Bureau of Waste Management
Curtis State Office Building
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Robert Moser, MD, Secretary.

Kansas
Department of Health & Environment

phone: 785-296-1600
fax: 785-296-1592
email: bwmweb@kdheks.gov
www.kdheks.gov/waste

Sam Brownback, Governor

January 31, 2013

Mr. Rob Exline, President
Exline, Inc.
P.O. Box 1487
Salina, KS 67402

RE: Financial Assurance Variance
Exline, Inc. - Salina, Kansas
EPA RCRA ID No. KSD007127327

Dear Mr. Exline:

The Kansas Department of Health and Environment (KDHE) is in the process of renewing the Hazardous Waste Management Facility Permit for Exline, Inc. Review of the Part B Permit Application has revealed that Exline wishes to extend an existing variance from the financial assurance requirements of 40 CFR 264.145. This variance allowed the Permittee to demonstrate financial assurance for a lesser amount than the approved post-closure cost estimate. As required by K.A.R. 28-31-13(d), Exline must submit a request, in writing, to extend the variance. The request must demonstrate the need for continuation of the variance. Furthermore, Exline must demonstrate that the requested variance meets the requirements of K.A.R. 28-31-13(a). Current applicable regulations can be found at: http://www.kdheks.gov/waste/regsstatutes/hw_laws.pdf. Please provide all supporting documentation regarding the request for variance no later than February 15, 2013. If you have questions regarding this letter, please contact our Financial Assurance Auditor, Brian Busby, at (785) 296-0680.

Sincerely,

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permitting Section

cc: Max Shepard - Shepard Engineering
Lisa Gotto - EPA Region 7 AWMD/RCAP
Jennifer Nichols – KDHE/NCDO
Bill Bider – BWM

Shepard Engineering, Inc.

65 Ash Lane • Bennington, KS 67422 • (785) 488-3336 • Fax: (785) 488-2955 • e-mail: shepard@twinvalley.net

January 29, 2013

RECEIVED
BUREAU OF WASTE MANAGEMENT

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permitting Section
Kansas Department of Health and Environment
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Re: 2012 Annual Groundwater Corrective Action Monitoring Report
Exline, Inc., Salina, Kansas
EPA ID No. KSD 007127327
SEI File No. 13-010C

Dear Mr. Pfeiffer:

I have attached one copy of the 2012 (annual) Groundwater Corrective Action Monitoring Report for the Exline facility.

Please contact me if you have any questions or need additional information.

SHEPARD ENGINEERING, INC.

M Shepard

Max Shepard, P.E.
President

cc: Steve Puttbrese – Exline, Inc. (letter and one copy of report)
Rob Exline – Exline, Inc. (letter only)
Vince DePhillips – Exline, Inc. (letter only)
Lisa Gotto – EPA Region 7 (letter and one copy of report)

Enc.

Shepard Engineering, Inc.

65 Ash Lane • Bennington, KS 67422 • (785) 488-3336 • Fax: (785) 488-2955 • e-mail: shepard@twinvalley.net

January 24, 2013

Ryan Pfeiffer
Hazardous Waste Permitting Section
Kansas Department of Health and Environment
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

RECEIVED
FEB 04 2013
AWMD/WRAP-KNRP

Re: Revised RCRA Post-Closure Permit Renewal Application
Signature Pages
Exline, Inc., Salina, Kansas
EPA ID No. KSD 007127327
SEI File No. 13-010G

Dear Mr. Pfeiffer:

The RCRA Post Closure Renewal Permit Application for the Exline facility was recently sent to your office. As noted in my January 18, 2013 e-mail, two signature pages were not included with the permit application. These pages are attached:

1) Page 3 of 10 from Part A permit application.
2) Post-Closure Permit Application Document Certification.

Please note that I have also included pages 2 (of 10) and 4 (of 10) of the Part A permit application. Please place all three (3) pages (pages 2, 3, and 4) in the 3-ring binder and remove pages 2 and 4 from the original document. The original document included pages 2 and 4 on the same page (i.e., pages 2 and 4 were inadvertently copied 2-sided).

The "Documents Certification" page should be placed at the front of the Permit Application.

Please contact me if you have any questions or need additional information.

SHEPARD ENGINEERING, INC.

M Shepard

Max Shepard, P.E.
President

cc: Steve Puttbrese – Exline, Inc. (letter and one copy of attachments)
Rob Exline – Exline, Inc. (letter, only)
Vince DePhillips – Exline, Inc. (letter, only)
Lisa Gotto – EPA Region 7 (letter and one copy of attachments)

Enc.

RCRA
522509

EXLINE, INC.

POST-CLOSURE PERMIT APPLICATION

DOCUMENT CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Exline, Inc.

Signature: _____
Robert W. Exline, Jr., President

Date: 1-22-13

	B. Name of Site's Operator:	Date Became Operator (mm/dd/yyyy):
	Exline, Inc.	01/24/1994
	Operator Type: ☒ Private • County • District • Federal • Indian • Municipal • State • Other	

10. Type of Regulated Waste Activity (Mark the appropriate boxes for activities that apply to your site. See pages 7-11 of the instructions)

A. Hazardous Waste Activities

1. Generator of Hazardous Waste (Choose only one of the following three classifications)

• • a. EPA: 1,000 kg/mo (2,200 lbs in any single mo.) or more of non-acute hazardous waste, greater than 1 kg of acute hazardous waste;
or
☒ b. KSG Sub-Class 1: 100 kg or more and less than 1,000 kg (220 - 2,200 lbs in any single mo.) of non-acute hazardous waste;
or
• • b. KSG Sub-Class 2: 25 kg or more and less than 100 kg (55 - 220 lbs in any single mo.) of non- acute hazardous waste;
or
• • c. SQG: Less than 25 kg/mo (55 lbs./mo.) of non-acute hazardous waste

In addition, indicate other generator activities. (Mark all that apply)

• • d. United States Importer of Hazardous Waste

• • e. Mixed Waste (hazardous and radioactive) Generator

For Items 2 through 6, mark all that apply.

• • **2. Transporter of Hazardous Waste**

☒ **3. Treater, Storer, or Disposer of Hazardous Waste (at your site)** Note: A hazardous waste permit is required for this activity.

• • **4. Recycler of Hazardous Waste (at your site)** Note: A hazardous waste permit may be required for this activity.

5. Exempt Boiler and/or Industrial Furnace

• • a. Small Quantity On-site Burner Exemption

• • b. Smelting, Melting, and Refining Furnace Exemption

• • **6. Underground Injection Control**

B. Universal Waste Activities

1. Large Quantity Handler of Universal Waste (accumulate 5,000 kg or more) [refer to Kansas regulations to determine what is regulated]. Indicate types of universal waste generated and/or accumulated at your site. (Mark all boxes that apply):

	Generate	Accumulate
a. Batteries	•	•
b. Pesticides	•	•
c. Thermostats	•	•
d. Lamps	•	•
e. Other (specify) _____	•	•
f. Other (specify) _____	• •	• •
g. Other (specify) _____	•	•

• • **2. Destination Facility for Universal Waste**

Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities (Mark all boxes that apply.)

1. Used Oil Transporter - Indicate Type(s) of Activity(ies)

• • a. Transporter

• • b. Transfer Facility

2. Used Oil Processor and/or Re-refiner - Indicate Type(s) of Activity(ies)

• • a. Processor

• • b. Re-refiner

• • **3. Off-Specification Used Oil Burner**

4. Used Oil Fuel Marketer - Indicate Type(s) of Activity(ies)

• • a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner

• • b. Marketer Who First Claims the Used Oil Meets the Specifications

11. Description of Hazardous Wastes (See page 11 of the instructions)

Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	D002	D007	D008	D009	D018	D039
D040	F001	F002	F006			

12. Comments (See page 11 of the instructions)

13. Certification. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. **(See page 11 of the instructions)**

Signature of owner, operator, or an authorized representative	Name and Official Title (type or print)	Date Signed (mm/dd/yyyy)
	Robert Exline, President	01/22/2013

MAIL TO:
KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
BUREAU OF WASTE MANAGEMENT
1000 SW JACKSON, SUITE 320
TOPEKA, KS 66612-1366

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT INFORMATION FORM (8700-23)

1. Facility Permit Contact (See instructions on page 16)	**First Name:** Steve	**MI:**	**Last Name:** Puthbrese
	Phone Number: 785-825-4683		**Phone Number Extension:**
2. Facility Permit Contact Mailing Address (See instructions on page 16)	**Street or P.O. Box:** 3256 E. Country Club Road		
	City, Town, or Village: Salina		
	State: KS		
	Country: USA		**Zip Code:** 67422
3. Legal Owner Mailing Address and Telephone Number (See instructions on page 17)	**Street or P.O. Box:** PO Box 1487		
	City, Town, or Village: Salina		
	State: KS		
	Country: USA	**Zip Code:** 67402-1487	**Phone Number** 785-825-4683
4. Operator Mailing Address and Telephone Number (See instructions on page 17)	**Street or P.O. Box:** 3256 E. Country Club Road		
	City, Town, or Village: Salina		
	State: KS		
	Country: USA	**Zip Code:** 67401	**Phone Number** 785-825-4683
5. Facility Existence Date (See instructions on page 17)	**Facility Existence Date (mm/dd/yyyy):** 04/01/1970		

6. Other Environmental Permits (See instructions on page 17)

A. Permit Type *(Enter code)*	B. Permit Number	C. Description
E	0002	City of Salina Industrial Wastewater Discharge Permit

7. Nature of Business (Provide a brief description; see instructions on page 18)

Repair and manufacture of parts for large stationary engines, compressors, and various types of mechanical equipment.

Shepard Engineering, Inc.

65 Ash Lane • Bennington, KS 67422 • (785) 488-3336 • Fax: (785) 488-2955 • e-mail: shepard@twinvalley.net

January 18, 2013

RECEIVED
BUREAU OF WASTE MANAGEMENT

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permitting Section
Kansas Department of Health and Environment
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Re: Revised RCRA Post-Closure Permit Renewal Application
Exline, Inc., Salina, Kansas
EPA ID No. KSD 007127327
SEI File No. 13-010G

Dear Mr. Pfeiffer:

The RCRA Post Closure Permit Renewal Application has been revised in order to address the items that were enumerated in your December 19, 2012 letter to Rob Exline. A copy (3-ring binder) of the revised permit application is attached.

Thank you for your assistance with this project. Please contact me if you have any questions or need additional information.

SHEPARD ENGINEERING, INC.

M. Shepard

Max Shepard, P.E.
President

cc: Steve Puttbrese – Exline, Inc. (letter and one copy of attachment)
Rob Exline – Exline, Inc. (letter, only)
Vince DePhillips – Exline, Inc. (letter, only)
Lisa Gotto – EPA Region 7 (letter and one copy of attachment)

Enc.

HAZARDOUS WASTE POST-CLOSURE PERMIT RENEWAL APPLICATION

EXLINE, INC.
SALINA, KANSAS

EPA ID Number: KSD007127327

MAX SHEPARD
LICENSED
9648
1/14/13
KANSAS
PROFESSIONAL ENGINEER

June, 2012
Revised January, 2013

Shepard Engineering, Inc.

EXLINE, INC

POST-CLOSURE PERMIT APPLICATION

DOCUMENT CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted Based on my inquiry of the person or persons directly responsible for gathering the information the information submitted is, to the best of my knowledge and belief, true, accurate, and complete I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations

Exline, Inc

Signature _____

Robert W Exline Jr President

Date 1-22-13

SECTION 1 –INTRODUCTION

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

1. INTRODUCTION

This application for a hazardous waste permit has been prepared in accordance with the requirements of Chapter 40 of the Code of Federal Regulations (CFR) Parts 270.13, 270.14 and 270.17. The information submitted herein addresses the closed hazardous waste surface impoundment and corrective action (groundwater treatment) system located at the Exline, Inc. (Exline) facility, Salina, Kansas. Plate 1.1 is a site location map of the subject facility.

Exline manufactures and rebuilds large stationary industrial engines and engine parts. Chrome plating was performed at the facility from 1968 to early 2001. In 1968, Exline began discharging chrome plating bath waste to an on-site surface impoundment, which was intended to act as a non-overflow evaporation basin. Other wastes discharged to the impoundment included steam cleaning rinse water, deionizer column regenerant, reverse strip-sodium chromate solution, and caustic cleaner waste. Exline notified the Environmental Protection Agency (EPA) of hazardous waste activity and submitted a Part A application in 1980. A synthetic liner was installed in the surface impoundment during that same year and it was subsequently discovered that the impoundment holding capacity was rapidly being approached.

Further investigation led to the conclusion that infiltration had occurred prior to liner installation. Monitor wells were installed and groundwater investigation revealed that chromium contamination had occurred in the aquifer underlying the Exline site.

The liquid waste in the surface impoundment was transferred to aboveground storage tanks and the surface impoundment was closed in August of 1984.

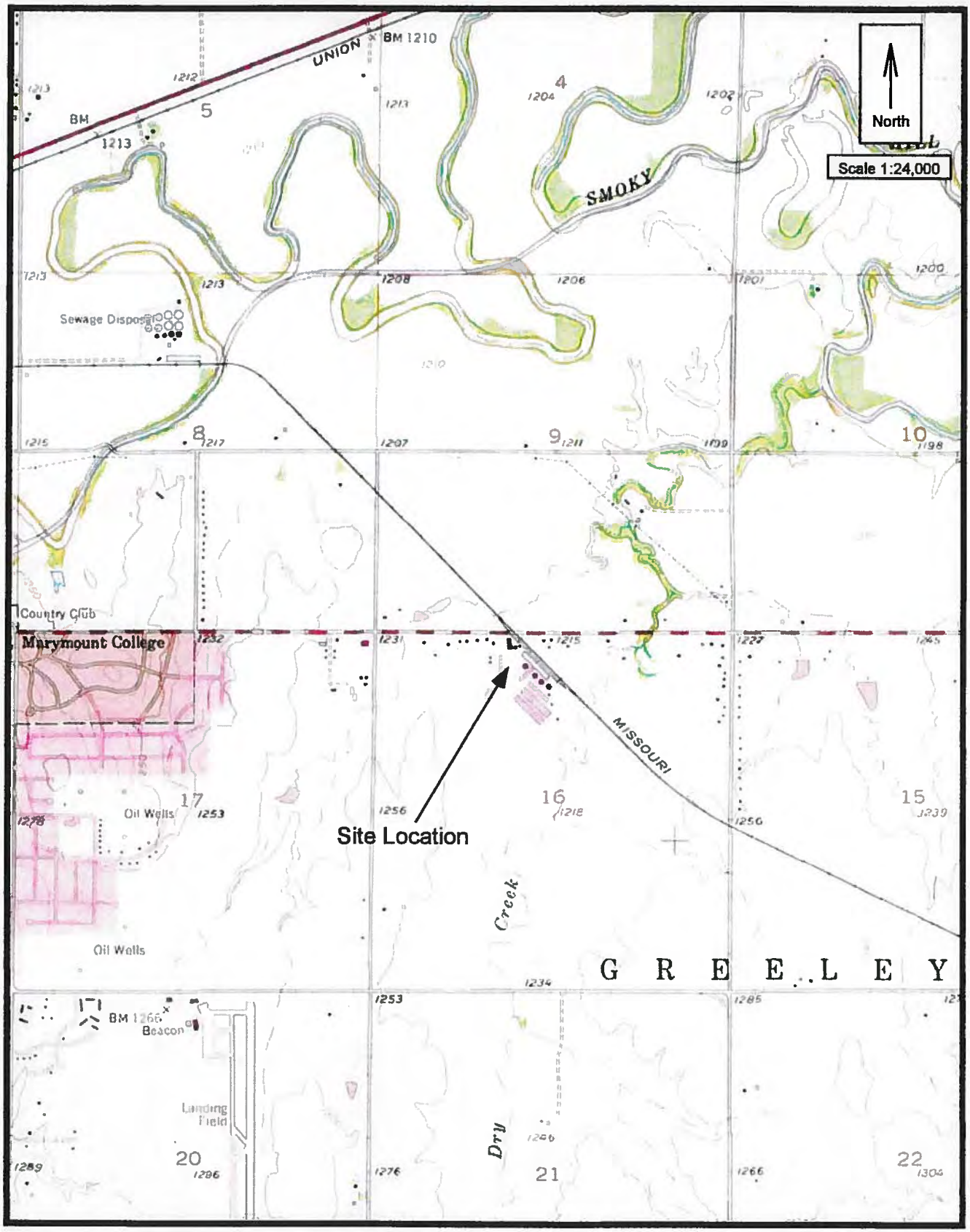
A groundwater treatment system was constructed and treatment started in February 1984 and operated until early 2004. After a follow-up hydrologic investigation was completed in November 1987, two additional groundwater removal wells were installed. The groundwater treatment flow rate was increased from 10 gallons per minute to 35 gallons per minute on April 27, 1988. When the treatment system was operating, the groundwater was treated with sodium bisulfite, sulfuric acid, and calcium hydroxide (lime) to reduce and precipitate chromium as the hydroxide. Since the untreated groundwater chromium concentrations have decreased to levels below the discharge limit set forth in the Exline Industrial Wastewater Discharge permit, the recovered groundwater is discharged directly to the City of Salina Public Owned Treatment Works (POTW). Regulated parameters include pH and total chromium.

In the unlikely event that future groundwater treatment would be required (e.g., City permit limit is lowered and/or groundwater chromium concentrations increased), Exline would install an ion exchange system to remove hexavalent chromium. As a result, the former groundwater treatment system has been removed.

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

SECTION 1 – INTRODUCTION
TABLE OF CONTENTS

Section		Page No.
1. Introduction		1-1
Plate 1.1	follows	1-1



Map Source: USGS 7.5 Minute Topographic Map, Salina, 1978

Plate 1.1: Site Location Map

SECTION 2 –PART A PERMIT APPLICATION

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

SECTION 2 – PART A PERMIT APPLICATION
TABLE OF CONTENTS

Section		Page No.
2. Part A Permit Application		2-1
Notification of Regulated Waste Activity for KS TSD Facilities	follows	2-1
Plate 2-1 Topographic Map	follows	2-1
Plate 2-2: Facility Drawing	follows	2-1
Figure 2-1: Closed Surface Impoundment Photographs	follows	2-1

2. PART A PERMIT APPLICATION

This section fulfills the requirements of 40 CFR, Part 270.13 which addresses the contents of the Part A hazardous waste permit application. Exline, Inc. originally completed a Part A application form on November 13, 1980. Up-dated Part A applications were submitted in 1989, 1994, and 2002. A revised Part A application has been completed to update information and reflect changes, which have occurred since the most recent application was submitted.

MAIL COMPLETED 8700-12 FORM TO: KDHE-BWM 1000 SW Jackson, Suite 320, Topeka, KS 66612-1366	Kansas Department of Health and Environment **Notification of Regulated Waste Activity for Kansas Treatment, Storage, and Disposal Facilities** KANSAS FORM 8700-23 (RCRA SUBTITLE C SITE IDENTIFICATION FORM)	

1. Reason for Submittal (See page 4 of the instructions) MARK ALL BOX(ES) THAT APPLY	**Reason for Submittal:** ☐ To provide Initial Notification of Regulated Waste Activity (to obtain an EPA ID Number) ☒ To provide Subsequent Notification of Regulated Waste Activity (to update information) ☐ As a component of a FIRST–Kansas RCRA Hazardous Waste Part A Permit Application ☒ As a component of a REVISED–Kansas RCRA Hazardous Waste Part A Permit Application ☐ As a component of the Hazardous Waste Report	
2. Site EPA ID Number (See page 5 of the instructions)	**EPA ID Number:** KSD007127327	
3. Site Name (See page 5 of the instructions)	**Name:** Exline, Inc.	
4. Site Location Information (See page 5 of the instructions)	**Street Address:** 3256 E. Country Club Road	
	City or Town: Salina	**State:** KS
	County Name: Saline	**Zip Code:** 67422
5 Site Land Type (See page 5 of the instructions)	**Site Land Type:** ☒ Private • County • District • Federal • Indian • Municipal • State • Other	
6. North American Industry Classification System (NAICS) Code(s) for the Site (See page 5 of the instructions)	**A.** 33271	**B.** 81131
	C. 332812	**D.**
7. Site Mailing Address (See page 6 of the instructions)	**Street or P. O. Box:** PO Box 1487	
	City or Town: Salina	
	State: KS	
	Country: USA	**Zip Code:** 67422
8. Site Contact Person (See page 6 of the instructions)	**First Name:** Steve **MI:** **Last Name:** Puttbrese	
	Phone Number & Extension: 785-825-4683	**Email Address:** s.puttbrese@exline-inc.com
9. Legal Owner and Operator of the Site (See page 6 of the instructions)	**A. Name of Site's Legal Owner:** Exline Leasing, Inc.	**Date Became Owner (mm/dd/yyyy):** 01/04/1960
	Owner Type: ☒ Private • County • District • Federal • Indian • Municipal • State • Other	

	B. Name of Site's Operator:	Date Became Operator (mm/dd/yyyy):
	Exline, Inc.	01/24/1994
	Operator Type: ☒ Private • County • District • Federal • Indian • Municipal • State • Other	

10. Type of Regulated Waste Activity (Mark the appropriate boxes for activities that apply to your site. See pages 7-11 of the instructions)

A. Hazardous Waste Activities

1. Generator of Hazardous Waste (Choose only one of the following three classifications)

• a. EPA: 1,000 kg/mo (2,200 lbs in any single mo.) or more of non-acute hazardous waste, greater than 1 kg of acute hazardous waste;
or
☒ b. KSG Sub-Class 1: 100 kg or more and less than 1,000 kg (220 - 2,200 lbs in any single mo.) of non-acute hazardous waste;
or
• b. KSG Sub-Class 2: 25 kg or more and less than 100 kg (55 - 220 lbs in any single mo.) of non- acute hazardous waste;
or
• c. SQG: Less than 25 kg/mo (55 lbs./mo.) of non-acute hazardous waste

In addition, indicate other generator activities. (Mark all that apply)

• d. United States Importer of Hazardous Waste

• e. Mixed Waste (hazardous and radioactive) Generator

For Items 2 through 6, mark all that apply.

• **2. Transporter of Hazardous Waste**

☒ **3. Treater, Storer, or Disposer of Hazardous Waste (at your site)** Note: A hazardous waste permit is required for this activity.

• **4. Recycler of Hazardous Waste (at your site)** Note: A hazardous waste permit may be required for this activity.

5. Exempt Boiler and/or Industrial Furnace

• a. Small Quantity On-site Burner Exemption

• b. Smelting, Melting, and Refining Furnace Exemption

• **6. Underground Injection Control**

B. Universal Waste Activities

1. Large Quantity Handler of Universal Waste (accumulate 5,000 kg or more) [refer to Kansas regulations to determine what is regulated]. Indicate types of universal waste generated and/or accumulated at your site. (Mark all boxes that apply):

	Generate	Accumulate
a. Batteries	•	•
b. Pesticides	•	•
c. Thermostats	•	•
d. Lamps	•	•
e. Other (specify) _____	•	•
f. Other (specify) _____	•	•
g. Other (specify) _____	•	•

• **2. Destination Facility for Universal Waste**

Note: A hazardous waste permit may be required for this activity.

C. Used Oil Activities (Mark all boxes that apply.)

1. Used Oil Transporter - Indicate Type(s) of Activity(ies)

• a. Transporter

• b. Transfer Facility

2. Used Oil Processor and/or Re-refiner - Indicate Type(s) of Activity(ies)

• a. Processor

• b. Re-refiner

• **3. Off-Specification Used Oil Burner**

4. Used Oil Fuel Marketer - Indicate Type(s) of Activity(ies)

• a. Marketer Who Directs Shipment of Off-Specification Used Oil to Off-Specification Used Oil Burner

• b. Marketer Who First Claims the Used Oil Meets the Specifications

11. Description of Hazardous Wastes (See page 11 of the instructions)

Waste Codes for Federally Regulated Hazardous Wastes. Please list the waste codes of the Federal hazardous wastes handled at your site. List them in the order they are presented in the regulations (e.g., D001, D003, F007, U112). Use an additional page if more spaces are needed.

D001	D002	D007	D008	D009	D018	D039
D040	F001	F002	F006			

12. Comments (See page 11 of the instructions)

13. Certification. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. **(See page 11 of the instructions)**

Signature of owner, operator, or an authorized representative	Name and Official Title (type or print)	Date Signed (mm/dd/yyyy)
	Robert Exline, President	1-22-13

MAIL TO:
KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
BUREAU OF WASTE MANAGEMENT
1000 SW JACKSON, SUITE 320
TOPEKA, KS 66612-1366

United States Environmental Protection Agency

HAZARDOUS WASTE PERMIT INFORMATION FORM (8700-23)

1. Facility Permit Contact (See instructions on page 16)	**First Name:** Steve	**MI:**	**Last Name:** Puhbrese
	Phone Number: 785-825-4683		**Phone Number Extension:**
2. Facility Permit Contact Mailing Address (See instructions on page 16)	**Street or P.O. Box:** 3256 E. Country Club Road		
	City, Town, or Village: Salina		
	State: KS		
	Country: USA		**Zip Code:** 67422
3. Legal Owner Mailing Address and Telephone Number (See instructions on page 17)	**Street or P.O. Box:** PO Box 1487		
	City, Town, or Village: Salina		
	State: KS		
	Country: USA	**Zip Code:** 67402-1487	**Phone Number** 785-825-4683
4. Operator Mailing Address and Telephone Number (See instructions on page 17)	**Street or P.O. Box:** 3256 E. Country Club Road		
	City, Town, or Village: Salina		
	State: KS		
	Country: USA	**Zip Code:** 67401	**Phone Number** 785-825-4683
5. Facility Existence Date (See instructions on page 17)	**Facility Existence Date (mm/dd/yyyy):** 04/01/1970		

6. Other Environmental Permits (See instructions on page 17)

A. Permit Type *(Enter code)*	B. Permit Number	C. Description
E	0002	City of Salina Industrial Wastewater Discharge Permit

7. Nature of Business (Provide a brief description; see instructions on page 18)

Repair and manufacture of parts for large stationary engines, compressors, and various types of mechanical equipment.

8. Process Codes and Design Capacities (See instructions on page 18)

A. PROCESS CODE - Enter the code from the list of process codes below that best describes each process to be used at the facility. Thirteen lines are provided for entering codes. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in Item 9.

B. PROCESS DESIGN CAPACITY- For each code entered in column A, enter the capacity of the process.

1. AMOUNT - Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.

2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code in column B(2) from the list of unit of measure codes below that describes the unit of measure used. Select only from the units of measure in this list.

C. PROCESS TOTAL NUMBER OF UNITS - Enter the total number of units for each corresponding process code.

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	Disposal:	
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet; Hectare-meter; Acres; Cubic Meters; Hectares; Cubic Yards
D81	Land Treatment	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards
D99	Other Disposal	Any Unit of Measure Listed Below
	Storage:	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S05	Drip Pad	Gallons; Liters; Acres; Cubic Meters; Hectares; or Cubic Yards
S06	Containment Building Storage	Cubic Yards or Cubic Meters
S99	Other Storage	Any Unit of Measure Listed Below
	Treatment:	
T01	Tank Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T02	Surface Impoundment Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Day; Liters Per Hour; or Million Btu Per Hour
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; Btu Per Hour; or Million Btu Per Hour
T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Liters Per Hour; Kilograms Per Hour; or Million Btu Per Hour
T82	Lime Kiln	
T83	Aggregate Kiln	
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, or Refining Furnace	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Hour; Liters Per Hour; or Million Btu Per Hour
T88	Titanium Dioxide Chloride Oxidation Reactor	
T89	Methane Reforming Furnace	
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used In The Recovery Of Sulfur Values From Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed In 40 CFR §260.10	
T94	Containment Building - Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
	Miscellaneous (Subpart X):	
X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; or Million Btu Per Hour
X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
X99	Other Subpart X	Any Unit of Measure Listed Below

UNIT OF MEASURE	UNIT OF MEASURE CODE
Gallons	G
Gallons Per Hour	E
Gallons Per Day	U
Liters	L
Liters Per Hour	H
Liters Per Day	V

UNIT OF MEASURE	UNIT OF MEASURE CODE
Short Tons Per Hour	D
Metric Tons Per Hour	W
Short Tons Per Day	N
Metric Tons Per Day	S
Pounds Per Hour	J
Kilograms Per Hour	R
Million Btu Per Hour	X

UNIT OF MEASURE	UNIT OF MEASURE CODE
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
Btu Per Hour	I

8. Process Codes and Design Capacities (*Continued*)

EXAMPLE FOR COMPLETING Item 8 (shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons.

Line Number		A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY (1) Amount (Specify)	(2) Unit of Measure (Enter code)	C. Process Total Number of Units	For Official Use Only
X	1	S 0 2	5 3 3 . 7 8 8	G	0 0 1	
	1	D 8 3	0	NA	0 0 1	
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
1	0					
1	1					
1	2					
1	3					

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, taking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in Item 9.

9. Other Processes (*See instructions on page 18 and follow instructions from Item 8 for D99, S99, T04 and X99 process codes*)

Line Number (Enter #s in sequence with Item 8)		A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY (1) Amount (Specify)	(2) Unit of Measure (Enter code)	C. Process Total Number of Units	D. Description of Process
X	1	T 0 4				In-situ Vitrification
	1					
	2					
	3					
	4					

10. Description of Hazardous Wastes (See instructions on page 18)

A. **EPA HAZARDOUS WASTE NUMBER** - *Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR Part 261, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.*

B. **ESTIMATED ANNUAL QUANTITY** - *For each listed waste entered in column A, estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A, estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.*

C. **UNIT OF MEASURE** - *For each quantity entered in column B, enter the unit of measure code. Units of measure which must be used and the appropriate codes are:*

ENGLISH UNIT OF MEASURE	*CODE*	*METRIC UNIT OF MEASURE*	*CODE*
POUNDS	*P*	*KILOGRAMS*	*K*
TONS	*T*	*METRIC TONS*	*M*

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure, taking into account the appropriate density or specific gravity of the waste.

D. **PROCESSES**

1. **PROCESS CODES:**

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Items 8A and 9A on page 3 to indicate the waste will be stored, treated, and/or disposed at the facility.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Items 8A and 9A on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. *Enter the first two as described above.*
2. *Enter "000" in the extreme right box of Item 10.D(1).*
3. *Use additional sheet, enter line number from previous sheet, and enter additional code(s) in Item 10.E.*

2. **PROCESS DESCRIPTION:** *If a code is not listed for a process that will be used, describe the process in Item 10.D(2) or in Item 10.E(2).*

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. *Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.*
2. *In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.*
3. *Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.*

EXAMPLE FOR COMPLETING Item 10 (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operations. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number		A. EPA Hazardous Waste No. (Enter code)				B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES									
								(1) PROCESS CODES (Enter code)									(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
X	1	K	0	5	4	900	P	T	0	3	D	8	0				
X	2	D	0	0	2	400	P	T	0	3	D	8	0				
X	3	D	0	0	1	100	P	T	0	3	D	8	0				
X	4	D	0	0	2												Included With Above

10. Description of Hazardous Wastes (*Continued; use additional sheets as necessary*)

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES	
				(1) PROCESS CODES (Enter code)	(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					

10. Description of Hazardous Wastes (*Continued; Additional Sheet*)

Line Number	*A. EPA Hazardous Waste No. (Enter code)*	*B. Estimated Annual Quantity of Waste*	*C. Unit of Measure (Enter code)*	*E. PROCESSES* *(1) PROCESS CODES (Enter code)*	*E. PROCESSES* *(2) PROCESS DESCRIPTION (If a code is not entered in E(1))*

11. Map (See instructions on page 19)

Attach to this application a topographic map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in this map area. See instructions for precise requirements. Plate 2-1

12. Facility Drawing (See instructions on page 20) Plate 2-2

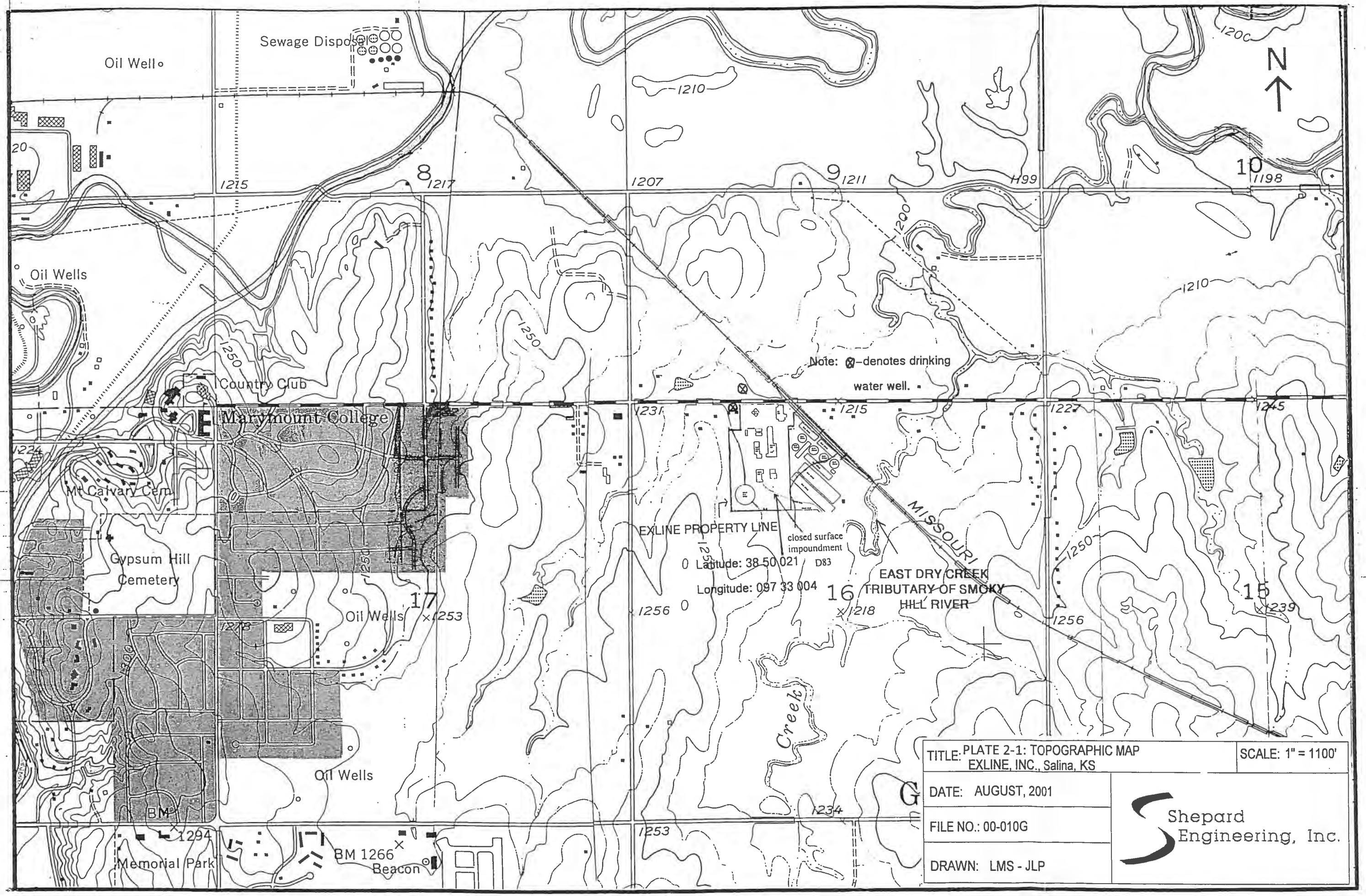
All existing facilities must include a scale drawing of the facility (see instructions for more detail).

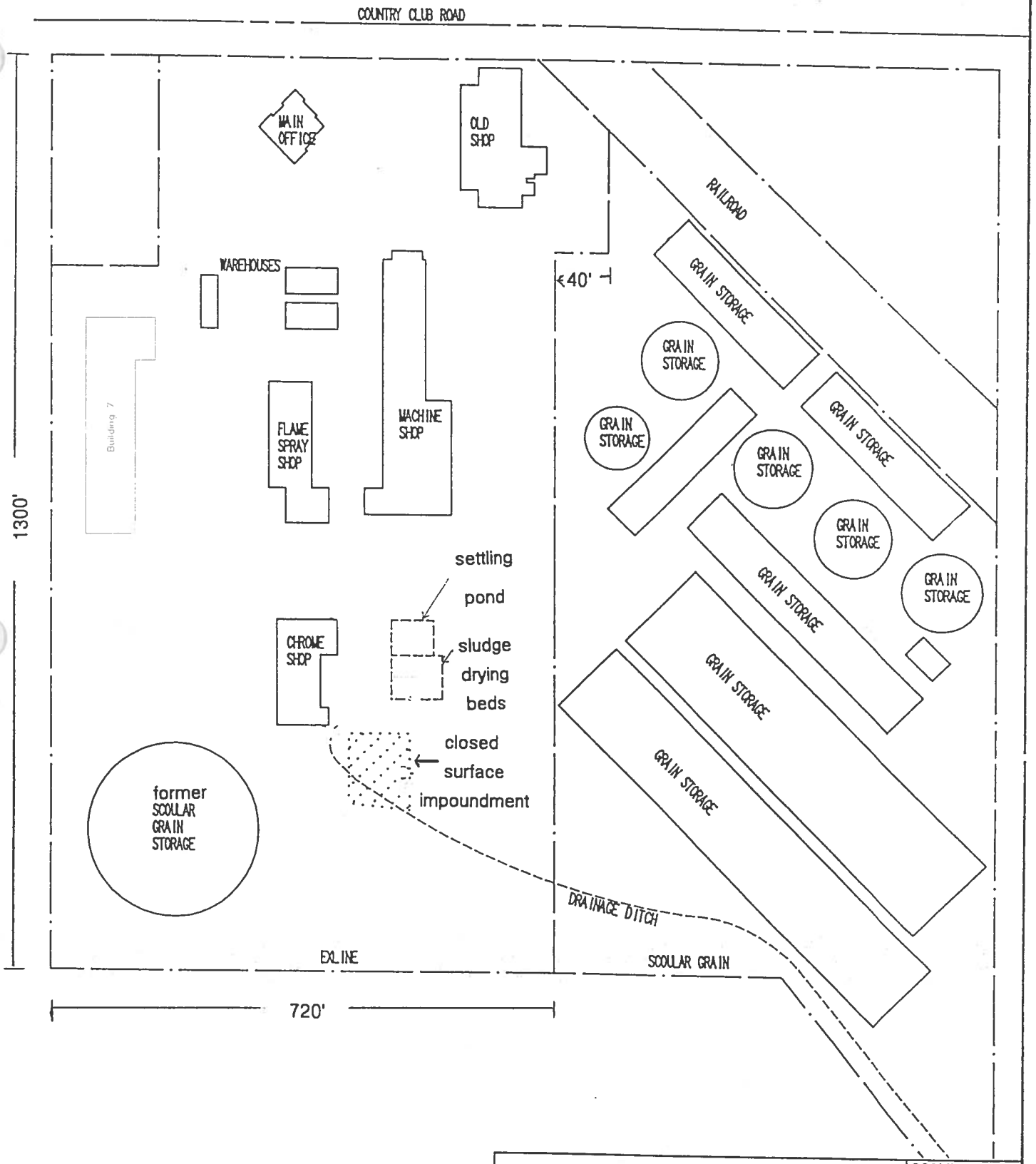
13. Photographs (See instructions on page 20) Figure 2-1

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

14. Comments (See instructions on page 20)

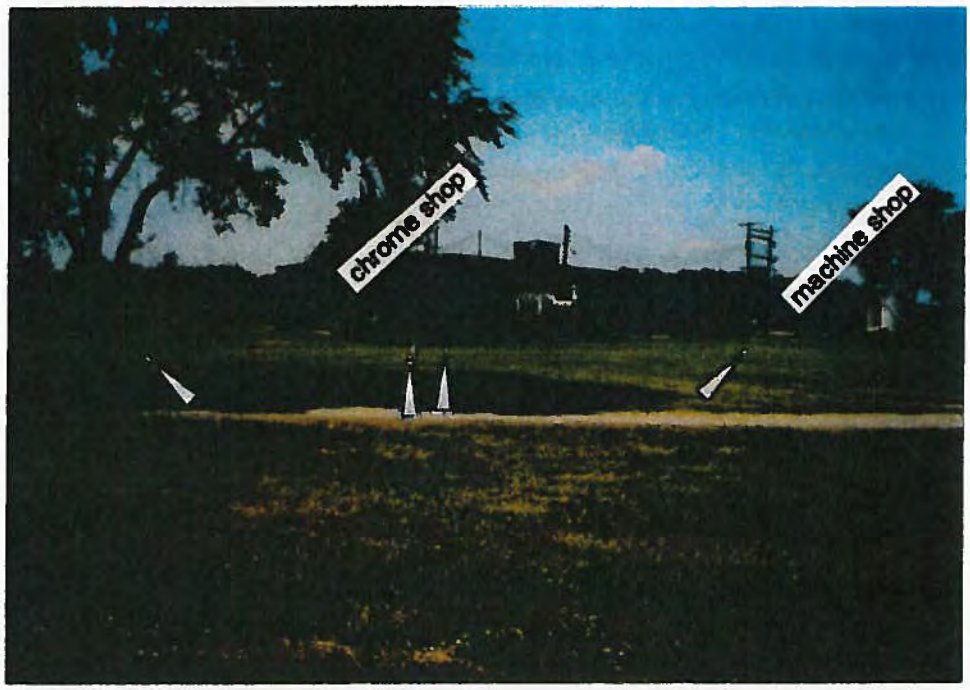
Surface impoundment was closed in mid-1980s. Underlying ground water contained hazardous waste constituent (chromium). No hazardous wastes are currently treated, stored, or disposed at the site.


Sewage Disposal
Oil Well
Oil Wells
Country Club
Marymount College
Mt Calvary Cem
Gypsum Hill Cemetery
Oil Wells
Oil Wells
Memorial Park
BM 1266
Beacon
EXLINE PROPERTY LINE
closed surface impoundment
Latitude: 38 50 021
Longitude: 097 33 004
D83
Note: ⊗-denotes drinking water well.
EAST DRY CREEK TRIBUTARY OF SMOKY HILL RIVER
MISSOURI
Creek
N
8
9
10
16
15
17
TITLE: PLATE 2-1: TOPOGRAPHIC MAP
EXLINE, INC., Salina, KS
SCALE: 1" = 1100'
DATE: AUGUST, 2001
FILE NO.: 00-010G
DRAWN: LMS - JLP
Shepard Engineering, Inc.



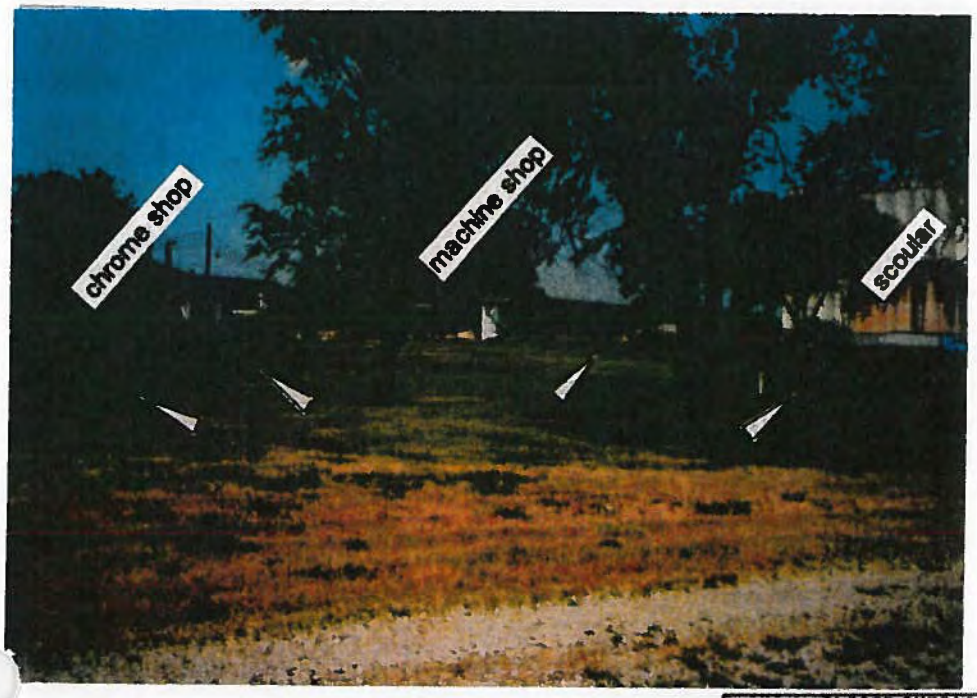
TITLE: FACILITY DRAWING - EXLINE, INC., Salina, KS		SCALE: 1"=200'
PLATE 2-2		Shepard Engineering, Inc.
FILE NO.: 00-010G		
DRAWN: LMS - TH	DATE: JUNE, 2000	

CLOSED SURFACE IMPOUNDMENT
EXLINE, INC., SALINA, KANSAS
BACKGROUND: Chrome Shop
VIEW: Northwest
DATE: 6-23-00



Closed Surface Impoundment **(D83)** boundary indicated by markers

CLOSED SURFACE IMPOUNDMENT
EXLINE, INC., SALINA, KANSAS
BACKGROUND: Left to right – Chrome Shop Machine Shop, Scoular
VIEW: North
DATE: 6-23-00



Closed Surface Impoundment **(D83)** boundary indicated by markers

TITLE:	CLOSED SURFACE IMPOUNDMENT PHOTOGRAPHS EXLINE, INC., Salina, KS	SCALE: NONE
FIGURE 2-1		Shepard Engineering, Inc.
FILE NO.: 00-010G		
DATE: JUNE, 2000		

SECTION 3 –GENERAL INFORMATION REQUIREMENTS

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS
SECTION 3 – GENERAL INFORMATION REQUIREMENTS
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POST-CLOSURE PERMIT APPLICATION
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3. GENERAL INFORMATION REQUIREMENTS.

3.1. General Facility Description. Exline, Inc., located in Salina, Kansas, manufactures and repairs large stationary industrial engines and engine parts. A facility Site Location Map was presented earlier as Plate 1.1. A topographic facility map is also presented in this section (Plate 3-1). This map has been prepared at a scale of 1 inch = 200 feet, and shows a distance around the facility of 1000 feet.

Waste chrome plating solution was discharged to an unlined surface impoundment at the facility from around 1970 to 1980. Other wastes fed to the surface impoundment included steam cleaning rinse water, wastewater from deionizer column regeneration, reverse strip-sodium chromate waste and caustic cleaner waste. Outside dimensions of the lagoon were 66' by 82' by 87' by 80', with an approximate working depth of 3 feet. Installation of a synthetic liner in 1980 revealed that infiltration had occurred, resulting in groundwater contamination with respect to hexavalent chromium. A Closure Plan was prepared by Wilson Laboratories on behalf of Exline, Inc. in November of 1983. This Closure Plan was submitted to the KDHE, and subsequently approved. The Plan was executed in 1984. The liquid waste was removed and the surface impoundment closed in August of 1984. The surface impoundment closure was certified by Exline, Inc. on January 17, 1985. A copy of the certification document is included in Attachment 3-1: "Surface Impoundment Closure Report".

Exline, Inc. entered into a Consent Agreement with the KDHE in 1987 to conduct additional hydrogeologic investigations at the site. These investigations were completed and a summary report submitted to the KDHE in late 1987.

In July of 1987, KDHE requested a Part B application based on the fact that the surface impoundment was not clean closed. Clean closure was not obtained due to the fact that chromium contamination remained in the subsurface (i.e., groundwater).

Exline submitted Part A and Part B permit applications in March of 1989. A Hazardous Waste permit was issued in October of 1989. The surface impoundment is currently regulated by the Hazardous Waste Post-Closure Permit that became effective on October 29, 1989.

As required by the Hazardous and Solid Waste Amendments (HSWA) of 1984, releases from Solid Waste Management Units (SWMUs) have been evaluated at the Exline facility. Part of this evaluation consisted of a RCRA Facility Assessment (RFA). The RFA was conducted in 1989 and consisted of a Preliminary Review (PR) and a Visual Site Inspection (VSI). The VSI was completed on May 19, 1989. The RFA findings were documented in a report titled: "RCRA Facility Assessment at Exline", July 14, 1989. The RFA was completed by Metcalf & Eddy, Inc. under contract to US EPA Region VII. The RFA Report included suggestions for further action at certain SWMUs that were identified during the evaluation process.

The Exline Part B permit issued in October of 1989 identified four (4) SWMUs, which required additional investigation. Exline, Inc. completed a sampling and analysis project for these 4 SWMUs and surface water run-off in October of 1992. The results of that sampling effort were

summarized in a document titled: "Solid Waste Management Unit RCRA Facility Investigation Final Report", dated December, 1993. As a follow-up to that RFI Report, Exline, Inc. submitted a Work Plan to the EPA titled: "Sampling and Analysis Work Plan for Background Metals Concentrations", dated September, 1994. US EPA Region VII commented on that Work Plan in August of 2000. Following Exline's development of a Quality Assurance Project Plan and resolution of a few other issues, the subject Work Plan was approved by EPA Region VII in May of 2001. Exline, Inc. completed the sampling in May of 2001. The sampling project results were summarized in a report titled: "RCRA Facility Investigation Sampling Program Report – Background Soil and Hexavalent Chromium Analysis". This Report was submitted to U.S. EPA Region VII in August, 2001.

A RCRA Facility Investigation Work Plan Addendum and associated Sampling and Analysis Plan/Quality Assurance Project Plan were submitted to EPA Region 7 in April, 2005 and October, 2005, respectively. The former Plan was revised and re-submitted in November of 2005 to address EPA Region 7 comments. These Plans were subsequently approved by EPA Region 7 and a sampling program was implemented in November, 2005; April, May, and June of 2006. An RFI Report was prepared and submitted to EPA Region 7 in July of 2006. This Report summarized RFI sampling results. The Report was revised to address EPA Region7 comments in February of 2007 and was subsequently approved by EPA Region 7.

The following additional documents have been submitted to EPA Region 7 following the Agency's approval of the RFI Report.

1) Corrective Measures Study Work Plan – August, 2007.
2) Corrective Measure Study Work Plan – Revised December, 2007.
3) Solid Waste Management Unit (SWMU) Summary Report – February, 2008.
4) Corrective Measures Study Report – July, 2008.
5) Corrective Measures Study Report – Revised November, 2008.
6) Corrective Measured Implementation (CMI) Work Plan – March, 2010.
7) Sampling and Analysis Plan/Quality Assurance Project Plan – March, 2010.
8) CMI Work Plan – Revised January, 2011.
9) RFI Addendum (SWMU-5 and SWMU-6) – February, 2011.
10) Chromium (VI) Feasibility Test Report – July, 2011.
11) RFI Addendum Report (SWMU-5 and SWMU-6) – September, 2011.
12) Vadose Zone Pilot Scale Treatability Study Work Plan – January, 2012.

Monitoring wells have been placed at the facility and on adjacent property to monitor the rate of movement and extent of chromium contamination. In addition, Exline is performing corrective action to remediate the uppermost aquifer beneath the site. This corrective action includes the operation of three groundwater withdrawal wells, which are currently removing groundwater at a total rate of approximately 35 gallons per minute on a 7 days per week, 24 hours per day basis. This recovered groundwater is discharged to the City of Salina sanitary sewer. The groundwater discharge is regulated by an Industrial Wastewater Discharge permit, which has been issued by the City of Salina (permit No. 0002). The non-hazardous sludge that was generated by the groundwater treatment process was disposed in the City of Salina sanitary landfill. A groundwater treatment system was operated for chromium removal from 1985 until early 2004.

Exline, Inc. removed the far down-gradient recovery well (SC-2) from the groundwater recovery well network in 2008, due to the fact that SC-2 has exhibited chromium concentrations less than 0.02 mg/L since September of 1999.

An industrial wastewater batch pretreatment system was constructed and started up in February 1985, for the purpose of treating industrial wastewater generated in the Chrome Shop. The treated wastewater was discharged to the City of Salina sanitary sewer in accordance with the Industrial Wastewater Discharge permit discussed earlier (permit No. 0002). Most of the sludge generated by the pretreatment system was F006 listed hazardous waste and was de-watered using a plate and frame filter press. This de-watered sludge was transported off-site to a permitted hazardous waste disposal facility. The sludge was stored on-site for a period less than 90 days.

Both the groundwater and industrial wastewater pretreatment systems were located in the cylinder (formerly chrome plating) shop, with the exception of the groundwater treatment system clarifier, settling pond, and sludge drying beds, which were located east of the cylinder shop. As discussed earlier, the groundwater treatment system is no longer operated since chromium concentrations in the untreated groundwater are well below the industrial wastewater discharge permit limit. Most of the groundwater treatment system equipment has been removed. In the unlikely event that future groundwater treatment would be required (e.g., City permit limit is lowered and/or groundwater chromium concentrations increased significantly), Exline would install an ion exchange system to remove hexavalent chromium.

It should be noted that chrome plating is no longer conducted at the facility (hence the name change from the Chrome Plating Shop to the cylinder shop). Chrome plating was discontinued in early 2001. As a result, chromium-bearing waste is no longer generated. Additional detail for the respective portions of this facility is provided in subsequent sections of this permit application. In addition, the industrial wastewater treatment system is no longer operated as a result of the fact that Exline discontinued chrome plating operations and chrome-bearing industrial wastewater is no longer generated. Most of the industrial wastewater treatment equipment has been removed.

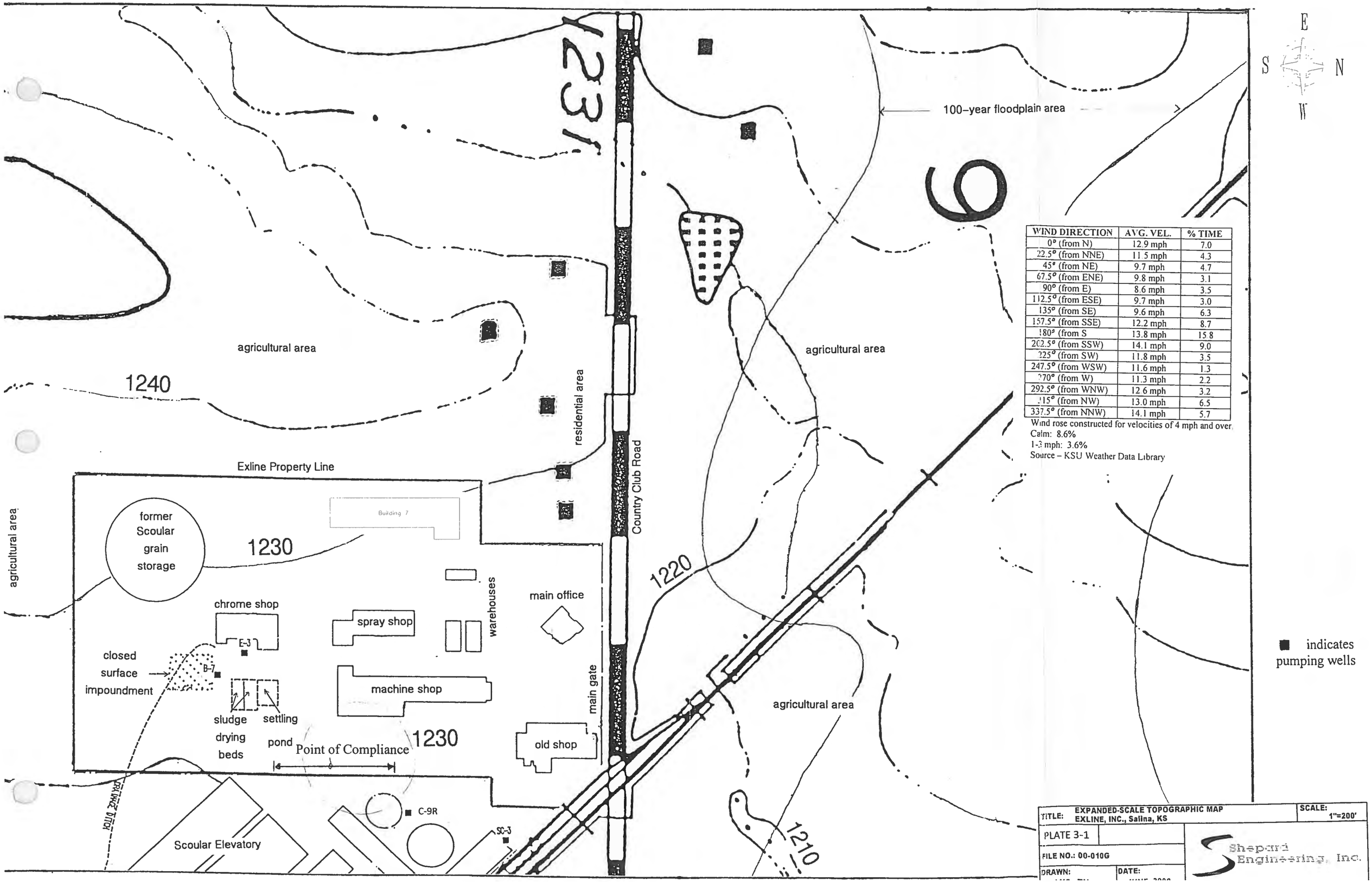
3.2. Hazardous Waste Analysis. Hazardous waste was removed from the Exline surface impoundment when it was closed in 1984. Therefore, hazardous waste is no longer being treated, stored or disposed at the facility. Chemical analyses are provided in this section for:

1) Wastes added to the surface impoundment during its active life.
2) Soil remaining at the surface impoundment site at closure.

Groundwater chemical analysis data are presented in Section 4 - Groundwater Monitoring.

3.2.1. Wastes Added to Closed Surface Impoundment. Each waste that was added to the subject surface impoundment prior to closure is discussed below.

3.2.1.1. Chrome Plating Bath Waste. Waste from the chrome plating baths at the Exline facility was generated and discharged to the surface impoundment as a result of plating operations.



WIND DIRECTION	AVG. VEL.	% TIME
0° (from N)	12.9 mph	7.0
22.5° (from NNE)	11.5 mph	4.3
45° (from NE)	9.7 mph	4.7
67.5° (from ENE)	9.8 mph	3.1
90° (from E)	8.6 mph	3.5
112.5° (from ESE)	9.7 mph	3.0
135° (from SE)	9.6 mph	6.3
157.5° (from SSE)	12.2 mph	8.7
180° (from S	13.8 mph	15.8
202.5° (from SSW)	14.1 mph	9.0
225° (from SW)	11.8 mph	3.5
247.5° (from WSW)	11.6 mph	1.3
270° (from W)	11.3 mph	2.2
292.5° (from WNW)	12.6 mph	3.2
315° (from NW)	13.0 mph	6.5
337.5° (from NNW)	14.1 mph	5.7

Wind rose constructed for velocities of 4 mph and over.
Calm: 8.6%
1-3 mph: 3.6%
Source – KSU Weather Data Library

TITLE: EXPANDED-SCALE TOPOGRAPHIC MAP EXLINE, INC., Salina, KS		SCALE: 1"=200'
PLATE 3-1		Shepard Engineering, Inc.
FILE NO.: 00-010G		
DRAWN:	DATE:	

Chrome plating waste was generated by part dragout that would accumulate in the chrome shop basement. This waste was subsequently pumped out to the surface impoundment. Thus, the composition of this waste would have been similar to that of the solution in the chrome plating baths. Table 3-1 is a representative analysis of an Exline chrome plating bath solution.

