

May 19, 2026

**IMPERIAL COUNTY AIR POLLUTION CONTROL DISTRICT  
Authority to Construct Review**

Permit No: 2217A-8

Source Name: ORMAT Nevada, Inc.  
(Heber 2, Heber South, Goulds 2 & Dogwood OEC)

Source Type: Geothermal Power Plant

Location: 855 Dogwood Road,  
Heber, CA 92249

Responsible Agent: Alissa Sanchez, Director  
947 Dogwood Road,  
Heber, CA 92249  
(775) 722-3166

Facility Contact: Troy Owens, Regional Manager  
(541) 640-6534

Permit Reviewer: Victor H. Mendez  
APC Senior Engineer

**Introduction**

ORMAT Nevada, Inc. (Ormat), owns and operates the “Heber Geothermal Energy Complex” in the town of Heber, in Imperial County, CA. The facility was originally issued an Authority to Construct with operating conditions in 1992. The facility currently operates under Permit to Operate (PTO) 2217A-7. PTO no. 2217A-7 includes emissions generated from the Heber 2, Heber South, and Goulds 2 facilities, which are adjacent to each other, altogether forming what is known as the “Heber Geothermal Energy Complex”.

OrHeber 3, LLC. (a wholly owned subsidiary of Ormat Technologies, Inc.) proposes the development/addition of a new 25 megawatt (MW) geothermal energy facility (Dogwood Ormat Energy Converter Unit or Dogwood “OEC”) and a medium voltage distribution cable. The proposed “Dogwood OEC” unit will also be located within the existing Heber Geothermal Energy Complex (855 Dogwood Rd, Heber, CA). In addition, Ormat has requested an increase to the permitted total dissolved solids (TDS) and water circulation

rates limits for the existing cooling tower system. Authority to Construct No. 2217A-8 will include all potential emissions and applicable rules/regulations from the newly proposed Dogwood OEC unit and TDS increase, in addition to all emissions from the existing Heber Geothermal Energy Complex facilities.

## Facility Description

### Existing Heber Geothermal Energy Complex:

#### *Heber 2*

Heber 2 consists of two ORMAT Energy Converters (OECs). OEC-1 is a two-turbine combined cycle binary unit, operating on a subcritical Rankine cycle, with isopentane as the motive fluid for the system. This system also consists of a generator, vaporizer, water-cooled condensers, preheaters, and recuperators, with the OEC served by the existing Sullair Model VS12-20 vapor recovery unit (VRU) at the Heber 2 site for purging and maintenance events. The design capacity for the unit is 23.6 MW gross output. OEC-1 contains approximately 35,000 gallons of isopentane.

OEC-2 is a two-turbine combined cycle binary unit, operating on a subcritical Rankine cycle, with isopentane as the motive fluid for the system. This system also consists of a generator, vaporizer, water-cooled condensers and preheaters, with the OEC served by the existing Sullair Model VS12-20 VRU at the Heber 2 site for purging and maintenance events. The design capacity for the unit is 14.52 MW gross output. OEC-2 contains approximately 28,000 gallons of isopentane.

The two OECs at Heber 2 are operationally interconnected to each other as well as to Goulds 2 and Heber South. The VRU and MF storage tanks are shared by all the units and there is piping connecting the MF circuits between the units.

Heber 2 facility currently operates two (2) 6-cell Harmon mechanical draft counter-flow cooling towers. This cooling tower's framework and fan deck are made of treated Douglas fir, fiberglass fan stacks and PVC drift eliminators. The drift eliminators have a drift rate of 0.0008% of circulating water flow. The significant design features of the tower are listed below:

#### 6-Cell Harmon Cooling Tower (per tower)

Capacity rating	63,000 gpm
Number of fans	6
Drift loss, %of circulating flow	0.0008%

## Goulds 2

The Goulds 2 OEC unit is located at the northwest corner of the facility. The Goulds 2 OEC unit is rated at a gross output of 10 MW. It operates on a subcritical Rankine cycle, using isopentane from the existing facility system as the motive fluid as previously described. The integrated two-level OEC unit contains a Level 1 and Level 2 loop, and each loop contains two vaporizers, two condensers, two brine preheaters. The two-level Goulds 2 OEC contains approximately 22,500 gallons of isopentane.

The Goulds 2 OEC cooling water comes from a 3-cell Marley model F499A-5.91-3 cooling tower. The Goulds 2 OECs cooling tower is a flash mechanical draft counter flow tower, made of industrial fiberglass, with *fire*-retardant pultruded reinforced polyester framing and polyvinyl chloride cellular drift eliminators. The significant design features of the tower are listed below:

3-Cell Cooling Tower	
Capacity rating	41,250 gpm
Inlet water temperature	85.6 °F
Wet bulb temperature, inlet	61 °F
Number of fans	3
Total fan power	540 Hp
Drift loss, %of circulating flow	0.001%
Evaporation loss, design conditions	530 gpm each
Overall dimension, L x W	162.7 ft x 54.7 ft
Overall tower height	51.6 ft
Air delivery per fan	1,384,866 cfm

## Heber South

The Heber South OEC unit is located at the southwest corner of the facility. The Heber South OEC unit is rated at a gross output of 12 MW. It operates on a subcritical Rankine cycle, using isopentane from the existing facility system as the motive fluid as previously described. The integrated two-level OEC unit contains a Level 1 and Level 2 loop, and each loop contains two vaporizers, one separator, two condensers, one diffuser, and brine preheaters. The two-level Heber South OEC contains approximately 25,500 gallons of isopentane.

The Heber South OEC cooling water comes from a 3-cell Marley model F499A-5.91-3 cooling tower. The Heber South OECs cooling tower is a flash mechanical draft counter flow tower, made of industrial fiberglass, with *fire*-retardant pultruded reinforced polyester framing and polyvinyl chloride cellular drift eliminators. The significant design features of the tower are listed below:

### 3-Cell Cooling Tower

Capacity rating	41,250 gpm
Inlet water temperature	85.6 °F
Wet bulb temperature, inlet	61 °F
Number of fans	3
Total fan power	540 Hp
Drift loss, % of circulating flow	0.0005%
Evaporation loss, design conditions	530 gpm each
Overall dimension, L x W	162.7 ft x 54.7 ft
Overall tower height	51.6 ft
Air delivery per fan	1,384,866 cfm

### Auxiliary Combustion Equipment

Type	Engine Make & Model	Engine Power	Operating Hours
Emergency Generator	Cummins KTA19G2	685 hp	20 hrs/yr
Fire Pump	Clarke JW6H-UF40	300 hp	50 hrs/yr
Emergency Pump	John Deere 6090H	350 hp	50 hrs/yr
Fire Pump	John Deere JW6H-UFADFO	311 hp	50 hrs.yr

Note: Combustion equipment is further described in the emissions section.

### Above Ground Storage Tanks

There are five existing Isopentane above ground storage tanks located at Heber 2 and one at Goulds 2. Each tank has a capacity of 10,000 gallons, for a total storage capacity of 60,000 gallons.

### *Vapor Recovery Unit (VRU)*

The VRU unit is a Sullair Model VS12-20, 20 hp heavy duty industrial vacuum system, used for system purging and maintenance purposes. The VRU systems consists of a:

- *Vacuum Pump*
- *20 hp Motor*
- *Motor Starter*
- *Instrumentation:*
  - *Vacuum Gauge*
  - *Temperature Gauge*
  - *Delta P Gauges*
  - *Inlet Filter Differential Pressure Gauge*
- *Lubrication/Sealing*
- *Discharge Separator*
- *Inlet Gas Filter*

### *Power Generation Process*

The Goulds 2, Heber South and Heber 2 OECs units are binary units, meaning they contain two separate fluid systems: a geothermal train and a closed isopentane loop. The geothermal fluids from the production wells flow through sand filters and the Level 1 and Level 2 vaporizers and preheaters, transferring the heat to the isopentane working fluid through the OEC shell-and-tube heat exchangers. The cooled geothermal fluid is then pumped to the geothermal fluid injection system without coming in contact with the atmosphere. The geothermal fluids heat the isopentane. In the closed loop system, the vaporized isopentane from the Level 1 and Level 2 vaporizers flow to the Level 1 and Level 2 turbines, which power a generator. After transferring energy to the turbines, the vaporized isopentane flows from the turbines through diffusers into shell-and-tube condensers, and the condensed fluid is returned to the preheaters and vaporizers to repeat the cycle. The isopentane loop for the units is integrated into the facilities isopentane system and use the existing Sullair Model VS12-20 VRU at the Heber 2 site for purging and evacuation of the units prior to maintenance. The isopentane vapors are cooled with a third fluid, cooling water. The isopentane vapors are cooled by the water circulated through the shell-and-tube condensers. The heated water from the condensers is cooled by contact with cooler air in the cooling tower. During this process small amount of the circulating water is evaporated. The make-up water comes from the Central Main Canal.

