



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
ENVIRONMENTAL
MANAGEMENT

Ventilation Systems Capital Asset Projects

Safety Significant Confinement Ventilation System (15-D-411)

Exhaust Shaft (15-D-412)

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Office of Environmental Management

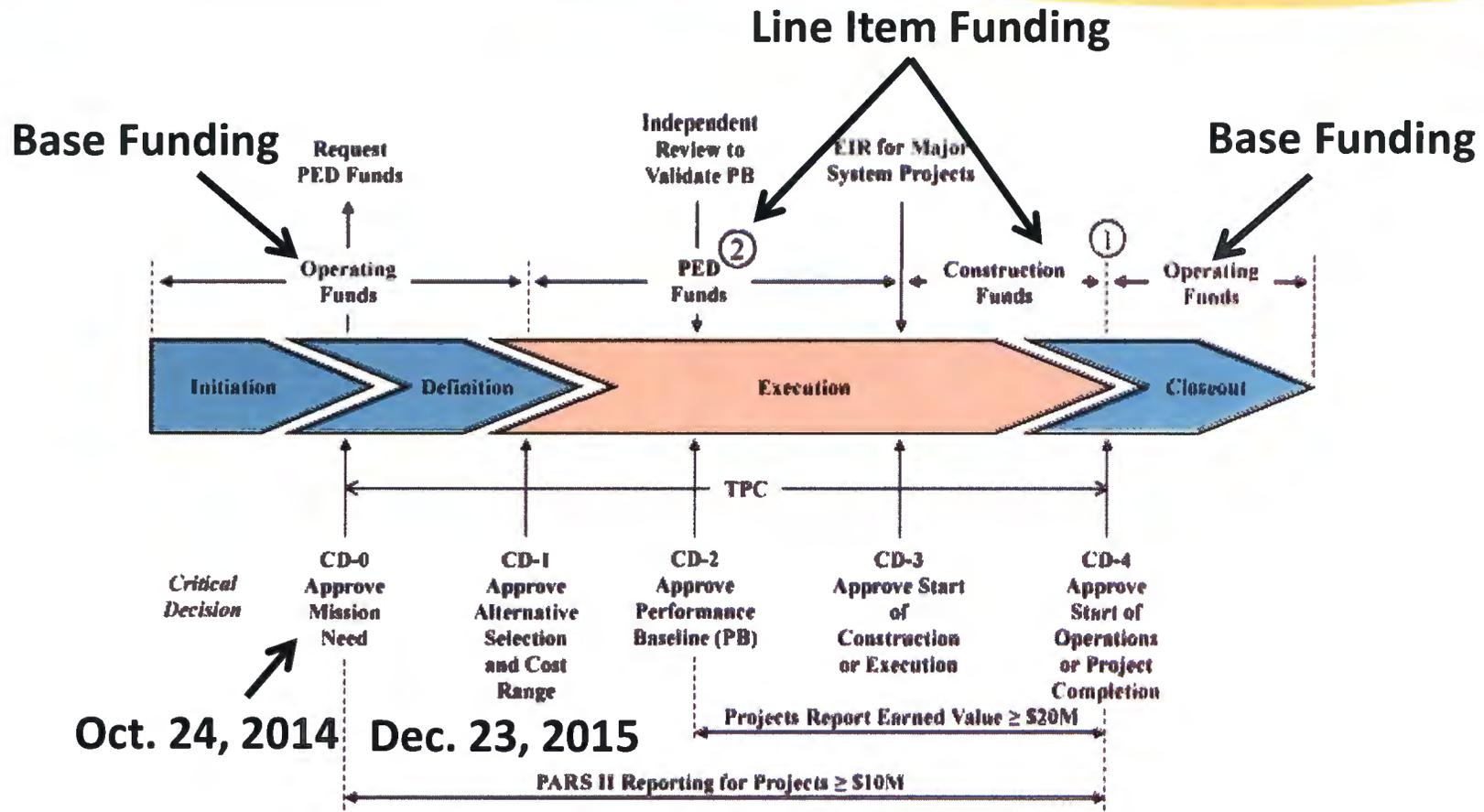
February 19, 2016

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- DOE Order 413.3B “Program and Project Management for the Acquisition of Capital Assets”
 - Disciplined approach for acquiring capital assets
 - Project goes through “Critical Decisions (CD)” during the development and approval of the project
 - Many independent reviews by other organizations to ensure acquired asset will meet the mission need
- Secretary of Energy Memorandum December 2014 “Improving the Department’s Management of Projects”
 - Additional review requirements
 - Independent Analysis of Alternatives to General Accounting Office standards
 - Additional design maturity requirements for Hazard Category 2 Nuclear Facility at CD-2

Critical Decision (CD) Process



NOTES:

1. Operating Funds may be used prior to CD-4 for transition, startup, and training costs.
2. PED funds can be used after CD-3 for design.

Critical Decision 1 – Approve Alternative Selection and Cost Range

- CD-1 documentation and reviews consisted of the following:
 - Acquisition Strategy
 - Preliminary Project Execution Plan
 - Tailoring Strategy
 - Independent Analysis of Alternatives
 - Independent Cost Review
 - Independent Project Review
 - Conceptual Design Report / Conceptual Safety Validation Report
 - Conceptual Safety Design Report
 - National Environmental Policy Act Strategy

- Nuclear Waste Partnership (NWP) proposed a total of 24 alternatives with 2 requiring additional study through Conceptual Design