TABLE 3-1: TYPICAL COMPOSITION FOR EXLINE CHROME PLATING SOLUTION
All concentrations are in mg/L unless otherwise noted.

Parameter	Low	High
Chromium, total	122,000	150,400
Chromium, hexavalent	119,000	128,900
Sodium	8,160	71,000
Sulfate	2,050	3,300
Iron	6,440	14,700
pH, S.U.	0.1	0.9
Chloride	70	70
Total Organic Carbon	160	160

Analyses in Table 3-1 were compiled using laboratory reports from Arrow Laboratories, Wichita, Kansas; Wilson Laboratories, Salina, Kansas; and Butler Laboratories, Salina Kansas.

3.2.1.2. Steam Cleaner Rinse Water. Table 3-2 summarizes the steam cleaner rinse water analyses. These analyses were performed by Wilson Laboratories on a sample collected October 25, 1982.

TABLE 3-2: EXLINE STEAM CLEANER WASTEWATER CHEMICAL ANALYSES
All concentrations are in mg/L unless otherwise noted.

Parameter	Concentration
BOD_5	23
COD	246
Chromium, hexavalent	14.5
pH, S.U.	6.9
Dissolved solids	530

3.2.1.3. Deionizer Column Regeneration Wastewater. Analyses are not available for this waste. However, a qualitative description of this waste can be provided as the columns were used to produce deionized water from the rural water supply. The regeneration procedure included back-washing, followed by regenerating the cation and anion columns with sulfuric acid and sodium hydroxide, respectively. This procedure was followed by a final rinse. The combined waste, theoretically, would be neutral as both regenerations should take equivalent amounts of acid and base. However, it is more likely that the waste from a given regeneration would be slightly acidic or basic. This regeneration wastewater would have also contained significant quantities of dissolved solids, including sulfate, chloride, bicarbonate, sodium, calcium, and magnesium.

3.2.1.4. Reverse Strip Sodium Chromate Wastewater. This process solution was used to provide a porous surface on certain chrome-plated parts. Chrome was dissolved into solution by applying a voltage, which is opposite of that, used to plate chrome. Table 3-3 presents the composition of this solution. The sample was collected in September, 1984 and analyses were performed by Wilson Laboratories, Salina, Kansas.

TABLE 3-3: CHEMICAL ANALYSES FOR EXLINE REVERSE STRIP-SODIUM CHROMATE WASTE WATER (Conc. in mg/L unless otherwise noted)

Parameter	Concentration
Chromium, hexavalent	2090
Arsenic	0.007
Barium	0.2
Cadmium	< 0.01
Chromium, Total	40,000
Lead	0.4
Mercury	< 0.001
Selenium	< 0.001
Silver	< 0.01
pH, S.U.	7.5

3.2.1.5. Caustic Cleaner Waste. Caustic cleaner process solution is an alkaline cleaning mixture for steel parts. Chemical analyses for caustic cleaner waste are summarized in Table 3-4. The sample was collected on March 16, 1983, and analyzed by Wilson Laboratories, Salina, Kansas.

TABLE 3-4: CHEMICAL ANALYSES FOR EXLINE CAUSTIC CLEANER WASTE
All concentrations are in mg/L unless otherwise noted.

Parameter	Concentration
pH, S.U.	10.5
Alkalinity, total (as $CaCO_3$)	46,300
Arsenic	9.7
Barium	4.6
Cadmium	0.11
Chromium, Total	250
Lead	4.5
Mercury	< 0.01
Selenium	0.082
Silver	0.01

3.2.1.6. Combined Waste in Surface Impoundment. Analyses were performed on the liquid waste that was present in the surface impoundment. The sample was collected after the surface impoundment solution was transferred to a storage tank for reprocessing and reclamation. The analyses for the surface impoundment waste are summarized in Table 3-5. The sample was collected on July 12, 1984 from a holding tank, which was used to store the waste after removal from the surface impoundment. Analyses were performed by Wilson Labs, Salina, Kansas.

TABLE 3-5: EXLINE SURFACE IMPOUNDMENT WASTE CHEMICAL ANALYSIS SUMMARY - All concentrations are in mg/L, unless otherwise noted.

Parameter	Concentration
Arsenic, EP Toxicity	0.005
Barium, EP Toxicity	2.3
Cadmium, EP Toxicity	1.5
Chromium, EP Toxicity	52,700.0
Lead, EP Toxicity	6.3
Mercury, EP Toxicity	< 0.01
Selenium, EP Toxicity	< 0.01
Silver, EP Toxicity	< 0.01
pH, pH units	5

3.2.2. Surface Impoundment Soil Remaining at Closure. Surface impoundment soil samples were collected and analyzed in July, 1984, following removal of visual contamination at the site. The top six inches of soil in and around the surface impoundment area were sampled and analyzed for total and extractable (EP toxicity method) chromium. A layout of the surface impoundment is presented in Attachment 3-1 – "Surface Impoundment Closure Report".

Six sub-samples were collected at a depth of 6 inches from each section shown in Attachment 3-1. These six sub-samples were composited to produce a single sample representative of each section. Each of these section composite samples was analyzed for EP toxicity chromium and lead as well as total chromium. Results are presented in Table 3-6. Chemical analyses were performed by Wilson Laboratories, Salina, Kansas in accordance with EPA-approved methods. Samples were collected on July 9, 1984, with one exception as noted in Table 3-6.

TABLE 3-6: SOIL CHEMICAL ANALYSES RESULTS - EXLINE SURFACE IMPOUNDMENT CLOSURE

Section Number	EP Toxicity Chromium (mg/1)	EP Toxicity Lead (mg/1)	Total Chromium (mg/kg)
1	8.5	-	-
2	3.38	< 0.1	1000
3	< 0.05	< 0.1	287
4	< 0.05	< 0.1	754
5	< 0.05	< 0.1	54
6	< 0.05	< 0.1	7.2
7	< 0.05	< 0.1	470
8	< 0.05	< 0.1	21
1*	0.18	< 0.1	901

*Section 1 was re-sampled following additional soil removal since the first round of sampling exhibited an EP toxicity chromium concentration above the 5 mg/l hazardous waste limit. The follow-up sampling was conducted on 8/10/84.

3.3. Waste Analysis Plan. As stated earlier, Exline, Inc. is no longer a hazardous waste treatment, storage or disposal facility, as the subject surface impoundment was closed in 1984. A Waste Analysis Plan was prepared in March, 1983, prior to surface impoundment closure. However, this plan is no longer applicable. Chemical analysis data for the hazardous waste that was stored in the surface impoundment can be found in the previous section (3.2).

3.4. Potential for the Public to be Exposed to Releases. As discussed earlier, the surface impoundment has been closed. All releases of chromium from the closed impoundment were to the subsurface (i.e., vadose zone and saturated zone). The impoundment was back-filled with clean soil following removal of the liquid contents and contaminated soil. Therefore, the potential for the public to be exposed to releases from the closed surface impoundment via the pathways of direct contact with soil, or inhalation or ingestion of contaminated soil is low.

With respect to human exposure via the ingestion of groundwater, the chromium contamination in the saturated zone is being monitored by an extensive groundwater monitoring well system. In addition, a groundwater recovery system has been operating on a continuous basis since February of 1984. This system was designed to hydraulically contain (i.e., prevent further migration of) the chromium plume and remove chromium from the aquifer.

40 CFR, Part 270.10 (j) requires that exposure information must be submitted, which addresses the following items:

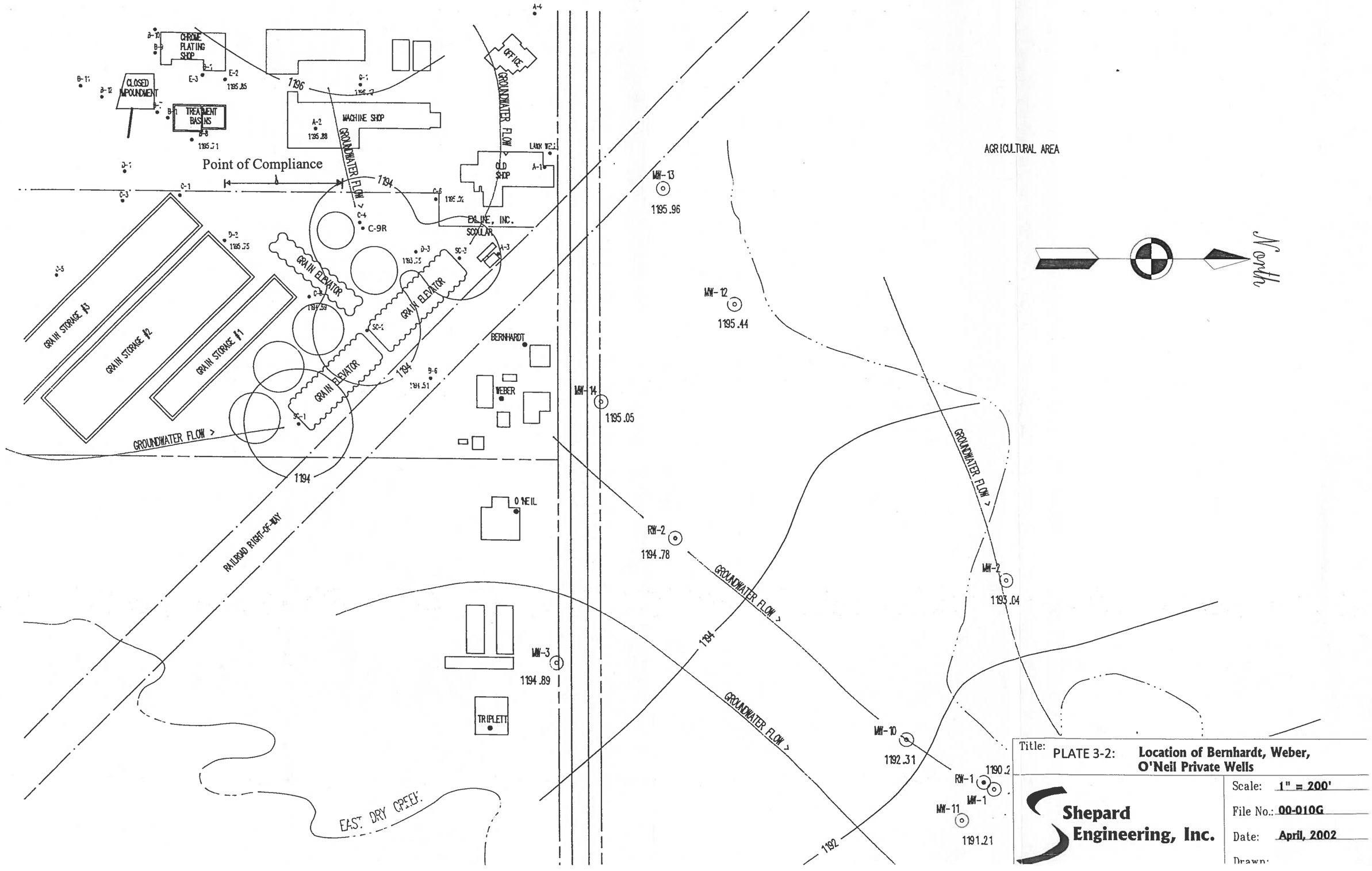
"(i) Reasonably foreseeable potential releases from both normal operations and accidents at the unit, including releases associated with transportation from the unit."

The subject surface impoundment was closed in August of 1984. The closure process included the removal of impoundment liquid and contaminated soils. Backfill was completed with clean soils. Since the impoundment has been closed, no material is being added to or removed from the unit. And since clean soil was used for backfill, the only reasonably foreseeable potential releases would be chromium being released to the groundwater underlying the unit.

"(ii) The potential pathways of human exposure to hazardous wastes or constituents resulting from the releases described under (j)(1)(i) of this section."

The potential pathways of human exposure to hazardous wastes or constituents resulting from the releases of chromium to the groundwater include ingestion of chromium via drinking water.

"(iii) The potential magnitude and nature of the human exposure resulting from such releases." The potential magnitude of the human exposure resulting from the release of chromium to the groundwater is low, based on the following information. When released to the groundwater, chromium follows a path in the direction of groundwater flow - generally from southwest to northeast. As discussed earlier, Exline installed a groundwater monitoring system and four recovery wells that were designed to contain the chromium plume and remove chromium from the groundwater.



Title: PLATE 3-2: **Location of Bernhardt, Weber, O'Neil Private Wells**

Shepard Engineering, Inc.

Scale: **1" = 200'**

File No.: **00-010G**

Date: **April, 2002**

Drawn:

Three (3) private water supply wells located within 450 to 700 feet down-gradient of C-9R (the farthest down-gradient Exline recovery well). These three private water supply wells are identified as the Bernhardt, Weber, and O'Neill wells. The locations of these three private water supply wells are shown on Plate 3-2. None of these private wells is being used as a drinking water supply due to VOC contamination caused by releases of carbon tetrachloride and EDB from the Scoular Grain Elevator. These private wells were sampled 17 times from 1982 to 1983 and have been sampled on an annual basis from 1984 to the present for total chromium analysis. All sample chromium concentrations have been less than the drinking water limit of 0.10 mg/L. Detailed sampling data for these private wells are presented in Section 4 (Table 4-6). The fact that these wells have never exhibited a chromium concentration in excess of the chromium MCL, and they are not being used for drinking water is compelling evidence that the potential for ingestion of chromium via the drinking water pathway is extremely low. A fourth private well (Roesner) is located approximately 2900 feet downgradient from C-9R. This well is also not being used as a drinking water supply. It was taken out of service circa 1988 due to carbon tetrachloride contamination from the Scoular Elevator site.

Monitor well B-6, located down-gradient from the farthest down-gradient recovery well (C-9R) and downgradient from the Exline chromium plume, exhibited non-detect chromium concentrations for 88 of 95 samples collected between 1988 and 2000. Of the seven samples with detectable concentrations, none exceeded the drinking water MCL of 0.10 mg/L. Also, only two of the seven detectable chromium concentrations were measured since 1992: 0.023 mg/L in 1998 and 0.011 mg/L in 1999. Exline, Inc. experienced problems with cross-contamination of chromium in monitor well sampling in the early to mid-1990s. This cross-contamination was likely caused by the fact that the monitor well sampling was conducted by chrome shop personnel until the mid 1990s. In addition, monitoring well H-6 was installed in August of 2002 as a replacement well for B-6. Semi-annual sampling has been conducted from May, 2003 through December, 2011 – 18 samples. Most of the total chromium sample concentrations have been non-detect during that period. The highest total chromium concentration measured in monitor well H-6 during that time period has been 0.016 mg/L.

To summarize, the potential magnitude of the human exposure via ingestion of chromium through the drinking water pathway is extremely low due to the following:

1) The presence of a groundwater monitoring system, which includes annual sampling of three private water wells located down-gradient of the Exline chromium groundwater plume.
2) None of the private wells located immediately down-gradient from Exline is used as a drinking water supply.
3) All samples from the three private wells have been below the MCL of 0.10 mg/L with respect to total chromium.
4) Exline, Inc. has installed a groundwater recovery system that is designed to hydraulically contain the chromium plume.

With respect to item # 4, it should be noted that Exline, Inc. personnel monitor the recovery well system on a daily basis. If a recovery well fails, then Exline, Inc. maintenance personnel and/or a local water well pump contractor repair or replace the pump within 48 hours. The pumps that are used in the Exline recovery wells are in stock locally.

If the recovery wells are not achieving complete capture of the chromium plume, then elevated chromium concentrations would be detected in either the downgradient monitor well H-6 or one of the three down-gradient private wells. As stated earlier, none of the 95 samples collected from B-6 between 1988 and 2000 exhibited a concentration above the MCL and 88 of those samples were non-detect. Of the seven samples that exhibited detectable concentrations of chromium in monitor well B-6 over that 13 year period, it is quite possible that the detects were caused by sampler contamination. In addition, the highest detected chromium concentration measured in monitoring well H-6 since it was installed in August of 2002 has been 0.016 mg/L.

3.5. Site Security Plan. The following information will document Exline, Inc.'s compliance with 40 CFR, part 264.14 (b) (2) (i) and (ii) and (c).

The hazardous waste surface impoundment at the Exline facility has been closed. However, security procedures are in effect for waste treatment structures, equipment, and monitor wells associated with the corrective action program at the facility.

Monitor wells are secured with a rod-padlock system, which remains locked except during sampling.

As discussed earlier, the groundwater treatment system is no longer operating. However, groundwater recovery system piping is still located in the Cylinder Shop and the water (although no longer treated) continues to flow through tanks located in the Cylinder Shop. Therefore access to the Cylinder Shop by unauthorized personnel is prohibited. All Exline personnel are instructed to identify unauthorized personnel in the Cylinder Shop and request proper identification. Warning signs marked "DANGER – UNAUTHORIZED PERSONNEL KEEP OUT" are posted at each entrance to the Cylinder Shop building and are legible from 25 feet. Access doors to the Cylinder Shop and the main gate to the facility property are locked when Exline personnel are not on-site. Exline Cylinder Shop personnel are on-site from 7:00 A.M. to 12:00 midnight, Monday through Friday.

A fence was installed in 2002 with a locking gate around the settling pond and drying beds, which are associated with the groundwater treatment system. Each of the four sides of the fence was equipped with a sign, which is legible from 25 feet and states: "DANGER – UNAUTHORIZED PERSONNEL KEEP OUT". The fence has been removed since the groundwater treatment system is no longer is use.

3.6. General Inspection Schedule. The requirements for this section (40 CFR, Parts 270.14 (b) (5) and 264.15) are met in Attachment 3-2: "Inspection and Maintenance Plan". Included in the Inspection and Maintenance Plan are a schedule and procedures for inspecting the closed surface impoundment site, monitor wells, withdrawal wells, groundwater recovery system, emergency/safety equipment, and security. A summary of inspection items is included in Table 3-7.

TABLE 3-7: INSPECTION SCHEDULE SUMMARY TABLE

Item	Schedule	Comment
Monitor well sampling and analysis	semi-annual	includes the following monitoring wells: D-2, E-2, G-1, G-2 H-1, H-2, H-3, H-4, H-5, and H-6
Piezometric surface measurement	semi-annual	includes the following wells: D-2, E-2, G-1, G-2, H-1, H-2, H-3, H-4, H-5, H-6, B-4, B-8, B-11, C-1, C-3, C-4, C-5, C-6, C-8, D-1, and D-3
Recovery well sampling and analysis	semi-annual	recovery wells: B-7, C-9R, E-3
Surface impoundment inspection	monthly and after storm events	
Monitor well inspection	monthly and after significant storm events	
Monitor well depths	semi-annual	
Groundwater recovery well inspection	monthly	
Groundwater recovery system flow log	daily	
Emergency & safety equipment/security	daily	

3.7. Preparedness and Prevention. Exline, Inc. no longer treats, stores, or disposes hazardous waste. However, chromium is recovered in the groundwater, which was contaminated by the closed hazardous waste surface impoundment. This section discusses the equipment and procedures in place at the Exline facility, which are designed to minimize the potential for unplanned sudden or non-sudden release of chromium to the environment.

3.7.1. Equipment.

3.7.1.1. Internal Communications. Internal communications in the Cylinder (formerly Chrome Plating) Shop are by direct voice.

3.7.1.2. Telephones. Three (3) telephones are located in the Cylinder Shop. These phones are available to all personnel in the Cylinder Shop at all times. The locations of the telephones are shown on Plate 3-3 (item B).

3.7.1.3. Fire Extinguishers. Portable ABC-type (compatible with ordinary combustibles, liquid and electrical fire) fire extinguishers are located throughout the Cylinder Shop. The locations of the fire extinguishers are shown on Plate 3-3. Fire extinguishers are checked periodically to ensure they are charged and in operating order.

3.7.2. Aisle Space. Adequate aisle space is maintained to allow the unobstructed movement of personnel and equipment. The aisle space and exterior doors in the Cylinder Shop are shown on Plate 3-3.

Un-obstructed access is afforded through any route where equipment or storage is not designated to be present on Plate 3-3.

3.7.3. Arrangement with Local Authorities. Copies of the Exline, Inc. Hazardous Waste Contingency Plan have been distributed to those agencies that might be required to respond to an incident at the facility. Agencies receiving copies of the Contingency Plan are: Rural Fire District No. 5, the City of Salina Fire Department, the Saline County Sheriff's Department, and the Office of Emergency Preparedness. A copy of the Hazardous Waste Contingency Plan, discussed below, is included as Attachment 3-3.

Since the surface impoundment has been closed, the liquid in the impoundment and the contaminated soil disposed off-site, and chromium waste is no longer disposed in the impoundment (i.e., Exline is not an active TSD) there is no need for all of the equipment specified by 40 CFR § 264.32. The equipment listed above is more than adequate to respond to emergencies, which may be associated with the corrective action program (i.e., groundwater recovery system). Therefore, in accordance with 40 CFR § 270.14 (b) (6), Exline, Inc. requests a waiver of the preparedness and prevention requirements set forth in 40 CFR part 264, subpart C.

3.8. Contingency Plan. A copy of the Hazardous Waste Contingency Plan for the Exline Facility has been prepared in accordance with the requirements set forth in 40 CFR 264.50 through 264.56. A copy of the Contingency Plan is included as Attachment 3-3.

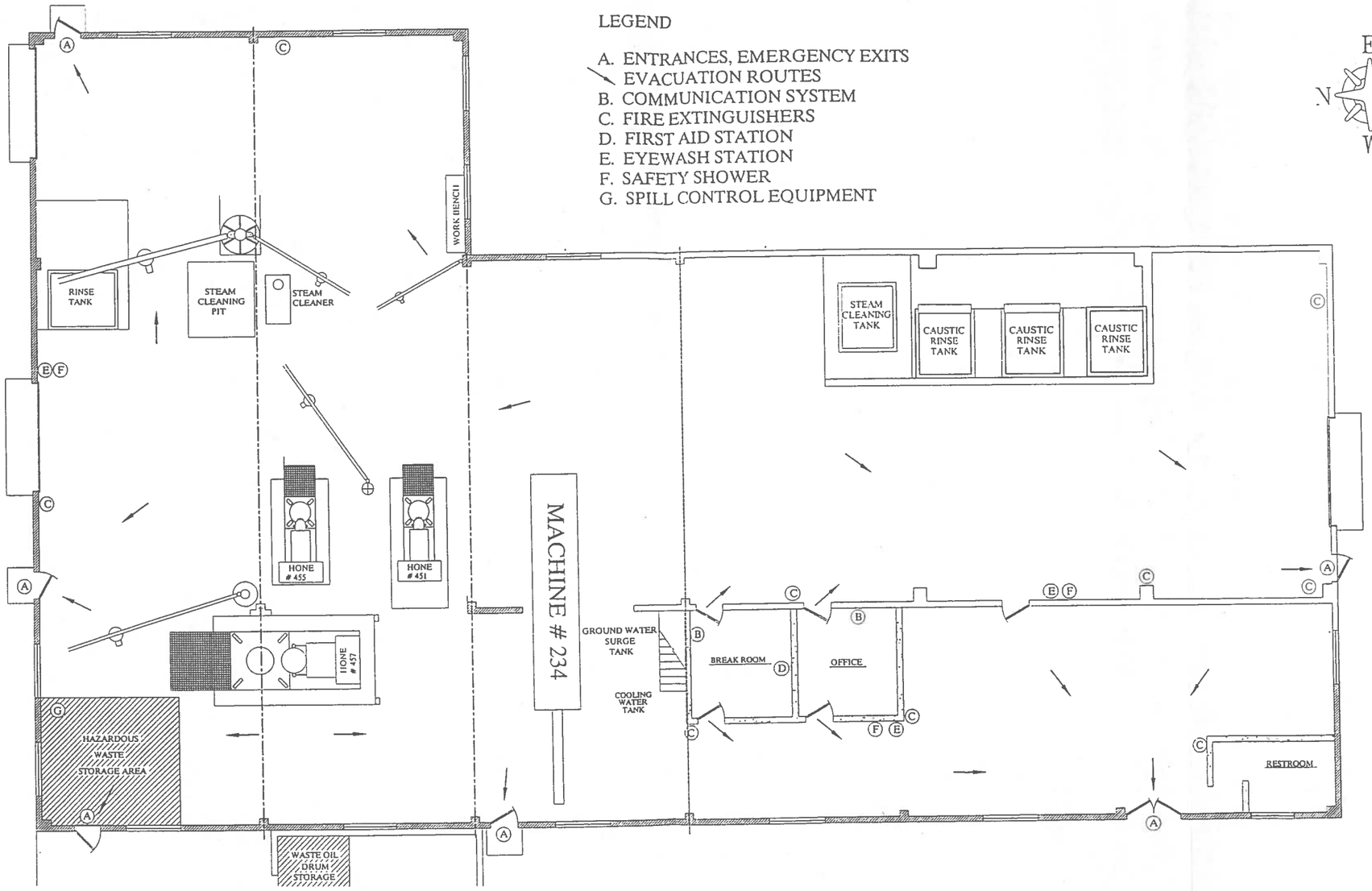
REV

TITLE: CYLINDER SHOP LAYOUT (EMERGENCY PLAN)

ITEM NO.	DESCRIPTION	PART NO	MATERIAL	QUAN

LEGEND

A. ENTRANCES, EMERGENCY EXITS
EVACUATION ROUTES
B. COMMUNICATION SYSTEM
C. FIRE EXTINGUISHERS
D. FIRST AID STATION
E. EYEWASH STATION
F. SAFETY SHOWER
G. SPILL CONTROL EQUIPMENT



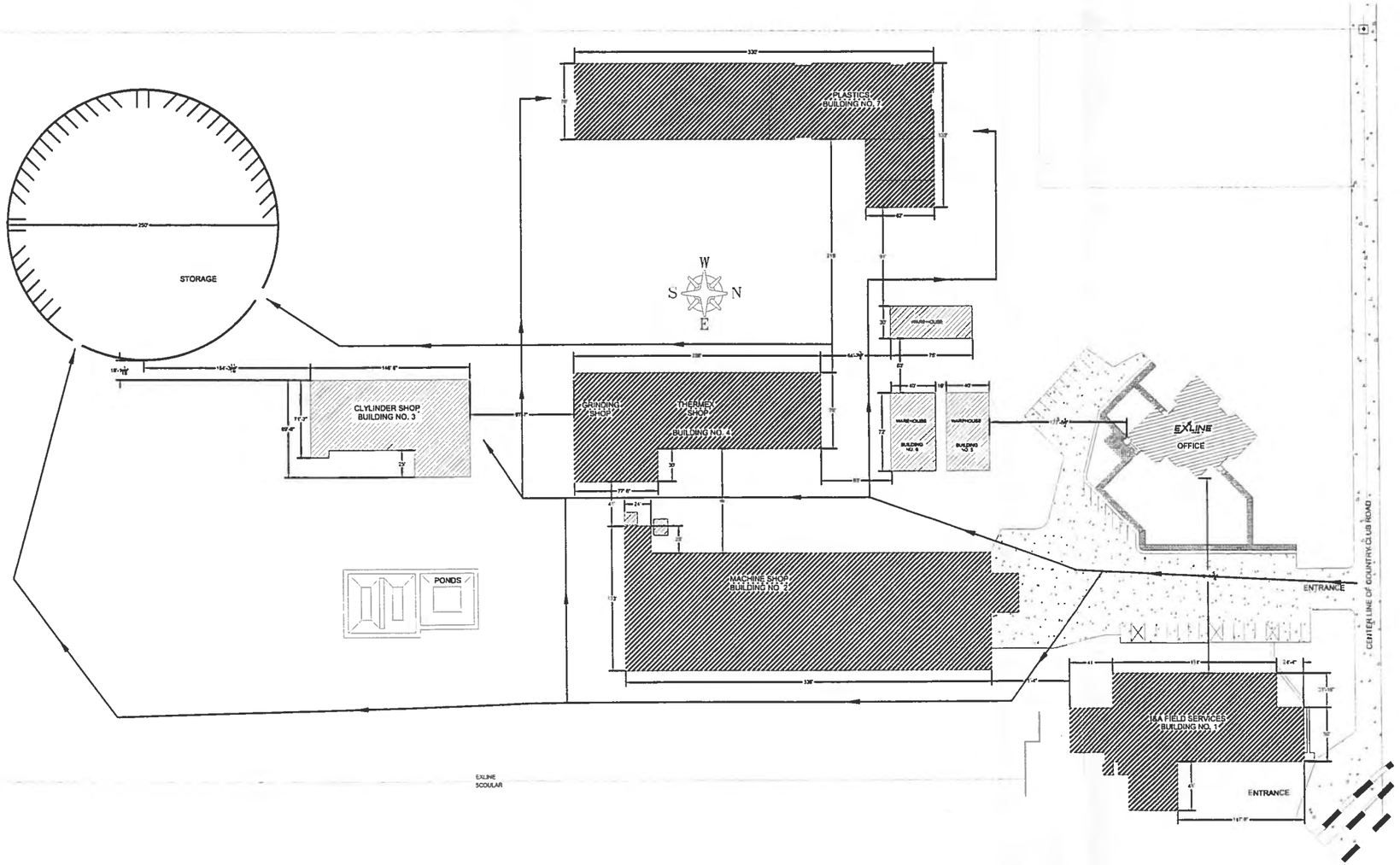


PLATE 3-4: EXLINE, INC. FACILITY TRAFFIC PATTERN

Date: January, 2013

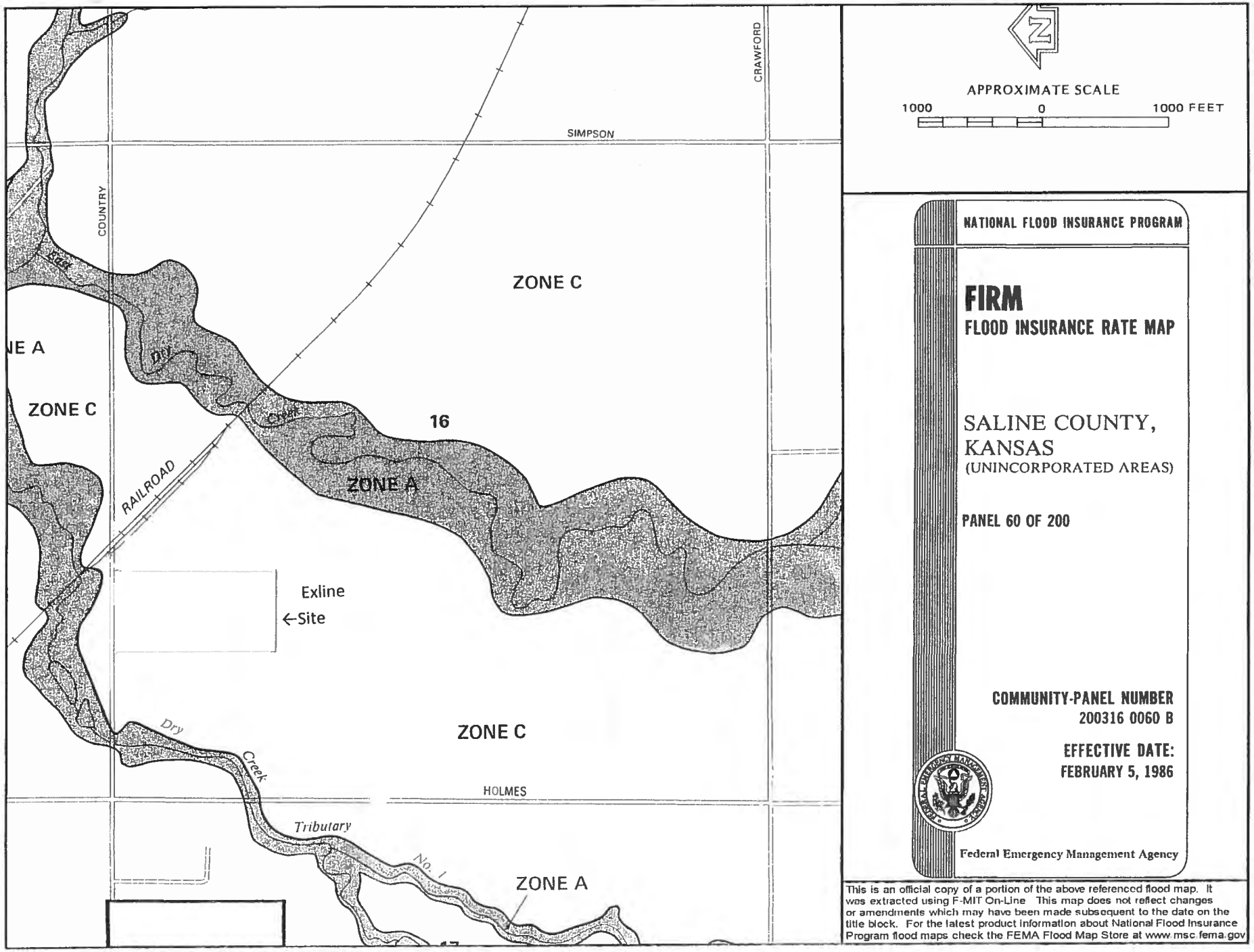


PLATE 3-5: Flood Plain Map

Copies of the Contingency Plan have been distributed to Rural Fire District 5, the City of Salina Fire and EMS, the Office of Emergency Preparedness and the Saline County Sheriff's Department.

3.9. Hazard Prevention. The following procedures are utilized at the Exline facility to minimize hazards related to the operation of the groundwater recovery system.

The potential for a release into the environment from the groundwater recovery system is minimal. Should a tank overflow or a tank or plumbing leak develop, any fluid lost before the system was shut down would be contained within the Cylinder Shop and pumped out to the lift station, which pumps the water to the City sewer.

3.10. Precautions to Prevent Ignition or Reaction. This section is not applicable as the only hazardous constituent present in the recovered groundwater is chromium at a concentration of approximately 1 mg/1. This waste does not constitute a hazard with respect to ignition, reaction or incompatibility with other wastes at the Exline facility.

3.11. Traffic. Access to the Cylinder Shop from East Country Club Road is by gravel roadway. The traffic volume from the public roadway to the Cylinder Shop is minimal. The road has sufficient load bearing capacity for any vehicles that may need access to the area. The access route from East Country Club Road to the Cylinder Shop is shown on Plate 3-4.

3.12. Facility Location Documentation.

3.12.1. Seismic Standard. Exline, Inc. is located in Saline County, Kansas. Since this county is not listed in Appendix VI of 40 CFR, Part 264, no additional information is required to demonstrate compliance with 40 CFR, Part 264.18(a).

3.12.2. Floodplain Information. Plate 3-5 shows the location of the Exline, Inc. facility relative to the 100-year floodplain. The 100-year floodplain area is shown as Zone A. Zone C represents the 500-year floodplain area. The Exline facility is located in Zone C.

3.13. Personnel Training.

3.13.1. Maintenance Department Personnel. Exline, Inc. Maintenance Department employees are responsible for the operation of the Exline, Inc. groundwater recovery system. Therefore, each Maintenance Department employee is provided with initial training in system operation at the time of employment and with refresher training on an annual basis.

3.13.2. Groundwater Recovery System Training Outline.

3.13.2.1. Basic System Operation.

1) Pumping wells.
2) Valve systems.
3) Piping, underground and in plant.

3.13.2.2. Review of Possible Groundwater Recovery System Contingencies.

1) No flammable materials are employed in the process.
2) System leaks in building: shut down system, make repairs, pump water to lift station.
3) System leak outside building: shut down system, repair and pressure test line. No further action required.
4) Groundwater tank overflow: This can occur from any one of three tanks in the system. Shut system down. Correct cause of overflow. Pump overflow water to lift station.
5) Contact emergency coordinator.

3.13.2.3. System Emergency Shutdown.

1) Locations of shut down switches.
2) System devices which will cause shutdown.

3.13.2.4. System Check. Note – these checks are performed only when the groundwater recovery system is operating.

1) The system is visually inspected each day by Maintenance Department personnel.
2) Operating parameters are recorded daily on the "Groundwater Recovery System Log Form" and maintenance activities are recorded on a "Maintenance Log Sheet".

3.13.3. Recording of Training. Maintenance department employees shall be trained within 15 days of their initial employment date; record of the training shall be documented in writing.

3.13.4. Plant Tour. All employees, at the time of either initial or refresher training, shall be given a tour of the facility accompanied by the Exline Facility Superintendent. Possible contingencies shall be examined along with remedies. Areas examined shall include:

1) Contingency areas.
2) Hose bibs.
3) Shut down switches.
4) Floor drains.

3.13.5. Qualifications of Trainer. Training of groundwater recovery system operators will be performed by the Exline Inc. Facility Superintendent or the most experienced operator.

3.14. Closure Plan. In accordance with 40 CFR, Part 270.14 (b) (13), a copy of the approved Closure Plan for the subject surface impoundment is included as Attachment 3-4. The plan was initially prepared by Wilson Laboratories, Salina, Kansas, in July, 1983, and revised in November, 1983. Closure activities outlined by the plan were conducted from May, 1984, through August, 1984. These activities are described in more detail in the following section.

3.15. Closure Activities. A December, 1984 Report entitled "Surface Impoundment Closure Report" was prepared for the purpose of documenting Exline surface impoundment closure activities. A copy of this Report is included as Attachment 3-1. The primary closure activities, which are documented in the certification report, are summarized below.

The first step in the closure process was to transfer the liquid in the impoundment to the chrome plating shop for processing and subsequent re-use in the chrome plating baths.

Contaminated soil was removed from the edge of the impoundment. Then, the edge of the synthetic liner was uncovered and the liner was removed and decontaminated for future use. Next, visually-contaminated soil was removed in and around the surface impoundment. All contaminated soil was moved to a pre-arranged storage area in the chrome plating shop.

Following removal of signs of visual contamination, soil sampling and analysis were conducted to demonstrate removal of hazardous waste. The first round of sampling demonstrated that, with the exception of one section, all remaining soil met the cleanup criteria for lead and chromium set forth in the approved Closure Plan. Additional soil was removed from this contaminated section and subsequent sampling and analysis demonstrated that chromium and lead criteria were met for this section as well. These analysis results were previously summarized in Section 3.2 of this permit application. Attachment 3-1, "Surface Impoundment Closure Report", provides greater detail with respect to the closure activities.

3.16. Post-Closure Plan. The Post-Closure Plan for the Exline Surface impoundment is included as Attachment 3-5. This plan was prepared in accordance with 40 CFR, Parts 264.188, 264.228, and 264.310.

3.17. Notice Documentation for Closure of Hazardous Waste Surface Impoundment. The Kansas Department of Health and Environment has been notified of the type, location, and quantity of waste disposed in Exline's Surface Impoundment with the submittal of the Closure Plan and Closure Certification for the site. The Saline County Planning Commission, Salina, Kansas, has been notified of the type, location, and quantity of waste formerly disposed in the surface impoundment. The notification letter and the survey plat are included in Attachment 3-5, the "Surface Impoundment Post-Closure Plan".

Closure of the surface impoundment was certified on January 17, 1985. This certification was completed by the Facility Owner and a Kansas Registered Professional Engineer. These certifications are included in the "Surface Impoundment Closure Report", dated December, 1984 (Attachment 3-1).

3.18. Closure Cost Estimate. This section is not applicable since closure activities have been completed.

3.19. Post-Closure Cost Estimate. A Post-Closure cost estimate has been prepared for the Exline facility in accordance with the requirements of 40 CFR 265.142. This estimate is generally developed on an annual basis. The most recent estimate has been included as Attachment 3-6.

3.20. Financial Assurance Documentation. 40 CFR, part 264.145 sets forth the financial assurance requirements for post-closure care. Exline Leasing, Inc. and Exline, Inc. will provide financial assurance per Mostafa Kamal's April 18, 2014 e-mail, which outlines quarterly payments of $ 25,000 for 10 years to the trust fund ($ 100,000 per year) and maintaining a $ 100,000 Irrevocable Standby Letter of Credit.

ATTACHMENT 3-1

SURFACE IMPOUNDMENT CLOSURE REPORT

SURFACE IMPOUNDMENT

CLOSURE REPORT

FOR

EXLINE, INC.

SALINA, KANSAS

DECEMBER 1984

EXLINE INC.®
P.O. Box 1267 • Country Club Road
Salina, Kansas 67401

CERTIFICATION OF CLOSURE

BY OWNER

I certify that the subject surface impoundment, located at Exline, Inc., Salina, Kansas, has been removed and closed in accordance with the specifications in the approved surface impoundment closure plan for this facility.

Signed:

Jerry K. Exline
Vice President
Exline, Inc.

Date: 17 Oct 85

CERTIFICATION OF CLOSURE

BY REGISTERED PROFESSIONAL ENGINEER

I certify that in my professional opinion, the subject surface impoundment located at Exline, Inc., Salina, Kansas, has been removed and closed in accordance with the specifications in the approved surface impoundment closure plan for this facility.

JANIS C. BUTLER
LICENSED
8675
KANSAS
PROFESSIONAL ENGINEER

Signed:

Janis C. Butler

Janis C. Butler, P.E.
Registered Professional Engineer

Date: 17 January 1985

SURFACE IMPOUNDMENT

CLOSURE REPORT

INTRODUCTION

This report describes the procedures undertaken to close the hazardous waste surface impoundment located at Exline, Inc., East Country Club Road, Salina, Kansas. The closure of this impoundment has been carried out in accordance with procedures set forth in the closure plan approved by the U.S.E.P.A. and the Kansas Department of Health and Environment (KDHE). [1]

The location of the subject impoundment is shown on Plate I.

Closure of the Exline, Inc. surface impoundment began in May 1984, final approval to proceed with closure having been received from the KDHE on 25 April 1984. The general closure procedure was to remove the impoundment liner and any surrounding contaminated soil. Successive quantities of contaminated soil were removed until laboratory analysis showed that contaminant levels in the remaining soils were below the limits set forth in the approved hazardous waste closure plan for this facility.

Closure of the Exline, Inc. surface impoundment was accomplished in accordance with the approved closure plan, so as to accomplish the complete removal of the surface impoundment (by the complete removal of all wastes). As a result of this closure, no post closure care will be required for this surface impoundment.

The closure process for the subject surface impoundment was complete, with the exception of final soil disposal (which was held in storage), by 17 August 1984. At this time, the surface

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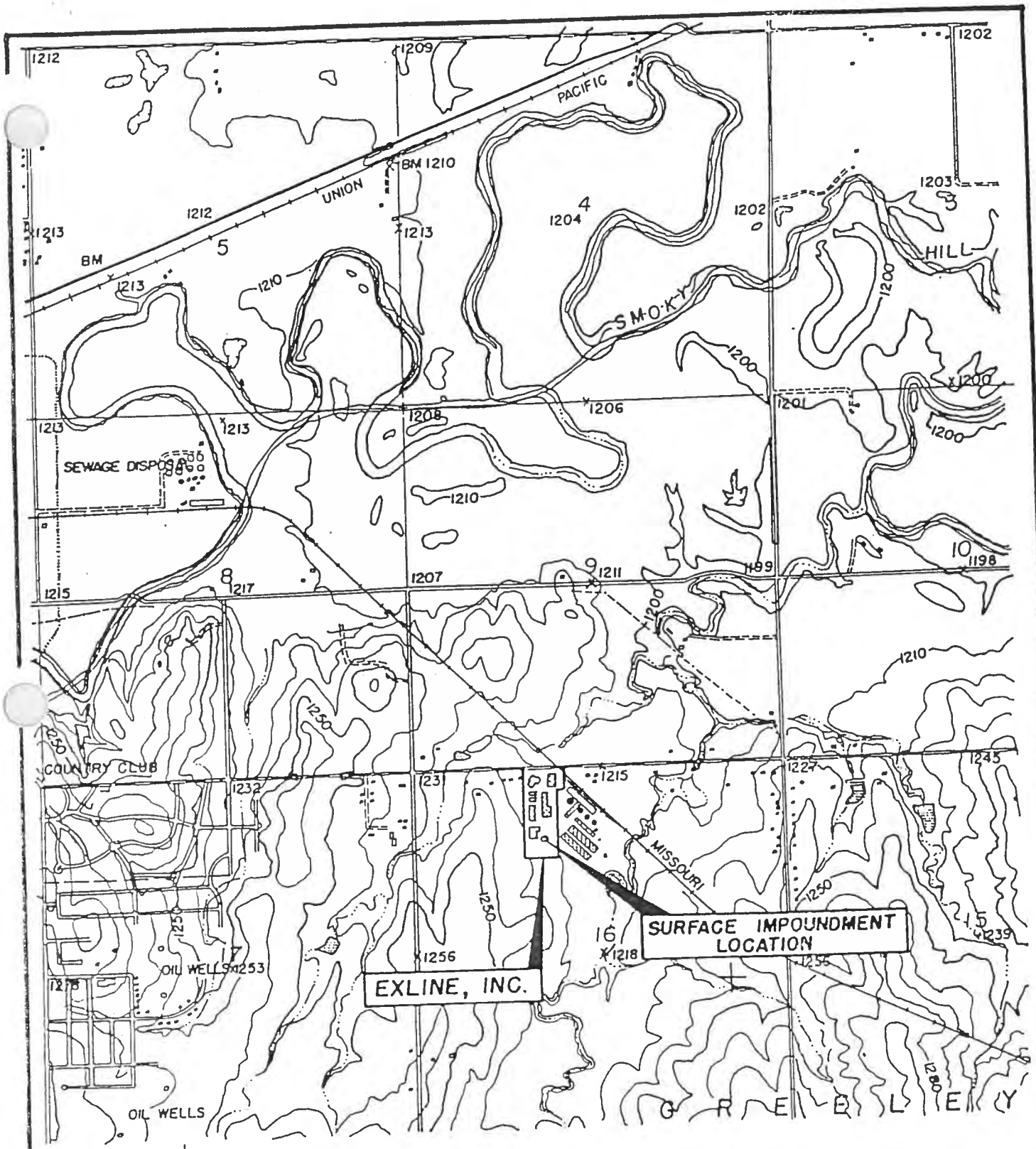
1. Surface Impoundment Closure Plan for Exline, Inc., Salina, Kansas, Wilson Laboratories, Salina, Kansas, July 1983, Revised November 1983.



NORTH

EXLINE INC. IS LOCATED IN NE 1/4, NW 1/4, SECTION 16, T14S, R2W, SALINE COUNTY, KANSAS

REVISIONS			SH. OF	DATE 1/14/1985	EXLINE INC.
NO.	DATE	BY	CHK'D.	SCALE	
1			APP'D. TMC	DRAWN BY K. MYERS	
2					
3			TITLE LOCATION OF EXLINE INC. SALINA, KS.		DRAWING NO. PLATE 1

impoundment was filled and regraded.

On 10 July 1984, Exline, Inc., proposed to the KDHE that a deviation be made from the approved closure plan, allowing the on-site treatment of contaminated soil removed from the surface impoundment. The KDHE rejected this request on 27 November 1984. In response to this decision, Exline, Inc. removed all contaminated soil from storage to a licensed hazardous waste disposal facility on 16 January 1985, completing the closure on the surface impoundment.

This report presents data from the analysis of soils underneath the surface impoundment and certifications by the owner and registered professional engineer that closure has been completed in accordance with the approved closure plan for the facility.

CLOSURE PROCEDURES:

Closure procedures were undertaken in accordance with the Exline, Inc. Surface Impoundment Closure Plan (July 1983, Revised November 1983).

The first step in closing the impoundment was to remove contaminated soil from the edge of the impoundment, uncover the liner edge, and remove soil from the liner itself. The impoundment was empty at the commencement of closure, all waste solution contained in the impoundment having been recycled to the Exline, Inc. plating shop for use in the plating process. The closure process was initiated following receipt of notice to proceed from the KDHE on 25 April 1984.

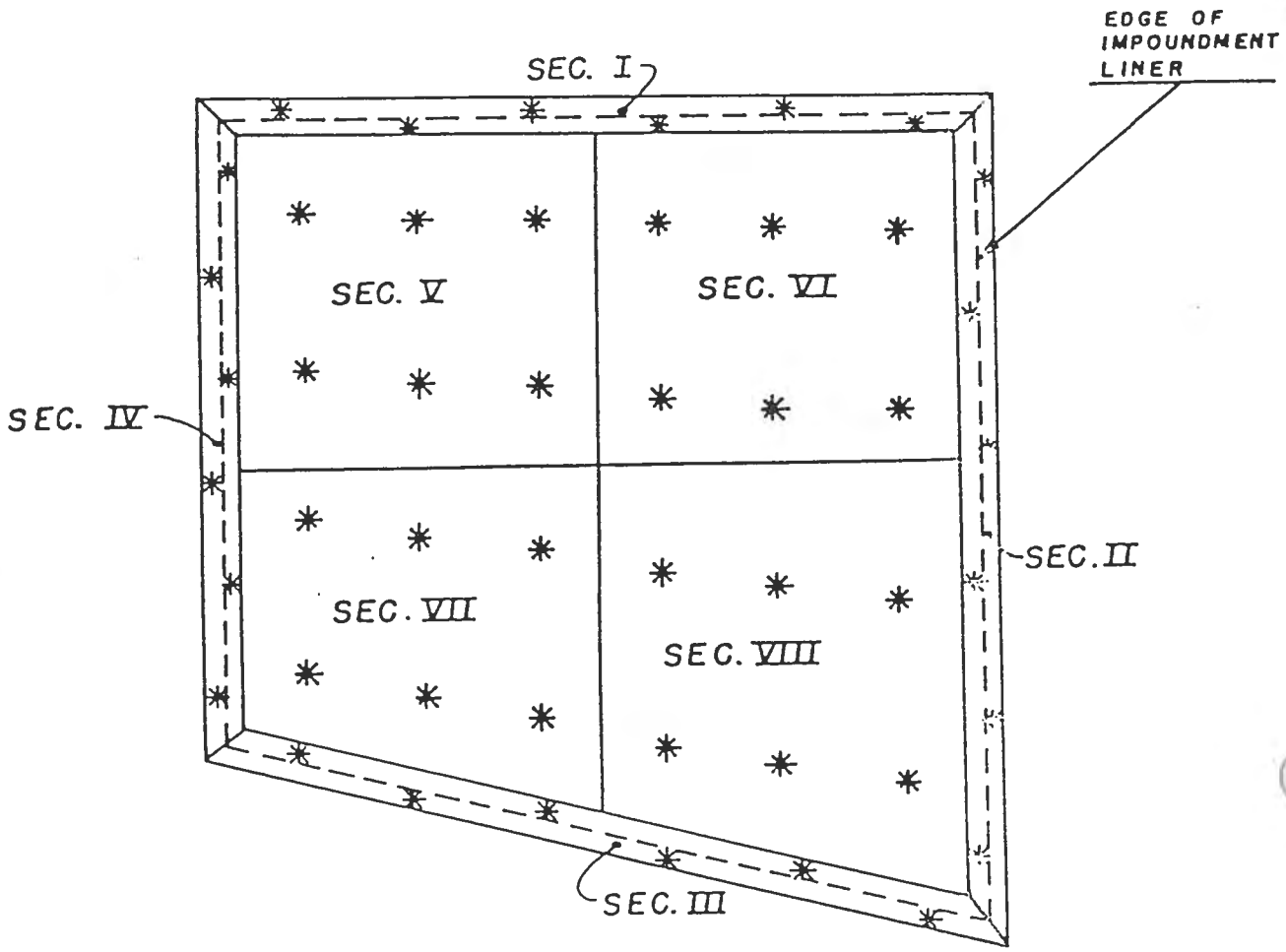
Contaminated soils removed from the edge and liner were transported by skid steer loader to the pre-arranged storage area in the chrome plating shop. Following removal of these soils, the liner

was washed, and on 10 May 1984, removed for future use. A large portion of this liner has already been used in the construction of tank liners in the Exline, Inc. plating shop.

Following removal of the impoundment liner, contaminated soils around the impoundment edge which could not be removed with the liner in place, were collected and transported to the soil storage area.

Following removal of visually detectable contaminated soils, the top six (6) inches of soil in areas around and beneath the impoundment was sampled and composite samples analyzed for total and extractable (EP Tox method) chromium. All soil sampling was performed by B. L. Johnson of Wilson Laboratories, Salina, Kansas. Soil analyses were also performed by Wilson Laboratories. Sampling procedure notes and chain of custody records maintained by Wilson Laboratories Sampling personnel for this project are contained in Appendix I. The first sampling of the impoundment area was performed on 9 July 1984. A map of the sampling locations is shown on Plate I. Analytical results from this round of sampling are shown on Table I.

The general soil sampling procedure, used at each soil sampling, was to obtain six (6) sub-samples from each section, as shown on Plate II. The six (6) sub-samples were mixed together to form a composite sample representative of the section.



NOTE:
✳ — DESIGNATES SUBSAMPLE LOCATION, ALL SUBSAMPLES FROM A GIVEN SECTION WERE COMBINED TO FORM A COMPOSITE SAMPLE REPRESENTING THAT SECTION.

REVISIONS					
NO.	DATE	BY	SH. OF	DATE JAN. 11, 1985	EXLINE INC.
1			CHK'D. T. M.C.	SCALE 1" = 20'	
2			APP'D. T.M.C.	DRAWN BY R.E.W.	
3			TITLE SURFACE IMPOUNDMENT SOIL SAMPLE LOCATIONS		DRAWING NO. PLATE II
4					

TABLE I *

RESULTS OF FIRST ROUND SOIL SAMPLING

RESULTS

Section	EP Toxicity-(Chromium (mg/l)	EP Toxicity-(Lead (mg/l)	Total Chromium mg/l)
I	8.5	* *	* *
II	3.38	ND (0.1)	1000.
III	ND (0.05)	ND (0.1)	287.
IV	ND (0.05)	ND (0.1)	754.
V	ND (0.05)	ND (0.1)	54.
VI	ND (0.05)	ND (0.1)	7.2
VII	ND (0.05)	ND (0.1)	470.
VIII	ND (0.05)	ND (0.1)	21.
Closure Plan Limit	5.	5.	1000.

* Original laboratory reports for these data are continued in Appendix II

** EP Toxicity-Lead and total chromium were not analyzed for this section has already failed, due to high EP-Toxicity-Chromium.

All of the sections sampled and analyzed during the first round of sampling, with the exception of Section I, met or exceeded the soil removal limits set forth in the approved surface impoundment closure plan. Analyses of lead and chromium EP Toxicity were performed in accordance with the closure plan. Lead and chromium were the only metals which exceeded EP Toxicity limits (40 CFR 261.24) in the solution formerly stored in the impoundment. A laboratory analysis of the former impoundment solution is contained in Appendix III.

Because Section I of the impoundment did not meet the limitation on soil removal as set forth in the closure plan, an additional lift of soil was removed from this area. A second round of sampling was performed on 10 August 1984.

Soil sampling for the second sampling round was performed by B. L. Johnson of Wilson Laboratories and subsequent analyses were performed at Wilson Laboratories. Sampling and chain of custody records for this sampling are contained in Appendix I. The laboratory report for this sample is contained in Appendix II, and analytical results summarized in Table II.

TABLE II

RESULTS OF SECOND ROUND SOIL SAMPLING

	RESULTS		
Section	EP Toxicity-Chromium (mg/l)	EP Toxicity (Lead (mg/l)	Total Chromium (mg/l)
1	0.18	ND (0.1)	901.

Following laboratory confirmation that Section I had met the removal limits set in the closure plan, the impoundment area was regraded. Regrading was completed on 17 August 1984.

All contaminated soil removed from the impoundment area during the closure process was stored in the Exline, Inc. chrome plating shop.

In order to complete the closure process, all soil in storage was transported to a licensed hazardous waste disposal facility. The last load was transported on 16 January 1985. Hazardous waste disposal manifests completed at the time of shipment of the soil are contained in Appendix IV. A total of 123,540 pounds of contaminated soil, tires and boards were sent to the U. S. Pollution Control, Inc., Lone Mountain Surface Disposal Site at Waynoka, Oklahoma.

All tools and equipment used in removing contaminated soil from the impoundment area, or in loading soil for transport to disposal were decontaminated by steam cleaning. All wastewater generated by this cleaning process was disposed in the Exline, Inc. Industrial Wastewater Pretreatment System.

APPENDIX I

SAMPLING NOTES AND CHAIN OF CUSTODY RECORDS

WILSON LABORATORIES

528 N. NINTH • P.O. BOX 1858 • SALINA, KANSAS 67402-1858 • (913) 825-7186

28 December 1984

JAN 2 1985

Mr. Jerry K. Exline
Exline, Inc.
P.O. Box 1267
Salina, KS 67402-1267

Re: Notes on Sampling of Exline Surface Impoundment
Wilson Lab File: 84-9520

Dear Mr. Exline:

Enclosed are copies of the sampling notes and chain-of-custody records you requested. Please let us know if you need additional information.

WILSON LABORATORIES

Barbara L. Johnson

Barbara L. Johnson
Geological Engineer

Enc.

-slw

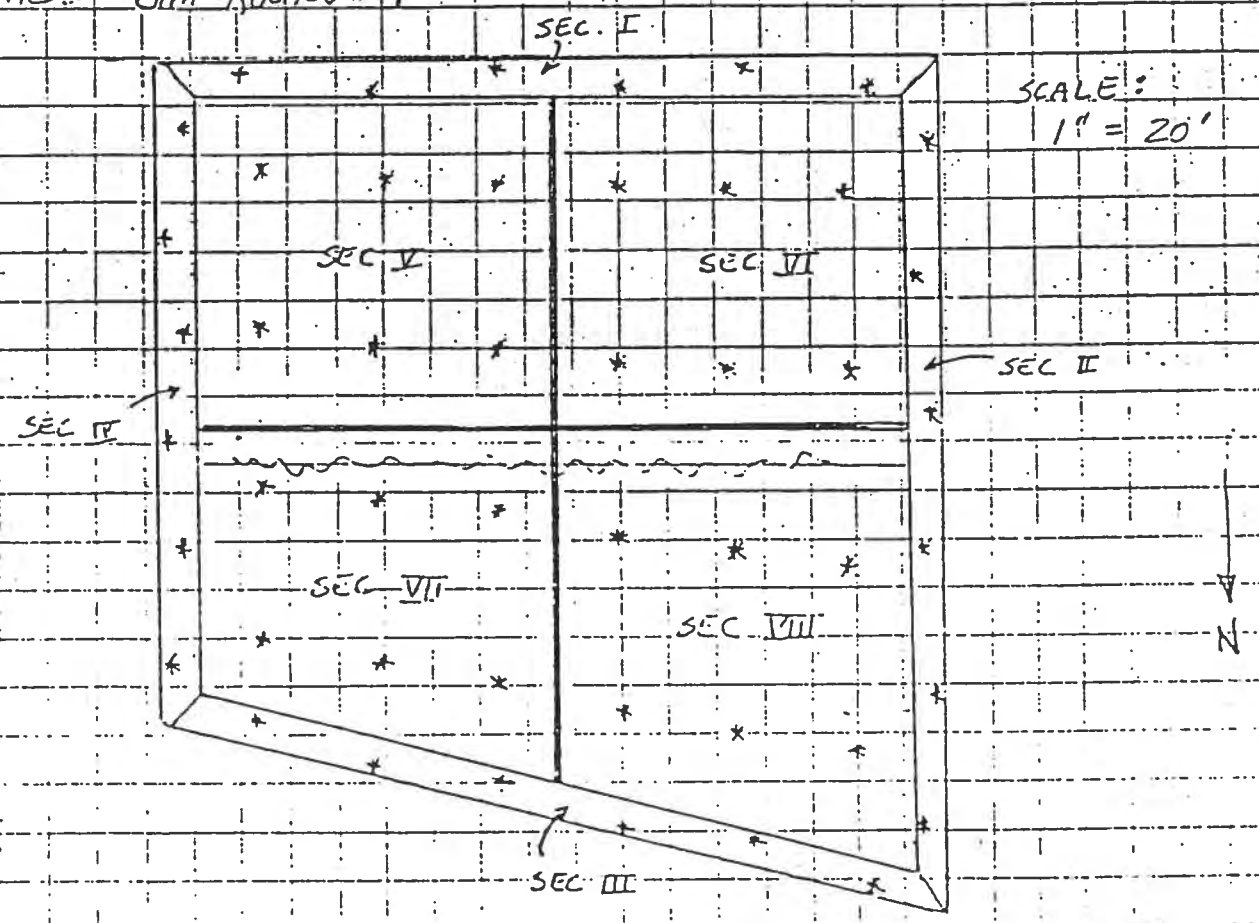
Page No.

e: Surface Impoundment, bottom and four sides

ate: 7/9/89

Weather: upper 90's

The follow points were staked out with flags by Wilson Lab's BL Johnson and Exline's Jim Kochevar.