### *Proposed Dogwood OEC Project*

The proposed Dogwood OEC unit is a two-turbine combined cycle binary unit, operating under a subcritical Rankine cycle, with isopentane as the motive fluid. The OEC system consists of a generator, turbines, three vaporizers, air-cooled condensers, pre-heaters and one recuperator, and an evacuation skid/vapor recovery unit for purging and maintenance events. The design capacity for the unit is 25 MW (net). In addition, the

proposed Dogwood OEC unit will result in the installation of the following units:

- One (1) Integrated three level unit (I3LU) air cooled Ormat Energy Converter (OEC) generating unit.
- Two (2) double walled 20,000 Gallon Isopentane tanks for motive fluid storage with the following specs:
  - Concrete foundations with blast walls separating the tanks from the OEC unit.
  - An automated water suppression system.
  - Concrete containment areas.
  - Two flame detectors, which will immediately detect any fire and immediately trigger the automatic fire suppression system.
  - A gas detector, which will immediately detect any isopentane leak and alert the control room, which is manned 24/7.
- One (1) project substation for transmission to the grid.
- Ancillary and auxiliary equipment
  - 545 bhp Emergency Diesel Generator.
- A new seven (7) megawatt (MW) solar photovoltaic field dedicated to the Dogwood OEC unit (for parasitic load purposes).
- Medium voltage distribution cable from the solar field to the Dogwood OEC unit.
- A cooling tower array will perform air-cooling operations. The proposed cooling tower will utilize “dry cooling” technology which does not result in water evaporation; therefore, no associated emissions of particulate matter are expected from the operation of the proposed cooling tower array system.

### *Supplemental Proposed Projects*

A new 15 MW solar field will be constructed to provide auxiliary energy to the existing Heber 2 geothermal plant. The proposed solar array will effectively reduce the margin between gross and net geothermal energy generation, therefore, allowing for more efficient generation of geothermal energy.

In addition, the proposed project will require a new substation to step up the low voltage electrical energy generated at the Dogwood OEC unit to the higher voltage required for commercial transmission. No upgrades to the off-site transmission facilities are necessary and the proposed substation will connect directly to the existing point of interconnection with the Imperial Irrigation District controlled grid.

These proposed supplemental projects will not result in the release of emissions, therefore, will not be included in the potential to emit or operating conditions sections of this review, they are only referenced here as general information of the facility.

## **Emissions Calculations**

### *Isopentane Emissions*

Isopentane emissions are produced by OEC units during maintenance events, purging, and normal operations (fugitive releases from pipes, seals, flanges and valves).

#### Maintenance Isopentane Emissions

Occasionally, isopentane must be evacuated from a portion of an OEC for maintenance or repair. The OECs are divided into zones that can be isolated and evacuated for maintenance while the isopentane remains in the rest of the system. To evacuate the isopentane from a zone for maintenance, the isopentane liquid and vapor are removed using the VRU (with a 95% control efficiency) and held in the storage tanks. Any remaining vapors are purged from the zone using nitrogen and passes through the VRU. The unit is not open to atmosphere until the vapor concentration is less than 20% of the lower explosion limit for isopentane. Maintenance isopentane emissions are estimated based on site-specific emission factors derived from previous actual emissions data.

#### Purging Isopentane Emissions

Over time impurities build up in the motive fluid (MF). These impurities include non-condensable gases (NCG's) which decrease the operating efficiency of the units. NCGs are purged from the system using the existing VRU. During the purging, vapors from the OECs pass through a knock-out drum and chiller to separate the condensable gases from the NCGs. The remaining gases are passed through an activated carbon bed to collect hydrocarbons before being vented to the atmosphere. The facility's current air permit requires the VRU to achieve 95% hydrocarbon capture efficiency.

#### Fugitive Isopentane Emissions

Fugitive isopentane emissions occur from leaks in seals, flanges, pumps, valves, and other components. It is not feasible to measure fugitive emissions directly, but fugitive emissions leaks can be quantified based on the addition of isopentane to the system to make up for the lost fluid. Ormat tracks fluid additions, and the fluid additions that are not attributed to known non-fugitive causes are counted as fugitive emissions.

Existing Isopentane Emissions

The facility daily Isopentane Emissions in pounds per day are provided in table 1

**Table 1- Existing Isopentane Emissions**

Emission Category	MF Volume (Gallons)	E.F (lbs/day/1,000 gal)	Emission Reduction	Isopentane Emissions (lbs/day)	Isopentane Emissions (Tons/Yr)
Maintenance	111,000	0.45	50%	24.97	4.55
Purging	111,000	2.9 x 10 <sup>-5</sup>	0%	0.0032	0.0005
Fugitive	171,000 (Including Tanks)	1.20	50%	102.6	18.72
<b>Total</b>				<b>127.57</b>	<b>23.27</b>

Proposed Dogwood OEC Potential to Emit

Per Permit to Operate 2217A-7 issued by the ICAPCD, site specific isopentane maintenance, purging, and fugitive emissions were calculated based on worst case quarterly emissions from the years 2019 and 2020. Emission adjusted for the decreased complexity (significant decrease of seals, flanges, pumps, valves) of the newly proposed units as compared to the previous operating units, therefore, a 50% emission reduction is hereby accounted for the fewer potential emission release points on the newly proposed units. Emissions have been converted into a per 1,000-gallon factor. Table 2 summarizes the resulting “project-specific” emission factors.

**Table 2- Project Specific Isopentane Emission Factors (E.F)**

Emission Category	E.F (2019 & 2020 Worst Case Quarterly Emissions PTO 2217A-7)	Emission Reduction
Maintenance	0.45	50%
Purging	2.9 x 10 <sup>-5</sup>	0%
Fugitive	1.2	50%

The proposed OEC and I3LU have a combined volume of approximately 82,140 gallons, and both Isopentane storage tanks have a total capacity of 40,000 gallons. Isopentane emissions are related to the size of the proposed system. Potential emissions were calculated based on the total isopentane volume. Table 3 summarizes the estimated isopentane emissions from the proposed Dogwood OEC unit.

**Table 3- Dogwood OEC Isopentane Potential to Emit**

<b>Emission Category</b>	<b>System Motive Fluid Volume (Gallons)</b>	<b>Emission Factor</b>	<b>Emission Reduction</b>	<b>Isopentane Emissions (lbs/day)</b>	<b>Isopentane Emissions (Tons/Yr)</b>
Maintenance	82,140 (OEC/I3LU)	0.45	50%	18.48	3.37
Purging	82,140 (OEC/I3LU)	2.9 x 10 <sup>-5</sup>	0%	0.002	0.0004
Fugitive	122,140 (OEC/I3LU/Tanks)	1.20	50%	73.28	13.37
<b>Total</b>				<b>91.76</b>	<b>16.74</b>

Total Isopentane Emissions

Table 4 Summarizes the total Isopentane potential to emit from both the existing operation and the newly proposed Dogwood OEC unit.

**Table 4- Facility Total Isopentane Potential to Emit**

<b>Emission Category</b>	<b>Isopentane Emissions (lbs/day)</b>	<b>Isopentane Emissions (Tons/Yr)</b>
Existing (2217A-7)	127.57	23.27
Proposed	91.76	16.74
<b>Total</b>	<b>219.33</b>	<b>40.00</b>

*Existing Cooling Towers Emissions*

Particulate Matter (PM10) emissions from the existing cooling towers at the facility, which serves the Heber geothermal complex facility are calculated using the methodology contained in U.S. EPA AP-42, *Compilation of Air Pollutant Emission Factors* (Fifth Edition), Section 13.4. Each cooling tower's PTE is based on the conservative assumption that all of the aerosols (particulate matter), which form when emitted by each cooling tower liquid drift evaporates, are PM10 and PM2.5 emissions. The potential operating schedule of each cooling tower is 24 hours per day for 365 days per year, which is used in calculating the daily and annual PTE for each emissions unit.