 - Alternative 1-A
 - Provide a new unfiltered exhaust shaft for mining operations and use existing exhaust shaft with additional filtration capacity for full waste handling and disposal operations
 - Alternative 1-D
 - Existing exhaust shaft with filtered ventilation sufficient for full mining and waste handling and disposal operations
- An Independent Analysis of Alternatives was contracted with Trinity Engineering Associates that developed 4 alternatives that were similar to the ones developed by NWP

- Approved Acquisition Strategy
- Approved Preliminary Project Execution Plan
- Approved Tailoring Strategy that combined CD-2 and CD-3
- Alternative 1-A selected with two projects, cost ranges, and proposed CD schedule
 - Safety Significant Confinement Ventilation System (15-D-411)
 - Use existing exhaust shaft with additional filtration capacity for waste handling and disposal operations
 - \$189M to \$280M
 - Exhaust Shaft (15-D-412)
 - New unfiltered exhaust shaft for mining operations
 - \$81M to \$118M

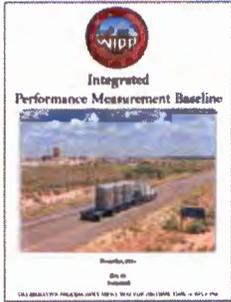
- Design Request for Proposal on the two projects
- Design in Fiscal Year 2016, completion in Fiscal Year 2017
- Long Lead Procurements in Fiscal Year 2017
 - Salt Removal Systems
 - Exhaust Fans
 - Filter Housings
 - Diesel Standby Generators



WIPP Integrated Performance Measurement Baseline Workshop

U.S. Department of Energy
Waste Isolation Pilot Plant

February 19, 2016



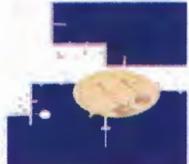
The image shows the cover of a report titled "WIPP Integrated Performance Measurement Baseline". It features a circular logo with "WIPP" inside, a photograph of a desert landscape with a road and a building, and the text "U.S. DEPARTMENT OF ENERGY WASTE ISOLATION PILOT PLANT".

