predicted to be the following:
1. Sodium (Na)
2. Chloride (Cl)
3. Calcium (Ca)
4. Potassium (K)
5. Sulfate (SO_4)
6. Lithium (Li)
7. Lead (Pb)
8. Arsenic (As)
b. **Drilling muds with additives –** Drilling mud is inert mineral clay such as bentonite clay. Drilling mud additives may include sodium bicarbonate, soda ash, drilling soap, organic polymers, wood fibers, graphite, cottonseed hulls, walnut shells and cement. Drilling mud additives do not render the drilling mud hazardous when used according to manufacturer's specifications.
Ormat Nevada, Inc.
North Brawley Geothermal Power Project
Waste Discharge Requirements (Revision 1)
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c. **Drill cuttings (rock)** – small rock fragments pulverized during drilling and forced to the surface by drilling mud, aerated mud, and/or air.
Drilling Waste Containment (WMUs)
14. The Discharger proposes to contain geothermal brine generated during drilling, testing,
or maintenance by discharging into large portable tanks. Geothermal brine will be returned to the geothermal resource via injection, or discharged offsite into permanent Class II surface impoundments constructed pursuant to Title 27 of the California Code of Regulations (Title 27).
15. Drilling muds and rock cuttings generated during well drilling, testing, or maintenance will
be discharged to mud sumps/containment basins designed to temporarily (less than one (1) year) contain the material while drying. Mud sumps/containment basins will be built with a minimum of twelve (12) inches of compacted clay with permeability of approximately $1x10^{-6}$ cm/sec, or a synthetic liner(s) providing equivalent protection. Each mud sump/containment basin will be approximately 100 feet by 250 feet by 5 feet deep, and will be operated to maintain a minimum of two (2) feet of freeboard.
16. Geothermal wells are drilled to minimize mixing of drilling mud and cuttings with geothermal brine. Only a small amount of brine may commingle with drilling mud, primarily brines in that part of the formation displaced by the drill bit. Geothermal brine will not be discharged into mud sumps/containment basins. Standing fluid observed in mud sumps/containment basins (if any) will be removed immediately, stored in portable

tanks, and returned to the geothermal resource, or discharged offsite into Class II surface impoundments constructed pursuant to Title 27.
17. Clay liner compaction must be certified by a Civil Engineer or Certified Engineering Geologist registered by the State of California. Synthetic liner placement and welding must be certified by the installer to verify factory requirements were satisfied, and no damage occurred during placement. Both types of certification must be submitted, in writing, to the Regional Board prior to use of the temporary mud sump/containment basin. After cleanout of discharged geothermal solids, the integrity of the liner must be re-certified before reuse.
Drilling Waste Disposal
18. Liquid wastes produced from drilling, testing, and maintenance of geothermal wells will
be contained in portable tanks and returned to the geothermal resource, or discharged off-site to Class II surface impoundments built to construction standards of Title 27.
19. Solids discharged to mud sumps/containment basins will be removed offsite or closed in
place, provided that representative samples of solids are shown not to be hazardous or designated waste.
Surface Water
20. Surface water in the area of the North Brawley KGRA consists of canals and agricultural
drains operated and maintained by Imperial Irrigation District.
Ormat Nevada, Inc.
North Brawley Geothermal Power Project
Waste Discharge Requirements (Revision 1)
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21. The Facility is not located in a 100-year flood plain.
Regional Groundwater
22. The regional groundwater flow direction within the Imperial Valley is toward the Salton
Sea, a closed basin with a surface elevation of approximately 225 feet below sea level. The North Brawley KGRA is located approximately 120 feet below sea level; groundwater flows in a general northwest direction.
Local Groundwater
23. The Discharger reports that shallow groundwater in the area of the North Brawley KGRA
occurs approximately ten (10) feet below ground surface, flows generally to the northwest, and has a TDS concentration ranging from 10,000 to 20,000 mg/L.
24. Groundwater depth, gradient, and quality in the area of the North Brawley KGRA may be
influenced, at times, by irrigation of adjacent agricultural fields, and by recharge from nearby canals.
Regional Geology
25. The North Brawley Geothermal Exploration site is located within the Salton Trough area
of southeast California. The Salton Trough is a tectonically active zone containing numerous faults associated with the San Andreas Fault Zone. The site is located on the north-central portion of the trough, and is underlain by deltaic and lacustrine formations associated with the Colorado River delta. Bedrock in this part of the Salton Trough is approximately three (3) miles below ground surface.
Climate
26. Climate in the region is arid. Climatological data obtained from 1951 to 1980 indicate an
average seasonal precipitation of 2.5 inches, and an average annual pan evaporation rate greater than 100 inches.
27. The wind direction follows two general patterns:
a. Seasonally from fall through spring, prevailing winds are from the west and