Table 5 below displays the operating parameters for the Goulds 2 OEC Marley three-cell cooling tower, Heber South OEC Marley three-cell cooling tower and the Heber 2 OEC's Harmon six-cell cooling towers. Tables 5 below, display the PTE for the cooling towers.

**Table 5- Operational Parameters for Existing Cooler Tower System**

Emissions Unit	Water Flow (gpm)	TDS (ppm)	Drift Rate %	Water Density (lbs/gal)
Goulds 2 three-cell cooling tower	41,250	3,950	0.0010	8.31
Heber South three-cell cooling tower	41,250	3,950	0.0005	8.31
Heber 2 six-cell cooling tower	63,000	3,950	0.0008	8.31
Heber 2 six-cell cooling tower	63,000	3,950	0.0008	8.31

*Proposed Cooling Tower System TDS and Water Circulation rates Increase*

**Table 6- Operational Parameters for Proposed TDS Increase**

Emissions Unit	Water Flow (gpm)	TDS (ppm)	Drift Rate %	Water Density (lbs/gal)
Goulds 2 three-cell cooling tower	45,000	10,000	0.0010	8.31
Heber South three-cell cooling tower	45,000	10,000	0.0005	8.31
Heber 2 OEC six-cell cooling tower	63,000	10,000	0.0008	8.31
Heber 2 OEC six-cell cooling tower	63,000	10,000	0.0008	8.31

Equation to determine daily PM emissions:

$$PM = \text{Water Recirc. Rate} \times (\text{TDS of water}/1,000,000) \times (\text{drift loss}/100) \times 8.31 \text{ lb/gal} \times 60 \text{ mins/hr} \times 24 \text{ hrs/day}$$

**Table 7- Proposed Cooling Tower System Potential to Emit**

Emissions Unit	Total PM (lb/day)	Total PM (ton/yr)	PM10 (lb/day)	PM10 (ton/yr)	PM2.5 (lb/day)	PM2.5 (ton/yr)
Goulds 2 Three-cell Cooling Tower	53.84	9.83	21.54	3.93	21.54	3.93
Heber South Three-cell Cooling Tower	26.92	4.91	10.77	1.97	10.77	1.97
Heber 2 Six-cell Cooling Tower	60.31	11.01	24.12	4.40	24.12	4.40
Heber 2 Six-cell Cooling Tower	60.31	11.01	24.12	4.40	24.12	4.40
<b>Total Cooling Tower Emissions</b>	<b>201.38</b>	<b>36.75</b>	<b>80.55</b>	<b>14.70</b>	<b>80.55</b>	<b>14.70</b>

Note: 40% of Total PM is less than PM10 and PM2.5. Air District staff referred to the document by Joel Reisman and Gordon Frisbie – Calculating Realistic PM10 Emissions from Cooling Towers, figure 1 on sheet 5,

*Proposed “Dry-Cooling” Towers System*

The proposed Cooling Tower Array System will include a series of heat-absorbing evaporators and condensers to capture and transfer heat stored in geothermal fluid. The “dry-cooling” array system does not result in water evaporation, therefore, there are no

expected emissions of particulate matter associated with the proposed cooling tower systems as there are with “wet-cooling” tower systems.

### *Existing Combustion Equipment Emissions*

The existing emergency standby pump, driven by the John Deere diesel engine model 6090H (350 hp), will remain at the site. This emissions unit is operated on a regular basis for maintenance and testing (M&T) purposes only and can operate on an unlimited basis during emergency events. Per ARB’s Airborne Toxic Control Measure for Stationary Compression-Ignition Engines (ATCM), the pump engine will continue to be limited to 50 hours per year of operation for M&T purposes. In calculating the daily PTE for the pump, it is assumed that the unit would operate no more than 1 hour per day for M&T. The emissions will be calculated using Tier III standards.

**Table 8- John Deere 6090H 350hp Diesel Engine**

Units	NOx	CO	PM 10
g/bhp-hr	2.76	2.6	0.15
lbs/hour	2.13	2.0	0.12
<b>Lb/day</b>	<b>2.13</b>	<b>2.0</b>	<b>0.12</b>
<b>tons/year (50 hrs)</b>	<b>0.05</b>	<b>0.05</b>	<b>0.01</b>

The existing emergency standby electric generator, driven by the Cummins diesel engine (685 hp), will remain at the site. This emissions unit is operated on a regular basis for maintenance and testing (M&T) purposes only and can operate on an unlimited basis during emergency events. Per ARB’s Airborne Toxic Control Measure for Stationary Compression-Ignition Engines (ATCM), the electric generator engine will continue to be limited to 20 hours per year of operation for M&T purposes. In calculating the daily PTE for the electric generator, it is assumed that the unit would operate no more than 1 hour per day for M&T. The emissions were calculated using applicable limits according to ICAPCD Policy 40 Guidelines for establishing a NOx and CO emission limit(s) to existing standby engines from source test results conducted on October 16, 2014.

**Table 9- DMT-500C2 685 bhp Diesel Engine**

Units	NOx	CO	PM 10
g/bhp-hr	---	---	0.4
lb/hr	11.32	4.37	0.6
<b>lb/day</b>	<b>11.32</b>	<b>4.37</b>	<b>0.6</b>
<b>tons/year (20 hrs)</b>	<b>0.11</b>	<b>0.04</b>	<b>0.01</b>

The Heber 2 fire pump, driven by the John Deere diesel engine (311bhp) model JW6H-UFADFO, will be operated on a regular basis for maintenance and testing (M&T) purposes only, and can operate on an unlimited basis during emergency events. Per ARB's Airborne Toxic Control Measure for Stationary Compression-Ignition Engines (ATCM), the pump engine will be limited to 50 hours per year of operation for M&T purposes. In calculating the daily PTE for the fire pump, it is assumed that the unit would operate no more than 1 hour per day for M&T. The emissions will be calculated using Tier III standards.

**Table 10- John Deere JW6H-UFADFO 311hp Fire pump Engine**

Units	NOx	CO	PM 10
g/bhp-hr	2.8	2.6	0.15
lbs/hour	1.92	1.78	0.11
<b>lb/day</b>	<b>1.92</b>	<b>1.78</b>	<b>0.11</b>
<b>tons/year (50 hrs)</b>	<b>0.05</b>	<b>0.04</b>	<b>0.002</b>

The Heber south fire pump is a 300 hp (224 kW) Clarke engine uses 15 ppm sulfur fuel and would meet EPA Tier 2 standards for diesel engines between 225 kW and 450 kW for model years 2001 and later, as shown in the following Table. It will be allowed to operate 50 hours per year for maintenance/testing. In calculating the daily PTE for the fire pump, it is assumed that the unit would operate no more than 1 hour per day for M&T.

**Table 11- Clarke JW6H-UF40 300hp Fire pump Engine**

Units	NOx	CO	PM 10
g/bhp-hr	4.27	0.33	0.12
lbs/hour	3.02	0.23	0.08
<b>lb/day</b>	<b>3.02</b>	<b>0.23</b>	<b>0.08</b>
<b>tons/year (50 hrs)</b>	<b>0.07</b>	<b>0.005</b>	<b>0.002</b>

*Proposed Combustion Equipment Potential to Emit*

The proposed emergency generator, driven by a Tier III Perkins diesel engine (578bhp) model 2206D-E13TAG3, will be operated on a regular basis for maintenance and testing (M&T) purposes only, and can operate on an unlimited basis during emergency events. Per ARB's Airborne Toxic Control Measure for Stationary Compression-Ignition Engines (ATCM), the emergency generator engine will be limited to 50 hours per year of operation for M&T purposes. In calculating the daily PTE for the emergency generator, it is assumed that the unit would operate no more than 1 hour per day for M&T. The emissions will be calculated using Tier III standards.