Agenda

- Introduction and Workshop Objective
- Integrated Performance Measurement Baseline
- Integrated PMB Details
- CD-1 Process – Permanent Ventilation System
- Questions and Answers



New EOC



Combustible Control Zone



AIB/SMP Corrective Actions

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Introductions and Workshop Objective

- Introductions
- The objective of this workshop is to provide a forum for a detailed discussion of the WIPP Integrated Performance Measurement Baseline and to address stakeholder questions and comments
- The review will include:
 - Development of the Integrated Performance Measurement Baseline
 - The scope and schedule critical path specific to the recovery effort
 - Integrated PMB costs
 - The risks and challenges associated with the recovery effort
 - How progress is being monitored and measured



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Integrated Performance Measurement Baseline (PMB)

What is the Integrated PMB?

- The DOE WIPP Project includes several participants
 - Carlsbad Federal Office (CBFO)
 - Nuclear Waste Partnership (NWP)
 - Los Alamos National Laboratory-Carlsbad LANL
 - Sandia National Labs (SNL)
 - Carlsbad Technical Assistant Contractor (CTAC)
- The integrated PMB presents the scope, cost and schedule activities for all of the WIPP participants. It combines the previously issued Recovery PMB with Base Operations activities and the capital Asset Project (Permanent Ventilation System)
- The integrated PMB is primarily focused on FY16 and FY17. This represents the current contract period.
- The integrated PMB was developed to an 80% confidence level.
- The integrated PMB was built utilizing 3 tools: Activity Based Cost sheets, Primavera P6 Scheduling Software and Cobra cost processor.
- Changes to the baseline scope, schedule and estimate are being managed through a formal Change Control Process

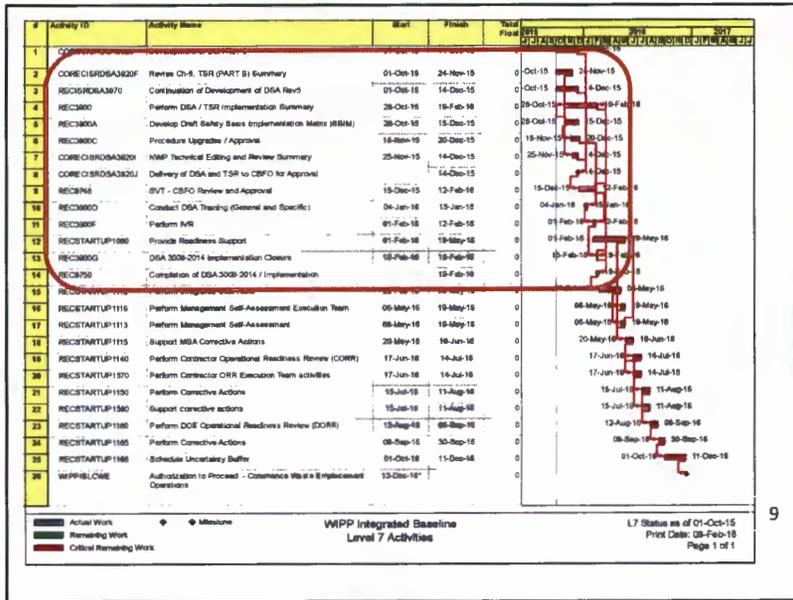
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Integrated PMB - Key Assumptions

- Waste emplacement is scheduled to begin in December 2016, after a DOE Operational Readiness Review with the CH TRU waste stored at WIPP and site-derived TRU waste.
- Pre-event emplacement rates is not expected to be achieved until the Permanent Ventilation System is brought online. After the emplacement of the Site-Derived waste and Contact Handled (CH) waste stored in the Waste Handling Building, then waste emplacement from the active TRU waste generator sites will begin with up to 5 shipments per week.
- The waste hoist controller upgrades will start in FY17.

Integrated PMB Key Assumptions - continued

- Pre-start required improvements in the Safety Management Programs at the WIPP site from the corrective action plans, in response to the Accident Investigation Reports, will be completed.
- Annual audits of CBFO and direct CBFO participants (NWP, SNL-CB, LANL-CB), certification audits for the approval of new processes and for the initial certification of the CCP characterization activities at each TRU waste generator site and annually thereafter will continue to be required.
- Support for the Carlsbad Environmental Monitoring and Research Center for its independent monitoring function will continue.



