

# START

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Final

Meeting Minutes  
Unit Managers Meeting: 2101-M Pond  
Washington State Department of Ecology  
Kennewick, Washington

Meeting Held January 21, 1992

2101-M Closure Plan, Unit Managers' Approval

Robert G. McLeod Date: 5-27-92  
Robert G. McLeod, Unit Manager, RL, ERD

Elizabeth A. Wiley Date: 5-27-92  
Elizabeth A. Wiley, Unit Manager, Ecology

Not Present Date: \_\_\_\_\_  
Daniel L. Duncan, Unit Manager, EPA Region 10, RCRA Program Manager

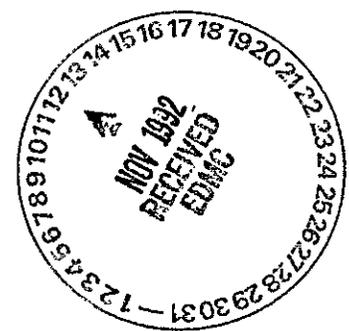
William G. Cox Date: 5/27/92  
William G. Cox, WHC, Contractor Representative  
FA RUCK III

PURPOSE: Monthly status report.

Meeting Minutes are attached.

- Attachment #1 - Meeting Summary of Discussion and Commitments
- Attachment #2 - Meeting Agenda
- Attachment #3 - Commitments/Agreements Status List
- Attachment #4 - Attendance List

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Attachment #1

Unit Managers Meeting  
2101-M Pond  
Meeting Held January 21, 1992

Summary of Discussion

Current Status of Closure Plan

WHC distributed and discussed the handouts (Attachment 5) on the following:

- Brief history and current status of M-Pond.
- Layout of 2101-M Lab, whose effluent discharges to M-Pond.
- Layout of M-Pond, including the surface-runoff ditch, which showed the locations of the soil samples and the four groundwater monitoring wells.
- Soil-sampling results.

Well sampling to date has found no major contamination of the groundwater. Samples from downgradient wells appear to be cleaner than those from upgradient wells. This shouldn't be too surprising since M-Pond receives largely "clean" effluent from 2101 Lab.

Soil samples exceeded the background threshold levels for several contaminants, particularly copper, lead, and zinc.

WHC is in the process of completing an investigation of possible soil standards based on human health and the environment. The study would be used for preparing the 2101-M Closure Plan. WHC presented the preliminary findings of the study, and distributed a handout (Attachment 6). The findings are very encouraging, with copper appearing to be the only contaminant of concern.

NOD issues

Ecology is in the process of reviewing Revision 1 of the Notice of Deficiency (NOD) response table. The sampling data will be reviewed by Ecology's consultant, PTI.

Action Item: WHC will contact Elizabeth Wiley of Ecology to determine if the NOD Response Table has been updated since August 1990.  
Action: F. Ruck

Next Unit Managers Meeting

The next Unit Managers Meeting is tentatively scheduled for Wednesday, March 4, 1992, at a location to be determined.

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Attachment #2

2101-M Pond  
Unit Managers Meeting  
Meeting Held January 21, 1992

Agenda

- Status Sampling Analysis
- Status Ecological Risk Assessment
- New Business

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Attachment #3

Unit Managers Meeting: 2101-M Pond  
Meeting Held January 21, 1992

ACTION ITEM

COMMITMENTS/AGREEMENTS STATUS LIST

6-25-90:3 RL will send a letter to Ecology which will outline a proposed method to resolve the issue of the inclusion of new data in plans. Also included will be a proposed time schedule for the Closure Plan and Sample Plan. Action: Cliff Clark.

CLOSED

7-11-90:1 Send Ecology a copy of all of the data set used in the development of the soil background model strategy. Action: RL/WHC

CLOSED, Remanded to the Site-Wide Permit Meetings

7-11-90:2 The reference for a study which compared intake values for and comparing rats LD<sub>50</sub> v.s. mice. The reference originates from Reference Organisms Condition in the Ecosystem Toxicity section. Action: Jim Hoover.

OPEN

1-10-91:1 Confer with Sue Price and determine that engineering certifications are the same in Closure Plans and Part B applications as well as the Interim Status Closure Plans. Action: Fred Ruck.