**Table 12- 578 hp Perkins Diesel Engine**

Units	NOx	CO	PM 10
g/bhp-hr	2.5	2.01	0.12
lbs/hour	3.2	2.5	0.15
<b>lb/day</b>	<b>3.2</b>	<b>2.5</b>	<b>0.15</b>
<b>tons/year (50 hrs)</b>	<b>0.08</b>	<b>0.06</b>	<b>0.004</b>

*Total Facility-Wide PTE*

The total PTE for the Heber geothermal complex facility, includes the potential isopentane emissions from the newly proposed Dogwood OEC and the existing OEC units located at Heber 2, Heber South and Gould's 2, emissions from the facility's four existing cooling towers, and the maintenance and testing (M&T) emissions from the proposed combustion units and existing emergency water pump, fire water pumps and electric generator.

**Table 13: Heber Geothermal Complex Facility-Wide Post-Modification PTE**

Pollutants	Lbs/day	Tons/Yr
VOC	219.33	40.0
CO	10.88	0.91
NOx	21.59	0.4
PM10	81.61	14.73
PM2.5	81.61	14.73

*Offset Calculations*

The Heber Geothermal Complex facility potential emissions of pollutants specified in ICAPCD Rule 207 are below the offsetting thresholds, except for VOC emissions. The proposed Dogwood OEC project results in a total VOC Potential to Emit of 219.33 lbs/day.

Excess emissions (Total daily PTE – 137 lbs/day, as per ICAPCD Rule 207 Section C.2.a) are calculated based on a 91 days per quarter schedule, at a 1.2 to 1 offsetting ratio for VOC **stationary** ERC's or at a 2 to 1 offsetting ratio for VOC **agricultural** ERC's. Tables 14 and 15, listed below, summarize both stationary and agricultural offset calculations:

**Table 14- Stationary VOC Offset Calculations**

<b>Lb/day</b>	<b>219.33</b>
offsetting threshold	137
excess daily emissions	82.33
days per quarter	91
excess quarterly lbs	7492.03
excess quarterly tons	3.7
Stationary VOC ERCs offset ratio (1.2 to 1)	1.2
<b>Stationary VOC ERCs required/qtr (1<sup>st</sup> year)</b>	<b>4.50</b>
<b>Stationary VOC ERCs (one time basis)</b>	<b>18.0</b>

**Table 15- Agricultural VOC Offset Calculations**

<b>Lb/day</b>	<b>219.33</b>
offsetting threshold	137
excess daily emissions	82.33
days per quarter	91
excess quarterly lbs	7492.03
excess quarterly tons	3.7
Agricultural VOC ERCs offset ratio (2 to 1)	2
<b>Agricultural VOC ERCs required/qtr</b>	<b>7.5</b>
<b>Agricultural VOC ERCs required/yr</b>	<b>30.0</b>

### **Applicable Rules and Regulations**

The following section summarizes the Air District Rules and Regulations which are applicable to the new and existing emissions units and processes operated by Ormat at the Heber geothermal complex facility.

#### **Rule 111 Equipment Breakdown**

This Air District Rule details the notification and corrective action requirements in an equipment breakdown situation. As the operator and permittee of this geothermal power plant, Ormat is required to continue to comply with the requirements of District Rule 111.

#### **Rule 201 Permits Required**

Except as exempted within the Air District Rules and Regulations, new or modified sources which may emit or control air contaminants must obtain written authorization from the ICAPCD prior to construction. The Heber geothermal complex facility includes

existing emissions sources and abatement equipment that require both an Authority to Construct (ATC) and Permit to Operate (PTO) from the Air District.

#### **Rule 204 Applications**

The Permittee has satisfied District Rule 204 with the submittal of a complete permit application, as well as two subsequent addendums to the application, to the Air District for the proposed modification of the Heber geothermal complex facility.

#### **Rule 206 Processing of Applications**

This District Rule contains the guidelines established by the APCO for the processing of applications and issuance of permits. This proposed project is classified as a discretionary permit/non-ministerial project and will be processed according to the instructions included in the Recommendations Section of this District Analysis. This Rule outlines steps taken to process both ministerial and discretionary projects. This application is classified as a discretionary permit because the modified Heber geothermal complex facility will continue to have a facility-wide PTE greater than or equal to 100 pounds per day for VOC emissions. As a result, this project, and resulting draft ATC Permit will follow the public noticing and review requirements of Rule 206 for discretionary permits.

#### **Rule 207 New and Modified Stationary Source Review**

Rule 207 provides preconstruction review requirements for new and modified stationary sources to ensure that the operation of such sources does not interfere with the attainment or maintenance of ambient air quality standards. Rule 207 is applicable for the permittee's proposed project, which consists of the modification of the Heber geothermal complex facility. Imperial County is classified as a nonattainment area for both state and federal ozone and PM<sub>2.5</sub> air pollutants. VOC emissions are precursors for ozone.

##### *Best Available Control Technology (BACT)*

Rule 207.C.1.a requires the implementation of BACT emission controls for any new source that has the potential to emit 25 pounds or more on any nonattainment pollutant or its precursors. The facility is in an area classified as nonattainment for ozone, and VOC emissions are an ozone precursor.

The proposed Dogwood OEC reduces technology complexity, compared to previously operated energy conversion units, minimizing potential emissions by up to 50% due to a decrease in possible emission release points (less valves, flanges, pumps, seals, etc.). In addition, the proposed OEC project includes emission control equipment (VRU with 95% control efficiency), which will help mitigate emission releases during normal

operations, maintenance and purging activities. The proposed Dogwood OEC unit is therefore considered BACT.

The proposed increase to the total dissolved solids and water circulation rates does not result in an emission increase equal or greater to 25 lbs/day per emission unit, therefore, BACT is not required as per Rule 207.C.1 for this request.

### *Offsets*

Rule 207.C.2.a requires that any new or modified emission source with a potential to emit (PTE) greater than 137 pounds per day (lb/day) for VOC, PM<sub>10</sub>, NO<sub>x</sub> or SO<sub>x</sub> emissions be offset by the permittee. The proposed Dogwood OEC unit is expected to result in a VOC emission increase, totaling 219.33 lbs/day, which is greater than the 137 lbs/day threshold for offsetting requirements, therefore, the applicant will be required to relinquish Emission Reduction Credits to account for the excess emissions resulting from the proposed project. The total tons of Emission Reduction Credits to be relinquished by the applicant are included on the potential to emit and operating conditions sections of this review.

Offsets required as a condition of an Authority to Construct or a Permit to Operate shall be an enforceable requirement at the time of Authority to Construct issuance and shall be in effect no later than the date of initial operation of the new emissions unit.

### **Rule 208 Permit to Operate**

The Air District shall inspect and evaluate the Heber geothermal complex facility, including its various emissions units and abatement systems, prior to allowing the stationary source to operate under a Permit to Operate (PTO). The permittee is expected to fully comply so that a PTO may be issued upon confirmation of compliance after the proposed modification is fully constructed and all equipment is in operation.

### **Rule 400.3 Internal Combustion Engines**

This District Rule applies to any internal combustion engine (ICE) with a brake horsepower (bhp) rating greater than 50. In order to comply with this Rule, Ormat will maintain an engine operating log on-site for the facility's internal combustion units. The emission units are operated on a regular basis for maintenance and testing (M&T) purposes only, but can operate on an unlimited basis during emergency events.

### **Rule 401 Opacity of Emissions**

The opacity of the emissions from each of the emission units at the Heber geothermal complex facility, other than uncombined water vapor, may not be as dark or darker as designated as No. 1 on the Ringelmann Chart (20% opacity) for a period or periods

aggregating more than three minutes in any one hour. The Permittee will continue to comply with this rule.

### **Rule 403      General Limitations on the Discharge of Air Contaminants**

This prohibitory rule applies to the discharge of air contaminants, combustion contaminants, and particulate matter into the atmosphere. The requirements establish maximum emission rates for particulate matter that vary according to the weight of the materials processed by an emissions unit and/or the volume discharge rate of an emissions unit. The applicable emission limit rates are listed in Tables 403-1 and 403-2. The new and existing emissions sources at the Heber geothermal complex facility will be required to comply with Rule 403.

### **Rule 407      Nuisances**

Rule 407 states that no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property. The permittee will continue to be required to comply with this rule at all times.

### **Regulation VIII      Fugitive Dust (PM10) Rules**

The Air District Rules under Regulation VIII include requirements and Best Available Control Measures (BACM) which operators must implement in order to reduce fugitive dust emissions from construction and earthmoving activities, open areas, movement of bulk materials, carry out and track out activities, and paved and unpaved roads. The permittee must meet all the applicable requirements of District Rules 800 through 805 while the proposed modification is constructed and operations resume post-modification.