northwest. Most of these winds originate in the Los Angeles basin. Humidity is lowest under these conditions.
b. Summer weather patterns are dominated by intense heat induced low-pressure areas that form over the interior desert, drawing air south of the Facility. Humidity is highest under these conditions.
Basin Plan
28. The Water Quality Control Plan (Basin Plan) for the Colorado River Basin Water Board,
as amended to date, designates the beneficial uses of ground and surface waters in this region.
Ormat Nevada, Inc.
North Brawley Geothermal Power Project
Waste Discharge Requirements (Revision 1)
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29. The beneficial uses of groundwater in the Imperial Hydrological Unit are:
a. Municipal Supply (MUN)*
b. Industrial Supply (IND)
*With respect to the MUN designation, the Basin Plan states: "At such time as the need arises to know whether a particular aquifer which has no known existing MUN use should be considered as a source of drinking water, the Regional Board will make such a determination based on the criteria listed in the 'Sources of Drinking Water Policy' in Chapter 2 of the Basin Plan. An indication of MUN for a particular hydrologic unit indicates only that at least one of the aquifers in that unit currently supports a MUN beneficial use. For example, the actual MUN usage of the Imperial Hydrologic Unit is limited only to a small portion of that ground water unit."
30. The beneficial uses of surface waters in the area of the North Brawley Geothermal Power Project are as follows:
a. Imperial Valley Drains
i. Freshwater Replenishment (FRSH)
ii. Water Contact Recreation (RECI)
iii. Non-contact Water Recreation (RECII)
iv. Warm Freshwater Habitat (WARM)
v. Wildlife Habitat (WILD)
vi. Preservation of Rare, Threatened, or Endangered Species (RARE)
b. All American Canal System
vii. Municipal (MUN)
viii. Agricultural (AGR)
ix. Aquaculture Supply (AQUA)
x. Freshwater Replenishment (FRSH)
xi. Industrial (IND)
xii. Groundwater Recharge (GWR)
xiii. Water Contact Recreation (RECI)
xiv. Non-Contact Water Recreation (RECII)
xv. Warm Freshwater Habitat (WARM)
xvi. Wildlife Habitat (WILD)
xvii. Hydropower Generation (POW)
xviii. Preservation of Rare, Threatened, or Endangered Species (RARE)
Storm Water
31. Federal regulations for storm water discharges were promulgated by the U.S. Environmental Protection Agency (40 CFR Parts 122, 123, and 124). The regulations require specific categories of facilities that discharge storm water associated with industrial activity to obtain a National Pollutant Discharge Elimination System (NPDES) permit, and to implement Best Conventional Pollutant Technology (BCPT) to reduce or eliminate industrial storm water pollution.
Ormat Nevada, Inc.
North Brawley Geothermal Power Project
Waste Discharge Requirements (Revision 1)

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Anti-Degradation Policy
32. State Water Resources Control Board (State Water Board) Resolution No. 68-16 ("Policy
with Respect to Maintaining High Quality Waters of the State"; hereafter Resolution No. 68-16) requires a Regional Board, in regulating the discharge of waste, to maintain high quality waters of the state (i.e., background water quality) until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in plans and policies (e.g., violation of any water quality objective). The discharge is required to meet waste discharge requirements that result in the best practicable treatment or control of the discharge necessary to assure pollution or nuisance will not occur, and the highest water quality consistent with maximum benefit to the people will be maintained.
CEQA
33. The Imperial County Planning Department prepared a Mitigated Negative Declaration for
the North Brawley Development Project. The Imperial County Planning Commission certified the Mitigated Negative Declaration during a meeting on November 14, 2007. The Board has considered the Mitigated Negative Declaration. Compliance with these WDRs should prevent and mitigate any water quality impacts.
Notification
34. The Regional Board has notified the Discharger and all known interested agencies and
persons of its intent to adopt (WDRs) for said discharge, and has provided them with an opportunity for a public meeting and to submit comments.
35. The Regional Board, in a public meeting, heard and considered all comments pertaining
to this discharge.
IT IS HEREBY ORDERED, that in order to meet the provisions contained in Division 7 of the
California Water Code and regulations adopted there under, the Dischargers shall comply with
the following:
A. Specifications
1. The treatment or disposal of wastes at this facility shall not cause pollution or nuisance,
as those terms are defined in Section 13050 of Division 7 of the California Water Code.
2. Waste material at this facility must be contained at all times.
3. Containment of waste shall be limited to the areas designated for such activity. Any revision or modification of the waste containment area or change in operation that alters the nature and constituents of the waste produced must be submitted in writing to the Regional Board Executive Officer for review and approval before the change in operation or modification of the designated area is implemented.
4. Prior to drilling a new well at the facility, the Discharger shall notify, in writing, the Regional Board Executive Officer of the proposed change.
Ormat Nevada, Inc.
North Brawley Geothermal Power Project
Waste Discharge Requirements (Revision 1)
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5. Any substantial increase or change in volume of material to be discharged under this Order must be submitted in writing to the Regional Board Executive Officer for review and approval.
6. Liquid or solid geothermal waste discharged to tanks shall be contained at all times.
7. A minimum freeboard of two (2) feet shall be maintained in mud sumps/containment basins at all times.
8. Following well completion, residual solids and semisolids contained in tanks shall be

