

WP 04-AU1007

Revision 11

Underground Openings Inspections

Technical Procedure

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APPROVED FOR USE

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INTRODUCTION

This procedure provides instructions to perform a ground control inspection of the ground conditions and roof bolts in the underground at the Waste Isolation Pilot Plant (WIPP).

The ground control program has been established, implemented, and is maintained to initiate remedial actions for unstable ground conditions and to characterize, monitor, and trend salt behavior. The ground control program provides routine monitoring and evaluation of underground conditions by visual or physical examination, geomechanical data analysis, and performance of installed ground support. The program is designed to detect conditions that indicate instability and initiate corrective actions. The ground control program minimizes the likelihood of falling objects from the underground facility (i.e., roof and ribs) and provides early warning to prevent a roof fall event in the underground areas. Weekly ground control inspections ensure that changing conditions are promptly identified, evaluated, and addressed appropriately.

Performance of this procedure will generate the following Quality/Resource Conservation and Recovery Act records:

- Mine Operations Shift Logbook
- Attachment 1, Underground Openings Inspection Checklist

REFERENCES

BASELINE DOCUMENTS

- 30 CFR Part 57, "Safety and Health Standards - Underground Metal and Nonmetal Mines"
- Hazardous Waste Facility Final Permit, Waste Isolation Pilot Plant, Permit No. NM4890139088-TSDF, issued by the New Mexico Environment Department
- New Mexico Mine Safety Code for all Mines
- DOE/WIPP 02-3212, *Ground Control Annual Plan for the Waste Isolation Pilot Plant*
- DOE/WIPP-07-3372, *Waste Isolation Pilot Plant Documented Safety Analysis*
- DOE/WIPP-07-3373, *Waste Isolation Pilot Plant Technical Safety Requirements*
- WP 15-PR, WIPP Records Management Program

REFERENCED DOCUMENTS

- WP 04-AD3001, Facility Mode Compliance
- WP 04-IM1000, Issues Management Processing of WIPP Forms
- EA04IM1000-1-0, WIPP Form

EQUIPMENT

- Scaling bar or other appropriate sounding device (e.g., hammer, drillsteel, or roof bolt of appropriate length)
- Lift truck where needed for sounding high back

PRECAUTIONS AND LIMITATIONS

- The Technical Safety Requirements (TSRs), Limiting Conditions for Operation (LCOs), and Specific Administrative Controls (SACs) provide specific preventative or mitigative limits and required actions for identified accident scenarios. Failure to comply with TSRs, LCOs, or SACs may constitute a violation and must be immediately reported to the Facility Shift Manager (FSM). Listed below are the specific safety requirements that apply during performance of this procedure.
- Ground control inspections **SHALL** be conducted weekly. **[SAC 5.1.1.3]**
- Personnel performing this work, at a minimum, must have completed the U.S. Department of Labor, Mine Safety and Health Administration 40-Hour Newly Employed, Inexperienced Miner Training.
- Inspections should begin at a safe and sound starting point.
- Ground conditions that create a hazard to persons **SHALL** be taken down **OR** supported before other work or travel is permitted in the affected area. Until corrective work is completed, the area **SHALL** be posted with a warning against entry and, when left unattended, **SHALL** have a barrier installed to impede unauthorized entry.^{1,2}
- Access to some areas of the Underground may be restricted. Postings, barriers, and/or barricades may be encountered requiring additional actions or approval to access these restricted areas. Personnel are required to follow instructions on the postings, barriers, or barricades prior to entering restricted areas.

PERFORMANCE**1.0 EMPLOYEE WORK AREA DAILY GENERAL INSPECTION**

1.1 Employee, prior to performing work, visually conduct inspection of the work area for the following:

- Damaged, loose, or missing roof and/or rib bolts
- Damaged, loose, or missing roof and/or rib bolt plates

NOTE

Hazardous ground is defined as ground conditions that create an immediate hazard to persons in the form of loose ground and/or unsupported drummy areas.

- Back and rib for cracks, fractures, and separations that may be hazardous

NOTE

A shallow separation in the back or rib may be detected by a hollow or drummy sound when struck with a hammer, scaling bar, or other solid object. This process is called "sounding" the back or rib and is a common method used to aid in determining competency of underground openings.

NOTE

When broken or missing bolts are replaced, the load-bearing plate is to be marked with the letter "R" to indicate that a replacement bolt has been installed in the area.

