



**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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TABLE OF CONTENTS

<b>I.</b>	<b>EXECUTIVE SUMMARY</b>	<b>4</b>
	TABLE 1. DOE Goal Summary Table	6
<b>II.</b>	<b>PERFORMANCE REVIEW AND PLAN NARRATIVE</b>	<b>15</b>
	<b>GOAL 1: Greenhouse Gas Reduction</b>	<b>15</b>
1.1	28% Scope 1 & 2 GHG reduction by FY 2020 from a FY 2008 baseline	15
1.2	13% Scope 3 GHG reduction by FY 2020 from a FY 2008 baseline	20
	<b>GOAL 2: Sustainable Buildings</b>	<b>21</b>
2.1	30% energy intensity (Btu per gross square foot) reduction by FY 2015 from a FY 2003 baseline	21
2.2	EISA Section 432 energy and water evaluations, benchmarking, project implementation, and measures follow up	23
2.3	Individual building metering for 90% of electricity (by October 1, 2012); for 90% of steam, natural gas, and chilled water (by October 1, 2015)	23
2.4	Cool roofs unless uneconomical, for roof replacements unless project already has CD-2 approval. New roofs must have thermal resistance of at least R-30	24
2.5	<i>15% of the number of existing buildings greater than 5,000 gross square feet (GSF) to be compliant with the five guiding principles of HPSB by FY 2015</i>	25
2.6	All new construction, major renovations, and alterations of buildings greater than 5,000 GSF must comply with the GPs	26
2.7	Efforts to increase regional and local planning coordination and involvement	26
	<b>GOAL 3: Fleet Management</b>	<b>27</b>
3.1	10% annual increase in fleet alternative fuel consumption by FY 2015 relative to a FY 2005 baseline	27
3.2	2% annual reduction in fleet petroleum consumption by FY 2020 relative to a FY 2005 baseline	27
3.3	100% of light duty vehicle purchases must consist of alternative fuel vehicles (AFV) by FY 2015 and thereafter (75% FY 2000 - 2015)	28
	<b>GOAL 4: Water Use Efficiency and Management</b>	<b>28</b>
4.1	26% potable water intensity (gallons per gross square foot)) reduction by FY 2020 from a FY 2007 baseline	28
4.2	20% water consumption (Gal) reduction of industrial, landscape and agricultural (ILA) water by FY 2020 from a FY 2010 baseline	31
	<b>GOAL 5: Pollution Prevention and Waste Reduction</b>	<b>32</b>
5.1	Non-hazardous solid waste diversion (50% by FY 2015) – Non hazardous	32
5.2	Construction & Demolition waste diversion (50% by FY 2015) –	33
	<b>GOAL 6: Sustainable Acquisition</b>	<b>33</b>
6.1	Procurements meet requirements by including necessary provisions and clauses in 95% of applicable contracts	33
	<b>GOAL 7: Electronic Stewardship and Data Centers</b>	<b>35</b>
7.1	Data Centers and Electronic Stewardship	35
7.2	Core data centers maximum annual weighted average Power Utilization Effectiveness (PUE) of 1.4 by FY 2015	35
7.3	Power Management – 100% of eligible PCs, laptops, and monitors with Power Management actively implemented and in use by FY 2012 and continually thereafter	37

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

---

7.4	Electronic Stewardship – 95% of eligible electronic acquisitions meet EPEAT standards	38
<b>GOAL 8: Renewable Energy</b>		<b>38</b>
8.1	20% of annual electricity consumption from renewable sources by FY 2020 and thereafter (7.5% FY 2013)	38
<b>GOAL 9: Climate Change Resilience</b>		<b>39</b>
9.1	Address DOE Climate Change Adaptation Plan Goals	39
<b>GOAL 10: Energy Performance Contracts</b>		<b>45</b>
10.1	Utilization of Energy Performance Contracts	45
<b>Goal 11: Sustainable Remediation</b>		<b>46</b>
11.1	Integrating Sustainability into Remediation Activities	46
<b>Budget and Funding Efforts – Applicable to All Goals</b>		<b>46</b>
<b>III.</b>	<b>FLEET MANAGEMENT PLAN</b>	<b>47</b>
<b>IV.</b>	<b>CONCLUSION</b>	<b>48</b>

## I. EXECUTIVE SUMMARY

The mission of the Waste Isolation Pilot Plant (WIPP) is to demonstrate the safe, environmentally sound, cost-effective, permanent disposal of defense-generated transuranic (TRU) waste. The WIPP *Site Sustainability Plan* (SSP), in concert with the *Consolidated Energy Data Report* (CEDR) explains how the WIPP will contribute to the U.S. Department of Energy (DOE) sustainability goals as required by DOE Order 436.1, *Departmental Sustainability* and the DOE Strategic Sustainability Performance Plan while accomplishing the mission. It is the WIPP management vision to utilize available resources for implementation of economically viable activities and to reinvest resources recovered from energy conservation measures to promote site sustainability and contribute to the department's sustainability goals. This plan reflects the accomplishments the WIPP has realized toward meeting the DOE sustainability goals and establishing the strategies to be pursued for further contributions.

The WIPP has made progress in each of the sustainability areas both prior to, and since the establishment of the current goal baselines. Areas where the WIPP has met or exceeded goals are Scope 3 Green House Gas (GHG) emission reductions, energy and water evaluations, metering, cool roofs, fleet management, and sustainable acquisition. In addition, progress has been made compared to the baseline in the areas of Scope 1 and 2 GHG reduction, building energy intensity, High Performance Sustainable Buildings (HPSB) for existing buildings, water efficiency, diversion of municipal solid waste, data center efficiency, and onsite renewable energy. However, given the unique nature of the WIPP location, mission, and energy environment, it is forecasted that the WIPP's contribution toward the goals will not meet the percentage established for the DOE as a whole in several areas. These areas include Scope 1 and 2 GHG emissions, building energy intensity, water efficiency, renewable energy and HPSB. The strategies and plans outlined in this document will be utilized by the WIPP to support the Department's site sustainability goals while fulfilling the Department's mission and maintaining economically viable stewardship.

Efficient use of energy resources has been important to the WIPP since startup of the facility. Through efficiency upgrades, scheduling, and management of resources, the WIPP has controlled energy use throughout the mining and waste receipt/disposal process as demonstrated in Figure 1.

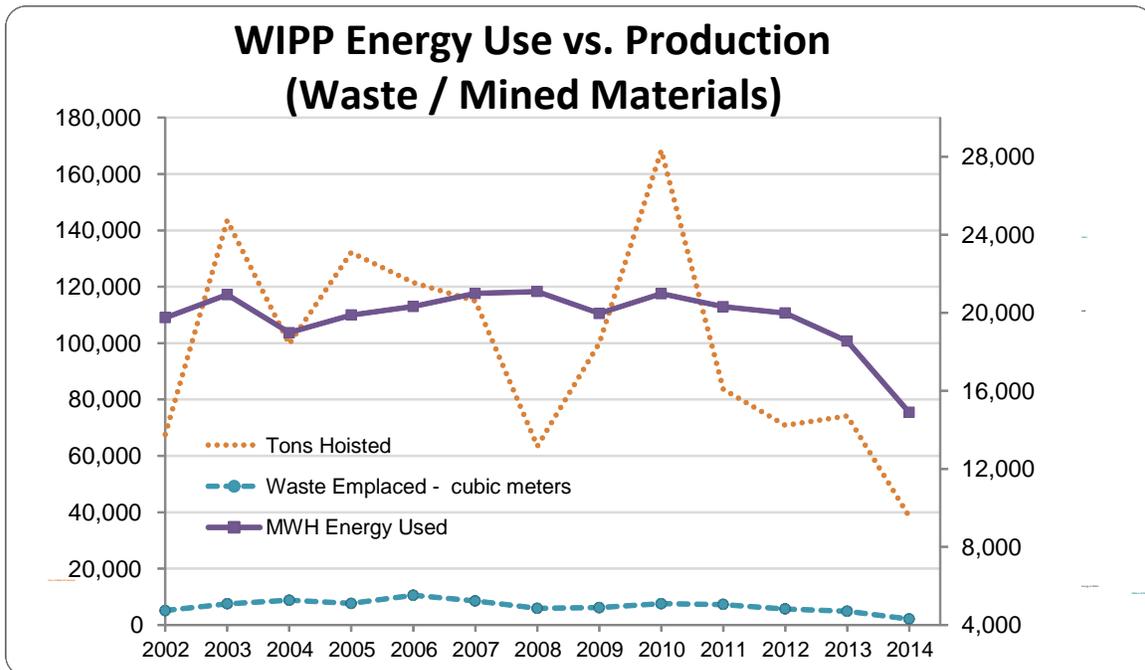


Figure 1

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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This performance is particularly significant since 75% of the energy consumed for the project is for process loads (Figure 4) with the largest energy use on-site attributable to providing underground ventilation (see Figure 5) required for work place habitability; protection of the worker, the public and the environment; mining salt and emplacing waste. The WIPP surface structures accommodate personnel, equipment, operational facilities and support services required for the receipt and emplacement of TRU waste for permanent disposal in the underground. The WIPP underground structures occupy approximately 100 acres for permanent emplacement of waste and are located approximately 2,150 feet below the surface. WIPP has played a key role in meeting objectives established in the National TRU Waste Management Plan, receiving shipments of TRU waste for disposal from March 1999 until February, 2014. This included supporting mining and underground outfitting for experimental projects including among others EXO, the Salt Disposal Investigation and Salt Defense Disposal Investigation.

In February 2014, two isolated events took place at the WIPP resulting in temporary disruption of TRU waste receipt and changes in operations that skews sustainability performance for FY2014. On February 5, an underground salt haul truck caught fire. Workers were evacuated and the underground portion of WIPP was shut down. Nine days later on February 14 a second event occurred when a continuous air monitor (CAM) alarmed during the night shift. Exhaust air dampers closed redirecting the exhaust through high efficiency particulate air (HEPA) filters. The ventilation for underground air has remained in this configuration, and is not planned to change until mine recovery activities are complete. The reduced operation is reflected in Figure 1.

Funding for energy conservation measures are allocated from the annual baseline operating budget along with the mission essential requirements. Funding is now concentrated on Recovery activities. After two attempts by Energy Savings Performance Contractors (ESPCs) and multiple attempts by third parties to provide renewable energy through a Power Purchase Agreement (PPA), viable projects with financially acceptable return on investment have not been identified. During FY 2013, the National Renewable Energy Laboratory (NREL) completed an Energy and Water Audit of the WIPP site to identify building and process energy efficiency opportunities. The audit identified 15 measures for energy and GHG reductions. Since the audit, the WIPP has pursued funding for all or part of these projects through either the ESPC Enable Program or a traditional ESPC, but has not been able to secure the funding.

During analysis performed in FY 2011, it became apparent that there are two potential paths for the WIPP to meet GHG reduction goals:

- Replacement of electrical energy supplied by the utility company with a renewable energy source.
- Energy conservation measures targeted directly at process loads.

Although these two paths continue to offer the most capability for meeting the goals, the NREL audit in FY 2013 confirmed that installation of renewable energy generating projects (wind and large scale solar photovoltaic) is not financially viable. Payback for either wind or solar renewable exceeds a ten year period. In light of this, the WIPP will focus its primary efforts on energy conservation measures for process loads that deliver the highest payback and the least disruption to mission critical and Recovery activities. Funded projects for FY 2014 included HVAC conversion to Variable Refrigerant Flow (VRF) for Building 489 (training). Funded projects to install variable frequency drives (VFDs), premium efficiency motors for Building 456 (pump house), and building-level photovoltaic projects were placed on hold due to the February events.

The WIPP will continue to scrutinize the energy market for improvements in economic viability of renewable energy projects on WIPP lands. As the energy market develops, the WIPP will explore alternative funding of projects including installation of utility-scale renewable energy generation

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

through a PPA and opportunities for ESPCs. The VRF project is under review for utility rebate, which may provide additional opportunities in the future.

Additional site information is available through the WIPP Ten-Year Site Plan, DOE/WIPP-04-3327, Revision 9. Table 1 below provides a status summary of SSPP goals for the WIPP. Risk of Non-Attainment reflects current status of meeting the subject goal with current funding and resources.

