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Mr. Kent Hunter
CAO/NMED Point of Contact
Carlsbad Area Office
P.O. Box 3090
Carlsbad, NM 88221-3090

August 2, 1996

Subject: Underground Lead Work Plan

Dear Mr. Hunter,

Enclosed you will find a copy of the Lead Sampling Work Plan AIP staff wishes to submit to CAO. This plan will give CAO primary sampling responsibility while allowing AIP staff to collect split samples to verify data. This plan is robust and comprehensive with as many as 31 boreholes surrounding the contaminated area that have not been tested (see Underground Borehole Map). It is our opinion that CAO needs to identify the boundary of the contamination by sampling the current boreholes and remediate as necessary, monitor fluid levels in the boreholes to insure the source head is being reduced, sample source streams at various depths in the Exhaust Shaft, sample surrounding ground water wells, take addition soil/salt samples to verify whether the lead does or does not remain in solution, and as a last resort consider drilling a shallow well to sample all Dewey Lake water zones near the Exhaust Shaft to determine lead content.

I hope that this plan will meet your approval since it provides for CAO to take primary responsibility, allows for AIP split samples for verification, and contributes ideas to make the current Lead Sampling Plan more comprehensive. Should any questions arise, feel free to call my office.

Sincerely,

Keith E. McKamey
Health Program Manager I, DOE Oversight Bureau/WIPP

Enclosures
cc Neil Weber

RECOMMENDED LEAD SAMPLING WORK PLAN

Introduction:

The New Mexico Environment Department DOE Oversight Bureau has been tasked according to the Agreement In Principle (9-95), to help assure that activities at DOE facilities are protective of the public health and safety and the environment. AIP staff recommends that DOE consider these ideas for a more comprehensive evaluation and remediation of the lead issue and recommends additional sampling and corrective action. AIP staff is willing to collect split samples to verify DOE data and to accomplish the objectives listed below. A visual inspection and preliminary sampling have already been conducted by AIP staff to verify that lead is present. This plan is presented to DOE/CAO as a recommendation to define the limits of the contamination for the purpose of extraction and disposal of contaminated waste.

Purpose:

The purpose of this plan is to systematically define the boundaries of contamination, identify source of contaminated water, and remediate the entire contaminated area at the lowest possible cost to the taxpayer.

Facility and Contamination Description:

The lead contaminated area occurs in the underground repository located 26 miles Southeast of Carlsbad, NM, known as the Waste Isolation Pilot Plant. Contaminated area is divided into two areas (see attached map with conservative contaminated area estimates) composed of approximately of 14,139 sq. ft. and 740 sq. ft. respectively. It is likely that the contamination covers a larger area from the Exhaust Shaft to the Waste Sump estimated at roughly 21,000 sq. ft. This estimated contaminated area is only the horizontal sampled area in the mine at approximately 2150' beneath the surface. Contamination has also been recorded at the 101' level beneath the surface.

The only known potential source of lead are the galvanized fencing lining the walls of the Exhaust Shaft and the lead wool packing between the cement liner and the formation.

Department of Energy Objectives:

1) Determine all possible sources of lead contamination
2) Establish the nature and extent of contamination
3) Conduct comprehensive ground water monitoring evaluations
4) Participate in compliance evaluation inspections
5) Evaluate corrective action procedures

Methods for Choosing Sample Locations, Media, and recommended progression:

1) Determine contaminated boundary by sampling brine between the contaminated boreholes and the uncontaminated boreholes:
   A) sample boreholes in the S400 drift between OH225 and Waste Shaft Sump to determine continuous contamination or separate contaminated areas (ie. OH222, MB1392, 51x-GE-00282, DH306, DH 306A, 51x-GE-00281, 51x-GE-00280)
   B) sample boreholes in drifts either side of the S400 drift (ie. MB1393, MB1394, DO202, OH61, OH63-69, DH304, EEP 20 B, EEP 20 D, EEP 20 F, EEP22 B, EEP22 D, EEP22 F, 51x-GE-00231, DH208)
2) Monitor fluid levels in boreholes surrounding S400 drift to determine if the volume of brine is ~~reducing~~ diminishing.
3) Re-sample potential source stream at 101' and sample other visible source steams at various depths in the Exhaust Shaft
4) Sample ground water in surface boreholes to determine source and extent (ie. ERDA 9 all open zones, H-16 all open zones, H-1 all open zones, WIPP 21 all open zones
5) Once contamination boundary is defined by brine samples and water source is eliminated consideration should be given to soil/salt sampling along the boundary to determine level of hazardous waste and the necessary corrective action
6) If source of lead is determined to come from the Dewey Lake in the Exhaust Shaft but no contamination is found in the surrounding Dewey Lake monitoring wells (ie. H-16) consideration should be given to drilling a shallow well near the Exhaust Shaft to sample various Dewey Lake water zones.