1.2 Sound suspicious roof bolts, back, and rib in the work area to determine the following:

- Loose roof bolts
- Potentially hazardous ground conditions

WARNING

To avoid injury, prescribed methods must be followed when using a scaling bar during scaling operations.

1.3 Using a scaling bar long enough to allow operator to work under good ground, remove bad ground.^{3, 4}

- 1.4 **IF** loose, broken, or missing roof bolts are found,
THEN perform the following:
- 1.4.1 Notify the Mine Operations Engineer, Mine Operations Manager, or Underground Facility Operations.
 - 1.4.2 Proceed as directed following notification.
 - 1.4.3 Document action taken on Attachment 1.²
- 1.5 **IF** potentially hazardous ground conditions **CANNOT** be removed manually,
THEN check the following are performed:
- 1.5.1 Post area to warn others of deficiencies.
 - 1.5.2 If area is to be left unattended, have barriers posted.¹
 - 1.5.3 Notify manager of deficiencies.
 - 1.5.4 Proceed as directed by supervisor.

2.0 MINE OPERATIONS UNDERGROUND TRAVELWAY WEEKLY VISUAL INSPECTIONS

- 2.1 Employee, visually inspect travelway roof bolts, back, and rib for the following [**SAC 5.1.1.3**]:
- Roof bolts for loose or deformed plates
 - Back and rib for cracks, fractures, and separations that may be hazardous⁵

NOTE

Hazardous back or rib will have a drummy, hollow, or unsolid sound when sounded.

- 2.2 Sound suspicious roof bolts, back, and rib to determine the following [**SAC 5.1.1.3**]:
- Loose roof bolts
 - Potentially hazardous ground conditions

WARNING

To avoid injury, prescribed methods must be followed when using a scaling bar during scaling operations.

- 2.3 Using a scaling bar that is long enough to allow operator to work under good ground, remove hazardous ground.^{3, 4}
- 2.4 **IF** loose, broken, or missing roof bolts are found,
THEN perform the following:
 - 2.4.1 Notify the Mine Operations Engineer, Mine Operations Manager, or Underground Facility Operations.
 - 2.4.2 Proceed as directed following notification.
 - 2.4.3 Document action taken on Attachment 1.²
- 2.5 **IF** potentially hazardous ground conditions **CANNOT** be removed manually,
THEN check that the following are performed:
 - 2.5.1 Post area to warn others of deficiencies.
 - 2.5.2 If area is to be left unattended, have barriers posted.¹
 - 2.5.3 Notify manager of deficiencies.
 - 2.5.4 Proceed as directed by supervisor.
 - 2.5.5 Document action taken on Attachment 1.
 - 2.5.6 Manager, review Attachment 1 for completeness and to ensure that it is properly filled in.
 - 2.5.7 Complete Surveillance Requirement Data Sheet 5.1.1.3 and EA04AD3001-SR40 for the Ground Control Program and submit to Facility Shift Manager for review and approval, in accordance with WP 04-AD3001.

3.0 MINE OPERATIONS UNDERGROUND FACILITY ANNUAL PHYSICAL INSPECTIONS

- 3.1 Employee, physically sound/inspect all accessible areas' roof bolts, back, and rib for the following:
- Back and rib for cracks, fractures, and separations that may be hazardous

NOTE

Bad back or rib will have a drummy, hollow, or unsolid sound when sounded.

- 3.2 Sound roof bolts, back, and rib to determine the following:
- Loose roof bolts
 - Potentially hazardous ground conditions

WARNING

To avoid injury, prescribed methods must be followed when using a scaling bar during scaling operations.

- 3.3 Using a scaling bar that is long enough to allow operator to work under good ground, remove hazardous ground.^{3,4}
- 3.4 **IF** loose, broken, or missing roof bolts are found, **THEN** perform the following:
- 3.4.1 Notify the Mine Operations Engineer, or Mine Operations Manager, or Underground Facility Operations.
- 3.4.2 Proceed as directed following notification.
- 3.4.3 Document action taken on Attachment 1.²
- 3.5 **IF** potentially hazardous ground conditions **CANNOT** be removed manually, **THEN** check the following are performed:
- 3.5.1 Post area to warn others of deficiencies.
- 3.5.2 If area is to be left unattended, have barriers posted.¹
- 3.5.3 Notify manager of deficiencies.