CLOSED, Remanded to the Site-Wide Permit Meetings

1-10-90:2 Send a letter to WHC stating agreement with the sampling plan and instructing WHC to proceed with sampling. Action: Megan Lerchen.

CLOSED

2-12-91:1 Ecology will provide letter of agreement with the proposed WHC/RL sampling plan and instruction to proceed with the sampling.

CLOSED

3-12-91:1 RL/WHC will inform Ecology at the next UMM of the date that field sampling will commence. Action: Fred Ruck III

OPEN

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3-12-91:2 WHC will draft a letter for RL to send to Ecology requesting written concurrence on the proposed sampling plan and authorize proceeding with sampling. Action: Fred Ruck III

OPEN

6-4-91:1 WHC will produce a definitive sampling schedule for 2101-M Pond and fax a copy to Megan Lerchen (Ecology) as well as provide a copy to Cliff Clark and Sandy Trine (RL). Action: Fred Ruck III

OPEN

7-11-91:1 Determine what the standard sampling procedures are in regards to maintaining the security of sampling vials and other equipment and report to Ecology. Action: Bill Cox.

OPEN

7-11-91:2 Forward the completed Ecological Risk Assessment to Ecology by the first week in September 1990. Action: Jim Hoover.

OPEN

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Attachment #4

2101-M Pond  
Unit Managers Meeting  
Meeting Held January 21, 1992

Attendance List

<u>Name</u>	<u>Organization</u>	<u>Phone</u>
W.G. Cox	WHC	509-376-1978
K. Donato	SWEC	509-376-8210
J.D. Hoover	WHC	509-376-2268
J.D. King	SWEC	509-376-9709
R.G. McLeod	RL	509-372-0096
T.M. Michelena	Ecology	206-376-7016
M.A. Mihalic	WHC	509-376-0967
A.L. Rodriguez	RL	509-376-0277
M.A. Wasemiller	WHC	509-376-9808
E.A. Wiley	Ecology	206-493-9426

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## 2101-M POND HISTORY

- Built in 1953
- BWIP Lab built from 1979 to 1981
- Administrative controls in 1985
- Initial Part A submitted 8/1986
- Area drainage improvements 1986
- BWIP termination 12/1987
- Lab operations ceased 4/1988
- Initial soil sampling in 1988
- Groundwater monitoring in 1988
- TPA Milestone (M-20-04) 9/1989