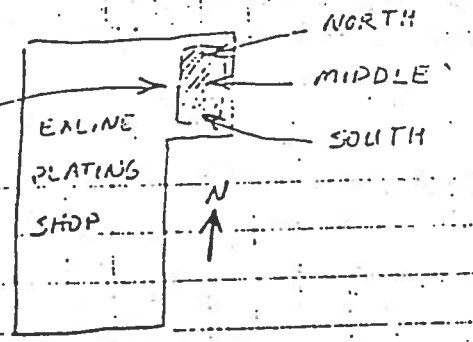
The impoundment was divided into 8 sections as labeled above. Six samples were obtained from each section and composited in plastic bags. Approximately 250 mls of soil was collected from each sampling point for an approx. total of 1500 mls per section. Samples were collected using a hand shovel

To Page No.

nessed & Understood by me,	Date	Invented by	Date
		Recorded by	7/9/89

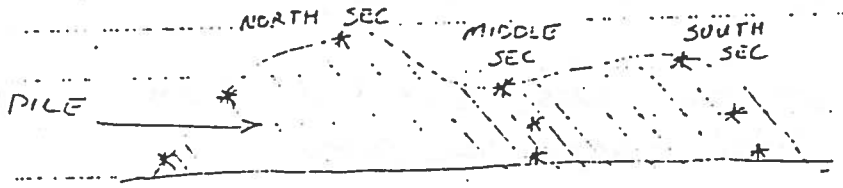
Page No.

PLACE: EXLINE CROME PLATING SHOP
STORED CONTAMINATED SOILS



DATE: 7/10/84
TIME: 1520 - 1530
SAMPLED BY: BL JOHNSON

SOIL SAMPLES WERE COLLECTED FROM THREE SEPARATE SECTIONS OF THE STORAGE PILE, THE NORTH SECTION, MIDDLE SECTION, AND SOUTH SECTION. APPROXIMATELY 600 ml OF SOIL WERE OBTAINED FROM THE BASE, THE MIDDLE, AND THE TOP OF EACH SECTION.



* APPROXIMATE SAMPLE LOCATIONS

SAMPLES IN EACH SECTION WERE COMPOSITED AND PLACED IN ONE-GALLON SEALED PLASTIC BAGS. APPROXIMATELY 200 ml. OF SAMPLE ~~WAS~~ WERE COLLECTED FROM EACH SECTION USING A HAND SHOVEL.

To Page No.

Witnessed & Understood by me,	Date	Invented by	Date
			7/10/84

Page No.

Resampled Sec. II at Surface Impoundment
(first sampling is recorded in Book No. 318, Page 13)

APPROXIMATELY 250 mls of soil was collected from six points in Sec. II for a total composite sample of 1500 mls. A hand shovel was used to collect the samples from the top ~6 inches

DATE: 1 AUG 1984
WEATHER: clear, 90°'s
SAMPLER: BL Johnson

Resampled Sec. I at Surface Impoundment
(first sampling is recorded in Book 318, Page 13)

APPROXIMATELY 250 mls of soil was collected from points in Sec II for a total composite sample of 500 mls.
A hand shovel was used to collect the samples from the top ~6 inches

DATE: 10 AUGUST 1984
WEATHER: ptly cloudy, 90°'s
SAMPLER: BL Johnson

To Page No.

essed & Understood by me,	Date	Invented by	Date
		Recorded by	

Client: EXLINE INC

File No: 84-9520

WILSON LABORATORIES
P.O. BOX 1858 • 528 NORTH NINTH STREET
SALINA, KANSAS 67401
(913) 825-7186

CHAIN OF CUSTODY RECORD

PROJECT NAME: SOIL SAMPLING

SAMPLERS (Signature): Barbara L. Johnson

SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE: WATER Comp	WATER Grab	AIR	SOLID	SEQ. NO.	No. of Containers	WILSON LABORATORIES NUMBER
Surface Impoundment	Sec. I	7/9/84	1140				✓		1	8407-0361
	Sec. II		1200				✓		1	8407-0362
	Sec. III		1215				✓		1	8407-0363
	Sec. IV		1230				✓		1	8407-0364
	Sec. V		1240				✓		1	8407-0365
	Sec. VI		1250				✓		1	8407-0366
	Sec. VII		1255				✓		1	8407-0367
	Sec. VIII		1310				✓		1	8407-0368

Analyses Required:

EP Tox

~~TOTAL~~ CHROMIUM

NOTE: Samples are composite samples.
Please mix thoroughly before preparing for analysis

RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RECEIVED BY: (Signature)			RECEIVED BY MOBILE LABORATORY FOR FIELD ANALYSIS: (Signature)	DATE	TIME
DISPATCHED BY: (Signature) Barbara L Johnson	DATE 7/9/84	TIME 1330	RECEIVED FOR LABORATORY BY: J. Peterson	DATE 7/9/84	TIME 1400
METHOD OF SHIPMENT Wilson Labs truck					

W-Lab No. 5 (8-81-1M)

Distribution: Original — Accompany Shipment
1 Copy — Survey Coordinator Field Files

Client: EXLINE, INC

File No: 84-9520

WILSON LABORATORIES

P.O. BOX 1858 • 528 NORTH NINTH STREET
SALINA, KANSAS 67401
(913) 825-7186

CHAIN OF CUSTODY RECORD

PROJECT NAME: CLOSURE PLAN

SAMPLERS (Signature): Barbara L. Johnson

SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE WATER Comp	SAMPLE TYPE WATER Grab	SAMPLE TYPE AIR	SAMPLE TYPE SOLID	SEQ. NO.	No. of Containers	WILSON LABORATORIES NUMBER
EXLINE, INC	SOUTH HOLDING TANK	7/12/84	1145		✓				1 - 500 ml plastic	8407-0528

Analyses Required:

TOTAL EP TOX METALS

RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RECEIVED BY: (Signature)			RECEIVED BY MOBILE LABORATORY FOR FIELD ANALYSIS: (Signature)	DATE	TIME
DISPATCHED BY: (Signature) Barbara L. Johnson	DATE 7/12/84	TIME 1200	RECEIVED FOR LABORATORY BY: Jo Peterson	DATE 7/12/84	TIME 1300
METHOD OF SHIPMENT WILSON LAB TRUCK					

W Lab No 5 (8 81 1M)

Distribution: Original — Accompany Shipment
1 Copy — Survey Coordinator Field Files

Client: LALINE, IA

File No: 84-9520

WILSON LABORATORIES

P.O. BOX 1858 • 528 NORTH NINTH STREET
SALINA, KANSAS 67401
(913) 825-7186

CHAIN OF CUSTODY RECORD

PROJECT NAME: SOIL SAMPLING

SAMPLERS (Signature): Barbara L. Johnson

SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE: WATER Comp	WATER Grab	AIR	SOLID	SEO NO.	No. of Containers	WILSON LABORATORIES NUMBER
Surface Impoundment	Sec. II	8-1-84	1600				✓		1 plastic bag	

Analyses Required:

EP TOX

CHROMIUM SCIII

NOTE: This is a composite sample, please mix thoroughly before preparing for analysis

RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RECEIVED BY: (Signature)			RECEIVED BY MOBILE LABORATORY FOR FIELD ANALYSIS: (Signature)	DATE	TIME
DISPATCHED BY: (Signature) Barbara L Johnson	DATE 8-1-84	TIME 1620	RECEIVED FOR LABORATORY BY: Jane Hartley	DATE 8/1/84	TIME 1625
METHOD OF SHIPMENT lab truck					

W Lab No 5 (8 81 1M)

Distribution: Original — Accompany Shipment
1 Copy — Survey Coordinator Field Files

Client: EXLINE

File No: 84-9520

WILSON LABORATORIES
P.O. BOX 1858 • 528 NORTH NINTH STREET
SALINA, KANSAS 67401
(913) 825-7186

CHAIN OF CUSTODY RECORD

PROJECT NAME: SOIL SAMPLING

SAMPLERS (Signature): Barbara L. Johnson

SAMPLE LOCATION	SAMPLE IDENTIFICATION	DATE	TIME	SAMPLE TYPE: WATER Comp	WATER Grab	AIR	SOLID	SEQ. NO.	No. of Containers	WILSON LABORATORIES NUMBER
Surface Impoundment	Sec. I	8/10/84	1530				✓		1 plastic bag	8408-0504

Analyses Required:

CROMIUM, EP TOX

TOTAL CHROMIUM

RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RELINQUISHED BY: (Signature)			RECEIVED BY: (Signature)	DATE	TIME
RECEIVED BY: (Signature)			RECEIVED BY MOBILE LABORATORY FOR FIELD ANALYSIS: (Signature)	DATE	TIME
DISPATCHED BY: (Signature) Barbara L. Johnson	DATE 8/10/84	TIME 1600	RECEIVED FOR LABORATORY BY: B Peterson	DATE 8/10/84	TIME 1600
METHOD OF SHIPMENT lab truck					

W Lab No 5 (8 81 1M)

Distribution: Original — Accompany Shipment

APPENDIX II

LABORATORY REPORTS OF

SOIL ANALYSES

AUG 2 7 1984

W I L S O N L A B O R A T O R I E S

528 NORTH NINTH STREET - P.O. BOX 1858 - SALINA, KANSAS 67402-1858 - (913)825-7186

LABORATORY REPORT

CLIENT: EXLINE INC.
ATTN: JERRY EXLINE
P.O. BOX 1267
SALINA, KS 67401

DATE RPTD: 08/23/84
DATE RCVD: 07/09/84
PURCHASE AUTH:
FILE NO.: 84-9520
ORDER NO.: 7007

LAB NUMBER: 84070361
SAMPLE DESCRIPTION: SURFACE IMPOUNDMENT SEC I

DATE SAMPLED: 07/09/84
TIME SAMPLED: 1140

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	8.5	MG/L	302-33

--CONCLUSION--LAB NUMBER: 84070361 SURFACE IMPOUNDMENT SEC I

LAB NUMBER: 84070362
SAMPLE DESCRIPTION: SURFACE IMPOUNDMENT SEC II

DATE SAMPLED: 07/09/84
TIME SAMPLED: 1200

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	3.38	MG/L	302-33
LEAD, EP TOXICITY	ND(0.1)	MG/L	302-65
CHROMIUM, TOTAL	1000.	UG/G	253-198

--CONCLUSION--LAB NUMBER: 84070362 SURFACE IMPOUNDMENT SEC II

LAB NUMBER: 84070363
SAMPLE DESCRIPTION: SURFACE IMPOUNDMENT SEC III

DATE SAMPLED: 07/09/84
TIME SAMPLED: 1215

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	ND(0.05)	MG/L	302-33
LEAD, EP TOXICITY	ND(0.1)	MG/L	302-65
CHROMIUM, TOTAL	287.	UG/G	253-198

--CONCLUSION--LAB NUMBER: 84070363 SURFACE IMPOUNDMENT SEC III

LAB NUMBER: 84070364
SAMPLE DESCRIPTION: SURFACE IMPOUNDMENT SEC IV

DATE SAMPLED: 07/09/84
TIME SAMPLED: 1230

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	ND(0.05)	MG/L	302-3

LABORATORY REPORT

CLIENT: EXLINE INC.

FILE NO.: 84-9520
ORDER NO.: 7007

LAB NUMBER: 84070364 (CONT.)

ANALYSIS	CONCENTRATION	UNITS	BOOK/PAGE
LEAD, EP TOXICITY	ND(0.1)	MG/L	302-65
CHROMIUM, TOTAL	754.	UG/G	253-198

--CONCLUSION--LAB NUMBER: 84070364 SURFACE IMPOUNDMENT SEC IV

LAB NUMBER: 84070365
SAMPLE DESCRIPTION: SURFACE IMPOUNDMENT SEC V

DATE SAMPLED: 07/09/84
TIME SAMPLED: 1240

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	ND(0.05)	MG/L	302-33
LEAD, EP TOXICITY	ND(0.1)	MG/L	302-65
CHROMIUM, TOTAL	54.	UG/G	253-198

--CONCLUSION--LAB NUMBER: 84070365 SURFACE IMPOUNDMENT SEC V

LAB NUMBER: 84070366
SAMPLE DESCRIPTION: SURFACE IMPOUNDMENT SEC VI

DATE SAMPLED: 07/09/84
TIME SAMPLED: 1250

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	ND(0.05)	MG/L	302-33
LEAD, EP TOXICITY	ND(0.1)	MG/L	302-65
CHROMIUM, TOTAL	7.2	UG/G	253-198

--CONCLUSION--LAB NUMBER: 84070366 SURFACE IMPOUNDMENT SEC VI

LAB NUMBER: 84070367
SAMPLE DESCRIPTION: SURFACE IMPOUNDMENT SEC VII

DATE SAMPLED: 07/09/84
TIME SAMPLED: 1255

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	ND(0.05)	MG/L	302-33
LEAD, EP TOXICITY	ND(0.1)	MG/L	302-65
CHROMIUM, TOTAL	470.	UG/G	253-198

--CONCLUSION--LAB NUMBER: 84070367 SURFACE IMPOUNDMENT SEC VII

W I L S O N L A B O R A T O R I E S

LABORATORY REPORT

CLIENT: EXLINE INC.

FILE NO.: 84-95
ORDER NO.: 7007

LAB NUMBER: 84070368
SAMPLE DESCRIPTION: SURFACE IMPOUNDMENT SEC VIII

DATE SAMPLED: 07/09/84
TIME SAMPLED: 1310

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	ND(0.05)	MG/L	302-33
LEAD, EP TOXICITY	ND(0.1)	MG/L	302-65
CHROMIUM, TOTAL	21.	UG/G	253-198

--CONCLUSION--LAB NUMBER: 84070368 SURFACE IMPOUNDMENT SEC VIII

ND(), WHERE NOTED, INDICATES NONE DETECTED WITH THE DETECTION LIMIT IN PARENTHESES.

EP TOXICITY ANALYSIS WAS PERFORMED ON SAMPLES AS RECEIVED AND IN ACCORDANCE WITH EPA PUBLICATION, SW-846, TEST METHODS FOR EVALUATING SOLID WASTE, JULY 1982.

SAMPLES WILL BE RETAINED FOR 30 DAYS UNLESS OTHERWISE NOTIFIED.

WILSON LABORATORIES

Lynn R Newcomer

LYNN R. NEWCOMER
CHIEF CHEMIST

W I L S O N L A B O R A T O R I E S

528 NORTH NINTH STREET - P.O. BOX 1858 - SALINA, KANSAS 67402-1858 - (913)825-7186

LABORATORY REPORT

CLIENT: EXLINE INC.
ATTN: JERRY EXLINE
P.O. BOX 1267
SALINA, KS 67401

DATE RPTD: 08/23/84
DATE RCVD: 08/10/84
PURCHASE AUTH:
FILE NO.: 84-9520
ORDER NO.: 7299

LAB NUMBER: 84080504
SAMPLE DESCRIPTION: SECTION I

DATE SAMPLED: 08/10/84
TIME SAMPLED: 1530

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
CHROMIUM, EP TOXICITY	0.18	MG/L	304-96
LEAD, EP TOXICITY	ND(0.1)	MG/L	302-50
CHROMIUM, TOTAL	901.	UG/G	253-204

--CONCLUSION--LAB NUMBER: 84080504 SECTION I

ND(), WHERE NOTED, INDICATES NONE DETECTED WITH THE DETECTION LIMIT IN PARENTHESES.

EP TOXICITY ANALYSIS WAS PERFORMED ON SAMPLES AS RECEIVED AND IN ACCORDANCE WITH EPA PUBLICATION, SW-846, TEST METHODS FOR EVALUATING SOLID WASTE, JULY 1982.

SAMPLES WILL BE RETAINED FOR 30 DAYS UNLESS OTHERWISE NOTIFIED.

WILSON LABORATORIES

Lynn R. Newcomer

LYNN R. NEWCOMER
CHIEF CHEMIST

APPENDIX III

LABORATORY ANALYSIS OF IMPOUNDMENT SOLUTION

This Appendix contains a laboratory analysis of solution which was contained in the surface impoundment. This solution was removed to a chrome plating solution storage tank where it was sampled for analysis of heavy metals in accordance with the surface impoundment closure plan.

W I L S O N L A B O R A T O R I E S

528 NORTH NINTH STREET - P.O. BOX 1858 - SALINA, KANSAS 67402-1858 - (913)825-7186

AUG 2 1984 1

LABORATORY REPORT

CLIENT: EXLINE INC.
ATTN: JERRY EXLINE
P.O. BOX 1267
SALINA, KS 67401

DATE RPTD: 08/01/84
DATE RCVD: 07/12/84
PURCHASE AUTH:
FILE NO.: 84-9520
ORDER NO.: 7040

LAB NUMBER: 84070528
SAMPLE DESCRIPTION: SOUTH HOLDING TANK

DATE SAMPLED: 07/12/84
TIME SAMPLED: 1145

ANALYSIS	CONCENTRATION	UNITS	BOOK-PAGE
ARSENIC, EP TOXICITY	0.005	MG/L	384-10
BARIUM, EP TOXICITY	2.3	MG/L	304-72
CADMIUM, EP TOXICITY	1.5	MG/L	304-79
CHROMIUM, EP TOXICITY	52700.	MG/L	302-34
LEAD, EP TOXICITY	6.3	MG/L	304-82
MERCURY, EP TOXICITY	ND(0.01)	MG/L	224-214
SELENIUM, EP TOXICITY	ND(0.01)	MG/L	384-15
SILVER, EP TOXICITY	ND(0.01)	MG/L	302-35

--CONCLUSION--LAB NUMBER: 84070528 SOUTH HOLDING TANK

ND(), WHERE NOTED, INDICATES NONE DETECTED WITH THE DETECTION LIMIT IN PARENTHESES.

EP TOXICITY ANALYSIS WAS PERFORMED ON SAMPLES AS RECEIVED AND IN ACCORDANCE WITH EPA PUBLICATION, SW-846, TEST METHODS FOR EVALUATING SOLID WASTE, JULY 1982.

SAMPLES WILL BE RETAINED FOR 30 DAYS UNLESS OTHERWISE NOTIFIED.

WILSON LABORATORIES

Lynn R Newcomer

LYNN R. NEWCOMER
CHIEF CHEMIST

APPENDIX IV

HAZARDOUS WASTE MANIFESTS

Industrial Waste Division
Oklahoma State Department of Health
P.O. Box 53551
Oklahoma City, Oklahoma 73152
(405) 271-5338

NATIONAL EMERGENCY RESPONSE CENTER:
(800) 424-8802

e: you are making six (6) copies. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2000-0404 Expires 7-31-86

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. K S D - 0 0 7 1 2 7 3
Manifest Document No. 0 0 0 0 4
2. Page 1 of 1
Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
EXLINE, INC.
P. O. BOX #1267
SALINA, KS 67402-1267
4. Generator's Phone (913) 825 - 4683

A. State Manifest Document Number (Okla.) 2391
B. State Generator's ID (Okla.)

5. Transporter 1 Company Name
U.S. POLLUTION CONTROL, INC.
6. US EPA ID Number
0 K D 0 8 1 0 4 6 3 0
C. State Transporter's ID (Okla.) 2004
D. Transporter's Phone (405)528-8371

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID (Okla.) 2004
F. Transporter's Phone 405-528-8371

9. Designated Facility Name and Site Address
U.S. POLLUTION CONTROL, INC.
LONE MOUNTAIN SURFACE DISPOSAL SITE
RR #2 BOX 180-A, WAYNOKA, OK 73860
10. US EPA ID Number
0 K D 0 6 5 4 3 9 3 7
G. State Facility's ID (Okla.) SDA7002
H. Facility's Phone (405)697-3237

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. CHROME CONTAMINATED SOIL		1	DT		P	Okla. 764715 / EPA D007
b.						Okla. / EPA
c.						Okla. / EPA
						Okla. / EPA

J. Additional Descriptions for Materials Listed Above
SOIL, BOARDS, CONSTRUCTION DEBRIS CONTAMINATED WITH CHROMIUM

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
MATERIAL IS DRY, ANY SPILL SHOULD BE SWEPT CLEAN AND REPACKED FOR SHIPMENT.

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

Printed/Typed Name: JERRY K. EXLINE
Signature
Date: Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

18. Transporter 2 Acknowledgement or Receipt of Materials
Printed/Typed Name
Signature
Date: Month Day Year

FACILITY

Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name
Signature
Date: Month Day Year

Industrial Waste Division
Oklahoma State Department of Health
P.O. Box 53551
Oklahoma City, Oklahoma 73152
(405) 271-5338

NATIONAL EMERGENCY RESPONSE CENTER:
(800) 424-8802

ard you are making six (6) copies. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2000-0404 Expires 7-31-8

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. K.S.D.-007123 | Manifest Document No. 00003
2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
EXLINE, INC.
P. O. BOX #1267
SALINA, KS 67402-1267

4. Generator's Phone (913) 825 - 4683

A. State Manifest Document Number (Okla.) 7900
B. State Generator's ID (Okla.) 61066

5. Transporter 1 Company Name: U. S. POLLUTION CONTROL, INC.
6. US EPA ID Number: O.K.T.4.1.0.0.1.0.4.7.4
C. State Transporter's ID (Okla.) 2004
D. Transporter's Phone 405-528-8371

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID (Okla.) 2004
F. Transporter's Phone 405-528-8371

9. Designated Facility Name and Site Address
U. S. POLLUTION CONTROL, INC.
LONE MOUNTAIN SURFACE DISPOSAL SITE
R.R. 2 - BOX 180A - WAYNOKA, OK 73860
10. US EPA ID Number: O.K.D.0.6.5.4.3.8.3.7.6
G. State Facility's ID (Okla.) SD47002
H. Facility's Phone 405 - 697-3237

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)

	HM		12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.		CHROME CONTAMINATED SOIL	1	DT		P	Okla. 764715 EPA D007
b.							Okla. EPA
c.							Okla. EPA
							Okla. EPA

J. Additional Descriptions for Materials Listed Above
SOIL, BOARDS, CONSTRUCTION DEBRIS CONTAMINATED WITH CHROMIUM

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
MATERIAL IS DRY, ANY SPILL SHOULD BE SWEPT CLEAN AND REPACKED FOR SHIPMENT.

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

Printed/Typed Name: JERRY W. EXLINE | Signature | Date Month Day Year: 1 14 85

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Date Month Day Year

18. Transporter 2 Acknowledgement or Receipt of Materials
Printed/Typed Name | Signature | Date Month Day Year

19. Discrepancy Indication Space

FACILITY

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name | Signature | Date Month Day Year

EPA Form 8700-22 (2-84)

ATTACHMENT 3-2

INSPECTION AND MAINTENANCE PLAN

EXLINE, INC.
SALINA, KANSAS

INSPECTION AND MAINTENANCE PLAN
EXLINE, INC.

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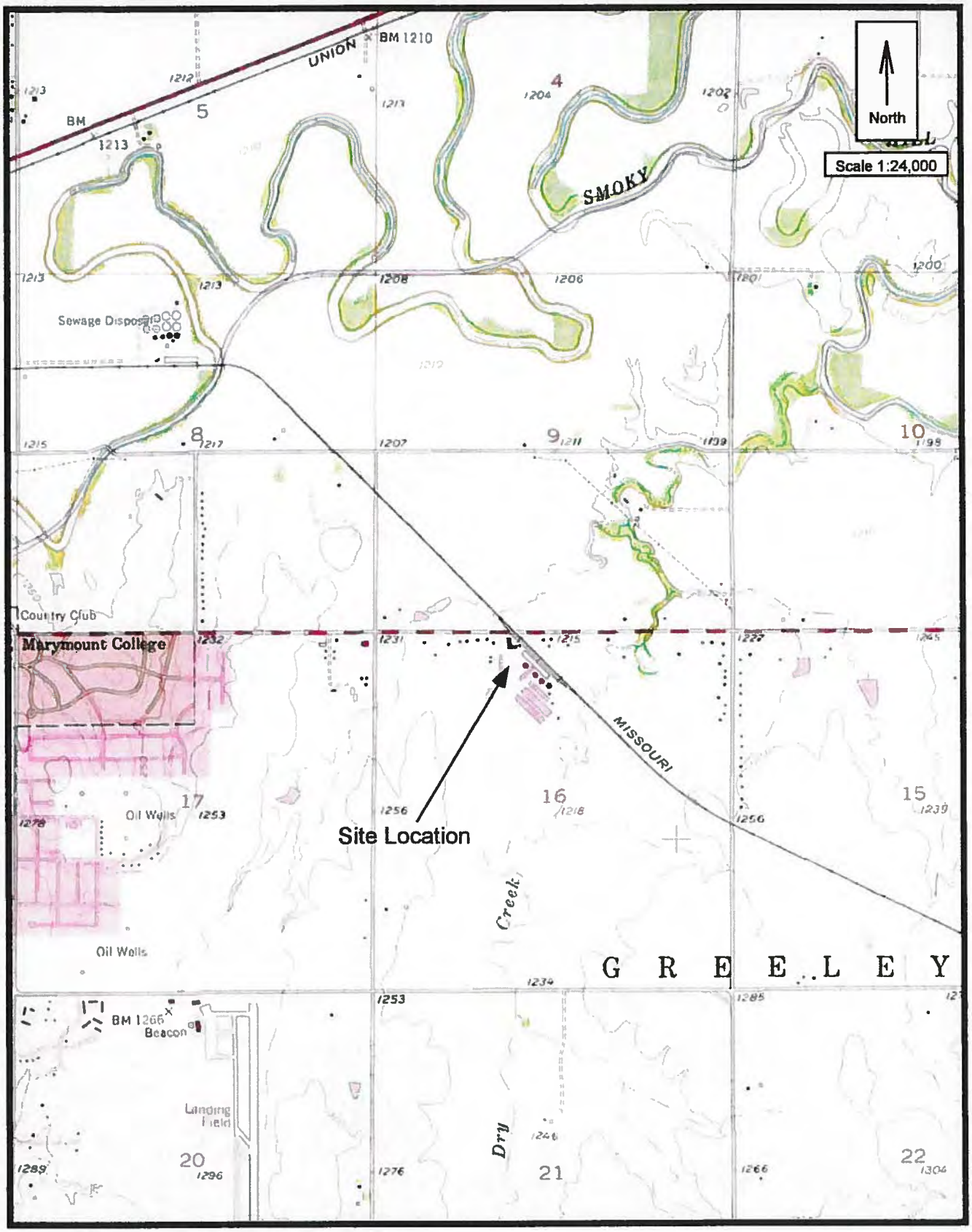
ATTACHMENTS

ATTACHMENT A – Surface Impoundment Monthly Inspection and Maintenance Checklist
ATTACHMENT B – Groundwater Monitoring System and Recovery Well Inspection and Maintenance Checklist
ATTACHMENT C – Groundwater Recovery System Daily Inspection and Maintenance Checklist
ATTACHMENT D – Maintenance Log Sheet
ATTACHMENT E – Groundwater Flow Log
ATTACHMENT F – Safety Equipment, Emergency Equipment and Security Devices Inspection Checklist



Map Source: USGS 7.5 Minute Topographic Map, Salina, 1978

Plate 1.1: Site Location Map

1. Introduction. This Plan includes procedures for the inspection and maintenance of the closed hazardous waste surface impoundment and the groundwater monitoring and recovery systems located at Exline, Inc., Salina, Kansas. The location of the facility is shown on Plate 1.1. This plan is submitted in accordance with 40 CFR 264.15.

Monitor wells were installed at the Exline facility to establish the extent of groundwater contamination caused by a surface impoundment formerly used for storage of chromium containing wastes. The chromium containing waste that was stored in the surface impoundment has been removed and the site was certified closed in December of 1984.

A groundwater investigation was implemented, followed by a ground water remediation operation. These programs were executed with the approval of the Kansas Department of Health and Environment (KDHE) Bureau of Waste Management (BOWM). The contaminated groundwater perimeter was established, and a withdrawal and treatment program for the contaminated groundwater was developed by Exline, approved by the regulatory agencies and implemented by Exline. This inspection and maintenance Plan has been prepared to ensure that the closure site is properly maintained and to provide reliable and accurate monitoring of the contaminated groundwater.

2. Inspections.

2.1. Surface Impoundment. Closure of the surface impoundment included removal of all stored plating solutions, removal of the synthetic liner, excavation and disposal of contaminated soil, back-filling the surface impoundment with non-contaminated soil, grading the soil to natural uniform slopes, and seeding the surface to establish a grass cover and prevent erosion. The area once included in the surface impoundment can no longer be distinguished from the surrounding property.

The area of the closed surface impoundment shall be visually inspected on a monthly basis and after storm events to detect evidence of any of the following:

1. Erosion of surface impoundment cover.
2. Bald spots or dying grass.
3. Rodent or insect infestation that may cause erosion or destruction of grass cover.
4. Deep root vegetation that can cause holes in the surface impoundment cover.
5. Restriction of any drainage ways that may cause water ponding.
6. Surface impoundment cover settlement that may cause water ponding.
7. Desiccant cracks in the surface impoundment cover.

All maintenance performed on the surface impoundment shall be recorded on a maintenance log sheet (MLS) a copy of which is included as Attachment A.

2.2. Groundwater Monitoring System. Monitor wells are constructed of PVC and are set in a concrete base. The well casings have slip-on inner caps and slip-on outer caps with a rod-padlock locking system.

Surface well integrity inspections shall be performed at the time of each sampling event and shall be documented in the inspection log. This evaluation for each monitoring well shall include a visual inspection of the outer protective casing, inner casing riser, surface well seal, well cap,

and locking mechanism to document any damage or deterioration. The ground surface in the immediate vicinity of each monitoring well and the annular space between the outer protective casing and casing riser shall be inspected for visible anomalies (e.g., collection of ponding of water, ground subsidence, etc.)

Subsurface well integrity inspections shall be performed annually in all wells, and shall be documented in the inspection log. Subsurface well integrity inspections shall consist of one or more of the following: total well depth measurements, groundwater turbidity measurements, in-situ hydraulic conductivity tests, casing caliper logs, down-hole video camera surveys, and/or other methods capable of verifying the subsurface integrity of the well casing and screen.
A monitoring well system inspection checklist is included as Attachment B. This checklist shall be completed during each inspection and a permanent record of the inspections shall be maintained on file at the Exline site.

2.3. Groundwater Withdrawal System. The original objective of the treatment process was to remove chromium from the groundwater to produce an effluent, which is in compliance with the Exline, Inc. industrial wastewater discharge permit (Permit No. 0002). This permit is administered by the City of Salina and regulates the discharge of industrial wastewater to the City Public Owned Treatment Works. The subject permit was amended in January of 2004 to allow Exline to bypass the treatment process, due to the fact that the untreated chromium concentrations have decreased to levels well below that which could cause an exceedance of the permit daily mass loading discharge limit.

Specific information regarding the groundwater recovery system is presented in the Groundwater Recovery System Operation and Maintenance Plan (Attachment 5-1) of the Permit Application.

The groundwater withdrawal system shall be inspected on a daily basis, when operating, to detect evidence of any of the following:

1. Electrical or mechanical failure of submersible well pump.
2. Mechanical failure or leaks from exposed portions of influent piping.
3. Electrical or mechanical failure of effluent pump.
4. Failure or leaks due to corrosion or puncture of effluent piping.
5. Malfunction of any of the control systems.

A groundwater recovery system checklist is included as Attachment C. This checklist shall be completed during the daily inspection that is conducted when the treatment system is operation and a permanent record of the inspection will be maintained on file. Maintenance performed on the system is recorded on a "Maintenance Log Sheet", a copy of which is included as Attachment D.

40 CFR 264.194 requires that the groundwater treatment tanks waste feed cut-off systems are inspected daily when in operation. Although the treatment system is no longer operating, groundwater does flow through tanks (that were formerly used for treatment) located in the Cylinder Shop. The groundwater recovery system operates on a 24 hours per day, seven days per week basis. Since groundwater still flows through the tanks, they shall be inspected to detect evidence of corrosion or erosion and leaking of fixtures and seams on a daily basis. The area immediately surrounding the tank shall also be inspected on a daily basis to detect signs of leakage.

A check-off column is included on the "Groundwater Flow Log" (Attachment E), which shall be initialed by the inspecting operator following each inspection. The groundwater flow logs shall be maintained on file at the Exline facility.

2.4. Safety Equipment, Emergency Equipment, and Security Devices. Daily inspections will be completed with respect to safety equipment, emergency equipment, and security devices. These inspections, and any maintenance that is required, will be documented on a checklist, a copy of which is included as Attachment F.

3. Maintenance.

3.1. Surface Impoundment. All deficiencies found during the monthly inspection of the surface impoundment shall be corrected as soon as possible. Deficiencies shall be repaired as follows:

1. **Erosion**. The area of the surface impoundment cap that has eroded shall be filled with uncontaminated soil, seeded with a hardy strain of grass, fertilized, and mulched. The possibility of diverting water away from the eroded area shall be investigated to prevent repeated erosion.

2. **Bald Spots or Dying Grass**. All bald spots on the surface impoundment cap shall be seeded with a hardy strain of grass and fertilized.

3. **Rodent or Insect Infestation**. All rodent burrows in the surface impoundment cap shall be plugged with uncontaminated soil and the area seeded with a hardy strain of grass, fertilized, and mulched. If rodents continue to burrow, they shall be removed by trapping or poisoning. Insect infestation shall be removed by applying a commercial insecticide.

4. **Deep Root Vegetation**. All deep root vegetation on the surface impoundment cap shall be removed. If necessary, a commercial herbicide shall be applied.

5. **Restriction in Drainage Ways**. All drainways that are restricted shall be cleared of brush, debris, and silt.

6. **Settlement**. The area of the surface impoundment cap that has settled shall be filled with uncontaminated soil, seeded with a hardy strain of grass, fertilized, and mulched.

7. **Desiccant Cracks**. Desiccant cracks in the surface impoundment cap shall be sealed by moistening the soil and compacting with a roller.

The grass over the surface impoundment shall be mowed when it reaches a height of approximately 6 inches.

All maintenance activities and the date completed shall be recorded on the monthly inspection or maintenance checklist. All invoices for purchased goods or services that were needed to complete the corrective action shall be attached to the maintenance records.

3.2. Groundwater Monitoring System. All deficiencies found during the monthly inspection of the groundwater monitoring system shall be corrected as soon as possible. Deficiencies shall be addressed as follows:

1. **Erosion**. The area around the concrete base that has eroded shall be filled with uncontaminated soil, seeded with a hardy strain of grass, fertilized, and mulched. The possibility of diverting water away from the eroded area shall be investigated.

2. **Cracking of Concrete Base**. The concrete base shall be repaired or replaced if cracked or broken to help seal and protect the well casing.

3. **Cracking of Well Casing**. The well casings shall be repaired or replaced if cracked or broken. If the damage to the well casing is excessive, the well shall be properly plugged and shall be replaced with a new well.

4. **Movement of Well Casings**. The well casing or concrete base that has been moved by accidental impact shall be repaired or replaced by a competent well driller.

5. **Cracked Slip-on Caps**. The slip-on caps that are cracked, broken, or missing shall be replaced with new caps.

6. **Rod-Padlock Type Locking System**. Unlocked padlocks shall be locked and remain locked at all times between sampling times. Missing padlocks or rods shall be replaced.

7. **Damage to Dedicated Bailer**. Bailer rope that is damaged or worn shall be replaced. A bailer that is cracked, broken, or has a leak in check valve shall be replaced with a new bailer.

8. **Excessive Overgrowth and Debris around Well Pad**. Excessive vegetative growth and/or the presence of debris around and on the well pad will be removed.

A well that has silt in the bottom of the casing, which exceeds 10 percent of the screened interval, shall be redeveloped before the next sampling event.

Criteria for determining when a groundwater monitoring well needs replaced are as follows:

1. Decreased well yield noticed during pre-sample purging, which is not attributable to lowered water table.
2. Excessive amount of sands and silts are produced in the well.
3. Physical damage to well.

The criteria used for replacing a monitoring well shall include:

1. Shall be located within a 10-foot radius of the previous well.
2. Shall be screened in the same interval.
3. Shall be installed by a monitoring well driller licensed by KDHE.
4. Shall be drilled using the auger or the mud rotary method. Mud additives shall not be used. Mud additives shall be used on pumping wells, only if needed.

In addition to the general criteria listed above, a Work Plan shall be submitted to the KDHE for review and approval, prior to the monitoring well installation. This Work Plan shall include all pertinent information relating to the monitoring well installation.

Maintenance activities and the date completed shall be recorded on the monthly inspection or maintenance checklist. All invoices for purchased goods or services that were needed to complete the corrective action shall be attached to the maintenance records.

3.3. Groundwater Recovery System. All deficiencies found during the monthly inspection of the groundwater recovery system shall be corrected as soon as possible. Deficiencies shall be repaired as follows:

1. **Well Pump Failure**. The well pump that has failed shall be repaired or replaced. If the repair period is more than 48 hours, a second submersible well pump shall be installed so groundwater treatment can continue.

2. **Leaks in Influent Pipe**. The influent pipe that is leaking shall be repaired or replaced.

3. **Effluent Pump Failure**. The effluent pump that has failed shall be repaired or replaced. The treatment system shall be shut down if this pump is out of service.

4. **Leaks in Effluent Piping**. The effluent pipe that is leaking shall be repaired or replaced.

5. **Control Circuit Malfunction**. The malfunctioning control circuits shall be repaired or replaced to ensure proper and safe operation of the groundwater recovery system.

All deficiencies found during the daily inspection of the groundwater treatment tanks and control systems shall be corrected as soon as possible.

All maintenance activities and the date completed shall be recorded on the monthly inspection or maintenance checklist. All invoices for purchased goods or services needed to complete the corrective action shall be attached to the maintenance records.

ATTACHMENT A

SURFACE IMPOUNDMENT
MONTHLY INSPECTION AND MAINTENANCE CHECKLIST

EXLINE, INC.
SALINA, KANSAS

EXLINE SURFACE IMPOUNDMENT
MONTHLY INSPECTION AND MAINTENANCE CHECKLIST

---

1) Any evidence of erosion of the surface impoundment cover?
   Yes ☐ No ☐

2) Any evidence of rodent or insect infestation in the surface impoundment cover?
   Yes ☐ No ☐

3) Any bald spots or dying grass?
   Yes ☐ No ☐

4) Any evidence of deep root vegetation in the surface impoundment cover?
   Yes ☐ No ☐

5) Any restrictions of drainageways near the surface impoundment cover?
   Yes ☐ No ☐

6) Any evidence of settling of the surface impoundment cover?
   Yes ☐ No ☐

7) Any evidence of desiccant cracks in the surface impoundment cover?
   Yes ☐ No ☐

INSPECTED BY: (print) _____ (Signature):_____

DATE: _____ TIME: _____

COMMENTS:

Initial: _____

For any item number above requiring corrective action: provide the date and a brief description of corrective action taken.

Initial: _____

ATTACHMENT B

GROUNDWATER MONITORING SYSTEM AND RECOVERY WELL INSPECTION AND MAINTENANCE CHECKLIST

EXLINE, INC.
SALINA, KANSAS

GROUNDWATER MONITORING SYSTEM AND RECOVERY WELL INSPECTION AND MAINTENANCE CHECKLIST
EXLINE, INC., SALINA, KANSAS

The following areas shall be inspected during each sampling event, unless otherwise noted.

Inspection Date: _____

Inspector Name (printed) _____

Inspector Signature: _____

Inspection Item	Well ID:									
Outer protective casing										
Inner casing riser										
Surface well seal										
Well cap										
Locking mechanism										
Ground surface around monitor well										
Annular space between outer casing and casing riser										
Subsurface well integrity (annual)										
Comments:	Document corrective action below.									

prepared 9/21/01 by SEI

ATTACHMENT C

GROUNDWATER RECOVERY SYSTEM
DAILY INSPECTION AND MAINTENANCE CHECKLIST

EXLINE, INC.
SALINA, KANSAS

GROUNDWATER RECOVERY SYSTEM DAILY INSPECTION CHECKLIST
EXLINE, INC., SALINA, KANSAS

Date	Time	Recovery Wells			Piping	Effluent Pump	Lift Station	Tanks	Flow Sensors	Inspected By
		B-7	E-3	C-9						

prepared by SEI - 9/24/01
Revised 2/4/08

ATTACHMENT D

MAINTENANCE LOG SHEET

EXLINE, INC.
SALINA, KANSAS

EXLINE, INC.

MAINTENANCE LOG SHEET

SYSTEM AFFECTED: _____

COMPONENET AFFECTED: _____

Date Equipment Malfunctioned: _____

Time Equipment Malfunctioned: _____

Date Corrected: _____

Time Corrected: _____

Description of Maintenance or Upgrade:

Person(s) performing work (print name(s)): _____

Inspected by (print): _____

Signature: _____

Date: _____

ATTACHMENT E

GROUNDWATER FLOW LOG

EXLINE, INC.
SALINA, KANSAS

EXLINE INC.
GROUND WATER FLOW LOG

MONTH/YEAR: ____________

--------------TOTALIZER READING--------------

DATE	CURRENT GALLONS	PREVIOUS GALLONS	APPROX. 24 Hr. FLOW	*SDI	TIME	COMMENTS

Total volume (gal)

REV: 1/11/13

* INITIAL IN THIS COLUMN TO INDICATE THAT THE GROUNDWATER RECOVERY SYSTEM DAILY INSPECTION HAS BEEN COMPLETED

ATTACHMENT F

SAFETY EQUIPMENT, EMERGENCY EQUIPMENT AND SECURITY DEVICES INSPECTION CHECKLIST

EXLINE, INC.
SALINA, KANSAS

SAFETY EQUIPMENT, EMERGENCY EQUIPMENT, AND SECURITY DEVICES INSPECTION CHECKLIST
EXLINE, INC. - SALINA, KANSAS

Month: _____ Year: _____

Day	Safety Equipment	Communication System	Fire Extinguishers	Building Locks	Fence Locks	Inspected By
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						

Record of Maintenance Activities:

ATTACHMENT 3-3

HAZARDOUS WASTE CONTINGENCY PLAN

HAZARDOUS WASTE CONTINGENCY PLAN

EXLINE, INC.
3256 EAST COUNTRY CLUB ROAD
SALINA, KANSAS 67401

March, 2011

Hazardous Waste Contingency Plan
Exline, Inc., Salina, Kansas

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Attachment A – Hazardous Material Release Notification Form		

I. INTRODUCTION

Exline, Inc. is located in the northeast quarter of the northwest quarter of Section 16, Township 14S, range 2W, Saline County, Kansas. The location is further identified by the street address:

3256 East Country Club Road
Salina, KS 67401

The facility telephone number is 785-825-4683. The Exline, Inc. EPA I.D. number is KSD007127327.

Exline manufactures and rebuilds large stationary engines and engine parts. Support activities for manufacture and repair include shipping and receiving, design services, inspection services, machining, and assembly.

Plate I-1 is a facility layout map.

This Contingency Plan has been prepared in order to fulfill requirements set forth by 40 CFR, § 264.51. This regulation requires that a Plan shall be prepared to address responses to fire, explosion, or release of hazardous waste or hazardous waste constituents, which could threaten human health or the environment.

A copy of this Plan shall be submitted to the local hospital, fire department, and police department. In addition, a copy shall be maintained at the facility at all times.

II. WASTES GENERATED

Hazardous wastes generated at the Exline facility on a routine basis include the following. Estimated maximum quantities on-site at any given time are also shown.

1. Paint solvent waste (D001, F003, F005): 25 pounds.

2. Perchloroethylene degreasing solvent waste (F001, F002, D039): 450 lb.

In addition to these hazardous wastes, other materials are occasionally generated, which are hazardous as a result of chromium leachability (D007 hazardous waste). However, since Exline, Inc. no longer conducts chrome plating operations, such instances are now extremely rare. Also, hazardous waste may be generated on occasion as a result of cleaning up a spill – for example perchloroethylene.

Perchloroethylene solvent waste primarily contains PCE.

III. EMERGENCY COORDINATORS/RESPONSIBILITIES

A. GENERAL PROCEDURES

The procedures set forth in this Contingency Plan must be executed immediately upon the release of hazardous waste, which could threaten human health or the environment. When such a contingency occurs, the person discovering such a contingency should immediately notify the Emergency Coordinator.

B. EMERGENCY COORDINATORS

1. General. To ensure that spills or other emergencies encountered in the temporary storage of hazardous wastes will be handled properly, a qualified Emergency Coordinator will be available to coordinate contingency plan activities. In the event that the Emergency Coordinator is not available, the Alternate Emergency Coordinator will be contacted. Exline, Inc. Emergency Coordinators are:

Name	Home Address	Office Phone	Home Phone
Steve Puttbrese*	712 Max Ave Salina, KS	826-4457	785-493-2957
Vaughn Mortimer**	1312 W. Falun Rd. Assaria, KS	826-4476	785-643-2002
Dave Jury**	1768 2600 Ave Chapman, KS	826-4451	785-452-8766

* - Primary Emergency Coordinator
** - Alternate Emergency Coordinator

All Emergency Coordinators shall be familiar with the various hazardous waste procedures and characteristics of the wastes. The Emergency Coordinator shall be empowered to command plant emergency personnel in the execution of contingency procedures, evacuate all plant personnel, if necessary, and provide site liaison with respect to emergency personnel. In the absence of the Primary Emergency Coordinator, the Alternate Emergency Coordinator shall assume the responsibilities and authority of the Primary Emergency Coordinator.

2. Responsibilities of Emergency Coordinator.

a. Whenever there is an imminent or actual emergency situation, the Emergency Coordinator must immediately:

1) Notify affected Exline, Inc. personnel by verbal contact and by the telephone intercom system (dial extension #88 to access the intercom).

2) Notify appropriate State or local agencies with designated response roles, if it is determined that their assistance is needed. The Kansas Department of Health and Environment must be notified immediately, if it is determined that the release of hazardous materials will likely be detrimental to the quality of waters of the State or cause soil pollution. Phone numbers for the appropriate State and Local Agencies are located in Section IV of this Plan.

b. Whenever there is a hazardous material release, fire, or explosion, the Emergency Coordinator must immediately identify the character, source, quantity, and extent of any released materials. This may be accomplished by observation, or review of facility records or manifests and, if necessary, by chemical analysis. Following identification of the character and source of released materials, the emergency coordinator shall, where possible, implement contingency response procedures outlined in Section V - CONTINGENCY/ EMERGENCY ARRANGEMENTS.

c. Concurrently, the Emergency Coordinator must assess possible hazards to human health or the environment that may result from the material release, fire, or explosion. This assessment must consider both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of surface water runoffs, which may contain hazardous substances generated from water or chemical agents used to control fire and heat-induced explosions).

d. If the Emergency Coordinator determines that the facility has had a hazardous material release, fire, or explosion which could threaten human health or the environment outside the facility, the findings must be reported as follows:

1) If the assessment indicates that evacuation of local areas may be advisable, the appropriate local authorities shall be notified immediately. The Emergency Coordinator must be available to assist appropriate local authorities and decide whether local areas should be evacuated.

2) The Emergency Coordinator must immediately notify either the government official designated as the on-scene coordinator for this geographical area or the National Emergency Response Center, using the 24-hour toll-free number: 800-424-8802. The report must include:

a) Name and telephone number of reporter.
b) Name and address of facility.
c) Time and type of incident (e.g., release, fire).
d) Name and quantity of material(s) involved, to the extent known.
e) The extent of injuries, if any.
f) The possible hazards to human health, or the environment, outside the facility.

A "Hazardous Material Release Notification Form" is included as Attachment A.

e. During an emergency, the Emergency Coordinator must take all reasonable measures necessary to ensure that fires, explosions, and hazardous materials releases do not occur, recur, or spread to other hazardous waste at the facility. These measures may include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.

f. If the facility ceases operations in response to a fire, explosion, or hazardous waste material release, the Emergency Coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.

g. Immediately after an emergency, the Emergency Coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil, surface water, or any other material that results from the emergency.

h. The Emergency Coordinator must ensure that, in the affected area(s) of the facility:

1) No waste that may be incompatible with the released material is treated, stored, or disposed until cleanup procedures are completed; and

2) All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed. The only equipment, which can be maintained after an emergency, is the fire extinguisher. The fire extinguisher will be replaced within two working days after being used.

i. The Emergency Coordinator must note in the operating record, the time, date, and details with respect to contingency events of the following nature:

1) Any contingency event which causes harmful exposure of personnel to hazardous wastes.

2) Any contingency event which results in a fire.

3) Any contingency event which results in a release of hazardous materials to the municipal sewer or storm sewer.

4) Any contingency event which results in damage to property other than damage to hazardous waste containers.

Within fifteen (15) days after such an incident, the Emergency Coordinator must submit a written report to the Secretary of Health and Environment, Landon State Office Building, Topeka, Kansas, 66612. This report must include:

a) Name, address, and telephone number of the owner or operator.
b) Name, address, and telephone number of the facility.
c) Date, time, and type of incident (e.g., fire, explosion).
d) Name and quantity of material(s) involved.
e) The extent of injuries, if any.
f) An assessment of actual or potential hazards to human health or the environment, where applicable.
g) Estimated quantity and disposition of recovered material that resulted from the incident.
h) A detailed description of the incident, outlining its cause, if possible.

IV. FEDERAL, STATE AND LOCAL RESPONSE CONTACTS

Local Agencies	Telephone
PRIMARY FIRE DEPARTMENT	
Rural Fire District No. 5	911
SECONDARY FIRE DEPARTMENT	
Salina City Fire Department	911
PRIMARY HOSPITAL	
Salina Regional Health Center	785-452-7000
OFFICE OF EMERGENCY MANAGEMENT	
Saline County Emergency Management	785-826-6511
State Agencies	
Kansas Highway Patrol	785-827-4437
KDHE Salina District Office (during business hours)	785-827-9639
KDHE Central Office (during business hours)	785-296-1679
(outside business hours)	785-296-1500
Kansas Division of Emergency Preparedness (24 hours)	785-296-3176
Federal Agencies	
EPA 24 Hour Spill Number	785-236-3778
EPA Routine Spill Business	785-236-3888
National Response Center (24 hour spill number)	800-424-8802
Chemtrec (provides chemical information about spilled material)	800-424-9300
Centers for Disease Control (technical information and health effects - 24 hours)	404-639-0615

V. CONTINGENCY/EMERGENCY ARRANGEMENTS

When emergency response is required of a State or local agency, the Emergency Coordinator will contact the agency by phone and advise them of the type of response required. The Emergency Coordinator will direct State and local agencies to the contingency site within the plant.

Rural Fire District 5 is responsible for providing fire protection service for the facility. A mutual-aid agreement exists between the Rural Fire District and the City of Salina Fire Department.

The City of Salina Fire Department operates the combined City/County Emergency Medical Service. The EMS will provide emergency aid on-site and transport injured persons to the hospital.

In the event of an uncontrollable hazardous material release, the Office of Emergency Management would coordinate the effort in providing materials and equipment to control the spread of contamination in the environment, if required to protect the public safety.

The Saline County Sheriff's department is responsible for traffic and crowd control around the facility.

VI. CONTINGENCY RESPONSE

In addition to hazardous waste contingencies, this plan addresses events, which could affect the area where wastes are stored, as well as, the groundwater remediation system. Listed below are possible emergency situations and response procedures.

A. RELEASE OF GROUNDWATER FROM GROUNDWATER RECOVERY SYSTEM

The primary contingency associated with the groundwater recovery system includes the release of groundwater from the system due to leaks caused by piping or equipment failure. It should be noted that Exline, Inc. is no longer required by the City of Salina to treat the recovered groundwater prior to discharge since the chromium concentration in the recovered groundwater is well below the discharge limit of 3.35 mg/L.

1. Any employee observing a release/spill of groundwater should contact the Emergency Coordinator by telephone. The Emergency Coordinator's and Alternate's phone numbers are listed on page 3. The Coordinator should assess the situation and determine whether an emergency response is required of a local or State agency. If the decision is made to contact a local or State agency, the agency should be contacted by phone using the numbers listed earlier.

2. Listed below are events, which could result from the groundwater recovery system operation, and procedures to assess the possible hazards to human health or the environment, as well as, remediation procedures.

    a. Groundwater recovery system leak in building. No hazards to human health or the environment are anticipated. The groundwater recovery system should be shut down. Any spills, which occurred inside the Cylinder Shop would flow by gravity to the caustic rinse tank pit located on the east side of the building. From there, the water would be pumped out to the City sewer after the leak has been repaired.

    b. Groundwater recovery system leak outside building. No hazards to human health or the environment are anticipated. If a visible leak occurs, the appropriate pump(s) should be shut off and the leak repaired as soon as possible.

B. FAILURE OF GROUNDWATER RECOVERY SYSTEM EQUIPMENT

As discussed earlier, recovered groundwater is no longer treated due to the fact that the untreated groundwater chromium concentration is well below the City of Salina permit discharge limit of 3.35 mg/L. Therefore, the only equipment failure of concern is that of the recovery well pumps. In the event that a pump failure occurs, the subject pump is repaired as soon as reasonably possible. In addition, the KDHE shall be notified if the pump is shutdown for more than a 24 hour period.

C. POWER FAILURE OR BUILDING HEATING FAILURE

As discussed above, a power failure or building heating failure would not cause a threat to human health of the environment. In the event that a power failure occurred, the groundwater recovery well pumps would shut down. Steps would then be taken to restore power and re-start the pumps as soon as reasonably possible.

D. BUILDING FIRE

No flammable materials are used in the Cylinder Shop. Fire in the building could cause the release of caustic materials.

1. Any employee aware of a fire during normal working hours should immediately sound the alarm, call the Fire Department (911), and notify the Emergency Coordinator or alternate whose phone numbers are listed on page 3.

2. The building should be evacuated. The Emergency Coordinator should assess the situation and determine whether to call for medical assistance. Cylinder Shop employees and contractor personnel should assemble at the Thermal Coating Shop for roll check.

E. SEVERE WEATHER WHICH COULD AFFECT THE GROUNDWATER RECOVERY SYSTEM

The Groundwater Recovery System design is such that, under normal operation, the system integrity is not compromised by severe weather or extended periods of cold weather.

VII. ENTRANCES, EMERGENCY EXITS AND EMERGENCY EQUIPMENT

Entrances and emergency exits for the Cylinder Shop are shown on Plate VII-1. Emergency equipment is also shown on Plate VII-1. Descriptions of emergency equipment are presented below.

Phones are multipurpose; they access outside public lines and also possess intercom capabilities. All phones are available to chrome shop personnel at all times. Fire extinguishers are all-purpose, class ABC. The first aid station includes basic first aid supplies including Band-Aids, dressings, eyewash, burn ointment, antibiotic ointment, cold packs, tourniquets, and a blood-borne pathogen kit. Eye wash stations are wall-mounted with dual spray nozzles. Safety showers are an overhead spray type and are activated by a pull chain. Spill control supplies are located in the northwest corner of the Cylinder Shop and include gloves, aprons, safety shields, and absorbent material for use in containing liquid spills.

VIII. EVACUATION PLAN

In the event of a threat of imminent danger, such as sighting a building fire, the Emergency Coordinator will order evacuation. The signal for an evacuation of the Cylinder Shop is an announcement over the intercom.

The employees are to proceed as follows:

1. Shut down all operating machines or equipment, if time allows.

2. Proceed to the nearest door.

3. Assemble at the Thermal Coating Shop for roll check.

The Emergency Coordinator will direct the required emergency crews (fire, medical, security, etc.), either to evacuate or to administer emergency procedures.

Evacuation routes are shown on Plate VII-1.