tested for constituents listed in Monitoring and Reporting Program No. R7-2008-0004, and for additional constituents requested by Regional Board Executive Officer (if any). Disposal of this material shall be in accordance with applicable laws and regulations based on analytical results of sampling and analysis.
9. Prior to removing solid material discharged to mud sumps/containment basins, the material shall be tested for constituents listed in Monitoring and Reporting Program No. R7-2008-0004, and for additional constituents requested by the Regional Board Executive Officer (if any). Disposal of this material shall be in accordance with applicable laws and regulations based on analytical results of sampling and analysis.
10. Public contact with material containing geothermal wastes shall be precluded through
fences, signs, or other appropriate alternatives.
11. Mud sumps/containment basins shall be constructed, operated and maintained to ensure their effectiveness, in particular:
a. Erosion control measures shall be implemented;
b. Liners in mud sumps/containment basins shall be maintained to ensure proper function; and
c. Solid material shall be removed from mud sumps/containment basins in a manner that minimizes the likelihood of damage to the liner.
12. Upon ceasing operation at the facility, all waste, natural geologic material contaminated
by waste, and surplus or unprocessed material shall be removed from the site and disposed of in accordance with applicable laws and regulations.
13. Surface drainage from tributary areas or subsurface sources shall not contact or percolate through waste discharged at this site.
14. The Discharger shall use the constituents listed in Monitoring and Reporting Program No. R7-2008-0004 and revisions thereto as "Monitoring Parameters".
15. The Discharger shall implement the attached Monitoring and Reporting Program No. R7-
2008-0004 and revisions thereto to detect at the earliest opportunity any unauthorized discharge of waste constituents from the facility, or any impairment of beneficial uses associated with (caused by) discharges of waste to the mud sumps/containment basins.
Ormat Nevada, Inc.
North Brawley Geothermal Power Project
Waste Discharge Requirements (Revision 1)
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16. Water used for the process and site maintenance shall be limited to the amount necessary for the process, dust control, and cleanup and maintenance.
17. The Discharger shall not cause or permit the release of pollutants or waste constituents
in a manner that could cause or contribute to a condition of contamination, nuisance, or pollution.
B. Prohibitions
1. Geothermal wells shall be drilled to minimize mixing of drilling mud and cuttings with geothermal brine. Only a small amount of brine may commingle with drilling mud, primarily brines in that part of the formation displaced by the drill bit. Geothermal brine shall not be discharged into mud sumps/containment basins. Standing fluid observed in mud sumps/containment basins (if any) will be removed immediately, stored in portable tanks, and returned to the geothermal resource, or discharged offsite into Class II surface impoundments constructed pursuant to Title 27.
2. The discharge of solid geothermal waste to mud sumps/containment basins as a final means of disposal is prohibited without written authorization by the Regional Board Executive Officer.
3. The Discharger shall not cause degradation of any groundwater aquifer or supply water.
4. The discharge of waste to land not owned or controlled by the Discharger is prohibited.