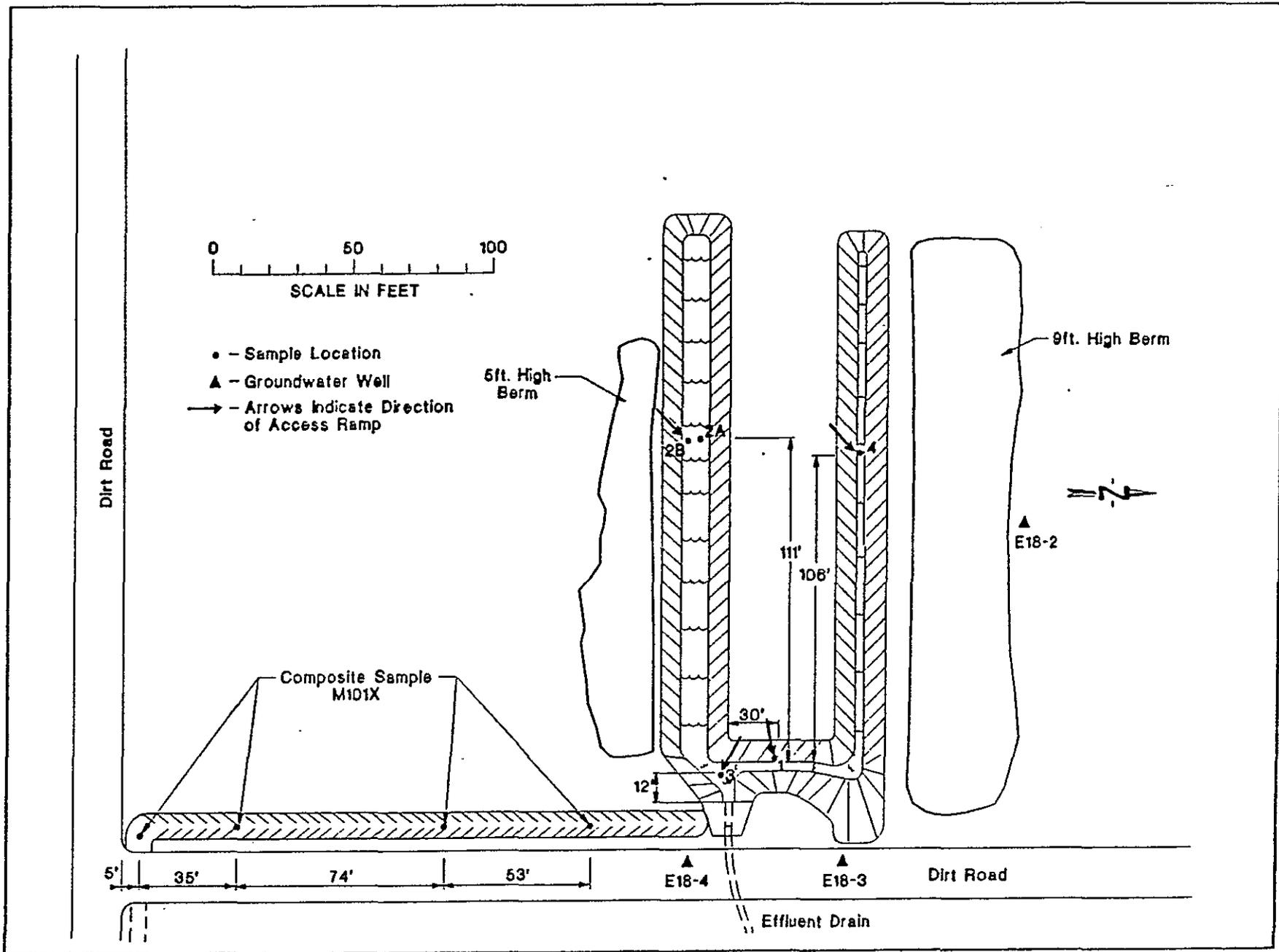
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# 2101-M POND

## HISTORY continued...

- Received NOD comments 12/1989
- Revision 1 submitted 4/1991
- Phase II sampling complete 6/1991

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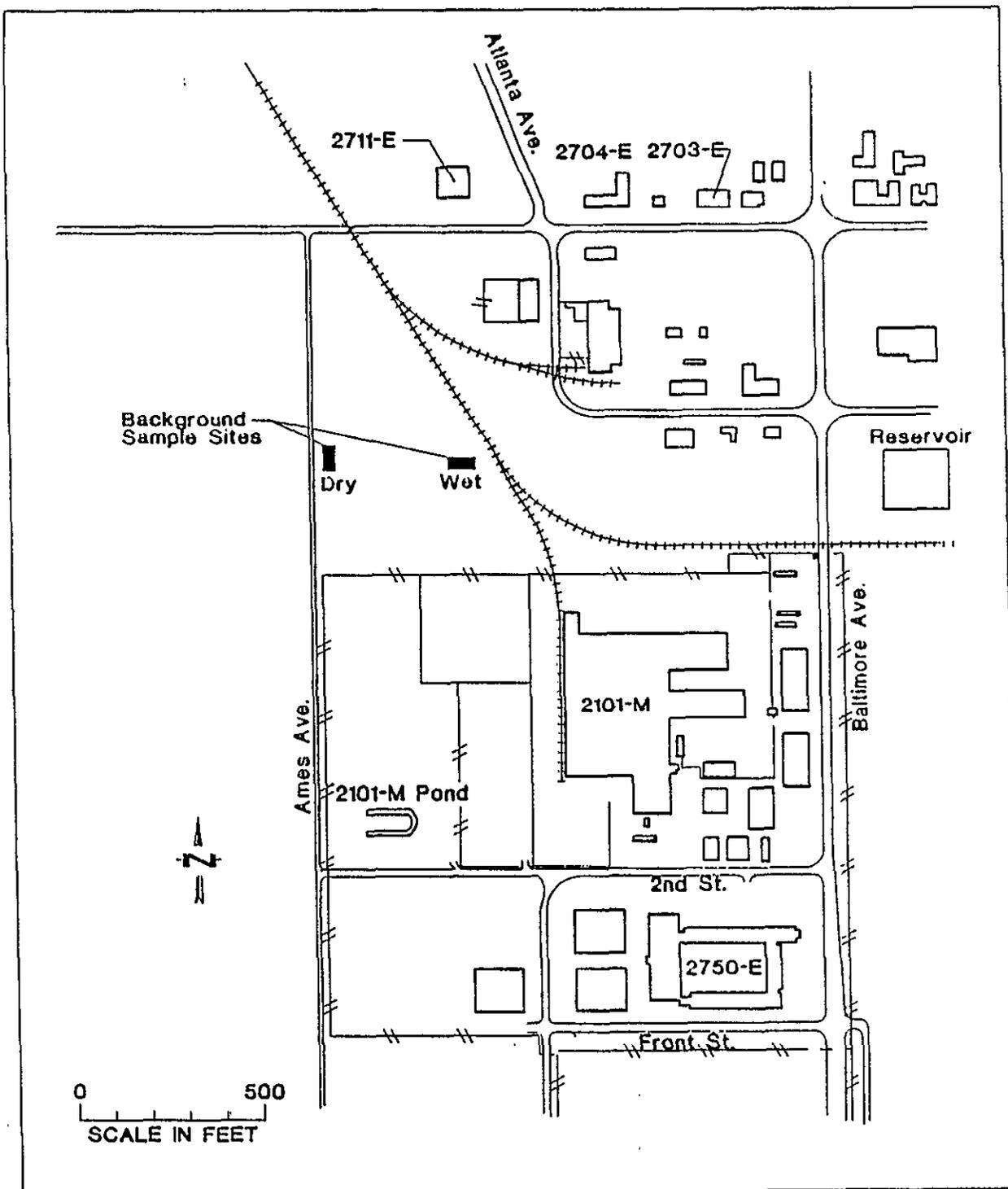


