ECOLOGY AND ENVIRONMENT, INC.

FIELD INVESTIGATION TEAM

SITE INSPECTION PLAN

US EPA RECORDS CENTER REGION 5
490225

A. GENERAL INFORMATION

SITE: Freeman United Coal Mining Co.

TDD NO.: F05-

LOCATION: RR#1 Banner Mine #27
Glasford, Il. 61533
Peoria County

U.S. EPA NO.: ILD000921981

SSID NO.:

WSIS NO.: FIL0571

PLAN PREPARED BY: Tom O'Brien

DATE: 12-21-87

APPROVED BY:

DATE:

OBJECTIVE (including description of work to be performed): Perform Site Inspection to include an interview with site representatives. Also collect 5 soil/sediment samples and 5 residential well samples

DESIRED REPORT FORM: SI REPORT (2070-13) ✓ HRS REPORT

OTHER (EXPLAIN)

PROPOSED DATE OF INVESTIGATION:

BACKGROUND REVIEW: Complete: Preliminary:

HRS PRELIMINARY SCORE OF ROUTES: GW 24.85 SW 4.25 AIR 0
(NO FIELD WORK)

DIRECT CONTACT 12.5 FIRE AND EXPLOSION 0

TOTAL PRELIMINARY HRS SCORE VALUE (NO FIELD WORK) 14.57

PROJECTED HRS SCORE: GW 37.20 SW 4.25 AIR 0
(WITH FIELD WORK)

DIRECT CONTACT 12.5 FIRE AND EXPLOSION 0

TOTAL PROJECTED HRS SCORE 21.64

IF NO SAMPLING, EXPLAIN ON PAGE 3.

INSPECTION PRIORITY (BASED ON PROJECTED HRS SCORE): LOW: ✓ MEDIUM: HIGH:

B. SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): Liquid ✓ Solid ✓ Sludge Gas

CHARACTERISTIC(S): Corrosive ✓ Ignitable Radioactive Volatile

Toxic ✓ Reactive Unknown Other (Name) persistent

E. ANALYTICAL SERVICES REQUIRED

RAS X SAS ___ CRL ___

F. QAPP

REQUIRED: YES ___ NO X

IF NO, EXPLAIN: QAPP is already on file.

G. SI WORK TEAM SIZE/LIMITATION

TEAM MEMBER	DISCIPLINE	RESPONSIBILITY
		Team Leader
		Site Safety Officer

WORK LIMITATIONS (Time of day, etc.): Work daylight hours only. Monitor for heat and cold stress. Observe buddy system

COMMENTS: Conduct soil/sediment sampling to determine waste characteristics. Also sample residential wells to determine presence of contaminants

FACILITY DESCRIPTION: Freeman United Coal Mining Company is approximatly 1,169 acres and was involved in surface mining operations.

Principal Disposal Method (type and location): Gob piles - piles of rock and soil resulting from the mining process

Unusual Features (dike integrity, power lines, terrain, etc.): Site is adjacent to Illinois River.

Status: (active, (inactive), unknown) The mine was closed on Feb. 23, 1974 and as of 1985 no abandonment permit has been submitted.

History: (worker or non-worker injury; complaints from public; previous agency action): Abandonment permit was submitted in Febuary of 1975 but was denied because an acceptable proposal for covering the gob pile was not submitted. As of Jan 1985 no proposal has been submitted.

C. HAZARD EVALUATION

(Use Hazard Evaluation of Chemicals sheets for specific or representative chemicals present.): Cadmium, lead

LEVEL OF PROTECTION: A ___ B ___ C ___ D X

Ecology and Environment, Inc.
Hazard Evaluation of Chemicals
Region V - Chicago

Chemical Name Cadmium **Date** _____

DOT Classification _____ **Job Number** _____

CAS Number 7440-43-9

REFERENCES CONSULTED (circle; also include MSDS if approprate.)
NIOSH/OSHA Pocket Guide Merck Index Hazardline Chris(vol.III)
ACGIH TLV Booklet Toxic & Hazardous Safety Manual SAX Aldrich
RTECS other: Casarett & Doull's Toxicology,Niosh Occupational Heathguides

