AGENDA
MEETING WITH NMED
JUNE 20, 1997

LOCATION: NMED Offices--Runnels Building, Santa Fe, NM
TIME: 9:30am

INTRODUCTION

PURPOSE OF MEETING

PRESENTATION OF STATUS OF THE MANAGEMENT OF UNDERGROUND WATER AT THE WIPP

DISCUSSION

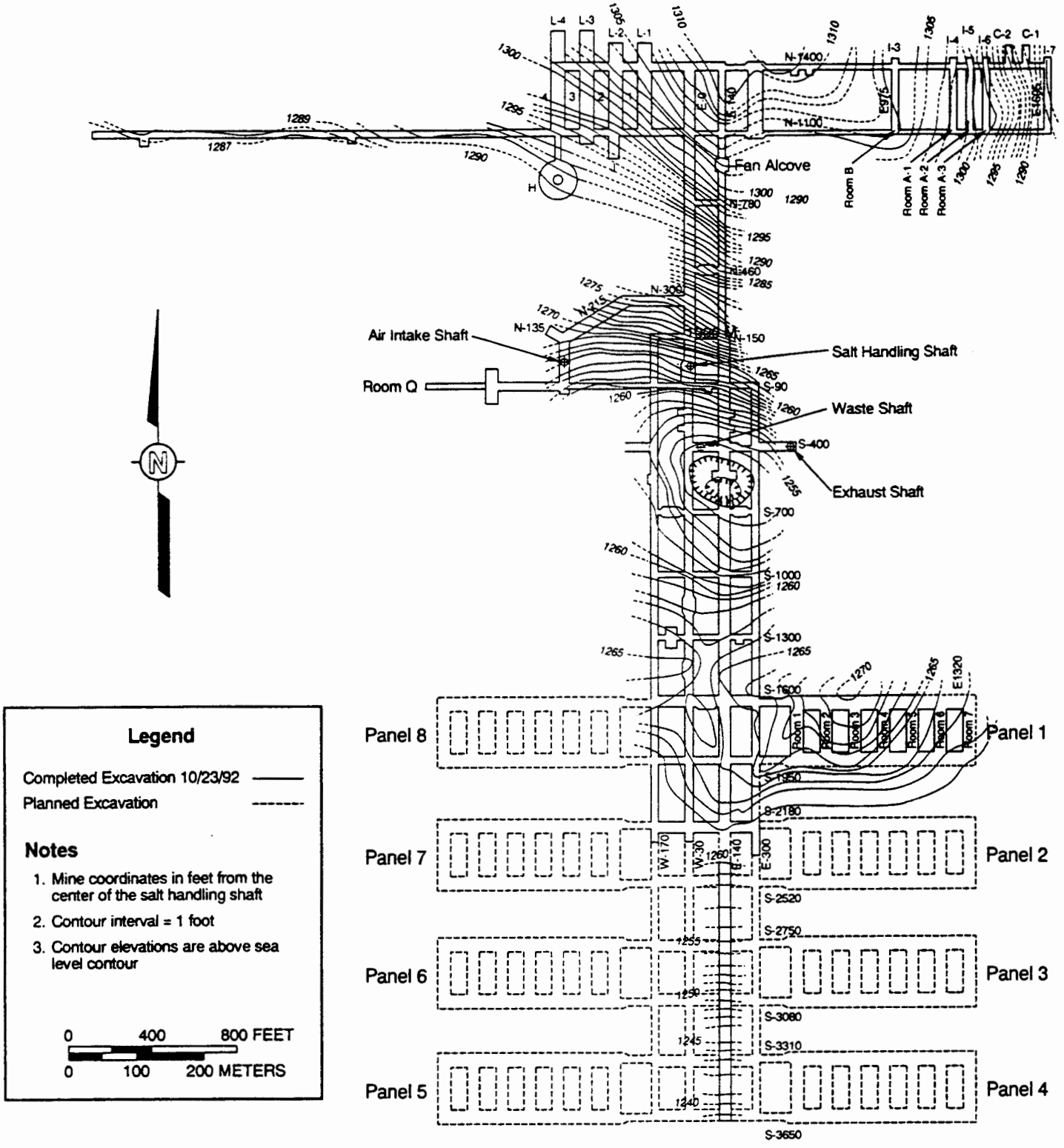

Figure B-11
Plan View of the Underground Showing Midheight Centers of Underground Disposal Area at the Orange Marker Band Relative to Sea Level

