ASSINIBOINE & SIOUX TRIBES OF THE FORT PECK INDIAN RESERVATION

Office of Energy/Economic Development

November 13-16, 2012


GLACIER NATIONAL PARK
Blackfeet Reservation
Rocky Boy's Reservation
Fort Belknap Reservation
Fort Peck Reservation
KALISPELL
Flathead Reservation
GREAT FALLS
MISSOULA
HELENA
BUTTE
BOZEMAN
BILLINGS
Crow Reservation
Northern Cheyenne Reservation
YELLOWSTONE NATIONAL PARK

NDMC F

FT. PECK TRIBES
ASSINIBOINE • SIOUX

EECBG

- Train 6 installers of GSHP's at the IGSHPA
- Install 8 GSHP on Tribal houses
- Monitor savings via electric bills

GROUND SOURCE HEAT PUMP INSTALLER TRAINING

- International Ground Source Heat Pump Association (IGSHPA)
- August 23rd thru August 26th, 2011
- Stillwater, Oklahoma
- Certified GSHP Installers
- Certified in Socket and Butt Fusion

INSTALLER TEAM

ENERGY DYNAMICS & RED STONE LLC

- James Schink- Energy Dynamics
- Mike McKeever- Red Stone LLC
- Provided Technical Assistance
- Ground Source Heat Pump Equipment
- Hands on Training
- Certified Tribal Installers as GSHP Dealers for Fort Peck Reservation

ENERGY DYNAMICS INC.