CHEMICAL PROPERTIES: (Synonyms: C.I 77180)
Chemical Formula Cd MW112.4 Ionization Potential N/A
Physical State Crystals Boiling Point1412° F Freezing Point 609° F
Flash Point N/A Flammable Limits N/A Vapor Pressure _____
Specific Gravity/Density 8.642 Odor/Odor Threshold None

Solubility-water: Insoluble Solubility-other: _____
Incompatabilities & Reactivity: Strong oxidizers,sulfur,selenium,zinc,ammonia

TOXICOLOGICAL PROPERTIES: (dust) (Fume)
Exposure Limits: TLV-TWA (ACGIH) .05mg/m³ PEL (OSHA) .2mg/m³ .1mg/m³
STEL None est. Ceiling Limits .6mg/m³/.3mg/m³ IDLH 40 mg/m³
Toxicity Data: (Indicate duration of study)
Human; IHL Tclo 39mg/m³/20M Dermal _____ Oral _____
Rat/Mouse; IHL _____ Dermal _____ Oral LD50 225mg/kg
Aquatic: N/A Other: _____
Carcinogen animal-pos Mutagen exp. _ Reproductive Toxin exper.teratogen
Route(s) of exposure - (circle all that apply): Inhalation Ingestion
Dermal Contact Eye(ocular) Dermal Absorption Other _____

HANDLING RECOMMENDATIONS: (personal protective measures)
Respirators: > any detectable air concentraton - use SCBA
Protective Clothing: Chemical resistant gloves & boots.
Special Equipment: None

DISPOSAL,FIRE and SPILLS: (Use numbered codes;see attached sheets for explanation.)
Disposal P Fire 13 Leaks&Spills 7.10
Decomposition Products: Toxic Cd fumes

FIRST AID:
INL: Large quantities of water,inducevomiting,medical attent.
IHG: Remove to fresh air,art. resp.if necessary, med.attent.immed.
Eye/Skin: Irrigate/wash with water for at least 15 min.

SYMPTOMS:
acute(immediate) exposure effects: IHL:irritation of nose & throat, 2-hour delay before symptoms of cough,chest pain,nausea,vomiting,dizziness, chills,stomach distress. ING Nausea,vomiting,diarrhea,abominal cramps

chronic(long term) exposure effects: loss of smell,ulceration of nose, shortness of breath,liver damage,kidney damage (most affected), mild anemia,emphysema,linked to cancer & hypertension.

reproductive effects: Possibly cuases prostate cancer, teratogenic in in lab animals.

12/86

Ecology and Environment, Inc.
Hazard Evaluation of Chemicals
Region V - Chicago

Chemical Name Lead **Date** _____

DOT Classification _____ **Job Number** _____

CAS Number 7439-92-1

REFERENCES CONSULTED (circle; also include MSDS if appropriate.)
NIOSH/OSHA Pocket Guide Merck Index Hazardline Chris(vol.III)
ACGIH TLV Booklet Toxic & Hazardous Safety Manual SAX Aldrich
RTECS other: Sittig

CHEMICAL PROPERTIES: (Synonyms: White lead, plumbum)
Chemical Formula Pb MW 207 Ionization Potential N/A
Physical State Variable Boiling Point 3164°F Freezing Point _____
Flash Point Incombust. Flammable Limits Incombus Vapor Pressure variable
Specific Gravity/Density 11.3 @61°FOdor/ Odor Threshold None
Solubility-water: Insoluble Solubility-other: _____
Incompatabilities & Reactivity: Strong oxidizers,perioxides,active metals

TOXICOLOGICAL PROPERTIES:
Exposure Limits: TLV-TWA (ACGIH) .15 mg/m³ PEL (OSHA) 50ug/m³
STEL None est. Ceiling Limits None est. IDLH Variable
Toxicity Data: (Indicate duration of study)
Human; IHL _____ Dermal _____ Oral Td10 450mg/kg/6Y
Rat/Mouse; IHL _____ Dermal _____ Oral Tdlo 790mg/kg
Aquatic: Unknown Other: Toxicity varies with lead cpds.
Carcinogen Indef. Mutagen Indef Reproductive Toxin exp.teratogen
Route(s) of exposure - (circle all that apply): Inhalation Ingestion
Dermal Contact Eye(ocular) Dermal Absorption Other _____