Documented Safety Analysis (DSA)

Safety Basis Documents are reviewed and approved by DOE as the rules (controls) to operate a nuclear facility.

The **Safety Basis** consists of 2 documents:

- **Documented Safety Analysis (DSA)**
 - The DSA documents the facility configuration, the processes to be performed, and analyzes accident scenarios appropriate for the facility and operations.
- **Technical Safety Requirements (TSRs)**
 - TSRs are “the rules” that come from the DSA analysis, and these rules are in place to reduce the probability and/or consequences of accident scenarios.

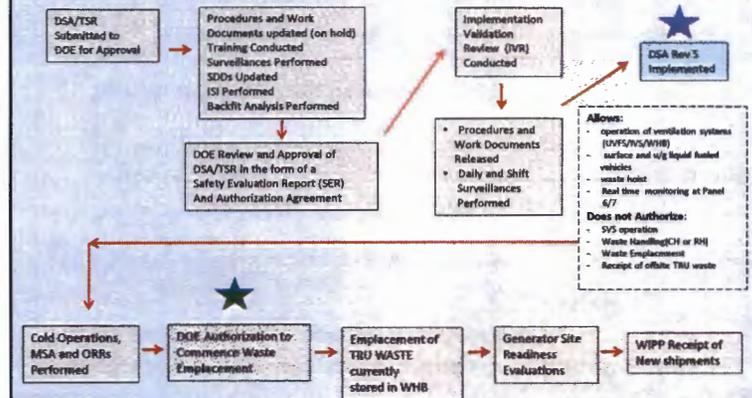
DSA Hazard Analysis

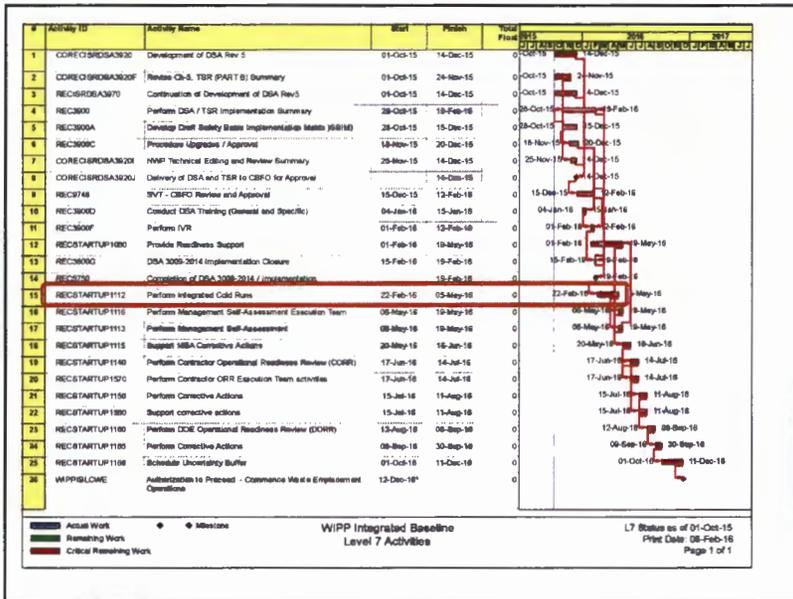
- **Types of Accidents Analyzed in DSA**
 - Natural Phenomena Hazards (Earthquake, Tornado, Wind, Snow)
 - Fires (pool fires, combustible fires, internal drum fires)
 - Explosions, deflagrations
 - Roof Falls
 - Drops
 - Punctures
 - "Repeat Event" from February 2014 drum rupture (exothermic chemical reaction)

The most significant accidents are fire, explosion and loss of confinement.