- 3.5.4 Proceed as directed by supervisor.
- 3.5.5 Document action taken on Attachment 1.
- 3.5.6 Manager, review Attachment 1 for completeness and to ensure that it is properly filled in.

4.0 DELINQUENT INSPECTIONS

NOTE

A delinquent inspection occurs when personnel discover that a scheduled Weekly Visual, or Annual Physical inspection, has not been performed. Delinquent Inspections require actions that should be verified by Management. These actions are listed in Steps 4.1 through 4.3.

- 4.1 Notify FSM and Site Environmental Compliance immediately of the delinquent inspection.
- 4.2 Initiate a WIPP Form (EA04IM1000-1-0) in accordance with WP 04-IM1000.
- 4.3 Schedule and complete the inspection.

Attachment 1 - Underground Openings Inspection Checklist

DATE: _____		TIME: _____	
Record Inspection Type:		Weekly: _____	Annual: _____
DRIFT	INITIALS	COMMENT & OBSERVATION	ACTION TAKEN & DATE
E-300 Drift from N-1400 to N-1100			
E-300 Drift from N-460 to S-1000			
E-300 Drift from S-1000 to S-1950			
E-300 Drift from S-1950 to S-2520			
E-300 Drift from S-2520 to S-3650			
E-300 Alcove north off N-460			
N-460 Alcove east off E-300			
N-250 Alcove east off E-300			
N-90 Alcove east off E-300			
N-0 Alcove (Golf Cart Shop) east off E-300			
S-400 drift east off E-300 (to Exhaust Shaft)			
S-1600 Drift from E-300 to Panel 1 Block Wall			
S-1950 Drift from E-300 to Panel 1 Block Wall			
ADDITIONAL INFORMATION			
INSPECTION PERFORMED BY (PRINT NAME): _____			
SIGNATURE: _____			
REVIEWED BY: _____			
MANAGER SIGNATURE			DATE

Attachment 1 - Underground Openings Inspection Checklist

DATE: _____		TIME: _____	
Record Inspection Type:		Weekly: _____	Annual: _____
DRIFT	INITIALS	COMMENT & OBSERVATION	ACTION TAKEN & DATE
S-2180 Drift from E-300 to Panel 2 Block Wall			
S-2520 Drift from E-300 to Panel 2 Block Wall			
E-140 Drift from N-1400 to N-780			
E-140 Drift from N-780 to N-150			
E-140 Drift from N-150 to S-1000			
E-140 Drift from S-1000 to S-2180			
E-140 Drift from S-2180 to S-3080			
E-140 Drift from S-3080 to S-3650			
S-3650 Drift (to waste face) from E-140 to Panel 4, Room 3			
S-3310 Drift from E-140 to Panel 4, Room 3			
N-780 Alcove east off E-140			
N-460 Drift between E-140 and E-300			
N-300 Drift between E-140 and E-300			
ADDITIONAL INFORMATION			
INSPECTION PERFORMED BY (PRINT NAME): _____			
SIGNATURE: _____			
REVIEWED BY: _____			
MANAGER SIGNATURE			DATE

Attachment 1 - Underground Openings Inspection Checklist

DATE: _____		TIME: _____	
Record Inspection Type:		Weekly: _____	Annual: _____
DRIFT	INITIALS	COMMENT & OBSERVATION	ACTION TAKEN & DATE
S-90 Drift between E-140 and E-300			
S-220 Alcove (Switch Station 2) east off E-140 Drift			
S-300 Alcove (I&C Conex) east off E-140 Drift			
S-400 Drift between E-140 and E-300			
S-520 Alcove (water collection area) east off E-140 Drift			
S-520 Alcove (cart parking) west off E-140 Drift			
S-700 Drift between E-140 and E-300			
S-1000 Drift between E-140 and E-300			
S-1300 Drift between E-140 and E-300			
S-1600 Drift between E-140 and E-300			
S-1950 Drift between E-140 and E-300			
S-2180 Drift between E-140 and E-300			
ADDITIONAL INFORMATION			
INSPECTION PERFORMED BY (PRINT NAME): _____			
SIGNATURE: _____			
REVIEWED BY: _____			
MANAGER SIGNATURE			DATE