HANDLING RECOMMENDATIONS: (personal protective measures)
Respirators: 5mg/m3 high efficiency particulate respirator, other concentrations - SCBA.
Protective Clothing: Avoid skin and eye contact
Special Equipment: None

DISPOSAL, FIRE and SPILLS: (Use numbered codes; see attached sheets for explanation.)
Disposal P Fire 13 Leaks&Spills 7,8,10
Decomposition Products: Toxic fumes of lead

FIRST AID:
ING: Give water, induce vomiting, medical attention immed.
IHL: Move to fresh air, artifical resp. if necessary, medical attent.
Eye/Skin: Irrigate/wash with water. Wash skin thoroughly with soap & water.

SYMPTOMS:
acute(immediate) exposure effects: Cumulative neurotoxin-commonly occurs from prolonged exposure. Symptoms include stomach distress, vomiting, diarrhea, black stools, anemia, nervous system effects.
chronic(long term) exposure effects: 3 clinical types: a-ailmentary-abominal pain, discomfort, constipation or diarrhea, metallic taste, lead line on gum headache. b-nueromuscular, muscle weakness, joint/muscle pain, dizziness, insomnia, paralysis c-encephalic: brain involvement, stupor, coma, death, rare.
reproductive effects: Human epid. studies have concluded that lead is a poison to male & female germ cells; increased incidence of miscarriages, stillbirths, sterility in females; sperm depression & decreased motiltiy in males

SULFURIC ACID, SPENT

SAC

Common Synonyms	Physical State	Color	Odor
Dilute sulfuric acid	Oily liquid	Colorless to dark brown	Odorless

Sinks and mixes with water.

AVOID CONTACT WITH LIQUID. Keep people away.
Wear goggles, and rubber overclothing (including gloves).
Stop discharge if possible.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Not flammable.
Poisonous gas may be produced in fire.
Flammable gas may be produced on contact with metals.
Wear goggles, self-contained breathing apparatus, and rubber overclothing.
Extinguish adjacent fires with dry chemical or carbon dioxide.

Exposure

CALL FOR MEDICAL AID.

LIQUID
Will burn skin and eyes.
Harmful if swallowed.

Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.

Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook)

Issue warning-corrosive
Restrict access
Disperse and flush

2. LABEL

2.1 Category: Corrosive
2.2 Class: 8

3. CHEMICAL DESIGNATIONS

3.1 CG Compatibility Class: Sulfuric acid
3.2 Formula: H_2SO_4-H_2O
3.3 IMO/UN Designation: 8.0/1832
3.4 DOT ID No.: 1832
3.5 CAS Registry No.: Data not available

4. OBSERVABLE CHARACTERISTICS

4.1 Physical State (as shipped): Liquid
4.2 Color: Colorless to dark brown
4.3 Odor: Odorless

5. HEALTH HAZARDS

5.1 Personal Protective Equipment: Chemical safety goggles and face shield; rubber gloves, boots, and apron.
5.2 Symptoms Following Exposure: Contact with eyes or skin causes severe burns, the severity depending on the strength of the acid. Ingestion can cause severe irritation of mouth and stomach.
5.3 Treatment of Exposure: Call a doctor. INGESTION: do NOT induce vomiting. SKIN OR EYES: flush affected parts with large amounts of water for at least 15 min.; do NOT use oils or ointments in eyes; treat burns.
5.4 Threshold Limit Value: Data not available
5.5 Short Term Inhalation Limits: Not pertinent
5.6 Toxicity by Ingestion: No effects except those stemming from tissue damage.
5.7 Late Toxicity: None
5.8 Vapor (Gas) Irritant Characteristics: Non-volatile
5.9 Liquid or Solid Irritant Characteristics: Severe skin irritant. Causes second-and third-degree burns on short contact and is very injurious to the eyes.
5.10 Odor Threshold: Not pertinent
5.11 IDLH Value: Data not available