5. Use of geothermal brine or drilling muds for dust control on access roads, well pads, or
within the plant area is prohibited.
6. The discharge of hazardous or designated wastes to areas other than a waste management unit authorized to receive such waste is prohibited.
7. Permanent (longer than one (1) year) disposal or storage of drilling waste to mud sumps/containment basins is prohibited, unless authorized in writing by the Regional Board Executive Officer.
8. All mud sumps/containment basins must be lined. Drilling waste shall not penetrate the
lining during the containment period.
9. Direct or indirect discharge of geothermal drilling wastes in mud sumps/containment basins or tanks, to surface water or surface drainage courses (including canals, drains, or subsurface drainage systems) is prohibited except as allowed under an appropriate NPDES permit.
10. The Discharger shall neither cause nor contribute to the contamination or pollution of groundwater via the release of waste constituents.
C. Provisions
1. The Discharger shall comply with Monitoring and Reporting Program No. R7-2008-0004
and future revisions thereto, as specified by the Regional Board Executive Officer.
Ormat Nevada, Inc.
North Brawley Geothermal Power Project
Waste Discharge Requirements (Revision 1)
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2. Unless otherwise approved by the Regional Board Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants", promulgated by the U.S. Environmental Protection Agency.
3. Prior to any change in ownership of this operation, the Discharger shall transmit a copy
of this Board Order to the succeeding owner/operator, and forward a copy of the transmittal letter to the Regional Board.
4. Prior to any modification that could result in a material change in the quality or quantity of discharge or material change in the location of the discharge the Discharger shall report all pertinent information in writing to the Regional Board Executive Officer and obtain revised requirements before implementing the modification.
5. All mud sumps/containment basins shall be certified, by a California Registered Civil Engineer or Certified Engineering Geologist to contain a continuous 1-foot-thick clay liner with a hydraulic conductivity of less than or equal to $1x10^{-6}$ cm/sec, or equivalent system approved by the Regional Board's Executive Officer.
6. The Discharger shall ensure that all site-operating personnel are familiar with the content
of this Board Order and shall maintain a copy of this Board Order at the site.
7. This Board Order does not authorize violation of any federal, state, or local laws or regulations.
8. The Discharger shall allow the Regional Board, or an authorized representative, upon presentation of credentials and other documents, as may be required by law, to:
a. Enter upon the premises regulated by this Board Order, or the place where records must be kept under the conditions of this Board Order;
b. Have access to and copy, at reasonable times, any records that shall be kept under the condition of this Board Order;
c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Board Order, and
d. Sample or monitor at reasonable times, for the purpose of assuring compliance with

this Board Order or as otherwise authorized by the California Water Code, any substances or parameters at this location.
9. The Discharger shall comply with all of the conditions of this Board Order. Any noncompliance with this Board Order constitutes a violation of the Porter-Cologne Water Quality Act and is grounds for enforcement action.
Ormat Nevada, Inc.
North Brawley Geothermal Power Project
Waste Discharge Requirements (Revision 1)
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10. The Discharger shall at all times properly operate and maintain all facilities and systems
of treatment and control, and related appurtenances, that are installed or used by the Discharger to achieve compliance with this Board Order. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures.
11. The Discharger shall comply with the following:
a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity;
b. The Discharger shall retain records of all monitoring information, copies of all reports required by the Board Order, and records of all data used to complete the application of the Board Order, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by the Regional Board Executive Officer at any time;
c. Records of monitoring information shall include:
i. The date, exact place(s), and time of sampling or measurement(s).
ii. The individual(s) who performed the sampling or measurement(s).
iii. The date(s) analyses were performed.
iv. The individual(s) responsible for reviewing the analyses.
v. The results of such analyses; and
d. Monitoring must be conducted according to test procedures described in the Monitoring and Reporting Program, unless other test procedures have been specified in this Board Order or approved by the Regional Board Executive Officer.
12. The Discharger is the responsible party for the WDRs, and the monitoring and reporting
program for the Facility. Ormat Nevada Inc. shall comply with all conditions of these WDRs. Violations may result in enforcement action, including Regional Board Orders or court orders, that require corrective action or impose civil monetary liability, or modification or revocation of these WDRs by the Regional Board.
13. The Discharger shall furnish, under penalty of perjury, technical monitoring program reports submitted pursuant to the specifications provided by the Regional Board Executive Officer. Specifications are subject to periodic revision as may be warranted.
14. The monitoring reports shall be certified to be true and correct, and signed, under penalty of perjury, by an authorized official of the company.
15. This Board Order does not convey property rights of any sort, or any exclusive privileges;
nor does it authorize injury to private property, invasion of personal rights, or infringement
of federal, state, or local laws and regulations.

Attachment VI

CALCULATION OF PRECIPITATION AND EVAPORATION FROM POND2

Pan Evaporation Rates from Brawley 2 SW 1957 - 1973

	Units per Month	
Month	mm	inches
Nov	126	4.96
Dec	88	3.46
Jan	96	3.78
Feb	129	5.08
Mar	208	8.19
Mean	129.40	5.09

Increase by 10% for open water body 5.60

Precipitation

Nov	3.20	
Dec	3.40	
Jan	16.10	
Feb	8.20	
Mar	12.10	
Mean	8.60	
Net gain/month	3.00	0.25 feet/month
Net gain/day		0.008 feet/day

Area of water surface Pond 2 only

Bottom Dimensions	270 X100	
Side Slopes	3:1	
W.S. Length	336	
W. S. Width	166	
Corner Area	Pi(33)^2	
Area	59195	
Volume Gain cuft/day	492.65	3,685 gal/day