<b>TABLE 1. DOE Goal Summary Table</b>				
<b>SSPP Goal #</b>	<b>DOE Goal</b>	<b>Performance Status</b>	<b>Planned Actions &amp; Contribution</b>	<b>Risk of Non-Attainment</b>
<b>GOAL 1: Greenhouse Gas Reduction</b>				
1.1	28% Scope 1 & 2 GHG reduction by FY 2020 from a FY 2008 baseline (2014 target: 19%)	33% reduction for FY 2014.  Note: The reduction in FY 2014 is an anomaly resulting from the limited operations (and corresponding reduction in energy use) due to the February events. This reduction is not expected to continue as the facility returns to mining and waste disposal operations.	The WIPP continues to explore onsite solar power generation through a PPA as opportunity arises. Attempts to implement third party financed solar powered generation have not proven economically viable.  It is expected that energy use will increase as interim and supplemental ventilation systems will require additional energy. However, as recovery projects (e.g. ventilation systems) are designed and implemented, energy efficiency will be a consideration.	High
1.2	13% Scope 3 GHG reduction by FY 2020 from a FY 2008 baseline (2014 target 5%)	Achieved. 44% Reduction in FY 2014  This significant achievement is a result of continued improvements in business travel and employee commute	Business travel and employee commute accounted for 80% of Scope 3 GHG in FY 2014. Although it is anticipated the WIPP will continue to meet this goal, some of the WIPP GHG reductions result from travel reductions between regulatory authorization cycles. As authorizations must be renewed, increased business travel supporting these efforts will result in increased Scope 3 emissions. Increased business travel due to Recovery activities will also result in increased Scope 3 emissions. Increases in the number of employees and the need for training is expected to have an impact on Scope 3 GHG production attributable to the WIPP mission.	Low

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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SSPP Goal #	DOE Goal	Performance Status	Planned Actions & Contribution	Risk of Non-Attainment
<b>GOAL 2: Sustainable Buildings</b>				
2.1.	30% energy intensity (Btu per gross square foot) reduction by FY 2015 from a FY 2003 baseline (2014 target 27%)	42% reduction reported for FY 2014 based on the FY 2003 baseline. The WIPP implemented many energy conservation measures in the late 1990's and early 2000 time period.	<p>It is not expected that the WIPP can continue the same level of reduction achieved this year. Part of the reduction was due to equipment being down. It is anticipated that the WIPP's reduction will be in the range of FY 2012 intensity numbers i.e. a 23% reduction.</p> <p>Continue identification of potential projects and the funding for those projects. Pursue funding to retrofit applicable buildings to improve HPSB compliance.</p> <p>The initial phase of the "IT Revitalization Project" began in FY 2014 with deployment of thin client (1<sup>st</sup> phase) at the WIPP Site. Completion of initial phase was delayed due to the February events.</p> <p>New technology in lighting continues to be implemented and contribute to WIPP energy intensity reduction.</p>	Moderate
2.2	EISA Section 432 energy and water evaluations	<p>Achieved. The NREL Energy and Water Audit of the WIPP completed an independent evaluation as required by this goal.</p> <p>Also, 11 facilities benchmarked through Portfolio Manager.</p>	<p>Continue benchmark process for relevant buildings, currently 78% of surface square footage. For the future, focus energy and water evaluations with benchmarking on traditional office space (non process related) buildings. This approach is supported by the NREL results.</p> <p>75% of the WIPP site energy usage is used in areas that cannot be entered into Portfolio Manager (the WIPP mine.) The WIPP can put all surface facilities in Portfolio Manager and not capture 75% of the facility energy usage. As written, the WIPP cannot meet EISA 432 guidance of up to 100% of facilities to capture a minimum of 75% of the site facility energy usage.</p>	High

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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2.3	Individual buildings metering for 90% of electricity (by October 1, 2012); for 90% of steam, natural gas, and chilled water (by October 1, 2015) (2014 target: 90% and 75% respectively)	Achieved. 100% of site electrical use metered, 97% of process metered to date, 100% of required buildings metered. A large percentage of metering was installed prior to current metering guidelines.	Temporary facilities placed to support recovery efforts will be metered for electricity and water. Chilled water, steam or natural gas metering is not applicable to the WIPP site.	Low
2.4	Cool roofs, unless uneconomical, for roof replacements unless project already has CD-2 approval. New roofs must have thermal resistance of at least R-30.	Achieved. 13 existing buildings have been enhanced with cool roof application as roof repairs and not as part of construction design projects.	The WIPP mission is currently at CD-0 with the WIPP Permanent Ventilation project which will have minimal opportunity for the use of cool roofs.	Low
2.5	15% of existing buildings greater than 5,000 gross square feet (GSF) are compliant with the Guiding Principles (GPs) of HPSB by FY 2015 (2014 target 13%)	100% of office space has been evaluated resulting in two of eight office buildings subject to goal being assessed for compliance in EPA's Portfolio Manager. These two buildings are assessed as 69% compliant with the GPs. In addition, A new modular building completed in FY 2010 although less than 5,000 GSF, was built to GPs.	Pursue funding for projects, continue building assessment. There is a high risk of the WIPP not achieving this goal without funding for retrofitting of relevant buildings to meet the GPs.	High
2.6	All new construction, major renovations, and alterations of buildings greater than 5,000 GSF must comply with the GPs	No new buildings or major renovations meeting these criteria are planned.	WIPP is considering the concept of building consolidation. A new building where HPSB GP is high priority would replace existing buildings that are not cost effective to bring up to GPs. Should the concept proceed to project, HPSB guiding principals will be utilized in design and construction.	Currently N/A
2.7	Efforts to increase regional and local planning coordination and involvement	The WIPP is pursuing a Joint Energy Efficiency Plan (JEEP) with Xcel Energy to achieve additional energy reductions through plant infrastructure modifications for both process and building loads. The agreement is being worked with site Contracting for implementation in FY2015.		
<b>GOAL 3: Fleet Management</b>				
3.1	10% annual increase in fleet alternative fuel consumption by FY 2015 relative to a FY 2005 baseline (2014 target: 136% cumulative since 2005)	Exemption 701, utilizing hybrid vehicles for fleet replacement.	Continue increasing use of hybrid vehicles for fleet replacement (GSA); re-assess economical viability of alternative fuel if it becomes available locally.	N/A Exempt

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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3.2	2% annual reduction in fleet petroleum consumption by FY 2020 relative to a FY 2005 baseline (2014 target: 18% cumulative since 2005)	Achieved. 24,034 gal used in FY 2005.  16,676 gallons used in FY 2014 for a 31% reduction since FY 2005.	Maintain reduction as mission allows.	Low
3.3	100% of light duty vehicle purchases must consist of alternative fuel vehicles (AFV) by FY 2015 and thereafter (75% FY 2000 – 2015)	No purchases were made in FY 2014. 92% of the WIPP fleet is AFV with no new purchases.	No plans to purchase light duty AFVs.  AFVs and hybrids are leased through GSA as units are replaced. Hybrids are selected when cost effective and available.	Low
<b>GOAL 4: Water Use Efficiency and Management</b>				
4.1	26% potable water intensity (Gal per gross square foot) reduction by FY 2020 from a FY 2007 baseline (2014 target: 14%)	Water intensity reduction in FY 2014 was 10.3 % below the baseline.  Total water usage remains fairly constant for the past three years at a reduction of 5% compared to the FY 2007 baseline. Refer to Figure 9  The WIPP reduced water use by 49% from FY 2003 to FY 2007.	Continue repair of fire water distribution system valves. Increased monitoring of water and additional meters pending funding. The WIPP has no economic driver to reduce water consumption since the site receives up to 6.6 million gallons of water per year at no cost based upon an agreement with the City of Carlsbad.	High
4.2	20% water consumption (Gal) reduction of industrial, landscaping, and agricultural (ILA) water by FY 2020 from a FY 2010 baseline (2014 target: 8%)	The WIPP uses no water for agriculture. Industrial use is minimal to support mining and other mission essential processes with no significant opportunities for conservation. Landscaping is not separately metered and water use is negligible. Landscaping is xeriscaped.	Maintain xeriscape practice to conserve water. Potential for the WIPP to meet the FY 2020 goal is low and not economically justifiable since water is at zero dollar cost to the WIPP.	High
<b>GOAL 5: Pollution Prevention and Waste Reduction</b>				
5.1	Divert at least 50% of non-hazardous solid waste, excluding construction and demolition debris, by FY 2015.	In FY 2014, 32% of non-hazardous solid waste was diverted.  Efforts in this goal were set back due to the February radiological event.	Continue to encourage the recycling of paper, plastics, cardboard, batteries, aluminum, toner cartridges, and wood pallets/waste.	Moderate

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

**TABLE 1. DOE Goal Summary Table**

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5.2	Divert at least 50% of construction and demolition materials and debris by FY 2015	In FY 2014, 46% of construction and demolition materials was diverted.  Concrete (127 metric tons) from the demolition of an underground concrete slab was not recyclable because of rebar content and salt contamination. Otherwise, WIPP would have had a 100% diversion rate.	Continue to verify all new construction projects use recycled material to the maximum extent practicable and maintain current contracts to continue recycling the metals from maintenance and upgrade of facility.	Low
<b>GOAL 6: Sustainable Acquisition</b>				
6.1	Procurements meet requirements by including necessary provisions and clauses in 95% of applicable contracts	Achieved. 100% of applicable contracts contained sustainable acquisition clauses. There were 11 contract actions for the two contract categories reviewed; six were determined to be eligible for sustainable purchasing and they contained sustainability clauses.  The WIPP continues to improve in the area of dollars spent on sustainable office products, with 65% of total dollars spent in FY 2014 on recycled content products.	Continue to be diligent in incorporating sustainable acquisition into contracts.	Low
<b>GOAL 7: Electronic Stewardship and Data Centers</b>				
7.1	All core data centers (DCs) are metered to measure a monthly Power Utilization Effectiveness (PUE) of 100% by FY 2015 (2014 target: 90%)	WIPP data centers are not classified as core data centers. There are two DCs supporting WIPP project, the Skeen Whitlock Building DC and the Site DC located in the support building. These two DCs are the minimal number of data centers needed for WIPP mission.  The strategy for metering at the SWBis to use power distribution units (PDU's) to track energy use for cooling, lights and servers. Progress has been made in implementing this strategy during FY 2014 in accordance with The SWB Data Center Sustainability Project Plan. This includes: Achieved funding for power metering equipment for the SWB Data	FY 2015 actions planned towards DC metering are to:  Install power metering for SWB DC with a goal of establishing a baseline PUE.  Install 208v and PDU's for the Site Data Center to reduce energy usage.  Work with Energy Manager to combine effort to establish a common platform for power metering reporting and identify the interfaces required to accomplish the initiative.	Moderate

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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		<p>Center.</p> <p>In addition to measuring through PDU's, equipment necessary to meter the SWB DC as a whole has been acquired.</p> <p>208v Power Plans for upgrading the SITE DC were submitted. Bench work to install the circuits has been completed. A power outage is required at the facility to complete the conversion from 110v to 208v (NOTE: Fire and radiological release events from February 2014 have impacted this endeavor.)</p>		

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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7.2	Core data centers maximum annual weighted average PUE of 1.4 by FY 2015 (2014 Target: 1.5)	<p>Goal is not applicable to WIPP DCs. However, both of the DCs have been assessed using DOEGRIT resulting in an estimated SWB DC PUE is 1.75 and Site DC is 1.85.</p> <p>In FY 2014, work continued to improve PUE as follows.</p> <p>Data servers continued to be consolidated for efficiency to increase system usage WIPPnet Servers were 75% virtualized by end of FY 2014.</p> <p>Equipment reconfigured in SWB DC and electrical realigned to progress hot/cold deck configuration.</p> <p>Perform testing and reconfigured air flow in SWB DC resulting in reduced DC temperature.</p> <p>Due to the February 2014 events further efforts of SSP activities halted. IRM continues supporting Recovery efforts over committed goals.</p>	<p>Reduce cooled space in the SWB DC by at least 25% by installation of curtains isolating hot/cold decks with additional installation of under floor baffling to control cool air flow contributing to the PUE value.</p> <p>Continue building IT solutions with virtualization efforts.</p> <p>Continue to modify the WIPP Data Center Sustainability Project Plan to achieve Goal 7.1 and 7.2. Scope changes include:</p> <ul style="list-style-type: none"> <li>• Extend plan to include year's 2014 – 2016.</li> <li>• Add additional phase (6) to achieve 5 ton cooling reduction (50%) by removing the 5 ton HVAC unit and leaving 10 ton HVAC unit operational in SWB Data Center.</li> <li>• Install additional 10 ton HVAC as backup unit in SWB Data Center.</li> <li>• Add phase (7) for funding, engineering support, acquisition and installation of diesel or natural gas generator at the SWB.</li> <li>• Add phase (8) for funding, electrical engineering design, support, and acquisition of a replacement UPS for the SWB DC including a life cycle plan. The current UPS was installed in 1997.</li> </ul>	Moderate

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

**TABLE 1. DOE Goal Summary Table**

SSPP Goal #	DOE Goal	Performance Status	Planned Actions & Contribution	Risk of Non-Attainment
7.3	Power Management - 100% of eligible PCs, laptops, and monitors with power management actively implemented and in use by FY 2012	Achieved.  DOE/WIPP 11-3474, the WIPP electronics policy supporting this goal has been in place since 2011.  99% of eligible PCs, 100% of monitors, and 98% of eligible laptops had active power management operational at end of FY 2014.	Electronic Stewardship policies are now in operational mode, as goals have been achieved.	Low
7.4	Electronic Stewardship – 95% of eligible electronics acquisitions meet EPEAT standards	100% desktops, 99% of LCD monitors, and 94% notebooks were EPEAT gold.  21% of tablets purchased were EPEAT gold.	DOE/WIPP 11-3474, the WIPP electronics policy requires the purchase of EPEAT silver or gold registered electronics. The selected site standard desktops are EPEAT silver or gold registered products. In FY 2015 a site standard tablet that is EPEAT registered will be identified.	Low
<b>GOAL 8: Renewable Energy</b>				
8.1	20% of annual electrical consumption from renewable sources by 2020 (2014 target: 7.5%)	Renewable Energy Credits (REC) were cancelled with plans to purchase at a better rate and utilize the funding for installation of phased onsite rooftop photovoltaic PV array project.  A phase of the project has been scoped, and the majority of equipment procured.	The WIPP is using the funding previously used for REC procurement to fund installation of site renewable energy generation. Installation of the first phase of rooftop PV array on Building 953 was planned for FY 2014. However, the February event put this project on hold. It is anticipated to be installed for FY2015.  At the current funding rate, the full goal will not be achieved for several years.	High
<b>GOAL 9: Climate Change Resilience</b>				
9.1	Address DOE Climate Change Adaptation Plan Goals (See Appendix C)	A screening analysis for mission specific vulnerability to climate change. (Refer to Table 3 in the Narrative section 9.1.) was performed, with none of the potential risks that were identified appearing to be imminent. Further work to better define the significance of potential risks will need to be performed but is not anticipated to be completed until after recovery activities are complete and WIPP resumes operations.		
<b>GOAL 10: Energy Performance Contracts</b>				

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

**TABLE 1. DOE Goal Summary Table**

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10.1	Utilization of Energy Performance Contracts	The WIPP has been through two performance contract initiatives, both failing to materialize. Factors preventing successful energy performance contracts are low utility rates, high percentage of process loads governed by mission needs and lack of local resources to minimize the construction/implementation costs that affect a reasonable payback for the contractor and DOE.		
<b>GOAL 11: Sustainable Remediation</b>				
11.1	Integrating Sustainability into Remediation Activities	The WIPP project does not have any remediation/cleanup activities within the scope of Green & Sustainable Remediation.		

## II. Performance Review and Plan Narrative

### GOAL 1: Greenhouse Gas Reduction

#### 1.1 28% Scope 1 & 2 GHG reduction by FY 2020 from a FY 2008 baseline

##### Performance Status

Figure 2 graphically demonstrates the WIPP Scope 1 and 2 Greenhouse Gas Profile. As shown, Scope 2 emissions, indirect emissions associated with purchase of electricity for operation of the site account for 97% of the total Scope 1 and 2 emissions. Seventy five percent of Scope 2 emissions are those associated with the energy used for process related functions with only 25% associated with building energy use. This was confirmed with the NREL Energy and Water Audit and is documented in the audit report dated August 2013.