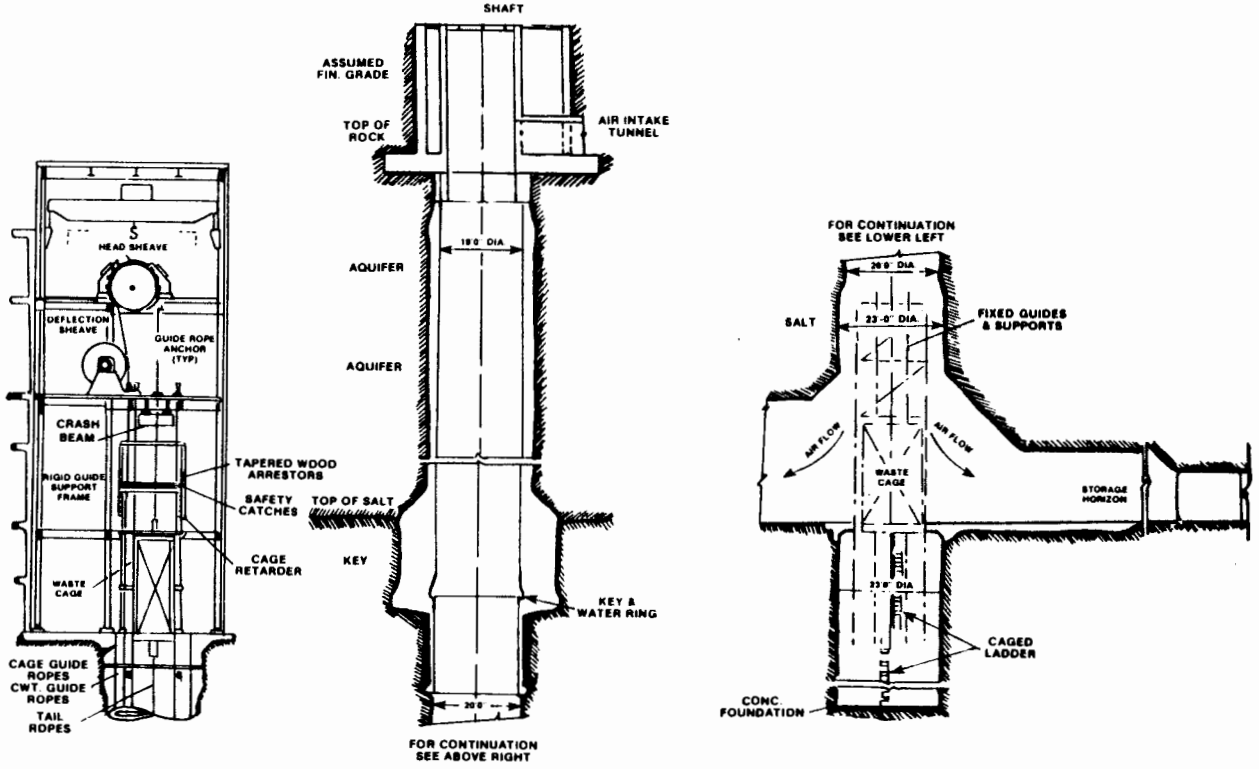

FIGURE 4.3-1. Waste Shaft and Waste Hoist Equipment Arrangements

January 1983

Management of Brine in the WIPP Underground: Status Report

New Mexico Environment Department

Harold Runnels Building

June 20, 1997

Purpose

- Bring the NMED up to date on what has transpired since the shaft liner leak was identified found in May 95
  - Salt cake on probes at Station A early 90's
  - Increased flow in the Waste Shaft Sump (change of fan operations)
  - June '95 newspaper articles on the WIPP "leak"
  - September 1995 meeting with NMED (Secretary Hip)
  - December 1996 conference call with NMED

Purpose

- Provide current status of activities to manage brine
  - brine collection
  - brine analysis
  - liner leak mitigation
  - brine disposition