ATTACHMENT A

HAZARDOUS MATERIAL RELEASE NOTIFICATION FORM

HAZARDOUS MATERIAL RELEASE NOTIFICATION FORM

In the event of a hazardous material release, contact the National Emergency Response Center using the 24-hour toll-free number: 800-424-8802. The following information must be provided:

Reporter's Name: _____

Reporter's Address: _____

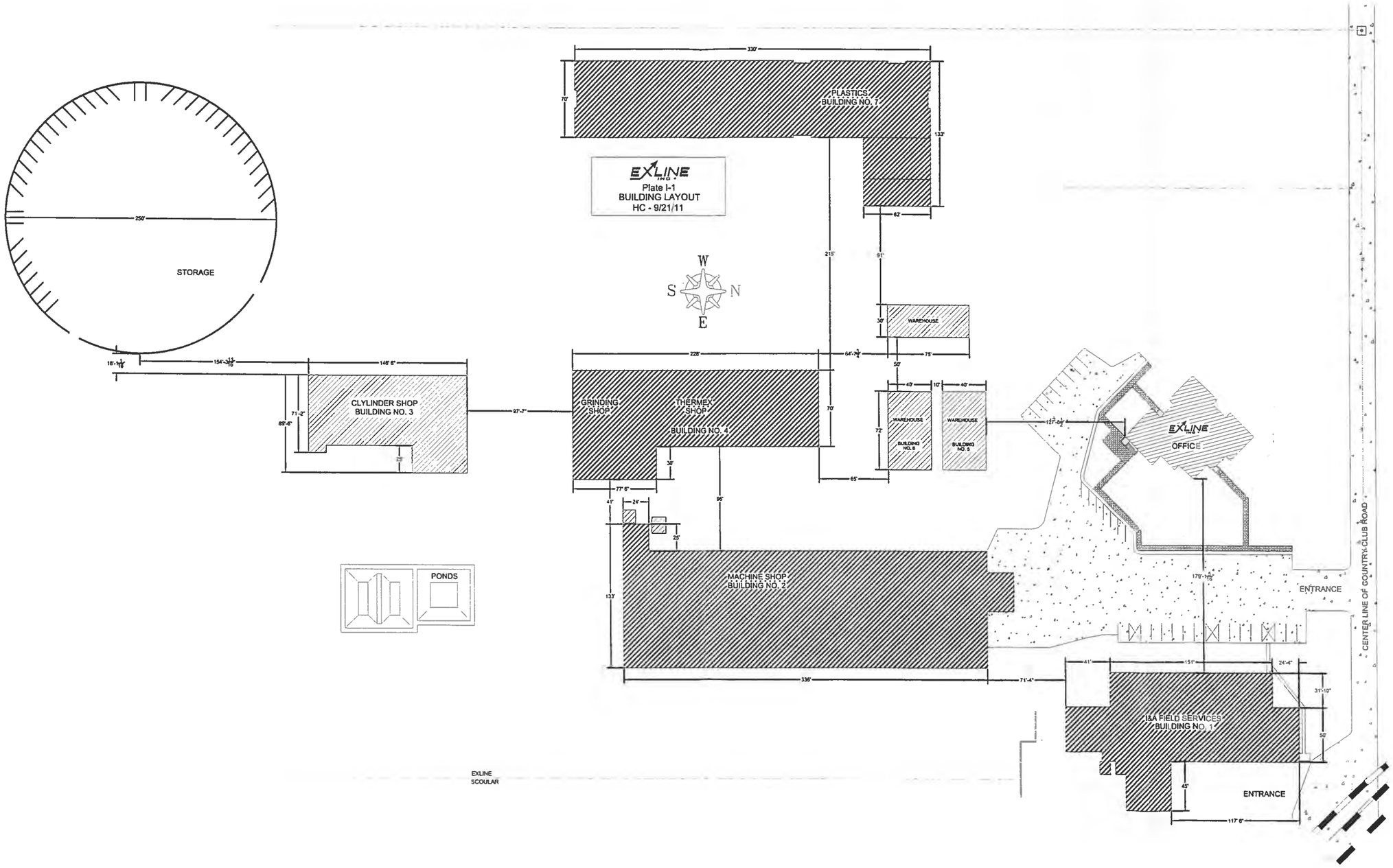
Facility Address: Exline, Inc.
3256 East Country Club Road
Salina, KS 67401

Time and Type of Release:

Name and Quantity of Material Involved:

Extent of Injuries, if any:

Possible Hazards to Human Health or the Environment Outside the Facility:


EXLINE
Plate I-1
BUILDING LAYOUT
HC - 9/21/11
STORAGE
PLASTICS BUILDING NO. 1
CLYLINDER SHOP BUILDING NO. 3
GRINDING SHOP
THERMEX SHOP BUILDING NO. 4
WAREHOUSE
WAREHOUSE BUILDING NO. 6
WAREHOUSE BUILDING NO. 5
EXLINE OFFICE
MACHINE SHOP BUILDING NO. 2
ENTRANCE
I&A FIELD SERVICES BUILDING NO. 1
ENTRANCE
PONDS
CENTER LINE OF COUNTRY CLUB ROAD
EXLINE SCOULAR
W
S
N
E

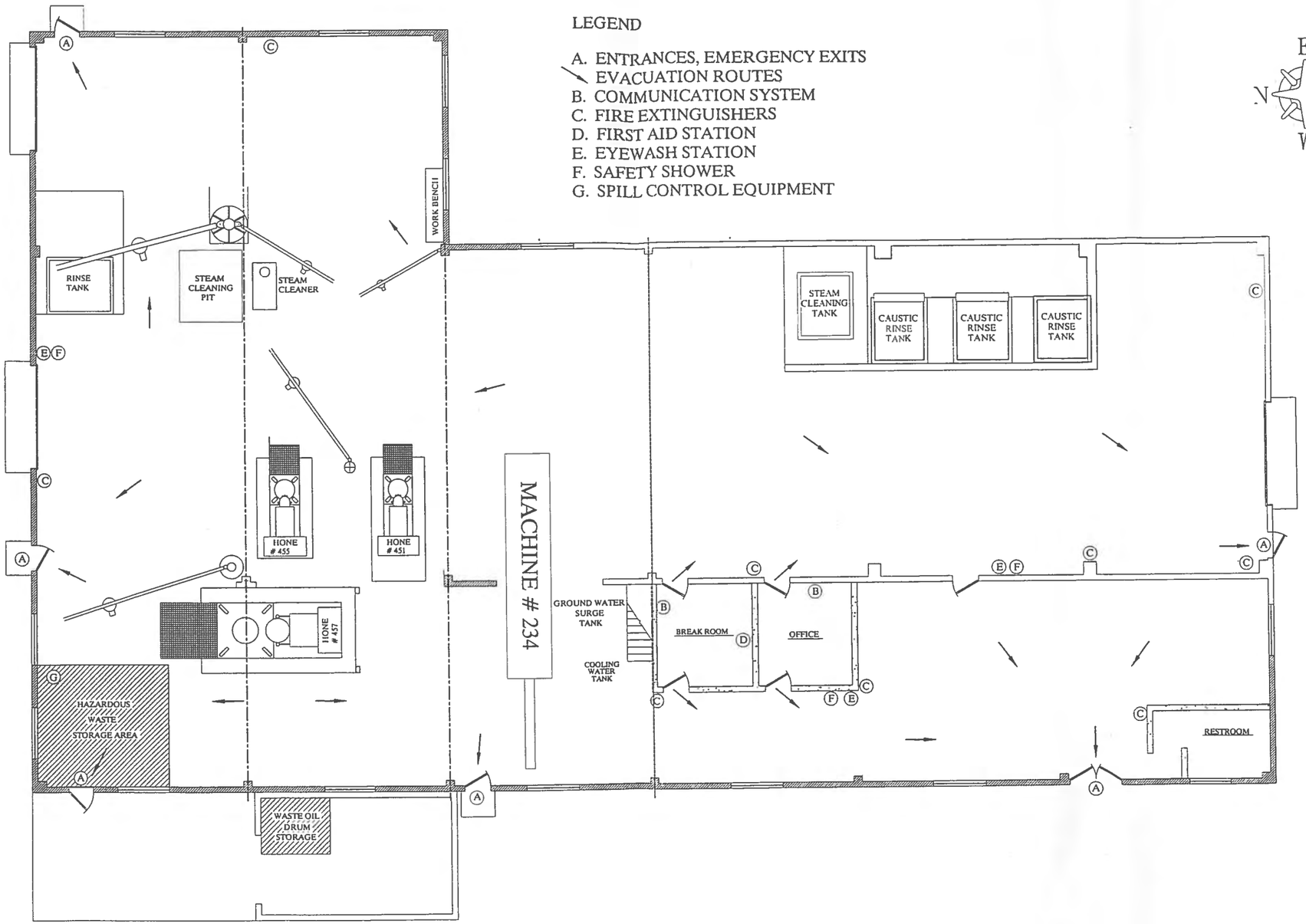
DRAWING NO. 999-05-005 REV.

TITLE: CYLINDER SHOP LAYOUT (EMERGENCY PLAN)

ITEM NO.	DESCRIPTION	PART NO.	MATERIAL	QUAN

LEGEND

A. ENTRANCES, EMERGENCY EXITS
EVACUATION ROUTES
B. COMMUNICATION SYSTEM
C. FIRE EXTINGUISHERS
D. FIRST AID STATION
E. EYEWASH STATION
F. SAFETY SHOWER
G. SPILL CONTROL EQUIPMENT



REVISIONS NO	REV. LOG NO.	DATE	BY	REVISIONS NO.	REV. LOG NO.	DATE	BY
1				5			
2				6			
3				7			
4				8			

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REFERENCE O.E.M. PART NO.		EXLINE PART NO.			
JOB NO. THAT THIS DWG. WAS MADE FROM	WC NO.	APP'D.	SH. OF.	DATE	12/14/05
BASE MAT'L OF PART FOR THIS JOB NO	PROG. NO	WEIGHT	DRAWN BY JCW	SCALE	NONE
TITLE VII-1 (CYLINDER SHOP LAYOUT "EMERGENCY PLAN")				DRAWING NO. 999-05-005	REV

EXLINE INC.

ATTACHMENT 3-4

SURFACE IMPOUNDMENT CLOSURE PLAN

SURFACE IMPOUNDMENT CLOSURE PLAN
FOR
EXLINE, INC.
SALINA, KANSAS

T. M. Christy, E.I.T.

ROBERT P. SELM
LICENSED
3185
KANSAS
PROFESSIONAL ENGINEER

JULY 1983
83-9547
REVISED NOVEMBER 1983

WILSON LABORATORIES
ANALYTICAL & RESEARCH CHEMISTS & BIOLOGISTS

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SECTION I

GENERAL

A. INTRODUCTION.

This plan specifies procedures which will be used to close a hazardous waste surface impoundment located at Exline, Inc., Salina, Kansas (EPA I.D. No. KSD-0071273). The location of Exline, Inc., is shown on Plate I-1. Located at this site is a hazardous waste surface impoundment (approximate capacity 225 cubic yards).

At the time of closure of the surface impoundment, all wastes will be removed from the site. Sampling and chemical analysis will be performed in order to demonstrate that no hazardous wastes remain at the surface impoundment site at the completion of closure. No post-closure care will be required for this site.

B. BACKGROUND INFORMATION.

The purpose of the Exline, Inc., surface impoundment is to store and evaporate spent plating solutions. The following is a listing of wastes which have been contributed to the surface impoundment:

1. Spent plating bath solutions (hazardous waste D007)
2. Steam cleaner rinse water (hazardous waste D007)
3. Deionizer column regenerates (non-hazardous waste)
4. Reverse strip-sodium chromate solution (hazardous waste D007)
5. Caustic cleaner baths (hazardous waste D002)

The composite solution of impoundment liquid is a pH 5 solution of high chromate content. In recent months, Exline, Inc., has developed methods and installed equipment to recycle the impoundment liquid back to the plating shop baths. At the time of submittal of this closure plan to the Kansas Department of Health and Environment (KDHE), the liquid contents of the surface impoundment have been removed from the impoundment to a plating solution tank storage facility. The removal and reuse of the impoundment liquid, which as a beneficially recycled material does not come under RCRA regulation, are not further addressed in this closure plan.

Extensive information has been generated concerning the condition of groundwater underlying the site.[1, 2, 3] Contamination of an aquifer underlying the site has occurred. Possible sources of this contamination included leaks in the plating shop basement, condensate drainage from chrome shop ventilator ducts, and percolation from the surface impoundment prior to the installation of the synthetic liner in 1980.

Plans and specifications for a groundwater removal and treatment system have been submitted to the KDHE. As of the writing of this closure plan, verbal approval for construction of the groundwater treatment system has been received from the KDHE. The proposed treatment system will remove

groundwater from the uppermost aquifer underlying the surface impoundment and chrome shop area and render such water suitable for discharge into the local watershed. This groundwater treatment system will have an NPDES discharge permit and will operate until a directive is received from the KDHE to cease removal and treatment operations.

Presently, groundwater sampling and analysis at Exline, Inc., and on surrounding properties are being carried out, as directed by the KDHE, on a monthly basis to assure the safety of local domestic users of the aquifer. Analytical results are reported to the KDHE on a monthly basis.

C. PURPOSE.

It is the purpose of this plan to fulfill the requirements of RCRA regulations found in 40 CFR Part 265 regarding the submittal of closure plans to the regulatory authorities prior to closure of hazardous waste surface impoundments.

D. CLOSURE PLAN SUMMARY.

The Exline Inc., surface impoundment measures approximately 74 feet by 72 feet and has an average working depth of less than 1.5 feet. All liquid wastes formerly contained in the impoundment have been removed for recycle back to the Exline, Inc., chrome plating shop.

Closure of the surface impoundment will consist of the removal of contaminated soils and decontamination and removal of the impoundment synthetic liner.

Contaminated soils will be stored temporarily in the chrome plating shop. Following chemical analyses to verify the removal of all hazardous wastes from the impoundment area, a hazardous waste disposal vendor will be contracted to remove all contaminated soils accumulated in the storage area.

The surface impoundment fence will be removed and the area will be regraded and restored to its original contours.

All hazardous wastes will be completely removed from the site. No post-closure care will be required for the site.

SECTION II

CLOSURE ACTIVITIES

A. INTRODUCTION.

After 7 August 1983, the liquid contents of the surface impoundment will have been removed to the Exline, Inc., plating solution tank storage system for recycle back to the plating baths. In order to close the surface impoundment the impoundment liner and any associated contaminated soils will be removed from the site. In addition the fence surrounding the impoundment will be removed and the impoundment area will be regraded to match original contours.

B. SUMMARY OF CLOSURE ACTIVITIES.

Closure activities will commence following approval of this closure plan by the Kansas Department of Health and Environment (KDHE).

As the liquid contents of the impoundment will have already been removed and recycled back to the plating shop, the first step in closure will be to remove soil that has washed onto the impoundment liner from the banks of the dike.

The impoundment liner will be pressure washed to remove chromium, and removed for future reuse. Wash water from the first washing of the liner will be recycled to the plating baths. Wash water from the second washing of the liner will be pumped to the Exline, Inc., plating shop industrial pretreatment system for treatment and disposal in the City of Salina sanitary sewer system.

Following removal of the impoundment liner, contaminated soils around the impoundment edge will be removed. Following soil removal operations, a sampling and analytical program will be implemented to demonstrate that none of the soils remaining in the impoundment area are hazardous wastes.

The impoundment security fence will be removed and the area regraded to complete the closure process.

When closure is completed, Exline, Inc., will submit to the KDHE a certification by an independent registered professional engineer that the facility has been closed in accordance with the specifications of this plan.

C. WASTE REMOVAL PROCEDURES.

The step by step procedures to be employed in removing wastes from the surface impoundment are as follows:

1. Uncovering Liner Edge. The synthetic fiber reinforced liner to the surface impoundment is buried approximately twelve (12) inches in the soil of the lagoon dike. This liner will be uncovered and the liner edge unwrapped and laid out on grade (see details, Plate II-1). Any soil around the liner edge which has been contaminated by wind and wave action across the impoundment surface, will be removed to the contaminated soil storage area located in the chrome plating shop. Soils will be loaded by hand and transported to the soil storage area using a front-end loader. The location of the soil storage area is shown on the Site Plan on Plate II-2.

2. Removal of Soil in Impoundment. No precipitation of solids has occurred from the liquid stored in the surface impoundment. However, there is a thin layer of soil on the bottom of the impoundment. This soil has been washed into the impoundment from the earthen dikes above the liner edge. This soil should be in a dry condition by the time of the impoundment closure, the liquid contents of the impoundment having already been pumped to the recycle system. This soil will be removed from the impoundment liner by hand, placed in a front-end loader and removed to the contaminated soil storage area.

3. Impoundment Liner Removal. It is desired to save the impoundment liner for future use. The impoundment liner will be decontaminated prior to removal by washing with a high pressure water jet. It is anticipated that a high concentration of soluble chromium will be contained in the water draining from the liner during the first pressure wash. All water drained from the liner during the first washing will be pumped to the plating solution storage tanks for eventual recycle to the plating baths.

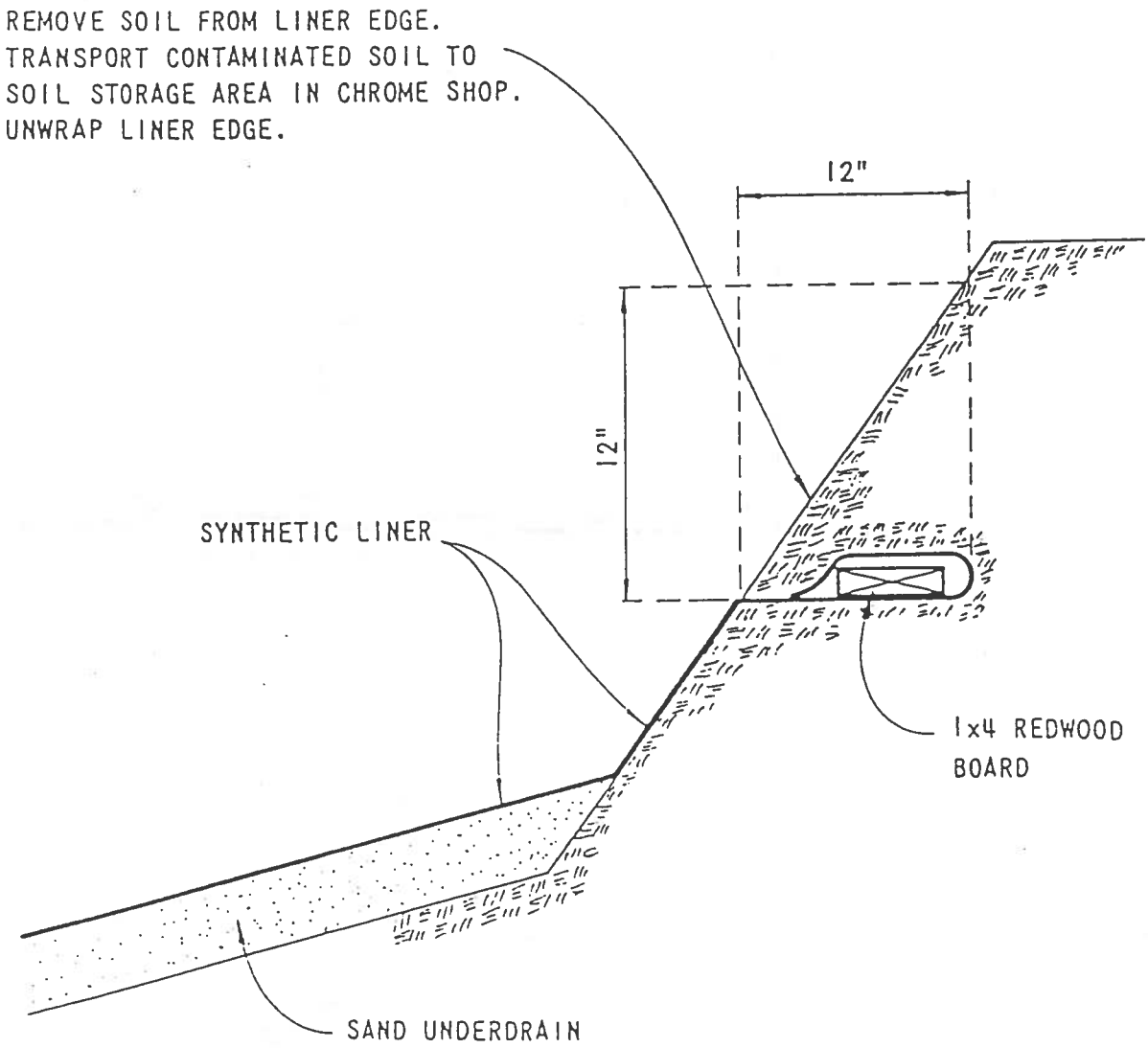
The liner will be washed with water until it is decontaminated. Water from all washing, with the exception of the first pressure washing, will be pumped to the Exline, Inc., chrome plating shop pretreatment system where any hexavalent chromium it may contain will be reduced and precipitated and the water released to the City of Salina sanitary sewer system.

Water from each washing of the lagoon liner will be analyzed for hexavalent chromium content. Washing of the liner will be repeated until the concentration of chromium in runoff from liner washing is less than .5 mg/l.

Following decontamination, the lagoon liner will be folded and removed for future use.

4. Removal of Contaminated Soils. Following removal of the impoundment liner, contaminated soils around the impoundment edge, which have not been removed during the uncovering of the liner edge will be removed.

Areas of known soil contamination are shown on Plate II-3. This contamination is obvious at the surface because of the iron staining caused by contact with the impoundment contents. Contamination of these soils has occurred through wind and wave action lapping the impoundment contents over the liner edge.



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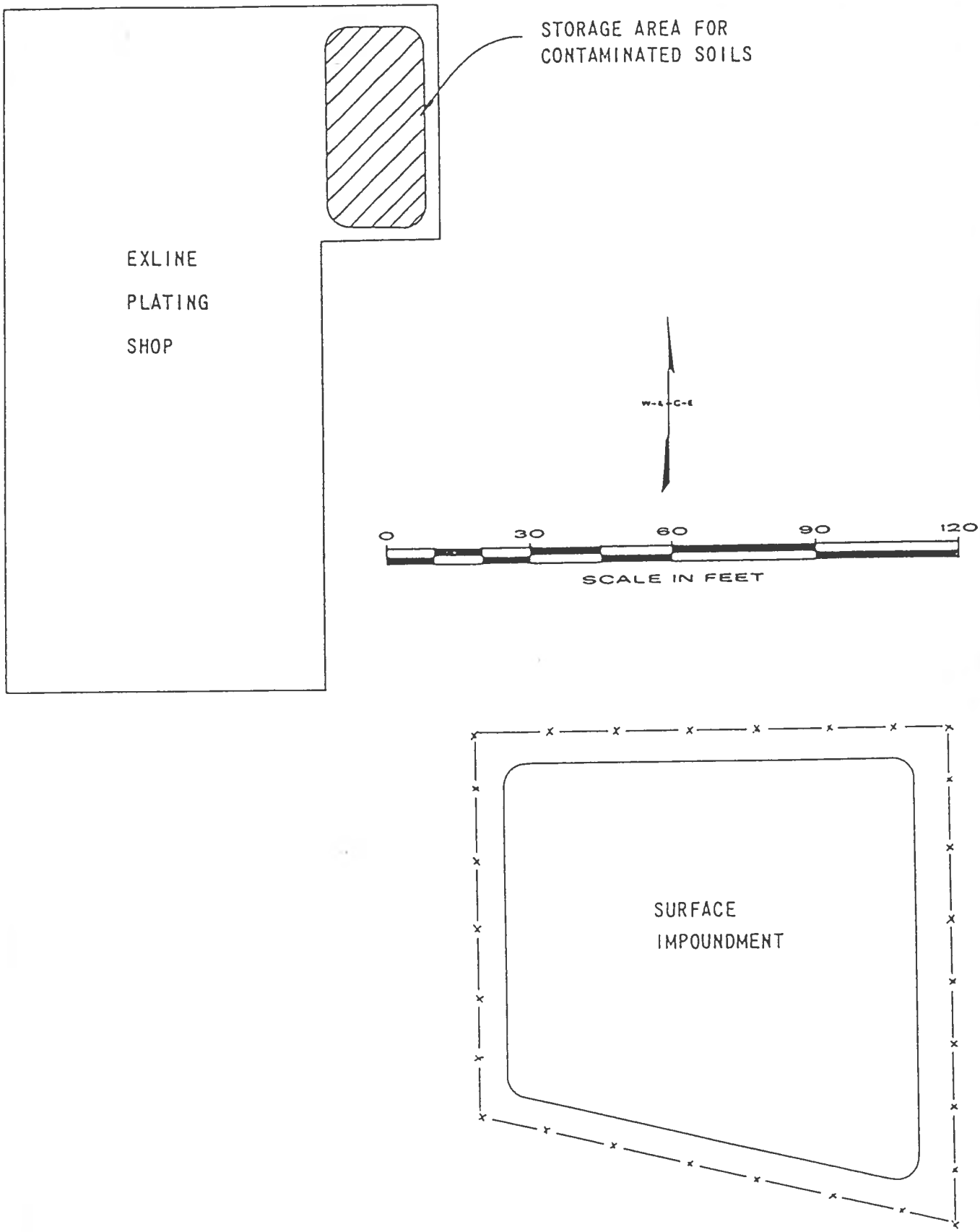
ENGINEERS ARCHITECTS

EXLINE, INC.

SURFACE IMPOUNDMENT CLOSURE

SYNTHETIC LINER DETAIL

DSGN	TMC	DR.	DFP	CK.	
FILE	83-9547	DATE	AUG. 83		PLATE II-1



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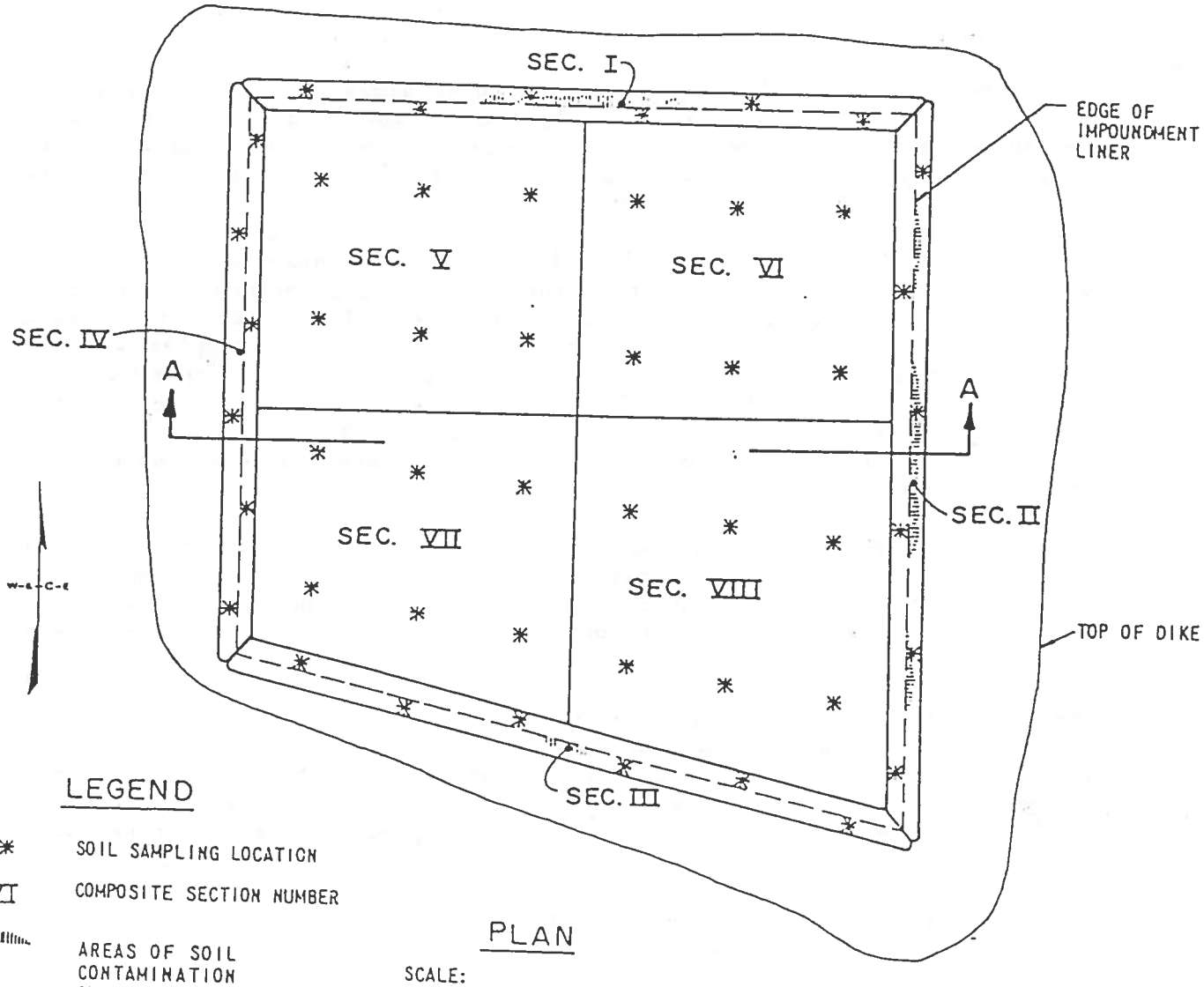
EXLINE, INC.
SURFACE IMPOUNDMENT CLOSURE
SITE PLAN

DSGN	THC	DR.	DFP	CK.	
FILE	83-9547	DATE	AUG. 83	PLATE II-2	



LEGEND

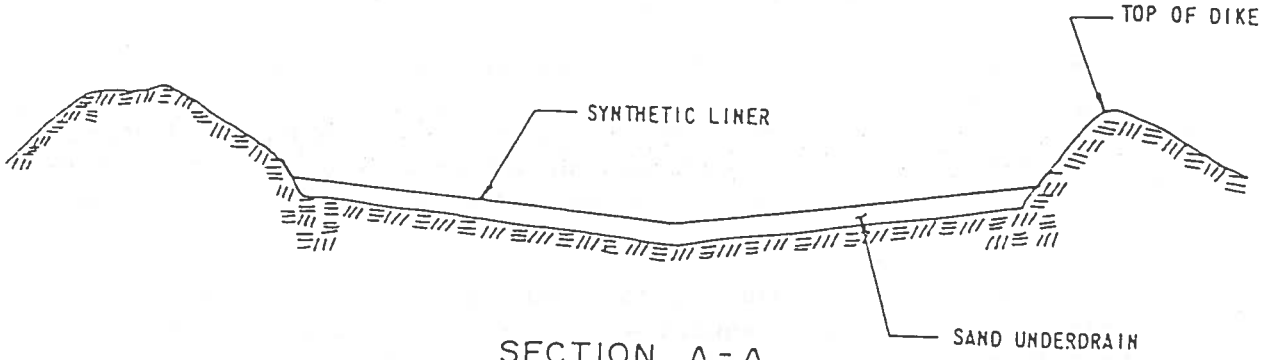
- ✱ SOIL SAMPLING LOCATION
- VI COMPOSITE SECTION NUMBER
- AREAS OF SOIL CONTAMINATION BY POND CONTENTS

PLAN

SCALE:

HORIZ. 1" = 20'

VERT. 1" = 2.5'



SECTION A-A

WILSON & COMPANY
ENGINEERS ARCHITECTS

SOIL SAMPLING LOCATIONS
EXLINE, INC.
SURFACE IMPOUNDMENT CLOSURE

DSGN. THC	DR. SKM	CK.
FILE 83-9517	DATE 7/83	PLATE II-2

Contaminated soils will be removed from these areas and will be excavated either with a skid steer loader or by hand. Removed soil will be transported by front-end loader to the soil storage area in the chrome plating shop. All of the collected soil will be disposed in a hazardous waste landfill at the end of closure operations.

Following the removal of all visually detectable contaminated soil, soil samples will be obtained from the four sides of the impoundment and from the impoundment bottom. These soil samples will be obtained from eight separate sections as shown on Plate II-3. These soil samples will be obtained using a shovel. The top six (6) inches of soil will be sampled by this method. Soil samples will be composited to form a sample representative of their respective section. Each of the eight (8) composite samples will then be extracted by the EP Toxicity method and the resulting extract analyzed for total chromium.

Should the composite samples prove to exhibit the EP toxicity characteristics for chromium, an additional soil lift will be removed and the sampling and analysis procedures described above will be repeated. Analysis and subsequent removal of soil will continue until all of the five soil areas no longer exhibit the EP characteristic for chromium.

The recommendation contained in this plan to analyze the site soils for chromium only is based on a knowledge of the processes contributing to the surface impoundment. Solutions of heavy metals other than chromium are not used in the Exline, Inc. plating shop. Trace quantities of various heavy metals dissolved from alloyed metal parts were present in the plating baths and cleaning solutions disposed in the surface impoundment. In order to provide assurance no other metal is present in the impoundment solution at concentrations sufficient to be a problem in the underlying soils, an analysis of the impoundment contents for total RCRA metals will be performed.

In addition to chromium, the site soils underlying the impoundment will also be analyzed for any of the RCRA metal found to be above the EP toxicity limit in the impoundment solution.

5. Disposal of Contaminated Soils. After all of the contaminated soils in the impoundment area have been collected and transported to the soil storage area in the chrome shop, and a demonstration has been made that no hazardous wastes remain in the impoundment area, the soil in storage will be removed from the premises by a permitted hazardous waste disposal contractor.

A disposal request will be made to the KDHE prior to removal of the waste from storage. This disposal request will specify both the intended hazardous waste transporter and the location and means of final disposal.

6. Equipment Decontamination. Following the removal of all contaminated soil from the impoundment area, all equipment used in the clean-up process (shovels, skid loader, wheel-barrows, etc.) will be steam cleaned. All steam cleaning will take place in the chrome shop at the existing steam

cleaner. Wastewater from this decontamination operation will be disposed of as wastewater effluent from the Exline chrome plating shop, and will be pretreated and disposed of in the City of Salina sanitary sewer system.

D. SOIL REMOVAL CONTINGENCY.

The possibility exists that it will be unfeasible to remove all of the contaminated soil beneath the impoundment liner to below the EP Toxicity limit. This would be the case if the extent of contamination is severe. This would also be true in cases where contamination above EP Toxicity limits extends into the saturated zone, requiring specialized excavation techniques. Whether or not such a case will be encountered cannot be determined until the impoundment synthetic liner is removed and the soils can be excavated and tested.

If the above described contingency is encountered, the following response steps will be implemented:

1. Excavation will be stopped.

2. The synthetic liner will be replaced into the surface impoundment depression in order to collect precipitation.

3. Within seven (7) working days of the discovery of the contingency, Exline, Inc., will submit to the KDHE data collected during soil excavation and testing along with an alternate plan to treat the contaminated soil in-situ. This soil treatment system will consist of leaching the soil in the depression with a solution of low pH, sodium meta-bisulfite to reduce hexavalent chromium. This system could only be implemented in the area while the Exline, Inc., groundwater treatment system is in operation. (The groundwater treatment system is scheduled to begin operation on 2 January 1984.)

4. The alternate plan to treat soils in place will also recommend a program of additional testing to determine the efficiency of the treatment system.

5. The alternate soil treatment system will be implemented as soon as approval of the alternate plan is received from the KDHE.

E. SITE RESTORATION.

Following the removal of all waste from the area and the completion of analyses demonstrating that no hazardous wastes remain in the impoundment area, the site will be restored to its original contours. The following procedures will be employed:

1. Removal of Security Fence. The surface impoundment security fence will be dismantled and removed for future reuse. This fence surrounds the outside perimeter of the surface impoundment and has never been in contact with the impoundment contents.

2. Regrading of Impoundment Area. Following the removal of contaminated soils, the impoundment area, and the security fence, the impoundment dikes will be pushed in and the area will be regraded to match existing contours of the surrounding area. The site will be sloped toward the drainage ditch which lies on the south and west sides of the impoundment.

Because all of the waste will be removed from the surface impoundment site prior to regrading, no cover materials will be necessary. The surface impoundment was created by shaping a depression in the ground. No soil was removed from the impoundment area during the original impoundment construction process. These same soils (silty clays and topsoil) will simply be regraded following the removal of all contaminants from the impoundment area. All of the soils present at the site are capable of sustaining vegetation. No attempt will be made to provide a cover of reduced permeability.

3. Seeding. The regraded impoundment area will be seeded with K-31 Fescue at a rate of 30 lbs. per acre. Following seeding the regraded area will be covered with mulch at a rate of 4,000 pounds per acre. Wheat straw will be used as the mulching material.

F. FIELD OBSERVATION AND CLOSURE CERTIFICATION.

Exline, Inc., will employ the services of an independent testing laboratory or engineering firm to provide field observation of all closure activities related to the removal of wastes from the impoundment or sampling to demonstrate the completion of removal of hazardous wastes.

When all closure activities have been completed, including the removal of soil from the soil storage area in the chrome shop, Exline, Inc., will submit to the KDHE, certification that the facility has been closed in accordance with the specifications of this plan. This certification will be signed by an authorized representative of Exline, Inc., and will be sealed by an independent registered professional engineer.

SECTION III

CLOSURE SCHEDULE

A. GENERAL.

This section contains a tentative schedule of closure activities. The time at which closure activities will begin is dependent upon approval of this plan by the KDHE and is, therefore, indeterminate. The schedule given begins on the date of approval-to-proceed with closure activities from the KDHE.

It is recognized that certain delays may be encountered in completing the closure operations described in this plan. Such delays may be caused by inclement weather.

B. SCHEDULE.

A schedule of closure activities appears in Table III-1. The activities listed in this table will begin on the day of receipt of final approval of this closure plan.

TABLE III-1
CLOSURE ACTIVITIES

Activity	Begin	End
Remove soil from impoundment liner, stockpile in chrome shop.	Week 1	Week 2
Decontaminate and remove synthetic liner	Week 2	Week 3
Remove contaminated soils from edges and bottom of impoundment	Week 3	Week 4
Sample and analyze composite soil samples for EP toxicity-chromium to demonstrate that all hazardous wastes have been removed from site	Week 4	Week 6
Provide written certification of closure to KDHE	Week 6	Week 7

BIBLIOGRAPHY

1. Groundwater Study Performed for Exline, Inc., Salina, Kansas, Wilson Laboratories, May 1982.

2. Exline, Inc., Salina, Kansas, Pollution Control Plan, Wilson Laboratories, September 1982.

3. Groundwater Monitoring Annual Report, Exline, Inc., Salina, Kansas, Wilson Laboratories, June 1983.

ATTACHMENT 3-5

SURFACE IMPOUNDMENT POST-CLOSURE PLAN

POST CLOSURE PLAN

EXLINE, INC.
SALINA, KANSAS

November, 2012

Post Closure Plan
Exline, Inc., Salina, Kansas
Table of Contents

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Appendix A – Deed Notice and Survey Plan		

1. Introduction.

This Post Closure Plan has been prepared for the closed hazardous waste surface impoundment that was located at the Exline, Inc. facility, Salina, Kansas. The Plan was prepared and is being submitted in accordance with requirements set forth in 40 CFR 265.110, 265.117 through 265.120, 265.144, 265.228, and 265.310.

The Exline, Inc. facility is located at 3256 East Country Club Road, Salina, Kansas. Plate 1.1 is a site location map for the subject facility. Plate 1.2 shows the location of the closed hazardous waste surface impoundment relative to Exline Cylinder Shop (as noted on the drawing – the Cylinder Shop was previously identified as the "Exline Plating Shop". The surface impoundment was used to store and evaporate spent chromium plating solution and associated wastes from 1967 until the early 1980s. The surface impoundment was closed in 1984 in accordance with a November, 1983 Closure Plan that was approved by the Kansas Department of Health and Environment (KDHE). The closure activities included removal of the plating solution waste. The synthetic liner was removed and contaminated soil was excavated and disposed. The surface impoundment was back-filled with clean soil and the surface was seeded to establish a grass cover.

A groundwater recovery system has been operating at the site since February, 1984 to the present (November, 2012). A historical summary of the recovery well and treatment system operation is presented below.

The current status of the Exline groundwater recovery well system flow rates is summarized below.

Recovery Well	Startup Date	Current Flow Rate (gpm)
B-7	February, 1984	15
C-9R*	May, 1988	10
E-3	August, 1989	10
SC-2**	May, 1988	10

* C-9R replaced C-9 on December 18, 2006.
** This well was removed from the Exline recovery system on September 26, 2008.

Well, E-3 was operated at 5 gpm was from August, 1989 through December, 1989. Well B-7 was operated around 7 gpm from February, 1984 through April, 1985. In May, 1985, the flow rate from B-7 was increased to 15 gpm and has remained at that rate through the present. Pumping rates for C-9R and SC-2 have remained at 10 gpm since their respective startup in May of 1988. As discussed earlier, well SC-2 continues to operate, but is no longer a part of the Exline corrective action program.

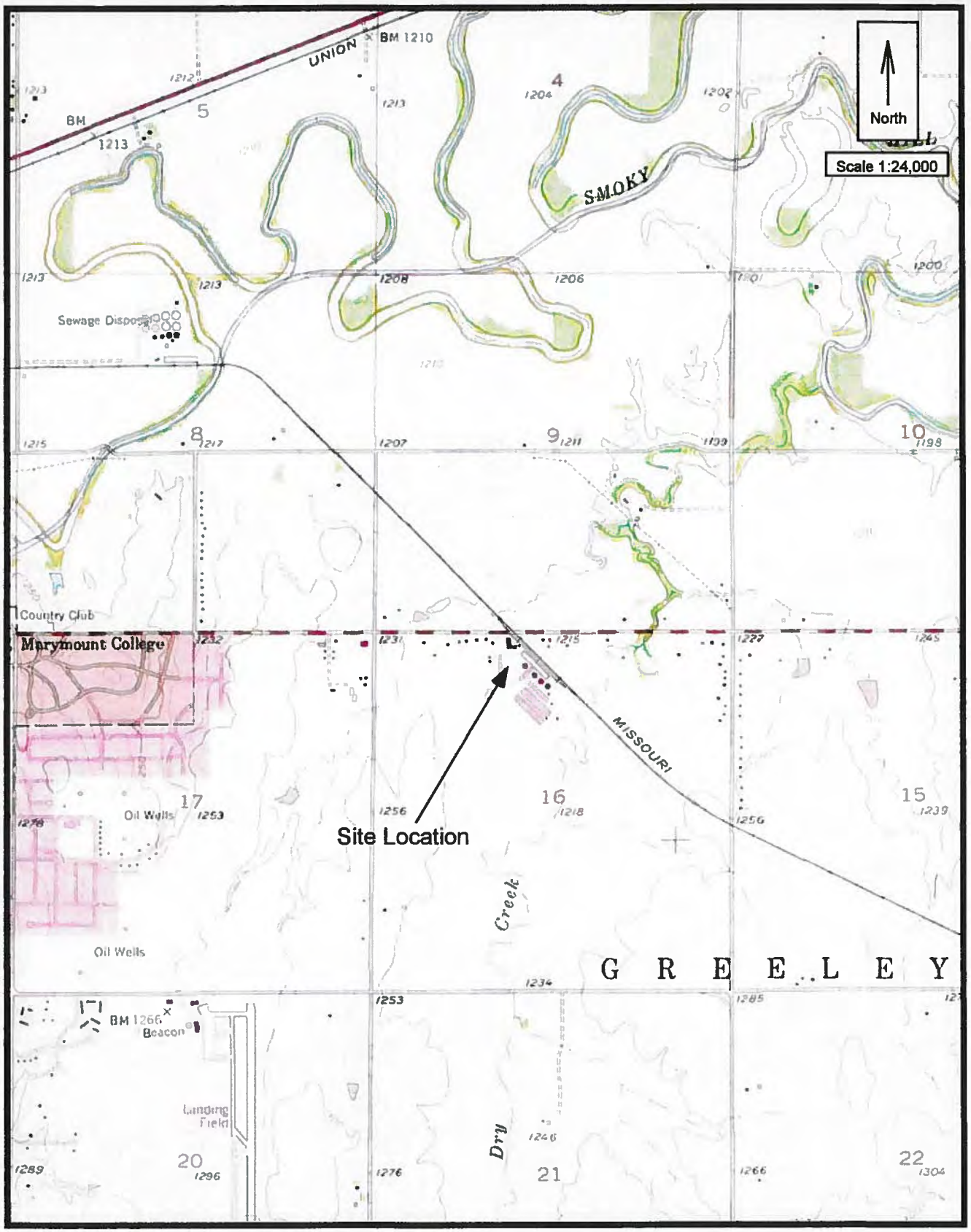
The groundwater recovery and treatment system was started up in February, 1984. With the exceptions noted below, the basic components and operation of the system have remained essentially the same since system startup through December of 2005. Significant changes include the following:

- The chemical reducing agent was changed from sulfur dioxide to liquid sodium bisulfite in 1998.

- An air stripper treated wastewater for VOC removal from September, 1991 through December, 1996. During that time, water was pumped to the air stripper following the pH adjustment step with sulfuric acid. Water from the air stripper was pumped back to the chromium removal system. This VOC removal process was discontinued after the treated effluent began being discharged to the City Sewer (in lieu of surface discharge under an NPDES permit), which was initiated in November of 1996. Air stripper treatment was no longer needed since VOC discharge limits are 2 to 3 orders-of-magnitude higher for discharge to the City sewer compared to surface discharge.

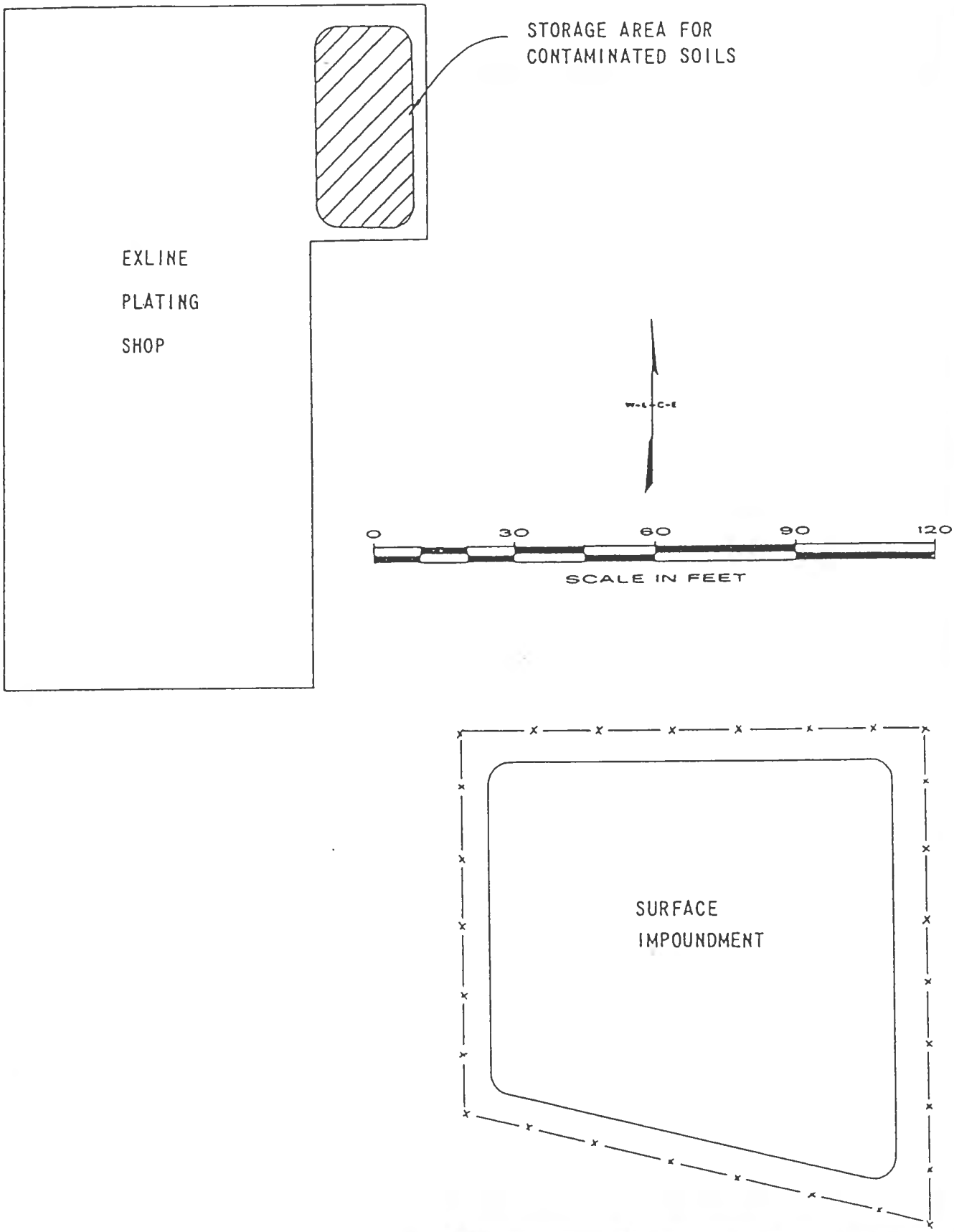
- In late 2003, the City of Salina agreed to accept the recovered groundwater from Exline without treatment. This decision was based on the fact that the untreated groundwater chromium concentration was well below the discharge limit of 3.35 mg/L. The recovered groundwater continues to be discharged to the City of Salina sewer system under the regulation of an Industrial Wastewater Discharge Permit. Beginning on January 1, 2004, the required minimum effluent monitoring frequency increased to monthly (in lieu of quarterly).

Finally, as discussed earlier, Scoular Elevator de-watering well SC-2 was removed from the Exline groundwater corrective action program on September 26, 2008 due to the fact that chromium concentrations in that well had been non-detect (less than 0.01 mg/L) for several years prior to that date.



Map Source: USGS 7.5 Minute Topographic Map, Salina, 1978

Plate 1.1: Site Location Map



WILSON & COMPANY
ENGINEERS
ARCHITECTS

EXLINE, INC.
SURFACE IMPOUNDMENT CLOSURE
SITE PLAN

DSGN	THC	DR.	DFP	CK.
FILE	83-9547	DATE	AUG. 83	Plate 1.2

2. Post Closure Care and Use of Property (40 CFR 265.117).

Post closure care for the hazardous waste management unit at the Exline facility will be conducted in accordance with the Inspection and Maintenance Plan. A copy of that document was included as Attachment 3-2 in the June, 2012 Exline Hazardous Waste Permit Application.

Groundwater will be recovered and monitored in accordance with the "Corrective Action Plan", which was included as Section 5 in the June, 2012 Exline Hazardous Waste Permit Application..

Exline has no plans to use the area where the closed surface impoundment was located.

3. Post Closure Plan (40 CFR 265.118).

This Post-Closure Plan has been developed to minimize or eliminate threats to human health and the environment and prevent the escape of contaminated groundwater from the hazardous waste management unit.

A groundwater assessment program was developed in 1982. The groundwater remediation program has been operating continuously from February, 1984 to the present (November, 2012). The groundwater remediation program history was summarized in Section 1.

A Post Closure Care Hazardous Waste permit was issued in 1989. That permit was re-issued in 2002. The permit renewal application was submitted to the KDHE and EPA Region 7 in June of 2012.

The current Post Closure Care Hazardous Waste Permit includes requirements associated with:

1) Inspections.
2) Financial Assurance.
3) Corrective Action.
4) Groundwater Monitoring.

4. Post Closure Notices (40 CFR 265.119).

The KDHE was notified of the type, location, and quantity of waste disposed in Exline's surface impoundment. This information was submitted in the Closure Plan and the Closure Certification Report for the site. The Saline County Planning Commission, Salina, Kansas has been notified of the type, location, and quantity of waste that was disposed in the surface impoundment. The notification letter from Exline and the survey plat of the surface impoundment are included in Appendix A.

A notation has been made on the deed to the facility, recording the location of the closed surface impoundment. A copy of the notation on the deed and a letter from Exline certifying that the notation on the deed has been filed is also included in Appendix A.

5. Certification of Completion of Post Closure Care (40 CFR 265.120).

No later than 60 days following completion of the post closure car period, the owner or operator will submit to the Regional Administrator, by registered mail, a certification that the post closure care for the surface impoundment was performed as specified in the approved Post Closure Plan. The certification will be signed by the owner or operator and an independent registered professional engineer.

The following documents shall be maintained by Exline and may be required to be submitted with the post closure certification:

1) Monitoring well sampling and analysis data generated by Exline, Inc. personnel.

2) Monitoring well sampling and analysis data generated by independent contract laboratories.

3) Chain-of-Custody forms for samples submitted to independent contract laboratories.

4) Inspection and maintenance records including maintenance invoices, if applicable.

5) Records of annual groundwater recovery volumes.

6) Regulatory agency correspondence.

7) Documentation of site visits by regulatory agency personnel.

8) Post Closure Plan amendments.

6. Responsible Party.

The following person is responsible for updating the Post Closure Plan, as well as, insuring that groundwater monitoring and treatment activities are completed as required by the Exline hazardous waste permit:

Mr. Robert Exline
Executive Vice President
Exline Leasing, Inc.
3256 East Country Club Road
PO Box 1487
Salina, KS 67401
(785) 825-4683

7. Post Closure Cost Estimate.

A Post Closure Care cost estimate was included as Attachment 3-6 with the January, 2013 Hazardous Waste Permit renewal application.

APPENDIX A

DEED NOTICE

and

SURVEY PLAT

LAW OFFICES
KENNEDY BERKLEY YARNEVICH & WILLIAMSON
CHARTERED
710 UNITED BUILDING
P. O. BOX 2567
SALINA, KANSAS 67402-2567

THOMAS J. KENNEDY
ROBERT B. BERKLEY
GEORGE W. YARNEVICH
TOM A. WILLIAMSON
DANIEL K. DIEDERICH

TELEPHONE (913) 825-4674
TELECOPIER (913) 825-5936

November 5, 1987

COPY

Regional Administrator
Environmental Protection Agency
726 Minnesota Avenue
Kansas City, MO 66101

Gentlemen:

Pursuant to Federal regulations we are enclosing herewith for filing with the Environmental Protection Agency a Survey Plat of the Exline, Inc. Hazardous Waste Disposal Area. In addition, I am enclosing herewith a copy of the Notice of Hazardous Waste Disposal Area filed in the office of the Register of Deeds of Saline County, Kansas with the certification of Exline, Inc. as to its filing.

Yours very truly,

KENNEDY BERKLEY YARNEVICH & WILLIAMSON

By: Tom A. Williamson

TAW/jd
Enclosure

CERTIFICATE

STATE OF KANSAS, COUNTY OF SALINE, ss:

I, Jerry K. Exline, Vice President of Exline, Inc., do hereby certify that attached hereto is a true and correct copy of the Notice of Hazardous Waste Disposal Area filed on October 28, 1987 in the office of the Register of Deeds of Saline County, Kansas in Volume 140 of Miscellaneous at Page 737.

Dated November 3, 1987.

Jerry K. Exline

Subscribed and sworn to before me this 3rd day of November, 1987.

Janice L. Doherty
Notary Public

JANICE L. DOHERTY
State of Kansas
My Appt. Exp. Aug. 26, 1988

STATE OF KANSAS } ss. (N) FILED FOR RECORD
COUNTY OF SALINE } IN MY OFFICE AT
3:45 O'CLOCK P.M. OCT 28 1987 AND DULY RECORDED
Misc. Book 140 Page 737
Helen Ingersoll REGISTER OF DEEDS AT PAGE 737

Misc. Book 140 Page 737

NOTICE OF HAZARDOUS WASTE DISPOSAL AREA

Pursuant to 40 C.F.R. §§ 264 and 265, notice is hereby given by the undersigned owner that the following-described real estate has been used for the disposal and management of hazardous wastes:

> A tract in the Northeast Quarter (NE/4) of the Northwest Quarter (NW/4) of Section Sixteen (16), Township Fourteen (14) South, Range Two (2) West of the 6th P.M., Saline County, Kansas described as follows: From the Northwest corner of said NW/4; thence East long the North line of said NW/4, One Thousand Nine Hundred Eight-five and Nine Hundredths (1,985.09) feet to the West right-of-way line of the Missouri Pacific Railroad; thence S44°53'E, along said West right-of-way line, One Hundred Thirty-nine (139) feet; thence S0°21'W, Two Hundred Twenty (220) feet; thence N89°29'W, Seventy-six (76) feet; thence S0°21'W, Six Hundred Sixty-six and Seventy-three Hundredths (666.73) feet; thence N89°39'W, One Hundred Ninety-six and Ninety-eight Hundredths (196.98) feet to the Northeast corner of the Old Wastewater Pond Site and the point of beginning; thence around said pond site as follows: Thence S05°37'W, One Hundred Ten and Seven Hundredths (110.07) feet; thence N65°07'W, Eighty-five and Fifty-nine Hundredths (85.59) feet; thence N08°32'W, Seventeen and Fifty-seven Hundredths (17.57) feet; thence N05°29'E, Fifty-eight and Sixteen Hundredths (58.16) feet; thence S88°48'E, Eight-five and Fifty-three Hundredths (85.53) feet to the point of beginning.

Future use of the above-described real estate is restricted under the terms of 40 C.F.R. Subpart G to the extent that such usage of the property must never be allowed to disturb the integrity of the final cover, liners, or any other components of any containment system, or the function of the area's monitoring system, unless the Regional Administrator of the United States Environmental Protection Agency or the Director of the Kansas Department of Health and Environment finds that the disturbance (1) is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or (2) is necessary to reduce a threat to human health or the environment.

A survey plat and record of the type, location and quantity of the hazardous waste disposed of within the above-described area has been filed with the Saline County Planning and Zoning Commission, the Kansas Department of Health and Environment and with the Regional Administrator of the United States Environmental Protection Agency.

IN WITNESS WHEREOF, the undersigned has executed this Notice of Hazardous Waste Disposal Area on this 27th day of October, 1987.

EXLINE, INC.

By: Jerry K. Exline
Vice President

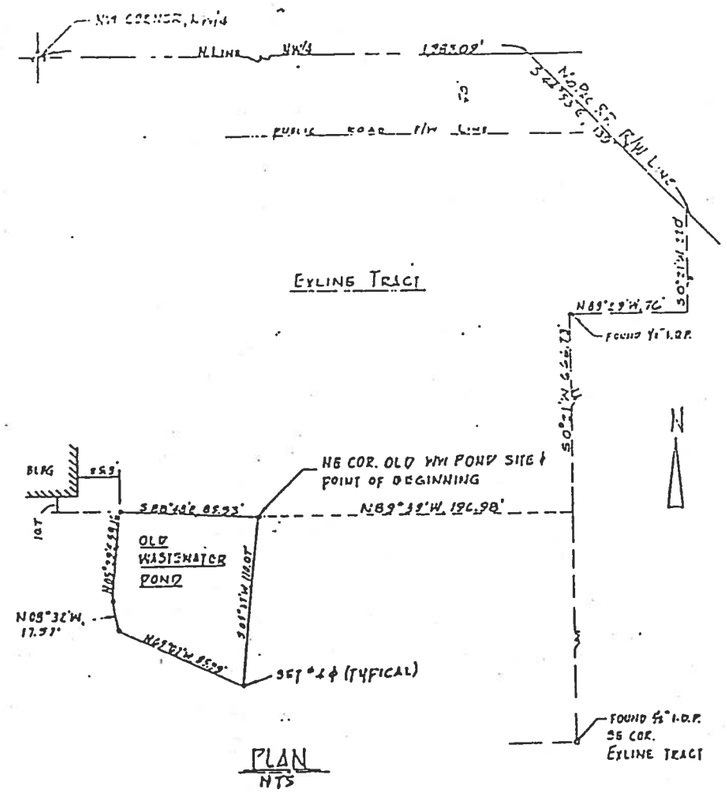
STATE OF KANSAS, COUNTY OF SALINE, ss:

The foregoing instrument was acknowledged before me this 27th day of October, 1987, by Jerry K. Exline, Vice President of Exline, Inc., a Kansas corporation, on behalf of said corporation.

Janice L. Doherty
Notary Public

JANICE L. DOHERTY
State of Kansas
My Appt. Exp. Aug. 26, 1988

Fred Williamson
Box 2527



SURVEYOR'S CERTIFICATE

STATE OF KANSAS, COUNTY OF SALINE, SS:

I, the undersigned, do hereby certify that I am a licensed professional engineer and a registered land surveyor in the State of Kansas; that the heretofore described property was surveyed by me or under my supervision; that the survey set forth herein has been prepared by me; that all monuments shown therein actually exist and their positions are correctly shown to the best of my knowledge and belief.

L. Dean Strowig
1211 Sunrise Drive
Salina, Kansas

L. DEAN STROWIG REGISTERED LS-193 KANSAS LAND SURVEYOR

L. DEAN STROWIG LICENSED 2189 KANSAS PROFESSIONAL ENGINEER

LEGAL DESCRIPTION

Exline, Inc., being the owner thereof, has caused the following described real estate to be surveyed to identify a hazardous waste disposal area:

A tract in the Northeast Quarter (NE/4) of the Northwest Quarter (NW/4) of Section Sixteen (16), Township Fourteen (14) South, Range Two (2) West of the 6th P.M., Saline County, Kansas described as follows: From the Northwest Corner of said NW/4; thence East along the North Line of said NW/4, One Thousand Nine Hundred Eighty-five and Nine Hundredths (1,985.09) feet to the West right-of-way line of the Missouri Pacific Railroad; thence S44°53'E, along said West right-of-way line, One Hundred Thirty-Nine (139) feet; thence S0°21'W, Two Hundred Twenty (220) feet; thence N89°29'W, Seventy-Six (76) feet; thence S0°21'W, Six Hundred Sixty-Six and Seventy-Three Hundredths (666.73) feet; thence N89°39'W, One Hundred Ninety-Six and Ninety-Eight Hundredths (196.98) feet to the Northeast Corner of the Old Wastewater Pond Site and the point of beginning; thence around said pond site as follows: thence S05°37'W, One Hundred Ten and Seven Hundredths (110.07) feet; thence N65°07' W, Eighty-Five and Fifty-Nine Hundredths (85.59) feet, thence N08°32'W, Seventeen and Fifty-Seven Hundredths (17.57) feet; thence N05°29'E, Fifty-Eight and Sixteen Hundredths (58.16) feet; thence S82°48'E, Eighty-five and Fifty-Three Hundredths (85.53) feet to the point of beginning.

DISPOSAL OF HAZARDOUS WASTE

The real estate described above and designed in the survey herein as "Old Wastewater Pond" was, prior to April 1984, used to impound and dispose of undetermined quantities of spent chromium plating solutions which are listed as hazardous wastes pursuant to 40 CFR Part 261 and K.A.R. 28-31-3.