### **ATCM 93115 California Airborne Toxic Control Measures (ATCMs)**

The diesel engines, which drive the new and existing diesel internal compression engines, and are permitted as emergency units or fire pumps, will continue to be subject to the Airborne Toxic Control Measure for Stationary Compression-Ignition (CI) Engines (Diesel ATCM). Ormat will continue to limit the M&T hours for the engines on an annual basis.

New stationary emergency standby diesel-fueled CI engines which are rated 50bhp or higher are required to meet the Emission Standard of 0.15 g/bhp-hr (0.20 g/kw-hr) for PM 10 and shall not operate more than 50 hours per year for maintenance and testing purposes.

## CA Health & Safety Code 42301.6

California Health and Safety Code, Sec. 42301.6 requires that the Air District prepare a public notice for any new or modified source which emits hazardous air emissions that is located within 1,000 feet from the outer boundary of a school site, prior to approving a Permit to Construct or Modification. The existing Heber geothermal complex facility, located at 855 Dogwood Road, Heber, is located over 3,000 feet from the closest school site, which is Heber Elementary School, located at 1052 Heber Ave, Heber CA. Therefore, ORMAT, is deemed to be in compliance with CA H&SC Sec. 42301.6. The Air District consulted the online Google Tool, Google Maps, as well as the software program Google Earth in making this determination.

### **AB2588 Assessment**

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) requires toxic emissions from stationary sources be quantified and compiled into an inventory according to criteria and guidelines developed by the California Air Resources Board (CARB), and that each facility be prioritized to determine whether a risk assessment must be conducted.

In order to streamline the evaluation of stationary sources potentially subject to the AB 2588 "Hot Spots" Program, screening risk assessment tables have been developed to estimate overall facility risk.

Screening risk assessment for the four (4) existing diesel engines and one (1) proposed diesel engine (based on diesel PM level) has been calculated using a Screening HRA for diesel engines tool provided by San Joaquin Valley APCD. The unit's horsepower, PM emission factor, the minimum potential distance to the nearest receptor, and the yearly operating hours of the units were considered in the screening. See results in the table below:

Engine	Horsepower	Emission factor	Distance to receptor	Operating hours
Cummins	685	0.4	530	20
John Deere	311	0.15	590	50
John Deere	350	0.15	700	50
Clarke	300	0.12	1130	50
Perkins	578	0.15	800	50

If the cancer risk exceeds the limit (ten in a million), additional health risk assessment is required. Under these conditions Diesel Exhaust PM cancer risk by the diesel engine has been calculated to be less than four (4). Since the risk score is below 10.0, no further detailed risk analysis will be required of the applicant. The prioritization score calculator sheet has been included as backup to this review and will be included on the permit file.

### **Authority to Construct and Permit to Operate Conditions**

#### **A. General Conditions**

1. Operation of this equipment shall be in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.  
(General Conditions)
2. Operation of this equipment shall be in compliance with all applicable APCD Rules and Regulations.  
(General Conditions)
3. This Permit does not authorize the emissions of air contaminants in excess of those allowed by USEPA (Title 40 of the Code of Federal Regulation), the State of California Division 26, Part 4, Chapter 3 of the Health and Safety Code, or the APCD (Rules and Regulations).  
(General Conditions)
4. This permit cannot be considered permission to violate applicable existing laws, regulations, rules or statutes of other governmental agencies.  
(General Conditions)
5. No air contaminant shall be released into the atmosphere which causes a public nuisance.
6. All equipment shall be maintained in good operating conditions and shall be operated in a manner to minimize emissions of air contaminants into the atmosphere.

#### **B. Isopentane Emissions**

1. Under all normal operating conditions (maintenance, VRU purging, and fugitive daily emissions), the total isopentane emissions shall not exceed 219.33 lbs/day
2. Purging and Fugitive Emissions
  - a. All non-condensable gas (NCG) purging of any ORMAT Energy

Converters (OEC) shall be conducted through the Vapor Recovery Units (VRU). The purging of gases through the VRUs to the atmosphere shall be conducted only after the separation process of non-condensable gases and isopentane gases is completed. Purging of non-condensable gases to the atmosphere shall be conducted in a manner to minimize entrainment of isopentane gases with non-condensable gases.

- b. Isopentane emissions occurring during normal purging events shall be considered part of the daily average isopentane emissions for the total isopentane loss for the reporting quarter.
- c. Visual inspections of potential isopentane leak points, including valves, flanges, pumps, and pressure relief points, shall be conducted daily. When identified, potential leaks shall be verified using a portable multi-gas monitor capable of measuring  $\pm 2.5$  percent of the lower explosive limit (LEL). Equipment containing isopentane with detectable leaks shall be isolated within 24 hours and repaired within 7 days.
- d. All combined purging and fugitive isopentane emissions shall not exceed 175.90 pounds per day calculated on a quarterly average.

### 3. Maintenance Emissions

- a. The ICAPCD shall be notified by telephone or fax at least 48 hours prior to the time which an OEC containing isopentane will be opened to the ambient air for scheduled maintenance.
- b. Unscheduled maintenance and repairs of an OEC containing isopentane may be conducted without prior APCD notification.
- c. Prior to conducting any scheduled or unscheduled maintenance or repairs to any OEC where the isopentane may be exposed to the atmosphere, the isopentane in that portion of the unit shall be first transferred to the isopentane storage tank or any type of vessel that serves as an isopentane storage tank, and any residual isopentane evacuated through the VRUs. The OEC shall be evacuated of isopentane in a manner that results in the minimum practical amount of isopentane being emitted to the atmosphere.
- d. Venting isopentane from an OEC to the atmosphere for the sole purpose of evacuation is prohibited. All isopentane shall be transferred to the storage tank through the VRUs.

- e. Isopentane emissions occurring during normal repair and maintenance shall not be considered a breakdown and shall be considered part of the daily average isopentane emissions for the total isopentane loss for the reporting quarter.
- f. Maintenance isopentane emissions shall not exceed 43.45 pounds per day calculated on a quarterly average.

#### 4. Breakdown Emissions

- a. Any breakdown, malfunction, or upset occurrence which constitutes a breakdown condition resulting in the emission of any air pollutant to the atmosphere, shall be reported to the ICAPCD as soon as reasonably possible but no later than two (2) hours after its detection, and should identify the time, specific location, equipment involved, and to the extent known the cause of the occurrence, and immediate remedial measures shall be undertaken to correct the problem and prevent further emissions into the atmosphere. The completion of corrective measures or the shutdown of emitting equipment is required within twenty-four (24) hours of occurrence of a breakdown condition.
- b. If the breakdown condition will require more than twenty-four (24) hours to correct, the Permittee, in lieu of shutdown, shall submit a variance application to the Air Pollution Control Officer (APCO) requesting to commence the emergency variance procedure set forth in the ICAPCD Hearing Board Procedures.
- c. Within 10 days after a breakdown occurrence has been corrected, the owner or operator shall submit a written report to the APCO which includes:
  - i. A statement that the occurrence has been corrected, together with the date of correction and proof of compliance;
  - ii. A specific statement of the reason(s) or cause(s) from the occurrence sufficient to enable the APCO to determine whether the occurrence was a breakdown condition;
  - iii. A description of the corrective measures undertaken and/or to be undertaken to avoid such an occurrence in the future;
  - iv. An estimate of the emissions caused by the occurrence;
  - v. Pictures of the equipment or controls which failed, if available.
- d. Failure to comply, or comply in a timely manner, with the reporting requirements established in Operating Condition B.4.a shall constitute cause for enforcement action.

- e. Isopentane breakdown emissions and losses shall be deducted from the total isopentane loss for the reporting quarter before calculating the daily average emissions.