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DOE/RL 88-41  
DRAFT 09/89

Figure B-2. Sample Sites Location Map.

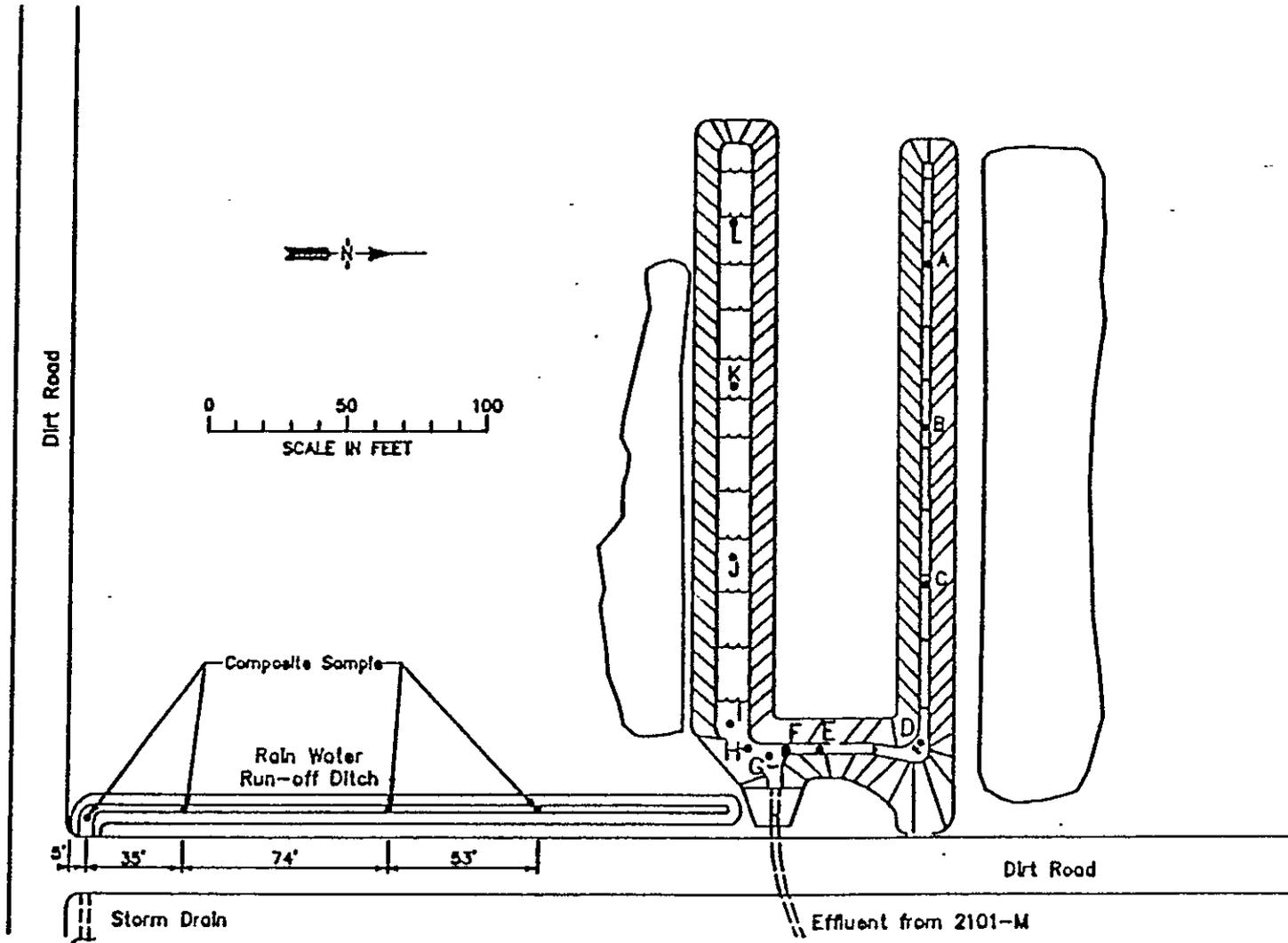
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Figure B-3. Location of Background Sample Sites.