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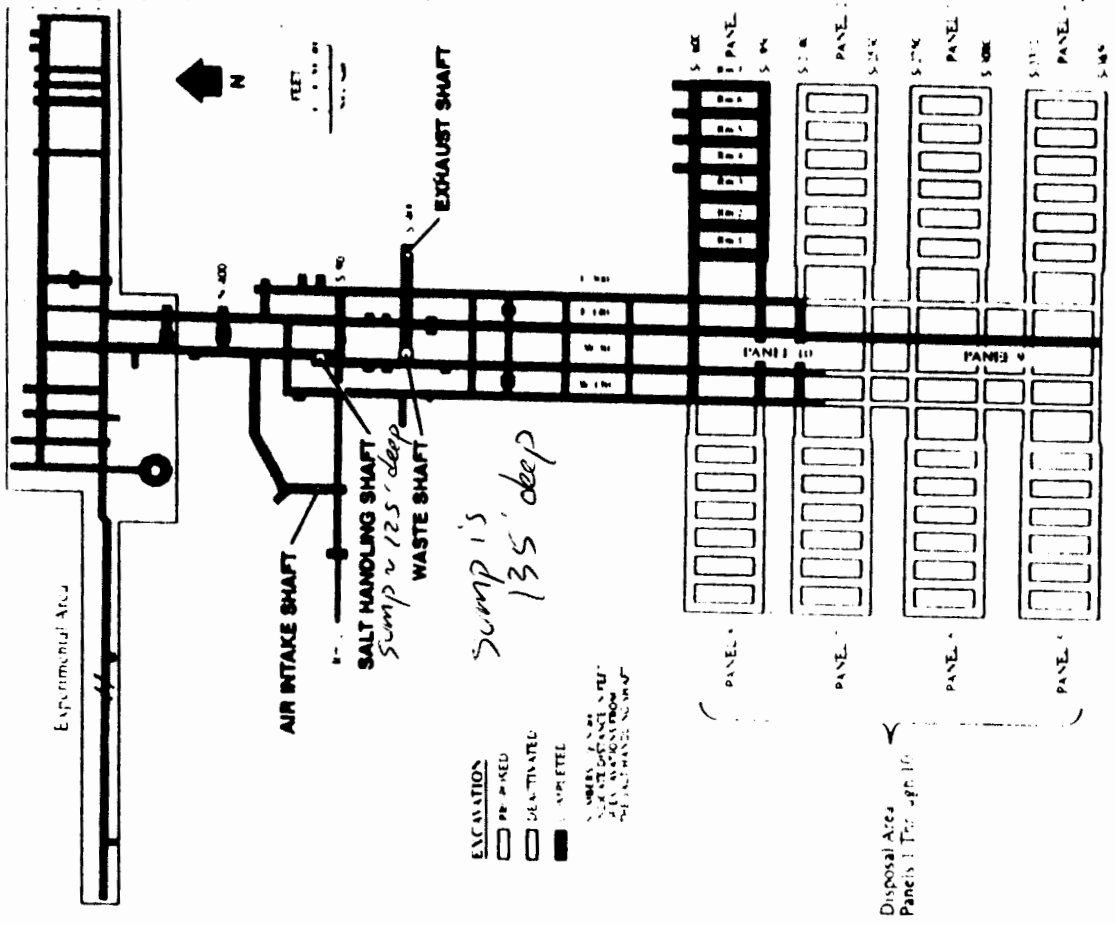
Plan View of WIPP Underground Facility



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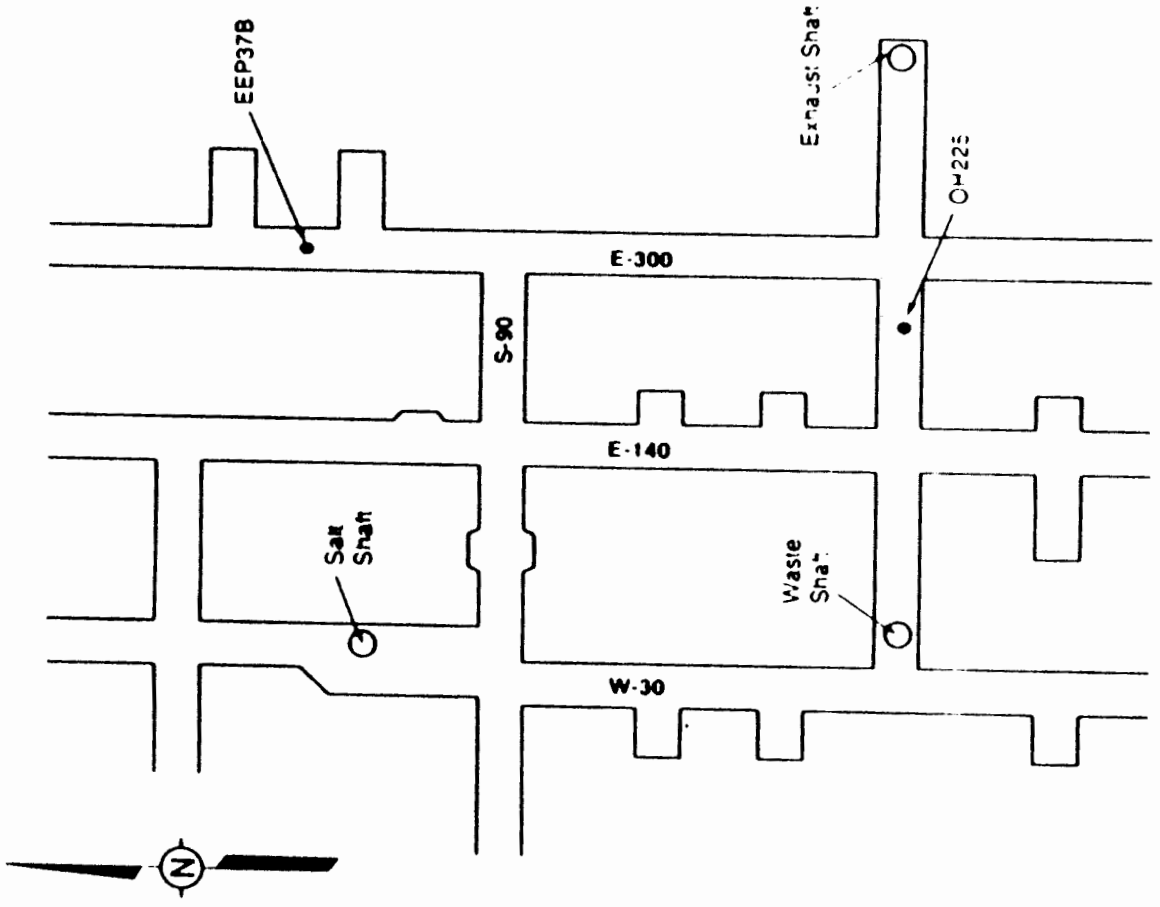
Schematic Drawing WIPP Exhaust Shaft and Waste Shaft