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Sequence of Implementation





Perform Integrated Cold Runs

- Demonstrate the Plant, People and Procedures are ready:

Plant

- Equipment necessary for receipt, processing and downloading of waste is available and properly functioning
- U/G Notification System, Localized Fire Suppression Systems in u/g

People

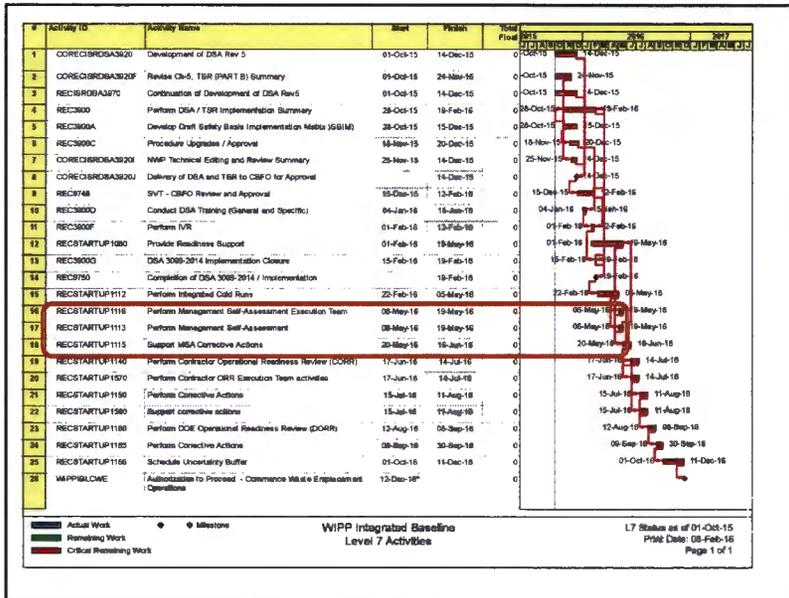
- Demonstrate Nuclear Safety Culture and Conduct of Operations Standards
- Proficiency with new DSA controls (surveillances, operator rounds)
- Waste emplacement activities utilizing empty containers
- Maintenance evolutions

Process

- Safety Management Program pre-start improvements are demonstrated
 - Examples: Fire Protection, Radiological Controls, Emergency Management
- Conduct drills (Radiological event, injury, fire)