APP E1-12



DOE/RL 88-41  
Revision 1

Proposed Soil Sample Points  
2101-M Phase II

MAV071190-A

Figure E1-2. Sample Points for 2101-M Pond.

SMALL COOLING TOWER: INOPERATIVE.  
SMALL EVAPORATOR TOWER: INOPERATIVE  
1--25 TON A/C UNIT.  
2--EXHAUST FANS.

FIRE SYSTEM TEST & ---  
AIR COMPRESSOR DRAIN

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SYMBOL LIST

- |     |
|-----|
| H/C |
| #   |

 HEATING/COOLING UNITS  
(QUAN 9)
- |    |
|----|
| UH |
|----|

 UNIT HEATER  
(QUAN 13)
- |   |
|---|
| S |
|---|

 SINK  
(QUAN 14)
- |   |
|---|
| H |
|---|

 HOOD W/DRAIN  
(QUAN 8)
- LPO: LOW PRESSURE DRAIN
- SW: SANITARY WASTE

U.S. DEPARTMENT OF ENERGY Building Research Office Washington, Virginia Building	
<h2>2101-M DRAINS</h2>	
F	CC 52810A

Figure I-10. 2101-M Building Drains.

Table B-10. Background Threshold Exceedances.

Constituent	Background threshold (ppm)	Level of occurrence (ppm)	Location	Significance (times higher)
Copper	11.9	1,340	Discharge (0-2 ft)	112.6
		270	North arm (0-2 ft)	22.7
		51.6	South arm (0-2 ft)	4.3
		42.9	South arm (2.5-4.5 ft)	3.6
		19	East arm (0-2 ft)	1.6
Ammonium	2.8	4.3	North arm (0-2 ft)	1.5
		3.8	Discharge (10-12 ft)	1.4
		3.6	North arm (5-7 ft)	1.3
		3.2	North arm (10-12 ft)	1.1
Zinc	112	220	Discharge (0-2 ft)	2
		137	East arm (10-12 ft)	1.2
Strontium	42.5	55.3	North arm (5-7 ft)	1.3
Vanadium	83.8	86.8	East arm (2.5-4.5 ft)	1.04
Lead	12.7	35.2	Discharge (0-2 ft)	2.8
Fluoride	3.1	15.2	Discharge (0-2 ft)	4.9
		3.3	South arm (0-2 ft)	1.1
TOC	157	318	Discharge (0-2 ft)	2

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DOE/RL 88-41  
Revision 1

Table B-10. Background Threshold Exceedances.