**C. Vapor Recovery Unit (VRU)**

1. Each VRU shall be maintained in good working order at all times and shall achieve a minimum 95% isopentane vapor recovery efficiency during the purging process of an OEC.
2. Each VRU shall be source tested at least once, on a yearly basis, to verify the isopentane vapor recovery efficiency. Efficiency shall be determined by using EPA Method 25B or other EPA/CARB approved method. Testing protocol(s) shall be submitted to the district for approval 30 days prior to source testing being conducted, and the source test shall be witnessed by the ICAPCD.
3. The Permittee shall submit the test results for each required source test per Operating Condition C.2 within thirty (30) days of the completion of each test.
4. Any breakdown, malfunction, or maintenance of each VRU resulting in the emission of isopentane to the atmosphere, shall be reported to the ICAPCD as soon as reasonably possible but no later than two (2) hours after its detection, and immediate remedial measures shall be undertaken to correct the problem and prevent further emissions into the atmosphere. The completion of corrective measures or the shutdown of emitting equipment is required within twenty-four (24) hours of occurrence of a breakdown condition.
5. If the breakdown condition will require more than twenty-four (24) hours to correct, the Permittee, in lieu of shutdown, shall submit a variance application to the APCO requesting to commence the emergency variance procedure set forth in the ICAPCD Hearing Board Procedures.
6. The Permittee shall install and maintain in good working order an in-line flow meter (cfm) at the inlet of each VRU. The flow meter shall be equipped with a totalizer. The flow meter shall be calibrated annually by a certified contractor.
7. The permittee shall conduct daily inspections on each VOC indicator attached to the VRUs Canisters, in order to assure that the VRUs canisters are working under proper operating conditions at all times, functionality shall be determined by the VOC indicator as per manufacturer specifications.
8. If the VOC indicator shows that the canister is "spent" (As per manufacturer specifications), the applicant shall replace the canisters with new ones. In addition,

the indicator shall be removed and replaced with a new one.

9. A log shall be maintained on the premises showing each VRU canister replacement date. Also, the log shall include each VOC indicator replacement date. This log shall be made available for inspection by the ICAPCD.
10. A daily log shall be maintained on the premises showing each VRUs hours of operation and/or purging events, and routine repairs. This log shall be made available for inspection by the ICAPCD.

**D. Cooling Towers**

1. The Cooling Towers shall not exceed the following PM10 emission limits:

<b>Cooling Tower</b>	<b>PM<sub>10</sub> (lb/day)</b>
Goulds 2 Three-cell Cooling Tower	21.54
Heber South Three-cell Cooling Tower	10.77
Heber 2 OEC Six-cell Harmon Cooling Tower	24.12
Heber 2 OEC Six-cell Harmon Cooling Tower	24.12

2. The Permittee shall control PM10 emissions from the Goulds 2 three-cell Cooling Tower by operating drift eliminators that comply with a maximum drift loss spec of 0.001% which is claimed in the permit application.
3. The Permittee shall control PM10 emissions from the Heber South three-cell Cooling Tower by operating drift eliminators that comply with a maximum drift loss spec of 0.0005% which is claimed in the permit application.
- 4.. The Permittee shall control PM10 emissions from the two (2) Heber 2 OEC six-cell Harmon Cooling Towers by operating drift eliminators that comply with a maximum drift loss spec of 0.0008% which is claimed in the permit application.
5. The Permittee shall maintain the drift eliminators in each cooling tower in good working order at all times to perform in accordance with the manufacturer specifications for drift loss to comply with the requirements of Operating Conditions D.2, D.3 and D.4.
6. The Permittee shall limit the total dissolved solids (TDS) concentrations in the recirculating cooling water of each of the cooling towers to 10,000 ppm.

7. The Permittee shall limit the circulating cooling water rate for the Goulds 2 Cooling Tower to a maximum of 45,000 gpm, as calculated from the cooling tower pump performance curve(s) or cooling tower circulating water flow meter.
8. The Permittee shall limit the circulating cooling water rate for Heber South Cooling Tower to a maximum of 45,000 gpm, as calculated from the cooling tower pump performance curve(s) or cooling tower circulating water flow meter.
9. The Permittee shall limit the circulating cooling water rate for the two (2) Heber 2 OEC Harmon Cooling Towers to a maximum of 63,000 gpm each, as calculated from the cooling tower pump performance curve(s) or cooling tower circulating water flow meter.

**E. Emergency Standby Equipment**

1. The diesel-fueled emergency equipment shall be restricted to the following maintenance operating hours:
  - Emergency Electric Power Generator, Model DMT-500C2, 500 KW, powered by a Cummins diesel-fueled engine model KTA19G2, rated 685 hp shall be restricted to operate 20 hours per year.
  - John Deere model 6090H diesel pump, 350 hp shall be restricted to operate 50 hours per year.
  - John Deere model JW6H-UFADFO diesel pump, 311 hp shall be restricted to operate 50 hours per year.  
(ATCM 93115)
  - Clarke model JW6H-UF40 diesel pump, 300 hp shall be restricted to operate 50 hours per year.  
(ATCM 93115)
  - Perkins model 2206D-E13TAG3 diesel engine, 578 hp shall be restricted to operate 50 hours per year.  
(ATCM 93115)
2. Operation of each emergency power generator for other than testing and maintenance purposes, shall be limited to provide backup power, in each instance, be documented to the satisfaction of the ICAPCD.
3. All internal combustion engines shall not discharge into the atmosphere any visible air contaminant other than uncombined water vapor, for a period or periods aggregating more than three minutes in any one hour, which is 20% opacity or greater.

4. Each unit, with an internal combustion engine rated greater than 50 horsepower, shall have installed a non-resettable hour meter. The device shall be kept in proper working condition at all times.
5. The permittee shall maintain an operation engine log onsite for each listed unit with an internal combustion engine rated greater than 50 horsepower. The Permittee shall maintain all required records for a minimum of two (2) calendar years and make them available to the ICAPCD upon request. The log(s) shall include the following for each unit:
  - a. Engine manufacturer name, model number, brake horsepower output rating, and type of fuel combusted;
  - b. A manual of recommended maintenance as provided by the engine manufacturer or other maintenance procedure as approved in writing by the APCO;
  - c. Record of routine engine maintenance, including date(s) and type of maintenance performed;
  - e. For each emergency unit, the total daily recorded hours of operation for maintenance and testing purposes.
  - f. For each emergency unit, the total daily recorded hours of operation for emergency events.
6. The listed Cummins Model KTA19G2 diesel emergency generator, with engine rated 685hp, shall be limited to 11.32 lb/hr of NO<sub>x</sub> and 4.37 lb/hr of CO.
7. The Clarke Diesel Fire Pump, model JW6H-UF40 rated 300 bhp diesel engine shall be limited to 3.02 lb/hr of NO<sub>x</sub> and 0.23 lb/hr of CO.
8. The emergency pump, powered by a John Deere model 6090H diesel engine rated 350bhp shall be limited to 2.13 lb/hr of NO<sub>x</sub> and 2.00 lb/hr of CO.
9. The emergency fire pump, with John Deere model JW6H-UFADFO diesel engine rated 311bhp shall be limited to emit 1.92 lb/hr of NO<sub>x</sub> and 1.78 lb/hr of CO.
10. The emergency generator, driven by a Perkins model 2206D-E13TAG3 diesel engine rated 578 bhp shall be limited to emit 3.33 lb/hr of NO<sub>x</sub> and 3.09 lb/hr of CO.
11. The Permittee shall conduct a source test for the Cummins Model KTA19G2 diesel engine and an initial source test to the the Perkins Model 2206D-E13TAG3 diesel engine within the first 12 months of initial operation, to demonstrate compliance with the emission limits listed on conditions E.6 and E.10, and at least once every 60 months thereafter.

12. The Cummins Model KTA19G2 diesel engine and the Perkins Model 2206D-E13TAG3 diesel engine shall be source tested at least at 80% of the total horsepower rating to determine compliance with the emission limits. If the permittee demonstrates to the satisfaction to the APCO that a listed unit cannot operate at 80% capacity, then the source test shall be performed at the highest achievable continuous power rating. Permittee may use other approved methods, such as ISO method 8178 in order to determine compliance. Compliance with the NOx emission limits shall be determined by using CARB Method 100 or US EPA Method 7E. Oxygen Content shall be determined by using CARB Method 100 or US EPA Method 3A. Compliance with the CO emission limits shall be determined by using CARB Method 100 or US EPA Method 10, or other approved method.
13. The source test protocol for each required test shall be submitted to the ICAPCD for approval 30 days prior to commencing testing. The source test results shall be submitted to the ICAPCD within 60 days of the test being completed.
14. Permittee shall maintain all records required by this Permit for a minimum of two (2) calendar years. These records shall be maintained with the units or at the company's office, and shall be made available to the District upon request.