FT. PECK TRIBES ASSINIBOINE SIOUX

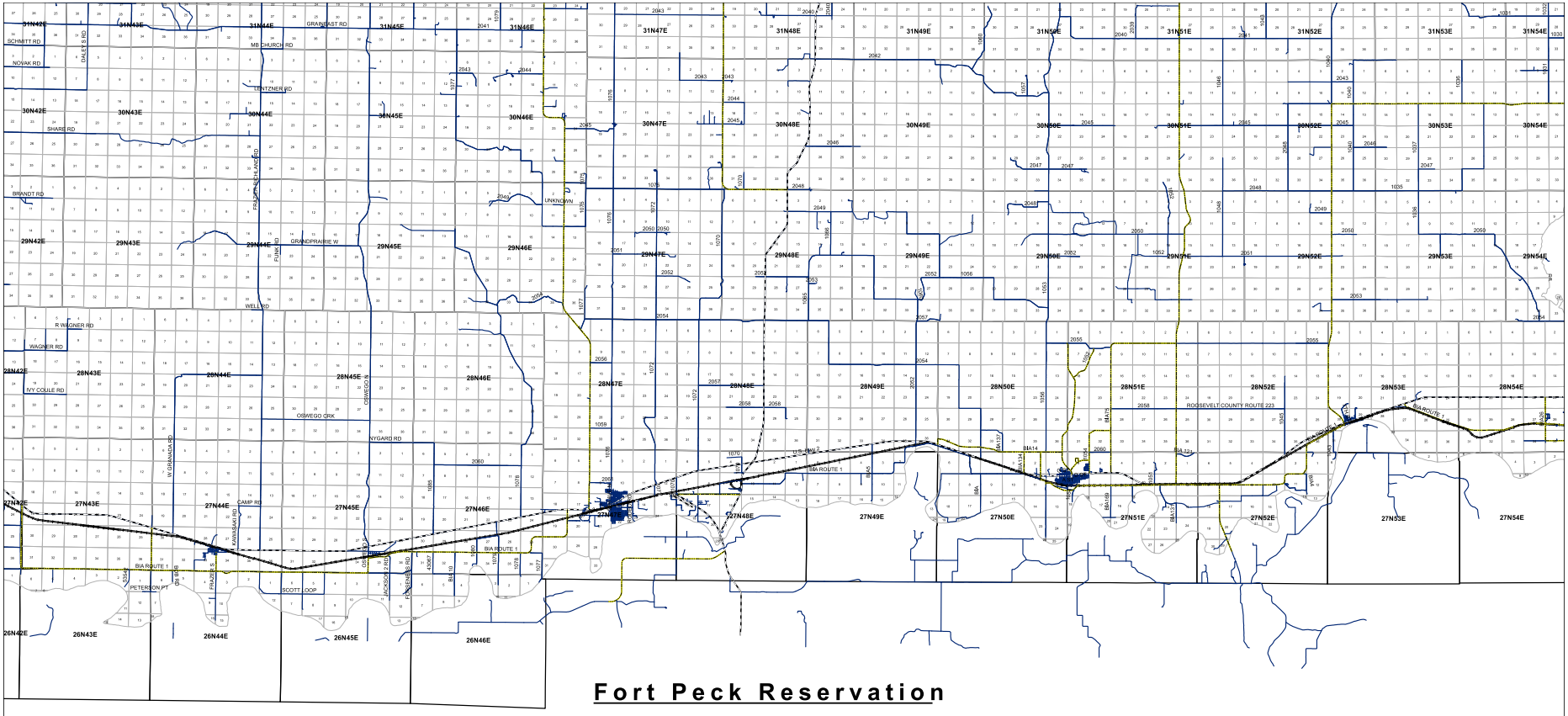
RESIDENTIAL WARRANTY

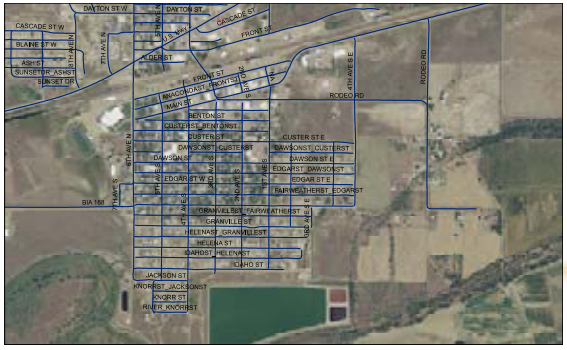
- ***Lifetime*** **Cabinet, Heat Exchanger and Compressor Warranty**
- **10-Year Refrigerant System**
- **Component Warranty**
- **10-Year Geothermal System Warranty**
- **10-Year Parts Warranty**
- **10-Year Labor Allowance Warranty**

