

RECLAMATION

Managing Water in the West

The Brackish Groundwater National Desalination Research Facility- BBFA

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U.S. Department of the Interior
Bureau of Reclamation

What Is BBFA?

It is an acronym for the Better Buildings Federal Award. It recognizes the Federal Government's highest-performing buildings through a competition to reduce annual energy use intensity (Btu per square foot of facility space) on a year-over-year basis. The Federal building that achieves the greatest percentage of energy intensity savings for that year wins.

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2012 Competition

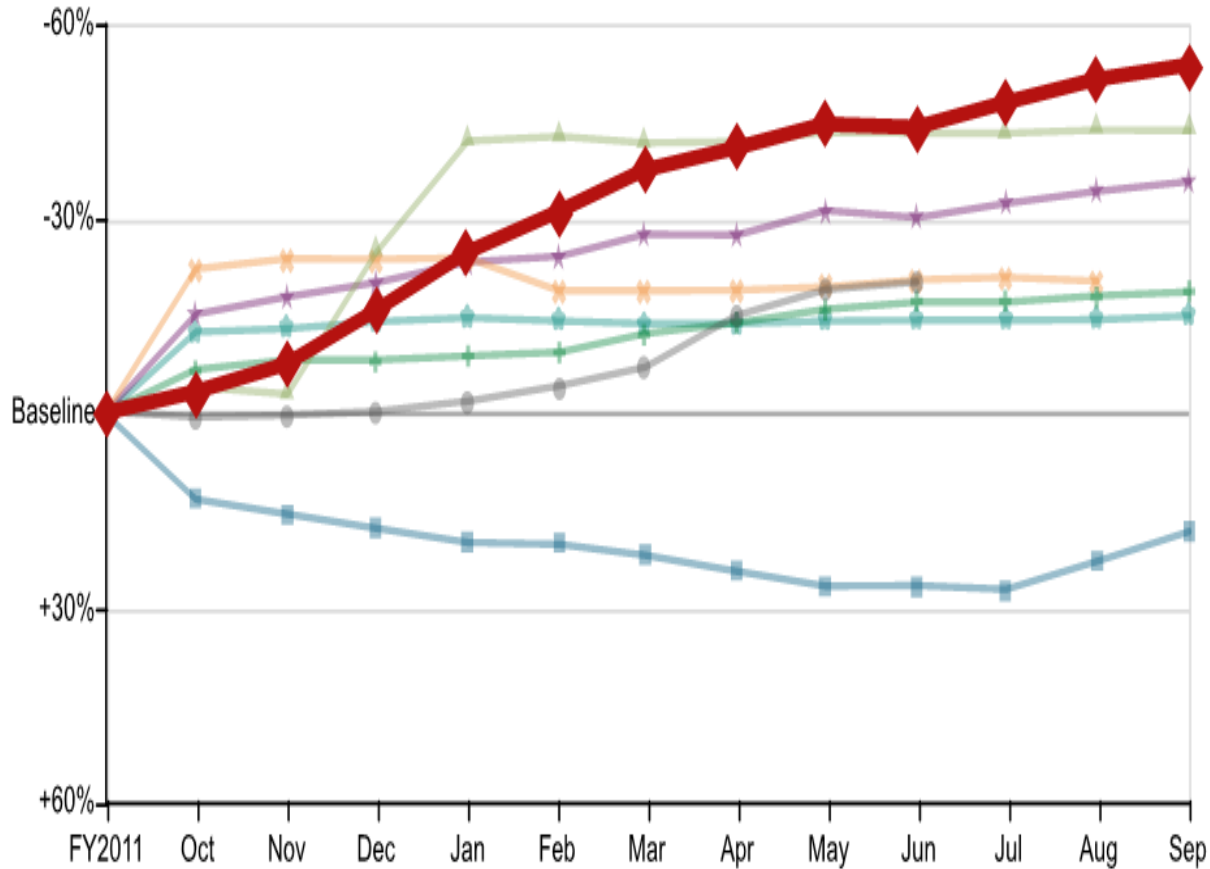
The 2012 BBFA competition winner, is the Brackish Groundwater National Desalination Research Facility (BGNDRF)!