6. FIRE HAZARDS

6.1 Flash Point: Not flammable
6.2 Flammable Limits in Air: Not flammable
6.3 Fire Extinguishing Agents: Not pertinent
6.4 Fire Extinguishing Agents Not to be Used: Not pertinent
6.5 Special Hazards of Combustion Products: Not pertinent
6.6 Behavior in Fire: Not pertinent
6.7 Ignition Temperature: Not flammable
6.8 Electrical Hazard: Not pertinent
6.9 Burning Rate: Not flammable
6.10 Adiabatic Flame Temperature: Data not available
6.11 Stoichiometric Air to Fuel Ratio: Data not available
6.12 Flame Temperature: Data not available

7. CHEMICAL REACTIVITY

7.1 Reactivity With Water: None, unless strength is above 80-90%, in which case heat is liberated.
7.2 Reactivity with Common Materials: Attacks many metals, releasing flammable hydrogen gas.
7.3 Stability During Transport: Stable
7.4 Neutralizing Agents for Acids and Caustics: Limestone, lime, or soda ash.
7.5 Polymerization: Not pertinent
7.6 Inhibitor of Polymerization: Not pertinent
7.7 Molar Ratio (Reactant to Product): Data not available
7.8 Reactivity Group: 2

8. WATER POLLUTION

8.1 Aquatic Toxicity:
24.5 ppm/24 hr/bluegill/lethal/fresh water
42.5 ppm/48 hr/prawn/LC_{50}/salt water
8.2 Waterfowl Toxicity: Data not available
8.3 Biological Oxygen Demand (BOD): None
8.4 Food Chain Concentration Potential: None

9. SHIPPING INFORMATION

9.1 Grades of Purity: Purity depends on the process in which the original acid is used. The strength (in water) is probably below 80%, and the solution may contain a wide variety of metals and organic compounds in solution.
9.2 Storage Temperature: Ambient
9.3 Inert Atmosphere: No requirement
9.4 Venting: Open

10. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook)

A-P

11. HAZARD CLASSIFICATIONS

11.1 Code of Federal Regulations: Corrosive material
11.2 NAS Hazard Rating for Bulk Water Transportation: Not listed
11.3 NFPA Hazard Classification:

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	0
Reactivity (Yellow)	2
	W

12. PHYSICAL AND CHEMICAL PROPERTIES

12.1 Physical State at 15°C and 1 atm: Liquid
12.2 Molecular Weight: Not pertinent
12.3 Boiling Point at 1 atm: 212°F = 100°C = 373°K
12.4 Freezing Point: Not pertinent
12.5 Critical Temperature: Not pertinent
12.6 Critical Pressure: Not pertinent
12.7 Specific Gravity: 1.39 at 20°C (liquid)
12.8 Liquid Surface Tension: Not pertinent
12.9 Liquid Water Interfacial Tension: Not pertinent
12.10 Vapor (Gas) Specific Gravity: Not pertinent
12.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
12.12 Latent Heat of Vaporization: Not pertinent
12.13 Heat of Combustion: Not pertinent
12.14 Heat of Decomposition: Not pertinent
12.15 Heat of Solution: <—418 Btu/lb = <—232 cal/g = <9.71×10^4 J/kg
12.16 Heat of Polymerization: Not pertinent
12.25 Heat of Fusion: Data not available
12.26 Limiting Value: Data not available
12.27 Reid Vapor Pressure: Data not available

NOTES

MODIFICATIONS: Work on-site in Level D with an upgrade to Level C if monitoring equipment measures an increased hazard.

SITE SAFETY PLAN ON FILE AT E & E: YES ✓ NO ___

D. FIELD WORK REQUIRED

PERIMETER ESTABLISHMENT: MAP/SKETCH ATTACHED? YES ✓ NO ___

Perimeter Identified? YES ___ NO ✓

Zone(s) of Contamination Identified? YES ___ NO ✓

Geophysical Work: YES ___ NO ✓.

Type: Magnetometry ___ Seismic Refraction ___ GPR ___ Resistivity ___ Other ___

Comments: Assume the entire site to be contaminated.