BEST GEOTHERMAL WARRANTY

Geothermal Systems Hydron Module

GSHP SITE LOCATIONS





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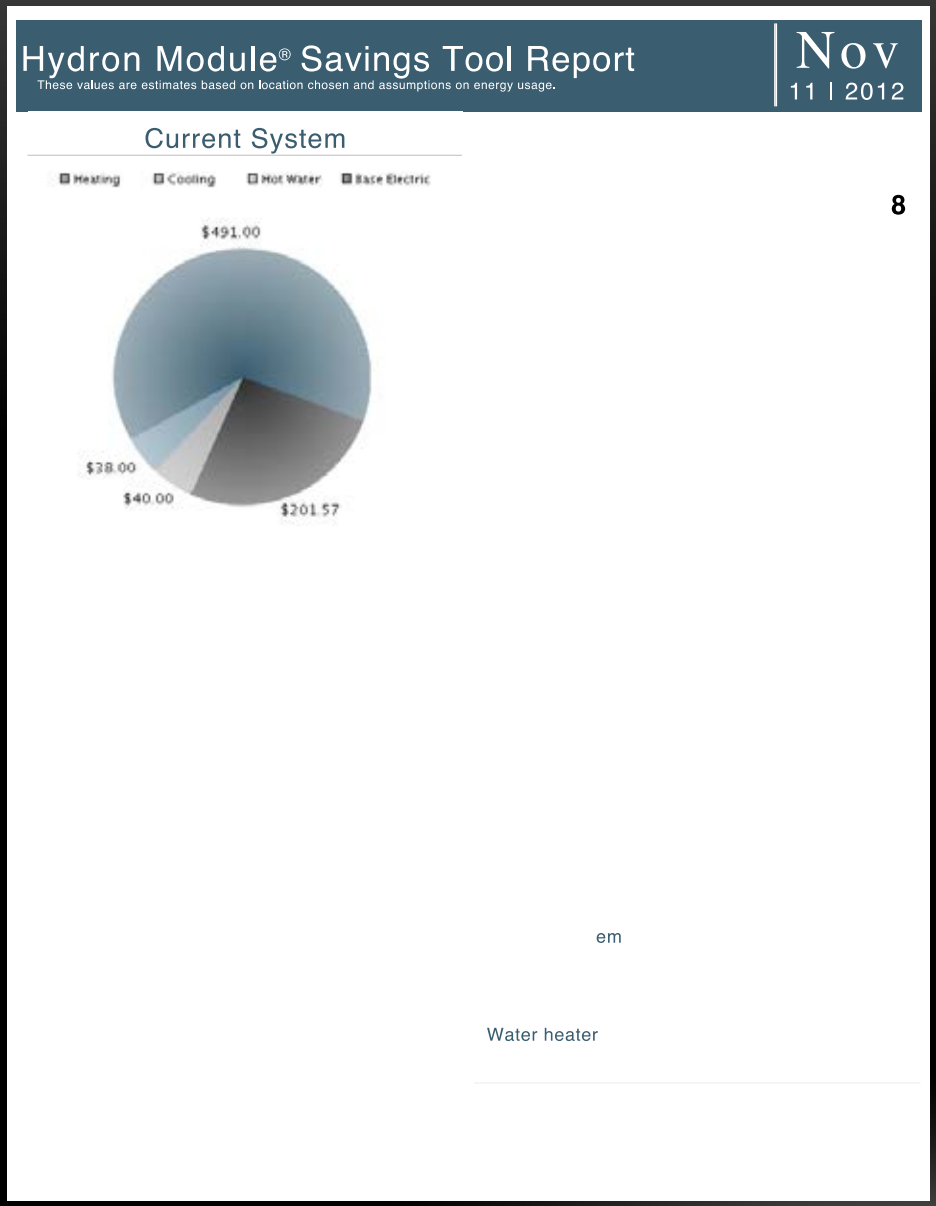
GROUND SOURCE HEAT PUMP SITES

- Installed 6 GSHP last fall 2011
- Selected 2 Additional GSHP locations
- Analyzed electric bills