This was the first year for the BBFA .

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Track the Competition

Energy Use Intensity



1

Brackish Groundwater National Desalination Research Facility (-53.6%)

Boatwright Maintenance Park Building 2770 (-43.8%)

Neal Smith Federal Building (-35.7%)

Sandia National Laboratories Building 753 (-18.7%)

Frank Carlson Federal Building & Courthouse (-15.1%)

Bureau of Public Debt Avery Street Building (+18.1%)

Army & Air Force Exchange Service (-20.2%)*

Sam Nunn Atlanta Federal Center (-20.2%)*

What was the cost of all Energy Modifications?

\$783.90

- \$0.05 per Square Foot Invested
- \$ 2.29 per Square Foot Saved
- Cost paid for itself in 9 days

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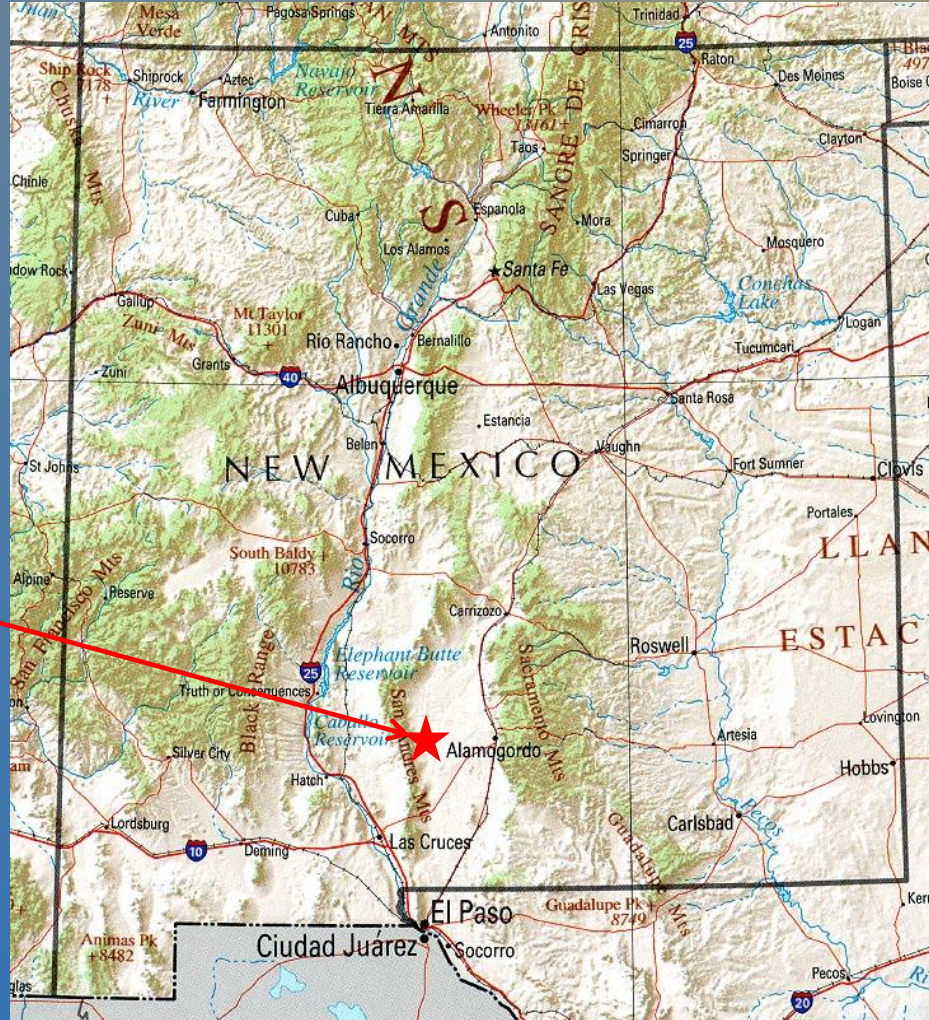
A Little About BGNDRF