Principles/Types of Sampling:

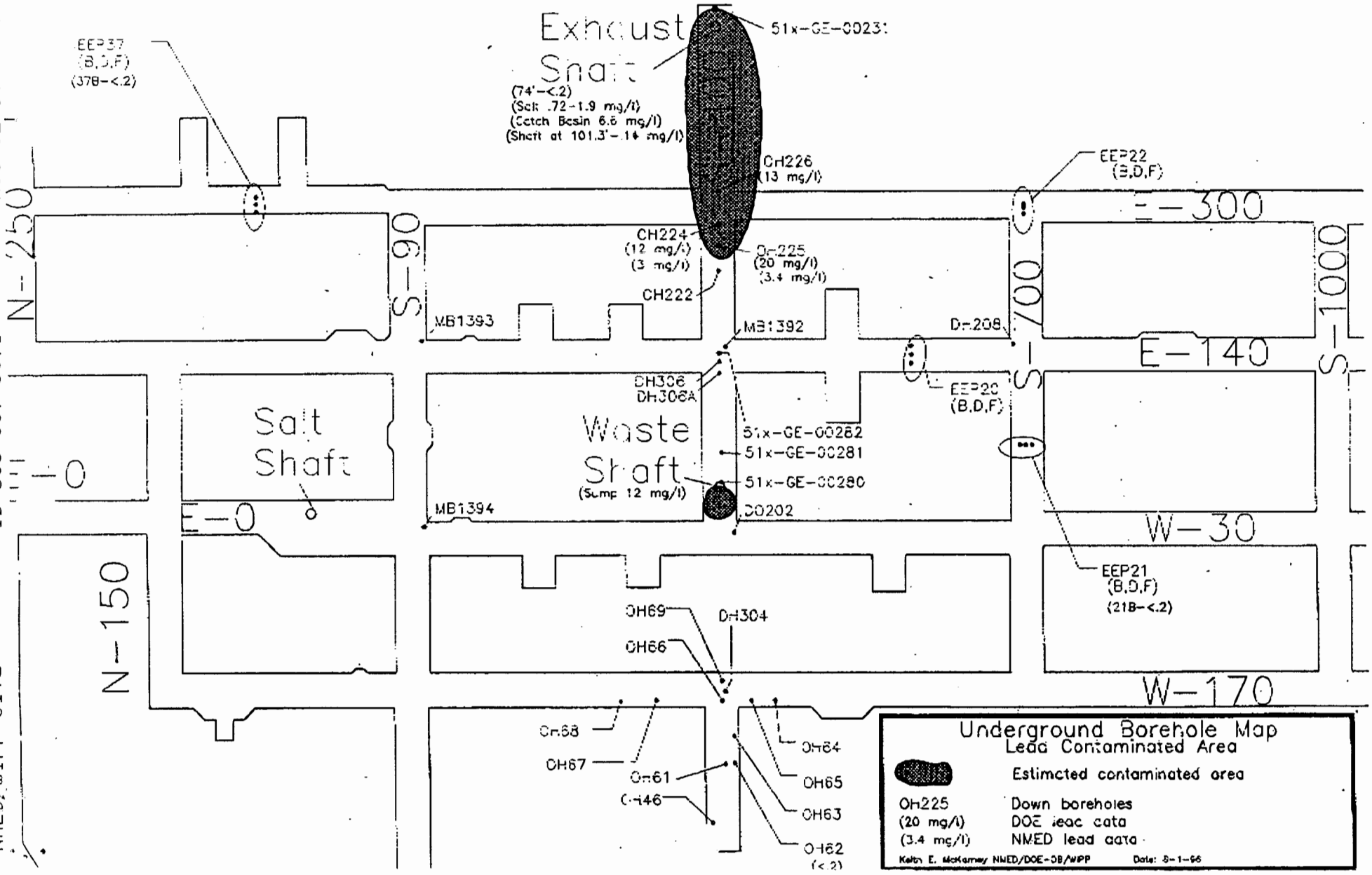
Grab sampling is suggested since it is a discrete aliquot which is representative of a specific location at a given point in time.

Methods and parameters used for analysis:

The brine water containing the lead contamination are highly ionized with large TDS values. The method of evaluating these complicated brines were addressed in the BSEP program. It is recommended that the analysis include the BSEP parameters (ie. acceptable recoveries on matrix spike and duplicate samples for all analytes, use +- 5% charge balance, request Standard Addition be performed). NMED recommends that the highest value be obtained and used regardless of analysis type (Total vs. TCLP). Total metal analysis is recommended by NMED if sample is taken from a borehole.

Duration and Frequency of Sampling:

Once the contaminant boundaries are defined, sampling should occur randomly to conserve sampling funds. The only exception to this rule might be during high climatic changes which affect the contaminated area.


Exhaust Shaft
(74'-<.2)
(Salt .72-1.9 mg/l)
(Catch Basin 6.6 mg/l)
(Shaft at 101.3'-.14 mg/l)
51x-GE-00231
EEP37
(B,D,F)
(378-<.2)
CH226
(13 mg/l)
EEP22
(B,D,F)
CH224
(12 mg/l)
(3 mg/l)
CH225
(20 mg/l)
(3.4 mg/l)
CH222
MB1393
MB1392
DH208
EEP20
(B,D,F)
CH306
DH306A
Salt Shaft
Waste Shaft
(Sump 12 mg/l)
51x-GE-00282
51x-GE-00281
51x-GE-00280
DD202
MB1394
EEP21
(B,D,F)
(218-<.2)
DH69
DH66
DH304
CH68
CH67
CH61
CH46
CH64
CH65
CH63
CH62
N-250
S-90
E-300
700
S-1000
E-140
W-30
W-170
N-150
E-0
Underground Borehole Map
Lead Contaminated Area
Estimated contaminated area
CH225 Down boreholes
(20 mg/l) DOE lead data
(3.4 mg/l) NMED lead data
Kelly E. McKamey NMED/DOE-OB/WIPP Date: 8-1-96