Historical Summary

Sources of Water in the U/G

- Shaft leakage prior to grouting 1985
  - small volume leak
  - water used for dust control
- Concrete curing in the WHB/WS 1985
  - used for dust control

Historical Summary

Sources of Water in the U/G

- Air Intake Shaft 1989 - 1994

1989– Flushing of the upreaming bit (progress was slowed by worn cutter bits) ~ ***20,000 gallons***

  - **ceased using water for dust control (1992)**

– Inflow from water bearing strata prior to grouting (first large quantity of water pumped from the underground) 1990

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Historical Summary
Sources of Water in the U/G

- Air Intake Shaft (cont.)
  - **Prior to grouting, water was pumped into a "frac" tank** — tested before disposal
  - **Emergency permit to discharge into the salt pile evaporation pond**

Historical Summary of Water Pumped

(continued)

- Evaporation cell added to WIPP sewage lagoon for discharge of non-hazardous brines

- Discharge Permit (DP-831) obtained from NMED Groundwater Protection Bureau 1500 - 2000 gal/day must meet MCL's

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Historical Summary of Water Pumped

- 1993 - No Records: quantities were generally small
- 1994 - 5,850 gallons: drought/full fan operations
- 1995 - 11,660 gallons
  - reduced fan operations
  - drought ending
  - increase in volume caused additional sampling
- 1996 - 10,373 gallons
- 1997 - 6,012 gallons to date

Water Sources

- Condensation
- Liner Leakage

Condensation

- Can produce large quantities but only during summer when relative humidity is high.
- Intake air contribution may reach 75% to 95% of water introduced when surface relative humidity is high, depending on amount of diesel equipment in use.

Underground weather stations measure relative humidity

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Liner Leakage

- Small, consistent flow first noted May, 1995, during a video inspection of the ES. It may not reach shaft bottom except when ventilation flow rate is low or condensation rate is high. estimate ~ ½ gallon/min
- Leakage is not significant compared to normal mine operations - simply adds to water balance
- Ventilation reduced on weekends starting October 1994.
- Indications of moisture in shaft were observed as salt build-up on Station A probe.

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Liner Leakage

Possible Sources – Fresh water
Not identified yet

- Precipitation infiltration
- Establishment of local recharge areas
- Domestic water line leakage

in a trench, since many lead to exhaust shaft.

Fire line is pressurized, pumps cycle on/off to maintain pressure – indicate minor leak