Attachment 1 - Underground Openings Inspection Checklist

DATE: _____		TIME: _____	
Record Inspection Type:		Weekly: _____	Annual: _____
DRIFT	INITIALS	COMMENT & OBSERVATION	ACTION TAKEN & DATE
S-2520 Drift between E-140 and E-300			
S-2750 Drift between E-140 and Panel 3 BH			
S-3080 Drift between E-140 and Panel 3 BH			
Panel 4, Room 3			
Panel 4, Room 2			
Panel 4, Room 1			
0-East Drift between N-1400 and N-780			
0-East Drift between N-780 and S-90			
W-30 Drift between S-90 and S-1000			
W-30 Drift between S-1000 and S-1950			
W-30 Drift between S-1950 and S-3650			
N-1400 Drift between E-0 and E-300			
N-1100 Drift between E-0 and E-300			
ADDITIONAL INFORMATION			
INSPECTION PERFORMED BY (PRINT NAME): _____			
SIGNATURE: _____			
REVIEWED BY: _____			
MANAGER SIGNATURE			DATE

Attachment 1 - Underground Openings Inspection Checklist

DATE: _____		TIME: _____	
Record Inspection Type:		Weekly: _____	Annual: _____
DRIFT	INITIALS	COMMENT & OBSERVATION	ACTION TAKEN & DATE
N-940 Alcove west off E-0 Drift			
N-780 Drift between E-0 and E-300			
N-620 Alcove west off E-0 Drift			
N-460 Drift between E-0 and E-300			
S-90 Drift (inc. SS #1) between E-0 and E-140			
S-225 Alcove (fire truck alcove) west off W-30			
S-300 Alcove (ambulance alcove) west off W-30			
S-550 Alcove west off W-30 (U/G Services)			
S-700 Drift between W-170 and E-140			
S-1000 Drift between W-170 and E-140			
S-1300 Drift between W-170 and E-140			
S-1600 Drift between W-170 and E-140			
S-1950 Drift between W-170 and E-140			
ADDITIONAL INFORMATION			
INSPECTION PERFORMED BY (PRINT NAME): _____			
SIGNATURE: _____			
REVIEWED BY: _____			
MANAGER SIGNATURE			DATE

Attachment 1 - Underground Openings Inspection Checklist

DATE: _____		TIME: _____	
Record Inspection Type:		Weekly: _____	Annual: _____
DRIFT	INITIALS	COMMENT & OBSERVATION	ACTION TAKEN & DATE
S-2180 Drift between W-170 and E-140			
S-2520 Drift (SSW 5/Maint) between W-170 and E-140			
S-2750 Drift between W-170 and E-140			
S-3080 Drift between W-170 and E-140			
S-3310 Drift between W-170 and E-140			
S-3650 Drift between W-170 and E-140			
W-170 Drift between N-150 and S-1000			
W-170 Drift between S-1000 and S-2180			
W-170 Drift between S-2180 and S-3650			
N-150 Drift between W-170 and E-0			
N-90 Alcove (fuel bay) west off W-170 Drift			
S-400 Alcove (core storage) west off W-170 Drift			
S-1300 Alcove (oil bay) west off W-170 Drift			
ADDITIONAL INFORMATION			
INSPECTION PERFORMED BY (PRINT NAME): _____			
SIGNATURE: _____			
REVIEWED BY: _____			
MANAGER SIGNATURE			DATE

Attachment 1 - Underground Openings Inspection Checklist

DATE: _____		TIME: _____	
Record Inspection Type:		Weekly: _____	Annual: _____
DRIFT	INITIALS	COMMENT & OBSERVATION	ACTION TAKEN & DATE
S-3310 Drift from W-170 to Panel 5, Room 7			
S-3650 Drift from W-170 to Panel 5, Room 7			
Panel 5, Room 1			
Panel 5, Room 2			
Panel 5, Room 3			
Panel 5, Room 4			
Panel 5, Room 5			
Panel 5, Room 6			
Panel 5, Room 7			
S-90 Drift from W-170 Drift to Q-Room			
W-620 Drift from AIS (shaft) to Switch Station 4			
N-300 Drift to AIS (shaft) between E-0 and W-620			
N-135 Alcove (Geotech Conex) west off W-620 Drift			
ADDITIONAL INFORMATION			
INSPECTION PERFORMED BY (PRINT NAME): _____			
SIGNATURE: _____			
REVIEWED BY: _____			
MANAGER SIGNATURE			DATE