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Constituent	Background threshold (ppm)	Level of occurrence (ppm)	Location	Significance (times higher)
Copper	11.9	1,340	Discharge (0-2 ft)	112.6
		270	North arm (0-2 ft)	22.7
		51.6	South arm (0-2 ft)	4.3
		42.9	South arm (2.5-4.5 ft)	3.6
		19	East arm (0-2 ft)	1.6
Ammonium	2.8	4.3	North arm (0-2 ft)	1.5
		3.8	Discharge (10-12 ft)	1.4
		3.6	North arm (5-7 ft)	1.3
		3.2	North arm (10-12)	1.1
Zinc	112	220	Discharge (0-2 ft)	2
		137	East arm (10-12 ft)	1.2
Strontium	42.5	55.3	North arm (5-7 ft)	1.3
Vanadium	83.8	86.8	East arm (2.5-4.5 ft)	1.04
Lead	12.7	35.2	Discharge (0-2 ft)	2.8
Fluoride	3.1	15.2	Discharge (0-2 ft)	4.9
		3.3	South arm (0-2 ft)	1.1
TOC	157	318	Discharge (0-2 ft)	2.0

Attachment 6

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DOE/RL 88-41  
Revision 1

Attachment #6

Constituent	2101-M Background Threshold (mg/kg)	Site-Wide Background Threshold* (mg/kg)
Ammonia	3	40
Copper	12	39
Fluoride	3	16
Lead	13	18
Vanadium	84	111
Zinc	112**	85/112**

\* Provisional data; 95/95 threshold

\*\* Based on non-parametric threshold

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site-wide

Table B-10. Background Threshold Exceedances.

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Constituent	Background threshold (ppm)	Level of occurrence (ppm)	Location	Significance (times higher)
Copper	<del>11.9</del>	1,340	Discharge (0-2 ft)	112.6
	39	270	North arm (0-2 ft)	22.7
		51.6	South arm (0-2 ft)	4.3
		42.9	South arm (2.5-4.5 ft)	3.6
		<del>19</del>	<del>East arm (0-2 ft)</del>	1.6
Ammonium	<del>2.8</del>	<del>4.3</del>	North arm (0-2 ft)	1.5
	40	<del>3.8</del>	Discharge (10-12 ft)	1.4
		<del>3.6</del>	North arm (5-7 ft)	1.3
		<del>3.2</del>	North arm (10-12)	1.1
Zinc	112	220	Discharge (0-2 ft)	2
		137 104	East arm (10-12 ft)	1.2
Strontium	42.5	55.3	North arm (5-7 ft)	1.3
Vanadium	<del>83.8</del> 111	<del>86.8</del>	East arm (2.5-4.5 ft)	1.04
Lead	<del>12.7</del> 18	35.2	Discharge (0-2 ft)	2.8
Fluoride	<del>3.1</del> 16	<del>15.2</del>	Discharge (0-2 ft)	4.9
		<del>3.3</del>	South arm (0-2 ft)	1.1
TOC	157	318	Discharge (0-2 ft)	2.0

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DOE/RL 88-41  
Revision 1

## 2101-M Health Effects Table

Constituent	RfD values; Information source in parentheses	MTCA	MTCA	MTCA	MTCA
		Chronic Toxic Threshold (mg/kg) Residential Exposure	Chronic Toxic Threshold (mg/kg) Industrial Exposure	Residential Exposure Exceedances	Industrial Exposure Exceedances
Ammonia	0.97 (a)	77,600	≥ 1E+06	none	none
Copper	0.037 (b)	2,960	129,500	none	none
Fluoride	0.06 (c)	4,800	210,000	none	none
Lead	0.014 (b)	1,120	49,000	none	none
Vanadium	0.007 (a)	560	24,500	none	none
Zinc	0.2 (a)	16,000	700,000	none	none

(a) Health Evaluation Assessment Summary Tables (HEAST)

(b) Superfund Public Health Evaluation Manual (PHEM)

(c) Integrated Risk Information System (IRIS)

Table B-11 Industrial/Worker Exposure Model

Based on MTCA Soil Cleanup Standards For Industrial Sites: WAC 173-340-745(4)

$$\text{Soil Cleanup Level} = \frac{\text{RFD} \times \text{ABW} \times \text{UCF2} \times \text{HQ}}{\text{SIR} \times \text{AB1} \times \text{FOC}}$$