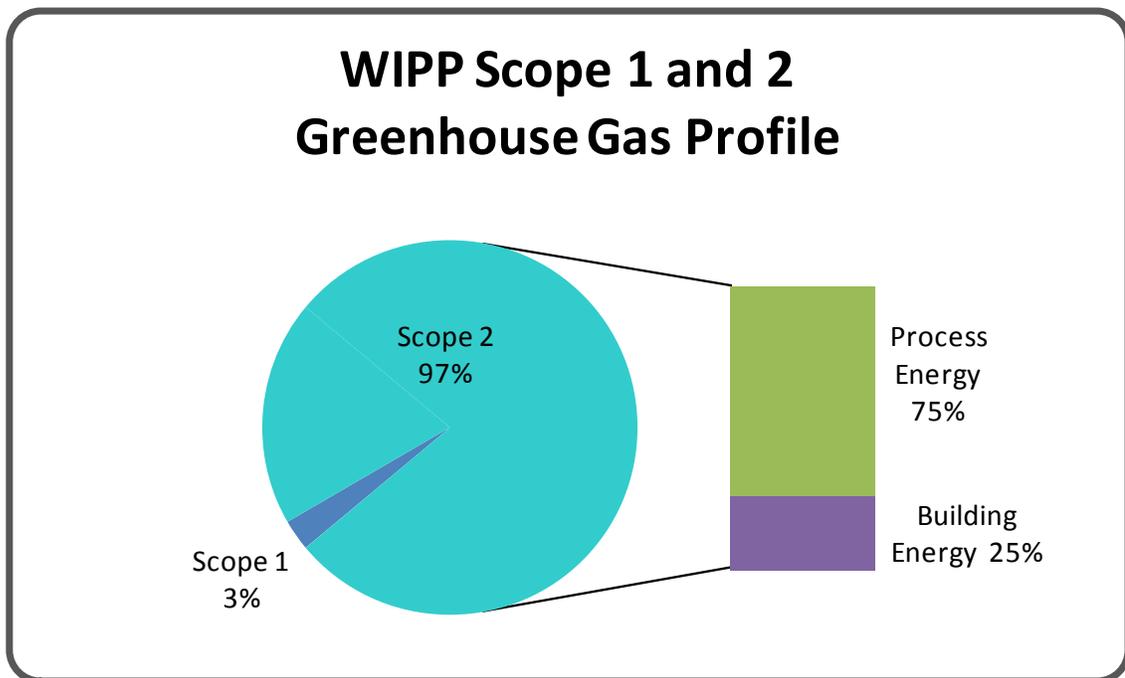


Figure 2

Of the three percent Scope 1 emissions, 98% are a result of use of petroleum based fuels and onsite wastewater lagoons. The remaining 2% are associated with fugitive emissions.

The WIPP has made consistent progress in reducing Scope 1 and 2 emissions associated with its operation as demonstrated by Figure 3 which shows annual reductions compared to the baseline.

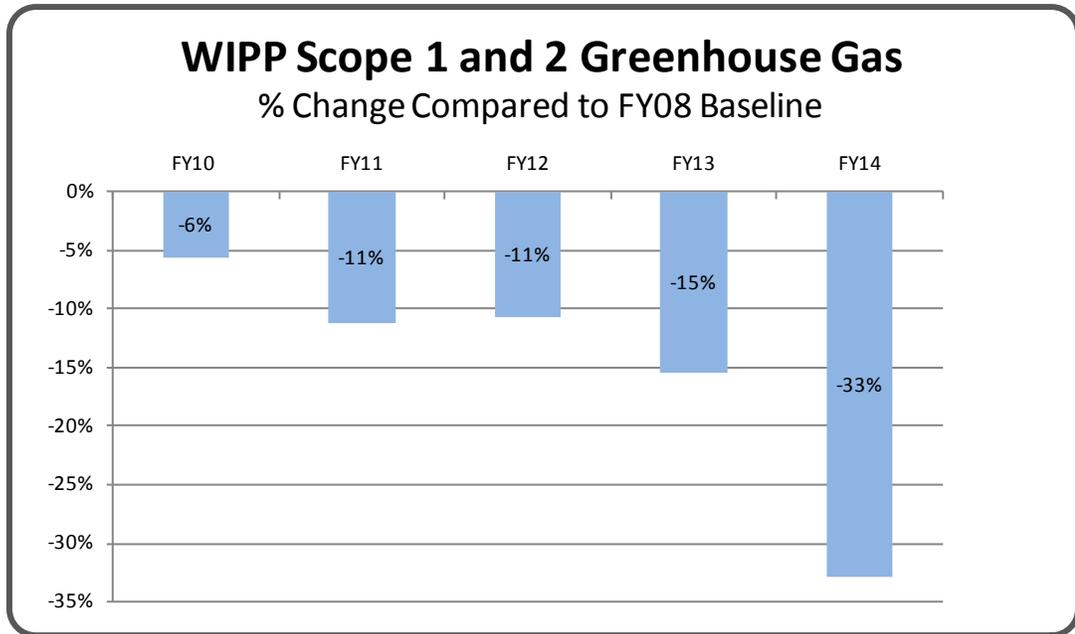


Figure 3

A large portion of the FY 2014 reduction in Scope 1 and 2 emissions is a result of limited operations due to the February events. This reduction is not anticipated to continue as Recovery activities return the WIPP facility to mining and waste disposal operations. A projected FY 2015 reduction of something in the range of the FY 2013 15% is more rational.

Scope 1 and 2 emission reductions in FY 2013 are primarily a result of the reductions in process related energy use. Specifically, several energy conservation measures were implemented in FY 2013 including right sizing the primary air compressors, and installation of LED lighting in Building 411. Perimeter lighting is replaced with Induction Lighting as existing high pressure sodium fixtures fail. The result is a reduction in both power requirements and maintenance activity due to the long life provided by the induction fluorescent technology. Replacement of the WIPP primary air compressors contributed to a 2% site energy use reduction from FY 2012 energy use. Site energy use reduction in FY 2013 reflects a 12% decrease in total energy use compared to the baseline.

The WIPP site's energy use profile reveals that the larger portion of energy use at the site is accounted for by industrial type processes required to emplace waste in the repository (e.g. hoist and ventilation) vs. non process related energy use (i.e. building, energy intensity). This is illustrated in Figure 4 which graphically depicts the breakdown between process vs. non process energy use and energy intensity performance since the WIPP began emplacing waste in 1999.

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

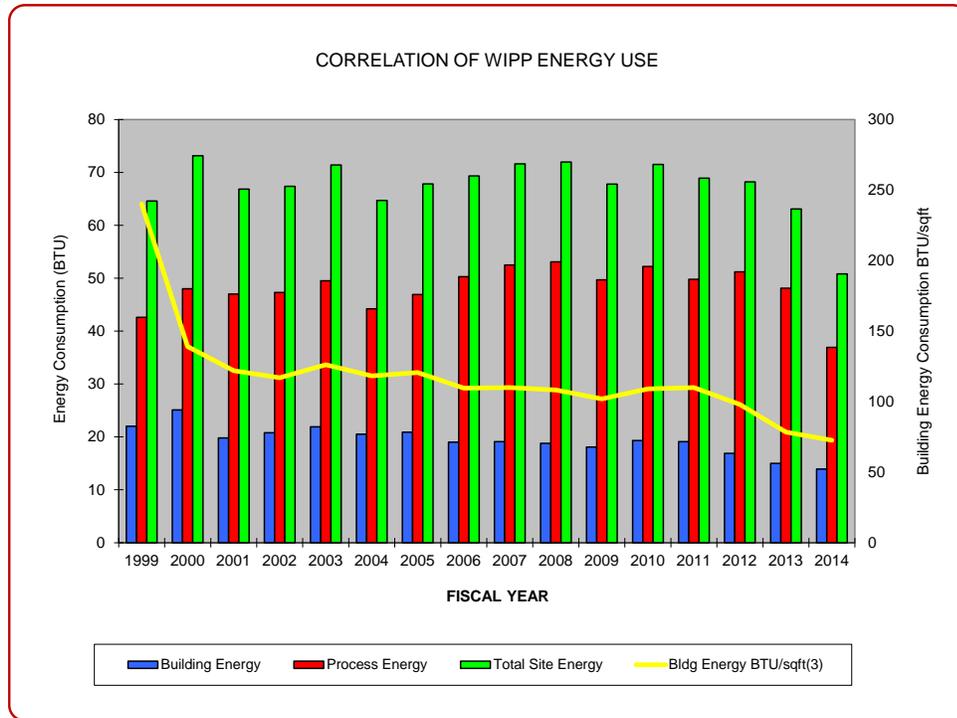


Figure 4

In Figure 4, the yellow line represents energy intensity (building energy BTU/sqft) and graphically illustrates the progress since the late 1990's in this area. The slight decrease for FY2014 is attributed to the February events.

Recent accomplishments include completion of the HVAC upgrade to Building 489 (training) utilizing Variable Refrigerant Flow (VRF) technology. This replaced a 20 year old traditional fan/coil system utilizing electric resistance heat. Initial savings are estimated to be approximately 220,000 kwh/yr. This project has been submitted to the utility for an energy rebate. The system also resulted in a significant change to occupant comfort. Additional facilities are being considered for conversion to this technology if funding is identified.

Although opportunities for energy intensity improvement are limited, WIPP continues to identify further contributions toward energy intensity reductions as noted in the FY 2015 CEDR, Tab 3.3. Lighting upgrades included T8 lighting and controls in Building 452. The lighting upgrades will reduce future maintenance as the existing fixtures operate continuously, while the new fixtures run significantly fewer hours. The WIPP also continues to look at operational improvements in the area of lighting. For example, the WIPP institutionalized manual lights shut-off after hours in several buildings where lights do not operate from sensors or timers and will make a further improvement in FY 2015 with plans to schedule these systems through the site building control system.

Other opportunities to further improve energy intensity would be gained by significant increases in building envelope insulation (e.g. related to meeting HPSB GP's).

Process energy use reduction has the most potential to significantly reduce the WIPP GHG emissions in the future. The largest portion of process energy consumed is associated with operation of the ventilation fans, hoisting system, and underground loads (see Figure 5). In these areas, operational practices and improvements in equipment technology provide opportunities for

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

energy use reductions. Recovery efforts will provide an opportunity explore reducing process related energy use.

The compressed air system is running with increased efficiency due to the replacement of the primary air compressors. Another compressed air station is identified for replacement that will further reduce process energy consumption. The project will also replace the dryer, providing additional savings.

**kW Sliding Window Demand Chart**

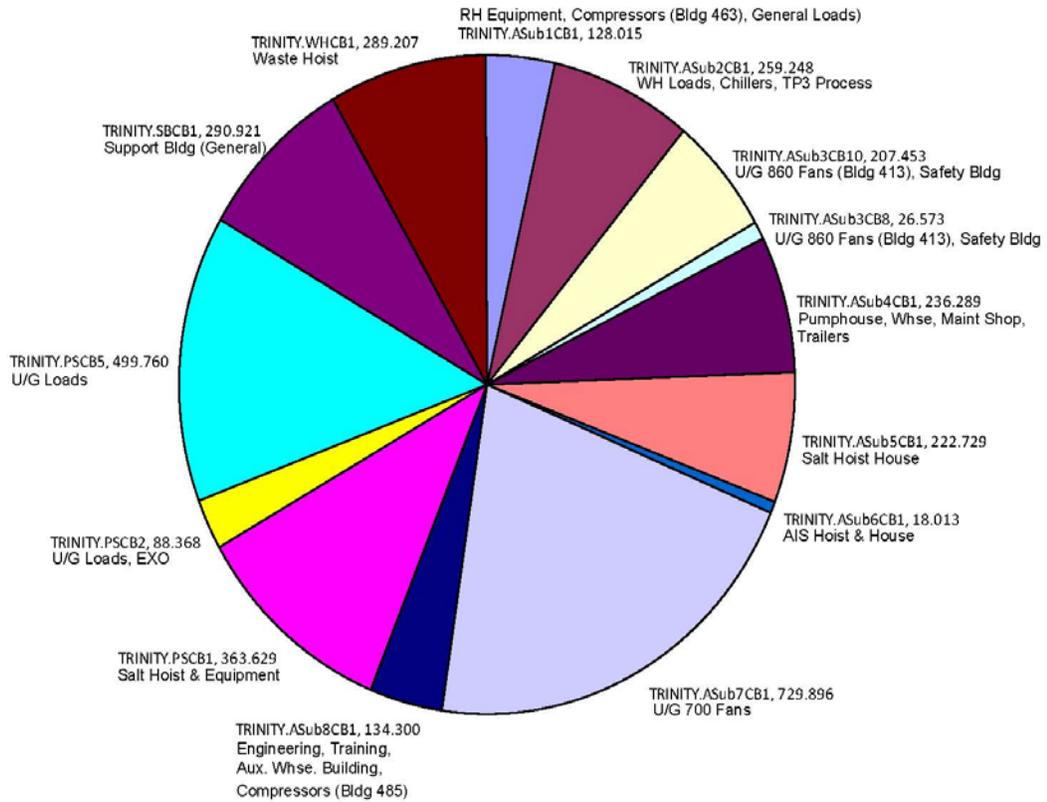


Figure 5

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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During FY 2013, the NREL provided technical assistance through an Energy and Water Audit of the WIPP. The final report (August 2013) supports the identified loads shown in Figure 5 along with strategies to maximize efficiency and reduce energy consumed by the biggest loads. The audit identified 15 potential energy conservation measures. Implementing the financially viable measures (simple payback less than 10 years) was estimated to save 4,125 MWh/yr and 2,941 mtCo<sub>2</sub>e. During FY 2013 the Carlsbad Field Office (CBFO) worked with DOE Headquarters and Federal Energy Management Program (FEMP) to pursue the funding needed (as estimated by NREL) to implement the measures through ESPC and/or ESPC ENABLE programs. The conclusion was that neither of these funding mechanisms is feasible due to the small project scopes and the project scope not meeting the criteria for the ENABLE program.

Phase 1 of the photovoltaic solar array on WIPP Building 953 was halted with the events in February. Design has resumed for Phase 1, planned for installation during FY 2015. Phase 2 should begin during FY 2016. Renovation plans for Building 482 were halted due to the February event. An evaluation is being performed to determine if the building is to be returned to service.