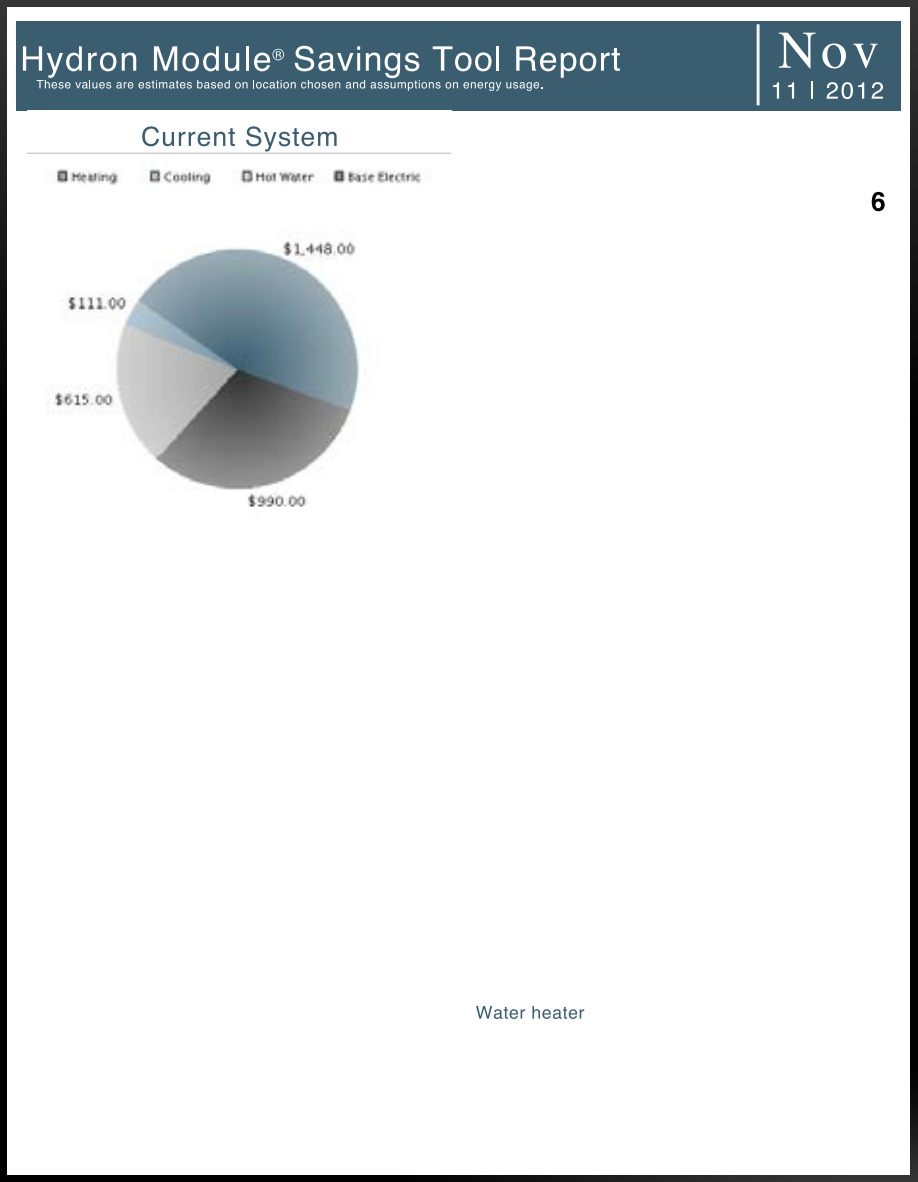
GRAY HAWK RESIDENCE

February 2011

- Heated Natural Gas- $105/month
- Electricity- $65.47/Month
- Total $175.47/Month
- $.04816 KWH

February 2012

- Heated GSHP -$103
- Water Heater Natural gas- $17.46



ACKERMAN RESIDENCE

February 2010

- Heated Propane- $180/month