(mg/kg)

Where:

RFD = Reference Dose as specified in WAC 173-340-708 (7) (mg/kg/day)

ABW = Average body weight over the period of exposure (70 kg)

UCF2 = Unit conversion factor (1,000,000)

SIR = Soil ingestion rate (50 mg/day)

AB1 = Gastrointestinal absorption rate (1.0)

FOC = Frequency of contact (0.4)

HQ = Hazard Quotient (1.0)

Daily Intake = Soil ingestion rate x constituent concentration in soil

$$\text{Average Daily Dose (ADD)} = \frac{\text{Daily intake}}{\text{ABW}} = \frac{\text{Daily intake}}{70 \text{ kg}}$$

(from ingestion)

$$\text{Hazard Quotient} = \frac{\text{Average Daily Dose}}{\text{Reference dose (RFD)}}$$

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Table B-13. Daily Dose and Hazard Quotient.

Constituent	Daily Dose (ADD) (mg/kg/day)	Reference Dose (RFD) (mg/kg/day)	Hazard Quotient (a)
Copper	3.82E-04	0.037	1.03E-02
Zinc	5.61E-05	0.2	2.80E-04
Lead	8.15E-06	0.014	5.82E-04
Vanadium	2.50E-05	0.007	3.57E-03
Ammonium	1.68E-05	0.97	1.73E-05
Fluoride	4.34E-06	0.06	7.23E-05
Toluene	2.04E-08	0.2	1.02E-07
Methylene Chloride	8.15E-09	0.06	1.36E-07
Chromium	4.59E-06	0.037	1.24E-04
Cadmium	1.12E-06	0.001	1.12E-03
Arsenic	1.12E-06	0.001	1.12E-03
Total of Hazard Quotients =			0.01721

(a) Hazard Quotient = Daily Dose/Reference Dose

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**Summary of the parameters used in assessing rodent acute and chronic toxicity**

<u>Parameters</u>	<u>Acute Toxicity</u>	<u>Chronic Toxicity</u>
Average body weight	25 g	25 g
Daily food consumption rate	3g/day	3g/day
Daily soil consumption rate	0.06 g/day	0.06 g/day
Duration of exposure	48 hrs	24 months (lifetime)
Dose response data	Acute LD50	Chronic LD50, LDL0, TDLO

LD50 = lethal dose 50% of the population.

LDL0 = lowest dose found to be lethal to any tested organism

TDLO= lowest dose resulting in any sublethal effects (e.g., adverse reproductive effects)

Daily soil consumption rate is <2% of the food consumption rate based on scat ashing studies and U.S. Department of Health data on food consumption rate for mice.

## Sample Calculations

$$\begin{array}{l} \text{Acute} \\ \text{Toxicity} \\ \text{Threshold for} \\ \text{Copper in} \\ \text{the 2101-M} \\ \text{Pond soil} \\ \text{(mg/kg)} \end{array} = \frac{\text{LD50 (mg/kg) x body mass (kg)] x Conversion factor}}{\text{Soil Ingestion Rate (mg/day) x Acute Exposure Duration (days)}}$$

$$= \frac{50 \text{ mg Cu/kg soil} \times 0.025 \text{ kg body weight} \times 10^6 \text{ mg soil/kg soil}}{0.06 \text{ mg soil/day} \times 2 \text{ days}}$$

$$\begin{array}{l} \text{Chronic toxicity threshold} \\ \text{for Copper in the} \\ \text{2101-M Pond Soil} \\ \text{(mg/kg)} \end{array} = \frac{\text{Chronic dose (mg Cu/kg body weight/day) x Body weight (kg) x Conversion factor}}{\text{soil ingestion rate (mg/day)}}$$

$$= \frac{0.05 \text{ mg Cu/kg body weight/day} \times 0.025 \text{ kg body weight} \times 10^6 \text{ mg soil/kg soil}}{0.06 \text{ mg soil/day}}$$

\*Only maximum values were used in the calculations.