*Plans and Projected Performance*

Projecting performance toward GHG reductions is not viable at this time as there are many process changes occurring at the facility during Recovery. It is expected that energy use will increase from FY 2014 as Recovery activities return the facility to mining and waste emplacement operations. While long term GHG reductions are not anticipated due to fundamental and significant changes in facility configuration that will result in increased process energy requirements (ventilation system), implementing the WIPP Recovery Plan provides the opportunity for WIPP to position itself for efficient use of the energy in the future. To this end, WIPP management established a new Environmental Management System objective to "Enable long term energy efficient WIPP operations through integration with recovery projects."

This objective reflects the strategic focus of the WIPP which is to:

- Research technological options available for improving process equipment energy use, and pursue implementation of these options based on economic viability
- Identify and implement operational improvements to minimize process energy use and demand charges
- Continue to investigate opportunities for third party financing of energy conservation projects via ESPC avenues

Supporting the objective and focus areas, specific FY 2015 plans are for the following conservation projects:

- WIPP will install LED fixtures in a trial area for future implementation site wide. The fixtures are a retrofit that will allow individual control of office lighting over cubicle spaces. This change in light fixtures is projected to provide energy savings.
- Photovoltaic array for Building 953
- Update lighting in Building 463 and 489
- Compressed air upgrade for Bldg 485
- Incorporate energy efficiency in Interim, Supplemental and Permanent Ventilation equipment and system design and installation

**1.2 13% Scope 3 GHG reduction by FY 2020 from a FY 2008 baseline**

*Performance Status*

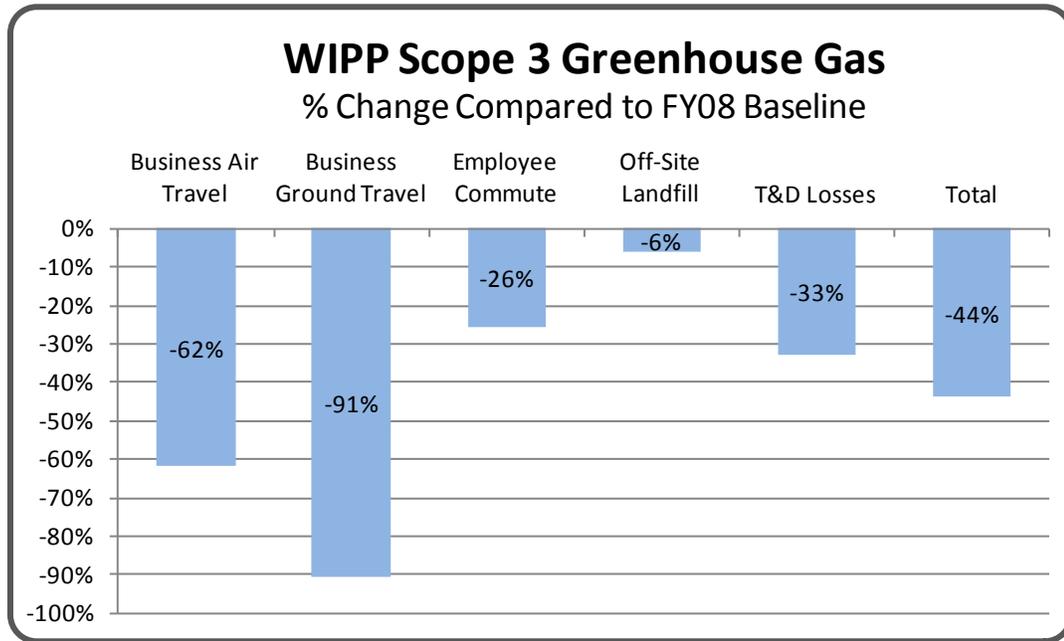


Figure 6

FY 2014 Scope 3 GHG emissions are 44% lower than the baseline year emissions, as shown in Figure 6. All categories of Scope 3 emissions are lower than the baseline. Reductions associated with business air travel and employee commute were the most significant contributors to the overall reduction.

The WIPP continues to limit travel to that necessary to support mission critical needs. Departments continue to find methods to reduce travel requirements while still achieving their performance expectations such as using teleconferencing, and electronic transfer and review of data.

Employee commuting is by single passenger vehicle, carpool or the commuter bus service, and is based on personal preference. The types of commuting personnel choose is highly dependent on fuel prices and personal schedules. During FY 2014, the WIPP experienced increases in commuting to the site via single passenger vehicles due to an increase in personnel. There was also an increase in gasoline vs. diesel fueled SUV's/trucks due to the price differential of the two fuels. These factors have contributed to increases in the commuter based GHG emissions compared to the FY 2013. However, the increases were offset by the decrease in T&D losses associated with less energy being used as a result of the February events.

Actions implemented at the WIPP that resulted in reductions in Scope 3 GHG emissions include:

- Providing commuter bus service to the WIPP site for employees for all shifts
- Encouraging bus ridership and carpooling via internal communication venues

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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- Instituting business travel restrictions that allow travel only for mission necessary purposes
- Staff was challenged to find methods to perform their work using electronic means vs. physical travel

*Plans and Projected Performance*

During FY 2015 through the target period (FY 2020), the focus will be on maintaining levels from business travel emissions that support the WIPP's contribution to the goal. However, successful completion of DOE's mission for the WIPP will require a base level of travel across the years and increased travel when regulatory compliance and waste characterization activities peak (e.g. renewal of the hazardous waste facility permit, compliance recertification with the Environmental Protection Agency [EPA], etc.). These increases, along with Recovery associated travel, will contribute to some increases in travel related emissions for the goal period.

Strategically, the WIPP continues to monitor Scope 3 GHG emissions to sustain the success achieved while balancing the need for emission reductions with the need to support personnel, retain core competencies, provide regulatory compliance coordination, and to support generator sites to achieve the WIPP mission.

Emissions associated with offsite waste disposal are not expected to decrease significantly. In fact, increases may occur with the Recovery. The WIPP will maintain its focus on recycling. However, recycling limitations due to the local recycling infrastructure will inhibit significant recycling rate growth.

*FY 2015 Actions*

- Maintain focus on using technology to minimize the need for travel
- Continue to optimize travel
- Continue awareness efforts for commute reduction

***GOAL 2: Sustainable Buildings***

**2.1 30% energy intensity (Btu per gross square foot) reduction by FY 2015 from a FY 2003 baseline**

*Performance Status*

The WIPP site continues to make improvements in efficiency as buildings/systems or areas are renovated. In FY 2014, the WIPP achieved a 42% energy intensity reduction (building use) compared to the FY 2003 baseline; exceeding the DOE's 30% reduction goal for the second year. In Figure 7, column 2 demonstrates improvements achieved in building energy intensity in the context of the overall site energy use profile. Sustaining the reduction is not anticipated as a portion of this reduction was due to HVAC systems not operating during FY 2013 and 2014. Those systems will be put back online during FY 2015.

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

Correlation of WIPP Energy Use										
1	2	3	4	5	6	7	8	9	10	11
Fiscal Year	Intensity Reduction	Bldg Energy BTU/sqft(3)	Building Energy BTU 10(9)	Process Energy BTU 10(9)	Total Site Energy BTU 10(9)	Total KWH Energy Use	Site Costs Energy	Total Cost	Shipments	Waste Emplaced Cubic Meters
1999		240	22	42.6	64.61	18,931,200	.037/kwh	\$710,614	32	266.32
2000		139	25.1	48	73.15	21,441,000	.037/kwh	\$797,865	58	351.75
2001		122	19.8	47	66.85	19,594,235	.047/kwh	\$938,179	304	1,964.93
2002		117	20.8	47.3	67.38	19,749,189	.040/kwh	\$795,318	861	5,134.45
2003	Base	126.2	21.9	49.5	71.4	20,928,382	.041/kwh	\$851,180	799	7,541.65
2004	7%	118.2	20.5	44.2	64.7	18,981,172	.050/kwh	\$955,162	964	8,810.25
2005	5%	120.6	20.9	46.9	67.84	19,883,982	.052/kwh	\$1,039,361	941	7,656.68
2006	13%	109.6	19	50.3	69.33	20,322,377	.063/kwh	\$1,298,910	1128	10,556.24
2007	13%	110	19.1	52.5	71.6	20,991,941	.055/kwh	\$1,167,463	1019	8,548.58
2008	14%	108.2	18.8	53.1	71.95	21,088,275	.067/kwh	\$1,428,320	797	5,944.37
2009	19%	102	18.1	49.7	67.8	19,970,391	.054/kwh	\$1,088,112	953	6,175.44
2010	14%	109	19.3	52.2	71.5	20,977,136	.049/kwh	\$1,038,121	1102	7,601.12
2011	13%	110	19.1	49.8	68.9	20,312,328	.050/kwh	\$1,021,997	939	7,266.74
2012	23%	98	16.9	51.2	68.2	19,986,235	.040/kwh	\$793,539	839	5,701.01
2013	37.9%	78.4	15	48.1	63.1	18,546,019	.048/kwh	\$884,584	734	4,854.02
2014	42.4%	72.6	13.9	36.9	50.8	14,894,466	.054/kwh	\$810,033	261	2,114.97
						316,598,328			Total:	90,488.52

Figure 7

Building energy intensity reductions have been substantial, though building energy accounts for only 25% of the overall energy use at the site. Considerable improvements were accomplished during a period when the project mission evolved from a training operation, to fully operational as a TRU waste disposal facility. Columns 6 and 11 in Figure 7 demonstrate that the site has been successful in maintaining the same overall load profile from general completion of construction through emplacement of a total of 90,489 cubic meters of waste, decreasing building energy intensity (column 2).

The 240 MBTU/SQFT peak shown in Figure 7, column 3 for FY 1999 is attributed to the method used for reporting energy intensity numbers prior to the year 2000. Between 1999 and 2000, the reporting changed to exclude process energy from energy intensity reporting. The sharp downturn shown in Figure 7, column 3 for FY 2000 is due to the separation of process energy from building energy for reporting and calculating energy intensity numbers. The increase beginning FY 2003 represents ramp-up activities. The downturn in FY 2006 represents a combination of metering, HVAC controls, and lighting upgrades.

The reduction experienced in FY 2013 is attributed to improvements made in new lighting and controls in buildings. Incremental reductions are realized as EXIT signs are replaced with photo luminescent units that require no power at all. However, it is recognized some of the reduction is due to HVAC systems not operating in two facilities that will be operable during FY 2015.

*Plans and Projected Performance*

The WIPP project will continue to be attentive to building energy efficiency improvement opportunities, recognizing the primary focus on making energy use improvements will be related to process areas. These provide the best opportunity for overall energy use and GHG emission reductions.

Improvements can only be made to buildings and infrastructure as funding allows. Current plans are identified in the CEDR, Tab 3.3a, Active ECM & RE Measures. The WIPP will determine building energy improvement projects based on the following general strategy:

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

---

- Roofs not able to utilize cool roof application will be reviewed for other enhancement opportunities as roof replacements become necessary.
- Implement building related projects identified in the NREL 2013 Energy and Water Audit as funding is identified and the projects can be incorporated into the project schedule under current staffing levels.
- Evaluate building energy use not identified in the NREL audit for improvements as possible within existing funding levels. For example:
  - The WIPP is evaluating the potential to alter the existing air-cooled chillers to heat pump configuration to minimize the use of direct resistance heat for space heating applications. Implementation of the modifications will depend on feasibility, impact to site mission, and availability of resources (primarily funding).
  - The WIPP is evaluating further use of variable refrigerant flow (VRF) HVAC for the Safety Building (452). The existing system is chilled water cooling and resistance heating. If implemented the technology change should provide enhanced occupant comfort while minimizing energy use.
- Install additional sub-metering based on mission priorities and economic viability in order to augment understanding of facility energy use.

During FY 2013, 200 thin clients were purchased to begin replacement of older desktop systems. These thin clients utilize a 36 watt power supply as opposed to a typical 500 watt power supply on older systems or 240 watt on the Energy Star compliant systems of a standard desktop computer. Roll out previously scheduled in July 2014 was pushed out due to the February 2014 events. Recovery schedules will determine implementation at the site.

## **2.2 EISA Section 432 energy and water evaluations, benchmarking, project implementation, and measures follow up**

### *Performance Status*

The WIPP site benchmarks eleven (11) buildings to date or seventy-eight percent of surface building square footage. Original requirements based on building criteria are met. Seventy-five percent of the WIPP site energy usage is used in areas that cannot be entered into Portfolio Manager (the WIPP mine.) The WIPP can put all surface facilities in Portfolio Manager and not capture 75% of the facility energy usage.

### *Plans and Projected Performance*

As written, the WIPP cannot meet EISA 432 guidance of up to 100% of facilities to capture a minimum of 75% of the site facility energy usage. WIPP plans to keep entries for those surface facilities that are in Portfolio Manger current.

## **2.3 Individual building metering for 90% of electricity (by October 1, 2012); for 90% of steam, natural gas, and chilled water (by October 1, 2015)**

### *Performance Status*

The WIPP site completed implementation of the initial metering system, based on earlier DOE Headquarters program requirements. Continued progress is based on funding priorities. Currently, 100% of the site electrical energy use is metered, 97% of process energy on site is

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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metered, and 87% of site office space is metered by building. The level of detailed information related to process and non-process loads since 1999 is due to the advanced metering installed at the WIPP in the 1999 to 2000 time frame. The advanced metering at the WIPP allows detailed monitoring of the significant site loads and analysis of electrical energy use.

The WIPP does not have a site wide central chilled water system. All the site chilled water systems serve individual buildings except for one system that serves two buildings. That system serves a process building (Waste Handling Building) and a multifunction building that provides facility operational support and houses administrative staff (Support Building). A study was convened in FY 1995 to determine the efficiency of creating a central chiller system. The results determined that low utility costs and the cost of trenching precluded an acceptable payback. WIPP currently has no natural gas or steam on site.

*Plans and Projected Performance*

The WIPP electrical metering meets current requirements. Additional metering will be installed based on economic viability. There is no funding or economic justification for chilled water metering at this time.