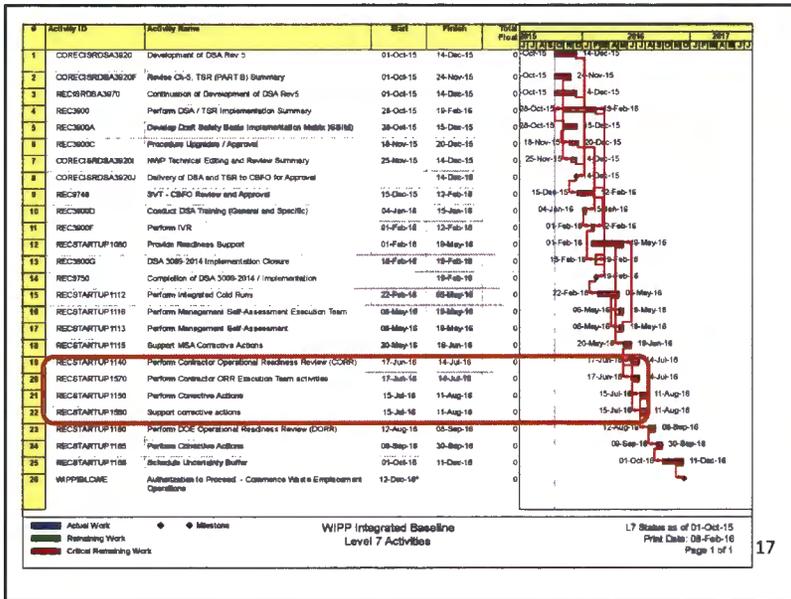


Notification System Radio



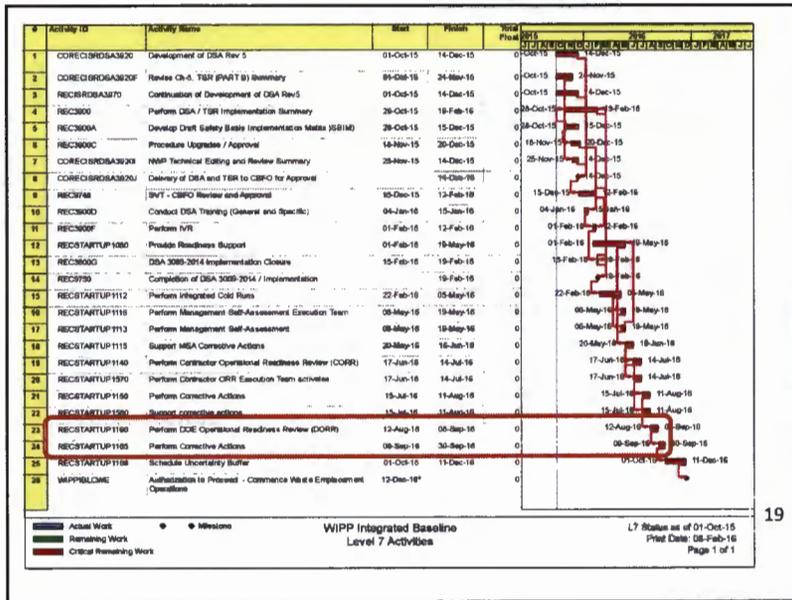
Readiness Activities

- Readiness Activities are governed under DOE O 425.1D, *Startup and Restart of Nuclear Facilities*.
 - The type of readiness activity to be performed is evaluated based on whether the activity is new, the length of time since an activity has been last performed and the complexity of the activity.
 - Readiness activities range from a checklist to a formal review
 - DOE approves the type of readiness activity
- The type of readiness activity for resumption of waste emplacement at WIPP has been determined to be a DOE led Operational Readiness Review.
- Prior to DOE conducting the Operational Readiness Review (ORR), it is prudent for the Contractor to conduct additional assessments to ensure they are ready.
- These include a **Management Self Assessment** and a Contractor ORR.



Contractor Readiness Review (CORR)

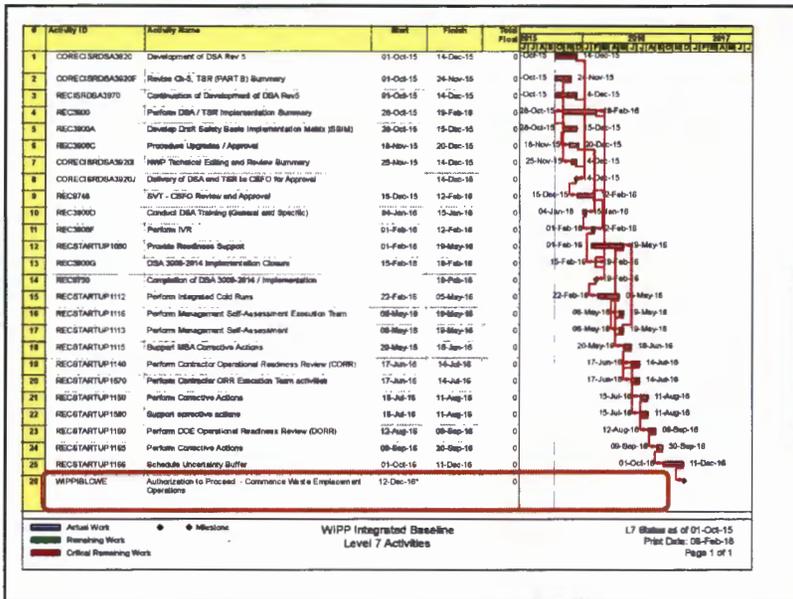
- Conducted by NWP prior to the DOE ORR utilizing a team of independent Subject Matter Experts
- A Plan of Action for the CORR is developed to document the scope of the review and approved by the DOE
- The CORR will focus on:
 - Implementation of corrective actions associated with the AIB reports
 - Implementation of Safety Management Program corrective actions
 - Ensure the plant, people and the processes are ready for safe and compliant resumption of waste emplacement activities
- From the Contractor ORR - Good Practices, Findings and Opportunities for Improvement may be identified. Findings that are considered to be pre-starts will be evaluated for closure prior to beginning the DOE Operational Readiness Review (CORR) or during the DOE ORR.
- NWP will formally declare readiness to the DOE, prior to start of the DOE ORR.