- Electricity- $146.80/Month
- Wood- $100/cord
- Total $426.80/Month
- $.09 KWH

February 2012

- Heated GSHP -$184/month
- Water Heater Electric-$ included

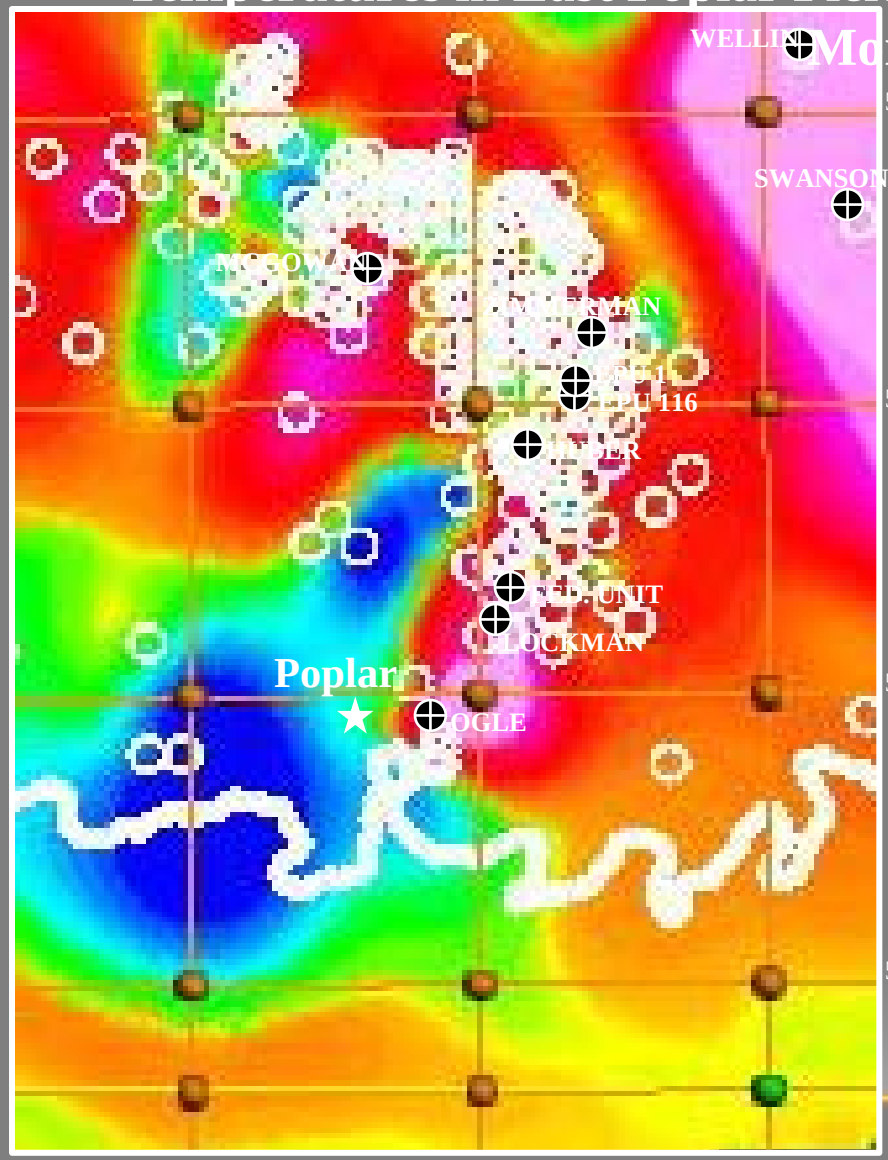
ELECTRICITY GENERATION FROM GEOTHERMAL RESOURCES ON THE FORT PECK RESERVATION IN NORTHEAST MONTANA