**2.4 Cool roofs unless uneconomical, for roof replacements unless project already has CD-2 approval. New roofs must have thermal resistance of at least R-30**

*Performance Status*

The site has installed cool roofs since FY 2002, with 243,121 square feet of total space enhanced with increased roof insulation and reflective surface. Facilities fitted with cool roofs include:

Bldg.	
384A	Mining Ops
411	Hoist Tower
	CH Bay
	RH Bay
	Mezzanine
412	TRUPACT Maintenance Bldg.
413	Exhaust Filter Bldg.
451	Support
456	Pump house
458	Guard & Security
475	Badge House
481	Auxiliary Warehouse
950	Office Trailer
951	Office Trailer
952	Office Trailer
953	Office Trailer

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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*Plans and Projected Performance*

Engineering standards for roofs are updated to require cool roof specifications for facility improvements. The WIPP intends to install cool roofs on existing buildings as roofs are repaired or maintenance is performed, if applicable.

**2.5 15% of the number of existing buildings greater than 5,000 gross square feet (GSF) to be compliant with the five guiding principles of HPSB by FY 2015**

*Performance Status*

As noted in the Executive Summary, there is high probability that WIPP will not meet this goal. The current status toward the goal is that two of the eight office buildings having greater than 5,000 GSF have been assessed to the GP's using EPA's Portfolio Manager (PM). Results of the assessments are summarized in Table 2.

WIPP HPSB GP Performance					
Building	GSF	Guiding Principles			
		% Met	% In Process	% Not Met	% of Not Assessed
486 – Engineering	14,692	69	23	8	0
451 – Support Building	41,069	69	23	4	4

Table 2

In addition to office buildings with greater than 5,000 GSF, a small modular building (approximately 4000 square feet), Trailer 953, was installed in 2009 to meet each of the five GPs.

Existing buildings at the WIPP were engineered as temporary facilities such that all surface structures would be removed upon completion of the mission. All permanent buildings are steel frame with exterior metal panels having only the minimum required insulation to meet code at the time of construction. Most of the opportunities to make progress toward the HPSB requirements are within the building systems themselves (lighting, heating/cooling, etc.). However, the building envelope remains the factor that limits achieving HPSB principles. Cool roof technology has been applied to facilities as opportunity and justification allowed.

The NREL audit incorporated an assessment of the global, versus individual building, status toward implementing the GPs at WIPP. The assessment report recognized that if viewed globally, WIPP is on track to be 80% compliant with the GPs. *Plans and Projected Performance*

Because the existing buildings' original designs were temporary with a finite life expectancy, the strategy is to make the building systems' energy use as efficient as practicable, which would minimize GHG generated relative to each building. Addressing the buildings' exterior metal panels is an option that could be implemented if funding is established as a priority with acceptable payback. Based on observed corrosion that has materialized in the last few years, such efforts would only be viable from life cycle cost perspective if structural member corrosion issues were also addressed. Projects are identified in the CEDR pending funding competing with the current recovery efforts to put the WIPP back into operation.

Working within this strategy, actions planned for FY 2015 are to:

- monitor energy consumption through the metering system to identify areas for optimizing energy performance and provide the opportunity and supporting data for these areas to appropriate management for decisions on priority, financing, and implementation
- add occupancy sensors and task lights where needed
- continue to upgrade task lighting to LED
- replace the HVAC system in Building 452 (Safety). Options for replacement are being evaluated for increased efficiency and newer technology that meets the needs of the operation
- pursue, as recovery implementation allows, consideration of building consolidation. If funded and implemented, building consolidation several existing office buildings that cannot cost effectively meet the GPs would be replaced with one building that incorporates the principles.
- Update PM to reconcile assessment with the NREL global scoring results.

While actions to improve buildings relative to the GPs will proceed as supported by funding, it is not anticipated WIPP will meet this goal.

## **2.6 All new construction, major renovations, and alterations of buildings greater than 5,000 GSF must comply with the GPs**

### *Performance Status*

The WIPP is evaluating various aging facilities (mobile and permanent), for upgrade and or replacement. Specific projects have not been identified. Subcontractors do at times bring trailers on site to support activities such as construction of underground panel closure block walls. These trailers are typically less than 5,000 sq. ft., on site for very short periods (3 to 6 months), and are used to support subcontractor administrative activities. The WIPP has not tasked such facilities to incorporate the HPSB GPs as they are typically already part of the contractor's equipment inventory and the investment required to meet HPSB GPs is not cost effective.

Trailer 953 was the last structure placed on the site, and was procured and installed using HPSB GPs.

### *Plans and Projected Performance*

WIPP is in conceptual stage to consolidate by replacing several aging structures with one new facility where HPSB principles will be utilized as required by EO 13423 and augmented by EO 13514. Directives in these orders will be implemented through the formalized design and procurement procedures utilized by the WIPP site.

## **2.7 Efforts to increase regional and local planning coordination and involvement**

The WIPP continues to work closely with the regional and local community. The activity providing the greatest potential benefit to the site is the pursuit to develop a utility scale onsite renewable energy generation project via a third party. This endeavor would be used to provide renewable

energy production for the site's infrastructure and to send power to the electric grid in place of coal or natural gas generated electricity.

The WIPP has always pursued the minimal use of water, given the geographic location of the facility. Project proposals for energy projects utilizing increased water are heavily reviewed for environmental impact due to the desert location and the importance of this natural resource.

Xcel Energy provides the electrical service to the WIPP. A proposal to enter into a Joint Energy-Efficiency Plan (JEEP) is anticipated to be in place during FY 2015. The JEEP will allow the WIPP to benefit through rebates on facility enhancements that produce energy savings. Primary funding remains the source for improvements.

### ***GOAL 3: Fleet Management***

#### **3.1 10% annual increase in fleet alternative fuel consumption by FY 2015 relative to a FY 2005 baseline**

##### *Performance Status*

The WIPP site continues to hold an exemption from the alternative fuel requirement due to lack of alternative fuel sources available in the area. In lieu of local alternative fuel infrastructure, the strategy has been to build alternative fuel capacity in fleet vehicles in preparation for availability of alternative fuel infrastructure.

Based on this strategy, either AFV or hybrid vehicles have been requested for all vehicle replacements in recent years. Replacement using hybrid vehicles is expensive and has limitations related to what types of vehicles are available. Currently, 92% of the WIPP fleet vehicles leased through the GSA are AFVs or hybrids.

The WIPP ceased efforts to test renewable diesel from a locally owned startup company in FY 2012. After extensive effort, the potential supplier could not provide evidence the fuel would continually meet required performance standards. This product had promised to be uniquely suitable for the heavy duty diesel equipment and the operational demands for the WIPP project.

No further opportunities for supply of renewable fuels or for renewable fuel infrastructure within the area have been identified since FY 2012.

##### *Plans and Projected Performance*

The WIPP will continue with the exemption from the alternative fuel requirement until such time as alternative fuel sources and infrastructure are available in the area.

The WIPP's strategy for contributing to this goal will be to prepare for availability of alternative fuels. Alternative fuel or hybrid vehicles leased through GSA will replace non alternative fuel capable vehicles in accordance with the normal replacement cycle. Leasing hybrid vehicles currently includes substantial increase in the initial cost compared to AFVs, which will limit the WIPP's future acquisition of hybrid vehicles.

#### **3.2 2% annual reduction in fleet petroleum consumption by FY 2020 relative to a FY 2005 baseline**

##### *Performance Status*

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

---

During FY 2014, the WIPP fleet petroleum use was reduced by 31% compared to the FY 2005 baseline. This can be credited to efforts to consolidate or reduce trips which resulted in a 25% reduction in miles driven and the use of more fuel-efficient or hybrid vehicles. The WIPP now uses three hybrid vehicles and DOE employees commute in groups by van from the SWB in Carlsbad to the WIPP site. A reduction in the overall fleet size is also a contributing factor.

*Plans and Projected Performance*

Maintaining the 31% reduction will be challenging for WIPP due to the potential increase of vehicles needed for Recovery and the increased number of personnel planned to be employed at the site. However, with the actions already implemented and with implementation of the strategies detailed below, it is anticipated that the WIPP will achieve this goal.

- As industrial equipment is replaced, more fuel efficient equipment will be acquired, reducing the use of petroleum-based fuel.
- Continue to monitor available technology for potential deployment at the WIPP. The site has and continues to investigate the potential for electric vehicles and implementation of alternative technology at the WIPP. However, an alternative to petroleum-powered industrial vehicles has not been identified due to lack of availability of fuel sources, strict mining emission requirements, fuel volatility issues, and operational demands for equipment.
- Benefit from more fuel efficient vehicle standards as fleet is replaced.
- Continue to request AFV or hybrid vehicles when replacing existing vehicles.
- Utilize hybrid vehicles when comparative in value to AFVs.

**3.3 100% of light duty vehicle purchases must consist of alternative fuel vehicles (AFV) by FY 2015 and thereafter (75% FY 2000 - 2015)**

*Performance Status*

The WIPP site has no plans to purchase light duty vehicles. Light duty vehicles are leased through the GSA. AFV and hybrid vehicles are requested as units are replaced. Currently, 92% of the WIPP fleet vehicles, leased through the GSA are AFVs or hybrids. Of the 92%, three are hybrid sedans used primarily for carpooling to the site by DOE staff.

*Plans and Projected Performance*

The WIPP anticipates continuing to meet this goal relative to GSA leased vehicles. AFV light duty vehicles will be requested when replacing existing fleet vehicles.

**GOAL 4: Water Use Efficiency and Management**

**4.1 26% potable water intensity (gallons per gross square foot) reduction by FY 2020 from a FY 2007 baseline**

*Performance Status*

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

The WIPP water use status is illustrated by Figure 8, which shows water use has been reduced by approximately 2.9 million gallons per year (approximately half the site annual water use) since the original FEMP base reporting year of FY 2003. An audit conducted in early FY 2003 (November 2002) provided 100% completion of water assessment and initial baseline for the site.

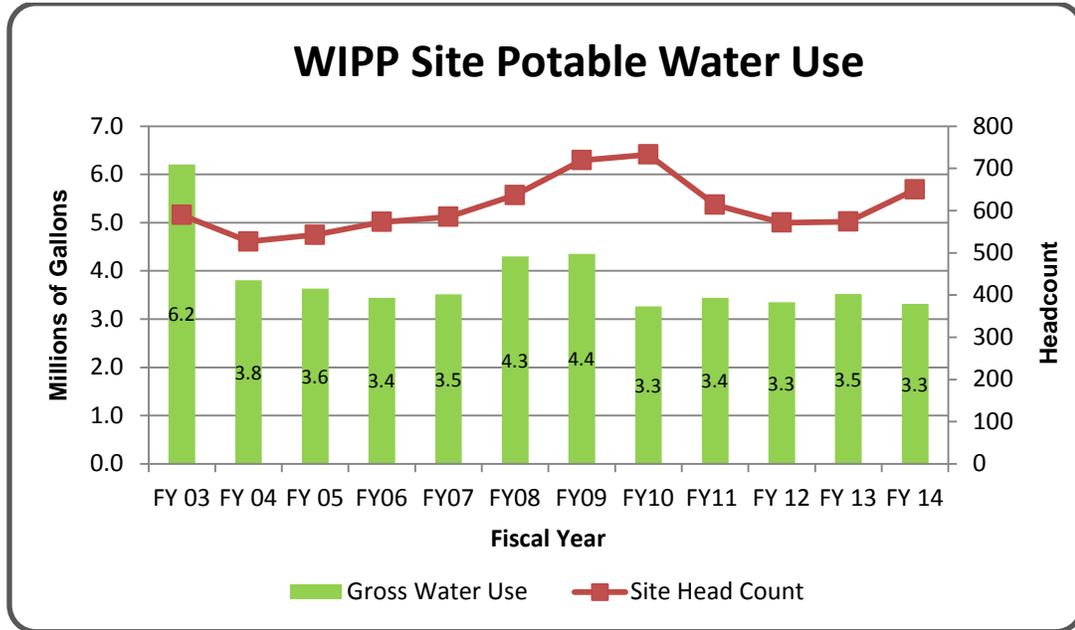


Figure 8

For the past six years, the WIPP has implemented a project for water distribution system maintenance resulting in the identification and repair of water leaks from the site fire suppression underground distribution loop. In addition, the WIPP continues ongoing efforts to conserve water through maintaining and repairing leaking toilets, urinals and faucets, installing low-flow showerheads, and providing employee information and education.

The WIPP overall water intensity numbers are reflected in Figure 9. The WIPP water intensity shows a relatively flat usage trend with the exception of anomalies of FY 2008 and FY 2009 attributed to leaks in the fire suppression distribution system. The NREL Audit of FY 2013 provides recommendations for potential water reductions. However, there is no payback associated due to the current water use agreement with the City of Carlsbad.

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

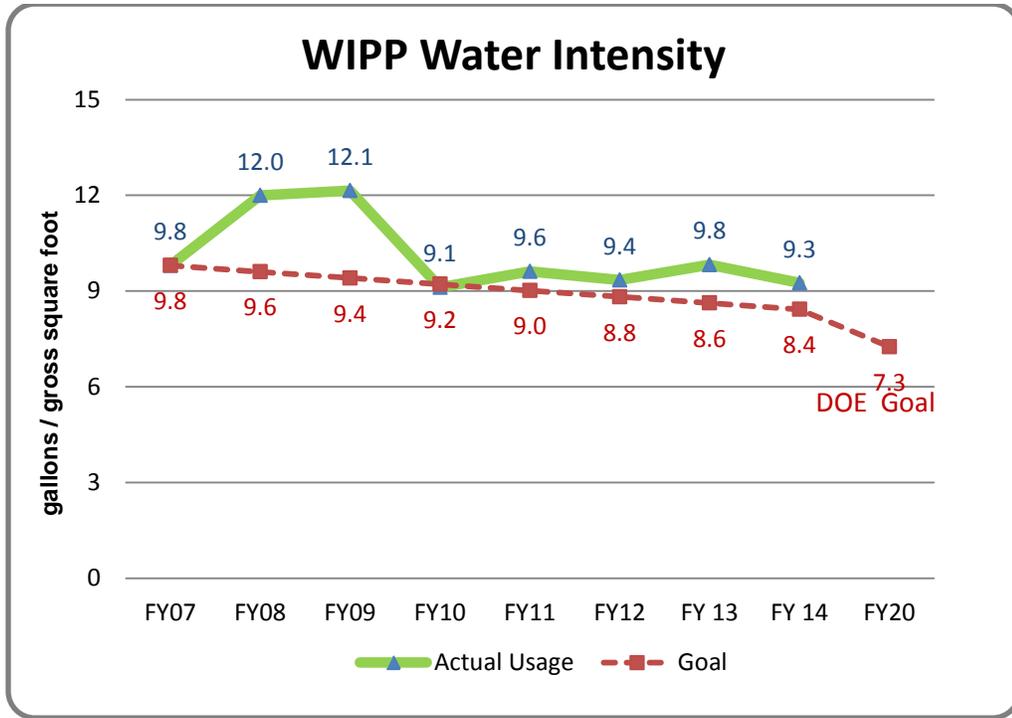


Figure 9

Water use is attributed to two primary functions, fire water system flow tests and domestic needs. The larger water consumer of the two is domestic use. Because of this profile, the WIPP uses total water use compared to employee count (Figure 8) and “water use per person per day” (Figure 10) to measure and communicate the WIPP’s progress in water use efficiency and management.