- Opened in 2007
- It is a Department of Interior federal research facility
- Operated and maintained by the Bureau of Reclamation
- Clients consist of Private Sector, Universities & Other Agencies
- Enhance research & development of desalination technologies using brackish water sources



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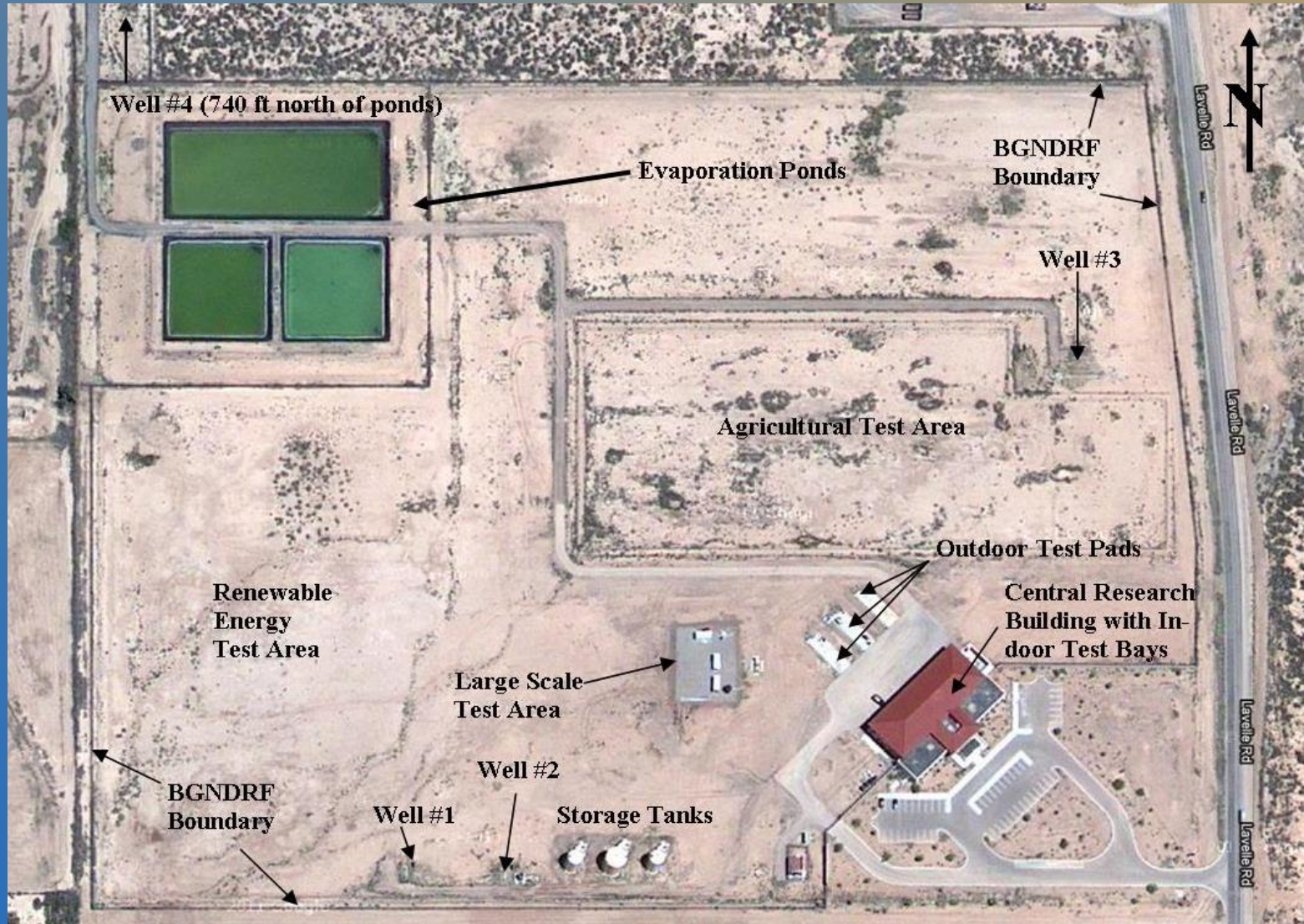
Location