**F. Monitoring, Testing and Analyses**

1. The ICAPCD may, at any time, monitor emissions from any source within the facility.
2. The ICAPCD may, at any time, but no more often than once per year, authorize third-party air emissions testing and/or an air emissions inventory assessment of the facility. The cost of the air emissions testing shall be borne by the Permittee. The ICAPCD shall give advance notification to the Permittee prior to any air emissions testing or required air emissions inventory assessment.
3. The Permittee shall inspect on a yearly basis during the turnaround or a plant shutdown the drift eliminators in each cooling tower to ensure that that every cooling tower cell has the complete set of panels of drift eliminators and replace those that are damaged. As a part of this annual inspection, the Permittee shall conduct an inventory survey of the drift eliminators to ensure that the equipment is up to proper spec, with a maximum drift loss of 0.001% for the Goulds 2 Cooling Tower, a maximum drift loss of 0.0005% for the Heber South Cooling Tower, and a maximum drift loss of 0.0008% for the two (2) Heber 2 OEC Harmon Cooling Towers.
4. The Permittee shall conduct monthly testing of the recirculating water total dissolved solids (TDS) levels for the cooling towers of the facility. Daily PM emissions from each cooling tower shall be calculated monthly as the product of

the TDS content of circulating water, the maximum drift rate, and the water circulated daily through the cooling tower for each respective cooling tower to verify compliance with Operating Condition D.1. In addition:

- a. The circulating cooling water in each cooling tower shall be sampled and tested for TDS monthly.
  - b. The circulating cooling water rate for each cooling tower shall be calculated from the cooling tower pump performance curve(s) or cooling tower circulating water flow meter.
5. All source test analyses shall use U.S. EPA or ARB approved methods, or any other equivalent method approved by the ICAPCD.
  6. The Permittee shall calculate all daily isopentane emissions (pounds per day) based on a quarterly average.
  7. A performance test protocol shall be submitted for each required source test to the APCO for approval 30 days prior to testing and should include the following information:
    - a. Emission unit or control system identification and description.
    - b. Sampling and analysis procedures.
    - c. Test schedule.
  8. The Permittee shall monitor through the sight glass the volume of the Isopentane in the working tank and storage tank on a weekly basis and every time in which the following occurs:
    - a. maintenance is conducted and the OEC system has to be emptied, and vapors recuperated through the VRUs portable system.
    - b. a new load of Isopentane is added to the system.
  9. The Permittee shall;
    - a. Place combustible gas detectors and flame detectors at strategic locations around the turbine, motive fluid pumps, and motive fluid storage tank. These combustible gas detectors and flame detectors will be connected to the power plant computer control system to quickly alert the plant operators to any such potentially hazardous situations, meaning it will also help to keep a check on significant isopentane leaks.
    - b. Visual inspections of potential isopentane leak points, including valves, flanges, pumps, and pressure relief points, shall be conducted daily. When identified, potential leaks shall be verified using portable multi-gas monitor capable of measuring  $\pm 2.5$  percent of the lower explosive limit (LEL).

Equipment containing isopentane with detectable leaks shall be isolated within twenty-four (24) hours and repaired within seven (7) days.

## **G. Reports**

1. At the end of each calendar quarter, and not more than thirty (30) days thereafter, the facility shall submit a report to the ICAPCD which contains the following information:
  - a. The total amount of isopentane renewals brought to the facility during the reporting quarter and the previous quarters of that calendar year. The report shall include the isopentane supplier's name and address. These renewals shall be reported in pounds of isopentane at Standard Temperature and Pressure.
  - b. The total amount of isopentane present at the facility before renewals.
  - c. The number of NCG purges from the OEC Units that occurred through the facility VRUs during the reporting quarter.
  - d. The number of isopentane withdrawals through the facility VRUs from each OEC Unit for hardware maintenance that occurred during the reporting quarter.
  - e. The number of OEC Units rotating seals replaced or installed, or any other OEC Units seal or gasket failure, that occurred during the reporting quarter.
  - f. The number of OEC Units pressure relief rupture discs removed and replaced during the reporting quarter.
  - g. The total flow, in cubic feet, through the facility VRUs in-line flow meter during the reporting quarter.
  - h. The date and amount in pounds of activated carbon replaced on each VRU.
  - i. The amount of isopentane transferred to each OEC Unit after maintenance.
  - j. The amount of isopentane transferred to each OEC Unit for engineering optimization and the date when each OEC Unit was last optimized.
  - k. The amount of isopentane transferred to each OEC Unit to replace fluid removed during purging and the date when each OEC was purged.

- I. The amount of isopentane transferred to each OEC Unit to replace fluid lost from fugitives.
  - m. The number of times isopentane leaks were detected and repaired.
  - n. The combined quarterly total and daily average quantity of isopentane fugitive, purging and maintenance emissions from each OEC Unit.
2. The Permittee shall submit to the ICAPCD an annual report by the end of February of each operating year which contains the following information for the listed emergency standby water pump, emergency fire pumps, and emergency standby electric generators:
  - a. Monthly fuel consumption
  - b. Monthly hours of operation for maintenance and testing purposes.
  - c. Monthly hours of operation for emergency events.
3. Permittee shall submit to the ICAPCD a report with the results of the cooling tower drift eliminators survey within thirty (30) days of the completion of the survey, in accordance with Operating Condition F.3 of this Permit.
4. The Permittee shall submit to the ICAPCD an annual report by the end of February of each operating year which contains the dates on which the VRU canisters and VOC indicators were replaced.
5. The Permittee shall report to the ICAPCD all non-normal (upset) releases of isopentane or geothermal gases to the atmosphere as established in Operating Condition B.4 of this Permit.

#### **H. Special Conditions for Construction Phase**

1. Air Quality Construction Mitigation Manager (AQCMM): The Permittee shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Operating Conditions H.3 through H.5 for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the Imperial County Air Pollution Control District (ICAPCD).

- a. Verification: At least 30 days prior to the start of ground disturbance, the Permittee shall submit to the ICAPCD for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates. The AQCMM and all Delegates must be approved by the District before the start of ground disturbance.
2. Air Quality Construction Mitigation Plan (AQCMP): The Permittee shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Operating Conditions H.3 through H.5
- a. Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the ICAPCD for approval. The ICAPCD will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt.
3. Construction Fugitive Dust Control: The AQCMM shall submit documentation to the Compliance Project Manager (CPM) in each Monthly Compliance Report (MCR) that demonstrates compliance with the following mitigation measures for the purposes of preventing all fugitive dust plumes from leaving the Project. All unpaved roads and disturbed areas in the project and linear construction sites shall be watered as frequently as necessary to comply with the dust mitigation objectives of Operating Condition H.4. The frequency of watering can be reduced or eliminated during periods of precipitation. Any deviation from the following mitigation measures shall require prior ICAPCD notification and approval:
- a. No vehicle shall exceed 10 miles per hour within the construction site.
  - b. The construction site entrances shall be posted with visible speed limit signs.
  - c. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.
  - d. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.
  - e. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.
  - f. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the ICAPCD.

- g. Construction areas adjacent to any paved roadway shall be provided with sandbags or other measures as specified in the Storm Water Pollution Prevention Plan (SWPPP) to prevent run-off to roadways.
  - h. All paved roads within the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.
  - i. At least the first 500 feet of any public roadway exiting from the construction site shall be swept at least twice daily (or less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff from the construction site is visible on the public roadways.
  - j. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered or shall be treated with appropriate dust suppressant compounds.
  - k. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.
  - l. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.
  - m. Verification: The Permittee shall include in the Monthly Compliance Report (MCR): (1) a summary of all actions taken to maintain compliance with this condition, (2) copies of any complaints filed with the ICAPCD in relation to project construction, and (3) any other documentation deemed necessary by the ICAPCD and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.
4. Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (1) off the project site or (2) 200 feet beyond the centerline of the construction of linear facilities or (3) within 100 feet upwind of any regularly occupied structures not owned by the project owner indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The

AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1 specified above fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2 specified above fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The Permittee may appeal to the ICAPCD any directive from the AQCMM or Delegate to shut down an activity, provided that the shutdown shall go into effect within one hour of the original determination, unless overruled by the ICAPCD before that time.