OWNER'S OBLIGATION TO RESTRICT DISTURBANCE

Future use of the above-described real estate is restricted pursuant to 40 CFR Subpart G to the extent that such usage of the property must never be allowed to disturb the integrity of the final cover, liners, or any other components of any containment system, or the function of the area's monitoring system, unless the Regional Administrator of the U.S.E.P.A. or the Director of the Kansas Department of Health and Environment finds that the disturbance (1) is necessary to the proposed use of the property and will not increase the potential hazard to health or the environment; or (2) is necessary to reduce a threat to human health or the environment.

Exline, Inc.

By: Jerry K. Exline, Vice President

STATE OF KANSAS, COUNTY OF SALINE, ss:

The foregoing instrument was acknowledged before me this 27th day of October, 1987, by Jerry K. Exline, Vice President of Exline, Inc., a Kansas corporation, on behalf of said corporation.

Notary Public

JANICE L. DOHERTY
State of Kansas
My Appt. Exp. Aug. 26, 1988

PREPARED BY: LINE, EXLINE, INC.

PLAT OF SURVEY
OF
TRACT IN NE/4, NW/4, 16-14-2W
SALINE COUNTY, KANSAS
26 SEPTEMBER 1987

ATTACHMENT 3-6

POST-CLOSURE CARE COST ESTIMATE

RECEIVED
APR 3 2 2013
BUREAU OF WASTE MANAGEMENT

Bureau of Waste Management
Curtis State Office Building
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

phone: 785-296-1600
fax: 785-296-1592
email: bwmweb@kdheks.gov
www.kdheks.gov/waste

Robert Moser, MD, Secretary

Kansas
Department of Health & Environment

Sam Brownback, Governor

RCRA Post Closure Cost Estimate Form for Hazardous Waste Facilities

Facility Information			
Facility Name:	Exline, Inc.	EPA ID No.:	KSD007127327
Address:	3256 East Country Club Road		
City:	Salina	Zip Code:	67401
Contact Name:	Rob Exline	Phone No.:	785-825-4683

PC_02 Post-Closure Care Removal of Leachate			
1	Volume of leachate to be removed per removal event	NA	gallons/event
2	Number of leachate removal events per year	NA	events/year
3	Volume of leachate to be removed per year	NA	gallons/year
4	Cost to treat leachate per gallon	$ NA	per gallon
5	Cost per year for removal of leachate	$ NA	per year
6	Number of years in post-closure (PC) care period	NA	years
7	TOTAL COST OF REMOVAL OF LEACHATE	$ NA	

PC_03 Post-Closure Care Site Security			
	FENCING		
8	Length of fencing	NA	feet
9	Labor, materials, and equipment cost per foot	$ NA	per foot
10	Cost to fence site	$ NA	
	CORNER POSTS		
11	Number of corner posts required	NA	posts
12	Cost per corner post	$ NA	per post
13	Cost to erect corner posts	$ NA	
14	Number of gates required	NA	gates
15	Labor, materials, and equipment cost per gate	$ NA	per gate
16	Cost to install gates	$ NA	

PC_03 Post-Closure Care Site Security (cont.)			
	REFLECTOR SIGNS		
17	Number of signs required	NA	signs
18	Labor, materials, and equipment cost per sign	$ NA	per sign
19	Cost to install signs	$ NA	
20	TOTAL COST OF SITE SECURITY	$ NA	

PC_04 Post-Closure Care Maintenance of Vegetative Cover			
	MOWING		
21	Area of cover to be mowed	NA	ft^2
22	Convert area in ft to area in MSF (thousand square feet)	NA	MSF
23	Labor and equipment cost per MSF	NA	per MSF
24	Cost of one mowing event	$ 16.67	per event
25	Number of mowing events per year	5	events per yr
26	Number of years in PC care period	30	years
27	Number of mowing events during the PC care period	150	events
28	Cost to mow for PC care period	$ 2500	
	FERTILIZING		
29	Area of cover to be fertilized	NA	MSF
30	Labor, materials, and equipment cost per MSF	$ NA	per MSF
31	Cost of one fertilizing event	$ NA	per event
32	Number of fertilizing events per year	NA	events/yr
33	Number of years in the PC care period	NA	years
34	Number of fertilizing events during the PC care period	NA	events
35	Cost to fertilize for the PC care period	$ NA	
	WATERING		
36	Area of cover to be watered	NA	MSF
37	Labor and material cost per MSF	$ NA	per MSF
38	Cost of one watering event	$ NA	per event
39	Number of watering events per year	NA	events/yr
40	Number of years in the PC care period	NA	years
41	Number of watering events during the PC care period	NA	events
42	Cost to water for the PC care period	$ NA	
43	TOTAL COST OF MAINTENANCE OF VEGETATIVE COVER	$ 2500	

PC_05 Post-Closure Care Repair and Inspection of Final Cover			
MAINTENANCE AND REPAIR OF FINAL COVER			
44	Cost of installing undifferentiated fill	$ NA	
45	Cost of installing clay liner	$ NA	
46	Cost of installing geomembrane	$ NA	
47	Cost of installing drainage layer	$ NA	
48	Cost of installing earthen layer	$ NA	
49	Cost of installing topsoil	$ NA	
50	Cost of installing colloid clay layer	$ NA	
51	Total cost of installing final cover	$ NA	
52	Maintenance and repair factor	% NA	
53	Cost to maintain and repair final cover	$ NA	
POST-CLOSURE CARE INSPECTION			
54	Cost of conducting one inspection	$ 100	per inspection
55	Number of inspections per year	12	inspections
56	Cost of conducting post-closure care inspections per year	$ 1200	per year
57	Number of years in PC care period	30	years
58	Cost to conduct inspections over the PC care period	$ 36000	
59	TOTAL COST OF REPAIR AND INSPECTION	$ 36000	

PC_06 Post-Closure Care Groundwater Monitoring					
COLLECTION OF GROUNDWATER SAMPLES					
60	Number of sampling locations			16	samples
61	Choose the appropriate level of PPE		Level D ■	Level C ☐	Level B ☐
62	Labor and equipment costs per work hour		$ 78		per work hr
63	Work rate to collect samples from one sampling location		2		work hr per
64	Number of hours required to collect all samples		32		work hours
65	Cost to collect groundwater samples per event		$ 2500		per event
ANALYSIS OF GROUNDWATER SAMPLES					
66	DESCRIPTION/METHOD	LIQUID/SOLID	COST	QTY	TOTAL
	6010B - Total chromium	LIQUID	$ 27.9	18	500.00
			$		$
			$		$
			$		$
			$		$
			$		$

PC_06 Post-Closure Care Groundwater Monitoring (cont.)					
ANALYSIS OF GROUNDWATER SAMPLES (CONT.)					
	DESCRIPTION/METHOD	LIQUID/SOLID	COST	QTY	TOTAL
			$		$
			$		$
			$		$
			$		$
67	Cost to analyze groundwater samples per event		$ 500		per event
TOTAL GROUNDWATER MONITORING FOR POST-CLOSURE CARE PERIOD					
68	Cost of sampling and analysis of groundwater for post-closure		$ 3000		per event
69	Number of sampling events per year		2		events per yr
70	Number of years of groundwater monitoring during PC care period		30		years
71	TOTAL COST OF GROUNDWATER MONITORING		$ 180000		

PC_07 Post Closure Care Deed Notation		
72	Attorney fees	$ NA
73	Clerical and deed filing fees	$ NA
74	TOTAL COST OF DEED NOTATION	$ NA

PC_08 Maintenance and Inspection of Asphalt Cover			
MAINTENANCE OF ASPHALT COVER			
75	Area of asphalt cover	NA	yd^2
76	Cost of seal coating asphalt per square yard	$ NA	per yd^2
77	Cost of one seal coating event	$ NA	per event
78	Number of seal coating events during PC period	NA	events
79	Cost to maintain asphalt cover	$ NA	
N			
80	Cost of conducting one inspection	$ NA	per inspection
81	Number of inspections per year	NA	inspections
82	Cost of conducting PC care inspections per year	$ NA	per year
83	Number of years in PC care period	NA	years
84	Cost to conduct inspections over PC care period	$ NA	
85	TOTAL COST OF MAINTENANCE AND INSPECTION	$ NA	

PC_09 Post-Closure Care Surface Emission			
	SURFACE EMISSION MONITORING		
86	Area of landfill requiring surface emission monitoring	NA	acres
87	Labor and equipment cost per work hour	$ NA	per work
88	Work rate required to monitor one acre	NA	work hrs per
89	Number of hours required to monitor entire area	NA	work hrs per
90	Cost of monitoring per event	$ NA	per event
	MONITORING EVENTS		
91	Number of monitoring events per year	NA	events per year
92	Number of years during the PC care period	NA	years
93	TOTAL COST OF SURFACE EMISSION MONITORING	$ NA	

PC_10 Gas Extraction and Perimeter Probe Monitoring			
	GAS EXTRACTION AND PERIMETER PROBE MONITORING		
94	Number of monitoring points	NA	points
95	Labor and equipment cost per work hour	$ NA	per work
96	Work rate required to monitor one point	NA	work hrs per
97	Number of hours required to monitor all points	NA	work hrs per
98	Cost of monitoring per event	$ NA	per event
99	Number of monitoring events per year	NA	events per year
100	Number of years during the PC care period	NA	years
101	TOTAL COST OF GAS EXT. AND PERIMETER PROBE MON.	$ NA	

PC_11 Certification of Completion of Post-Closure			
102	Number of units requiring cert. of completion of PC care	1	units
103	Cost of certification of completion of PC care per unit	$ 4246	per unit
104	TOTAL COST OF CERTIFICATION OF PC CARE	$ 4246	

UD-01 User Defined Activity - Corrective Action			
	SOIL VAPOR EXTRACTION		
105	Annual utility costs (e.g. electricity, natural gas, water)	$ NA	
106	Annual cost of scrubber chemicals	$ NA	
107	Annual testing and monitoring costs	$ NA	
108	Annual labor costs	$ NA	
109	Annual reporting costs	$ NA	
110	Number of years during the PC care period	NA	years
111	Annual cost of soil vapor extraction O&M	$ NA	
112	Decomissioning costs	$ NA	
113	TOTAL COST OF SOIL VAPOR EXTRACTION	$ NA	
	AIR SPARGE		
114	Annual utility costs (e.g. electricity, natural gas, water)	$ NA	
115	Annual contaminant monitoring costs	$ NA	
116	Annual performance monitoring costs	$ NA	
117	Annual off-gas treatment costs	$ NA	
118	Annual equipment rental and maintenance costs	$ NA	
119	Number of years during the PC care period	NA	years
120	Annual cost of air sparge O&M	$ NA	
121	Decomissioning costs	$ NA	
122	TOTAL COST OF AIR SPARGE	$ NA	
	PUMP AND TREAT		
123	Annual utility costs (e.g.electricity, natural gas, water)	$ 14700	
124	Annual contaminant monitoring costs	$ 2170	
125	Annual performance monitoring costs	$ 1000	
126	Annual equipment rental and maintenance costs	$ 5000	
127	Number of years during the PC care period	30	years
128	Annual cost of pump and treat	$ 22870	
129	Decomissioning costs	$ 10000	
130	TOTAL COST OF PUMP AND TREAT	$ 696100	
	MONITORED NATURAL ATTENUATION		
131	Annual MNA parmater monitoring costs	$ NA	
132	Annual performance monitoring and reporting costs	$ NA	
133	Number of years during the PC care period	NA	years
134	Annual cost of monitored natural attenuation	$ NA	
135	Decomissioning costs	$ NA	
136	TOTAL COST OF MONITORED NATURAL ATTENUATION	$ NA	
137	TOTAL COST OF CORRECTIVE ACTION	$ 696100	

UD-02 User Defined Activity - Reporting			
138	Annual cost of semi-annual/quarterly GW monitoring reports	$ 1000	
139	Annual cost of annual GW monitoring reports	$ 2000	
140	Annual reporting costs	$ 3000	
141	Number of years during the PC care period	30	years
142	TOTAL COST OF REPORTING	$ 90000	

UD-03 User Defined Activity - Additional Maintenance Costs			
143	Annual costs for maintenance of monitoring wells	$ 1000	
144	Annual costs for maintenance of site security features	$ NA	
145	Annual costs for maintenance of _____	$ NA	
146	Annual costs for maintenance of _____	$ NA	
147	Annual costs for maintenance of _____	$ NA	
148	Total annual cost of additional maintenance	$ 1000	
149	Number of years during the PC care period	30	years
150	TOTAL COST OF ADDITIONAL MAINTENANCE	$ 30000	

Post-Closure Care Summary			
151	Removal of leachate (PC-02)	$ NA	
152	Site security (PC-03)	$ NA	
153	Maintenance of vegetative cover (PC-04)	$ 2500	
154	Maintenance and inspection (PC-05)	$ 36000	
155	Groundwater monitoring (PC-06)	$ 180000	
156	Deed notation (PC-07)	$ NA	
157	Maintenance and inspection of asphalt cover (PC-08)	$ NA	
158	Surface emission monitoring (PC-09)	$ NA	
159	Gas extraction system and perimeter probe monitoring (PC-10)	$ NA	
160	User defined cost (UD-01) - Corrective Action	$ 696100	
161	User defined cost (UD-02) - Reporting	$ 90000	
162	User defined cost (UD-03) - Additional Maintenance Costs	$ 30000	
163	Subtotal of post-closure costs	$ 1034600	
164	Percentage of engineering expenses	% 0	
165	Engineering expenses	$ 0	
166	Certification of post-closure (PC-11)	$ 4246	
167	Subtotal	$ 1038846	
168	Pecentage of contigency allowance	% 10	
169	Contigency allowance	$ 103884	
170	TOTAL COST OF POST-CLOSURE CARE	$ 1142730	

ATTACHMENT 3-7

FINANCIAL ASSURANCE INFORMATION

AMENDED
TRUST AGREEMENT

This Amendment of the Trust Agreement, the "Agreement", entered into as of May 28, 2014 by and between Exline Leasing, Inc. and Exline, Inc., Kansas corporations, the **Grantor**, and UMB Bank, N.A., the "**Trustee**" Amends theTrust Agreement dated June 14, 2002 by and between Exline Leasing, Inc., as the Grantor, and UMB Bank, n.a. (formerly known as UMB National Bank of America) as the "Trustee".

Whereas, the Kansas Department of Health and Environment "the department", an administrative department of the State of Kansas, has established certain regulations applicable to the Grantor, requiring that the owner or operator of a hazardous waste management facility shall provide assurance that funds will be available when needed for closure and/or post-closure care, corrective action, or any combination of these,

Whereas, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein,

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee is willing to act as trustee;

Now Therefore, the Grantor and the Trustee agree as follows:

Section 1. Definitions. As used in this Agreement:

(a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor;
(b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

Section 2. Identification of Facilities and Cost Estimates: This Agreement pertains to the facilities and cost estimates identified on attached Schedule A (on Schedule A, for each facility list the EPA Identification Number, name, address, and the current closure and/or post-closure and/or corrective action cost estimates, or portions thereof, for which financial assurance is demonstrated by this Agreement)..

Section 3. Establishment of the Fund. The Grantor and the Trustee hereby establish a trust fund, "the Fund", for the benefit of **the department**. The Grantor and the Trustee intend that no third party have access to the Fund except as herein provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by **the department**.

Section 4. Payment for Closure, Post-Closure Care, Corrective Action, or Any Combination of These. The Trustee shall make payments from the Fund as the Secretary of the Kansas Department of Health and Environment (the "Secretary") shall direct, in writing, to provide for the payment of the costs of closure, post-closure care, corrective action, or any combination of these, of the facilities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the Secretary from the Fund for closure, post-closure care, corrective action, or any combination of these, in such amounts as the Secretary shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the Secretary shall specify in writing. The amounts duly reimbursed or refunded shall no longer constitute a part of the Fund as defined herein.

Section 5. Payments Comprising the Fund. Payments made to the Trustee for deposit into the Fund shall consist of cash or securities acceptable to the Trustee.

Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject however, to the provisions of this section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the interest of the department, and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims, except that:

(a) Securities or other obligations of the Grantor, or of any other owner or operator of the facilities, or of any of their affiliates as defined in the Investment Company Act of 1940, 15 U.S.C. 80a-2.(a), as amended, shall not be acquired or held, unless they are securities or other obligations of the federal or a state government;

(b) The Trustee is authorized to invest the Fund in any time or demand deposits of the Trustee, to the extent insured by an agency of the federal or a state government; and

(c) The Trustee is authorized to hold cash awaiting investment or distribution for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 *et. seq.*, as amended, including one which may be created, managed, underwritten, or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of the Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted;

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depositary even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depositary with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve Bank, but the books and records of the Trustee shall at all times show that all such securities are a part of the Fund;

(d) To deposit cash in the Fund in interest bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the federal or a state government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually furnish to the Grantor and to the Secretary a statement confirming the value of the Fund held in trust. The valuation statement shall show the tax cost and current market value of the Fund as of the annual valuation date, and shall include a record of transactions since the preceding annual valuation date. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and to the Secretary shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel to the Grantor, with respect to any question arising as to the construction of this Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of a resignation of the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the Secretary and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instructions by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions, provided that the acts required by such orders, requests, and instructions are not contrary to this Agreement. All orders, requests, and instructions by the Secretary shall be signed by the Secretary, and the Trustee shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or the department has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, or instructions from the Grantor or the department, except a provided for herein.

Section 15. Notice of Nonpayment. The Trustee shall notify the Grantor and the Secretary, by certified mail, within 10 days following the expiration of the 30 day period after the anniversary of the establishment of the

Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

Section 16. Amendment of the Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the Secretary, or by the Trustee and Secretary if the Grantor ceases to exist.

Section 17. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated by the written agreement of the Grantor, the Trustee, and the Secretary, or by the Trustee and the Secretary if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final administrative expenses, shall be delivered to the Grantor.

Section 18. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the department issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the State of Kansas.

Section 20. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement. This agreement shall be the governing instrument and shall govern over all prior agreements.

In Witness Whereof the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written: The parties below certify that the wording of this Agreement is identical to the wording specified in 40 CFR 264.151(a) with the inclusion of corrective action and K.A.R. 28 Article 31.

SIGNED FOR THE GRANTOR

/S/ _____

Date 6/3/2014

Name ROBERT W. EXLINE, JR

Title PRESIDENT/CEO EXLINE, INC.

Seal

SIGNED FOR THE TRUSTEE

/S/ _____

Date 5/30/14

Name Douglas Hare

Title Senior Vice President

Seal

State of: Kansas

County of: Saline

On this May 28, 2014, before me personally came Robert W. Exline, Jr. to me known, who, being by me duly sworn, did depose and say that he resides at Salina, Kansas 67401, that he is the Executive Vice President of Exline Leasing, Inc. and President of Exline, Inc. the corporations described in and which executed the above instrument; that he knows the seal of said corporations; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporations, and that he signed his name thereto by like order.

Signature Attested by the Notary

NOTARY PUBLIC OFFICIAL SEAL
JON A. RAMSEY
MY COMMISSION EXPIRES
6/24/2015

Jon A Ramsey

The Kansas Department of Health and Environment hereby approves the foregoing Amendment of the Trust Agreement.

SIGNED FOR THE DEPARTMENT

/S/ Robert Moser MD

Date 6/13/2014

Name Robert Moser MD

Title Secretary

'CHEDULE A TO THE TRUST AGREEMENT DATED June 14, 2002

SCHEDULE A Amendment Date May 28, 2014

THIS SCHEDULE A, being an attachment to the Trust Agreement made effective on the date first written above, identifies the hazardous waste facilities and cost estimates for closure (C), post-closure care (PC), or corrective action (CA), or any combination of these, for which financial assurance is provided herein.

Facility Name(s) and Address(es)	EPA ID # (s)	C, PC or CA	Cost Estimate(s)
Exline Leasing, Inc. and Exline, Inc. 3256 E. Country Club Rd. Salina, KS 67402-1487	KSD007127327	PC	$1,142,230

SCHEDULE B TO THE TRUST AGREEMENT DATED June 14, 2002

SCHEDULE B Amendment Date May 28, 2014

THIS SCHEDULE B, being an attachment to the Trust Agreement made effective on the date first written above, identifies the property transferred, or to be transferred, to the Fund if this is a funded trust fund; or, identifies the dedicated financial instrument which will be the source of monies deposited into the Fund, if this is a standby trust fund.

Identification of Funds or the Source of Funds	**Amount(s)**
Irrevocable Standby Letter of Credit No. SB2002-229 UMB Bank, N.A. International Trade Services 906 Grand Boulevard Kansas City, MO 64106	$100,000
Funded Trust Fund Account Number 115525.1 UMB Bank, N.A. Corporate Trust Services P.O. Box 419692 Kansas City, MO 64141-7014	$100,000/year

First quarterly payment of $25,000 received April 30, 2014. Subsequent quarterly payments to be made on or before each March 31, June 30, September 30, and December 31.

EXHIBIT A TO THE TRUST AGREEMENT DATED June 14, 2002

EXHIBIT A Amendment Date May 28, 2014

THIS EXHIBIT A, being an attachment to the Trust Agreement made effective on the date first written above, identifies the officers of the Grantor who are authorized to provide written instructions to the Trustee.

Name(s)	**Title(s)**
Robert W. Exline, Jr	Owner – President of Exline, Inc. Executive Vice President of Exline Leasing, Inc.
Jon A. Ramsey	Executive Vice President and Chief Financial Officer of Exline, Inc.

SECTION 4 – GROUNDWATER MONITORING PLAN

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS
SECTION 4 – GROUNDWATER MONITORING PLAN
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4. GROUNDWATER MONITORING PLAN

4.1. Introduction. This section provides information with respect to the groundwater monitoring activities, which are ongoing at the Exline, Inc. facility, and documents procedures and schedules by which monitoring at the site will be conducted.

A history of these activities, beginning with initial site investigation in 1982, is presented below. Reports prepared beginning in 1982 by Thomas M. Christy, P.E. and by O.S. Fent, Geologist, are re-stated here in sections addressing site hydrology and geology (1) (2) (5) (6).

4.2. History of Investigation. Chromium contamination in the aquifer underlying the site was discovered in May 1982 during the installation of monitor wells at the site in accordance with RCRA regulations. Details of this initial investigation were documented and submitted to the KDHE by Wilson Laboratories, Salina, Kansas. Wilson Laboratories submitted results of further investigation to the KDHE in September, 1982 (2).

A compilation of groundwater monitoring data obtained for the site through May 1983 was submitted to the KDHE by Wilson Laboratories in June 1983 (3). In response to questions by the KDHE following the Department's "Comprehensive Monitoring Evaluation", Exline Inc. submitted additional information in March, 1987, including information with respect to geology, well completion, topography, and contaminant flow.

In accordance with a Consent Order signed by Exline, Inc. in September 1987, Exline, Inc. commissioned additional study at the site. The results of this study were submitted to the KDHE in December 1987 (Hydrologic Investigation, Exline, Inc., Janis C. Butler, J.C. Butler Associates, Inc., Salina, Kansas and O.S. Fent, Hydraulic Drilling Company, Salina, Kansas, December, 1987). Parts of that submittal concerning contaminant distribution are included in this application.

A chronological history of the groundwater monitoring program at the Exline facility is presented below.

A-series Wells. Records for this series of four wells (A-1, A-2, A-3, and A-4), have not been located. Based on conversations with T.M. Christy (former project consultant), it appears that wells A-1, A-2, and A-3 were drilled as industrial water supply wells in the 1960s, at locations where water would be needed for process operations. A-4, located at the northwest corner of the old shop, was installed in the 1970s for the purpose of watering the office area lawn. Sampling of the four "A-series" wells in the early 1980s indicated chromium contamination in A-2, located in the machine shop. Due to the presence of chromium in that well and its proximity to the edge of the chromium plume, well A-2 was included in the groundwater monitoring program at the site.

B-series Wells. In 1980, the Exline, Inc. chromium wastewater impoundment was retrofitted with a synthetic liner, as part of a RCRA requirement. Shortly afterward, in 1982, the RCRA requirement of monitoring wells located around this impoundment was addressed. The B-series wells were installed as follows:

1. Two generally upgradient (of the impoundment) monitor wells (B-4 and B-5). Note that the exact groundwater flow direction was apparently not known at this time, since B-4 was located southwest of the impoundment, and B-5 was located southeast of the impoundment. Mr. Christy (project consultant at the time that the B-series wells were installed) has stated that, at that time, the

groundwater flow was assumed to be generally northeast toward the Smoky Hill River, which has since been confirmed. B-4 and B-5 were both completed on May 3, 1982.

2. One "far" downgradient monitor well (B-6), which was completed May 3, 1982. Note that this well was installed with larger casing, due to its location in the assumed directly downgradient direction (northeast) of the surface impoundment. At the time, the possibility that the chromium plume might have already migrated to the area around B-6 was considered, in which case, B-6 might become a groundwater recovery well.

3. Seven monitor wells were located around the impoundment (B-1, B-3, B-8, B-9, B-10, B-11 and B-12). These wells were drilled to determine the extent and degree of contamination from the impoundment, which at that time, was believed to be only in the small area where these B-series wells are located.

B-1 and B-3 were drilled at the end of April, 1982. These wells have since been plugged, presumably since they were so close to subsequently-drilled wells B-7 and B-12. B-1 and B-3 (deep and shallow, respectively) were located adjacent to B-7, and useful as aquifer testing observation wells. B-2 (shallow) was replaced by B-12 (deeper). The term "shallow" here indicates that these wells were screened or open-hole above the aquifer gravel layer; "deeper" indicates the well screen lies above bedrock in the gravel layer. A boring designated B-2 was also drilled at the same time as these wells, but was plugged after difficulty in maintaining an open-hole at 25', due to coarse fill.

4. One groundwater recovery well was installed adjacent to the surface impoundment dike (B-7) in June 1982. It was presumed at the time that this location would be optimum for recovery of contaminated groundwater from the impoundment.

5. B-8 was drilled in June 1982 directly downgradient of recovery well B-7, for the purpose of monitoring contaminated groundwater recovery progress and the extent of the B-7 groundwater flow capture zone.

6. B-9 through B-12 were located and installed after examining the sampling results of the initial B-series wells (1 through 8). Since the wells located near the impoundment (B-1 through B-3, B-7 and B-8) were contaminated, placement of subsequent B wells further away from the impoundment would presumably better define the extent of chromium contaminated groundwater. B-9 through B-12 wells were installed at the end of June, 1983.

C-Series Wells. The November, 1985 Exline, Inc. CME Report identified deficiencies in the groundwater monitoring system at the site. Most of the stated deficiencies were answered by Exline, Inc. responses in 1986 and 1987. However in the CME Report, KDHE indicated that "the extent and degree of chromium contamination in the aquifer, and the rate of contaminant movement, must (yet) be determined". KDHE issued a Consent Order in September, 1987 (Case 87-E-59), requiring the extent and rate of movement of the chromium contamination be addressed. J.C. Butler prepared a "Hydrologic Investigation Work Plan" in October, 1987, which addressed the stated deficiencies, and "a plan for withdrawal of contaminated groundwater for detoxification treatment under Exline's NPDES discharge permit". The work plan specified the installation of five additional C-series test wells near the Scoular metal grain storage buildings.

The J.C. Butler December, 1987 "Hydrologic Investigation Report" indicated that 2" monitor wells, C-1, C-2, C-3, C-4 and C-5, were installed November 16 to 18 (1987), approximately at the five

locations indicated in the Work Plan. Three additional test wells (C-6, C-7, and C-8) were apparently proposed and then drilled during the Hydrologic Investigation, immediately after the original five wells. C-6 and C-7 were installed on November 23, 1987, just north of the presumed northwesterly edge of the chromium plume, to monitor that side. C-8 was installed (November 24, 1987) at a location believed (at that time) to be south of the southeasterly edge of the chromium plume.

C-9 was installed (December 8, 1987) after the initial sampling results of the C-series test wells were evaluated. Vertical profile sampling had indicated that C-4 was in a chromium "hotspot", with the highest chromium concentration of the five C wells, 17 mg/L. J.C. Butler decided this would be an optimum location for a recovery well. C-9 was therefore installed to address the "withdrawal of contaminated groundwater" part of the Hydrologic Investigation work plan, i.e., C-9 was intended to supplement B-7 for chromium recovery. During this same time period, due to its location directly downgradient of B-7, and close to C-9, SC-2 (already pumping intermittently as a Scoular elevator de-watering well) was also designated to be included in the chromium contaminated groundwater recovery and treatment system.

D-series Monitor Wells. As indicated above, the C-series wells (not C-9) were intended as "test holes" for determination of chromium extent, degree and movement in the aquifer. The C monitor wells were completed properly for "temporary monitoring" purposes in that era (i.e., native backfill, overlying grout at the surface, machined screen slots, and native sand pack). At that time (1987), KDHE did not intend to allow the use of the C wells for chromium analysis in the future, only piezometric measurements.

Following an October, 1988 meeting between Exline and KDHE, three permanent wells (the D-series) would partly replace some of the C series wells. These "permanent" monitor wells were to be completed with graded sand pack across the screen and bentonite grout from 4' above the screen to surface, and would then be used for plume perimeter monitoring through chromium analysis. D-2 was to replace C-2, since a permanent well would be needed to monitor possible chromium migration to the northeast of the chromium impoundment. D-1 was to be located southeast of the chromium impoundment, for perimeter monitoring in that area, and as a replacement for nearby C-3. D-3 was to replace C-7 and SC-3, as a downgradient perimeter monitoring point. As T.M. Christy indicated to SEI in previous communication, this replacement process explains why no D well boring logs are available - they were never prepared. The boring logs for the replaced C wells (2, 3 and 7) served as boring logs for those D wells, to indicate appropriate screen/grout intervals. The D-series wells were completed in February, 1989.

E-series Wells. The E-series monitor wells were drilled shortly after the D-series wells. E-1 was drilled in May, 1989, and abandoned sometime after completion, for reasons unknown. E-2 was drilled also in May, 1989 (approximately 55' north of E-1), and has since served the purpose of monitoring in this area. E-2 was located downgradient of supplemental recovery well, E-3, presumably to monitor progress of contaminated groundwater recovery and the extent of the E-3 groundwater flow capture zone. E-3 was drilled in June, 1989. As indicated in Attachment 4-1 of this application, the E-3 recovery well was installed due to the fact that B-7 was located too far southeast to recover all chromium in the B-9 / B-10 area (around the chrome shop), thus resulting in the need for an additional recovery well, E-3. Attachment 4-1 of this application also proposed the closed impoundment flushing system, with pumping well F-1 (discussed below).

F-series Well. Well F-1 was drilled in July, 1989 as the water supply well for the closed impoundment irrigation system.

G-series Monitor Wells. In 1991 and 1992, KDHE requested a replacement for compliance monitoring well A-2, since A-2 was contaminated, whereas a compliance well should be non-detect for chromium. This replacement well, G-1, was drilled near A-2 in May, 1992, further from the chromium plume.

In 1998-1999, KDHE required replacing monitor wells B-9 and B-10, which had saw-cut screens that had apparently broken, allowing sand and gravel to enter the casing. Since B-9 is so close to B-10, Exline, Inc. installed one replacement well for the two, G-2, drilled in August, 1999. Also at that time, Exline, Inc. plugged unused monitor well B-1, along with B-9 and B-10.

H-series Monitor Wells. This is the group of monitor wells proposed (in a November 16, 2001 letter to the KDHE) for 2002 installation at the site. These wells were installed in an effort to better conduct corrective action monitoring at the site. Two of these wells (H-3 and H-6) were installed in August, 2002. The remaining four wells (H-1, H-2, H-4, and H-5) were installed on October 27 and 28, 2003.

4.3. Site Hydrogeology.

4.3.1. General. Data in this section are included to discuss hydrogeology beneath the subject site. Site well boring logs (Attachment 4-2) were used to assist preparation of this section.

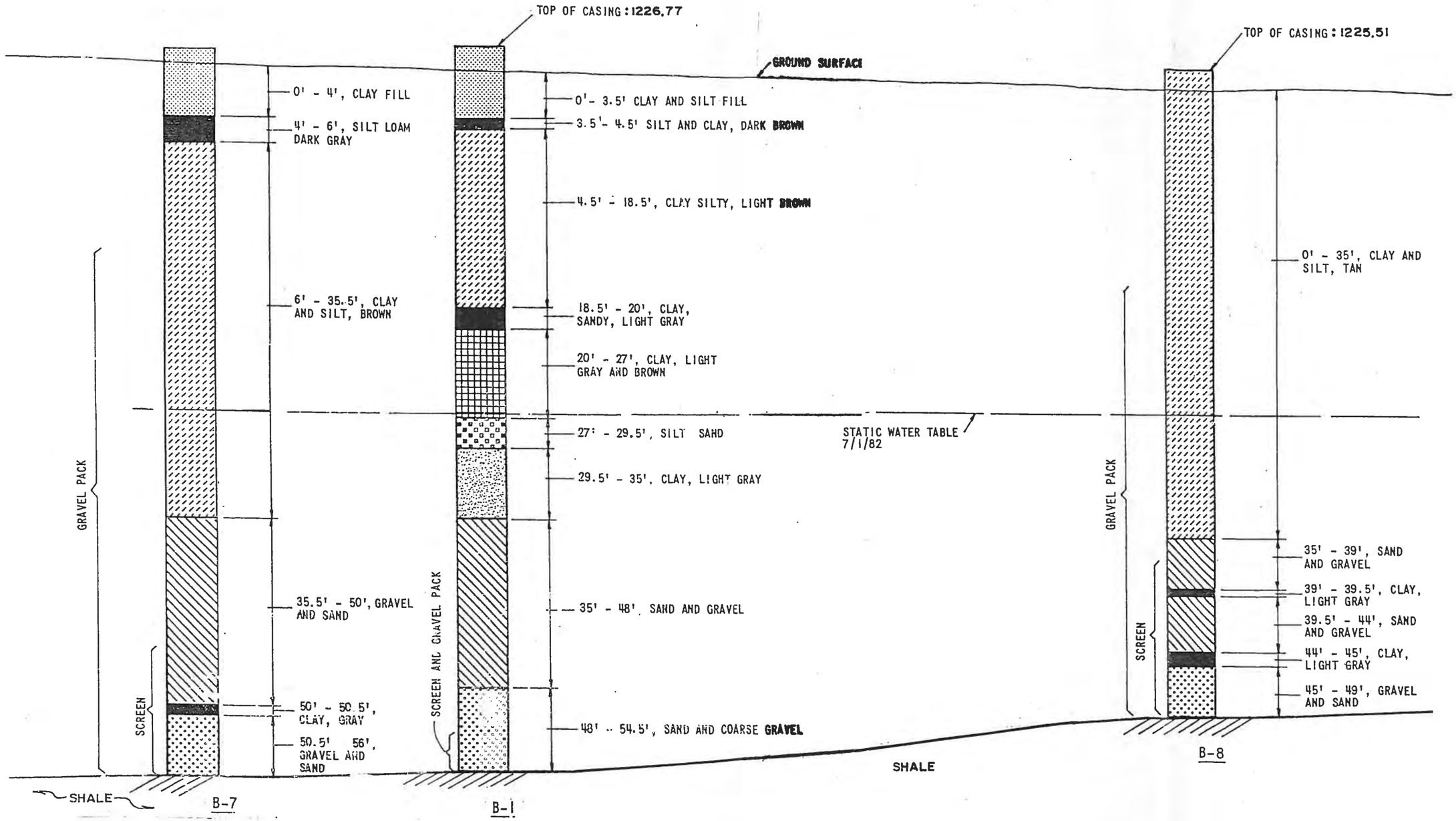
The study area profile consists of unconsolidated Pleistocene terrace and minor alluvial deposits underlain by shale of the Wellington Formation, which is Permian in age. The Pleistocene sediments, which vary from clays and silts near the surface to sands and gravels immediately above the shale, range in thickness from 44 to 57 feet over the extent of the site. The Wellington Shale acts as an aquitard serving as the lower boundary in depth for tracing the migration of contamination from the facility (Hydrologic Investigation, Exline, Inc., Salina, Kansas, Janis C. Butler, J.C. Butler and Associates, Inc., Salina, Kansas, and O.S. Fent, Hydraulic Drilling Company, Salina, Kansas).

Groundwater is encountered at depths varying from less than 10 to more than 30 feet beneath ground surface at the site, depending on surface elevation and seasonal precipitation. Ground water flow occurs through the unconsolidated Pleistocene deposits, moving generally from southwest to northeast, though locally influenced by withdrawal wells of the Exline, Inc. groundwater treatment system and nearby residential water supply wells.

A cross-section showing typical lithology encountered at the site is shown on Plate 4-1. Exline, Inc. has installed a total of 33 monitoring and pumping wells at the site, not including the four Scoular Elevator wells, sampled and/or pumped by Exline, Inc. The purpose in placing these wells has been to collect geologic information or to provide pumping or monitoring points. The location of wells at the site is shown on Plate 4-2. Plates 4-3 through 4-5 show the locations of borings and geologic cross sections through the Exline, Inc. site.

4.3.2. Regional Geologic Information. The regional geology sections that follow address the area around the Exline, Inc. site. This information is based on two publications:

1) "Groundwater Conditions in the Smoky Fill Valley in Saline, Dickinson and Geary Counties, Kansas", Latta, B.F., KGS Bulletin 84 (1949).



NOTE:

1. WELLS B-7 AND B-8 COMPLETED ON JUNE 30, 1982, B-1 COMPLETED ON 29 APRIL 1982.

INFORMATION SOURCE:
EXLINE, INC. SALINA, KS., POLLUTION CONTROL PLAN, WILSON LABORATORIES, SEPT. 1982

KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

GEOLOGIC PROFILE

SCALE	APPROVED BY	DRAWN BY
DATE 3-22-89	TMC	TMC

DRAWING NUMBER
PLATE 4-1

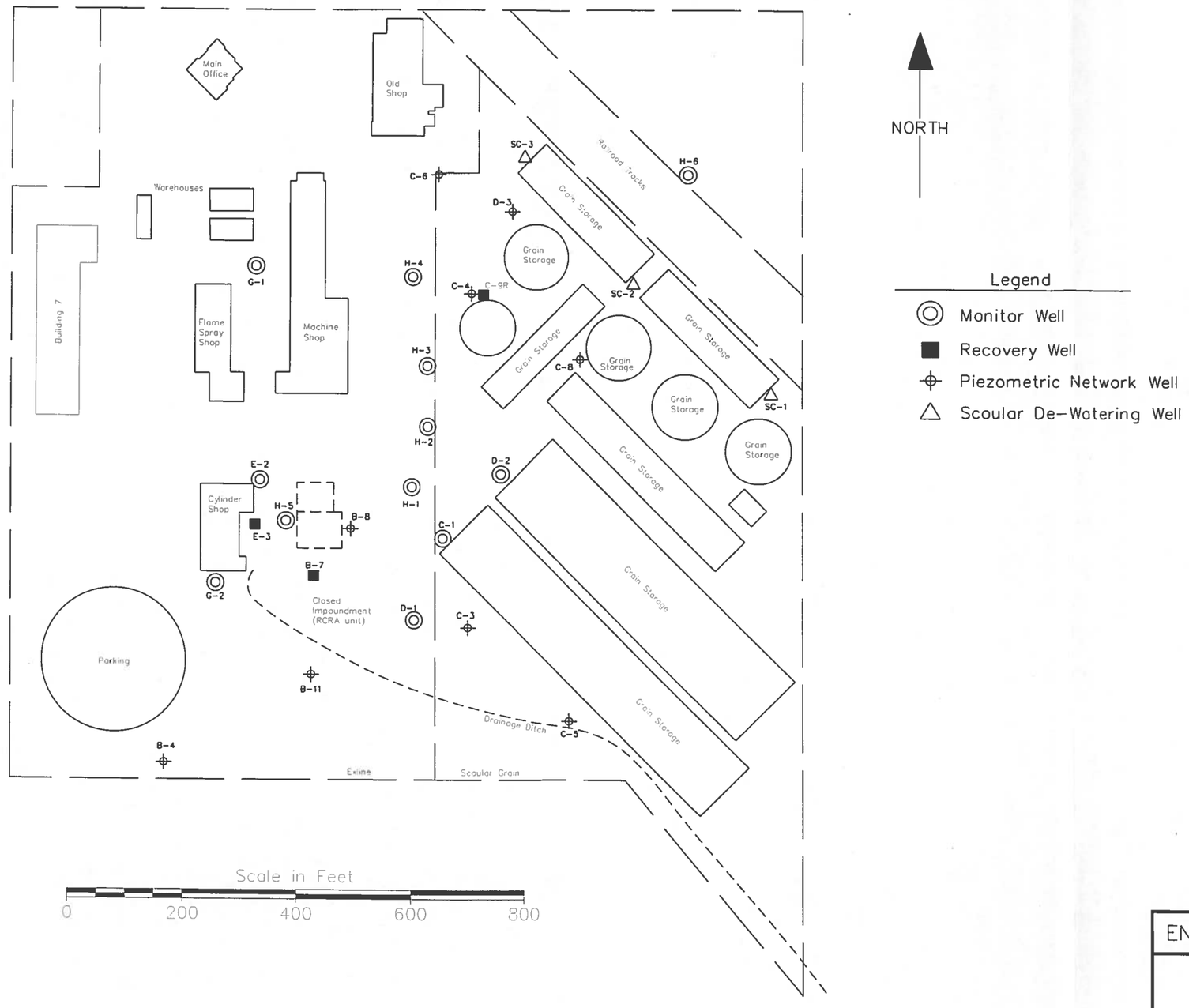
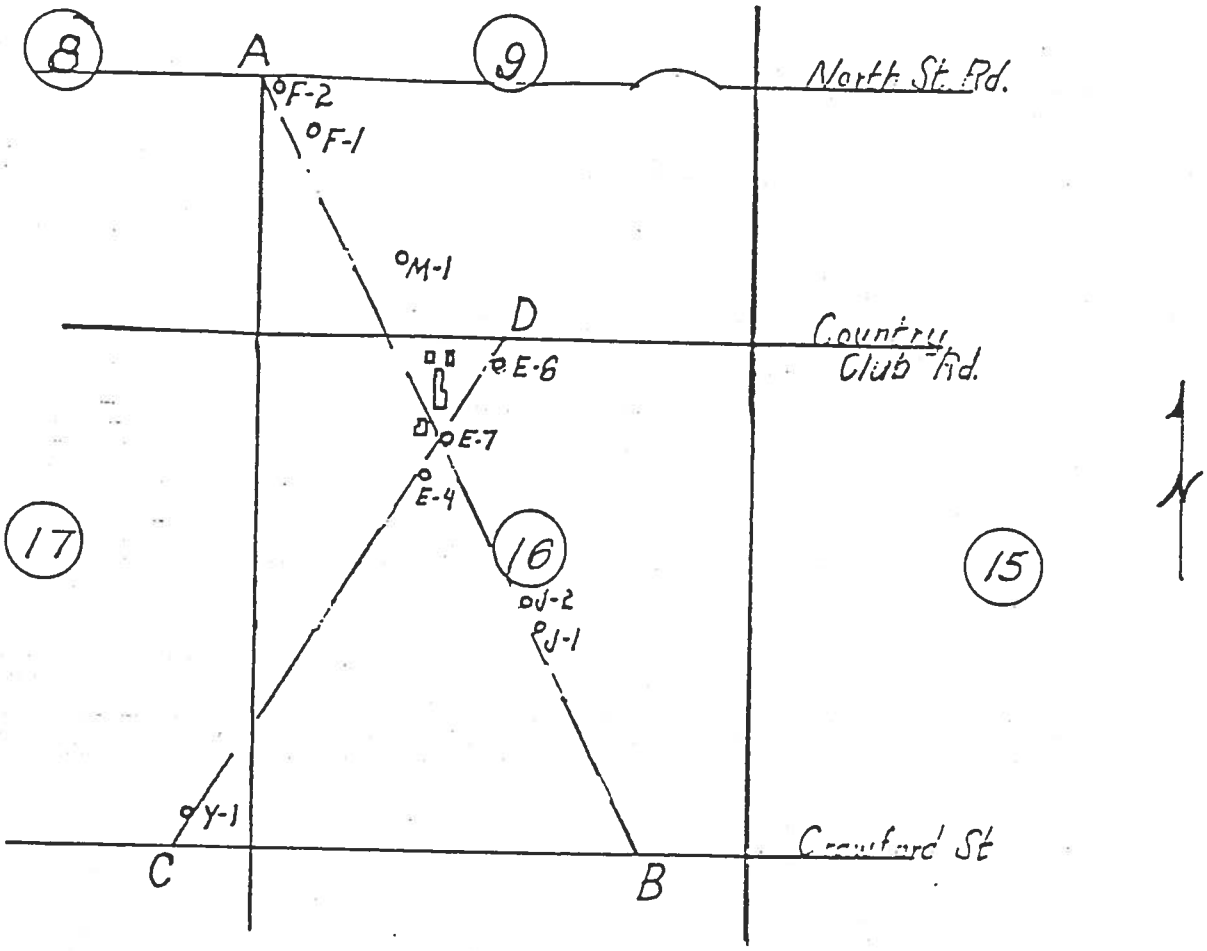


Plate 4-2:
Well Location Map

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
File Number: 13-010G	Date: Jan., 2013	Drawn By: Jack Eslick



Sketch of Sec. 16 and adjacent area showing lines of cross sections through Exline site, T.14.S., R.2 W., Saline County, Kansas

Source: Letter of 7 March 1986 to John W. Mitchell of the KDHE, by Jerry K. Exline, Exline, Inc., Salina, Kansas, Information by O.S. Fent and J.C. Butler Associates, Inc. attached.

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Salina, KS 67401
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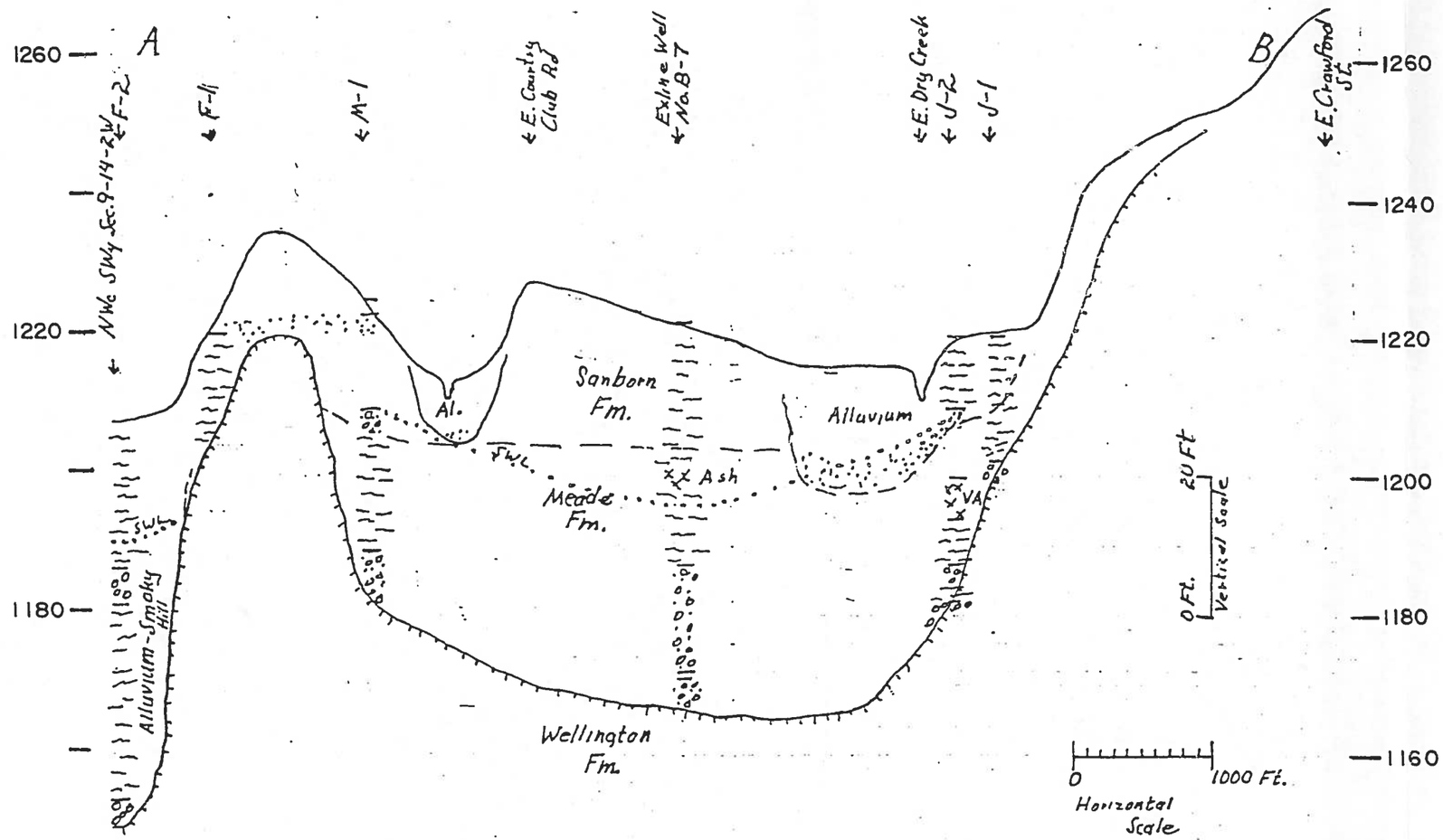
EXLINE INC.
CROSS SECTIONS
RUNNING THROUGH
EXLINE SITE.

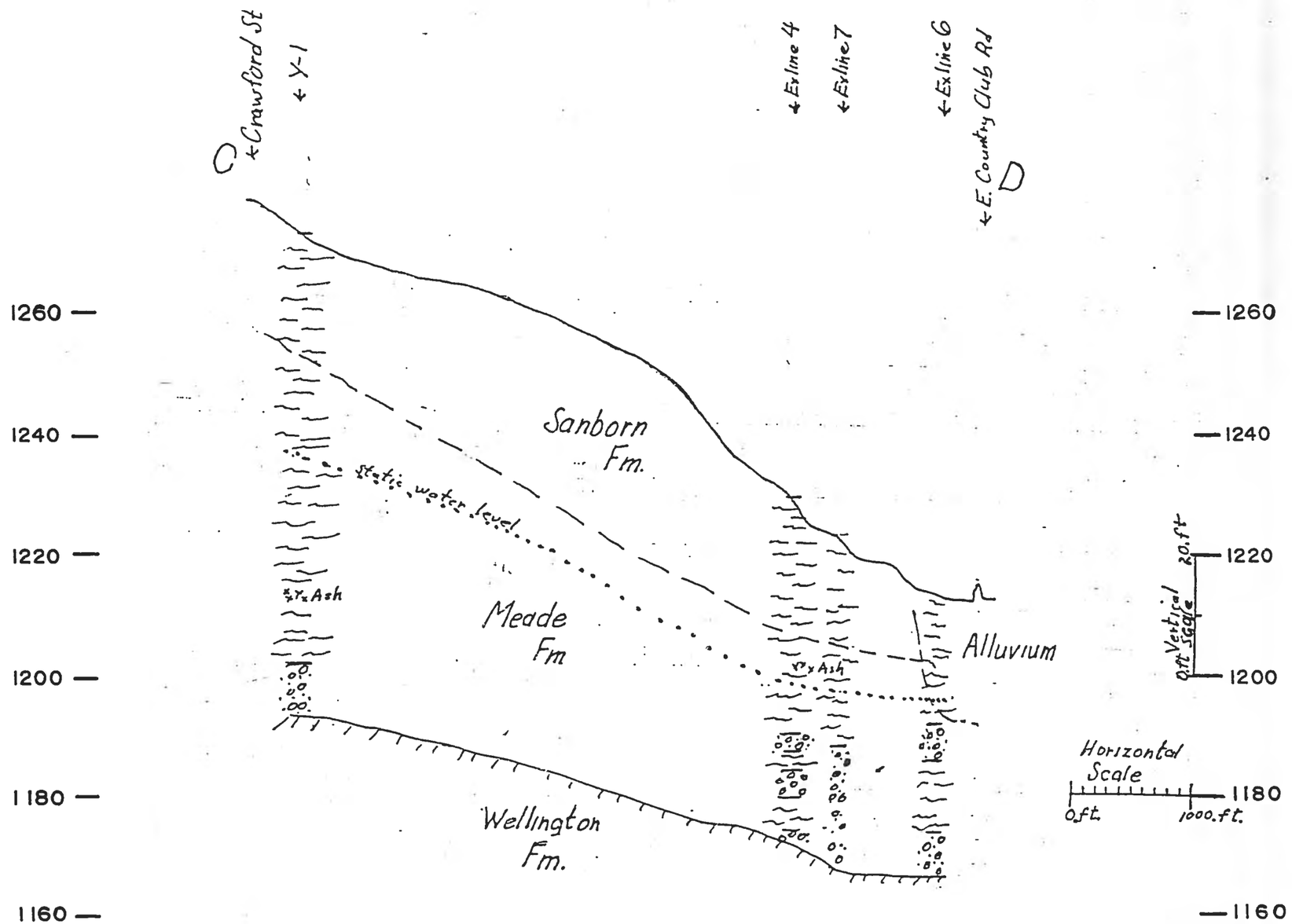
DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE
O.S. FENT	PLATE 4-3	TMC	3-20-89	DWG	3-20-89



NW-SE Geologic Cross Section A-B

Source: Letter of 7 March 1986 to John W. Mitchell of the KDHE, by Jerry K. Exline, Exline, Inc., Salina, Kansas, Information by O.S. Fent and J.C. Butler Associates, Inc. attached.

KEJR ENGINEERING, INC. 607 Barney St. Salina, KS 67401 (913) 825-1851	NW-SE GEOLOGIC CROSS SECTION A-B		
	SCALE 1000' = 1"	APPROVED BY	DRAWN BY
	DATE 3-20-89		O.S. FENT
			DRAWING NUMBER
			PLATE 4-4



SW-NE Geologic Cross Section C-D

Source: Letter of 7 March 1986 to John W. Mitchell of the KDHE, by Jerry K. Exline, Exline, Inc., Salina, Kansas, Information by O.S. Fent and J.C. Butler Associates, Inc. attached.

KEJR ENGINEERING, INC. 607 Barney St. Salina, KS 67401 (913) 825-1851	SW-NE GEO. CROSS SECTION		
	SCALE 1000' = 1"	APPROVED BY TMC	DRAWN BY O.S. FENT
	DATE 3-20-89		
			DRAWING NUMBER PLATE 4-5

2) "Saline Ground-water Discharge to the Smoky Hill River between Salina and Abilene, Central Kansas", Gillespie, et. al., USGS Water Resources Investigation 81-43 (1982).

4.3.2.1. Regional Geology of the Unconsolidated Deposits. The slopes of the upland ridges in the area around the Exline site (i.e., not the highest part of hills which are underlain by Cretaceous and Permian bedrock) are underlain by thin terrace gravel deposits at least as old as Nebraskan. The terrace ridges adjoin the Kansan age alluvial channel underlying the Exline site and the nearby (one-half mile wide) East Dry Creek alluvial valley east of the Exline site. Geologic dating of the channels is possible because of the zone of Pearlette ash found above the Kansan channel in the area. The upland terrace gravel has been channeled by this erosion cycle and necessarily pre-dates it. It is partly consolidated by secondary calcite and is probably at least as old as Nebraskan.

The upland and alluvial terrace deposits in this part of Saline County flank the several mile wide - Smoky Hill River alluvial valley, consisting of recent age alluvium which has removed the Pleistocene terrace deposits down to bedrock at depths ranging to 100'.

The Meade Formation consists of non-glacial terrace and alluvial deposits of Pleistocene age. This formation includes the Grand Island and Sappa members, present in some areas. The Sanborn Formation in places includes a basal sand, overlain by more common eolian loess and colluvium. This formation is Pleistocene age, younger than the Meade Formation.

4.3.2.2. Regional Geology of Wellington Shale Bedrock. The Wellington Shale of Permian age underlies all of this part of Saline County, and is generally a consistent aquitard below alluvial and terrace deposits in the region. The Wellington is primarily a fissile to clayey shale, with thin zones of gypsum and (rarer) dolomite or limestone. The Hutchinson Salt member, primarily composed of halite, is located in the middle portion of the Wellington where present, although in this part of Saline County, the Hutchinson Salt has been removed through dissolution and erosion, leaving the lower Wellington Shale, only.

In central Saline County, the uppermost part of the Wellington Formation is fissile shale, overlain by a few feet of weathered clay to clayey shale. In the eastern part of Saline County, where only the lowermost part of the Wellington Formation is present, and near the surface, more zones of gypsum and dolomitic limestone are encountered. In areas favorable for gypsum dissolution, where rainfall catchment and storage zones are found over gypsum-bearing shale, and adjacent to topographic lows permitting circulation, successful domestic and stock wells have been developed. The upland ridge located one-half mile east of the Exline facility has these geomorphic conditions. Here, several wells have encountered solution channels in the gypsum at depths of over 80 feet that will yield over 10 gallons per minute of useable water quality to wells (6).

The Wellington Formation forms an effective aquitard for the overlying unconsolidated Pleistocene deposits in the Exline site area, because of the nearly pure shale lithology. The Wellington becomes an aquifer in Saline County only where the shale contains soluble zones of gypsum or dolomitic limestone that have been exposed to groundwater flow through most of the Pleistocene (Gillespie, et. al., 1982). A number of test wells have been drilled in the Wellington Formation in the upland area just west of the Exline facility (6). None of these wells encountered useable quantities of water below the unconsolidated terrace deposits (in the shale). The nearest known test boring to encounter measurable permeability in the upper part of the Wellington Formation was located about 1/2 mile northwest of the Exline site. In this test boring, drilled for a real estate developer in the SW 1/4 of

Sec. 9-T14S-R2W, a concentrated brine, under artesian pressure, was found at approximately 100' below ground surface.

A map showing contours on the surface of the Wellington Shale is shown on Plate 4-6.

The Wellington Formation south and west of the Exline site is capped by plastic shale of the Kiowa Formation, inhibiting circulation of precipitation through any potentially permeable zones in the Wellington. The west-facing pit wall at the old brick quarry pit at Indian Rock Park in Salina illustrates this relationship. The location of this quarry can be seen on the 7-1/2" USGS quadrangle map for Salina, Kansas (shown on Plate 4-7). The old brick quarry is now a pond, shown near the center of the NW ¼, Section 18-T14S-R2W. The clayey shale of the Wellington can be seen in this cut face and in the river bypass channel just east of Indian Rock Park. Blocks of hard calcareous sandstone, erosional remnants of a higher channel in the Kiowa Formation underlying Marymount hill, are visible at the surface. A test boring penetrating about 300 feet of the Wellington Formation was drilled jointly by the Kansas and U.S. Geological Surveys at the north edge of Indian Rock Park, which is located in the NE ¼ NW ¼, Section 18-T14S-R2W. No zones of measurable permeability were encountered in that test boring.