Drilling: YES ___ NO ✓

Well Location Identified: YES ___ NO ___

Drill Plan/Well Installation Plan Attached: YES ___ NO ___

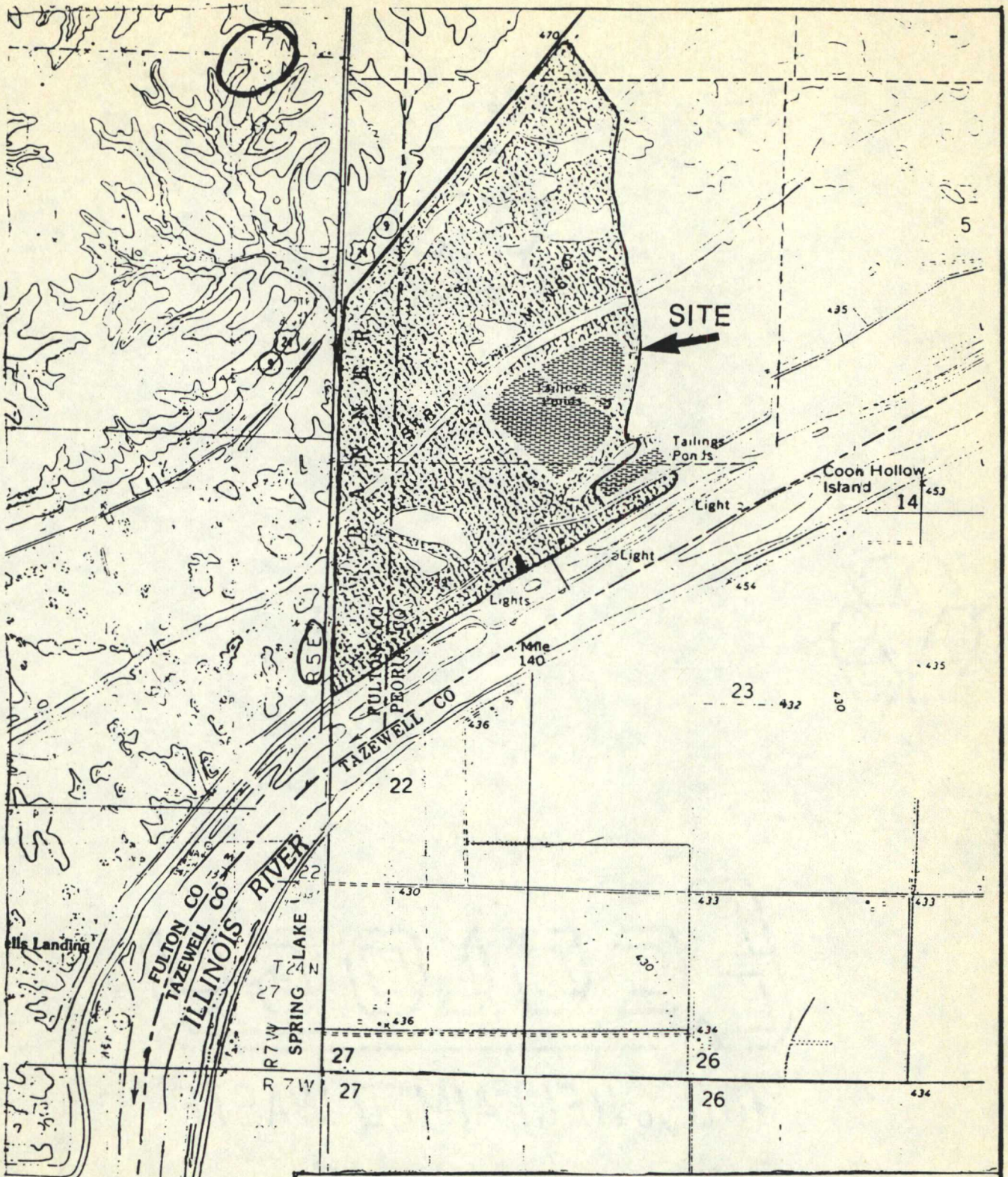
Sampling Required: YES ✓ NO ___

Type: GW ✓ SW ___ Air ___ Soil ✓ Waste ___ Other ___

Sampling Locations Identified: YES ___ NO ✓ To be determined

SUMMARY OF SAMPLING PROCEDURES: (Special Equipment, Facilities, or Procedures)

Collect 5 soil/sediment samples and 5 residential well samples, complete paperwork, package samples and ship to a predetermined lab maintain chain of custody at all times



ecology and environment, inc.