- The geothermal feasibility analysis will be performed to better define the geothermal resource underlying the Fort Peck Reservation
- Compiling historical research as well as conducting original research using the latest geophysical, geochemical, and geological sampling methods.
- In addition, the business feasibility analysis will examine the economic, technical, environmental, and cultural/social issues involved in developing the Tribes geothermal water for electrical generation.
- A business plan will also be developed to give Fort peck's Assiniboine and Sioux Tribal leaders clear direction on how to proceed with commercial development of the geothermal resource.
- Tribal energy issues, including power purchase agreements and potential project financing mechanisms, will be assessed and will also feed into the final business plan design.

GRADIENT GEOPHYSICS INC- GARRY CARLSON

BIRKBY CONSULTINGS LLC- JEFF BIRKBY

Gradient Geophysics' Color Contour Map of Oil Well Bottom Hole Temperatures in East Poplar Field, Fort Peck Reservation, Northeast Montana



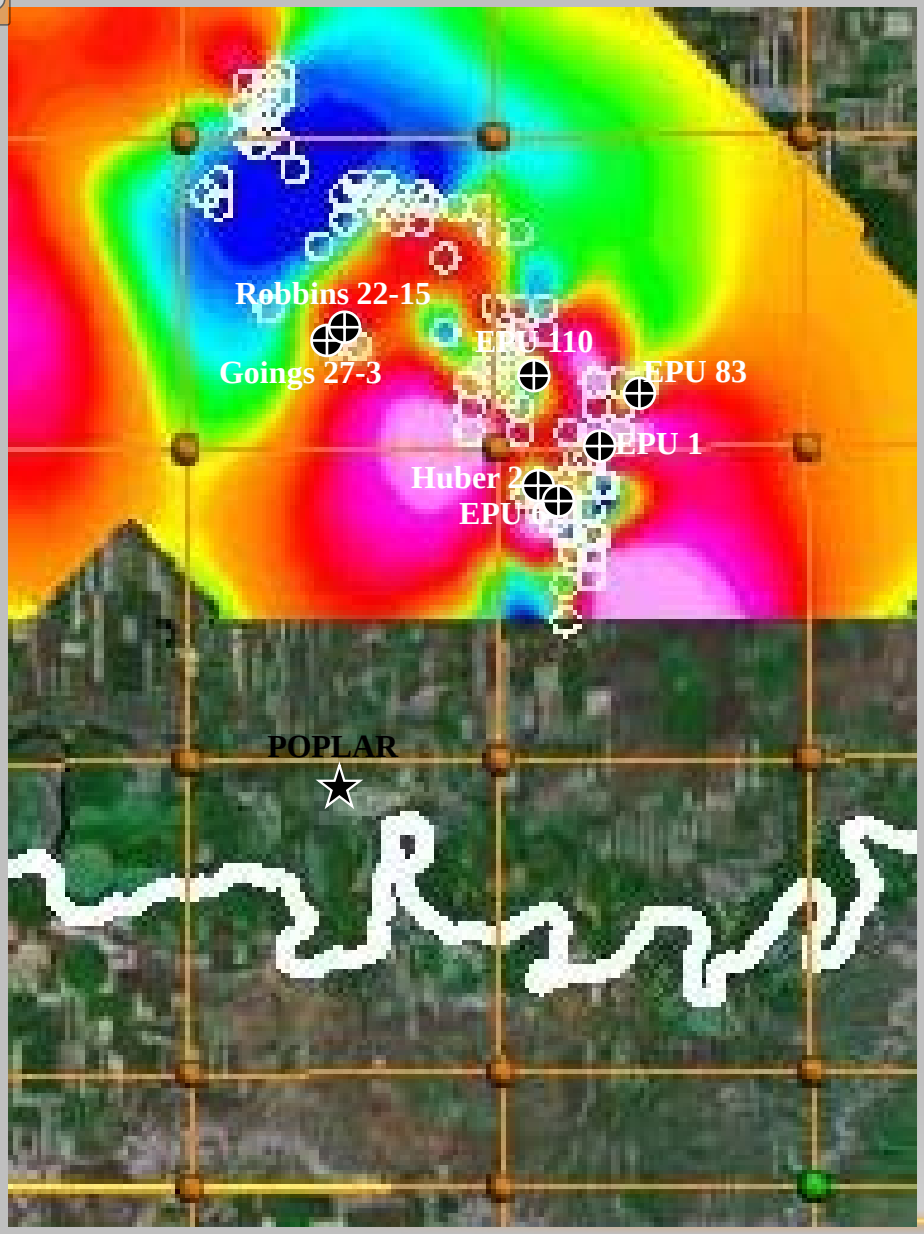
Top Reasons to Focus on East Poplar Field

- High Bottom Hole Temperatures
- Suggested High Water Flow Rates
- Close proximity to town of Poplar
- High density of existing oil wells
- Close proximity to cooling water

Top 10 Bottom Hole Temps in East Poplar Field

- EPU 1 : T deg = 275 F
- WELLIN> 1-29-3A : T deg = 271 F
- HUBER 5-D : T deg = 270 F
- ZIMMERMAN EPU 114 : T deg = 261F
- SWANSON 8-16 : T deg = 249 F
- LOCKMAN 3-34 : T deg = 248 F
- OGLE 1 : T deg = 243 F
- FED. UNIT #63 : T deg = 242 F
- EPU 116 : T deg = 237 F
- MCGOWAN 23-1 : T deg= 230 F

Gradient Geophysics, INC

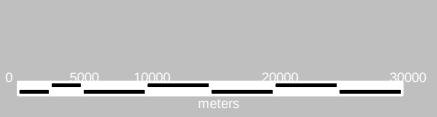


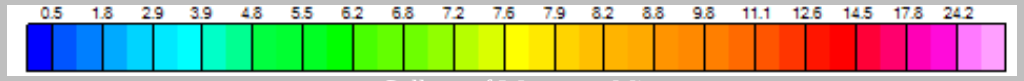
Top Oil Well Picks

1. EPU 1
2. EPU 6
3. Robbins 22-15

Top Water Producing Oil Wells in East Poplar Field with Bottom Hole Temperatures above 200 deg F