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Exhaust Shaft Liner Leakage

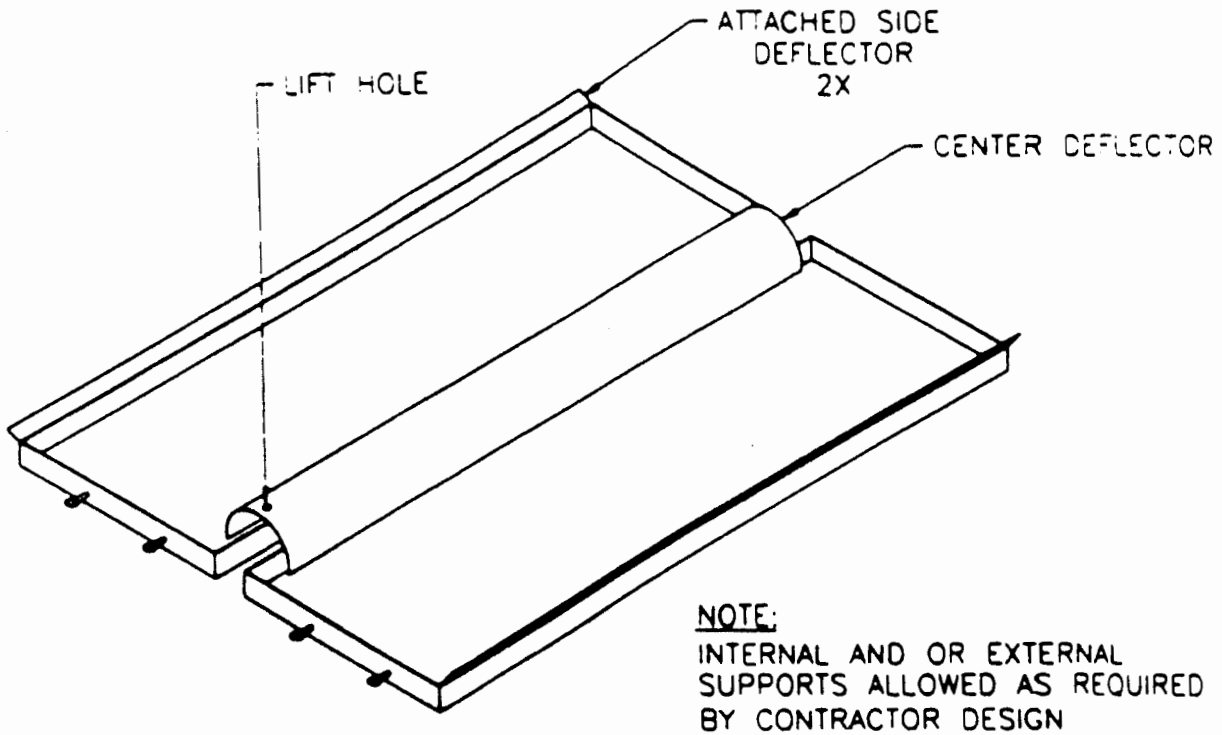
- Underground Lead/Brine Working Group (NMED participant) formed in July 1995.
- Catchment basin installed on 3/12/96 to facilitate operational efficiency to prevent brine from reaching WS sump in large volumes.
- At installation, there was no indication that catchment basin brine would contain Pb at hazardous levels.

Description of Catchment Basin

- High density polyethylene (HDPE) plastic
- 250 mil thick
- 19' wide x 28' long x 1' deep - segmented
- Deflection shield connects the two segments as well as diverts condensation droplets away from the seam and into either side (500 mil thick)
- Welds visually leak detected by vacuum and soap solution &/or a spark tester