BGNDRF
Alamogordo
New
Mexico

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The Facility



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Source Water System



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6 Indoor Test Bays



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Challenges

- Outdoor energy usage counted with building square footage



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Challenges

- Outdoor energy usage counted with building square footage



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Challenges

- Outdoor energy usage counted with building square footage
- Record number of clients



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How We Won

- **Reduced 24 hour lighting**
- **Reprogrammed HVAC control software**
- **Made use of wasted heat**
- **Made use of the sun**

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Current Facility Night Lighting



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Parking Lot Night Lighting



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Current Bay Night Lighting



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Tracer Summit

File Connect Status View Go Tree Setup Tools Window Help

← → Home Calendar Reports Home Settings Help

Tracer Summit

- Desal
 - Main Floorplan
 - Exhaust Fan Status
 - Office Area
 - ACU_01
 - Admin Assistant 111
 - Lab Office 103
 - Lavatories 112_114
 - Learning Area 108
 - Lobby Reception 109
 - Lunch RM 118
 - Mail Copy RM 116
 - Mens Locker RM 129
 - Monitoring RM 105
 - Office 113
 - Office 115
 - Office 117
 - Office_Corr. 119_120
 - Res_Hallway 102_121
 - VR 104_106_122
 - Womans Locker RM 128
 - ACU-02
 - Test-Area
 - AHU_02
 - AHU-01
 - ECU1
 - Water Lab Area
 - OAU-1

Voyager Name: ACU-01

Active Mode: Occupied Heating

Present Value: Occupied

[Override...](#)

Voyager™ Rooftop
Constant Volume with Economizer

Economizer

Damper Position: 4.0 %

Min Position Setpoint: 10.0 %

Supply Fan Status: On

Heat 1: Off

Heat 2: Off

EF-5 Status: Off

EF-5 Damper Pos.: CLOSED

Compressor 1: On

Compressor 2: On

Space Temp. Avg: 68.3 Deg

Local OA Temp: 39.5 Deg

Change-Over Spt: [Override Control](#)

Duct Pressure Spt: [Override Control](#)

Strong Calls for Heating: 0.0

Strong Calls for Cooling: 0.0

Supply Air Temperature: 89.5 Deg

Active Cooling Setpoint: 130.0 Deg


Active Change-Over Spt: 74.0 Deg

Active Duct Pressure Spt: 1.00 IWC

Active Duct Pressure: 0.94 IWC

Return Air Temp: -40.0 Deg

[More Details](#)