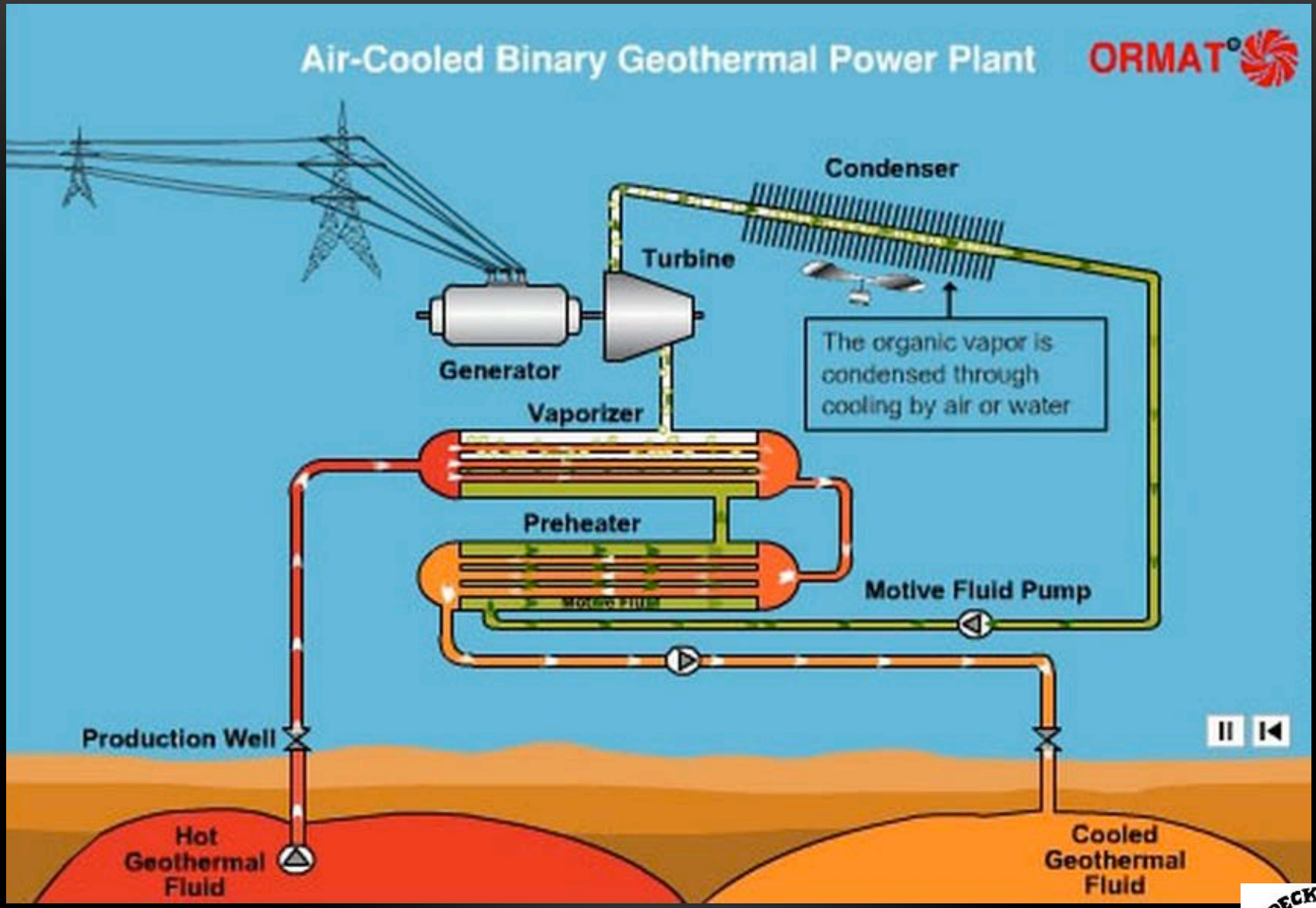
Robbins 22-15 : Temp = **219 F**
Goings 27-3 : Temp = **218 F**
EPU 110 : Temp = **227 F**
EPU 83 : Temp = **230 F**
EPU 1 : Temp = **275 F**
Huber 2 : Temp = **224 F**
EPU 6 : Temp = **209 F**