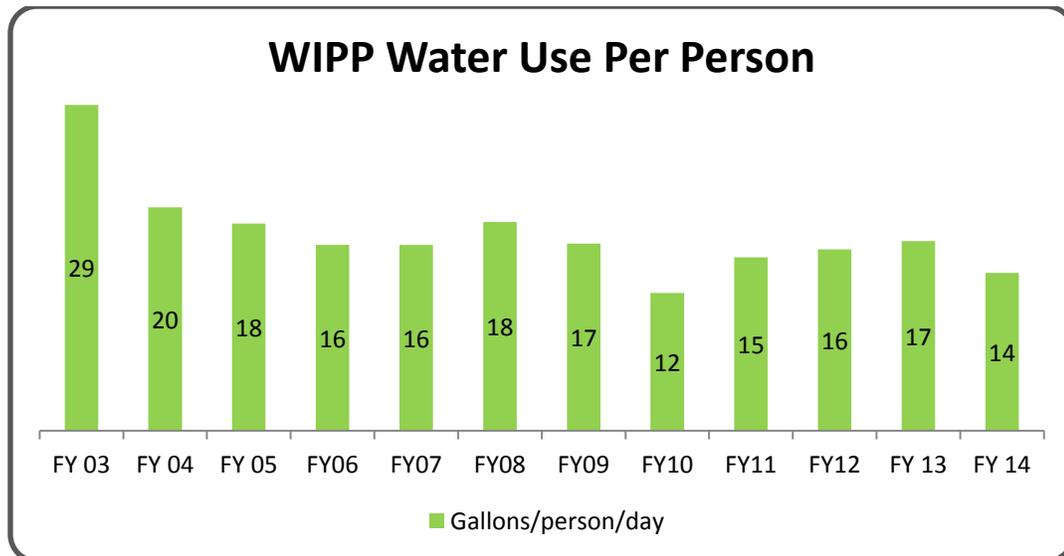


Figure 10

Overall water usage for the site is low for an industrial operation as illustrated in the foregoing figures. Water use for FY 2014 averaged 14 gallons per person per day and includes water used

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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for ice machines, fire system flow tests, toilets and showers. Average water use at a factory or other industrial facility is 25 gallons per person per day which means that the WIPP water use is 44% less than a standard industrial facility. With such low overall use, leak detection has not been implemented.

*Plans and Projected Performance*

The WIPP does not anticipate significant contributions to this DOE goal as significant water reductions were accomplished prior to this baseline and there is no economic driver to reduce water consumption because the site receives up to 6.6 million gallons of water per year at no cost based upon an agreement with the City of Carlsbad.

Site strategy to reduce water use for FY 2015 forward includes the following:

- Install conservation measures when practicable including low-flow urinals, toilets, and faucets and more efficient showerheads.
- Continue water distribution system repairs to mitigate water loss from the existing systems.
- Pursue water conservation options when working with third parties for onsite solar generation projects. For example, there is potential to use brackish, non-potable water from sources at the WIPP in renewable energy generation.

**4.2 20% water consumption (Gal) reduction of industrial, landscape and agricultural (ILA) water by FY 2020 from a FY 2010 baseline**

*Performance Status*

Industrial uses of water at the WIPP are limited to nuisance dust control in mining activities, and fire water protection system testing. The WIPP uses negligible water for landscaping purposes and no water for agricultural use. Water used at the site is not metered at a level sufficient to identify industrial vs. personal use. However, because the types of water use are known, total industrial use of water is minimal.

Contributions to this goal include:

- Continued implementation of the long term maintenance project on the fire water protection system. This project assures the mission can continue to be implemented and water resources conserved.
- Xeriscaping for the minimal landscaping at the site.

*Plans and Projected Performance*

Projected actions that will contribute to this goal are:

- Continue use of xeriscaping.
- Analysis of water system to determine opportunities for conservation.
- Pursuit of metering pending funding and economic viability.

**GOAL 5: Pollution Prevention and Waste Reduction**

**5.1 Non-hazardous solid waste diversion (50% by FY 2015) – Non hazardous**

*Performance Status*

An active Pollution Prevention Program has been in place at the WIPP since the 1990's with recycling as a key component of the program. As a result, the WIPP has historically recycled the waste streams that can be recycled within our regional infrastructure. These include a narrow scope of non-hazardous, construction and demolition (C&D), hazardous, universal and New Mexico special waste streams. Non-hazardous wastes recycled are paper, plastics, cardboard, aluminum cans, alkaline batteries, wood pallets/waste, and toner cartridges. C&D wastes that are routinely recycled are primarily metals. Other wastes recycled or recovered include circuit boards, used oil, used antifreeze, and universal batteries. Computers and electronics are either donated for reuse or sent to UNICOR for recycling. The WIPP also encourages recycling by on-site subcontractors.

The non-hazardous waste not diverted includes personal hygiene wastes from restrooms, food waste, and materials that cannot be recycled by local recycling centers (i.e., plastics that are not number 1 or 2 and Styrofoam®).

Recycling of non-hazardous solid and C&D wastes is illustrated in Figure 11.

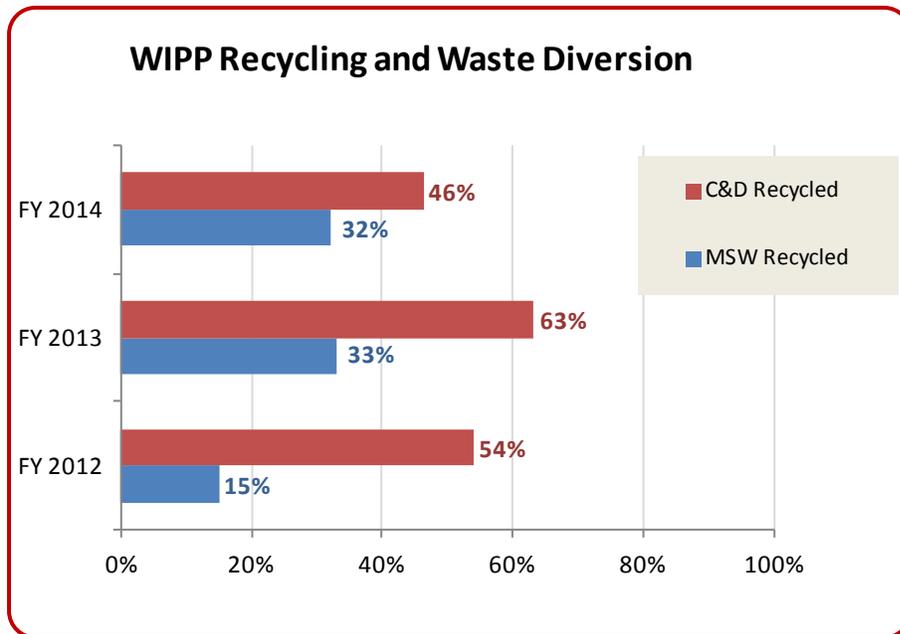


Figure 11

Efforts to increase solid waste diversion during FY 2014 were set back due to the February radiological event. Materials that would have been recycled were placed in the solid waste stream due to minimal work force being at the site following the February radiological event.

*Plans and Projected Performance*

The WIPP is committed to meeting the DOE goal of a 50% diversion rate for both non-hazardous and C&D materials and debris. For recycling of non-hazardous wastes, primary focus will be on updating and refreshing the WIPP recycling program by replacing recycle bins with new color-coded bins over the next few years. This is designed to increase awareness and increase the percentage of non-hazardous waste being diverted.

Specific actions that will be taken to increase recycling rates for both areas are:

- Replace 50% of recycle bins with color-coded recycle bins.
- Divert wood pallet waste to the search and rescue dog training program and wood waste for use in city parks
- Strengthen awareness and outreach efforts for recycling
- Incorporate recycling of waste streams into maintenance, refurbishment and restoration of infrastructure projects

## **5.2 Construction & Demolition waste diversion (50% by FY 2015) –**

*Performance Status*

The construction and demolition diversion rate decreased during FY 2014 (see Figure 11). This was due to concrete (127 metric tons) from the demolition of an underground concrete slab not being recyclable because of rebar content and salt contamination. WIPP would have had a 100% construction and demolition diversion rate if the concrete would have been recyclable. The WIPP continues to be diligent in recycling metals which is the primary stream of C&D materials and debris.

C&D wastes at the WIPP site consist of scrap metal and other materials generated from routine and periodic maintenance or refurbishment of facilities or roads. Materials other than scrap metal are placed in the WIPP Construction Landfill or an industrial landfill. Other materials include such items as broken or damaged cinder blocks, pond liners, and brush. A contract with a scrap metal recycling vendor that was established in FY 2011 has continued in FY 2014. The continued contract allowed the recycling of chain link fencing materials from the WIPP underground along with other metals, resulting in the 46% FY 2014 diversion rate.

*Plans and Projected Performance*

The WIPP anticipates meeting this DOE goal with implementation of current recycling programs and ensuring recycling and waste diversion is incorporated into the planning of projects that would generate C&D waste.

## **GOAL 6: Sustainable Acquisition**

### **6.1 Procurements meet requirements by including necessary provisions and clauses in 95% of applicable contracts**

*Performance Status*

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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The WIPP achieved a 100% rate toward this goal in FY 2014 with six of six qualifying contracts, from a total of 11 new construction contract awards, containing the applicable sustainability acquisition clauses for materials. The WIPP includes clauses in service and construction contracts to require the purchase and use of recycled and bio based content products by subcontractors when they meet Cost, Availability, and Performance (CAP) requirements. WIPP will continue to be diligent in incorporating sustainable acquisition into contracts.

The WIPP Sustainable Procurement Plan and supporting procedures are in place to facilitate meeting the requirements for sustainable acquisition of materials and services when they meet CAP requirements. The WIPP provides training to requisitioners and credit card holders to educate them about sustainable procurement requirements. Currently, the WIPP purchases some materials that meet the federal green procurement guidelines, including paper, computers, office supplies, and if they meet performance requirements, toner cartridges.

Purchase requisitioners and procurement card holders are also required to purchase sustainable products when they meet CAP criteria. During FY 2014, a U.S. Environmental Protection Agency Design for the Environment<sup>®</sup> program certified cleaner and degreaser (Cal-Green<sup>™</sup>), a U.S. Department of Agriculture Biobased certified cleaner (Citrus-Scrub<sup>®</sup>), a Green Seal<sup>™</sup> certified cleaner (Buckeye ECO pH Neutral Cleaner) and hand wash (Symmetry<sup>®</sup> Green Certified Foaming Hand Wash), LEED (Leadership in Energy and Environmental Design) approved wall panels, an adhesive with low volatile organic compounds emissions, and an Energy Star<sup>®</sup> certified roof coating (Black Jack<sup>®</sup> White Elastomeric Roof Coating) were some of the sustainable products purchased at the WIPP facility.

Training regarding sustainable purchasing was provided in FY 2014 during procurement training classes. Due to this and previous activities, 65% of dollars spent on office products was for recycled content materials in FY 2014. If new toner cartridge purchases not meeting CAP are excluded, the percentage is much greater at 75%. Excluding items that did not have a recycled content product available, the numbers are even greater with 88% of dollars being spent on recycled content products and 97% if toner cartridges are excluded.

In FY 2014, greater than 90% of dollars spent in the categories of binders, clipboards, and file folders and greater than 80% of dollars spent in the category of paper products were for recycled content products. The WIPP's contract for purchase of paper ensures that paper is 30% recycled content.

*Plans and Projected Performance*

The WIPP will meet this DOE goal.

The WIPP actions for FY 2015 in this area are:

- Continue to increase the amount sustainable products purchased
- Continue awareness efforts to ensure that sustainability clauses are placed in contracts and sustainable products are purchased

## ***GOAL 7: Electronic Stewardship and Data Centers***

### **7.1 Core data centers (DCs) are metered to measure a monthly Power Utilization Effectiveness (PUE) of 100% by FY2015).**

#### *Performance Status*

The WIPP has four locations with servers. Two of the locations meet the definition for DCs (based on current size and description) with neither of the two meeting the definition of a Core DC. The main, SWB, DC is located on the first floor of the SWB in Carlsbad and the Site DC is located on the second floor of the Support Building at the WIPP site. Both data centers employ uninterruptible power supply (UPS) systems. The SWB data center is cooled by a dedicated cooling system. The Site data center is cooled via a zone of the main building cooling system.

A survey of equipment was performed to determine a cost effective means to meter the facilities and equipment. During FY 2012, the WIPP Data Center Sustainability Project Plan was finalized. This plan provides the roadmap for achieving DOE's two sustainability goals related to data center efficiency. It is based on a phased approach and allows the WIPP project to fund the improvements across several budget cycles thus minimizing the financial impact in any one fiscal year. Implementation is dependent on funding. The first priority of this plan is to implement improvements in the SWB DC. Plans for the much smaller Site DC will be addressed in years beyond FY 2015.

Although originally planned for implementation in FY 2013, the mechanisms necessary to provide reporting of energy usage data from previously installed PDUs, into the project direct digital control system were not implemented. It is anticipated that communications for the installed PDUs will be completed during FY 2014.

During FY 2014, equipment in the SWB DC was reconfigured for hot/cold decks and electrical realignment in the SWB DC was complete. Installation of curtains will be completed by the end of the first quarter of FY 2015. Hot/cold deck consolidation with curtains is expected to reduce cooled space in the SWB DC by 25%. In addition, server virtualization was complete with 75% servers virtualized.