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VAV Name: Office 113

Active Mode: Occupy

Present Value: Occupied

Space Temperature: 72.6 Deg

Unoccupied Cooling Setpoint: 90.0 Deg

Occupied Cooling Setpoint: 90.0 Deg

Occupied Heating Setpoint: 74.0 Deg

Unoccupied Heating Setpoint: 67.0 Deg

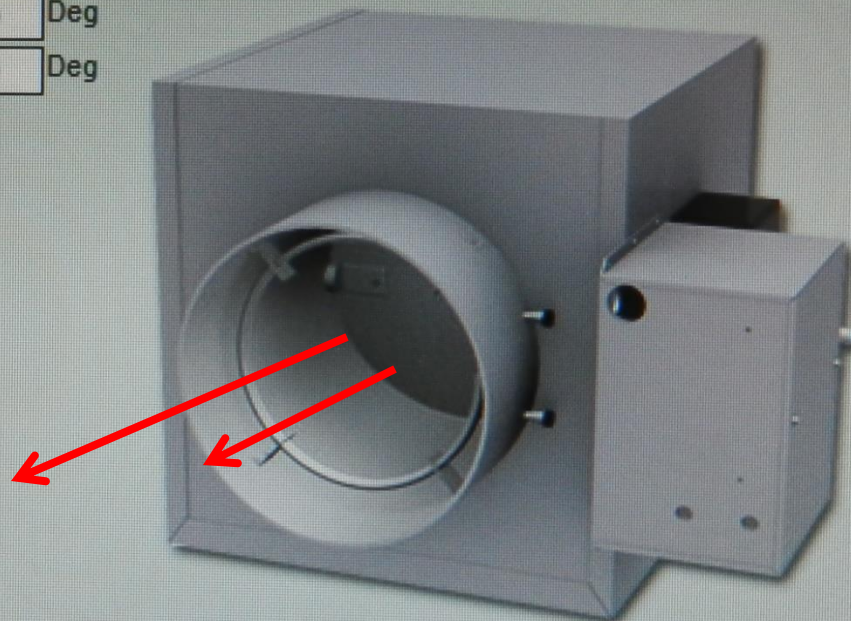
VariTrane F - Round

No Fan, No Heat

Override...

Active Cooling Setpoint: 84.0 Deg

Active Heating Setpoint: 68.0 Deg



More Details

Damper Position: 0 %

Air Flow: 0 Cfm

Damper Control Action: Heating

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Transformer Room



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HVAC For Transformer & Server Rooms