2600 gal capacity
1600 effective cap

Assembled Catchment Basin



NOTE:
INTERNAL AND OR EXTERNAL SUPPORTS ALLOWED AS REQUIRED BY CONTRACTOR DESIGN

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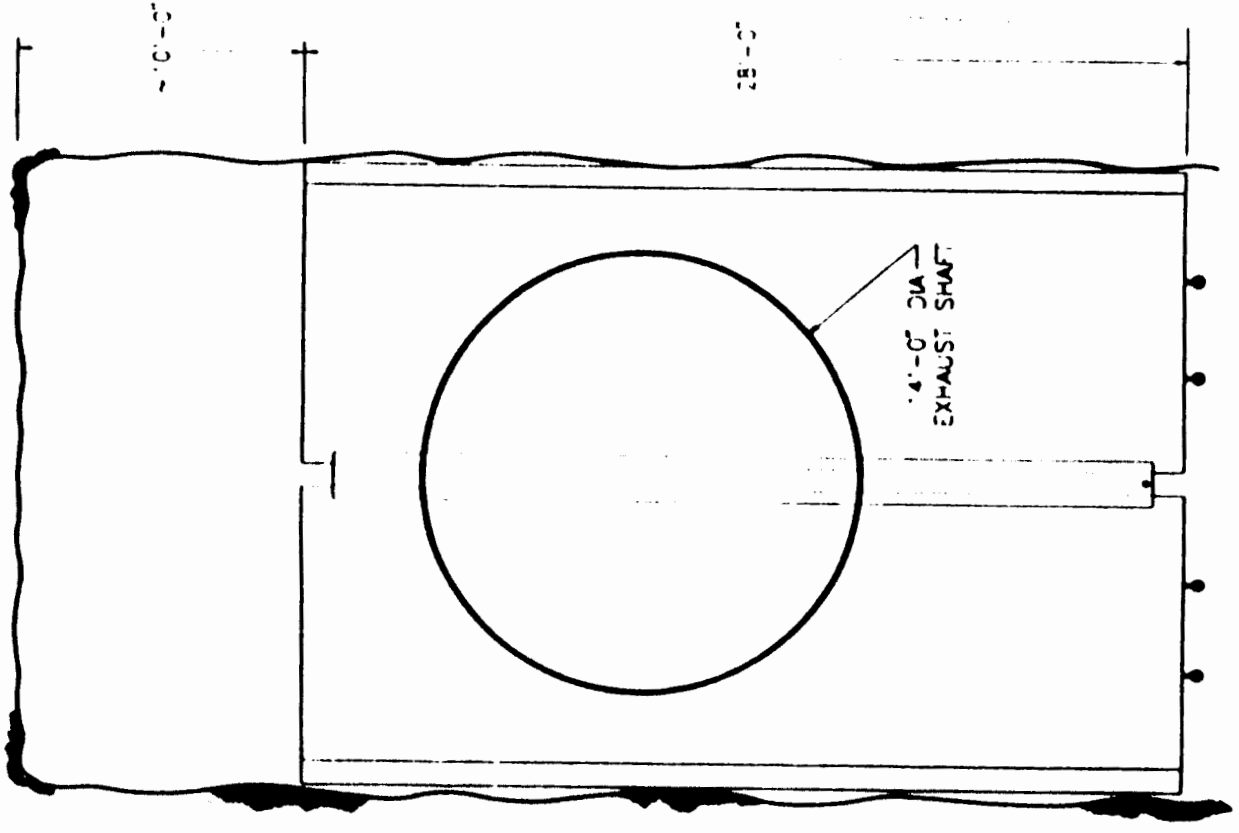
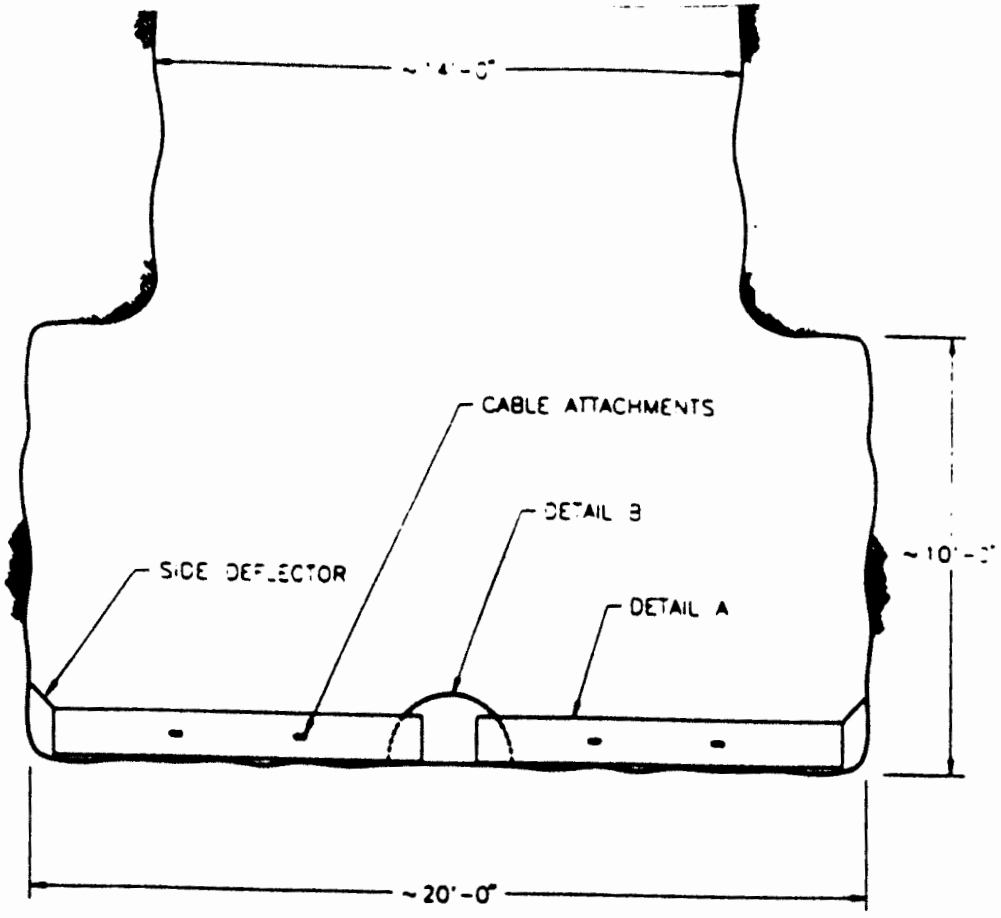
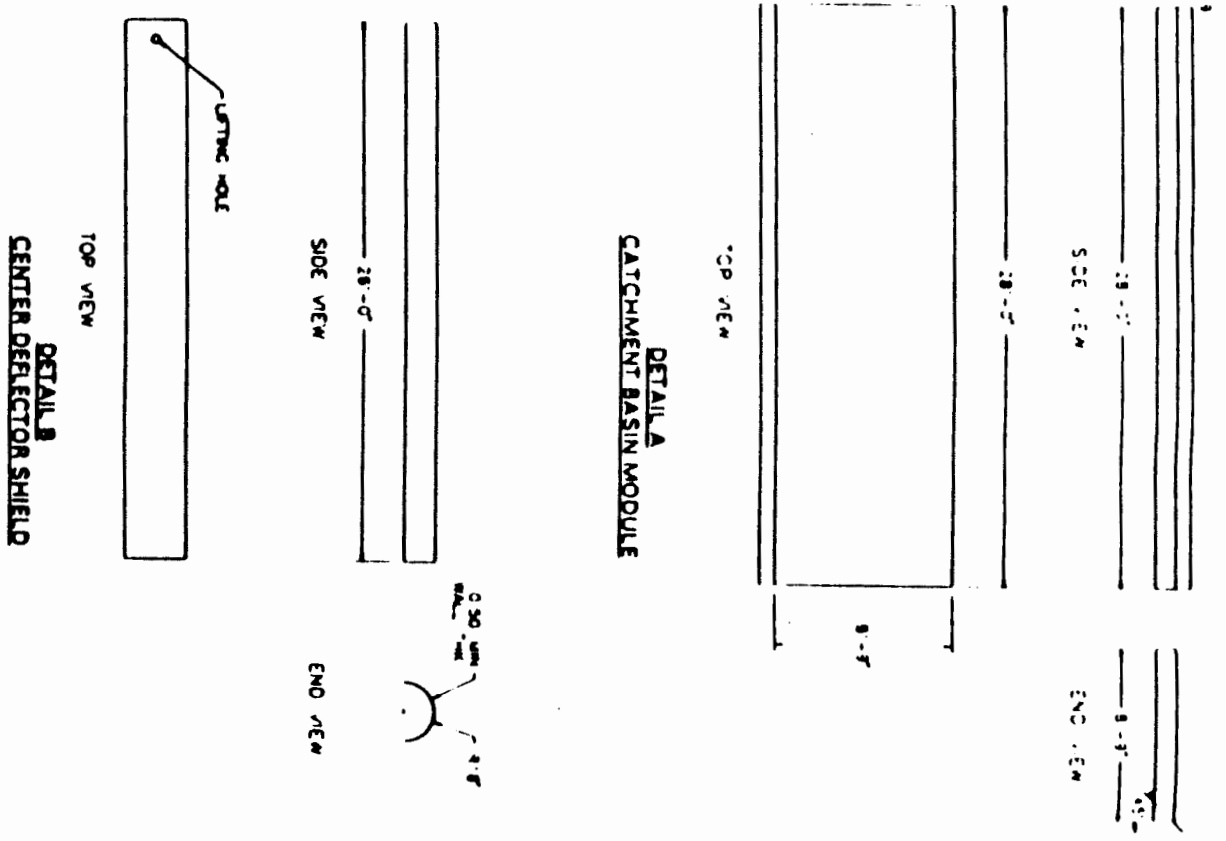
Plan View with Relationship to the Exhaust Shaft