#### *Plans and Projected Performance*

Communications necessary to provide reporting of energy usage data from PDUs previously installed have not been implemented. Communications for the PDUs are scheduled for completion during FY 2015. PDUs will be installed at other locations as funding is identified.

Although not considered core DC's the WIPP project is committed to installing metering for the SWB and Site DC with the intent being to install metering in the SWB first. Project personnel have been working with the owner of the SWB building, Cowperwood (building operator), and leaser (GSA), to install metering reporting to attain PUE. FY 2014 efforts indicate a meter will be installed in the SWB DC during FY 2015.

### **7.2 Core data centers maximum annual weighted average Power Utilization Effectiveness (PUE) of 1.4 by FY 2015**

#### *Performance Status*

The WIPP finalized the project plan for establishing the power consumption baseline and continued implementation since initiated during FY 2012. In addition to providing for measurement and establishing the baseline, the project plan also identifies in Phase 4 and 5,

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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actions that will contribute to reductions in data center PUEs. Phases 1 through 4 have been completed.

The WIPP has acquired part of the hardware and software needed to upgrade from multiple servers to a blade server system with multiple virtual servers. This will greatly reduce the number of servers located both at the site and at the Carlsbad facility. To date, the WIPPnet has achieved 75% server virtualization using this technology.

During FY 2014, the following actions were completed to support to improving energy efficiency performance in the SWB DC.

- Server virtualization was complete with 75% servers virtualized.
- testing was performed in the SWB DC with open floor plenum directly to vented floor tiles which created a drastic increase of upward air flow to the SWB DC. The airflow to areas adjacent to the SWB DC was also decreased and, in combination, reduced the temperature in the SWB DC from 72 degrees to 69 degrees.
- 
- equipment was reconfigured for hot/cold decks and electrical realigned in the SWB DC was complete. Installation of curtains will be completed by the end of the first quarter of FY 2015. Hot/cold deck consolidation with curtains is expected to reduce cooled space in the SWB DC by 25%. In addition, server virtualization was complete with 75% servers virtualized.

In addition assessments of the two DCs using DOEGRIT were completed resulting in estimated PUE for the SWB DC of 1.75 and for the Site DC of 1.85

*Plans and Projected Performance*

The strategy during FY 2015 toward ng this goal is to complete Phase 5 of the WIPP Data Center Sustainability Project Plan. Phase 5 has been funded and includes installing;

- A baffling system to channel air to desired areas in the hot/cold deck configuration
- An approximate 10 foot banister wall to create a physical line for curtain consolidation
- Install an industrial plastic strip curtain area to consolidated racks to decrease the cooled space and adjust vented floor tiles Installation of the curtains will complete the hot/cold deck reconfiguration and is expected to reduce cooled space in the SWB DC by 25%.

Once Phase 5 is completed, the reduced cooling space should allow for one HVAC 5 ton unit currently in operation to be removed, further reducing energy use in the SWB DC.

In addition, during FY 2015, modifications will be made to the Data Center Sustainability Project Plan to implement additional phases that include improvements to lower the data center PUEs. Changes include modifications to the cooling system and planning for installation of a diesel or natural gas generator at the SWB to provide a backup power source and to replace existing UPS (installed in 1997).

**7.3 Power Management – 100% of eligible PCs, laptops, and monitors with Power Management actively implemented and in use by FY 2012 and continually thereafter**

*Performance Status*

The WIPP achieved this goal beginning in FY 2012 with power management being actively implemented on 100% of eligible PCs, laptops, and monitors.

The WIPP Electronics Management Policy formalizes expectations for sustainable life cycle management of electronics. Implementation of this policy at the WIPP is reflected in Figure 12.

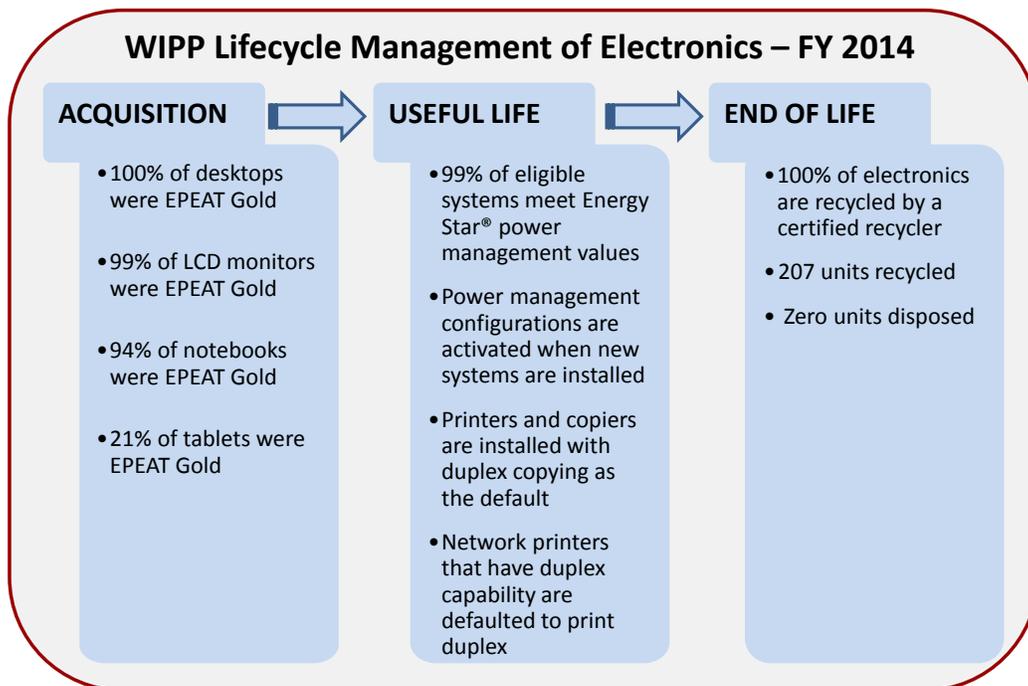


Figure 12

Approximately 99% of eligible systems have power management configurations that meet suggested Energy Star power scheme values.

The first phase of the project to replace desktop computers with thin clients was scheduled to be completed by July 2014. Phase 1 will replace 200 desktop units with Thin Clients. The Thin Clients utilize a 36 watt power supply as opposed to a typical 500 watt power supply on older systems or 240 watt on the Energy Star compliant systems of a standard desktop computer. The February 2014 events resulted in this effort being pushed out to FY 2015.

*Plans and Projected Performance*

The WIPP anticipates meeting this goal implementing power management on computers by the Information Technology department. Exemptions are granted on a case by case basis as justified by mission need.

#### **7.4 Electronic Stewardship – 95% of eligible electronic acquisitions meet EPEAT standards**

##### *Performance Status*

The WIPP electronics policy requires the purchase of EPEAT silver or gold registered electronics. The site has selected EPEAT registered electronics as the standard with any deviation requiring approval from the Information Technology department. During FY 2014, 100% of desktops, 99% of LCD monitors, 94% of notebooks, and 21% of tablets purchased were EPEAT Gold Certified products. Only one printer was purchased during this reporting period and it was not EPEAT registered.

WIPP practices sustainable lifecycle management from purchasing equipment that meets EPEAT standards through implementation of power management (Section 7.3) and end of life disposition of 100% of equipment either through donations, transfer for reuse or disposition through a certified recycler.

##### *Plans and Projected Performance*

The WIPP anticipates meeting this goal for desktops and notebooks through implementation of site standards for purchase of electronic equipment by the Information Technology department unless an exemption is granted based on mission need. Establishing a tablet and printer site standard to increase EPEAT registered purchase percentage will be the focus during FY 2015.

### **GOAL 8: Renewable Energy**

#### **8.1 20% of annual electricity consumption from renewable sources by FY 2020 and thereafter (7.5% FY 2013)**

##### *Performance Status*

Renewable energy by geothermal and hydro power is not applicable to the WIPP due to site location. Wind generation of renewable energy has been explored multiple times. The WIPP site is located in an area with insufficient sustained wind energy to support wind power generation.

A renewable solar project on the WIPP lands has also been pursued and evaluated several times with no success. In FY 2009, the site investigated installation of a large utility scale solar array. The WIPP continues to seek opportunities to develop a utility scale solar array system through a PPA. To date, systems that have been investigated have not proven to be economically viable.

The most recent evaluation of wind and solar renewable energy projects for the WIPP land was in the 2013 NREL assessment which calculated a simple payback period for wind turbines of 11.7 years and for solar photovoltaic arrays, 28.4 years. A financially viable project requires a payback period of less than or equal 10 years.

The WIPP site maintains two small on-site solar lighting systems to provide security lighting representing 2,522 kilowatt hours per year (kwh/yr) saved. The systems have performed well and were overhauled in FY 2007 with new batteries and electronics. Two more small systems (with

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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the same capacity as units mentioned previously) have since been purchased for convenience lighting of storage areas.

Changes in utility operations in New Mexico now allow for third party ownership of utility systems. The WIPP continues to seek partners to enter into a PPA to supply renewable energy (both on-site generated and off-site generated opportunities have been evaluated). A submittal to the local utility's Request for Proposal related to fulfilling the utility's mandated requirement for solar RECs was not accepted.

*Plans and Projected Performance*

The WIPP is using funds that were historically used for REC purchases to fund installation of building scale PV power generation. The PV arrays will also support meeting HPSB GPs for existing buildings. During FY 2015, the WIPP plans to install the first roof mounted photovoltaic power system on Building 953. The first phase of installation will generate an estimated 27.0 MWH per year of energy.

The WIPP continues to investigate and explore economically viable options to utilize renewable energy to meet some or all of the site's energy needs. .

An alternative strategy considered is to install a PV array in the WIPP site parking area to generate renewable energy and provide shade to reduce the effects of high temperatures on both government and employee vehicles. In addition, the potential costs and benefits of installing charging stations for electric vehicles continue to be evaluated for viability.

## **GOAL 9: Climate Change Resilience**

### **9.1 Address DOE Climate Change Adaptation Plan Goals**

Objective 1: DOE Climate Change Adaptation Screening assessment.

A climate change screening analysis was completed for the WIPP project. The analysis identified the aspects that are key to accomplishment of the WIPP mission and would have the most likely intersection with predicted climate change impacts for the Southwest region. Potential impacts were identified from the following documents.

- *National Climate Assessment, Climate Change Impacts in the United States*, 2014 (hereafter referred to as NCA in this section)
  - Chapter 2 – Our Changing Climate
  - Chapter 4 – Energy Supply and Use
  - Chapter 3 – Water Resources
  - Chapter 5 – Transportation
  - Chapter 9 – Human Health
  - Chapter 14 – Rural Communities
  - Chapter 20 – Southwest
- *U.S. Energy Sector Vulnerabilities to Climate change and Extreme Weather*, U.S. Department of Energy, July 2013

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

- *The Impact of Climate Change on New Mexico’s Water Supply and Ability to Manage Water Resources*, New Mexico Office of the State engineer/Interstate Stream Commission, John R. D’Antonio, P.E., State Engineer, July 2006
- *Potential Effects of Climate Change on New Mexico*, Agency Technical Work Group, State of New Mexico, December 30, 2005

The three climate change impacts with potential effect on completion of the WIPP missions will be “Warmer Summers”, “Increasing Drought” and increases in “Extreme Weather Events”. The results of this analysis indicate that aspects critical to accomplishment of the WIPP mission will be consistent, dependable availability of electricity and fuels, maintaining compliance with stormwater requirements during more frequent and intense storm events, increased health issues and impacts on transport infrastructure (roads). Table 3 summarizes the results of this analysis. In the table, the items in italics are based on the New Mexico climate change reports and the items with a (1) after the text are gleaned from the Energy Sector Vulnerabilities report noted above. The remainder of impacts in the table are taken from the NCA.

<b>Table 3- WIPP Climate Change Screening Analysis Matrix</b>				
<b>Item</b>	<b>Aspects Key to Accomplishing WIPP Mission</b>	<b>Description Projected Climate Change Impacts with Potential to Impact Accomplishment of the WIPP Mission</b>		
		<b>Warmer Summers &amp; Winters</b>	<b>Increasing Drought</b>	<b>Extreme Weather Events (torrential rain, extreme winds, tornados, hurricanes)</b>
1	Site Operations – Electricity. Components: Site Physical Structures - Ventilation System, Hoist, Buildings and Sewage, Water System, Fire Protection, and Communication/IT Systems; Worker Protection (Cooling); Communication Networks – Cell Towers, Satellites necessary for TRU Waste Transportation and connectivity between site and town operations; environmental monitoring	High summer temperatures will increase electricity use, causing higher summer peak loads. Warmer winters will decrease energy demands for heating. Net electricity is projected to increase.  Transmission system efficiency could reduce available transmission capacity.(1)  Transmission losses during a heat wave could be significant and contribute to power interruptions and power outages. (1)  Sustained high temperatures will increase cost for electricity	Less water available for energy production will constrain different forms of energy production  More frequent and severe wildfires increase risk of physical damage to electricity transmission infrastructure and could decrease available transmission capacity  Decreasing water availability at thermoelectric facilities could reduce available generation capacity	Disruptions from extreme weather are projected.  Extreme weather events affecting energy infrastructure in one place can lead to supply consequences elsewhere  Increasing intensity of storm events increases the risk of damage to electric transmission and distribution lines

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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2	Site Operations - Fuels-diesel & gasoline Equipment for Site Operations and Environmental monitoring		Oil and Gas Exploration requires both fresh and saline water. Decreasing water availability could impact oil and gas production. Increasing competition for water resources could reduce oil production and refined diesel. (1)	Severe weather events have increasing potential to affect refining and fuel transport ability. (1)
3	TRU Waste Delivery – Diesel for transportation			
4	Site Compliance Stormwater Management	Increased temperatures will increase evaporation rates from storm water collection ponds		Increase in frequency of extreme daily precipitation events (daily amount that now occurs once in 20 years) by the later part of this century (2081-2100) compared to the later part of last century (1981-2000) will occur from nearly twice as often up to five times as often
5	People - Site – Component: Health, Productivity	Threats to human health from increased temperatures in the summer are increased.  Productivity decreases during hottest months due to requirements for more frequent work/rest cycles.	Groundwater availability reduced; withdrawals will increase as drought and warmer weather reduces snowmelt, runoff, surface water availability and groundwater recharge.	Increased events create potential for reduced productivity.  Extreme rainfall and rising temperatures can foster indoor air quality problems with increases in respiratory and asthma related conditions.