4.3.3. Site-Specific Geologic Information.

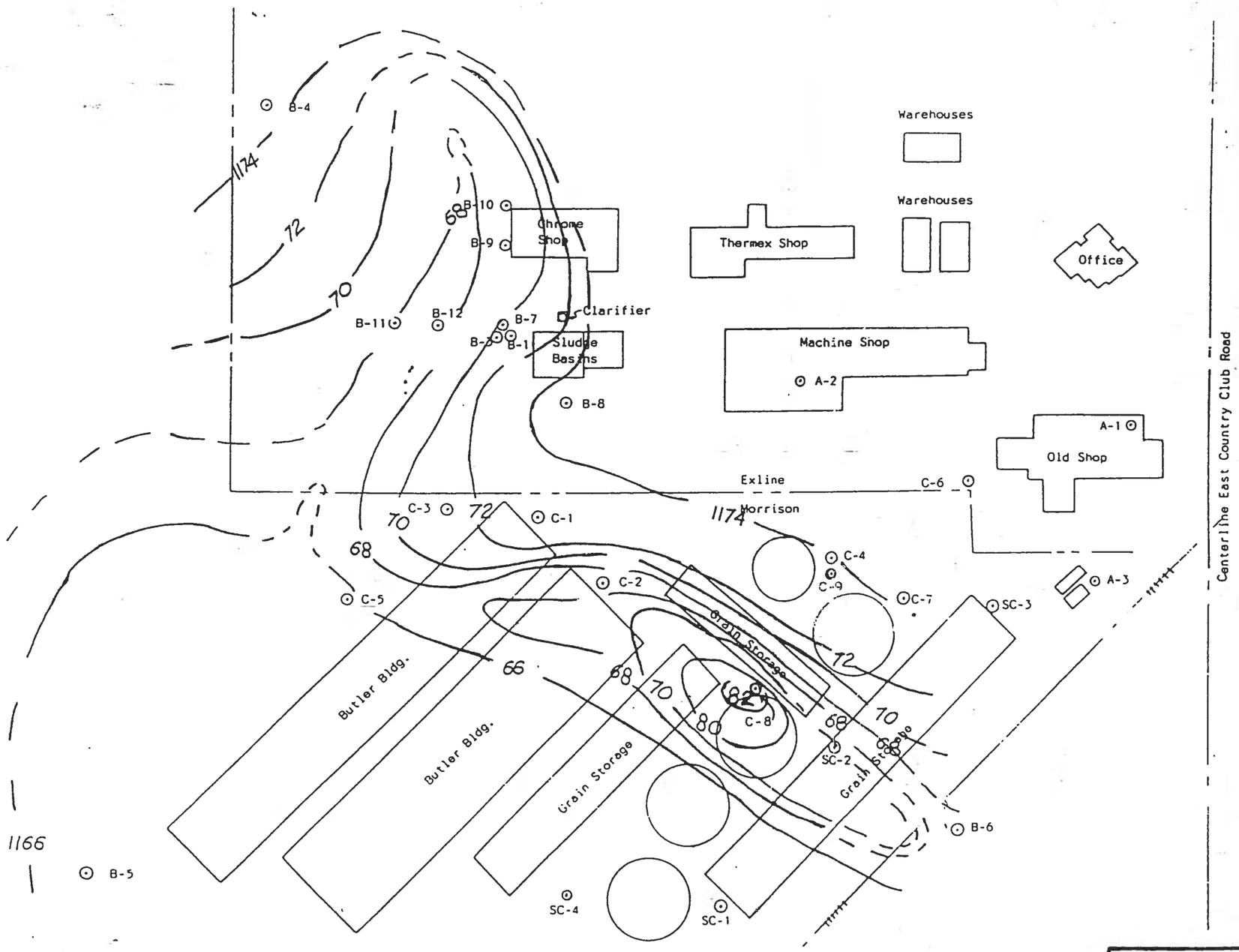
4.3.3.1. Geology of Unconsolidated Deposits. At the Exline site, the Pleistocene sediments, which vary from clays and silts near the surface to sands and gravels immediately above the shale, range in thickness from 37 to 57 feet.

There is only one aquifer underlying the subject site as evidenced from the extensive drilling effort undertaken at the site. Logs for each site monitoring and pumping well installed as part of the Exline, Inc. investigation, where available, are included as Attachment 4-2 of this Section. The unconsolidated sediments, which are Pleistocene in age, consist of clay and silty clay layers overlying a sand and gravel layer. This formation includes the Grand Island and Sappa members, present in some areas. Significant groundwater flow occurs only in the sand and gravel (the aquifer) at the site (i.e., compared with the insignificant flow that occurs in the clay and silty clay that is present in the saturated zone). It is in this zone (i.e., sand and gravel) that all but one of the monitor wells and all of the pumping wells at the site are screened. The exception is well B-3, which was plugged in November 1993.

Groundwater is encountered at depths varying from less than 10 to more than 30 feet beneath the ground surface at the site, depending on surface elevation and seasonal precipitation. Groundwater flow is generally from southwest to northeast.

A cross-section showing typical lithology encountered at the site is shown on Plate 4-1. The location of the wells at the site is shown on Plate 4-2. Plates 4-3 through 4-5 show the locations of borings and geologic cross sections through the Exline, Inc. site.

A cross-section of the site from southwest to northeast is shown on Plate 4-8. This cross section shows the position of the March, 1989 water table within the unconsolidated deposits overlying the Wellington Shale. This cross section depicts in order (left to right): ground water flowing into the area from the upgradient position (B-4), withdrawal occurring in the former impoundment area (B-7), recharge occurring from the filtration basin, withdrawal at SC-2, and downgradient monitoring at B-6.



SOURCE: Hydrologic Investigation, Exline, Inc., East Country Club Road, Salina, Kansas, 67402, Janis C. Butler, J.C. Butler Associates, Inc., Salina, Kansas and O.S. Fent, Hudraulic Drilling Company, Salina, Kansas, December 1987.

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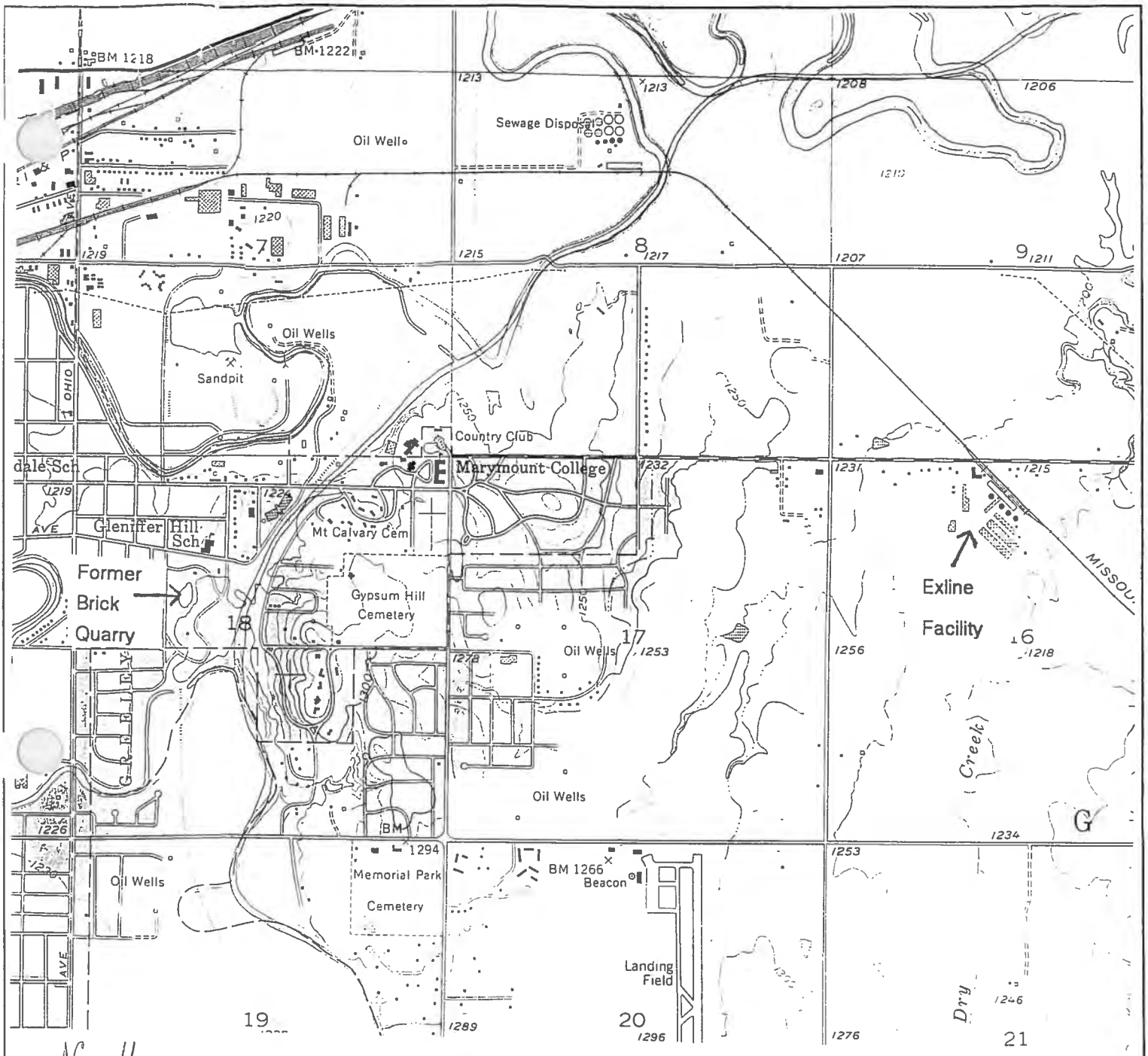
EXLINE, INC. BEDROCK CONTOURS

SCALE 1" = 150'	APPROVED BY TMC	DRAWN BY O.S. FENT
DATE 3-15-89		
		DRAWING NUMBER PLATE 4-6



Title: PLATE 4-7 : Location of Former Brick Quarry Pit

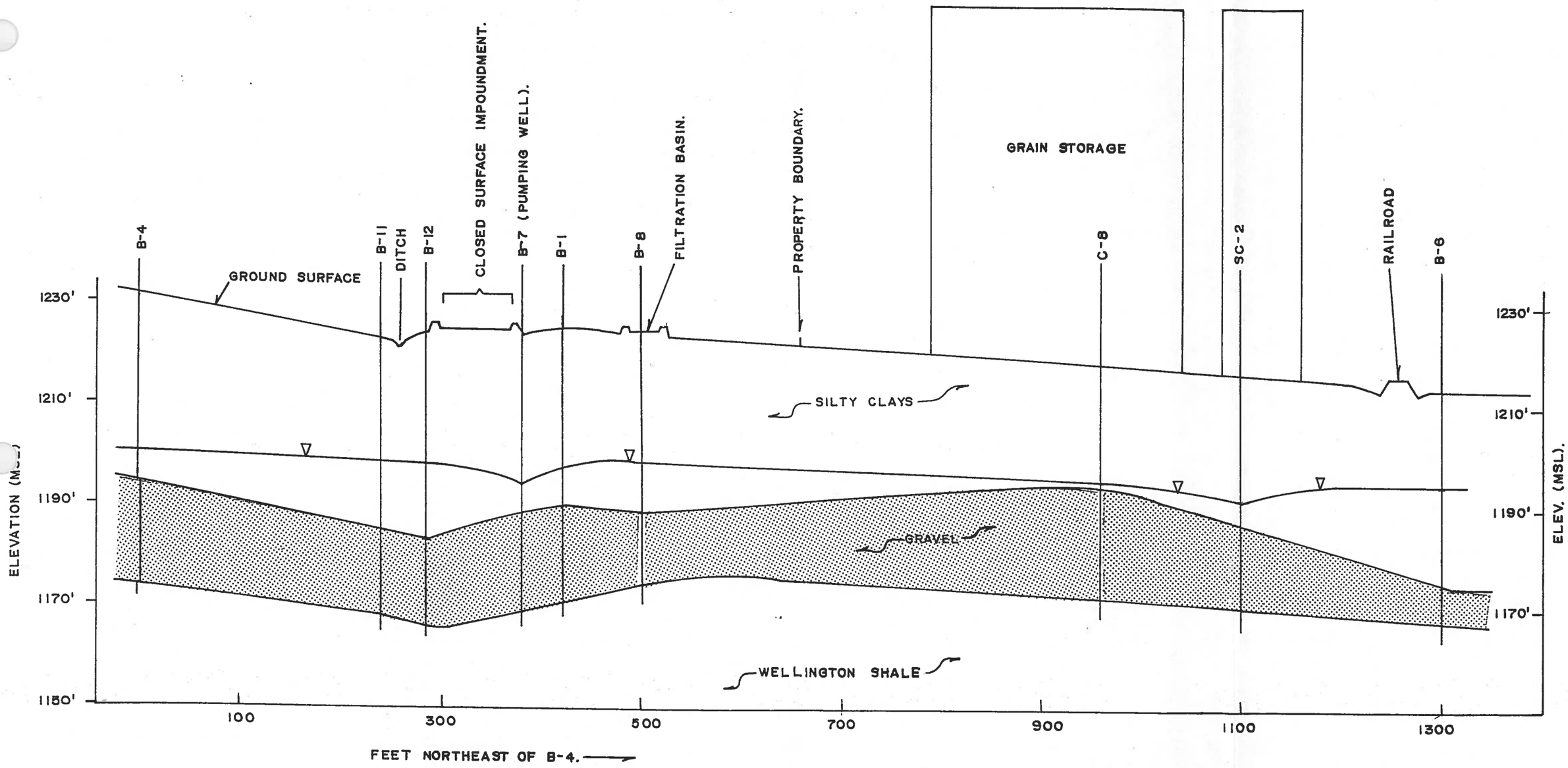
Shepard Engineering, Inc.

Scale: 1" = 2000'

File No.: 00-010G

Date: Dec., 2001

Drawn: JLP



KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

GEOLOGIC CROSS SECTION
B-4 THROUGH B-6.

SCALE	APPROVED BY	DRAWN BY
DATE 3-15-89	TMC	TMC

DRAWING NUMBER
PLATE 4-8

Although flow primarily occurs in the sand and gravel deposits (overlying the shale), saturation also occurs in the fine-grained clay and silt layers. These fine-grained deposits serve as a leaky aquitard overlying the sand and gravel aquifer, except in a few site wells, where the piezometric surface is below the base of the fine-grained deposits. In addition, the fine-grained members locally experience increased permeability. Tom Christy observed fluid losses of up to 75 gpm at less than 20 feet from ground surface while drilling borings B-1, B-2, B-3, and B-4. This phenomena is related to local fracturing of the silty clay as substantiated by O.S. Fent, local geologist. Fent reported vertical permeability values on Shelby tube samples of this silty clay of 0.02 to 19.33 gpd/ft^2. (6) Fent attributes this range of values to the position of desiccation cracks relative to the bore hole being sampled. The conditions discussed in this paragraph indicate the aquifer is "semi-confined".

Despite localized increased permeability in the upper fine- grained deposits, the fact that these sediments serve as a confining layer over the sand and gravel aquifer is clearly shown in the results of pump testing. Butler and Christy reported a storage coefficient of 0.00173 for a pump test performed in July 1982. Fent reported an average storage coefficient of 0.00861 for tests performed in February 1986. Both of these values are low, indicating confinement by the overlying fine-grained materials.

Piezometric contours in the aquifer are shown on Plate 4-9 using data generated in December, 20001. Plate 4-9 shows the direction of groundwater flow at the Exline site. Fent reported a transmissivity for the aquifer of 21,000 gpd/ft, based on aquifer test data (Hydrologic Investigation, Exline, Inc., Janis C. Butler, J.C. Butler Associates, Inc., Salina, Kansas and O.S. Fent, Hydraulic Drilling Company, Salina, Kansas, December, 1987). This figure agrees closely with the value of 22,050 gpd/ft. reported by Christy (Exline, Inc., Salina, Kansas, Pollution Control Plan, Wilson Laboratories, Salina, Kansas, September, 1982). Using these values, an assumed porosity for the aquifer of 0.35, an average thickness for the aquifer of 16 ft. (Hydrologic Investigation, Exline, Inc., December, 1987), and the average gradient for the aquifer listed above, yields an average groundwater flow velocity in the aquifer of 2.3 ft. per day moving along an axis from B-4 through B-6.

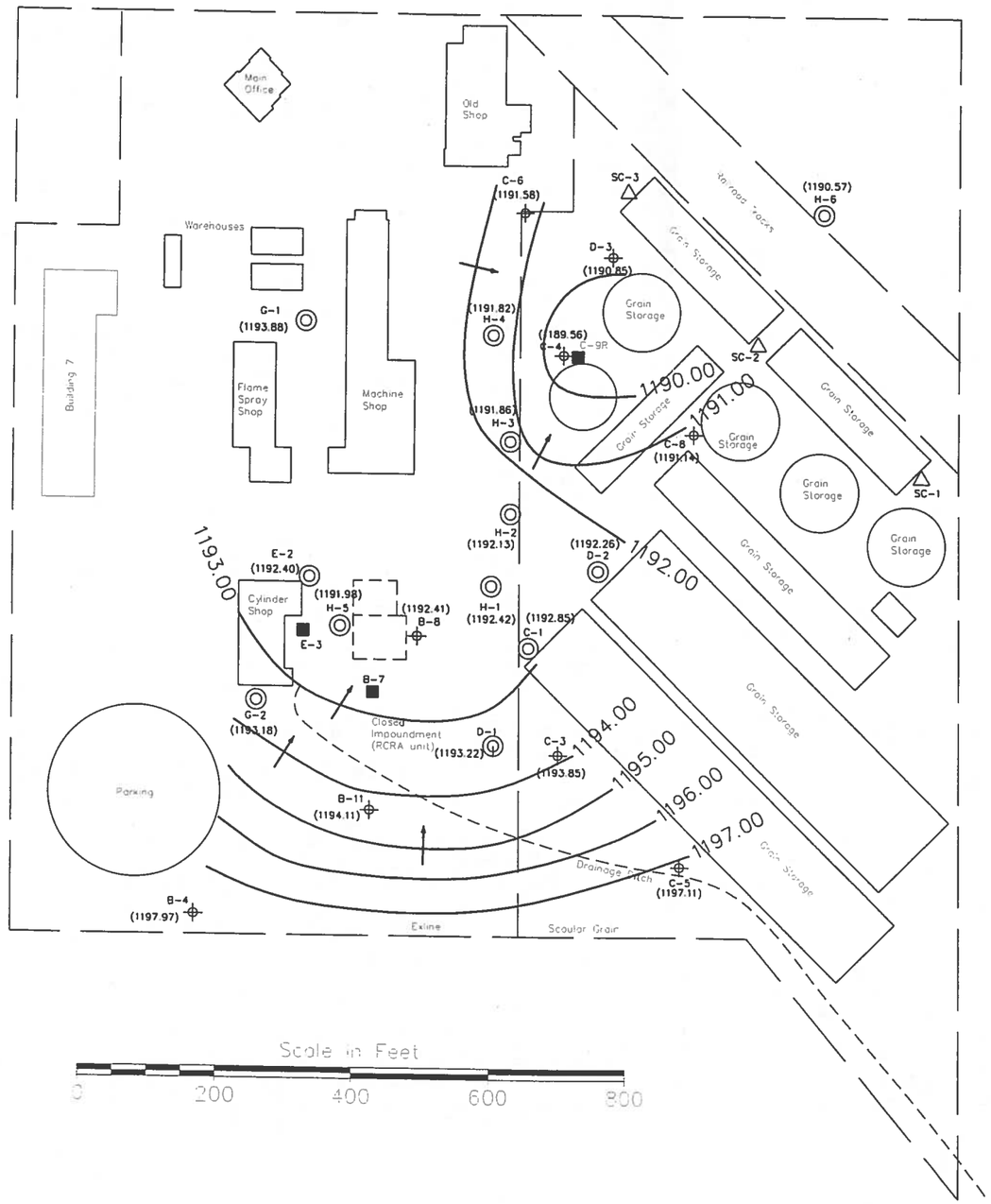
4.3.3.2. Geology of Wellington Shale Bedrock. The study area profile consists of unconsolidated deposits discussed above, underlain by Permian Wellington Shale. The Wellington shale locally acts as an aquitard serving as the lower boundary in depth for tracing the migration of contamination from the Exline, Inc. facility (6).

The effectiveness of the Wellington shale as an aquitard beneath the site has been previously discussed by Fent (6).

Boring logs for Exline monitor wells (included as Attachment 4-2) demonstrate the lack of measurable permeability of the shale beneath the unconsolidated deposits at the Exline site. Most of these borings, and all of the nearby Scoular borings (to the northeast in Section 9-T14S-R2W), penetrated at least a few feet of fresh, hard Wellington shale.

4.4. Characterization of Groundwater Contamination. Chromium groundwater analysis has been conducted on a routine basis since April of 1982.

A sample from monitoring well B-1 was analyzed for dissolved metals by Wilson Laboratories in May, 1982; results are summarized in Table 4-1. Information for this table was included in the 1982 annual groundwater monitoring report for the facility.



NORTH

Legend

- Monitor Well
- Recovery Well
- Piezometric Network Well
- Scoular De-Watering Well
- (1191.23) Groundwater Elevation (ft. above mean sea level)
- Groundwater flow direction

Note: Groundwater Velocity = 2.8 ft/day

Plate 4-9:
Groundwater Elevation Contours, Flow Direction and Rate
December, 2012 Data

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

File Number:	Date:	Drawn By:
13-010G	Jan., 2013	Jack Eslick

Section 3.2 of this application (Table 3-1). The data in Table 3-1 indicate that chromium would be a likely candidate for groundwater contamination.

TABLE 4-1: MONITORING WELL B-1 DISSOLVED METALS ANALYSES

Parameter	Concentration (mg/L)
Cadmium	ND(0.01)
Chromium, total	210.
Cobalt	ND(0.05)
Copper	0.01
Iron, total	0.01
Lead	ND(0.1)
Molybdenum	ND(0.01)
Nickel	ND(0.01)
Tin	ND(1)
Titanium	ND(0.02)
Vanadium	ND(0.1)
Zinc	0.060

Table 4-1 Notes:

1. Sample preparation: Filter sample through 0.45 micron cellulose filter.
2. Sample collected on May 21, 1982.
3. ND denotes "not detected" with the detection limit in parentheses.
4. Analyses conducted by Wilson Laboratories, Salina, Kansas.

4.4.1. Historical (pre-1988) Groundwater Chromium Concentrations. Extensive historical data exist from the analysis of chromium in site wells. Hexavalent chromium concentrations detected in quarterly sampling events from 1984 through 1988, are presented in summary form in Table 4-2. These results are only from the "B" series wells (the "C", "D", "E", and "G" series wells were installed after 1988). For most of the subject period, the analyses were conducted on a monthly basis. Table 4-2 data indicate that chromium concentrations in the area of influence of well B-7 were significantly reduced through 1988. The hexavalent chromium groundwater concentration in B-3 was reduced from a maximum level of 350 mg/L (2/15/84) to 15 mg/L (7/29/88). A similar reduction occurred at B-1, from 182 mg/L (2/15/84) to 0.40 mg/L (7/29/88).

Plate 4-10 is a hexavalent chromium iso-concentration map of the site from the February, 1989 analysis results.

4.4.2. Present (1987 through 2011) Groundwater Chromium Concentrations. Total chromium concentrations detected in all sampling events from 1987 through 1999, are summarized in Table 4-3. Table 4-3 includes all wells that were sampled during that time period. Table 4-3 data indicate that chromium concentrations in the area of influence of the withdrawal wells declined significantly during that time period.

The following tables summarize chromium concentration data from 2000 through 2011 for the ten (10) monitoring wells and the three (3) recovery wells that are currently being sampled:

TABLE 4-2

1984 - 1988, EXLINE, INC., MONITOR WELL CHROMIUM (VI) DATA.
SOURCE: EXLINE RECORDS
ALL ANALYSES PERFORMED BY EXLNE, INC. UNLESS
OTHERWISE NOTED

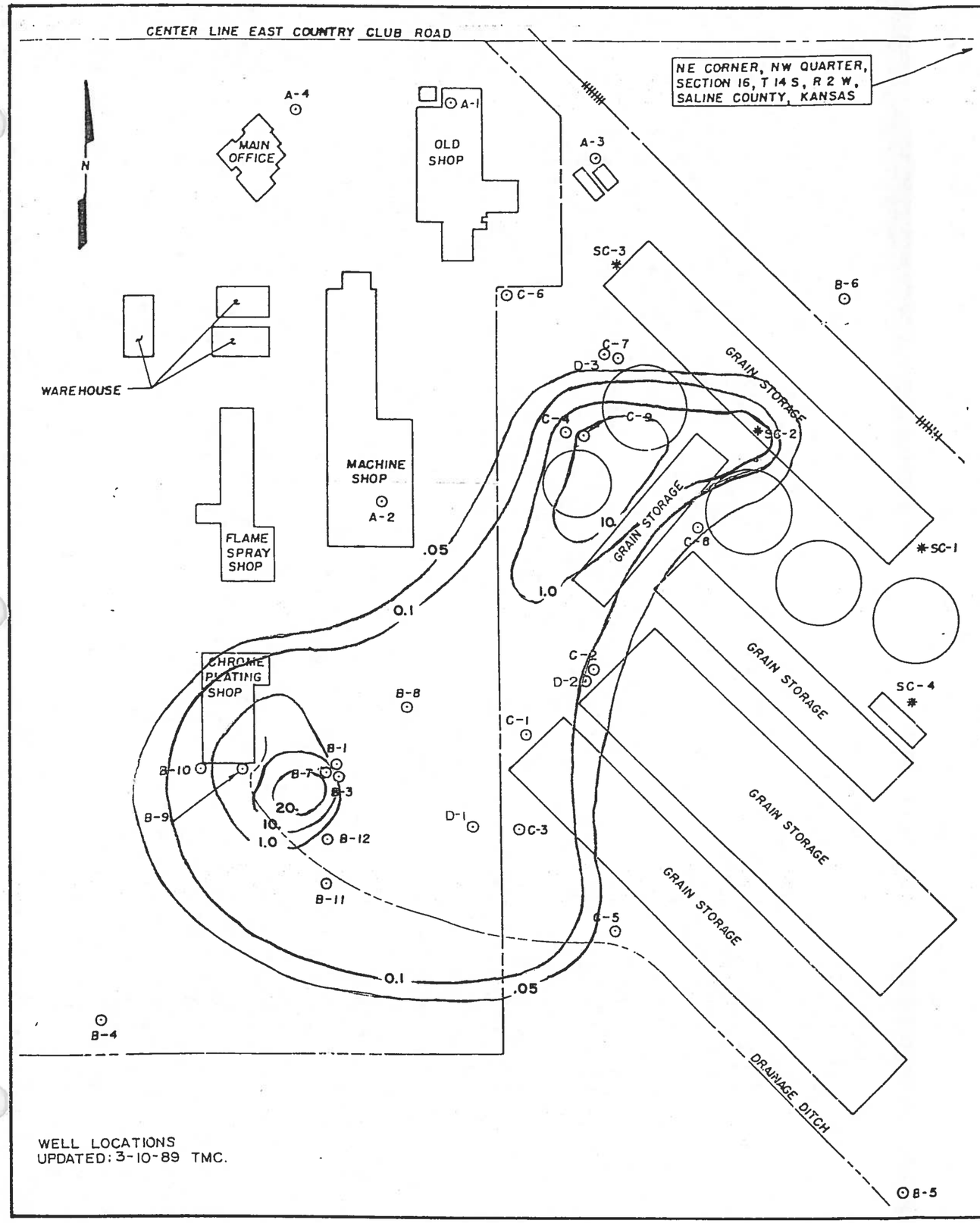
WELL NO.	SAMPLE DATE: 2/15/84	SAMPLE DATE: 4/4/84	SAMPLE DATE: 7/5/84	SAMPLE DATE: 10/3/84	SAMPLE DATE: 1/2/85	SAMPLE DATE: 4/3/85	SAMPLE DATE: 7/3/85	WELL NO.	SAMPLE DATE: 10/3/85	SAMPLE DATE: 1/23/86	SAMPLE DATE: 4/17/86	SAMPLE DATE: 7/25/86	SAMPLE DATE: 10/30/86	SAMPLE DATE: 1/28/87	SAMPLE DATE: 4/24/87	WELL NO.	SAMPLE DATE: 7/24/87	SAMPLE DATE: 10/30/87	SAMPLE DATE: 1/29/88	SAMPLE DATE: 4/28/88	SAMPLE DATE: 7/29/88	SAMPLE DATE: 10/13/88
B-1	182.	193.	66.7	3.70	2.80	2.00	3.50	B-1	3.25	4.00	2.35	1.25	1.00	1.55	1.50	B-1	0.95	1.85	1.52	2.35	0.40	
B-3	350.	280.	96.0	182.	155.	122.	88.0	B-3	52.0	46.0	10.0	2.50	1.50	0.75	1.00	B-3	1.00	0.35	0.18	0.16	0.17	
B-7	23.0	63.0	79.0	79.0	70.0	60.0	50.0	B-7	45.0	52.0	37.0	32.0	32.0	28.0	25.0	B-7	28.0	26.0	18.0	18.0	15.0	14.95
B-8			4.34	2.17	3.10	7.10	13.10	B-8	16.1	15.7	4.50	2.75	1.50	1.00	0.95	B-8	0.40	0.15	0.52	0.52	0.61	
B-9	1.61	2.44	0.23	0.27	1.85	3.00	13.10	B-9	5.25	3.25	29.0	30.40	22.0	17.5	20.50	B-9	27.0	24.0	28.5	28.5	15.0	
B-10	0.09	0.39	0.04	0.02	0.13	0.03	0.02	B-10	0.01	0.02	0.13	0.18	0.22	0.27	0.06	B-10	0.14	0.14	0.11	0.11	0.12	
B-11	0.14	0.23	0.28	0.27	0.22	0.19	0.42	B-11	0.26	0.10	0.15	0.16	0.12	0.10	0.08	B-11	0.01	0.09	0.09	0.09	0.09	
B-12	0.41	0.23	0.39	0.38	0.42	0.22	0.25	B-12	0.24	0.13	0.25	0.14	0.16	0.13	0.08	B-12	0.14	0.05	0.07	0.07	0.13	
																C-9						11.45
								SC-2			1.50	2.50	1.25	1.50	1.40	SC-2	1.55	1.65	2.30	2.30	1.05	0.95

KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

TABLE 4-2

SCALE	APPROVED BY	DRAWN BY
DATE 3-23-89	TMC	DWG

DRAWING NUMBER
TABLE IV-2



PLUME MAP BASED ON DATA FROM 23 FEBRUARY 1989 SAMPLING. (UNITS OF mg/l.)

WELL LOCATIONS UPDATED: 3-10-89 TMC.

KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

CHROMIUM ISOCONCENTRATION MAP

SCALE	APPROVED BY	DRAWN BY TMC
DATE 7-9-89	TMC	DWG

EXLINE, INC.

PLATE 4-10

TABLE 4-3 TOTAL CHROMIUM ANALYSES

PROJECT: Exline, Inc. Groundwater Remediation. KSGI File No. 90-027
1987 DATA
DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet.
ND indicates chromium was not detected in this sample. The detection limit for Cr-total is shown in parenthesis.

Sampling Date	Parameter	Monitoring Wells A-1	A-2	A-4	B-1	B-3	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	SC-1	SC-3	Pumping Wells B-7	C-9	SC-2
1/28/87	chromium	-	-	-	1.550	0.750	-	-	-	1.000	17.500	0.270	0.095	0.125	-	-	-	-	1.500
2/26/87	chromium	-	-	-	1.550	0.320	-	-	-	1.000	18.000	0.310	0.085	0.077	-	-	-	-	1.700
3/27/87	chromium	-	-	-	1.850	1.250	-	-	-	0.850	14.000	0.270	0.080	0.081	-	-	-	-	1.600
4/24/87	chromium	-	-	-	1.500	1.000	0.010	0.050	-	0.950	20.500	0.062	0.080	0.081	-	-	-	-	1.400
5/29/87	chromium	-	-	-	0.950	0.500	-	-	-	0.250	19.000	0.045	0.071	0.075	-	0.043	18.000	21.000	1.400
6/25/87	chromium	-	-	-	0.900	1.400	-	-	-	0.250	20.000	0.104	0.080	0.110	-	-	-	-	1.100
7/23/87	elevation	-	-	-	1200.65	1201.01	1204.30	1205.06	1198.10	1200.84	1201.10	1201.36	1201.58	1201.25	-	-	-	-	-
7/24/87	chromium	-	-	-	0.990	1.200	-	-	-	0.170	31.000	0.170	0.110	0.160	-	-	-	-	1.800
8/28/87	chromium	-	-	-	1.220	1.100	-	-	-	0.400	24.000	0.150	0.100	0.125	-	-	-	-	1.600
9/23/87	elevation	-	-	-	1199.13	1199.52	1203.07	1203.38	1196.19	1199.26	1199.64	1199.91	1200.14	1199.79	-	-	-	-	-
9/24/87	chromium	-	-	-	1.650	0.650	-	-	-	0.150	27.000	0.145	0.085	0.110	-	-	-	-	1.350
10/30/87	chromium	-	-	-	1.850	0.350	-	-	-	0.150	24.000	0.135	0.090	0.050	-	-	-	-	1.650
11/19/87	elevation	-	-	-	1198.58	1198.90	1202.46	1203.07	1196.19	1198.75	1199.02	1199.28	1199.50	1199.14	-	-	-	-	-
11/19/87	chromium	-	-	-	2.500	0.440	-	-	-	0.140	28.500	0.117	0.100	0.070	-	-	-	-	1.800
12/22/87	elevation	-	-	-	1198.58	1198.92	1202.59	1203.17	1196.25	1198.72	1199.09	1199.35	1199.60	1199.24	-	-	-	-	-
12/23/87	chromium	-	-	-	2.000	0.300	-	-	-	0.230	24.000	0.110	0.125	0.110	-	-	-	-	2.000

1988 DATA

Sampling Date	Parameter	Monitoring Wells A-1	A-2	A-4	B-1	B-3	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	SC-1	SC-3	Pumping Wells B-7	C-9	SC-2
1/29/88	chromium	-	-	-	1.520	0.175	-	-	-	0.230	20.000	0.100	0.090	0.035	-	-	-	-	-	-	-	-	-	-	-	-	1.650
2/24/88	elevation	-	-	-	1198.28	1198.59	1202.35	1202.86	1197.94	1198.49	1198.78	1199.06	1199.31	1198.94	-	-	-	-	-	-	-	-	-	-	-	-	-
2/25/88	chromium	-	-	-	2.500	0.180	-	-	-	0.210	20.000	0.110	0.080	0.070	-	-	-	-	-	-	-	-	-	-	-	-	1.850
3/23/88	elevation	-	-	-	1198.04	1197.96	1202.37	1202.86	1197.09	1198.57	1198.90	1199.06	1198.28	1198.62	-	-	-	-	-	-	-	-	-	-	-	-	-
3/24/88	chromium	-	-	-	2.620	0.155	-	-	-	0.460	27.000	0.092	0.095	0.070	-	-	-	-	-	-	-	-	-	-	-	-	2.200
4/27/88	elevation	-	-	-	1198.63	1198.94	1202.49	1202.85	1196.96	1198.83	1199.02	1199.27	1199.52	1199.17	-	-	-	-	-	-	-	-	-	-	-	-	-
4/28/88	chromium	-	-	-	2.350	0.157	-	-	ND(0.005)	0.515	28.500	0.110	0.850	0.650	-	-	-	-	-	-	-	-	-	-	-	-	2.300
5/10/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.100	-	-
5/26/88	chromium	-	-	-	1.950	0.160	-	-	-	0.515	18.000	0.110	0.085	0.140	-	-	-	-	-	0.054	-	-	-	0.043	18.000	21.000	1.800
5/26/88	elevation	-	-	-	1199.28	1199.85	1202.75	1202.85	1197.04	1199.53	1199.51	1199.71	1199.96	1199.69	1199.80	1198.56	1200.35	1195.15	1202.77	1197.42	1196.79	1197.31	-	-	-	-	-
5/27/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.450	21.600	-
6/9/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.720	18.960	-
6/23/88	elevation	-	-	-	1199.34	1199.96	1202.59	1202.24	1196.52	1199.61	1199.41	1199.59	1198.79	1199.57	1199.79	1198.49	1200.22	1194.86	1202.35	1196.77	1196.45	1197.16	-	-	-	-	-
6/23/88	chromium	-	-	-	0.700	0.152	-	-	-	0.585	17.200	0.120	0.085	0.140	-	-	-	-	-	-	-	-	-	-	16.000	17.000	1.350
6/28/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.300	19.050	0.572
7/6/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.250	17.350	1.161
7/29/88	elevation	-	-	-	1198.77	1199.41	1202.19	1201.58	1195.99	1198.99	1198.97	1199.18	1199.35	1199.12	1198.18	1198.00	1199.65	1194.45	1201.76	1196.28	1196.06	1196.78	-	-	-	-	-
7/29/88	chromium	-	-	-	0.400	0.170	-	-	-	0.610	15.000	0.110	0.090	0.120	-	-	-	-	-	-	-	-	-	-	15.000	13.000	1.050
8/9/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.000	10.900	0.707
8/26/88	elevation	-	-	-	1198.87	1199.79	1201.93	1201.16	1194.79	1199.17	1198.81	1198.98	1199.12	1198.93	1199.19	1197.62	1199.53	1193.66	1201.39	1195.58	1195.19	1195.93	-	-	-	-	1192.97
8/26/88	chromium	-	-	-	0.450	0.220	ND(0.05)	ND(0.05)	ND(0.05)	0.430	0.750	0.115	0.080	0.115	0.295	ND(0.05)	0.500	4.000	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	-	-	14.000	12.000	1.100
9/7/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.930	11.050	0.920
9/22/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15.050	10.950	0.789
9/27/88	elevation	-	-	-	1198.60	1199.48	1200.87	1201.04	-	1198.85	1198.61	1199.34	1198.91	1198.74	1198.89	1197.31	1199.16	1193.47	1201.03	1195.32	1194.90	1195.60	-	-	-	-	-
9/27/88	chromium	-	-	-	0.300	0.205	-	-	-	0.080	9.000	0.125	0.080	0.095	-	-	-	-	-	-	-	-	-	-	14.000	10.000	0.940
10/13/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.950	11.450	0.945
10/28/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.800	4.080	0.907
11/9/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.700	8.950	1.110
11/23/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.450	8.475	0.996
12/7/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.230	6.250	0.716
12/22/88	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.830	6.480	0.739

TABLE 4-3 (Continued).

PROJECT: Exline, Inc. Groundwater Remediation. KSGI File No. 90-027
1989 DATA

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet.
ND indicates chromium was not detected in this sample. The detection limit for Cr-total is shown in parenthesis.

Monitoring Wells

Sampling Date	Parameter	A-1	A-2	A-4	B-1	B-3	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3
1/5/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/26/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/13/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/22/89	elevation	-	1196.59	-	1197.94	1198.81	1199.98	1200.46	1194.2	1198.16	1198.00	1198.16	1199.25	1200.06	1198.23	1196.85	1198.47	1192.89	1200.19	1195.11	1194.56	1195.14	-	-	-	-	1194.15	1194.64
2/23/89	chromium	-	0.041	-	0.259	0.115	0.045	-	0.03	0.194	2.35	0.159	0.16	0.2	0.171	0.095	0.301	2.59	0.028	0.042	0.037	0.054	-	-	-	-	-	-
3/7/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.086	0.062	0.03	-	-	-
3/10/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/31/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/11/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/25/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/8/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/24/89	chromium	-	0.042	-	-	-	0.071	-	0.027	-	-	-	-	-	-	-	-	-	-	0.054	-	-	0.117	0.102	-	-	-	0.043
5/24/89	elevation	1194.80	1196.24	1195.20	1197.25	1197.91	1199.80	1201.73	1194.18	1197.48	1197.43	1197.64	1197.86	1197.61	1197.75	1196.50	1198.51	1192.46	1201.47	1194.95	1195.27	1194.93	1197.88	1196.60	1194.33	-	1195.12	1194.78
6/13/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/28/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7/7/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7/31/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8/10/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8/29/89	elevation	-	1194.98	-	1196.47	1197.61	1198.87	1202.09	1193.78	1195.75	1195.67	1196.03	1196.59	1196.14	1196.35	-	1197.06	1191.50	1200.86	1194.07	-	1194.43	1196.36	1195.64	1193.70	1195.32	1194.94	1193.80
8/30/89	chromium	-	-	-	0.389	-	0.045	0.099	0.049	0.15	1.754	0.091	0.05	0.067	-	-	-	-	-	-	-	-	0.142	0.077	0.061	-	0.04	0.061
9/15/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9/28/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/11/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/25/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/8/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/14/89	chromium	-	0.04	-	-	-	0.031	0.032	ND(0.025)	-	1.78	-	-	-	-	-	-	2.03	-	ND(0.025)	-	-	0.464	0.084	0.035	0.108	ND(0.025)	0.035
11/28/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/5/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/19/89	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Pumping Wells

Sampling Date	Parameter	B-7	C-9	E-3	SC-2
1/5/89	chromium	15.50	10.40	*	0.837
1/26/89	chromium	6.88	9.83	*	0.865
2/13/89	chromium	11.30	7.15	*	1.091
2/22/89	elevation	-	-	*	-
2/23/89	chromium	13.30	7.12	*	1.133
3/7/89	chromium	-	-	*	-
3/10/89	chromium	8.53	5.01	*	0.787
3/31/89	chromium	12.78	6.98	*	0.880
4/11/89	chromium	10.65	5.05	*	0.779
4/25/89	chromium	6.80	5.35	*	0.785
5/8/89	chromium	6.76	4.01	*	0.832
5/24/89	chromium	9.1	4.825	*	0.918
5/24/89	elevation	-	-	*	1192.09
6/13/89	chromium	11.000	5.840	*	0.760
6/28/89	chromium	8.600	4.860	*	0.744
7/7/89	chromium	8.50	4.54	*	0.699
7/31/89	chromium	6.51	2.87	*	0.161
8/10/89	chromium	10.80	2.82	*	0.498
8/29/89	elevation	-	-	-	-
8/30/89	chromium	3.920	2.340	4.960	0.389
9/15/89	chromium	4.78	3.05	7.81	0.609
9/28/89	chromium	4.46	2.82	10.47	1.053
10/11/89	chromium	4.85	3.80	11.66	0.624
10/25/89	chromium	4.85	3.61	11.7	0.58
11/8/89	chromium	4.76	4.15	11.98	0.649
11/14/89	chromium	-	-	-	-
11/28/89	chromium	4.20	3.49	12.2	0.646
12/5/89	chromium	3.96	3.36	10.1	0.624
12/19/89	chromium	4.06	3.68	9.81	0.676

*Wells D-1, D-2, and D-3 were drilled in February, 1989.
*Well E-2 was drilled in May, 1989.
* Well E-3 was drilled in June, 1989.

TABLE 4-3 (Continued):

PROJECT: Exline, Inc. Groundwater Remediation. KSGI File No. 90-027
1990 DATA

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet.
ND indicates chromium was not detected in this sample. The detection limit for Cr-total is shown in parenthesis.

Sampling Date	Parameter	Monitoring Wells A-2	B-1	E-2	E-3	B-6	B-8	E-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3
1/3/90	chromium	0.049	-	0.024	0.015	ND(0.01)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.026	-	ND(0.01)	-
1/3/90	elevation	1194.89	1195.11	1199.07	1201.77	1193.52	1195.37	1195.69	1196.33	1196.34	1195.88	1195.92	1196.86	1191.07	1200.52	1194.09	1194.11	1195.98	1195.19	1193.54	1195.31	1194.65	1193.72
1/5/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/16/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/26/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/7/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2/12/90	chromium	0.045	0.462	0.228	0.020	ND(0.01)	0.327	1.686	0.027	0.036	0.017	0.096	0.054	1.595	ND(0.01)	0.023	0.028	0.604	0.082	0.022	0.068	ND(0.01)	ND(0.01)
2/12/90	elevation	1194.92	1195.37	1198.92	1201.49	1193.36	1195.67	1195.24	1195.60	1196.52	1196.09	1196.55	1197.71	1190.92	1201.28	1193.97	1194.02	1196.67	1196.42	1193.33	1194.89	1194.65	1193.54
2/27/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/6/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/26/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/4/90	chromium	ND(0.05)	0.512	0.156	ND(0.05)	ND(0.05)	0.412	1.199	ND(0.05)	0.065	ND(0.05)	-	-	-	-	-	-	0.556	-	ND(0.05)	0.116	ND(0.05)	-
4/4/90	elevation	1195.44	1195.92	1199.57	1202.85	1194.19	1196.28	1195.99	1196.33	1197.29	1196.82	-	-	-	-	-	-	1197.30	-	1195.20	1195.54	1188.91	-
4/9/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4/25/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/4/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/16/90	chromium	ND(0.05)	0.363	ND(0.05)	ND(0.05)	ND(0.05)	0.298	1.373	ND(0.05)	0.190	ND(0.05)	ND(0.05)	ND(0.05)	1.32	ND(0.05)	ND(0.05)	ND(0.05)	0.451	0.071	ND(0.05)	0.097	ND(0.01)	ND(0.01)
5/16/90	elevation	1195.58	1195.98	1199.97	1203.29	1194.56	1196.34	1196.02	1196.38	1197.40	1196.89	1197.32	1198.72	1191.73	1203.68	1194.99	1195.15	1197.42	1196.40	1194.45	1195.48	1195.85	1194.60
5/25/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/6/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6/14/90	chromium	-	0.344	0.136	ND(0.05)	ND(0.05)	0.262	2.44	0.079	0.222	0.088	-	-	-	-	-	-	0.488	-	-	0.15	-	-
6/14/90	elevation	-	1195.54	1200.75	1203.25	1194.54	1195.93	1197.98	1195.93	1196.20	1196.30	-	-	-	-	-	-	1196.81	-	-	1195.23	-	-
6/26/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7/13/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7/23/90	chromium	ND(0.05)	0.327	ND(0.05)	ND(0.05)	ND(0.05)	0.25	2.45	0.061	0.154	ND(0.05)	-	-	-	-	-	-	0.405	-	0.068	0.141	ND(0.05)	-
7/23/90	elevation	1195.14	1195.32	1194.37	1201.67	1193.89	1195.74	1195.38	1195.71	1196.11	1195.95	-	-	-	-	-	-	1196.27	-	1193.95	1195.01	1195.20	-
7/26/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8/10/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8/23/90	chromium	0.085	0.796	0.281	0.069	ND(0.05)	0.15	1.942	ND(0.05)	0.165	0.074	0.081	ND(0.05)	0.97	ND(0.05)	ND(0.05)	0.075	0.363	0.102	ND(0.05)	0.157	ND(0.05)	0.057
8/23/90	elevation	1196.00	1196.75	1200.27	1202.45	1194.76	1197.25	1196.62	1195.90	1197.53	1197.12	1197.53	1198.27	1191.94	1201.55	1194.90	1195.22	1197.50	1196.57	1194.53	1196.4	1195.96	1194.69
8/29/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9/6/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9/26/90	chromium	-	0.647	0.091	ND(0.05)	ND(0.05)	0.143	1.059	0.051	0.155	0.169	-	-	-	-	-	-	0.28	-	-	0.133	-	-
9/26/90	elevation	-	1196.22	1199.72	1201.37	1193.59	1196.66	1196.14	1196.42	1196.89	1196.53	-	-	-	-	-	-	1196.89	-	-	1195.92	-	-
9/27/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/5/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/16/90	chromium	0.165	0.623	ND(0.05)	ND(0.05)	ND(0.05)	0.127	0.946	0.074	0.149	0.099	-	-	-	-	-	-	0.229	-	ND(0.05)	0.137	ND(0.05)	-
10/16/90	elevation	1195.47	1196.03	1199.77	1201.42	1193.69	1196.49	1196.03	1196.31	1196.84	1196.46	-	-	-	-	-	-	1196.76	-	1193.85	1195.76	1194.95	-
10/26/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/6/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11/15/90	chromium	0.343	0.523	ND(0.05)	ND(0.05)	ND(0.05)	0.158	1.926	0.083	0.196	0.104	0.092	ND(0.05)	1.09	ND(0.05)	ND(0.05)	0.072	0.242	-	ND(0.05)	0.159	ND(0.05)	ND(0.05)
11/15/90	elevation	1195.90	1195.74	1199.66	1201.66	1193.69	1196.12	1195.82	1196.14	1196.72	1196.30	1196.58	1197.38	1191.33	1200.73	1194.37	1194.36	1196.55	1195.75	1193.85	1195.51	1194.97	1194.32
11/16/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.17	-	-	-	-
11/27/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/5/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/11/90	chromium	-	0.456	ND(0.05)	ND(0.05)	ND(0.05)	0.209	2.51	0.073	0.174	0.105	-	-	-	-	-	-	0.233	-	-	0.162	-	-
12/11/90	elevation	-	1195.57	1199.58	1201.71	1193.63	1196.01	1195.62	1195.93	1196.57	1196.14	-	-	-	-	-	-	1196.49	-	-	1195.40	-	-
12/20/90	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sampling Date	Parameter	Pumping Wells B-7	C-9	E-3	SC-2
1/3/90	chromium	-	-	-	-
1/3/90	elevation	4.02	2.65	9.72	0.558
1/5/90	chromium	-	-	9.72	-
1/16/90	chromium	2.77	2.51	9.46	0.635
1/26/90	chromium	2.08	2.32	8.87	0.482
2/7/90	chromium	-	-	-	-
2/12/90	chromium	-	-	-	-
2/12/90	elevation	1.93	2.39	8.53	0.552
2/27/90	chromium	1.833	2.350	7.460	0.515
3/6/90	chromium	1.624	2.123	5.010	0.476
3/26/90	chromium	-	-	-	-
4/4/90	chromium	-	-	-	-
4/4/90	elevation	1.613	2.250	6.960	0.489
4/9/90	chromium	1.37	1.93	5.85	0.478
4/25/90	chromium	1.422	2.047	4.620	0.441
5/4/90	chromium	-	-	-	-
5/16/90	chromium	-	-	-	-
5/16/90	elevation	1.328	1.903	4.890	0.430
5/25/90	chromium	1.359	2.003	6.100	0.410
6/6/90	chromium	-	-	-	-
6/14/90	chromium	-	-	-	-
6/14/90	elevation	1.419	1.865	5.000	0.416
6/26/90	chromium	1.530	2.260	8.050	0.449
7/13/90	chromium	-	-	-	-
7/23/90	chromium	-	-	-	-
7/23/90	elevation	1.634	1.833	5.120	0.442
7/26/90	chromium	1.464	1.358	5.720	0.382
8/10/90	chromium	-	-	-	-
8/23/90	chromium	-	-	-	-
8/23/90	elevation	1.700	1.762	6.080	0.418
8/29/90	chromium	2.089	2.039	6.360	0.445
9/6/90	chromium	-	-	-	-
9/26/90	chromium	-	-	-	-
9/26/90	elevation	1.895	1.614	5.590	0.381
9/27/90	chromium	2.130	1.710	6.570	0.421
10/5/90	chromium	-	-	-	-
10/16/90	chromium	-	-	-	-
10/16/90	elevation	2.150	1.570	9.280	0.463
10/26/90	chromium	2.00	1.45	8.20	0.385
11/6/90	chromium	-	-	-	-
11/15/90	chromium	-	-	-	-
11/15/90	elevation	2.40	2.29	7.95	0.402
11/16/90	chromium	2.062	1.439	7.650	0.374
11/27/90	chromium	-	-	-	-
12/5/90	chromium	-	-	-	-
12/11/90	chromium	-	-	-	-
12/11/90	elevation	1.968	1.389	6.600	0.358
12/20/90	chromium				

TABLE 4-3 (Continued):

PROJECT: Exline, Inc. Groundwater Remediation. KSGI File No. 90-027
1991 DATA

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet.
ND indicates chromium was not detected in this sample. The detection limit is shown in parenthesis.

Sampling Date	Parameter	Monitoring Wells A-2	B-1	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	Pumping Wells B-7	C-9	E-3	SC-2
1/3/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	1.22	8.95	0.34
1/14/91	chromium	0.349	0.387	0.083	ND(0.05)	ND(0.05)	0.119	1.783	0.056	0.134	0.082	-	-	-	-	-	-	0.15	-	0.06	0.128	ND(0.05)	-	-	-	-	-
1/14/91	elevation	-	1195.41	1199.43	1201.41	1193.53	1195.83	1195.41	1195.72	1196.35	1195.92	-	-	-	-	-	-	1196.3	-	1193.56	1195.14	1194.65	-	-	-	-	-
1/25/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.24	1.27	5.65	0.364
2/5/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.78	1.62	9.34	0.4
2/20/91	chromium	0.198	0.398	0.094	0.11	0.1	0.179	1.157	0.085	0.202	0.202	0.114	0.093	-	0.091	0.092	0.09	0.168	0.132	0.096	0.172	0.082	0.092	-	-	-	-
2/20/91	elevation	1195.57	1196.76	1199.52	1201	1193.69	1196.89	1196.49	1196.66	1197.32	1197.04	1197.16	1198.01	1191.44	1201.01	1194.39	1194.45	1197.33	1195.97	1193.84	1196.07	1194.93	1194.31	-	-	-	-
2/26/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.94	1.53	7.71	0.4
3/7/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.67	1.34	7.26	0.38
3/27/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.19	7.46	0.33
4/3/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.29	1.13	7.10	0.35
4/15/91	chromium	0.213	-	0.068	0.11	ND(0.01)	-	-	-	-	-	-	-	0.739	-	-	-	-	-	ND(0.01)	-	ND(0.01)	-	-	-	-	-
4/15/91	elevation	1195.52	-	1201.17	1201.09	1193.82	-	-	-	-	-	-	-	-	-	-	-	-	-	1193.89	-	1195.04	-	-	-	-	-
4/25/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.01	1.12	7.26	0.32
5/6/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.06	1.25	7.98	0.35
5/21/91	chromium	0.163	0.258	ND(0.05)	ND(0.05)	ND(0.05)	0.215	1.39	ND(0.05)	0.334	0.133	0.103	ND(0.05)	0.691	ND(0.05)	ND(0.05)	ND(0.05)	0.188	0.112	ND(0.05)	0.162	ND(0.01)	ND(0.01)	-	-	-	-
5/21/91	elevation	1195.23	1196.26	1200.92	1200.93	1193.52	1196.33	1196.02	1196.23	1196.94	1196.64	1196.74	1197.65	1191.22	1200.92	1194.24	1194.26	1196.93	1195.66	1193.67	1195.55	1194.69	1194.13	-	-	-	-
5/31/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.11	1.23	7.36	0.37
6/7/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.81	1.13	8.72	0.33
6/25/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.84	1.05	5.12	0.27
7/2/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.99	1.15	5.52	0.03
7/10/91	chromium	0.25	-	ND(0.05)	ND(0.05)	ND(0.05)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND(0.05)	-	ND(0.05)	-	-	-	-	-
7/10/91	elevation	1195.64	-	1201.19	1201.08	1193.39	-	-	-	-	-	-	-	-	-	-	-	-	-	1193.41	-	1194.59	-	-	-	-	-
7/30/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.98	1.04	6.25	0.26
8/6/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.67	1.21	5.05	0.31
8/20/91	chromium	0.188	0.665	0.064	0.085	ND(0.05)	0.11	1.162	ND(0.05)	0.224	0.078	ND(0.05)	ND(0.05)	0.574	ND(0.05)	ND(0.05)	ND(0.05)	0.185	0.069	ND(0.05)	0.119	ND(0.05)	ND(0.05)	-	-	-	-
8/20/91	elevation	1193.57	1193.42	1201.34	1200.12	1192.32	1193.78	1193.65	1194.09	1194.77	1194.21	1194.49	1195.45	1189.95	1199.33	1192.79	1192.99	1194.44	1194.00	1192.34	1193.4	1193.51	1192.81	-	-	-	-
8/22/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.32	0.98	5.62	0.29
9/3/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.24	1.01	4.98	0.34
9/27/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.31	1.22	4.98	0.44
10/4/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.41	1.21	4.95	0.04
10/8/91	chromium	0.322	-	ND(0.05)	0.075	ND(0.05)	-	-	-	-	-	-	-	-	-	-	-	-	-	ND(0.05)	-	ND(0.05)	-	-	-	-	-
10/8/91	elevation	1192.75	-	1201.34	1200.44	1191.45	-	-	-	-	-	-	-	-	-	-	-	-	-	1191.56	-	1192.69	-	-	-	-	-
10/29/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	1.00	3.62	0.37
11/6/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.77	1.03	3.82	0.38
11/15/91	chromium	0.181	-	0.062	0.061	ND(0.05)	-	0.592	-	-	-	-	-	0.729	-	ND(0.05)	-	0.16	0.104	ND(0.05)	0.102	ND(0.05)	ND(0.05)	-	-	-	-
11/15/91	elevation	-	-	1199.16	1200.26	1191.33	-	1192.72	-	-	-	-	-	1189.00	-	1191.93	-	1193.62	1192.93	1191.27	1192.40	1186.54	1191.20	-	-	-	-
11/26/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.65	1.06	3.49	0.35
12/9/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.87	1.15	3.85	0.33
12/20/91	chromium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.51	0.93	3.06	0.32

TABLE 4-3 (Continued):

PROJECT: Exline, Inc. Groundwater Remediation. KSGI File No. 90-027
1992 DATA

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells.
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet.
"ND" indicates chromium was not detected in this sample. The detection limit for Cr-total is 0.05 mg/l.

Sampling Date	Parameter	Monitoring Wells A-2	B-1	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	G-1	Pumping Wells B-7	C-9	E-3	SC-2
1/7/92	chromium																								1.349	0.873	2.390	0.318
1/9/92	chromium	0.100		ND	0.060	ND														ND		ND						
1/9/92	elevation	1192.59		1199.07	1199.58	1191.72														1191.58		1192.76						
1/24/92	chromium																								1.487	0.954	2.760	0.326
2/7/92	chromium																								1.231	0.885	2.240	0.327
2/20/92	chromium	ND	0.214			ND	0.063	0.278	ND	ND	ND	ND	ND	0.708	ND	ND	ND	0.111	0.059	ND	0.105	ND	ND					
2/20/92	elevation	1192.45	1192.20	1198.91	1199.62	1191.53	1192.56	1192.34	1192.65	1193.63	1193.08	1193.58	1194.46	1189.00	1198.68	1191.99	1191.89	1193.34	1192.81	1191.32	1192.14	1192.55	1191.89		1.184	0.870	2.180	0.289
2/21/92	chromium																								1.311	0.953	3.930	0.337
3/5/92	chromium																								1.077	0.912	1.665	0.255
3/27/92	chromium																								1.015	0.838	1.826	0.255
4/6/92	chromium																											
4/13/92	chromium	ND		0.033	0.018	ND														ND		ND						
4/13/92	elevation	1192.42		1198.59	1199.52	1191.62														1191.35		1192.61						
4/24/92	chromium																								1.100	0.733	1.491	0.243
5/11/92	chromium																								0.889	0.725	1.606	0.239
5/18/92	chromium	0.069	0.195	0.062	0.159	0.089	0.131	0.265	0.124	0.128	0.119	0.084	0.062	0.579	0.125	0.088	0.077	0.161	0.088	0.061	0.200	0.070	0.080					
5/18/92	elevation		1191.94	1198.35	1199.98	1191.01	1192.34	1192.08	1192.48	1193.41	1192.86	1193.18	1194.33	1188.54	1198.78	1191.71	1191.72	1193.15	1192.65	1191.09	1191.89	1191.97	1191.64					
5/22/92	chromium																								0.494	0.802	1.420	0.300
6/9/92	chromium																								0.996	0.823	2.167	0.291
6/25/92	chromium																								1.109	0.842	1.457	0.245
7/6/92	chromium																								1.040	0.750	1.559	0.253
7/24/92	chromium																								0.910	0.700	1.290	0.203
8/5/92	chromium																								1.147	0.742	1.877	0.255
8/18/92	chromium																								0.868	0.666	1.509	0.171
8/20/92	chromium	ND	0.100	ND	ND	ND	0.067	0.165	ND	0.087	ND	ND	ND	0.535	ND	ND	ND	0.175	ND	ND	0.173	ND	ND	ND				
8/20/92	elevation	1193.10	1192.99	1199.25	1201.27	1192.81	1193.40	1193.22	1193.62	1194.64	1194.03	1194.28	1195.51	1190.06	1200.11	1192.82	1192.86	1194.27	1193.72	1192.21	1192.90	1194.09	1192.80	1193.15				
9/8/92	chromium																								0.821	0.593	1.057	0.163
9/21/92	chromium																								1.034	0.778	1.292	0.184
10/6/92	chromium																								1.302	0.876	1.453	0.215
10/20/92	chromium	ND		ND	0.074	ND														ND		ND		ND				
10/20/92	elevation	1193.15		1198.83	1200.77	1192.65														1192.25		1193.68		1193.24				
10/22/92	chromium																								1.030	0.607	1.193	0.153
11/5/92	chromium																								1.131	0.627	1.337	0.211
11/16/92	chromium	ND		ND	ND	ND		0.270						0.574		ND		ND	ND	ND	0.172	ND	ND	ND				
11/16/92	elevation	1192.90		1199.05	1201.27	1192.63		1193.17						1191.44		1191.93		1194.22	1193.76	1192.31	1192.80	1193.67	1192.88	1193.37				
11/23/92	chromium																								1.139	0.611	1.110	0.175
12/4/92	chromium																								1.321	0.689	1.371	0.181
12/18/92	chromium																								1.310	0.678	1.422	0.153

TABLE 4-3 (Continued):

PROJECT: Exline, Inc. Groundwater Remediation. KSGI File No. 90-027
1993 DATA

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells.
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet.
"ND" indicates chromium was not detected in this sample. The detection limit for Cr-total is 0.05 mg/l.