111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415

TITLE: SITE MAP	FIGURE #: 1
SITE: FREEMAN UNITED MINE #27	SCALE: NTS
CITY: GLASFORD STATE: IL.	P.A.N.: FIL0571
SOURCE: USGS TOPO MAP	DATE:
	REVISED:

PRE-HRS

Facility name Freeman United Coal Mining Co. Peoria Co.

Location RR#1 Banner Mine #27, Glasford, IL 61533

FACILITY DESCRIPTION The site is approximatly 1,169 acres and mined No. 2 colchester coal. It is a surface mine and is adjacent to the Illinois River. The site operated from 1959 to 1974 and was never permitted because discharge contained excessive concentrations of dissolved solids.

POTENTIAL SW + GW Scores: $S_M = 14.57$ ($S_{gw} = 24.85$ $S_{sw} = 4.25$ $S_a = 0$) $S_{FE} = 0$ $S_{DC} = 12.5$	OBS. RELEASE SW + GW $S_M = 21.99$ ($S_{gw} = 37.20$ $S_{sw} = 7.97$ $S_a = 0$) $S_{FE} = 0$ $S_{DC} = 12.5$
Potential SW OBS. RELEASE GW $S_M = 21.64$ ($S_{gw} = 37.20$ $S_{sw} = 4.25$ $S_a = 0$) S_{FE} 0 S_{DC} 12.5	Potential GW OBS RELEASE SW $S_M = 15.88$ ($S_{gw} = 24.85$ $S_{sw} = 7.97$ $S_a = 0$) $S_{FE} = 0$ $S_{DC} = 12.5$

PRE-HRS
WORKSHEET
-GW & SW

Groundwater Route

Depth to aquifer of concern	~20 ft	3
Net precipitation	35-34 in	1
Permeability (material type)	clay shale	8
Physical state	liquid	3
Containment (type, degree)	piles, unstabilized, no liner	3
Toxicity; persistence (compounds)	heavy metals	14
quantity	unknown	1
Groundwater use	drinking water	3
Population served	360	16
Nearest well	< 1 mile	

Surface Water Route

Slope and terrain	< 3%	0
24 hr rainfall	2.8 inches	2
Nearest Surface water	< 1000 ft	3
Physical state	liquid	3
Containment (type, degree)	piles, unstabilized, no liner	3
Toxicity; persistence (compounds)	heavy metals	18
quantity	unknown	1
Surface water use	recreation	2
Sensitive environment	N/A	
Intake distance	N/A	
Population served	N/A	

05T:2T

	S	S²
Groundwater Route Score (S_{gw})	24.85	617.52
Surface Water Route Score (S_{sw})	4.25	18.06
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		635.58
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		25.21
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_w =$		14.57

OBSERVED RELEASE

	S	S²
Groundwater Route Score (S_{gw})	37.20	1383.84
Surface Water Route Score (S_{sw})	7.97	63.52
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		1447.36
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		38.04
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_w =$		21.99

OBSERVED RELEASE GW ONLY

	S	S²
Groundwater Route Score (S_{gw})	37.20	1383.84
Surface Water Route Score (S_{sw})	4.25	18.06
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		1401.9
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		37.44
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_w =$		21.64

OBSERVED RELEASE SW ONLY

	S	S²
Groundwater Route Score (S_{gw})	24.85	617.52
Surface Water Route Score (S_{sw})	7.97	63.52
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		681.04
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		26.09
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_w =$		15.08