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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6	<p>Regional Infrastructure – Roads</p> <p>Transportation of TRU Waste from generator sites</p> <p>Disposal of site generated hazardous waste,</p> <p>Commuting to worksite,</p> <p>Maintenance of North and South Access Road</p> <p>Infrastructure systems have been designed to cope with weather extremes that could be anticipated on the basis of historical climate. Engineering design standards are currently based on assumption that climate is stable; for example today's 100 year flood will be the same 20, 50, or 75 years from now. Projections are that 50 years from now, today's 100 year flood may be expected to recur every 20 years.</p>	<p>Extreme heat accelerates asphalt deterioration and causes buckling of pavements</p> <p><i>Additional maintenance demands for asphalt surfaces in southern regions due to deformation of the roadway from heat.</i></p> <p><i>Increasing mowing maintenance because of longer growing season for vegetation</i></p> <p><i>Changes in animal migration and roadway crossings</i></p>	<p><i>Blowing dust would create hazards for travel on roadways, rail lines and airports</i></p> <p><i>Increase in number of dust impaired visibility areas and events</i></p> <p><i>Excessive groundwater pumping causes subsidence and creates fissures under roadways and rail lines</i></p> <p><i>Decrease in mowing maintenance from decrease in vegetation in right of way</i></p> <p><i>Increase in right of way erosion from lack of vegetation</i></p>	<p><i>Increase in erosion in right of way</i></p> <p><i>Roadway flooding from insufficient drainage</i></p> <p><i>Water flow based on increasingly more frequent and intense rainfall instead of slower snowmelt could increase likelihood of bridge damage</i></p> <p><i>Severe storm events will disrupt highway traffic, leading to more accidents and delays</i></p> <p><i>Infrastructure will be affected – storm drainage systems for highways, tunnels, airports and city streets could prove inadequate resulting in localized flooding</i></p> <p><i>Bridge piers/foundations weakened from flood scour.</i></p>
7	<p>Supply Chain - Other Materials</p> <p>MGO, Equipment Parts, Lubricants, Concrete/Mortar; blocks, TRU waste containers, Hazardous waste containers, Refrigerants</p>	<p>Likely potential impacts would be reflected in items two and three (fuels for transport, refining capacity) and six (roads) as well as potential impacts from availability of energy for manufacturing items.</p>		

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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8	Processes / Systems – ER Capability  ER Capability - Site; TRU Transportation Routes	<p>Increased potential for health issues from poorer air quality, increased pollen and longer allergy and asthma season.</p> <p>Episodes of extreme heat are expected to increase several fold in the mid to late 21<sup>st</sup> century with daily maximum temperatures now exceeded only on the hottest 18 days of the year project to be exceeded on 60 to 70 days per year.</p>		<p><i>Wildfire season will continue to increase. There will be increased risk of large wildfires.</i></p>
9	Workforce Availability - Community – Utilities and fuels  Living conditions / transportation to work site	Likely potential impacts would be similar or identical to those in items one, two and three (electricity, fuels for transport, refining capacity).		

**Site Sustainability Plan  
Waste Isolation Pilot Plant, Fiscal Year 2015 Narrative  
DOE/WIPP-14-3542**

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10	Workforce Availability (Community) – Human Health	<p>More frost free days and warmer seasonal air temperatures can contribute to shifts in flowering time and pollen initiation from allergenic plant species resulting in increased allergies and asthma episodes. The ultimate effect could be diminished productive work and school days.</p> <p><i>Episodes of extreme temperatures are expected to become more severe and much more frequent, resulting in increases in heat related illness and mortality.</i></p>	<p><i>Dust storms more frequent, more severe, and more widespread resulting in significantly reduced air quality with associated impacts on human health.</i></p> <p><i>Increased wildfires are likely to increase particulate air pollution.</i></p> <p><i>Disruptions of Ecosystems and natural controls may lead to increased outbreaks of infectious diseases transmitted by rodents, birds, insects (e.g. hantavirus, plague, dengue fever, West Nile virus)</i></p> <p><i>Warmer temperatures and increased dust storm activity may result in greater incidence of Valley Fever which is caused by a soil fungus and is currently more common in AZ than in NM.</i></p>	<p>Increased wildfires reduce air quality both in the area local to the fire and downwind. Smoke exposure increases respiratory and cardiovascular hospitalizations, emergency department visits and medication dispensations for asthma, chest pain, bronchitis, etc.</p>

In addition to this screening analysis, the voluntary screening assessment survey referenced in Appendix C of the Guidance for FY015 DOE Site sustainability Plans was completed.

**Objectives 2 -7: Determining Risk, Building Resilience, Future Activities, Real Property and Supply Chain Resilience, Regional and Local Coordination, AND Removing and Reforming Barriers**

The next step for WIPP is to use the screening analysis summarized in Table 3 to estimate the significance or risk associated with each of potential climate change impacts identified followed by planning for resilience and implementing the plan. Given the current and projected focus on implementing the Recovery Plan to resume operations for disposal of TRU waste during FY 2015, resources will not be available to meaningfully engage in actions toward addressing these three objectives. Deferral of further action in order to resume operations is prudent and is not judged to create additional short or long term risks to accomplishing the WIPP mission. Deferral of further action will also provide the opportunity to utilize the knowledge gained from the vulnerability assessments being conducted by the Department when actions to address climate

change impacts can resume. In addition, WIPP will also reach out to other DOE Sites in New Mexico to leverage knowledge and learning with these sites.

Addressing climate change has been incorporated into the responsibilities of the existing energy management and sustainability staff both for the Carlsbad Field Office and the managing and operating contractor. No additional staffing or technical resources have been added to address climate change. Technical assistance will be needed in order to complete the activities necessary to adequately address Objectives 2-7. Given the breadth of these objectives, it is likely that additional staff may be necessary to adequately address this area for the long term. One example indicating that additional staff may be necessary is that WIPP is located in a rural area with personnel necessary for the operation of the project coming from two small communities. Chapter 14 of the NCA recognizes that “rural communities face particular geographic and demographic obstacles in responding to and preparing for climate change risks” and that “responding to the challenges from climate change impacts will require significant adaptation within rural transportation and infrastructure systems, as well as health and emergency response systems.” Both communities that provide the personnel for operating the project already have fully allocated resources due to a regional boom in oil and gas development. The NCA recognizes that ‘governments in rural communities have limited institutional capacity to respond to, plan for, and anticipate climate change impacts’. With the oil and gas boom stretching municipal resources and the communities already having limited local health and emergency response systems, the local governments may look to DOE as well as other federal agencies (Bureau of Land Management, U.S. Forest Service) to provide leadership, expertise and support to address climate change.

## ***GOAL 10: Energy Performance Contracts***

### **10.1 Utilization of Energy Performance Contracts**

#### *Performance Status*

After two attempts by Energy Savings Performance Contractors (ESPCs) and multiple attempts by third parties to provide renewable energy utilizing a Power Purchase Agreement (PPA), viable projects with financially acceptable return on investment have not been identified. During FY 2013, the National Renewable Energy Laboratory (NREL) completed an Energy and Water Audit of the WIPP site to identify building and process energy efficiency opportunities. The audit identified 15 measures for energy and GHG reductions. Since the audit, the WIPP has pursued funding for all or part of these projects through either the ESPC Enable Program or a traditional ESPC, but has not been able to secure the funding.

#### *Plans and Projected Performance*

The WIPP will continue to explore alternative funding of projects including installation of utility scale renewable energy generation through a PPA and/or ESPC dependent on the development of favorable market conditions (economic viability).

## ***Goal 11: Sustainable Remediation***

### **11.1 Integrating Sustainability into Remediation Activities**

#### *Performance Status*

There are currently no contracts requiring the use of the Green and Sustainable Remediation and Innovative Technology Contracting language template as requested by the Office of Environmental Management.

The WIPP project does not have any remediation/cleanup activities within the scope of Green and Sustainable Remediation. Remediation of a shallow lens of subsurface water contaminated with salts is being addressed through natural attenuation and monitoring.

#### *Plans and Projected Performance*

At WIPP, there is no significant activity with opportunity to apply the principles of Green and Sustainable Remediation.

### ***Budget and Funding Efforts – Applicable to All Goals***

Projects identified for energy and water efficiencies, as identified in the CEDR conservation measures tab will require funding of \$2 million over the next five to seven years to implement. Other improvement actions noted in the *Plans and Projected Performance* sections for each of the goals require financial support or manpower.

As referenced in Section 1.1, the NREL Energy and Water Audit identified fifteen potential energy conservation measures. The cost for implementing the financially viable (simple payback less than 10 years) projects is estimated at \$1,400,000. It was determined that there were no applicable ESPC or ESPC ENABLE opportunities at WIPP based on required criteria and economic viability.

As noted throughout this plan, measures or actions identified for the WIPP to support the DOE sustainability goals are dependent on funding. Multiple efforts to find external sources for funding ESPCs or Utility Energy Savings Contracts (UESCs) have not been successful.

Without the option to use a third party funding mechanism, the measures or actions require funding above that available in the WIPP baseline budget. This places the sustainability measures or actions in direct competition with those activities needed to support the basic mission. Given the specific economic environment in which the WIPP project is conducted, projects focused on sustainability often cannot compete based on payback or return on investment. This is due to the relatively low cost of energy, zero cost for water, isolated site location, limited regional recycling infrastructure, and no regional biofuel sources or infrastructure.

The WIPP has made progress in many of the sustainability goal areas by integrating measures and actions into normal work scope and funded projects, even before there were “sustainability goals.” One of the accomplishments made in FY 2013 was to establish an account for funds received for metals recycled and materials dispositioned for reuse to a separate account. This account is then used for further sustainability projects. Although the dollars are small in comparison to the total budget, they will allow the WIPP to pursue smaller sustainability projects. For example, dollars were spent on electric hand dryers, LED task lighting, and recycle bins. Completion of the VRF HVAC project for Building 489 (Training) has been submitted for a utility rebate. If approved, the funds will provide additional ‘seed’ money to continue conservation efforts.

Given current Recovery status of the WIPP facility and economic conditions with limited federal budget for the foreseeable future, implementing this plan will be an even greater challenge than in the past.

In light of this, the WIPP will continue to pursue the following site specific actions in order to fund sustainability efforts:

- Track site savings in dollars from installed sustainability efforts and use the identified savings to fund conservation measures and other sustainability actions

### **III. Fleet Management Plan**

The fleet at the WIPP consists of 26 GSA leased vehicles and seven DOE-owned vehicles. There are policies and procedures in place by the DOE CBFO and the Management & Operating Contractor, Nuclear Waste Partnership LLC (NWP) covering fleet vehicles. The primary procedures for fleet management are WP 15-PM3505 Acquisition, Use and Control of Government Vehicles and DOE/CBFO 96-1186, Carlsbad Field Office Vehicle Safety Program. The WIPP fleet is managed through NWP Property Management and the various user work group managers. The DOE CBFO Contracting Officer also provides control over the acquisition, use and reporting processes.

#### *Fleet Procurement*

GSA-leased vehicles are obtained based on the type of work for which the vehicle is to be used. For example, the Environmental Monitoring Group regularly drives on dirt roads in remote areas and carries equipment necessary for accomplishing sampling and monitoring. For this type of work, a 4-wheel-drive vehicle is more suitable than a sedan.

The GSA generally provides AFVs for vans, light-duty pickups, and SUVs in the WIPP fleet. Sedans in use at the WIPP are hybrids, providing great fuel economy. Alternative fuel is not available in our area. If alternative fuel does become available, many of the fleet vehicles will be able to immediately use it. The seven DOE-owned vehicles are all heavy duty vehicles. Six require diesel, one requires gasoline, and none are alternative fuel capable.

If a need for an additional vehicle arises, the department manager must forward a request to Property Management stating the purpose of the vehicle required and the type of vehicle. If the acquisition increases the total fleet, approval must be obtained from the CBFO Contracting Officer and the Environmental Management Consolidated Business Center (EMCBC), DOE Headquarters. Once the increase is approved, if it is a GSA leased vehicle, a request is sent to the GSA fleet center. If it is a DOE owned vehicle, additional approvals are required for funding of the purchase. A Purchase Order is generated for the purchase of the vehicle only after approvals are obtained. Normally the procurement of a used vehicle is not authorized unless justified by special circumstances.

#### *Vehicle Use*

The WIPP's procedures cover vehicle checkout, use, and fueling requirements. Each fleet vehicle is assigned to a working group with that group coordinating employee check-out. In addition, each work group manager is required to review usage of vehicles for effective utilization. A member of the Property Management group coordinates all the reporting and maintenance requirements for the leased vehicles. The Government Vehicle use policy contains anti-idling requirements. All contractor and frequent CBFO drivers are required to attend an 8-hour

Defensive Driving class before driving a government owned or leased vehicle. Safety requirements are included in all policies and procedures concerning government vehicles. The main purpose is to prevent personnel injuries, vehicular accidents and property damage.

## **IV. Conclusion**

The WIPP will work to maintain the progress already achieved in the areas of Scope 3 GHG emission reductions, metering, cool roofs, fleet management, diversion of C&D waste, sustainable procurement and water intensity. Further contributions to the DOE goals for Scope 1 and 2 GHG reduction, building energy intensity, HPSB for existing buildings, diversion of municipal solid waste, data center efficiency and onsite renewable energy will be pursued. With the funding source for making further improvements being the annual baseline operating budget, efforts will be focused on making the progress that is economically viable while fulfilling the Departments mission for the WIPP. Relative to energy efficiency improvements, the WIPP will focus primarily on energy conservation measures for process loads.

Although the WIPP's efforts to make improvements in the DOE sustainability goal areas will continue, given the unique nature of the WIPP location, mission and energy environment, there are several areas where it is forecasted that the WIPP's contribution toward the goals will not be the percentage established for DOE as a whole. These areas include Scope 1 and 2 GHG emissions, building energy intensity, water efficiency, renewable energy and HPSB GPs for existing buildings. Recovery efforts will utilize sustainable strategy and determine the priority for potential projects during the period of this plan (FY 2015).