DOE Readiness Review (DORR)

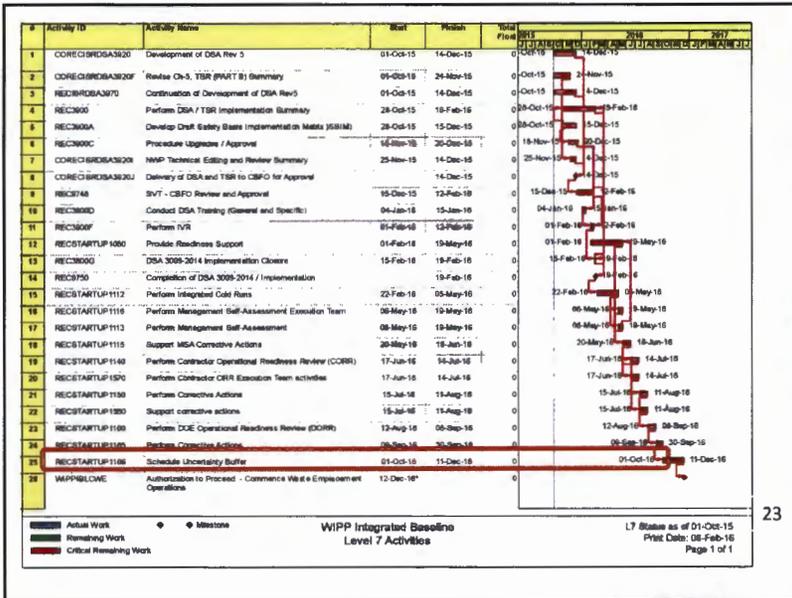
- Conducted by the DOE utilizing a team of independent Subject Matter Experts to assess and determine if waste emplacement activities can be resumed.
- Similar to the CORR, the DORR will focus on:
 - Implementation of corrective actions associated with the AIB reports
 - Implementation of Safety Management Program corrective actions
 - The assessment will ensure the plant, people and the processes are ready for safe and compliant resumption of waste emplacement activities.
- From the DOE ORR - Good Practices, Findings and Opportunities for Improvement may be identified. Findings considered to be a prestart activity for commencement of waste emplacement will be addressed and closed.
- DOE will provide concurrence with the closure of the prestart findings.

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Authorization to Proceed – Commence Waste Emplacement

- Once the DOE has completed the DOE Operational Readiness Review and agreed upon prestart findings have been satisfactorily closed, authorization to Commence Waste Emplacement will be provided to NWP.
- In conjunction with the DOE, NMED will perform an evaluation of readiness to restart waste emplacement activities as it applies to their areas of oversight.
 - The current schedule has resumption of waste emplacement starting in December 2016



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Integrated PMB – Risk Approach

How were risks identified?

- A comprehensive risk and estimating uncertainty assessment was performed. The initial Recovery risk register was expanded to include those risks that could impact the WIPP base operational activity program to form an integrated risk register containing both Recovery Project and Base operational activity risks and opportunities.

Because the integrated baseline is primarily focused on FY16 and FY17 and the resumption of waste emplacement operations, a specific risk analysis was conducted for the risk items that have the potential to impact the resumption of waste emplacement operations.

Estimate Uncertainty (Management Reserve and Contingency)

- A cost probability distribution was developed for each risk using the best, most likely and worst case residual cost impacts. The management reserve and contingency estimates have been rolled back into work activities to support resumption of waste emplacement.