Ground Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)	OBS. RELEASE
1 Observed Release	0 45	1	0	45	3.1	45
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2						
2 Route Characteristics					3.2	
Depth to Aquifer of Concern	0 1 2 (3)	2	6	6		
Net Precipitation	0 (1) 2 3	1	1	3		
Permeability of the Unsaturated Zone	(0) 1 2 3	1	0	3		
Physical State	0 1 2 (3)	1	3	3		
	Total Route Characteristics Score		10	15		
3 Containment	0 1 2 (3)	1	3	3	3.3	
4 Waste Characteristics					3.4	
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18		
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8		
	Total Waste Characteristics Score		19	26		19
5 Targets					3.5	
Ground Water Use	0 1 2 (3)	3	9	9		
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 (16) 18 20 / 24 30 32 35 40	1	16	40		
	Total Targets Score		25	49		25
6 If line 1 is 45, multiply 1 x 4 x 5 / If line 1 is 0, multiply 2 x 3 x 4 x 5			14250	57,330		21375
7 Divide line 6 by 57,330 and multiply by 100		S_{gw} = 24.85				37.2

FIGURE 2
GROUND WATER ROUTE WORK SHEET

Surface Water Route Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)	OBS. RELEASE
1 Observed Release	0 45	1	1	45	4.1	45
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.						
2 Route Characteristics					4.2	
Facility Slope and Intervening Terrain	(0) 1 2 3	1	0	3		
1-yr. 24-hr. Rainfall	0 1 (2) 3	1	2	3		
Distance to Nearest Surface Water	0 1 2 (3)	2	3	6		
Physical State	0 1 2 (3)	1	3	3		
Total Route Characteristics Score			8	15		
3 Containment	0 1 2 (3)	1	3	3	4.3	
4 Waste Characteristics					4.4	
Toxicity/Persistence	0 3 6 9 12 15 (18)	1	18	18		
Hazardous Waste Quantity	0 (1) 2 3 4 5 6 7 8	1	1	8		
Total Waste Characteristics Score			19	26		19
5 Targets					4.5	
Surface Water Use	0 1 (2) 3	3	6	9		
Distance to a Sensitive Environment	(0) 1 2 3	2	0	6		
Population Served/Distance to Water Intake Downstream	(0) 4 6 8 10 12 16 18 20 24 30 32 35 40	1	0	40		
Total Targets Score			6	55		6
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			2736	64,350		5130
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} = 4.25				7.97

FIGURE 7
SURFACE WATER ROUTE WORK SHEET

Air Route Work Sheet N/A					
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)
1 Observed Release	0 45	1		45	5.1
Date and Location:					
Sampling Protocol:					
If line 1 is 0, the S_a = 0. Enter on line 5. If line 1 is 45, then proceed to line 2.					
2 Waste Characteristics					5.2
Reactivity and Incompatibility	0 1 2 3	1		3	
Toxicity	0 1 2 3	3		9	
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1		8	
	Total Waste Characteristics Score			20	
3 Targets					5.3
Population Within 4-Mile Radius	0 9 12 15 18 21 24 27 30	1		30	
Distance to Sensitive Environment	0 1 2 3	2		6	
Land Use	0 1 2 3	1		3	
	Total Targets Score			39	
4 Multiply 1 x 2 x 3				35,100	
5 Divide line 4 by 35,100 and multiply by 100		S_a =			

FIGURE 9
AIR ROUTE WORK SHEET

Direct Contact Work Sheet						
Rating Factor	Assigned Value (Circle One)	Multi-plier	Score	Max. Score	Ref. (Section)	OBS. RELEASE
1 Observed Incident	0 45	1	0	45	8.1	45
If line 1 is 45, proceed to line 4 If line 1 is 0, proceed to line 2						
2 Accessibility	0 1 2 3	1	3	3	8.2	
3 Containment	0 15	1	15	15	8.3	
4 Waste Characteristics Toxicity	0 1 2 3	5	15	15	8.4	15
5 Targets					8.5	
Population Within a 1-Mile Radius	0 1 2 3 4 5	4	4	20		
Distance to a Critical Habitat	0 1 2 3	4	0	12		
Total Targets Score			4	32		4
6 If line 1 is 45, multiply 1 x 4 x 5 If line 1 is 0, multiply 2 x 3 x 4 x 5			2700	21,600		2700
7 Divide line 6 by 21,600 and multiply by 100		S_{DC} =	12.5			12.5

FIGURE 12
DIRECT CONTACT WORK SHEET

References

USGS Topographic Map
Phone Log to US FWS
Well Logs
Climatic Atlas
Ecology + Environment Inc./FIT file info.