4 Months A Year

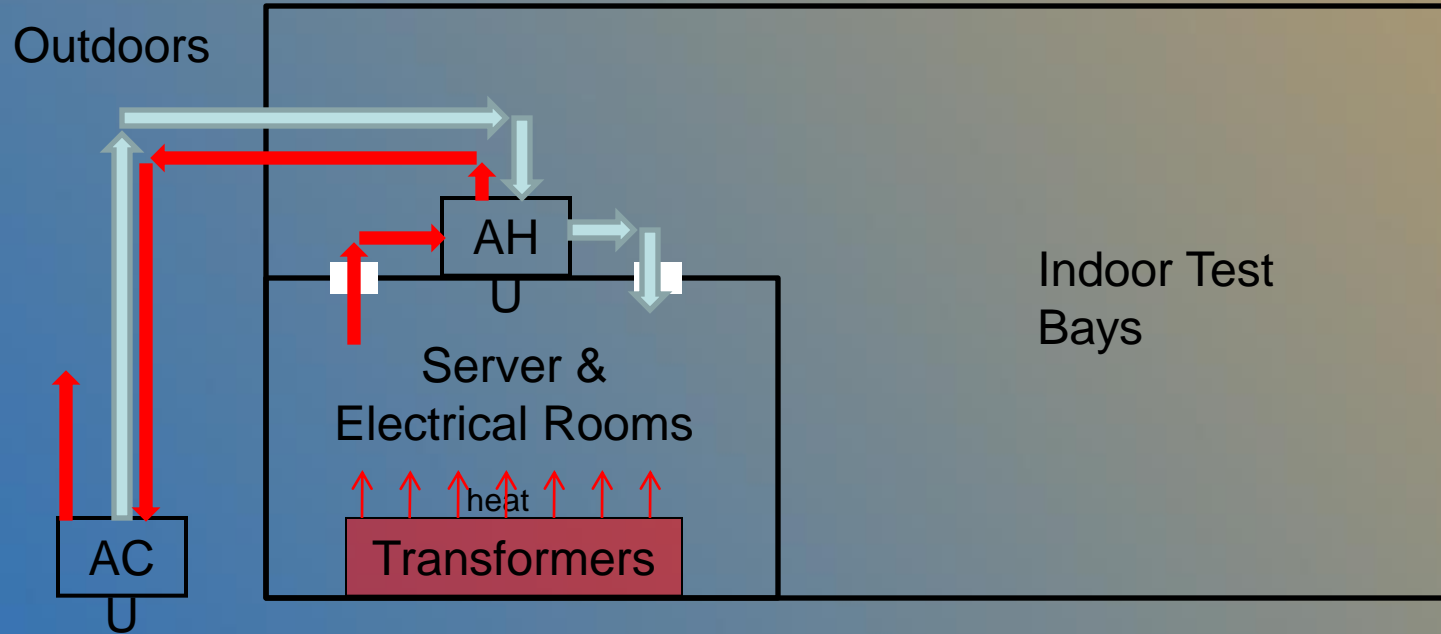


8 Months A Year



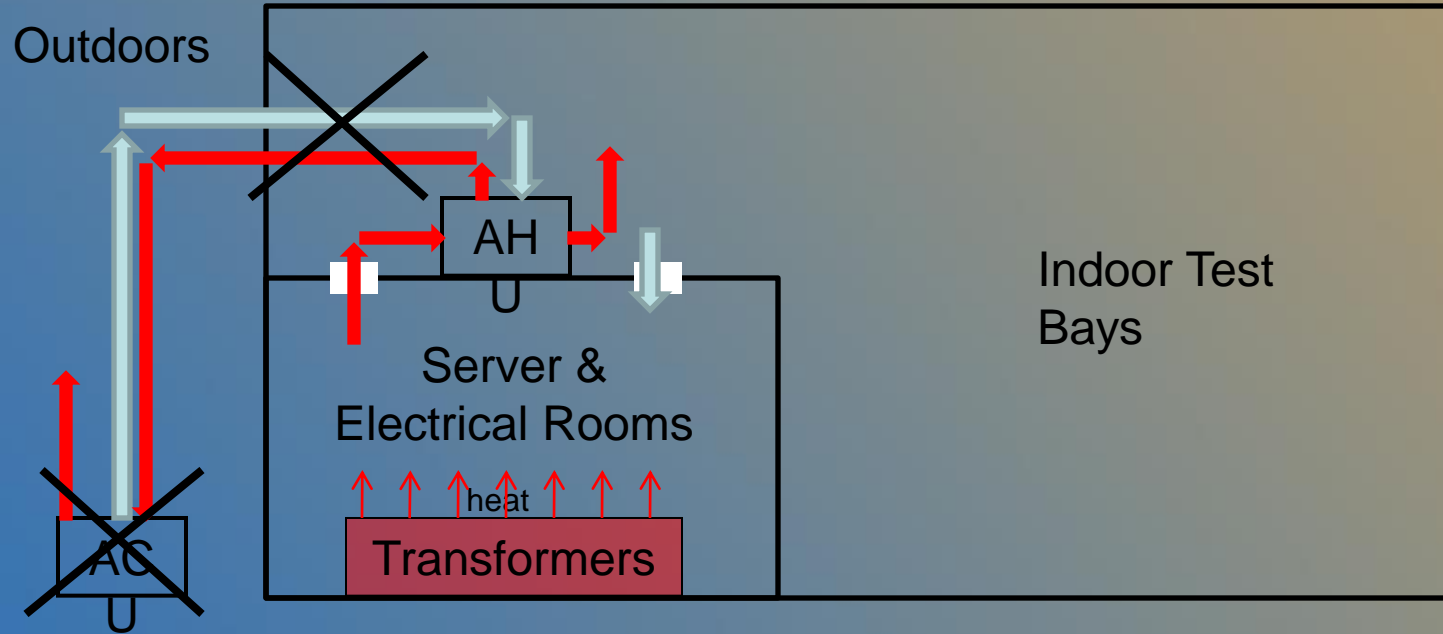
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4 Months A Year