Schedule Uncertainty

- The analysis provides and estimate of schedule duration necessary to respond to realized risks.
- An 80% schedule uncertainty was derived for the recovery scope.

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Example - Resumption of Waste Emplacement Risk Events

Event ID	Event Title	Event Owner	Unclassified Likelihood	Unclassified Consequence	Mitigation Strategy	Revised Likelihood	Revised Consequence	Residual Level	Best Case Cost (\$K)	Most Likely Cost (\$K)	Worst Case Cost (\$K)	Best Case Sched	Most Likely Sched	Worst Case Sched
001	Qualified Work Planners Not Available	NWP	Very Likely	Significant	Mitigate	Very Unlikely	Marginal	Low	50	100	150	1 Mth	2 Mths	3 Mths
016	ISA Discrepancies With New/Upgraded Equipment Design (ISV & SVS)	NWP	Likely	Marginal	Mitigate	Likely	Marginal	Moderate	250	500	750	1 Mth	2 Mths	3 Mths
022	Root Bolting Requirements Exceed Assumptions	NWP	Likely	Significant	Mitigate	Likely	Significant	Moderate	100	200	300	2 Mth	4 Mths	6 Mths
023	Contamination From Bolting/UG Excavation Activities	NWP	Unlikely	Marginal	Mitigate	Unlikely	Marginal	Low	25	50	100	0	1 Mth	2 Mths
025	Impact of Working (Bolting) in a Contaminated Workplace	NWP	Likely	Significant	Mitigate	Likely	Significant	Moderate	25	75	150	0	3 Mths	6 Mths
030	Closing Unused Areas - OPPORTUNITY	NWP	Unlikely	Exceptional	Enhance	Unlikely	Exceptional	Moderate	(300)	(300)	(150)	(6 Mths)	(6 Mths)	(2 Mths)

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Schedule Uncertainty Buffer

- The Integrated PMB was developed with an 80% schedule confidence level.
- The schedule buffer provides additional time to mitigate risks that affect the critical path schedule; eliminating or greatly reducing the potential to impact the commencement of waste emplacement.

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Integrated PMB – Monitoring of Progress

Plan of the Day (POD) meetings (Monday, Wednesday and Friday)

- Review of the current two week window of schedule activities
- The Champions status schedule activities to be performed in that window that are scheduled to start or scheduled to complete
- Issues that would prevent activities from starting or completing as scheduled are discussed and a path forward is developed to minimize impact

Plan of the Week meetings (Tuesday)

- A review of the critical path schedule
- A review of the programmatic activities (Safety Management Programs, AIB actions)
- Actions are taken to mitigate the critical path activities

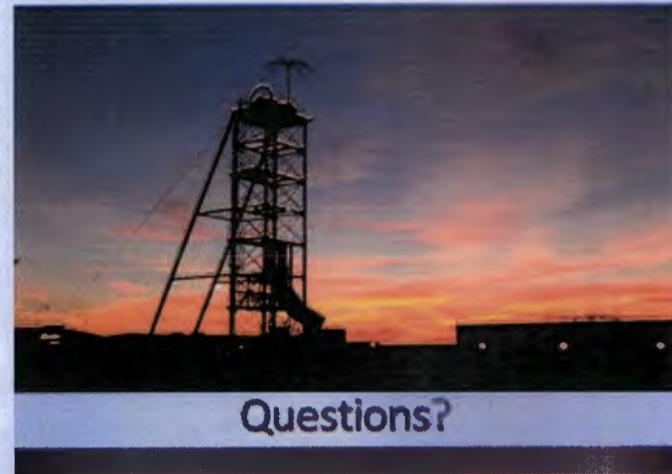
Monthly Project Status Meetings with CBFO

- Cost and schedule performance are reviewed against the baseline

Monthly Change Control Board Meeting

- Changes to the baseline (schedule or cost) that impact schedule milestones or cost impacts greater than \$250,000 are reviewed.

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Ground Control