Sampling Date	Parameter	Monitoring Wells																							Pumping Wells			
		A-2	B-1	B-3	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	G-1	B-7	C-9	E-3	SC-2
1/7/93	chromium																									1.285	0.637	1.291	0.145
1/18/93	chromium				ND	ND																							
1/18/93	elevation				1199.78	1201.74	1191.72																						
1/22/93	chromium																				ND		ND		ND				
																					1192.88		1194.39		1193.91				
2/8/93	chromium																									1.343	0.657	1.321	0.155
2/24/93	elevation		1194.92		1199.27	1202.92	1194.17	1195.30	1195.11	1195.47	1196.47	1195.89	1196.12	1197.44	1192.11	1202.01	1194.26	1194.41	1196.18	1195.44	1193.74	1194.75	1195.28	1194.30	1194.84	2.028	0.685	1.683	0.147
2/24/93	chromium		0.100		ND	ND	ND	ND	0.375	ND	0.111	0.083	0.063	ND	0.550	0.053	0.063	0.070	0.162	0.074	0.065	0.136	ND	ND	0.058				
2/25/93	chromium																												
3/8/93	chromium																									1.536	0.608	1.173	0.160
3/23/93	chromium																												
4/6/93	chromium																									2.225	0.783	1.661	0.130
4/16/93	chromium				ND	ND	ND																			1.982	0.669	1.153	0.105
4/16/93	elevation				1200.28	1204.45	1196.22																						
4/20/93	chromium																				ND		ND		ND	2.416	0.738	1.868	0.121
																					1195.85		1197.33		1196.84				
5/4/93	chromium																									1.913	0.541	1.334	0.104
5/21/93	chromium																												
5/27/93	elevation		1201.47		1202.83	1205.96	1199.67	1200.61	1200.58	1200.90	1201.81	1201.23	1201.15	1202.12	1199.52	1205.57	1200.09	1199.95	1201.27	1200.67	1199.59	1200.35	1200.65	1200.09	1200.47	1.529	0.351	0.950	<0.05
5/27/93	chromium		0.121		ND	ND	ND	ND	0.654	0.058	0.084	0.122	ND	ND	0.436	ND	ND	ND	0.098	ND	ND	0.156	ND	ND	ND	2.640	0.514	1.835	0.101
6/8/93	chromium																												
6/22/93	chromium																												
7/10/93	chromium																									2.980	0.599	1.754	0.126
7/16/93	chromium				ND	0.060	ND																			3.910	0.554	1.981	0.120
7/16/93	elevation				1206.09	1209.76	1203.87																						
7/26/93	chromium																				ND		ND		ND	4.770	0.568	2.360	0.131
																					1202.87		1203.21		1203.10				
8/9/93	chromium																									6.010	0.547	2.800	0.100
8/18/93	chromium	ND	0.144	0.859	ND	0.072	ND	ND	8.160	ND	0.194	0.118	0.056	0.090	0.406	ND	ND	ND	0.119	ND	ND	0.100	ND	ND	ND				
8/18/93	elevation	1202.58	1203.13	1204.03	1205.59	1207.37	1200.95	1203.36	1203.56	1204.00	1204.50	1204.06	1203.66	1204.50	1199.49	1207.19	1201.34	1200.90	1203.91	1202.68	1199.96	1203.14	1188.35		1203.10	8.350	0.774	4.030	0.118
8/25/93	chromium																												
9/7/93	chromium																									12.800	0.556	4.390	0.150
9/22/93	chromium																												
10/5/93	chromium																									14.400	0.445	8.800	0.069
10/6/93	chromium																									19.400	0.531	18.400	0.059
10/6/93	elevation				ND	ND	ND																						
10/26/93	chromium				1204.83	1206.84	1199.91														0.056		ND		ND	25.900	0.723	20.500	0.104
																					1199.14				1203.04				
11/15/93	chromium																									20.800	0.559	11.100	0.081
11/18/93	chromium				ND	ND	ND		0.077						0.468		0.064		0.154	0.060						18.400	0.569	12.800	0.128
11/18/93	elevation				1203.44	1206.63	1198.99		1201.10						1195.21		1199.49		1201.51	1200.44	ND	ND	ND		ND				
11/24/93	chromium																				1198.15	1200.74			1200.86				
12/6/93	chromium																									16.100	0.517	14.600	<0.05
12/29/93	chromium																									15.800	0.437	13.300	0.055
																										16.400	0.480	16.100	0.143

TABLE 4-3

WELL SAMPLING ANALYSIS RESULTS

Exline, Inc. Groundwater Remediation: KSGI File No. 90-027

ESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells.
OTE: Cr-total values are mg/l. Piezometric elevations are in feet.
"ND" indicates chromium was not detected in this sample. The detection limit for Cr-total is 0.05 mg/l.

ampling ate	Parameter	Monitoring Wells																							Pum ping Wells			
		A-2	B-1	B-3	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	G-1	B-7	C-9	E-3	SC-2
/7/94	chromium																									15.800	0.475	21.000	0.242
/12/94	chromium				ND	0.066	ND														ND		ND		ND				
/12/94	elevation				1203.16	1205.48	1197.76														1196.94				1200.09				
/21/94	chromium																									15.400	0.409	27.900	<0.05
/8/94	chromium																									16.100	0.499	26.100	0.068
/28/94	elevation	1199.62	1200.16		1202.80	1205.42	1198.02	1200.45	1200.52	1200.90	1201.[illegible]		1200.66	1201.72	1194.30		1198.20	1197.63	1201.04	1199.50	1196.79	1200.15			1199.69				
/28/94	chromium	ND	0.302		ND	ND	ND	ND	0.072	ND	ND		ND	ND	0.267		ND	ND	ND	ND	ND	ND	ND		ND	14.800	0.386	22.400	<0.05
/22/94	chromium																									13.400	0.424	17.800	<0.05
/9/94	chromium																									13.400	0.381	15.500	<0.05
/23/94	chromium																												
/6/94	chromium																									13.500	0.448	13.600	<0.05
/18/94	elevation				1200.19	1205.36	1198.80														1199.02		1199.95		1200.61				
/18/94	chromium				ND	ND	ND														ND		ND		ND				
/26/94	chromium																									11.100	0.332	13.400	0.061
/5/94	chromium																									10.700	0.330	10.600	<0.05
/18/94	elevation	1200.74			1201.43	1205.09	1199.59								1196.49		1200.42		1201.27	1200.72	1199.51	1200.38	1200.51		1201.08				
/18/94	chromium	ND			ND	ND	ND		1200.47						0.315		ND		0.110	ND	ND	0.092	0.065		ND				
/27/94	chromium								0.282																	9.430	0.381	8.380	<0.05
/7/94	chromium																									8.730	0.397	8.700	0.062
/21/94	chromium																									9.990	0.376	10.000	0.073
/6/94	chromium																									8.900	0.389	9.580	<0.05
/12/94	elevation				1199.28	1203.89	1198.81														1198.67		1199.59		1199.98				
/12/94	chromium				ND	ND	ND														ND		ND		ND				
/25/94	chromium																									11.700	0.486	12.300	<0.05
/[illegible]/94	chromium																									14.300	0.647	21.500	0.085
	elevation		1198.89		1200.01	1203.57	1198.39	1199.22	1199.07	1199.42	1199.[illegible]		1199.74	1200.54	1195.12		1198.98	1198.66	1199.76	1199.46	1198.30	1199.00	1199.28		1199.58				
/2[illegible]	chromium		0.399		ND	0.059	ND	0.170	0.367	0.115	0.1[illegible]		ND	0.157	0.281		ND	ND	0.109	0.060	ND	ND	ND		ND				
	chromium																									10.400	0.482	14.200	<0.05
/8/94	chromium																									8.180	0.404	10.300	<0.05
/22/94	chromium																									10.700	0.485	17.900	<0.05
0/4/94	chromium																									9.530	0.478	14.300	<0.05
0/10/94	chromium				ND	ND	ND														ND		ND		ND				
0/10/94	elevation				1197.69	1202.24	1196.89														1196.82		1197.80		1198.15				
0/25/94	chromium																									8.050	0.468	12.900	<0.05
1/7/94	chromium																									6.880	0.470	10.300	<0.05
1/17/94	elevation				1200.29	1203.46	1197.12		1197.75						1193.81		1198.30	1197.94			1196.88	1197.54	1197.78		1198.29				
1/17/94	chromium				ND	ND	ND		0.168						0.214		0.063	ND			ND	ND	ND		ND				
1/23/94	chromium																									5.330	0.433	11.500	<0.05
2/7/94	chromium																									5.930	0.460	10.100	<0.05
2/20/94	chromium																									5.880	0.460	11.900	<0.05

TABLE 4-3

WELL SAMPLING ANALYSIS RESULTS

Exline, Inc. Groundwater Remediation. KSGI File No. 95-010C

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells.
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet.
"ND" indicates chromium was not detected in this sample. The detection limit for Cr-total is 0.05 mg/l.

Sampling Date	Parameter	Monitoring Wells																						Pumping Wells			
		A-2	B-1	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	G-1	B-7	C-9	E-3	SC-2
1/10/95	chromium																								5.630	0.439	11.000	<0.05
1/17/95	elevation			1199.92	1202.37	1196.58																						
1/17/95	chromium			ND	ND	ND																						
1/24/95	chromium																			1196.29 ND		1197.32 ND		1197.45 ND				
2/8/95	chromium																								5.480	0.463	13.800	0.059
2/22/95	chromium																											
3/9/95	chromium																								4.350	0.427	8.800	<0.05
3/10/95	elevation		1197.08	1200.19	1202.39	1196.72	1197.44	1197.52	1197.94	1198.58		1198.05	1199.08	1193.46		1196.84	1196.83	1198.18	1197.68	1196.46	1197.31	1197.46		1197.67	4.400	0.443	9.500	<0.05
3/10/95	chromium		0.110	ND	ND	ND	ND	ND	ND	ND		ND	ND	0.147		ND	ND	0.081	ND	ND	ND	ND		ND				
3/25/95	chromium																								4.330	0.428	11.200	<0.05
4/6/95	chromium																								3.817	0.416	9.810	<0.05
4/25/95	elevation			1198.54	1202.97	1196.99																						
4/25/95	chromium			ND	ND	ND																						
4/25/95	chromium																			1197.32 ND		1198.28 ND		1198.50 ND	3.725	0.434	9.010	0.062
5/8/95	chromium																								3.462	0.397	8.950	<0.05
5/15/95	elevation			1201.30	1204.09	1198.53	1199.38	1198.85																				
5/15/95	chromium	ND		ND	ND	ND		ND																				
5/31/95	chromium													1198.25 0.146		1198.82 ND		1199.56 0.082	1199.17 ND	1198.28 ND	1199.10 ND	1199.24 ND		1199.34 ND	3.378	0.395	8.325	<0.05
6/7/95	chromium																								3.391	0.366	7.360	<0.05
6/26/95	chromium																											
7/24/95	chromium																								3.802	0.376	7.820	0.053
7/28/95	elevation			1201.55	1206.34	1199.62																			5.780	0.446	7.000	<0.05
7/28/95	chromium			ND	ND	ND																						
7/31/95	chromium																			1198.67 ND		1200.67 ND		1201.32 ND	8.700	0.360	3.690	0.030
8/10/95	elevation	1202.14	1202.34	1204.62	1206.27	1201.22	1202.05	1202.69	1202.75	1203.28		1202.53	1203.50	1198.02		1201.50	1201.33	1202.74	1202.12	1201.02	1201.96	1202.09		1202.33	7.570	0.436	4.040	<0.05
8/10/95	chromium	ND	0.125	ND	ND	ND	ND	0.057	ND	ND		ND	ND	0.107		ND	ND	ND	ND	ND	ND	ND		ND				
8/[illegible]	chromium																											
8/[illegible]	chromium																											
9/26/95	chromium																								7.720	0.375	5.450	<0.05
9/28/95	chromium																								8.470	0.331	8.670	<0.05
10/5/95	elevation			1200.57	1204.61	1200.08																			9.410	0.389	7.020	<0.05
10/5/95	chromium			ND	ND	ND																			8.980	0.414	8.600	<0.05
10/16/95	chromium																			1200.09 ND		1200.76 ND		1201.47 ND				
10/25/95	chromium																								6.880	0.274	5.320	<0.05
11/6/95	elevation			1202.75	1204.60	1200.00		1200.09						1196.99		1200.57		1200.94	1200.83	1198.84	1200.02	1200.44		1201.26	9.550	0.319	2.500	<0.05
11/6/95	chromium			ND	0.072	ND		0.067						0.211		ND		0.075	ND	ND	0.088	ND		ND				
11/9/95	chromium																											
11/21/95	chromium																											
12/13/95	chromium																								6.120	0.289	6.340	<0.05
12/22/95	chromium																								8.410	0.252	10.500	<0.05
																									6.450	0.311	5.790	<0.05
																									6.420	0.281	5.420	1.110

TABLE 4-3

WELL SAMPLING ANALYSIS RESULTS

Exline, Inc. Groundwater Remediation KSGI File No. 96-010C
1996 DATA

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells.
Cr-total values are mg/l. Piezometric elevations are in feet.
"ND" indicates chromium was not detected in this sample. The detection limit for Cr-total is 0.05 mg/l.

Sampling Date	Parameter	Monitoring Wells																							Pumping Wells			
		A-2	B-1	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	G-1	B-7	C-9	E-3	SC-2
1/12/96	elevation			1202.77	1203.92	1199.74														1200.05		1200.60		1201.02				
1/12/96	chromium			ND	ND	ND														ND		ND		ND				
1/15/96	chromium																								6.520	0.300	6.050	0.040
1/29/96	chromium																								7.170	0.288	6.410	ND
2/8/96	elevation	1199.33	1199.11	1202.01	1204.18	1198.99	1199.53	1199.36	1199.81	1200.49		1200.12	1201.06	1196.72		1199.19	1199.20	1200.18	1199.81	1198.84	1199.13	1199.78		1199.91				
2/8/96	chromium	ND	0.115	ND	ND	ND		ND	ND	ND		ND	ND	0.039		ND	ND	ND	ND	ND	ND	ND		ND				
2/26/96	chromium																								6.320	0.333	7.220	ND
2/27/96	chromium																								7.060	0.347	8.850	ND
3/26/96	chromium																								5.460	0.340	10.200	ND
3/28/96	chromium																								5.610	0.362	8.760	ND
4/15/96	chromium																								5.690	0.383	9.850	ND
4/22/96	chromium																								5.510	0.336	7.730	ND
4/23/96	elevation			1201.37	1203.65	1198.46														1198.81		1199.58		1200.00				
4/23/96	chromium			ND	0.113	ND														ND		ND		ND				
5/14/96	chromium																								7.920	0.640	9.820	ND
5/23/96	elevation			1202.76	1204.33	1199.35		1200.45						1198.23		1199.88		1201.20	1200.73	1199.43	1200.38	1200.80		1200.49				
5/23/96	chromium			ND	ND	ND		ND						0.127		ND		0.078	ND	ND	ND	ND		ND				
5/28/96	chromium																								5.900	0.340	6.700	ND
6/17/96	chromium																								5.920	0.362	5.660	ND
6/28/96	chromium																								7.060	0.298	7.110	0.074
7/15/96	chromium																								10.200	0.376	7.340	ND
7/22/96	chromium																								9.330	0.355	5.900	ND
7/24/96	elevation			1200.23	1204.17	1199.51														1199.74		1202.66		1201.22				
7/24/96	chromium			ND	ND	ND														ND		ND		ND				
8/13/96	chromium																								8.920	0.314	5.100	ND
8/26/96	elevation	1201.16	1200.76	1203.24	1204.54	1199.49	1201.1[illegible]	1201.27	1201.52	1201.77		1201.35	1202.16	1197.69		1200.64	1199.85	1201.37	1200.89	1199.97	1200.67	1200.41		1199.87				
8/26/96	chromium	ND	0.319	ND	ND	ND	0.100	ND	ND	ND		ND	ND	0.171		ND	ND	ND	ND	ND	ND	ND		ND				
8/27/96	chromium																								8.780	0.307	4.430	0.062
[illegible]96	chromium																								8.810	0.157	6.060	ND
[illegible]96	chromium																								8.480	0.325	6.590	ND
10/10/96	elevation			1200.33	1203.26	1200.10														1199.79		1200.78		1201.42				
10/10/96	chromium			ND	ND	ND														ND		ND		ND				
10/11/96	chromium																								8.640	0.357	7.440	ND
10/28/96	chromium																								8.700	0.272	6.860	ND
11/20/96	elevation			1204.56	1204.73	1200.96		1203.20						1201.96		1201.98		1203.30	1202.24	1201.63	1201.80	1200.86		1202.76				
11/20/96	chromium			ND	ND	ND		ND						ND		ND		ND	ND	ND	ND	ND		ND				
12/11/96	chromium																								7.690	0.331	6.720	ND
12/30/96	chromium																								8.730	0.340	5.800	0.092

TABLE 4-3

1997 MONITOR AND RECOVERY WELL SAMPLING ANALYSIS RESULTS

Exline, Inc. Groundwater Remediation. SEI File No. 97-010C

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells.
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet.
"ND" indicates chromium was not detected in this sample. The detection limit for Cr-total i 0.05 mg/l.

		Monitoring Wells																						Pumping Wells			
Sampling Date	Parameter	A-2	B-1	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	G-1	B-7	C-9	E-3	SC-2
1/10/97	chromium																								7.020	0.290	5.360	ND
1/22/97	elevation			1202.70		1196.73									1204.51					1199.36		pumping		1200.50				
1/22/97	chromium			ND		ND									ND					ND		ND		ND				
1/29/97	chromium																								6.990	0.084	6.290	ND
2/10/97	chromium																								4.790	0.210	4.680	ND
2/17/97	elevation	1200.12	1199.37	1202.44		1196.58	1199.79	1199.82	1200.37	1200.78		1200.20	1201.14	1199.14	1204.02	1199.03	1199.23	1200.28	1200.17	1198.57	1199.62	pumping		1200.33				
2/17/97	chromium	0.086	0.153	ND		ND	0.174	ND	ND	ND		ND	ND	0.356	ND	ND	ND	ND	ND	ND	ND	ND		ND				
2/26/97	chromium																								6.290	0.235	7.090	ND
3/10/97	chromium																								6.440	0.344	6.420	ND
3/20/97	chromium																								5.230	0.307	5.660	ND
4/7/97	chromium																								6.870	0.358	7.530	ND
4/14/97	chromium																								5.550	0.354	5.800	ND
4/15/97	elevation			1198.57		1196.57									1203.95					1196.64		pumping		1199.18				
4/15/97	chromium			ND		ND									ND					ND		ND		ND				
5/7/97	chromium																								5.317	0.316	4.124	ND
5/15/97	chromium																								5.190	0.294	6.810	0.069
5/19/97	elevation			1201.53		1195.36		1196.15						1191.71	1203.46	1197.67		1199.07	1198.10	1196.41	1199.86	pumping		1196.92				
5/19/97	chromium			ND		ND		ND						0.127	ND	ND		ND	ND	ND	ND	ND		ND				
6/10/97	chromium																								3.990	0.319	5.410	ND
6/23/97	chromium																								4.300	0.259	5.730	ND
	chromium																								3.510	0.293	4.360	ND
	elevation			1199.58		1195.25									1202.01					1195.10		pumping		1197.54				
7/15/97	chromium			ND		ND									ND					ND		ND		ND				
7/18/97	chromium																								4.160	0.320	6.210	ND
8/13/97	chromium																								2.440	0.164	3.640	ND
8/25/97	chromium																								3.005	0.254	4.518	0.072
8/26/97	elevation	1197.63	1197.17	1200.67		1196.59	1197.41	1197.72	1198.33	1198.83		1197.79	1198.95	1193.37	1202.48	1197.14	1196.11	1198.66	1197.25	1196.24	1197.40	pumping		1198.00				
8/26/97	chromium	ND	0.138	ND		ND	0.057	0.126	0.187	ND		ND	ND	0.115	ND	ND	ND	ND	ND	ND	ND	ND		ND				
9/9/97	chromium																								2.975	0.262	4.066	ND
9/24/97	chromium																								2.413	0.259	3.531	0.054
10/2/97	chromium																								2.660	0.253	4.140	ND
10/23/97	elevation			1200.69		1197.05									1202.64					1196.93		pumping		1198.59				
10/23/97	chromium			ND		ND									ND					ND		ND		ND				
10/28/97	chromium																								2.252	0.203	3.256	ND
11/7/97	chromium																								2.039	0.276	3.229	0.066
11/13/97	elevation			1201.15		1197.05		1198.25						1193.95	1203.06	1197.59		1198.41	1197.84	1196.90	1197.75	pumping		1198.50				
11/13/97	chromium			ND		ND		ND						0.101	ND	ND		ND	ND	ND	ND	ND		ND				
11/24/97	chromium																								2.459	0.297	3.307	ND
12/4/97	chromium																								2.170	0.278	3.300	0.106
12/30/97	chromium																								2.805	0.282	4.037	0.024

TABLE 4-3 1998 MONITOR AND RECOVERY WELL SAMPLING ANALYSIS RESULTS

PROJECT: Exline, Inc Groundwater Remediation SEI File No 98-010C

DESCRIPTION: Total chromium and piezometric elevations for site monitoring and recovery wells.
NOTE: Cr-total values are mg/l. Piezometric elevations are in feet. "ND" indicates chromium was not detected in this samp e. The current QWAL Lab chromium reporting limit is 0.01 mg/L.

Sampling Date	Parameter	Monitoring Wells A-2	B-1	B-4	B-5	B-6	B-8	B-9	B-10	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	G-1	Pumping Wells B-7	C-9	E-3	SC-2
1/8/98	chromium																								2.370	0.449	3.650	0.058
1/20/98	elevation			1200.79		1195.87									1202.67					1194.87		pumping		1197.45				
1/20/98	chromium			ND		ND									ND					ND		ND		ND				
1/28/98	chromium																								1.970	0.233	3.140	0.027
2/6/98	chromium																								1.930	0.236	3.080	ND
2/23/98	chromium																								2.140	0.232	3.000	ND
2/24/98	elevation	1197.46	1197.51	1201.19		1196.30	1197.59	1198.18	1198.76	1199.31		1198.04	1199.37	1192.64	1203.20	1196.50	1195.95	1198.41	1197.35	1195.29	1197.59	pumping		1197.87				
2/24/98	chromium	0.018	0.046	ND		ND	0.016	ND	ND	0.066		ND	ND	0.075	0.035	ND	ND	0.023	ND	ND	ND	ND		ND				
3/5/98	chromium																								2.100	0.271	2.910	0.018
3/24/98	chromium																								2.040	0.235	3.150	0.031
4/7/98	chromium																								2.324	0.243	2.983	NA
4/24/98	elevation			1202.67		1199.15									1204.71					1198.35		pumping		1200.53				
4/24/98	chromium			0.033		0.023									0.030					0.039		0.025		0.023				
4/30/98	chromium																								2.940	0.278	2.970	NA
5/5/98	chromium																								2.550	0.237	2.790	NA
5/20/98	elevation			1202.53		1199.02		1199.66						1195.33	1204.31	1199.26		1200.02	1199.71	1198.18	1199.65	pumping		1200.50				
5/20/98	chromium			ND		ND		ND						0.069	ND	ND		ND	ND	ND	ND	ND		ND				
5/26/98	chromium																								2.720	0.198	2.710	NA
6/18/98	chromium																								2.880	0.257	3.570	NA
6/25/98	chromium																								2.960	0.246	3.070	0.015
7/13/98	chromium																								3.420	0.323	2.770	0.047
7/24/98	chromium																								3.733	0.252	3.148	0.024
7/28/98	elevation			1201.07		1196.78									1202.73					1195.72		pumping		1198.29				
7/28/98	chromium			ND		ND									ND					0.017		ND		ND				
8/10/98	chromium																								3.440	0.278	3.280	0.029
8/26/98	elevation	1198.06	1197.70	1200.77		1197.48	1198.00	1198.27	1198.83	1199.44		1198.47	1199.53	1193.37	1203.30	1197.28	1196.91	1198.71	1198.01	1196.08	1197.98	1196.90		1198.50				
8/26/98	chromium	0.016	0.118	ND		ND	0.029	0.080	0.112	ND		0.022	0.029	0.092	ND	ND	ND	ND	0.016	ND	0.049	ND		ND				
8/31/98	chromium																								3.470	0.265	2.790	0.026
9/15/98	chromium																								3.790	0.297	3.730	0.020
9/30/98	chromium																								3.320	0.295	3.200	0.022
10/19/98	chromium																								2.850	0.275	3.470	0.025
10/14/98	elevation			1201.07		1197.14									1203.08					1196.44		pumping		1198.80				
10/14/98	chromium			0.029		ND									ND					ND		ND		ND				
10/26/98	chromium																								3.830	0.290	3.050	0.019
11/10/98	chromium																								2.850	0.253	2.720	0.048
11/16/98	elevation			1203.77		1199.49		1201.00						1197.85	1206.06	1200.24		1201.36	1200.50	1199.04	1200.50	pumping		1201.15				
11/16/98	chromium			ND		ND		0.017						0.085	ND	ND		0.013	0.012	ND	ND	0.017		0.014				
11/23/98	chromium																								4.400	0.226	2.860	0.017
12/11/98	chromium																								4.540	0.254	2.720	0.023
12/30/98	chromium																								5.747	0.296	2.389	0.022

TABLE 4-3

1999 MONITOR AND RECOVERY WELL SAMPLING ANALYSIS RESULTS

Exline, Inc Groundwater Remediation SEI File No 99-010C

DESCRIPTION Total chromium and piezometric elevations for site monitoring and recovery wells

Cr-total values are mg/l Piezometric elevations are in feet "ND" indicates chromium was not detected in this sample The current QWAL Lab chromium reporting limit is 0 01 mg/L

Sampling Date	Parameter	Monitoring Wells																							Pumping Wells			
		A-2	B-1 *	B-4	B-6	B-8	B-9 *	B-10 *	B-11	B-12	C-1	C-3	C-4	C-5	C-6	C-8	D-1	D-2	D-3	E-2	SC-1	SC-3	G-1	G-2 **	B-7	C-9	E-3	SC-2
1/18/99	chromium																								4.610	0.351	2.887	0.022
1/14/99	elevation			1202.85	1197.86									1204.47					1197.01		pumping		1199.90					
1/14/99	chromium			ND	ND									ND					ND		ND		ND					
1/27/99	chromium																								3.994	0.241	2.796	0.024
2/8/99	elevation	1199.61	1199.44	1203.01	1198.09	1199.90	1200.08	1200.64	1201.27		1200.00	1201.31	1197.63	1205.13	1198.56	1197.70	1200.45	1199.53	1197.16	1199.64	pumping		1200.04					
2/9/99	chromium	0.022	0.220	ND	0.011	0.015	0.031	0.024	0.014		0.014	0.032	0.097	ND	ND	ND	0.027	ND	0.012	0.017	ND		0.020					
2/15/99	chromium																								4.540	0.270	2.560	0.020
2/24/99	chromium																								4.606	0.283	2.914	0.024
3/9/99	chromium																								4.112	0.242	2.845	0.015
3/24/99	chromium																								3.616	0.238	2.612	0.019
4/12/99	chromium																								4.881	0.310	3.161	0.022
4/20/99	elevation			1203.27	1199.19									1205.67					1198.09		pumping		1200.92					
4/20/99	chromium			0.012	ND									ND					ND		ND		ND					
4/28/99	chromium																								5.340	0.340	3.410	0.200
5/10/99	chromium																								4.420	0.310	3.440	0.050
5/12/99	elevation			1204.09	1200.71		1201.45						1196.87	1205.85	1201.08		1201.78	1201.09	1199.62	1202.44	pumping		1201.91					
5/12/99	chromium			ND	ND		0.018						0.099	ND	ND		0.033	ND	ND	0.020	ND		ND					
5/27/99	chromium																								3.960	0.310	2.850	0.030
[illegible]/99	chromium																								4.160	0.270	2.840	0.020
[illegible]21/99	chromium																								5.780	0.343	3.220	0.010
7/14/99	chromium																								5.830	0.340	3.710	0.020
7/28/99	chromium																								5.770	0.360	4.200	0.020
7/22/99	elevation			1203.57	1199.29									1205.08					1198.57		pumping		1201.41					
7/23/99	chromium			0.02	ND									0.02					0.02		0.01		0.01					
[illegible]/99	chromium																								6.406	0.240	4.310	0.010
[illegible]9	elevation	1200.28		1203.21	1196.69	1200.10			1201.48		1200.39	1201.40	1195.77	1204.41	1199.34	1198.41	1200.71	1199.79	1197.99	1200.20	pumping		1200.85	1200.53				
[illegible]9	chromium	0.050		ND	ND	0.020			0.010		0.010	0.020	0.070	ND	ND	ND	0.030	ND	0.010	0.010	ND		ND	ND				
8/27/99	chromium																								6.530	0.290	0.020	0.030
9/17/99	chromium																								6.540	0.314	3.130	0.017
9/24/99	chromium																								6.860	0.318	4.270	0.017
10/13/99	chromium																								6.930	0.329	4.360	0.016
10/26/99	elevation			1199.02	1196.99									1202.90					1196.25		pumping		1199.03					
10/26/99	chromium			0.01	ND									ND					0.016		ND		ND					
10/27/99	chromium																								6.700	0.306	4.000	0.016
11/12/99	chromium																								7.310	0.330	4.480	0.016
11/22/99	elevation			1201.47	1196.69									1202.90					1196.59		pumping		1198.59					
11/22/99	chromium			0.01	ND									ND					0.018		ND		ND					
11/29/99	chromium																								6.860	0.310	4.740	0.017
12/7/99	elevation			1201.57	1196.72	1198.13			1199.68				1193.72	1203.16				1197.83	1196.27		pumping		1198.68	1198.75				
12/7/99	chromium					0.029			ND				0.074					ND						0.010				
12/14/99	chromium																								6.090	0.334	4.490	0.016
12/29/99	chromium																								6.360	0.318	4.670	0.014

Wells B-1 B-9 and B-10 were plugged in July, 1999

- Well G-2 was drilled in July, 1999.

Table 4-4: Monitoring Wells
Table 4-5: Recovery Wells (also includes data from Scoular Elevator de-watering well SC-2, which was removed from the Exline recovery well network in 2008).

Plates 4-11, 4-12, 4-13, and 4-14 are total chromium iso-concentration maps of the site for the February, 1993, May, 1993, August, 1993, and November, 1993 sampling events, respectively. Plates 4-15, 4-16, 4-17, and 4-18 are total chromium iso-concentration maps of the site for the February, 1999, May, 1999, August, 1999, and November/December, 1999 sampling events, respectively. Finally, Plates 4-19 and 4-20 are total chromium iso-concentration maps for the site from the June, 2011 and December, 2011 sampling events, respectively.

4.4.3. Background and Residential Water Quality. Background chromium groundwater concentration at the site is represented by upgradient wells B-4 (past) and G-2 (present). Except for a few analyses, where cross-contamination via Exline, Inc. sampling personnel was suspected, total chromium was not typically detected in well B-4, which was sampled every 45 days as part of the site monitoring program through 2002. Besides these analyses, the KDHE database lists a non-detect (0.01 mg/L) analysis for hexavalent chromium on 4/24/87.

As shown in Tables 4-3 and 4-4 monitor well G-2 has been sampled on a semi-annual basis since 1999. That well has also typically exhibited non-detect chromium concentrations (detection limits have ranged from 0.005 mg/L to 0.1 mg/L). The highest detectable chromium concentration in that well measured 0.016 mg/L in May of 2002.

In addition to monitoring chromium in the plume area, Exline, Inc. has performed routine monitoring of downgradient residential water supply wells at the O'Neil Veterinary Clinic, Weber residence, and Bernhardt residence. Data for the residential well sampling are summarized in Table 4-6. The locations of these wells are shown on Plate 3-2.

Volatile Organic Compounds (VOCs) have been detected in groundwater at the Exline, Inc. facility. This VOC contamination is being investigated and remediated as the "Scoular Elevator project", as part of an Administrative Order (AO) between the KDHE Bureau of Environmental Remediation (BER) and Country Club Acres, LLC (Morrison Ventures and Research Products).

Prior to the AO, a Consent Order (CO) was executed between the KDHE and Morrison Enterprises in December, 1992. This CO required that Morrison Enterprises conduct a Comprehensive Investigation and Corrective Action Study (CI/CAS) to address VOC groundwater contamination at the Scoular Elevator site as well as adjoining properties (including Exline). VOCs addressed by the Consent Order are summarized below along with their respective Maximum Contaminant Levels (MCLs) or KDHE Tier 2 risk-based standards (source: Risk-Based Standards for Kansas, RSK Manual – 5th Version, KDHE BER, October, 2010):

1) 1,1-DCE: 7 μg/L
2) 1,1-DCA: 25 μg/L
3) chloroform: 80 μg/L
4) 1,1,1-TCA: 200 μg/L
5) carbon tetrachloride: 5 μg/L
6) PCE: 5 μg/L
7) TCE: 5 μg/L
8) benzene: 5 μg/L
9) EDB: 0.05 μg/L

TABLE 4-4: MONITOR WELL HISTORICAL CHROMIUM CONCENTRATION DATA - 2000 TO 2011
EXLINE, INC., SALINA, KANSAS

Sample Date	D-2 Cr Conc. (mg/L)	Sample Date	E-2 Cr Conc. (mg/L)	Sample Date	G-1 Cr Conc. (mg/L)	Sample Date	G-2 Cr Conc. (mg/L)	Sample Date	H-1 Cr Conc. (mg/L)
5/24/00	< 0.01	2/23/00	< 0.01	1/25/00	< 0.01	5/24/00	< 0.1	11/14/03	0.222
5/24/00	< 0.01*	8/23/00	0.015	1/25/00	< 0.01*	11/16/00	< 0.1	6/21/04	0.044
11/16/00	< 0.01	2/19/01	0.011	2/22/00	< 0.01	5/7/01	< 0.1	11/19/04	0.088
5/7/01	< 0.01	8/30/01	< 0.01	2/22/00	< 0.01*	11/21/01	< 0.1	6/14/05	0.088
11/21/02	< 0.01	8/30/01	< 0.01	4/27/00	< 0.01	5/13/02	< 0.1	11/14/05	0.049
5/13/02	< 0.01	2/19/02	< 0.01	5/24/00	0.012	11/5/02	0.016	6/15/06	0.05
11/5/02	< 0.01	8/8/02	< 0.01	7/13/00	0.01	5/14/03	< 0.01	10/5/06	0.061
5/14/03	< 0.01	8/8/02	< 0.01*	8/22/00	< 0.01	11/14/03	< 0.01	5/11/07	0.041
11/14/03	0.014	11/5/02	< 0.01	10/17/00	< 0.01	6/21/04	0.011	12/19/07	0.035
6/21/04	< 0.01	5/14/03	< 0.01	11/15/00	< 0.01	11/19/04	< 0.01	6/18/08	0.017
11/19/04	< 0.01	11/14/03	0.018	1/16/01	< 0.01	6/14/05	< 0.01	1/5/09	0.024
6/13/05	< 0.01	6/21/04	0.023	1/16/01	0.01*	11/14/05	< 0.01	6/16/09	0.029
11/14/05	0.011	11/19/04	< 0.01	2/19/01	< 0.01	6/15/06	< 0.01	12/17/09	0.034
6/15/06	< 0.01	6/13/05	< 0.01	4/10/01	< 0.01	10/5/06	< 0.01	6/24/10	0.035
10/5/06	< 0.01	11/14/05	0.012	4/10/01	< 0.01	5/10/07	< 0.01	12/28/10	0.034
5/11/07	< 0.01	6/15/06	< 0.01	5/7/01	< 0.01	12/19/07	< 0.01	6/20/11	0.028
12/19/07	< 0.01	6/15/06	< 0.01*	7/23/01	< 0.01	6/18/08	< 0.01	12/14/11	0.049
6/18/08	< 0.01	10/5/06	< 0.01	8/30/01	< 0.01	1/5/09	< 0.01		
1/5/09	< 0.01	10/5/06	< 0.01*	10/18/01	< 0.01	6/15/09	< 0.005		
6/16/09	< 0.005	5/11/07	< 0.01	10/18/01	< 0.01*	12/17/09	0.007		
12/17/09	0.007	5/11/07	< 0.01*	11/21/01	< 0.01	6/23/10	< 0.005		
6/24/10	< 0.005	12/19/07	< 0.01	1/10/02	< 0.01	12/27/10	< 0.10		
12/28/10	< 0.01	6/18/08	< 0.01	2/19/02	< 0.01	6/20/11	< 0.005		
6/20/11	< 0.005	6/18/08	< 0.01*	4/16/02	0.018	12/14/11	< 0.005		
12/14/11	< 0.005	1/6/09	< 0.01	4/16/02	0.012*				
		1/6/09	< 0.01*	5/13/02	< 0.01				
		6/16/09	< 0.005	6/24/02	< 0.01				
		12/17/09	< 0.005	8/8/02	0.013				
		12/17/09	< 0.005*	11/5/02	< 0.01				
		6/24/10	< 0.005	5/14/03	< 0.01				
		12/28/10	< 0.010	11/14/03	< 0.01				
		6/20/11	< 0.005	6/21/04	< 0.01				
		12/14/11	< 0.005	11/19/04	< 0.01				
				11/19/04	< 0.01				
				6/13/05	< 0.01				
				11/14/05	< 0.01				
				6/15/06	< 0.01				
				10/4/06	< 0.01				
				5/10/07	< 0.01				
				12/19/07	< 0.01				
				6/18/08	< 0.01				
				1/5/09	< 0.01				
				6/16/09	< 0.005				
				12/17/09	< 0.005				
				6/24/10	< 0.005				
				12/27/10	< 0.005				
				6/20/11	< 0.005				
				12/14/11	< 0.005				

* - denotes duplicate sample.

TABLE 4-4: MONITOR WELL HISTORICAL CHROMIUM CONCENTRATION DATA - 2000 TO 2011
EXLINE, INC., SALINA, KANSAS (continued)

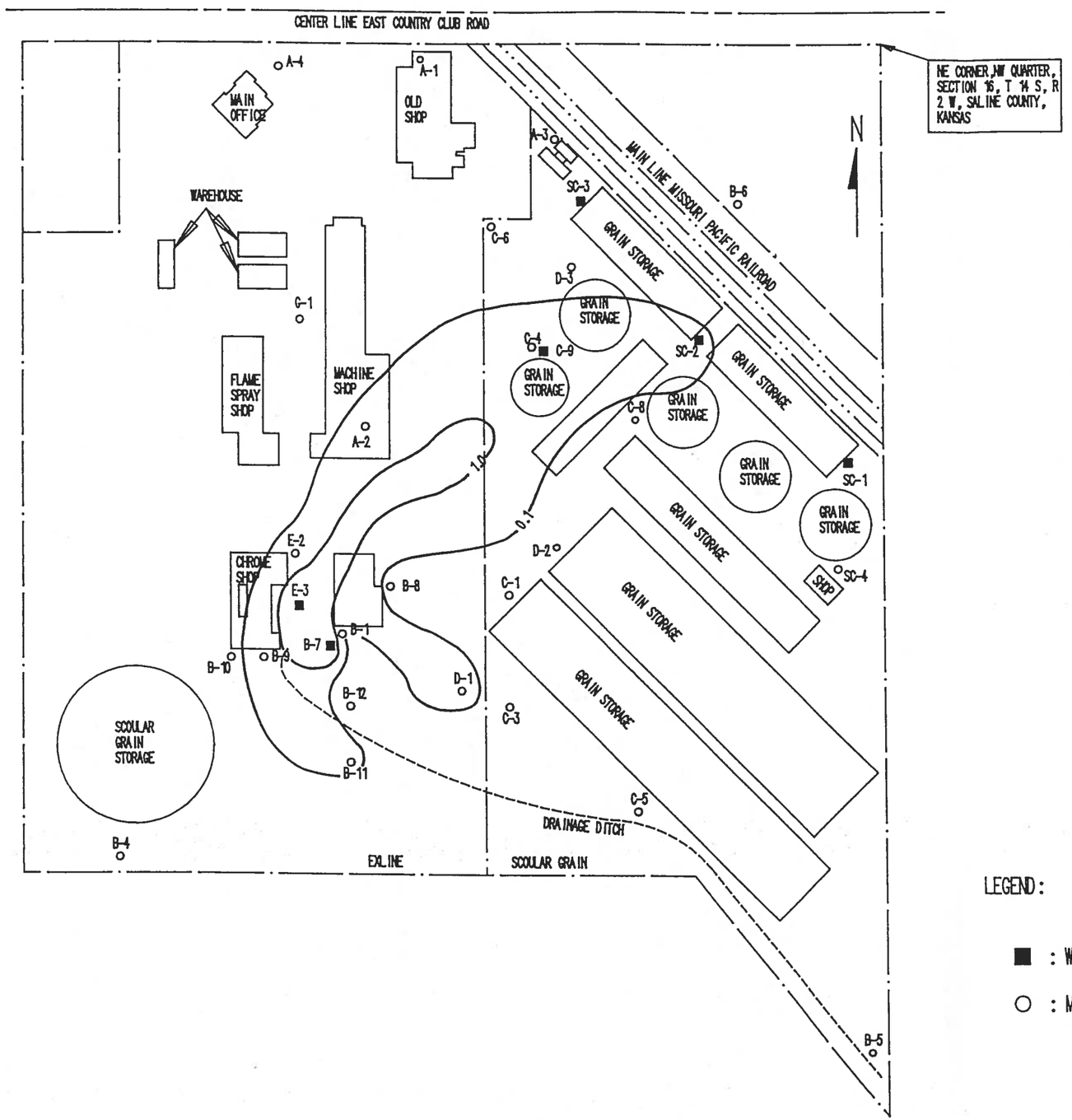
Sample Date	H-2 Cr Conc. (mg/L)	Sample Date	H-3 Cr Conc. (mg/L)	Sample Date	H-4 Cr Conc. (mg/L)	Sample Date	H-5 Cr Conc. (mg/L)	Sample Date	H-6 Cr Conc. (mg/L)
11/14/03	0.263	5/14/03	2.01	11/14/03	0.161	11/14/03	0.804	5/14/03	< 0.01
6/21/04	0.104	5/14/03	2.07*	06/21/04	< 0.01	6/21/04	0.6	11/14/03	< 0.01
6/21/04	0.105*	11/14/03	1.75	11/19/04	< 0.01	11/19/04	0.535	6/21/04	0.01
11/19/04	0.051	11/14/03	1.83*	06/13/05	< 0.01	6/13/05	0.504	11/19/04	< 0.01
6/14/05	0.016	6/21/04	1.64	06/13/05	< 0.01*	11/13/05	0.652	6/13/05	< 0.01
11/14/05	0.011	11/19/04	1.6	11/14/05	< 0.01	6/15/06	0.507	11/14/05	< 0.01
6/15/06	< 0.01	6/14/05	1.33	06/15/06	< 0.01	10/4/06	0.249	6/15/06	< 0.01
10/5/06	0.01	11/14/05	1.21	10/05/06	< 0.01	5/11/07	0.112	10/4/06	< 0.01
5/11/07	0.011	11/14/05	1.22*	05/11/07	< 0.01	12/19/07	0.083	5/10/07	< 0.01
12/19/07	0.041	6/15/06	1.06	12/19/07	< 0.01	6/18/08	0.087	12/19/07	< 0.01
6/18/08	0.092	10/5/06	1.01	06/18/08	< 0.01	1/5/09	0.274	6/18/08	< 0.01
1/5/09	0.159	5/11/07	1.1	01/05/09	< 0.01	6/16/09	0.234	1/5/09	< 0.01
6/16/09	0.141	12/19/07	0.971	06/16/09	0.074	12/17/09	0.225	6/15/09	< 0.005
12/17/09	0.087	12/19/07	0.938*	12/17/09	0.088	6/24/10	0.162	12/17/09	0.008
6/24/10	0.243	6/18/08	1.21	06/24/10	0.118	12/28/10	0.091	12/17/09	0.008
12/28/10	0.16	1/5/09	1.32	12/27/10	0.034	6/20/11	0.075	6/23/10	< 0.005
6/20/11	0.156	6/16/09	1.11	06/20/11	< 0.005	12/15/11	1.62	12/27/10	< 0.03
12/14/11	0.155	12/17/09	1.15	12/14/11	0.009			6/20/11	0.011
		6/24/10	0.974					12/13/11	0.016
		12/28/10	0.956						
		6/20/11	0.946						
		12/15/11	0.928						

* - denotes duplicate sample.

TABLE 4-5: RECOVERY WELL HISTORICAL CHROMIUM CONCENTRATIONS - 2000 TO 2011
EXLINE, INC., SALINA, KANSAS

Sample	Chromium Concentrations - mg/L				Sample	Chromium Concentrations - mg/L			
Date	C-9	B-7	SC-2	E-3	Date	C-9	B-7	SC-2	E-3
1/14/00	0.308	6.08	0.015	4.68	11/30/01	0.21	1.83	0.012	2.31
1/26/00	0.314	5.63	0.013	4.8	12/20/01	0.207	2.12	0.016	2.39
2/17/00	0.316	5.63	0.012	5.53	12/27/01	0.205	2.06	0.01	2.14
2/29/00	0.294	4.69	0.013	5.03	1/24/02	0.178	1.87	0.011	1.73
3/14/00	0.319	4.68	0.013	4.33	1/31/02	0.208	2.4	0.013	1.93
3/21/00	0.309	4.5	0.014	4.75	2/21/02	0.213	2.7	0.011	2.04
4/5/00	0.302	3.56	0.014	3.86	2/28/02	0.211	2.76	0.013	2.24
5/4/00	0.316	3.84	0.015	3.57	3/20/02	0.202	2.58	0.012	1.93
5/15/00	0.305	4.04	0.014	3.72	3/30/02	0.223	2.68	0.012	2.22
5/26/00	0.303	3.95	0.014	3.79	4/26/02	0.212	2.6	0.012	2.52
6/6/00	0.306	3.48	0.014	4.05	4/30/02	0.224	2.46	0.014	2.01
6/19/00	0.305	3.87	0.013	3.44	5/20/02	0.225	2.34	0.015	2.26
7/7/00	0.289	3.84	0.013	3.51	5/30/02	0.225	2.34	0.015	2.26
7/14/00	0.279	3.63	0.012	3.91	6/13/02	0.206	2.21	0.01	2.17
8/2/00	0.256	3.64	0.011	2.84	6/27/02	0.203	2.3	0.013	2.13
8/18/00	0.266	3.98	0.012	3.1	7/8/02	0.208	2.34	0.013	2.09
9/8/00	0.43	4.08	0.013	3.24	7/25/02	0.212	2.14	0.013	1.93
10/3/00	0.281	3.45	0.013	3.68	8/20/02	0.208	1.87	0.012	1.89
10/13/00	0.296	3.4	0.014	2.97	8/30/02	0.208	1.87	0.012	1.89
10/20/00	0.3	3.51	0.014	3.32	9/17/02	0.203	1.89	0.013	1.56
11/3/00	0.278	3.01	0.013	3.22	9/26/02	0.197	1.84	0.014	1.49
11/13/00	0.28	2.87	0.014	2.86	10/11/02	0.196	1.67	0.013	1.45
12/12/00	0.274	2.61	0.013	2.44	10/18/02	0.193	1.89	0.013	1.39
12/28/00	0.268	2.27	0.014	2.21	11/15/02	0.214	2.58	0.015	1.42
1/18/01	0.263	1.98	0.016	2.08	11/30/02	0.214	2.58	0.015	1.42
1/30/01	0.284	2.02	0.017	2.01	12/13/02	0.198	2.31	0.013	1.16
2/15/01	0.269	1.85	0.016	1.92	12/20/02	0.177	2.25	0.012	1.1
2/28/01	0.258	1.67	0.017	1.86	5/16/03	0.401	1.41	0.012	0.803
3/21/01	0.236	1.59	0.013	1.83	11/14/03	0.168	1.9	0.012	0.932
3/27/01	0.258	1.66	0.015	1.84	6/21/04	0.145	1.69	< 0.01	0.767
4/24/01	0.254	1.65	0.01	1.69	12/21/04	0.125	0.35	< 0.01	1.08
4/30/01	0.224	1.73	0.013	1.83	6/14/05	0.122	2.02	< 0.01	1.03
5/8/01	0.259	1.61	0.012	1.68	11/22/05	0.108	2.04	< 0.01	2.1
5/24/01	0.242	1.84	0.012	1.55	6/15/06	0.101	1.51	< 0.01	1.87
6/18/01	0.278	1.75	0.012	1.66	10/5/06	0.106	1.43	< 0.01	0.94
6/29/01	0.244	2.03	0.01	1.75	5/11/07	0.075	0.834	< 0.01	1.63
7/18/01	0.232	2.18	0.014	2.3	12/19/07	0.073	2.59	< 0.01	2.58
7/31/01	0.224	2.28	0.013	2.36	6/17/08	0.075	4.05	< 0.01	1.02
8/23/01	0.241	2.38	0.011	2.76	1/6/09	0.089	2.54	"DC"	5.42
8/30/01	0.227	2.24	0.012	2.95	6/16/09	0.079	1.39	"DC"	5.22
9/21/01	0.22	2.2	0.012	3.02	12/17/09	0.07	5.59	"DC"	2.21
9/28/01	0.22	2.15	0.012	2.78	6/23/10	0.069	2.07	"DC"	2.81
10/23/01	0.203	2.24	0.012	2.64	12/28/10	0.068	0.997	"DC"	2.52
10/30/01	0.2	2.08	0.012	2.49	6/20/11	0.069	0.775	"DC"	1.54
11/20/01	0.212	2.05	0.012	2.37	12/15/11	0.075	1.19	"DC"	0.85

"DC" denotes dis-continued operating.