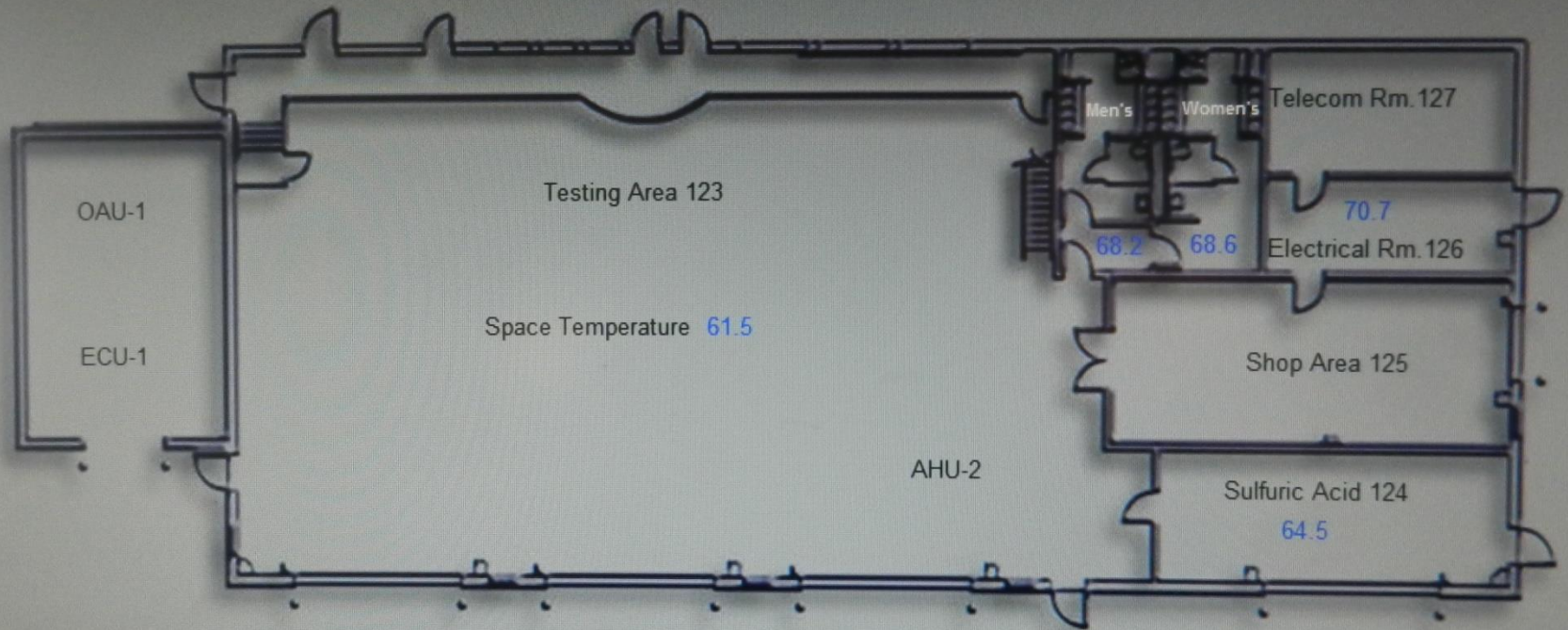
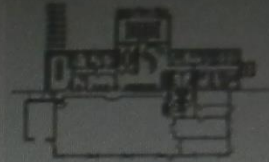