\*\* TDL0 values were used for Copper and Lead because LD values were unavailable

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Constituent	Acute (4hr) rodent LD50(a) mg/kg-BW	Rodent Chronic toxicity dose (b) mg/kg-BW/day	Rodent Chronic toxicity dose (c) mg/kg-BW/day	Body Mass (d) kg	Soil Ingestion Rate (e) SIR g/day	Soil Conc. required to produce an acute toxic effect (48 hr accumulation) mg/kg soil (ppm)	Soil Conc. required to produce a chronic toxic effect (c) mg/kg soil (ppm)	Soil Conc. required to produce a chronic toxic effect (b) mg/kg soil (ppm)
Copper	600	0.6	10	0.025	0.06	125,000	4,167	250
Ammonium	1650	1.65		0.025	0.06	343,750		688
Zinc	2510	2.51		0.025	0.06	522,917		1,046
Strontium	2250	2.25		0.025	0.06	468,750		937.5
Vanadium	540	0.54		0.025	0.06	112,500		225
Fluoride*	6000	6		0.025	0.06	>100%		2,500
Lead	790	0.79	30 (rat)	0.025	0.06	164,583	12,500 (rat)	329
Lead			52 (mouse)				21,667 (mouse)	

(a) Based on rat dose response toxicity data per unit mass body weight

(b) Based on acute LD50/1000; (Layton, Mallon, Rosenblatt, and Small, 1987.

Deriving Allowable Daily Intakes for Systemic Toxicants Lacking Chronic Toxicity Data,  
Regulatory Toxicology and Pharmacology, v. 7, pg. 96-112.

(c) Based on TDLO/10; TDLO=LOEC; LOEC/10=NOEC; NOEC=ADI (acceptable daily intake)

(d) Mouse body weight (U.S. Dept. Health & Human Services)

(e) Based on 2% of daily food ingestion rate (3 g/day; U.S. Dept. Health & Human Services) from scat ashing studies.

\* Conservative estimate of LD50 based on human NOEL/1.0E-05; (Layton, Mallon, Rosenblatt, and Small, 1987).

Constituent	Acute Toxicity Exceedances	Chronic Toxicity Exceedances; Soil Concentration (TDLO-based) (b) mg/kg soil (ppm)	Chronic Toxicity Exceedances; Soil Concentration (LD50-based) (a) mg/kg soil (ppm)
Copper	none	none	1340 mg/kg (Outfall; 0-2 ft) 270 mg/kg, (North arm; 0-2 ft)
Ammonium	none	none	none
Zinc	none	none	none
Fluoride	none	none	none
Strontium	none	none	none
Vanadium	none	none	none
Lead (rat)	none	none	none
Lead (mouse)	none	none	none

- (a) Based on acute LD50/1000; (Layton, Mallon, Rosenblatt, and Small, 1987. Deriving Allowable Daily Intakes for Systemic Toxicants Lacking Chronic Toxicity Data, Regulatory Toxicology and Pharmacology, v. 7, pg. 96-112.
- (b) Based on TDLO/10; TDLO=LOEC; LOEC/10=NOEC; NOEC=ADI (acceptable daily intake)

Distribution:

E.A. Bracken RL (A5-19)  
R.M. Carosino RL (A4-52)  
C.E. Clark RL (A5-15)  
W.G. Cox WHC ~~(S5-65)~~ H4-57  
D.L. Duncan EPA ~~(HW-124)~~ HW-106  
K.R. Fecht WHC (H4-56)  
C.J. Geier WHC (B2-19)  
J.D. Hoover WHC (H4-57)  
R.D. Izatt RL (A5-15)  
G.W. Jackson WHC ~~(R2-29)~~ B2-35  
R.N. Krekel RL (A5-15)  
R.J. Landon WHC (B2-19)  
R.E. Lerch WHC (B2-35)  
R.G. McLeod RL (A5-19)  
H.E. McGuire WHC (B2-35)  
M.A. Mihalic WHC (L4-88)  
F.A. Ruck III WHC (H4-57)  
M.A. Wasemiller WHC (H4-55)  
E.A. Wiley Ecology  
B. Woods EPA

GSSC RCRA UMM File, A4-35

EDMC

ADMINISTRATIVE RECORD (2101-M) [Care of Susan Wray, WHC (H4-22)]

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Please send comments on distribution list to Joe King, 376-4726.