- a. Verification: The Permittee shall include in the Monthly Compliance Report (MCR): (1) a summary of all actions taken to maintain compliance with this condition, (2) copies of any complaints filed with the air district in relation to project construction, and (3) any other documentation deemed necessary by the ICAPCD and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.
5. Diesel-Fueled Engine Control: The AQCMM shall submit to the District, in the Monthly Compliance Report (MCR), a construction mitigation report that demonstrates compliance with the following mitigation measures for the purposes of controlling diesel construction-related emissions. Any deviation from the following mitigation measures shall require prior District notification and approval:
- a. All diesel-fueled engines used in the construction of the facility shall be fueled only with ultra-low sulfur diesel, which contains no more than 15 ppm sulfur.
  - b. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.
  - c. All construction diesel engines, which have a rating of 100 hp or more, shall meet, at a minimum, the Tier 4 California Emission Standards for Off-Road

Compression-Ignition Engines as specified in California Code of Regulations, Title 13, section 2423(b)(1) unless certified by the on-site AQCMM that such engine is not available for a particular item of equipment. In the event a Tier 4 engine is not available for any off-road engine larger than 100 hp, a non-certified engine may be used and must comply with current ATCM emission restrictions.

- d. All heavy earthmoving equipment and heavy duty construction related trucks with engines meeting the requirements of Operating Condition H.5.c. above shall be properly maintained and the engines tuned to the engine manufacturer's specifications.
  - e. All diesel heavy construction equipment shall not remain running at idle for more than five minutes, to the extent practical.
  - f. Verification: The Permittee shall include in the MCR (1) a summary of all actions taken to maintain compliance with this condition, (2) copies of all diesel fuel purchase records, (3) a list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained, and (4) any other documentation deemed necessary by the ICAPCD and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.
6. The Permittee shall provide the CPM copies of all ICAPCD issued Authority to Construct (ATC) Permits for the facility. The Permittee shall submit to the CPM for review and approval any modification proposed by the Permittee to any ATC for this project. The Permittee shall submit to the CPM any modification to any permit proposed by the ICAPCD or U.S. EPA, and any revised permit issued by the ICAPCD or U.S. EPA, for this project.
- a. Verification: The Permittee shall submit any ATC, PTO, and any proposed air permit modification to the CPM within five working days of its submittal either by 1) the Permittee to an agency, or 2) receipt of proposed modifications from an agency. The Permittee shall submit all modified air permits to the CPM within 15 days of receipt.
7. The Permittee shall comply with all Operating Conditions in Section H of this Permit for the Construction Phase of the project. The CPM, in consultation with the ICAPCD, may approve as an insignificant change, any change to an air quality Condition of Exemption, provided that: (1) the project remains in compliance with all applicable laws, ordinances, regulations, and standards, (2) the requested change clearly will not cause the project to result in a significant environmental impact, (3) no additional mitigation or offsets will be required as a result of the

change, (4) no existing daily, quarterly, or annual permit limit will be exceeded as a result of the change, and (5) no increase in any daily or annual permit limit will be necessary as a result of the change.

- a. Verification: The Permittee shall notify the CPM in writing of any proposed change to a condition of certification pursuant to this condition and shall provide the CPM with any additional information the CPM requests to substantiate the basis for approval.

## **I. Emission Offsets**

1. Offsets required as a condition of an Authority to Construct or a Permit to Operate shall be enforceable requirements at the time of Authority to Construct issuance and shall be in effect no later than the date of initial operation of the proposed Dogwood OEC unit. Ormat Nevada, Inc. shall surrender to the ICAPCD, Stationary VOC Emission Reduction Credits equal to the amount of eighteen (18) tons. Ormat Nevada, Inc. shall have the option of satisfying this offset requirement by relinquishing the total Stationary (18 tons) VOC ERCs on a one-time basis or by relinquishing 4.5 tons of Stationary VOC ERCs quarterly during the initial operating year of the proposed Dogwood OEC unit.

or

Prior to issuance of Permit to Operate 2217A-8 and before January 1<sup>st</sup> of each consecutive year, Ormat Nevada, Inc. shall surrender to the ICAPCD, Agricultural VOC Emission Reduction Credits equal to the amount of thirty (30) tons. Ormat Nevada, Inc. shall have the option of satisfying this offset requirement by relinquishing the total (30 tons) ERCs on an annual basis or on a quarterly basis (7.5 tons per quarter).

### **Equipment Listed at the Facility:**

- 1- ORMAT OEC, 23.6 MW (Heber 2, OEC-1)
- 1- ORMAT OEC, 14.52 MW (Heber 2, OEC-2)
- 1- ORMAT OEC, 12 MW (Heber South, OEC-8)
- 1- ORMAT OEC, 10 MW (Goulds 2, OEC-7)
- 1- ORMAT OEC, 25MW (Dogwood OEC)
- 2- 6-cell Harmon mechanical draft counter flow cooling towers, 63,000 gpm/tower, framework and fan deck made of treated Douglas fir, fiberglass fan stacks and PVC drift eliminators, with a drift rate of 0.0008% of circulating water flow. (Heber 2)
- 1- 3-cell Marley Model F499A-5.91-3, mechanical draft counter flow tower, 45,000 gpm, made of industrial fiberglass, with fire retardant pultruded reinforced polyester framing and polyvinyl chloride cellular drift eliminators, with a drift rate of 0.0010% of circulating water flow. (Goulds 2)

- 1- 3-cell Marley Model F499A-5.91-3, mechanical draft counter flow tower, 45,000 gpm, made of industrial fiberglass, with fire retardant pultruded reinforced polyester framing and polyvinyl chloride cellular drift eliminators, with a drift rate of 0.0005% of circulating water flow. (Heber South)
- 2- Sullair Model VS12-20, 20 hp heavy duty industrial vacuum system (VRU).
- 1- Emergency Electric Power Generator, Model DMT-500C2, 500 KW, powered by a Cummins diesel-fueled engine model KTA19G2, rated 685 hp, Tier 0.
- 1- Clarke Fire Pump, model JW6H-UF40, rated 300hp.
- 1- John Deere model 6090H diesel pump (emergency stand-by), 350 hp, Tier 3.
- 1- John Deere model JW6H-UFADFO diesel pump (emergency stand-by) 311 hp, Tier 3.
- 1- Emergency Generator powered by a Perkins diesel engine model 2206G-E13TAG3 rated at 578 bhp
- 6- 10,000 gallon Motive Fluid Tanks
- 2- 20,000 gallon Motive Fluid Tanks

**Production, Injection and Observation Wells**

<b>PRODUCTION WELLS</b>	<b>INJECTION WELLS</b>	<b>OBSERVATION WELLS</b>
P-1	HGU-151	CB Jackson
P-2	HGU-152	Holtz 1
P-3	HGU-153	
P-4	HGU-154	
P-5	HGU-155	
P-7	HGU-156	
P-8	HGU-157	
P-9	HGU-170	
P-11	HGU-171	
P-12	HGU-172	
P-16	HGU-173	
	HGU-174	
	HGU-175	
	HGU-206	
	HGU-211	
	HGU-251	
	HGU-252	
	HGU-253	
	HGU-254	
	HGU-255	

**Recommendations:**

A 30-day public review period for the proposed project will be conducted with a starting date of Friday May 22, 2026, and a completion date of June 22, 2026, as per the requirements set forth on ICAPCD Rule 206 section C.

**2026 Fees:**

*Schedule 9 – Miscellaneous Schedule*

(3) Emergency Units under 500bhp	\$233.00 X 3 =	\$699.00
(2) Emergency Units over 500bhp	\$615.50 X 2 =	\$1,231.00
(2) VRU Units	\$233.00 X 2 =	\$466.00

*Schedule 4 – Stationary Container*

(6) 10,000 gallon Motive fluid tanks	\$391.50 X 6 =	\$2,349.00
(2) 20,000 gallon Motive fluid tanks	\$836.00 X 2 =	\$1,672.00

*Schedule 6 - Geothermal Schedule*

60.1 MW Geothermal Facility (subsequent yr @ \$388.50 per MW)	=	\$23,349.00
25 MW Geothermal Facility (first yr @ \$778.00 per MW)	=	\$19,450.00
2026 Total Operating Fees:	=	\$49,216.00
2026 Total Operating Fees Paid:	=	\$24,514.00
<b>2026 Total Operating Fees Due:</b>	=	<b>\$24, 702.00</b>