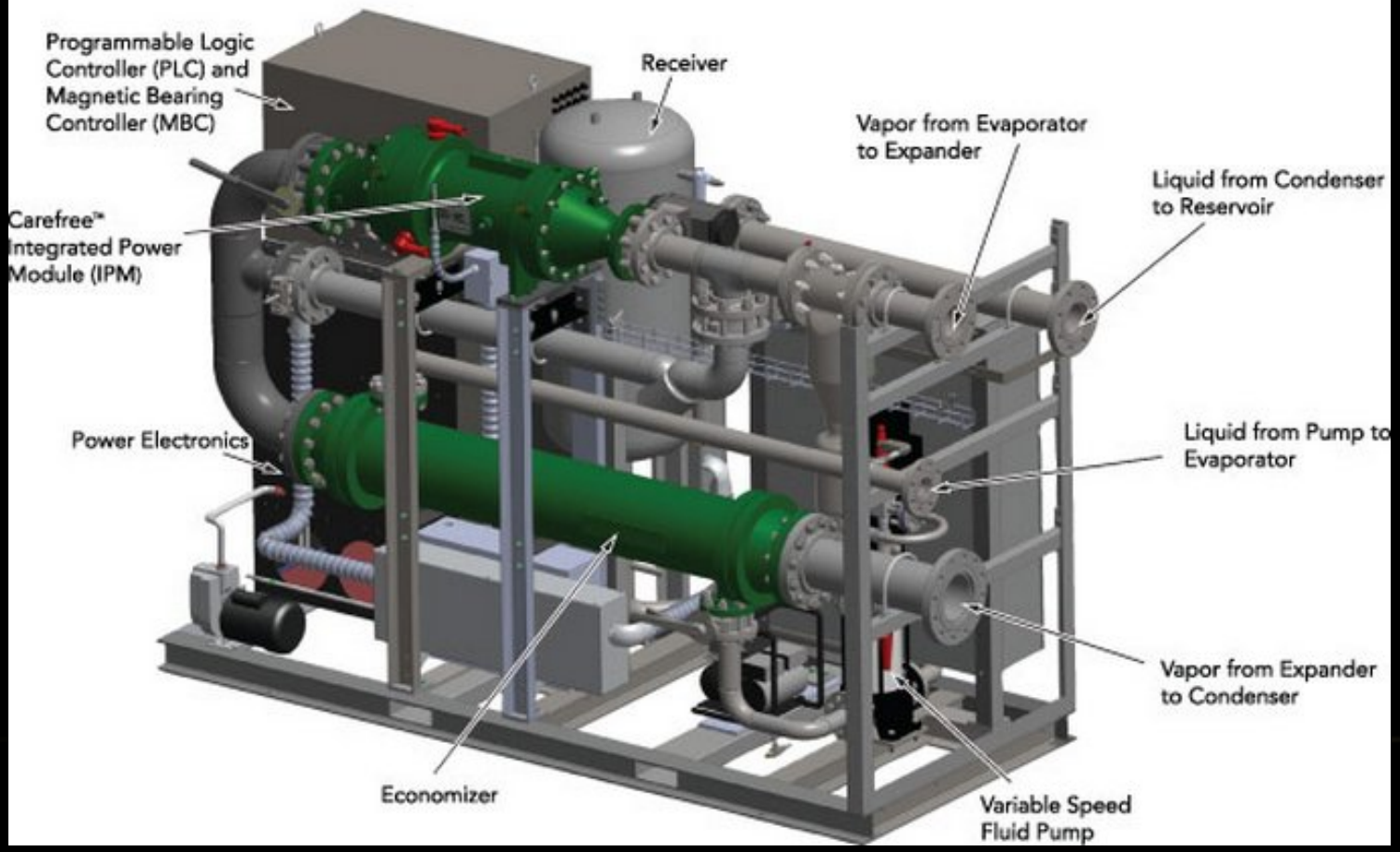


Color Contour Map of Oil Well Water Flow Rates in East Poplar Field, Fort Peck Reservation, Northeast Montana

Gradient Geophysics, INC


Air-Cooled Binary Geothermal Power Plant
ORMAT
Condenser
Turbine
Generator
The organic vapor is condensed through cooling by air or water
Vaporizer
Preheater
Motive Fluid Pump
Production Well
Hot Geothermal Fluid
Cooled Geothermal Fluid

Thermapower™ Medium Temperature Organic Rankine Cycle Module



GEOTHERMAL GREEN HOUSES

GEOTHERMAL GREEN HOUSES

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