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8 Months A Year



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Solar Heating



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Solar Heating



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Natural Lighting



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Next Steps

- Continue To Save Energy
- We Have Saved 17%
- PVRO



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Next Steps

- Led Lighting in Test Bays



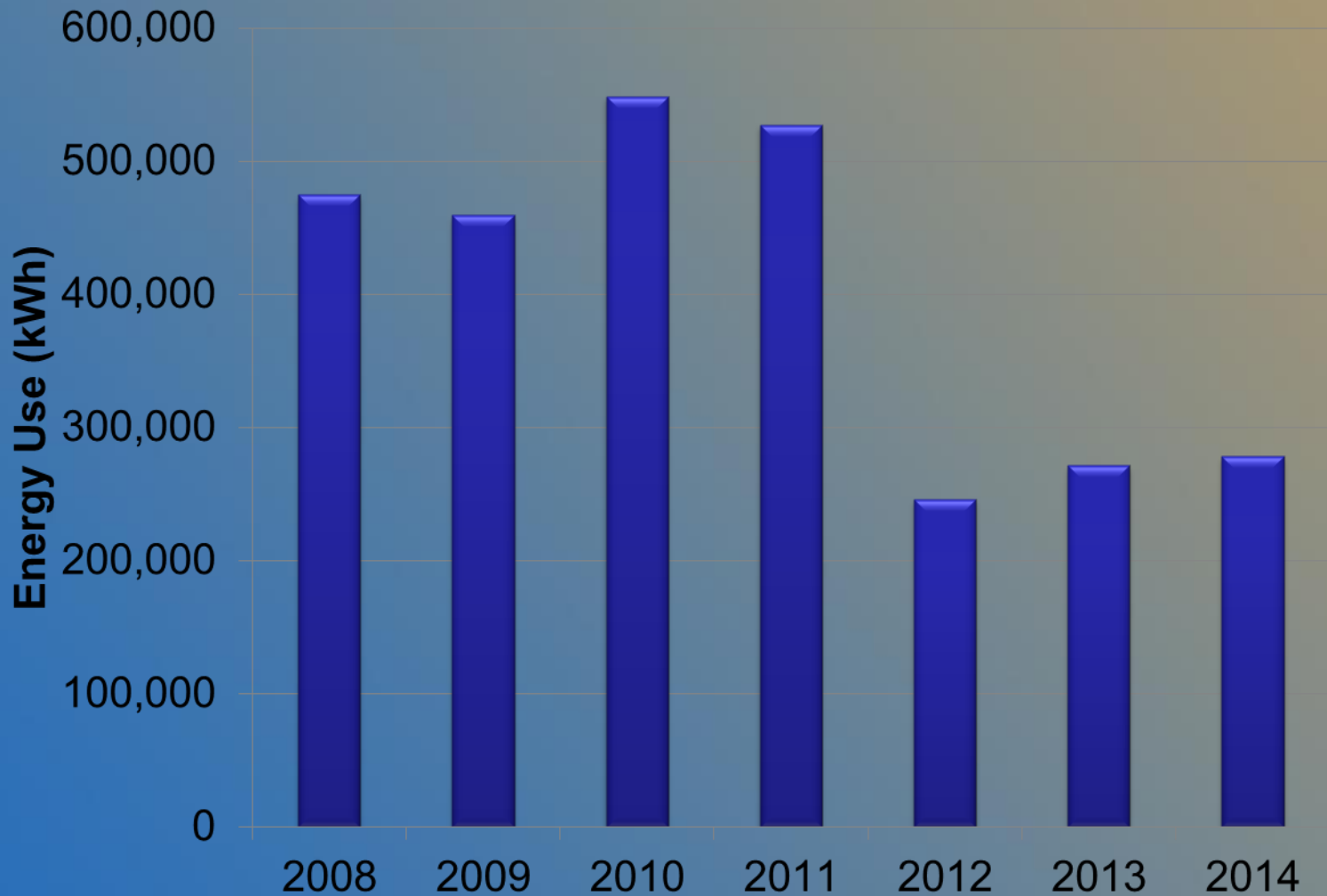
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Lessons Learned

- **Keep an open mind, always look for a way to save**
- **The impossible may very well be possible**
- **If exceptional is 10% don't save 53.6%**

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Energy Use After the BBFA



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Next Steps Update – May 2015

- An analysis of BGNDRF's suitability for using solar energy to offset its reliance on conventional electrical service was performed by the National Renewable Energy Laboratory (NREL).
- A 120 kW photovoltaic array is in the process of being purchased.

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Questions



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