Elevation View of Catchment Basin



Detail of Catchment Basin



Lead

- First noted any lead (traces) in WS Sump - August, 1993
- First detected hazardous levels in WS Sump of Pb in February, 1995 (- no sampling in 94 (drought))
- Discussed with NMED (Dan Robertson, SOE) on 9/1/95 trip to Santa Fe.
- First detected hazardous levels of lead in ES catchment basin in May 1996

Lead Sources

- Lead as impurity in galvanizing zinc on chain link mesh used for support.
- *Analysis of Corrosion Testing Results from Galvanized Mesh Material Obtained from the Waste Isolation Pilot Plant, New Mexico* (DOE/WIPP 96-2212)

  Lead/Zinc ratios indicate high probability that lead leached from galvanized shaft support material.

The Lead/Zinc Ratio's Relationship with Boron

- High concentrations of boron indicate indigenous Salado Formation brine as in the case of Borehole EE37B

- Graph indicates Pb/Brine in ES basin WS sump and proximate boreholes are comprised of non-indigenous brine, i.e., brine results from inflow ~~of~~ or condensation.

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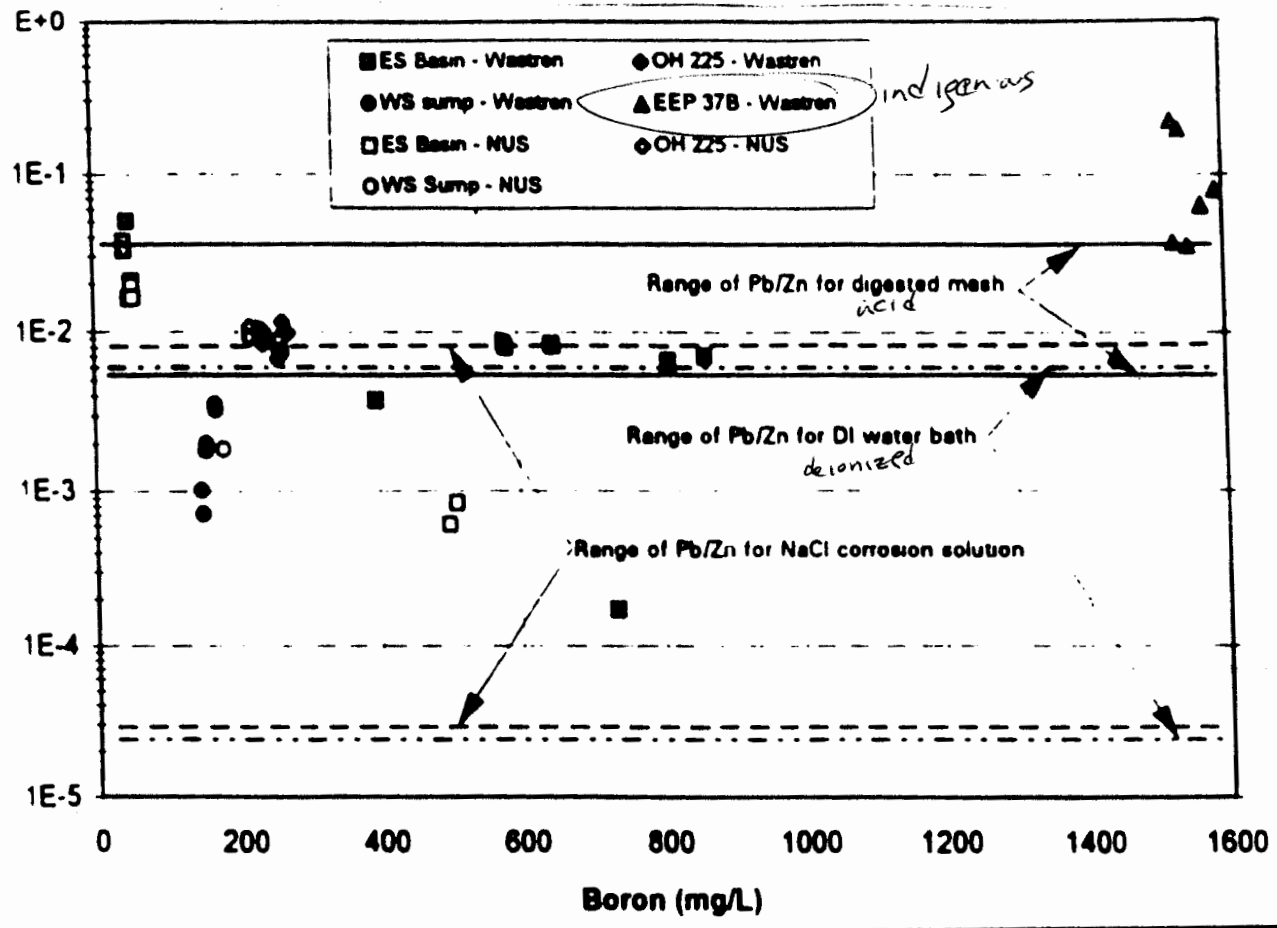
Lead/Zinc Ratios as a Function of Boron



Current Activities

- Brine — Removed on a weekly basis, checked daily
  - Managed under DP-831
  - Disposed of as hazardous waste – all of it
- Leak
  - Preparing de-watering holes
  - Investigating cause – drilled 3 holes to determine location of water flow direction

will drill more "upstream" holes
dewater by pumping

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Current Activities

- Part B Permit Application - Changes to Corrective Action Chapter
  - closed ES Sump SWMU
  - added ES Catchment Basin
  - revised description to WS sump SWMU
- Increased fan usage
  - 3rd fan for reliability

Summary

- Managing brine to minimize impacts on operations
- Investigating source of water leaking through liner
- Disposing of all brine as hazardous waste

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Summary

- If NMED has any questions or concerns please contact us
  - Kevin Donovan at 234-8325
  - Craig Snider at 234-7452
  - Cooper Wayman at 234-7329
  - Gloria Barnes at 234-8383
  - Bob Kehrman at 234-8690
  - Wille Most at 234-8961
- If the public raises issues which we can help resolve, please contact any of the above

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