CHROMIUM CONCENTRATIONS

Well	Concentration
2-24-1993 DATA	
B-1	0.100
B-4	ND(0.05)
B-5	ND(0.05)
B-6	ND(0.05)
B-8	ND(0.05)
B-9	0.375
B-10	ND(0.05)
B-11	0.111
B-12	0.083
C-1	0.063
C-3	ND(0.05)
C-4	0.550
C-5	0.053
C-6	0.063
C-8	0.070
D-1	0.162
D-2	0.074
D-3	0.065
E-2	0.136
SC-1	ND(0.05)
SC-3	ND(0.05)
G-1	0.058
2-25-1993 DATA	
B-7	1.536
C-9	0.608
E-3	1.173
SC-2	0.160

Concentrations in mg/L.
Variable Contour Interval

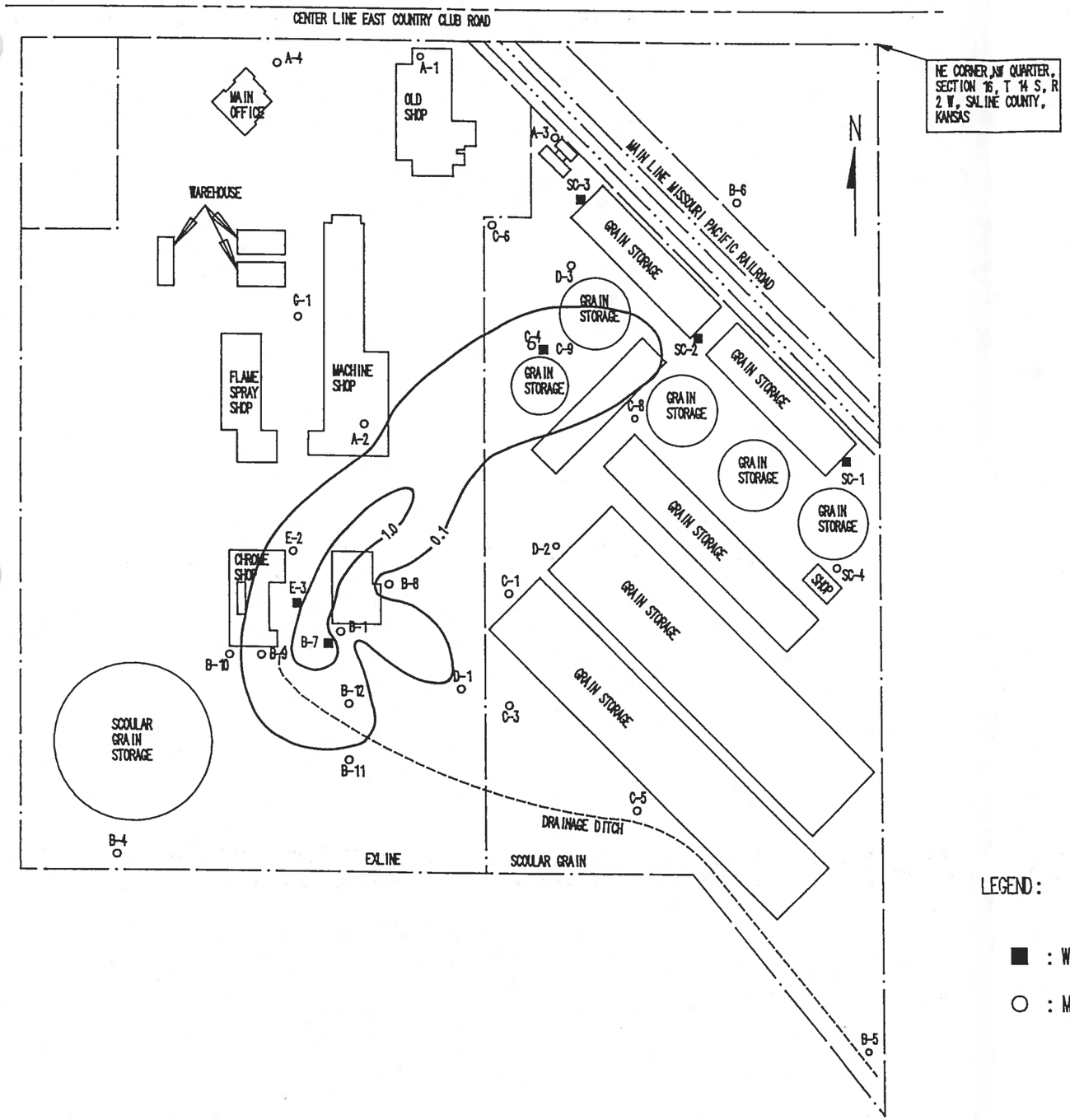
LEGEND:

■ : WITHDRAWAL WELL

○ : MONITOR WELL

PLATE 4-11

TITLE: 2-24 and 2-25-93 CHROMIUM ISOCONCENTRATION MAP EXLINE, INC., SALINA, KANSAS	SCALE: 1"=200'
KEJR SCIENCE GROUP, INC.	
DRN RTH / FILE NO.: 94-010C	DATE: February, 1994



CHROMIUM CONCENTRATIONS

Well	Concentration
5-21-1993 DATA	
B-7	1.529
C-9	0.351
E-3	0.950
SC-2	ND(0.05)
5-27-1993 DATA	
B-1	0.121
B-4	ND(0.05)
B-5	ND(0.05)
B-6	ND(0.05)
B-8	ND(0.05)
B-9	0.654
B-10	0.058
B-11	0.084
B-12	0.122
C-1	ND(0.05)
C-3	ND(0.05)
C-4	0.436
C-5	ND(0.05)
C-6	ND(0.05)
C-8	ND(0.05)
D-1	0.098
D-2	ND(0.05)
D-3	ND(0.05)
E-2	0.156
SC-1	ND(0.05)
SC-3	ND(0.05)
G-1	ND(0.05)

Concentrations in mg/L.
Variable Contour Interval

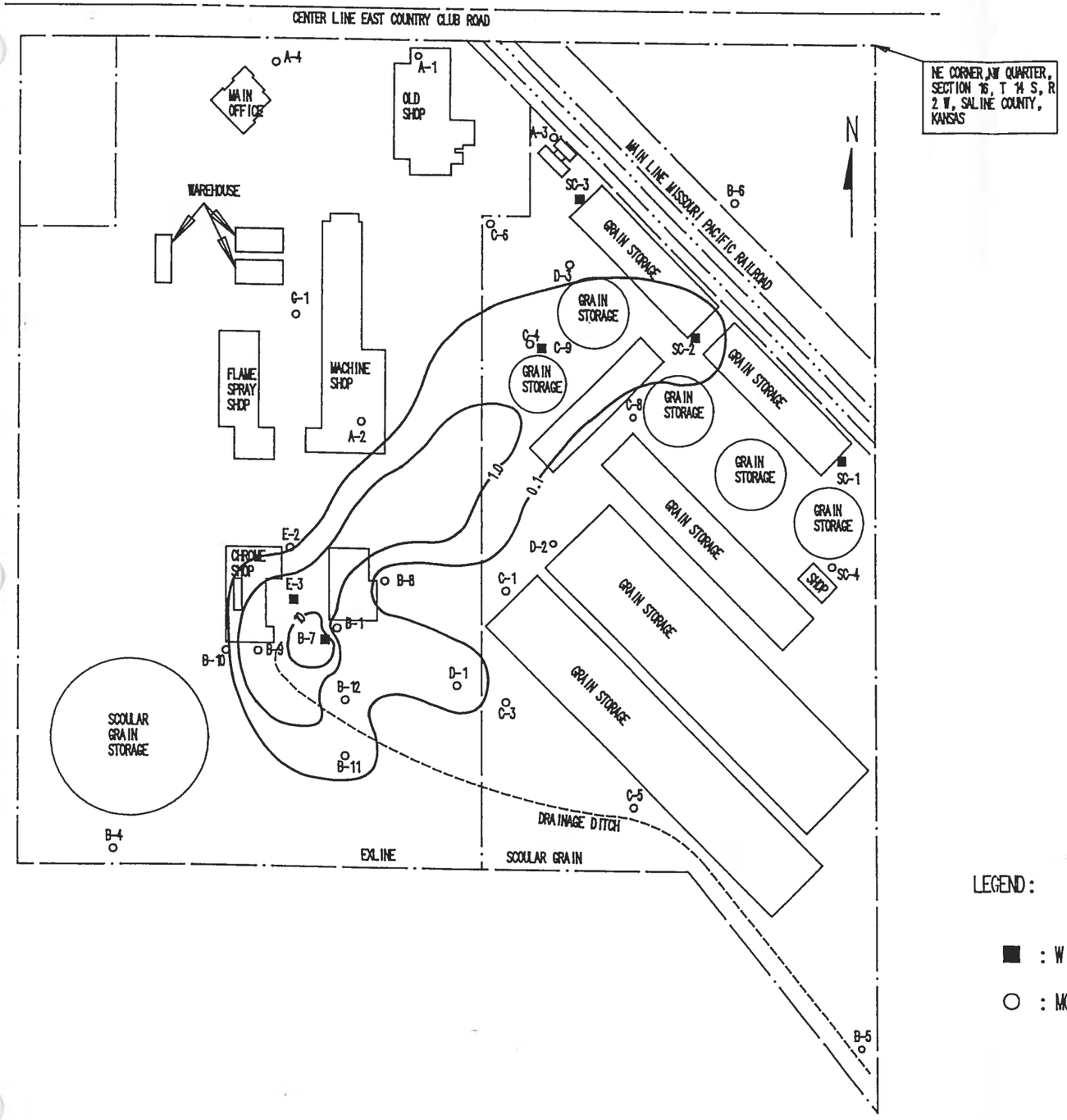
LEGEND:

■ : WITHDRAWAL WELL

○ : MONITOR WELL

PLATE 4-12

TITLE: 5-21 and 5-27-93 CHROMIUM ISOCONCENTRATION MAP EXLINE, INC., SALINA, KANSAS		SCALE: 1"=200'
KEJR SCIENCE GROUP, INC.		
DRN RTH	FILE NO.: 94-010C	DATE: February, 1994



CHROMIUM CONCENTRATIONS

Well	Concentration
8-18-1993 DATA	
A-2	ND(0.05)
B-1	0.144
B-3	0.859
B-4	ND(0.05)
B-5	0.072
B-6	ND(0.05)
B-8	ND(0.05)
B-9	8.160
B-10	ND(0.05)
B-11	0.194
B-12	0.118
C-1	0.056
C-3	0.090
C-4	0.406
C-5	ND(0.05)
C-6	ND(0.05)
C-8	ND(0.05)
D-1	0.119
D-2	ND(0.05)
D-3	ND(0.05)
E-2	0.100
SC-1	ND(0.05)
SC-3	ND(0.05)
G-1	ND(0.05)
8-25-1993 DATA	
B-7	12.800
C-9	0.556
E-3	4.390
SC-2	0.150

Concentrations in mg/L.
Variable Contour Interval

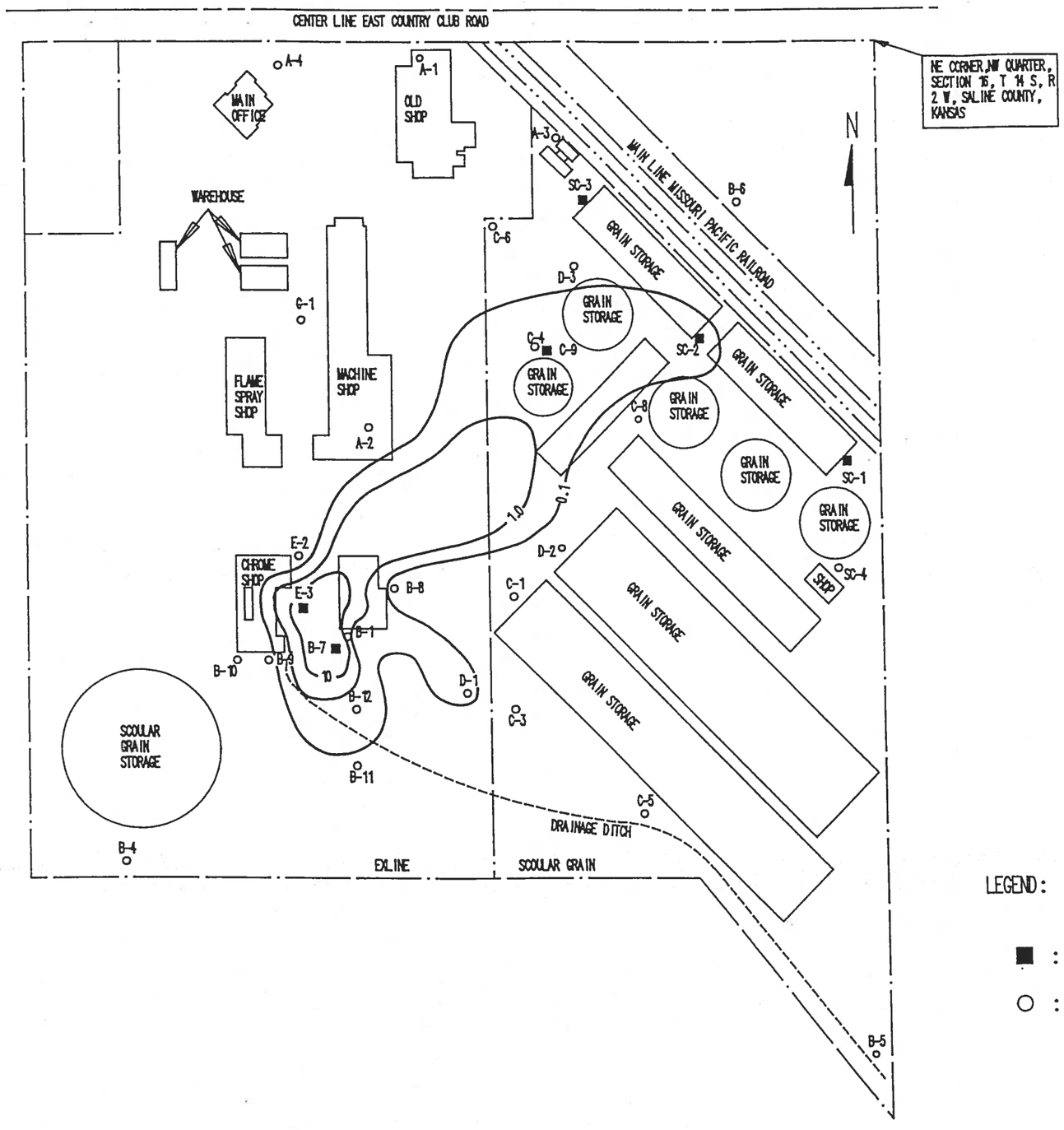
LEGEND:

■ : WITHDRAWAL WELL

○ : MONITOR WELL

PLATE 4-13

TITLE: 8-18 and 8-25-93 CHROMIUM ISOCONCENTRATION MAP EX.LINE, INC., SALINA, KANSAS		SCALE: 1"=200'
KEJR SCIENCE GROUP, INC.		
DRN RTH	FILE NO.: 94-010C	DATE: February, 1994



CHROMIUM CONCENTRATIONS

Well	Concentration
11-15-1993 DATA	
B-7	18.400
C-9	0.569
E-3	12.800
SC-2	0.128
11-18-1993 DATA	
B-4	ND(0.05)
B-5	ND(0.05)
B-6	ND(0.05)
B-9	0.077
C-4	0.468
C-6	0.064
D-1	0.154
D-2	0.060
D-3	ND(0.05)
E-2	ND(0.05)
SC-1	ND(0.05)
G-1	ND(0.05)

Concentrations in mg/L.
Variable Contour Interval

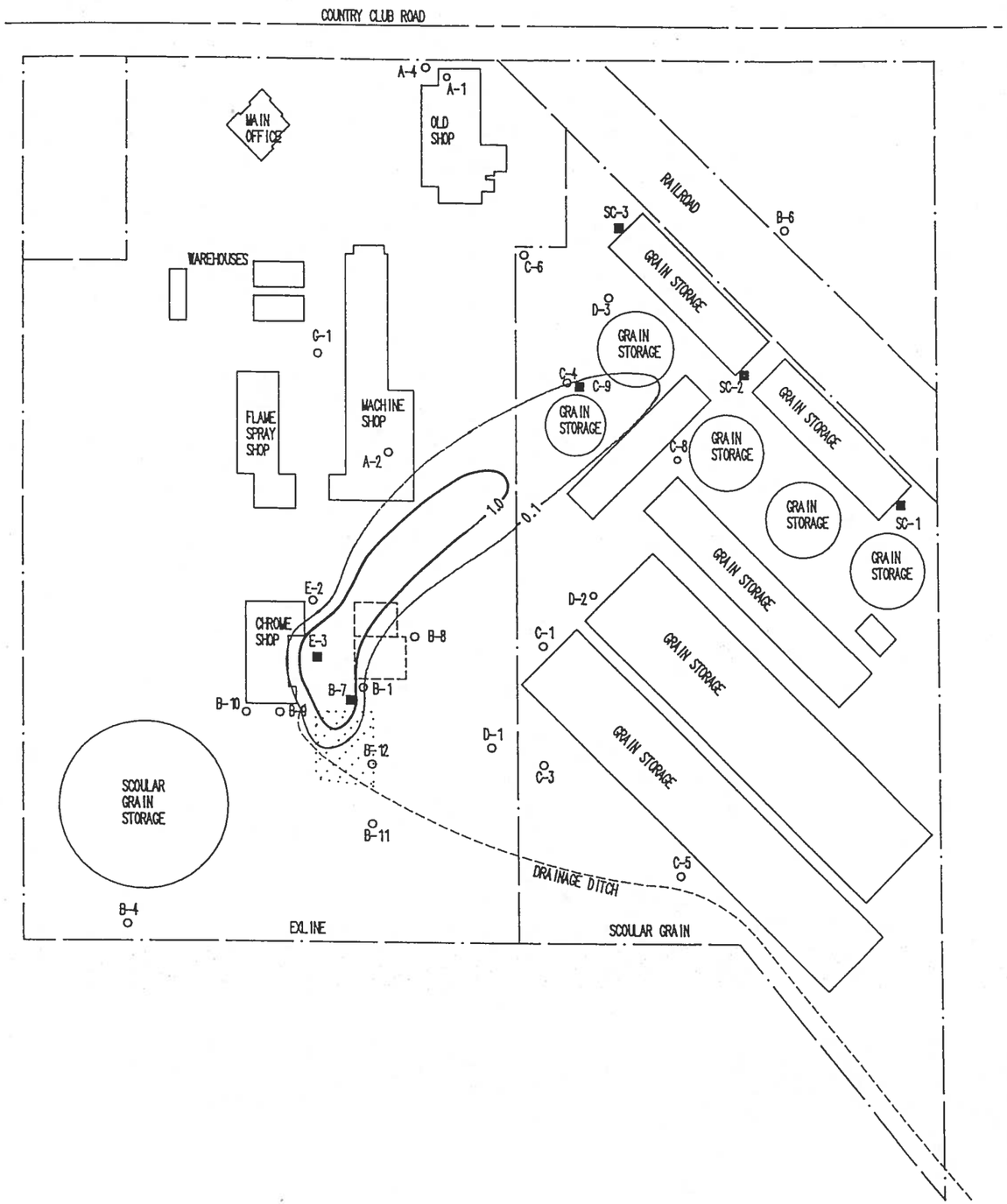
LEGEND:

■ : WITHDRAWAL WELL

○ : MONITOR WELL

PLATE 4-14

TITLE: 11-15 and 11-18-93 CHROMIUM ISOCONCENTRATION MAP EXLINE, INC., SALINA, KANSAS		SCALE: 1"=200'
KEJR SCIENCE GROUP, INC.		
DRN RTH	FILE NO.: 94-010C	DATE: February, 1994



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CHROMIUM CONCENTRATIONS

Well	Concentration
2-9-1999 DATA	
A-2	0.022
B-1	0.220
B-4	ND(0.01)
B-6	0.011
B-8	0.015
B-9	0.031
B-10	0.024
B-11	0.014
C-1	0.014
C-3	0.032
C-4	0.097
C-5	ND(0.01)
C-6	ND(0.01)
C-8	ND(0.01)
D-1	0.027
D-2	ND(0.01)
D-3	0.012
E-2	0.017
SC-1	ND(0.01)
G-1	0.020
2-15-1999 DATA	
B-7	4.540
C-9	0.270
E-3	2.560
SC-2	0.020

Concentrations in mg/L.
Variable Contour Interval

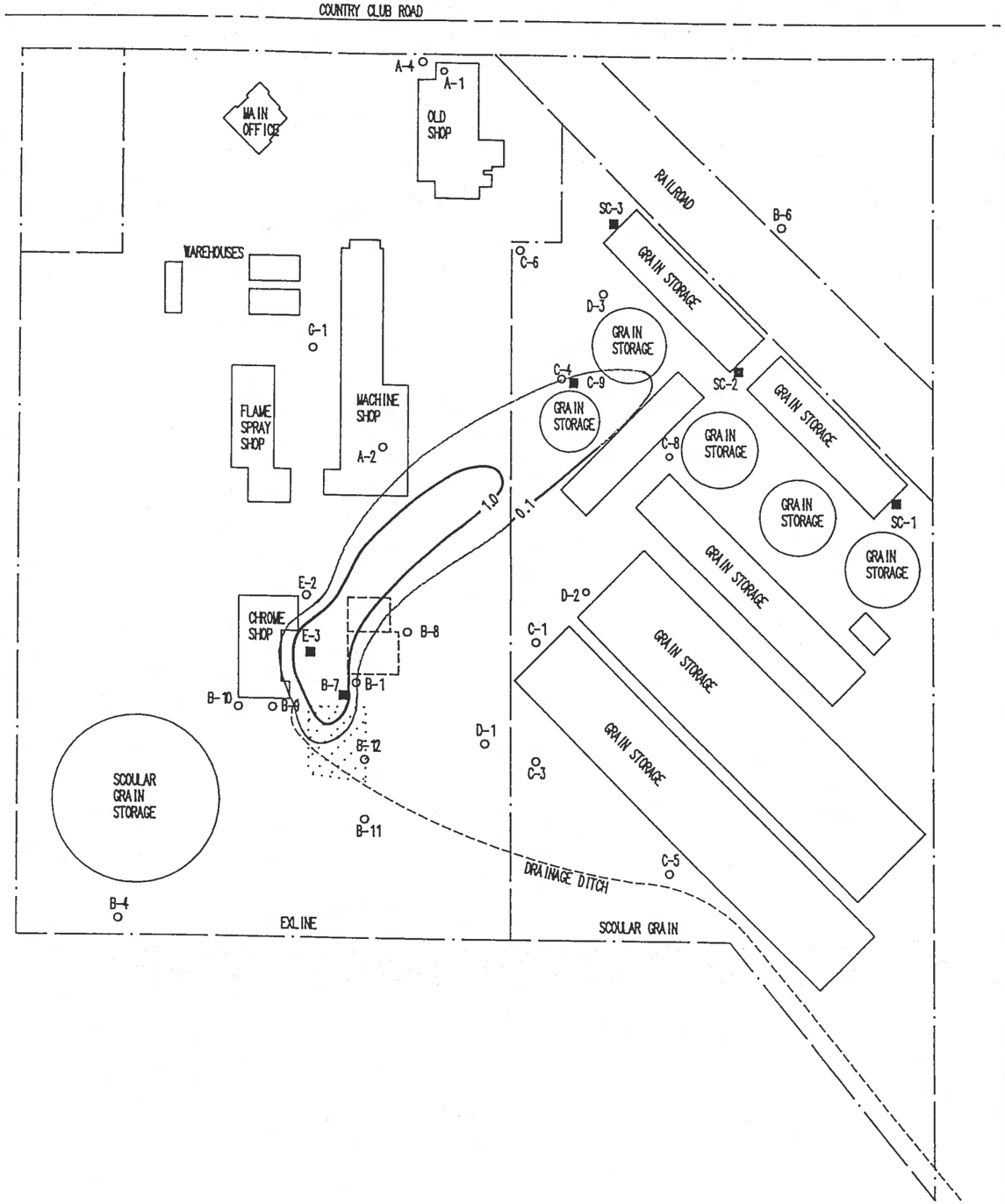
LEGEND:

■ : RECOVERY WELL

○ : MONITOR WELL

PLATE 4-15

TITLE: 2-1999 CHROMIUM ISOCONCENTRATION MAP EXLINE, INC., SALINA, KANSAS		SCALE: 1"=200'
Shepard Engineering, Inc.		
DRN RTH	FILE NO.: 00-010C	DATE: January, 2000



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CHROMIUM CONCENTRATIONS

Well	Concentration
5-10-1999 DATA	
B-7	4.420
C-9	0.310
E-3	3.440
SC-2	0.050
5-12-1999 DATA	
B-4	ND(0.01)
B-6	ND(0.01)
B-9	0.018
C-4	0.099
C-5	ND(0.01)
C-6	ND(0.01)
D-1	0.033
D-2	ND(0.01)
D-3	ND(0.01)
E-2	0.020
SC-1	ND(0.01)
G-1	ND(0.01)

Concentrations in mg/L.
Variable Contour Interval

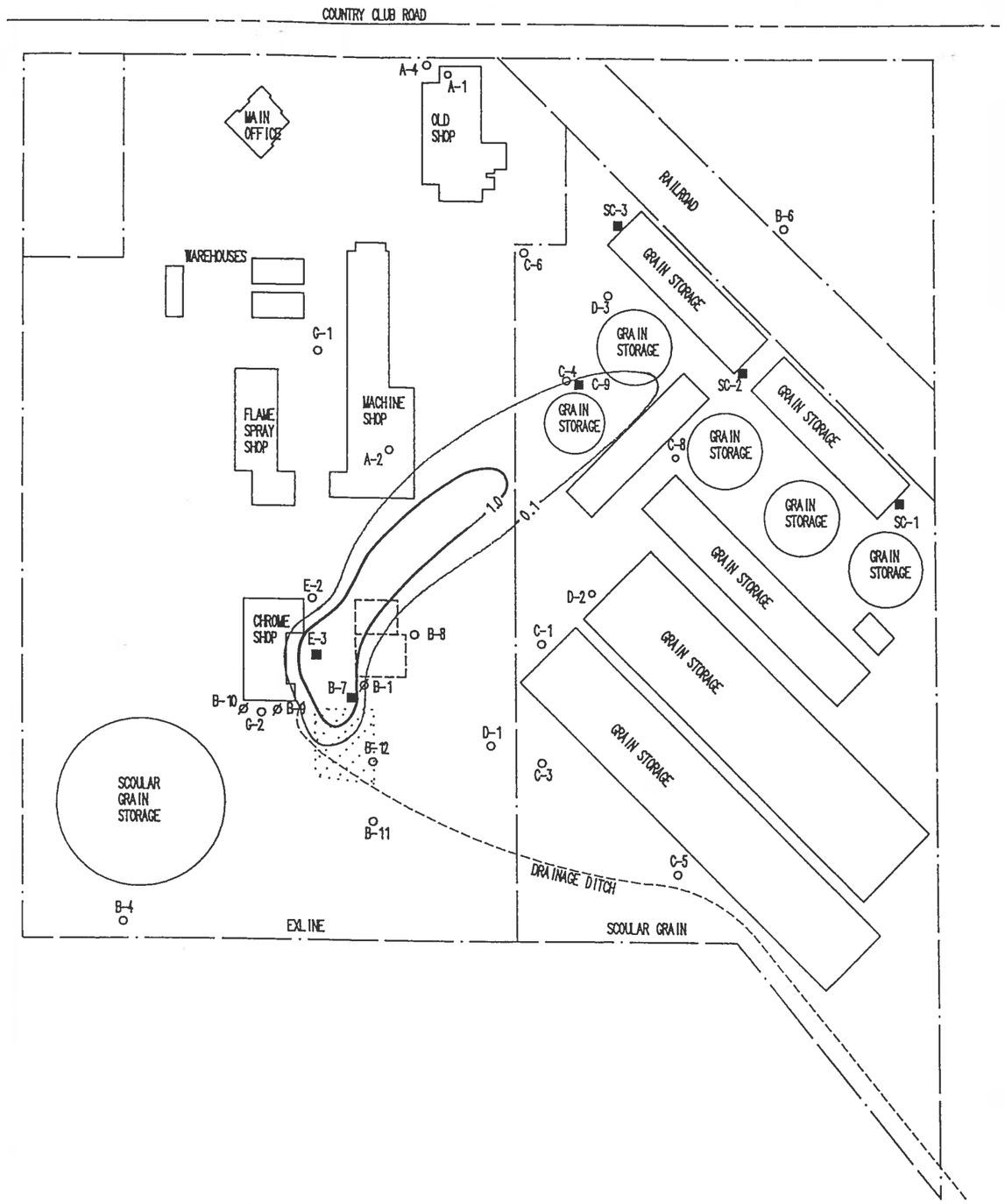
LEGEND:

■ : RECOVERY WELL

○ : MONITOR WELL

PLATE 4-16

TITLE: 5-1999 CHROMIUM ISOCONCENTRATION MAP EXLINE, INC., SALINA, KANSAS		SCALE: 1"=200'
Shepard Engineering, Inc.		
DRN RTH	FILE NO.: 00-010C	DATE: January, 2000



N

CHROMIUM CONCENTRATIONS

Well	Concentration
8-24-1999 DATA	
A-2	0.050
B-4	ND(0.01)
B-6	ND(0.01)
B-8	0.020
B-11	0.010
C-1	0.010
C-3	0.020
C-4	0.070
C-5	ND(0.01)
C-6	ND(0.01)
C-8	ND(0.01)
D-1	0.030
D-2	ND(0.01)
D-3	0.010
E-2	0.010
SC-1	ND(0.01)
G-1	ND(0.01)
G-2	ND(0.01)
8-27-1999 DATA	
B-7	6.530
C-9	0.290
E-3	0.020
SC-2	0.030

Concentrations in mg/L.
Variable Contour Interval

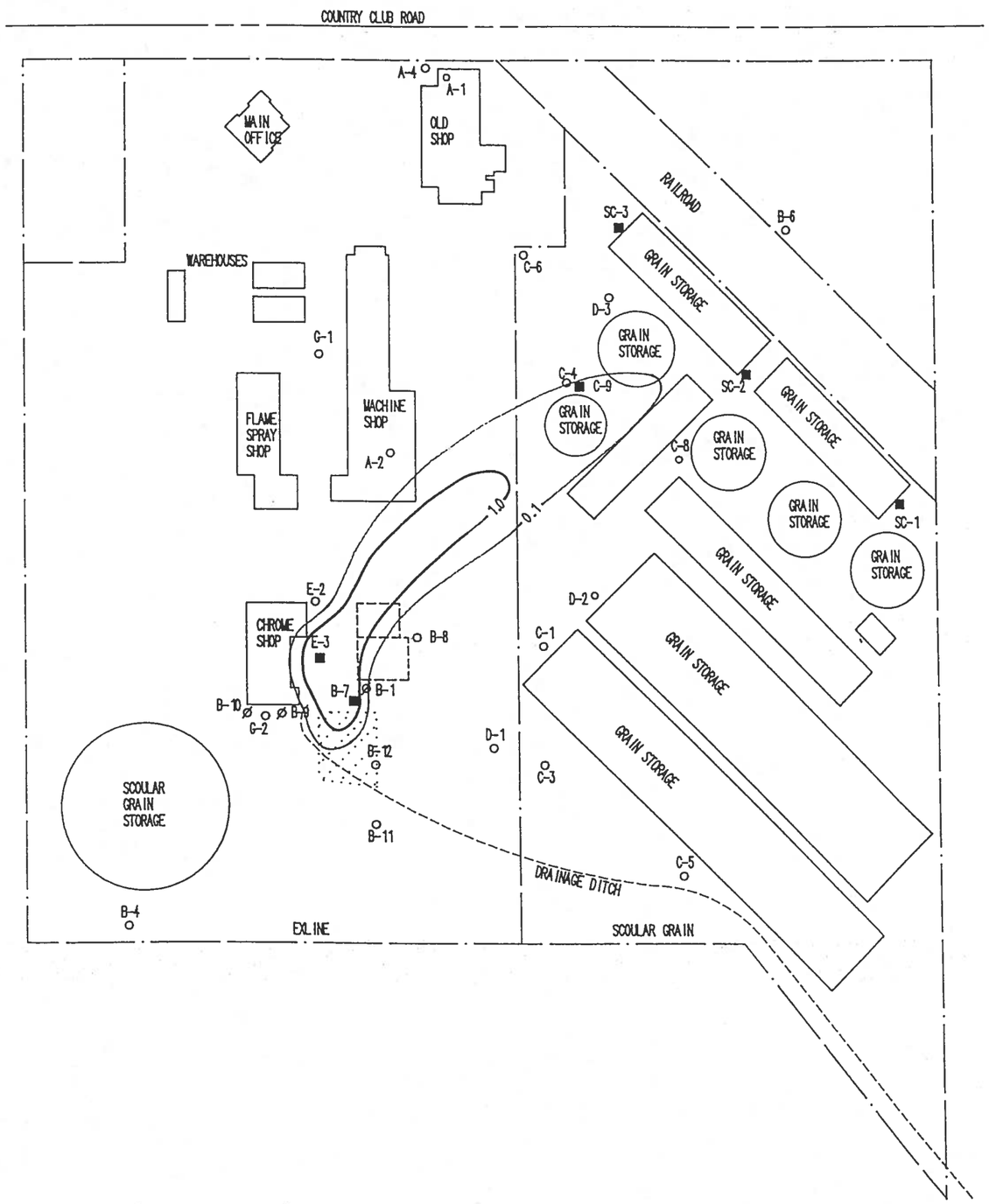
LEGEND:

■ : RECOVERY WELL

○ : MONITOR WELL

PLATE 4-17

TITLE: 8-1999 CHROMIUM ISOCONCENTRATION MAP EXLINE, INC., SALINA, KANSAS		SCALE: 1"=200'
Shepard Engineering, Inc.		
DRN RTH	FILE NO.: 00-010C	DATE: January, 2000



N

CHROMIUM CONCENTRATIONS

Well	Concentration
11-22-1999 DATA	
B-4	0.010
B-6	ND(0.01)
C-5	ND(0.01)
D-3	0.018
SC-1	ND(0.01)
G-1	ND(0.01)
11-29-1999 DATA	
B-7	6.860
C-9	0.310
E-3	4.740
SC-2	0.017
12-7-1999 DATA	
B-8	0.029
B-11	ND(0.01)
C-4	0.074
D-2	ND(0.01)
G-2	0.010

Concentrations in mg/L.
Variable Contour Interval

LEGEND:

■ : RECOVERY WELL

○ : MONITOR WELL

PLATE 4-18

TITLE: 11,12-1999 CHROMIUM ISOCONCENTRATION MAP EXLINE, INC., SALINA, KANSAS		SCALE: 1"=200'
Shepard Engineering, Inc.		
DRN RTH	FILE NO.: 00-010C	DATE: January, 2000

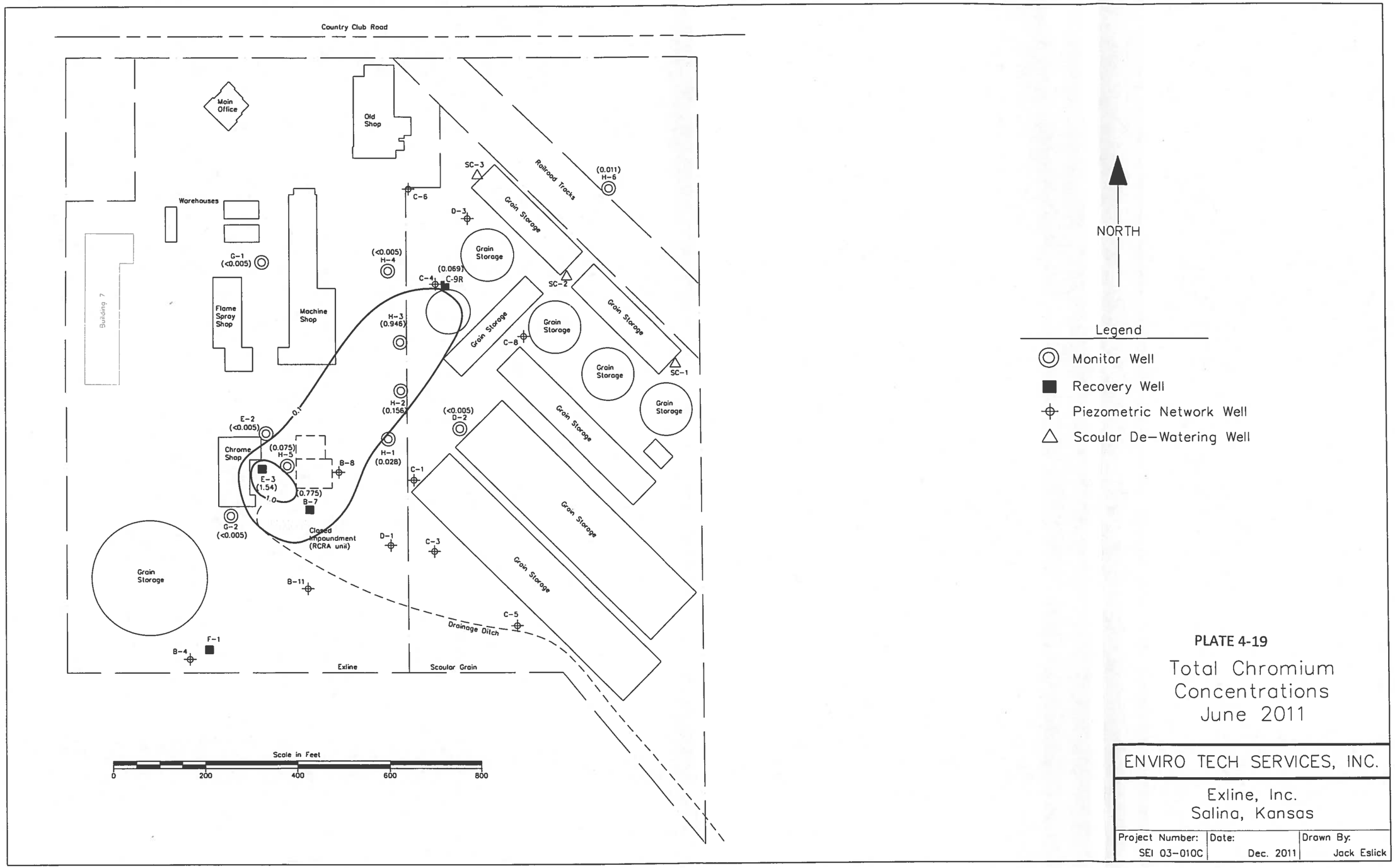
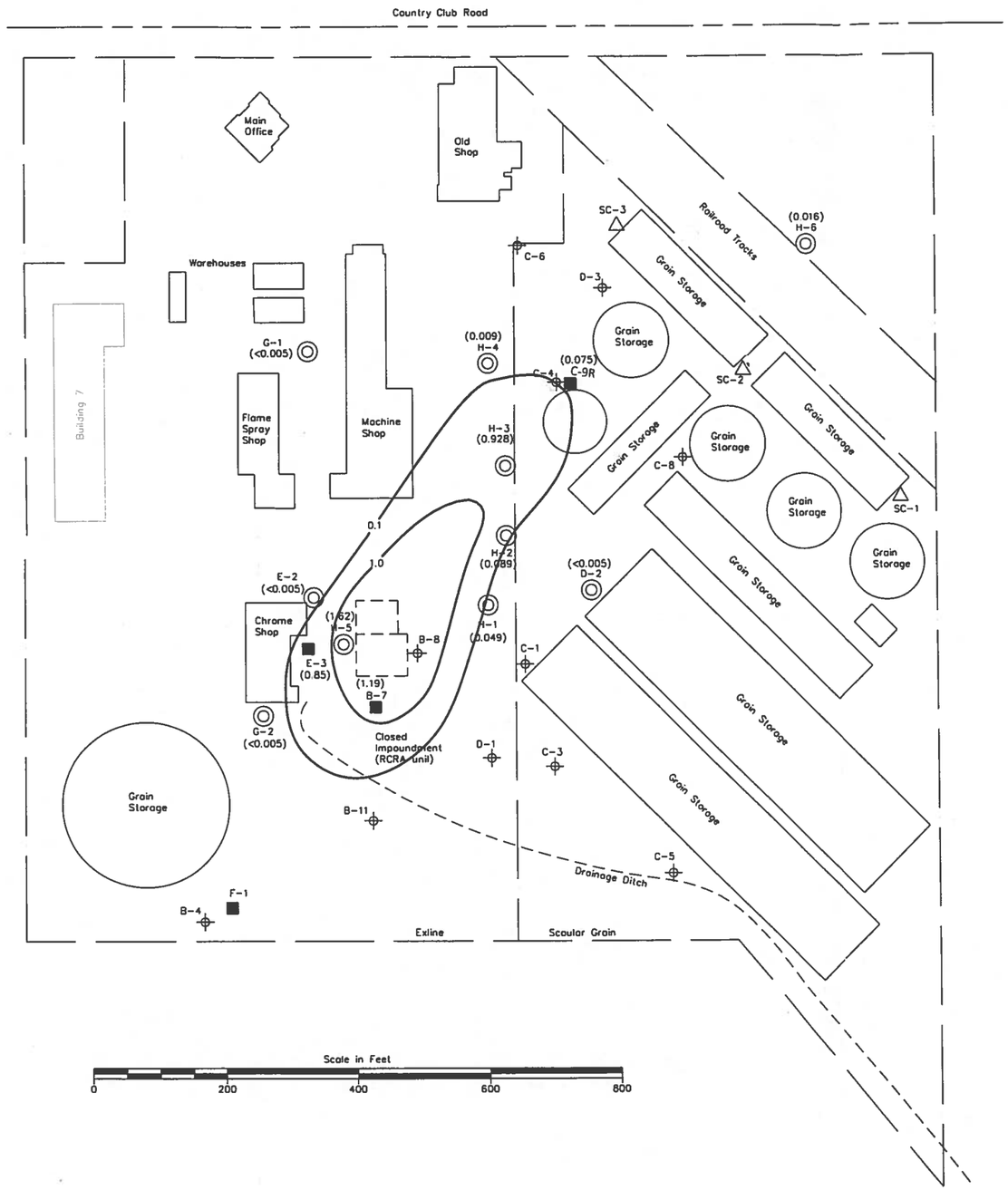


PLATE 4-19

Total Chromium Concentrations June 2011

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
Project Number: SEI 03-010C	Date: Dec. 2011	Drawn By: Jack Eslick



NORTH

Legend

- Monitor Well
- Recovery Well
- Piezometric Network Well
- Scoular De-Watering Well

PLATE 4-20

Total Chromium Concentrations December 2011

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn By:
SEI 03-010C	Dec. 2011	Jack Eslick

TABLE 4-6: TOTAL CHROMIUM ANALYSIS - RESIDENTIAL WELLS - EXLINE, INC., SALINA, KS

Sample Date	Well Cr Conc. - mg/L		
	Bernhardt	Weber	O'Neil
5/4/82	0.00001	0.0001	not anal.
6/2/82	0.004	0.0005	0.0005
6/9/82	0.0044	0.0051	0.05
6/16/82	0.008	0.001	0.0012
6/23/82	0.0017	0.0011	0.002
6/30/82	0.0035	0.0019	0.0016
7/8/82	0.0066	0.0016	0.0013
7/15/82	0.0035	0.0013	0.0012
8/23/82	0.0078	0.001	0.001
9/23/82	0.0093	0.001	0.0007
10/25/82	0.0045	0.001	0.0012
12/6/82	0.0065	0.0008	0.0006
12/22/82	0.0057	0.0005	0.0005
1/27/83	0.0042	0.0024	0.0005
3/9/83	0.005	0.0005	0.0005
4/29/83	0.003	0.0007	0.0005
5/27/83	0.003	not anal.	0.0005
3/21/84	0.0005	0.0005	0.0008
4/10/85	0.01	0.014	0.017
4/21/86	0.005	0.003	0.005
4/21/87	0.01	0.007	0.004
4/28/88	0.014	0.005	0.007
5/26/89	0.0058	0.0024	0.0084
5/16/90	0.0041	ND (0.001)	ND (0.001)
5/21/91	0.008	ND (0.001)	ND (0.001)
5/19/92	0.07	0.077	0.082
5/27/93	ND (0.05)	ND (0.05)	ND (0.05)
5/18/94	ND (0.05)	ND (0.05)	ND (0.05)
5/15/95	ND (0.005)	ND (0.005)	ND (0.005)
5/28/96	ND (0.05)	ND (0.05)	ND (0.05)
8/22/97	ND (0.05)	ND (0.05)	ND (0.05)
5/26/98	ND (0.05)	ND (0.05)	ND (0.05)
5/12/99	ND (0.01)	ND (0.01)	ND (0.01)
5/25/01	ND (0.01)	ND (0.01)	ND (0.01)
5/7/01	0.032	ND (0.01)	ND (0.01)
7/23/01	ND (0.01)	not anal.	not anal.
5/13/02	ND (0.01)	ND (0.01)	ND (0.01)
5/14/03	ND (0.01)	ND (0.01)	ND (0.01)
6/21/04	ND (0.01)	ND (0.01)	ND (0.01)
6/13/05	ND (0.01)	ND (0.01)	ND (0.01)
6/15/06	ND (0.01)	ND (0.01)	ND (0.01)
5/10/07	ND (0.01)	ND (0.01)	ND (0.01)
6/17/08	ND (0.01)	ND (0.01)	ND (0.01)
6/15/09	0.006	ND (0.005)	0.005
6/24/10	ND (0.005)	ND (0.005)	ND (0.005)
6/20/11	ND (0.005)	ND (0.005)	ND (0.005)

ND denotes non-detect with the detection limit in parentheses

Carbon tet and EDB contamination was identified as being sourced from activities at the Scoular Elevator site, which is located east of the Exline facility. The only activity positively identified from soil sampling and personnel interviews is a 300 to 600 gallon fumigant release by a Research Products Company delivery vehicle in 1963 near a grain dump pit at the upright elevator on the Scoular property.

Carbon tet and EDB concentrations have been detected in the groundwater at concentrations, which exceed their respective MCL on the Scoular and Exline properties, as well as, down-gradient from the Scoular property. The downgradient edge of the contamination is located approximately ½ mile from the Scoular facility. Carbon tet and EDB concentrations have been measured at levels as high as 2200 μg/L and 48.9 μg/L in the groundwater.

In addition, three solvent/solvent degradation compounds have been detected in the groundwater on both the Exline and Scoular property at or near the MCLs for the respective compounds. These three VOCs are (max concentration of the respective VOC measured in the groundwater is shown in parentheses): 1,1-dichloroethane (65 μg/L), 1,1-dichloroethylene (25.8 μg/L), and tetrachloroethylene (24.0 μg/L). Although extensive groundwater probe and monitor well sampling has been conducted, the exact source(s) of these compounds has not been determined. The difficulty of pinpointing sources at this site is due, in part, to contaminant "smearing" in groundwater, which occurred when VOC-contaminated groundwater, recovered in one of the Exline pumping wells (SC-2) returned to the aquifer via infiltration under the chromium treatment system settling basins. The installation and operation of an air stripper as part of the groundwater treatment system at the Exline facility resulted in a significant reduction of this "smearing" effect.

At present, only one Exline recovery well contains VOCs above their MCLs: C-9R. This well currently discharges directly into the City of Salina sewer system.

A summary of the VOC concentration data for Exline recovery well C-9R is presented in Table 4-7. Data are presented for those VOCs, which have been detected, above their respective MCLs.

The KDHE Bureau of Environmental Remediation (BER) agreed to allow the investigation and remediation of site VOCs to be conducted under the Scoular Site AO. This was done as there was no clear source of the non-grain fumigant VOCs and all of the VOCs were co-mingled in the aquifer.

A Corrective Action Study (CAS) Final Report was submitted on behalf of Morrison Enterprises to the KDHE BER in August of 1997 (following the submission of two earlier draft reports) by Shepard Engineering, Inc. This CAS Report was subsequently approved by the KDHE in August of 1997. The CAS Report addressed the remediation of VOCs in the groundwater by pumping and treating with an air stripper.

The KDHE issued a final Corrective Action Decision (CAD) in October of 2000. This CAD specified that three (3) recovery wells shall be installed and operated in the VOC plume area downgradient from the Scoular facility. Four (4) recovery wells have been installed and are currently operating. Two recovery wells (RW-1 and RW-2) and Scoular de-watering well SC-3 are discharged to a groundwater treatment system (GWTS # 1). That system treats the groundwater using an air stripper and activated carbon. The discharge is regulated by an NDPES permit. GWTS # 1 was started up in October of 2009.

TABLE 4-7 RECOVERY WELL C-9R VOC DATA - EXLINE, INC., SALINA, KS

Sample Date	Concentrations - ug/L		
	Carbon Tet	EDB	1,1-DCE
6-7-93	140	16	11
12-20-93	93	8.2	15
1-20-94	NA	6.3	NA
6-8-94	66	6	9.4
9-2-94	52	7.2	7.8
12-13-94	69	2.6	5.6
7-18-95	ND(0.2)	10	6.3
7-11-96	83	6.7	7.2
6-16-97	33	4.4	3.5
6-1-98	44.8	2.6	5.1
9-2-99	26.1	1.8	5.4
9-6-00	22.4	1.4	4.1
9-4-01	22.6	2.2	3.6
9-4-02	19.4	2	ND(0.5)
9-17-03	21.4	1.9	3.8
12-1-04	44.5	7.1	2.2
10-4-05	56.9	7	ND(3)
9-25-06	91.6	12	2.1
9-6-07	94	9.9	ND(2)
9-15-08	26.9	4.3	ND(1)
10-15-09	68	6.7	ND(1.0)
1-14-10	82.5	7.1	NA
4-29-10	59.1	1.7	ND(1)
7-27-10	73.4	7.3	NA
10-15-10	107	8.9	NA
10-15-10*	79.5	8.2	NA
2-4-11	78	6.3	NA
4-20-11	82.2	5.9	NA
7-14-11	52.9	5.4	NA
10-12-11	44.9	4.9	NA
1-30-12	45.3	3.4	NA
4-26-12	36	3.8	NA
4-26-12*	34.6	3.1	NA

Table 4-7 Notes:

1. NA denotes that sample was not analyzed.
2. * - denotes duplicate sample.
3. "ND" denotes - not detected with the detection limit in parentehses.

Recovery wells RW-3 and RW-4 are located at the end of the VOC plume – north of North Street. Those wells are pumped to a 2nd groundwater treatment system (GWTS # 2). That system also includes air stripping and activated carbon with the discharge regulated by an NPDES permit. GWTS # 2 was started up in April of 2012.

Monitoring wells are sampled in accordance with a Site Monitoring and Performance Evaluation Plan, which has been prepared for the site.

Additional information regarding the Scoular Elevator VOC investigation and remediation can be found in the following documents:

1) Consent Order for Comprehensive Investigation and Corrective Action Study, Scoular Elevator Site, Salina, Kansas, Case No. 91-E-214, effective date – 12/23/92.

2) Comprehensive Investigation Report, Scoular Elevator Site, Salina, Kansas, November, 1994.

3) Corrective Action Study Report, Scoular Elevator Site, Salina, Kansas, August, 1997.

4) Corrective Action Plan, Scoular Elevator Site, Salina, Kansas, May, 2008.

5) Site Monitoring and Performance Evaluation Plan, Scoular Elevator Site, Salina, Kansas, October, 2011.

4.5. Groundwater Monitoring. The following is a demonstration of how Exline will meet the specific requirements set forth in 40 CFR § 264.97 (general requirements), § 264.99 (compliance monitoring), and § 264.100 (corrective action monitoring).

4.5.1. General Groundwater Monitoring Requirements – 40 CFR § 264.97. The Exline, Inc. groundwater monitoring system has been designed to meet the following requirements as set forth in 40 CFR § 264.97:

1) A sufficient number of wells have been installed at appropriate locations and depths to yield groundwater samples that represent the quality of groundwater passing the point of compliance and allow for the detection of chromium that has migrated from the waste management area to the uppermost aquifer. Four monitoring wells (H-1, H-2, H-3, and H-4) have been located at the edge of the Exline property boundary and down-gradient of the closed surface impoundment. These four wells will be sampled on a periodic basis to yield samples that represent the quality of groundwater passing the point of compliance. For statistical comparisons, detection limits will be used in lieu of background values.

2) All monitoring wells have been cased in a manner that maintains the integrity of the monitoring well bore hole. In addition, the annular space above the sampling depth has been sealed to prevent contamination of samples and the groundwater.

3) The groundwater monitoring program includes consistent sampling and analysis procedures that are designed to insure valid monitoring results. These procedures are outlined in a document entitled: "Sampling and Analysis Plan" (SAP), which is included as Attachment 4-3. The SAP includes specifications for the procedures and techniques, which address:

- Sample collection.
- Sample preservation and shipment.
- Analytical procedures.
- Chain of custody control.

The specified sampling and analysis methods are designed to ensure accurate measurement of total chromium in groundwater samples.

4) Groundwater surface elevations will be measured each time a groundwater sampling event is conducted.

5) Sampling and analysis will be conducted to meet the statistical analysis requirements set forth in 40 CFR § 264.97 (g). This part of the regulations outlines the requirements relative to detection monitoring and compliance monitoring. Exline is currently implementing a corrective action monitoring program. When Exline moves to the compliance monitoring program, statistical analyses will be conducted as outlined in Attachment 4-4.

4.5.2. Compliance Monitoring Program – 40 CFR § 264.99. The Exline, Inc. groundwater monitoring program has been designed to meet the requirements for a Compliance Monitoring Program as set forth in 40 CFR § 264.99. Since the groundwater protection standard for chromium (0.10 mg/L) has been exceeded in the groundwater downgradient of the compliance point, then Exline, Inc. is currently not under the Compliance Monitoring Program. However, as described below, the elements will be in place for Exline to conduct Compliance Monitoring in the future, when the chromium concentration in the groundwater at the compliance point has decreased below the groundwater protection standard of 0.10 mg/L for total chromium. Elements of the Exline, Inc. Compliance Monitoring Program, which are designed to meet the requirements of 40 CFR § 264.99, are outlined below.

1) A sampling program will be conducted for total chromium in the groundwater, which determines whether the regulated unit (i.e., closed surface impoundment) is in compliance with the groundwater protection standard for total chromium (0.10 mg/L). Samples will be collected from four compliance point wells (H-1, H-2, H-3, and H-4) located downgradient from the regulated unit at the edge of the Exline property. These samples will be collected on a semi-annual basis for comparison of the groundwater protection standard for chromium – 0.10 mg/L. These four wells could not be installed at the downgradient edge of the regulated unit due to physical constraints at the site (e.g., traffic patterns). Monitoring wells H-5 and H-6 will also be sampled on a semi-annual basis for total chromium. Monitoring well H-5 has been located in the chromium plume, down gradient from the Exline Cylinder (formerly Chrome) Shop. Monitor well H-6 is located downgradient from the farthest down-gradient recovery well – C-9R.

2) Exline has installed a groundwater monitoring system at the compliance point. The compliance point shall be specified by the Regional Administrator. This groundwater monitoring system will comply with 40 CFR, § 264.97 (a) (2), (b), and (c). As discussed earlier, this monitoring system includes four monitoring wells (H-1, H-2, H-3, and H-4) located downgradient of the regulated unit at the edge of the Exline property boundary.

3) Exline, Inc. will conduct sampling procedures and statistical methods, which are consistent with 40 CFR § 264.97 (g) and (h). These procedures and methods are outlined in

Attachments 4-3 (Sampling and Analysis Plan) and 4-4 (Statistical Analysis Methods for Compliance Monitoring). This sampling program will satisfy the following elements:

- Sampling will be conducted for total chromium in accordance with 40 CFR § 264.97 (g), with the following exception. Samples shall not be collected from background wells. The detection limit of 0.01 mg/L will be used as the background concentration for total chromium. Statistical analysis methods shall be conducted as outlined in Attachment 4-4.

- Exline will record groundwater analytical data as necessary to determine statistical significance in accordance with § 264.97 (h) for the compliance period of the facility.

4) Exline will determine whether there is statistically significant evidence of increased contamination with respect to total chromium at the compliance point.

5) In determining whether statistically significant evidence of increased contamination exists, Exline will use the methods specified in the Hazardous Waste permit under §264.97 (h). The methods shall compare data collected at the compliance point with the groundwater protection standard for chromium (0.10 mg/L).

6) Exline will determine whether there is statistically significant evidence of increased contamination at each monitoring well at the compliance point within a reasonable time period after completion of sampling.

7) Exline will determine the groundwater direction and flow rate in the uppermost aquifer at least once each year.

8) The Regional Administrator will specify the frequency for sampling and conducting statistical analyses. Exline will adhere to the sampling frequency and statistical analysis frequency and methods that are specified by the Regional Administrator.

9) If Exline determines that any concentration limit under § 264.94 is being exceeded at any monitoring well at the point of compliance, then Exline shall:

- Notify the Regional Administrator of this finding within seven (7) days.

- Immediately reinitiate the groundwater corrective action program as described in Section IV-A of the Hazardous Waste Post-Closure Permit.

10) In addition, Exline may submit to the Regional Administrator an application for a permit modification to establish a more suitable corrective action program. The application shall include the following information:

- A detailed description of corrective actions that will achieve compliance with the groundwater protection standard.

- A groundwater assessment.

- A plan for a groundwater monitoring program that will demonstrate the effectiveness of the corrective action.

4.5.3. Corrective Action Monitoring Program – 40 CFR § 264.100. Groundwater monitoring at the Exline, Inc. site has demonstrated that total chromium concentrations have been measured in the groundwater at concentrations, which exceed the groundwater protection standard, downgradient from the closed surface impoundment. Therefore, in accordance with 40 CFR § 264.100, a corrective action program has been implemented at the site. Also, in accordance with § 264.100 (c), Exline shall monitor the groundwater as described below, in lieu of the compliance monitoring program. The corrective action monitoring program shall be conducted in accordance with § 264.100 (d), which includes the following elements. First, the existing elements of the current corrective action monitoring program will be described. Then, the elements of the modified corrective action monitoring program will be presented.

4.5.3.1. Previous Corrective Action Monitoring Program. The corrective action monitoring program shall demonstrate the effectiveness of the corrective action program. This is being accomplished by periodically measuring the total chromium concentration in the uppermost aquifer at locations around and down-gradient from the regulated unit (i.e., closed surface impoundment) and Cylinder (formerly Chrome) shop. Specifically, at the time of the initial permit application, samples were being collected in accordance with the schedule outlined in Table 4-8.

TABLE 4-8: PREVIOUS WELL SAMPLING SCHEDULE
Exline, Inc., Salina, Kansas

WELL TYPE	WELL NUMBER	CHEMICAL ANALYSIS * AND SAMPLING FREQUENCY	WATER LEVEL MEASUREMENT
Recovery Wells	B-7, C-9, E-3, SC-2	Total Chromium, twice monthly	none
Compliance Monitoring	B-4, B-6, C-5, D-3, G-1, SC-1	Total Chromium, four times per six month period	all sampled wells
Plume Perimeter	B-11, C-1 C-3, C-6, C-8, D-2, G-2	Total Chromium, once every six months **	all sampled wells
Plume Interior	A-2, B-8, C-4, D-1, E-2	Total Chromium, once every six months **	all sampled wells
Residential Wells	Bernhardt, Weber, O-Neil	Total Chromium, annual	none

* Analyses shall be completed by a laboratory which is certified by the KDHE for the subject parameter.

** Water level measurement and sampling events for the plume perimeter and plume interior wells shall be concurrent with a sampling event for the compliance wells.

Note: The "SC" wells are Scoular Elevator de-watering wells.

4.5.3.2. Current Corrective Action Monitoring Program. Samples will be collected on a semi-annual basis from monitoring wells H-1, H-2, H-3, and H-4, which are located down-gradient from the regulated unit near the Exline property boundary. Also, samples will be collected on a semi-annual basis from monitor well H-5, which is located down-gradient from an area where chromium was released from the Exline chrome plating ventilation system. Monitoring these locations over time will allow Exline to determine if the total chromium concentrations in the groundwater are decreasing, which will indicate whether the corrective action program is reducing the mass of chromium in the groundwater. Also, the total chromium concentration will be measured in the groundwater directly down-gradient from the farthest down-gradient recovery well (i.e., C-9R). This will be accomplished by sampling monitor well H-6 on a semi-annual basis. These monitoring data will provide one indication whether the recovery well system is adequately capturing the chromium plume. A complete summary of the monitoring well sampling, recovery well sampling, residential well sampling, and piezometric water level measurements is presented in Table 4-9.

TABLE 4-9: CURRENT WELL SAMPLING SCHEDULE
Exline, Inc., Salina, Kansas

WELL TYPE	WELL NUMBER	CHEMICAL ANALYSIS* AND SAMPLING FREQUENCY	WATER LEVEL MEASUREMENT
Recovery Wells	B-7, C-9R, E-3	total chromium, semi-annual	none
Corrective Action Performance	D-2, E-2, G-1 G-2, H-1, H-2 H-3, H-4, H-5 H-6, C-1, D-1	total chromium, semi-annual	yes
Supplemental Information Wells	B-4, B-8, B-11 C-3, C-4, C-5 C-5, C-6, C-8 D-3	no analyses semi-annual	yes
Residential Wells	Bernhardt, Weber, O'Neil	total chromium, annual	none

* Analyses shall be completed by a laboratory, which is certified by the KDHE, for the subject parameter.

Additional detail with respect to the proposed methods and procedures relating to the proposed corrective action monitoring program can be found in Attachment 4-3 (Sampling and Analysis Plan).

4.5.3.3. Access Agreement. Since some of the monitor wells that are included in the Exline monitoring network are located on the Scoular Elevator property, an access agreement has been executed between Exline, Inc. and Morrison Ventures (the owner of the Scoular Elevator property). A copy of this access agreement is included with this permit application as Attachment 4-5.

4.6. Corrective Action Monitoring Reporting. Exline, Inc. shall report the following information to the Hazardous Waste Section, Bureau of Waste Management:

4.6.1. Semi-annual Reports. Exline shall submit the following information on a semi-annual basis for the preceding six-month period (i.e., January through June and July through December) the following information:

1) Copies of all analytical data from Exline's semi-annual groundwater sampling events for the monitoring wells and groundwater remediation system.

2) Field parameter measurement results, copies of field sampling and well inspection log sheets, well repair documentation, volumes of groundwater extracted and other relevant groundwater-related information.

The semi-annual groundwater corrective action reports shall be submitted to the KDHE by March 1 and September 1 of each calendar year for the preceding six (6) month period. Information included in the March 1 semi-annual report may be combined with the Annual Report.

4.6.2. Annual Reports. The annual groundwater corrective action report shall include, but not be limited to:

1) A narrative discussion of the nature and evolution of Exline's groundwater monitoring and corrective action programs as well as conclusions regarding the overall adequacy of the programs. The evaluation shall include demonstration of the recovery and containment system's efficiency.

2) The groundwater flow rate and direction of groundwater movement in the underlying aquifer and potential effects on any component of the corrective action monitoring program to evaluate the effectiveness of the corrective action program.

3) The horizontal and vertical extent and concentrations of any hazardous constituents throughout the Site as evaluated from the data obtained from Exline's groundwater monitoring system.

4) Any surface and/or subsurface well integrity problems and their potential or actual influence on the groundwater data or efficiency of the corrective action monitoring program.

5) The conclusions and summary of analytical results from the groundwater corrective action monitoring program.

6) Conclusions with respect to the adequacy of the groundwater monitoring system, as it relates to its intended purpose.

7) Contaminant trend analyses from year to year to aid in evaluating the effectiveness of the corrective action in removing subsurface contaminants, to track the overall progress/trends in cleaning up the groundwater, and to provide the basis for future decisions regarding operation of and/or ultimately, cessation of pumping.

The annual report is due March 1 of the following year.

SECTION 4 BIBLIOGRAPHY

1. Groundwater Study Performed for Exline, Inc., Salina, Kansas, Wilson Laboratories, May 1982.

2. Exline, Inc., Salina, Kansas, Pollution Control Plan, Wilson Laboratories, September 1982.

3. Groundwater Monitoring Annual Report, Exline, Inc., Salina, Kansas, Wilson Laboratories, June 1983.

4. Surface Impoundment Closure Report for Exline, Inc., Salina, Kansas, Exline, Inc., Salina, Kansas, January 1985.

5. Letter of March 7, 1986 to John W. Mitchell of the KDHE by Jerry Exline, Exline, Inc. Information by O.S. Fent and J.C. Butler and Associates attached.

6. Hydrologic Investigation, Exline, Inc., East Country Club Road, Salina, Kansas, 67402, Janis C. Butler, J.C. Butler Associates, Inc., Salina, Kansas and O.S. Fent, Hydraulic Drilling Company, Salina, Kansas, December 1987.

7. Letter of August 4, 1988 to Martin West of the KDHE by Thomas M. Christy, P.E. of Kejr Engineering, Inc., Salina, Kansas.

ATTACHMENT 4-1

HYDRAULIC EFFECTS OF ADDING PUMPING WELL E-3

ATTACHMENT IV-4

HYDRAULIC EFFECTS OF ADDING PUMPING WELL E-3 AND THE UNSATURATED ZONE FLUSHING SYSTEM

It is proposed in the application that an additional pumping well, E-3, and a groundwater flushing system be added to the Exline, Inc. groundwater treatment system. The purpose of adding well E-3 is to capture chromate contamination in the B-9 - E-3 area. The purpose of adding the unsaturated zone flushing system is to speed the movement of chromates contained in the unsaturated zone.

In specifying the location for E-3 and the flushing system, certain checks of their hydraulic effects are necessary in order to assure that contaminants will not move past (between) the pumping centers. Of concern to the establishment of E-3 is that the capture radius for E-3 will overlap the capture radius of B-7, disallowing an avenue of contaminant travel between the two wells. Increased infiltration (recharge) in the cone of depression of well B-7 will decrease the area of influence of the well, this recharge must be taken into account before checking the radius of influence of B-7 and E-3.

A simple parametric approach to checking radius of influence is proposed, and calculations shown here. It should be made clear here that the calculations contained herein are for capture width, that area influenced towards the pumping well. Each of the pumping wells can be expected to have an effect on drawdown beyond its capture distance.

The recharge area of the unsaturated zone flushing system is centered 60' directly upgradient of well B-7. As a worst case scenario, we will assume that the recharge area is centered at B-7, and will replace it with a recharge well. The recharge rate under steady state conditions will equal the average application rate, which has been proposed in the permit at 2 gpm. By the method of images, the effective pumping rate at B-7 (the amount B-7 pumps from the aquifer) becomes 15 gpm - 2 gpm = 13 gpm. Therefore the effective radius of B-7 should be calculated based on a discharge rate of 13 gpm rather than 15 gpm.

In calculating the radius of influence of B-7 and E-3, the parameters of most importance are transmissivity and gradient. Fent and Butler (December 1987) report a transmissivity for the site of 21,000 gpd/ft. This agrees well with a previous value of 22,000 gpd/ft. reported by Christy (1982).

Fent and Butler (1987) report an average gradient for the site of .005 feet per foot. This agrees well with the gradient seen on the nearly recovered piezometric surface

measured 8/1/88 (Plate IV-8) of the Part B Application. Setting the pumping rate equal to the natural discharge will yield the width of flow influenced by well B-7.

$$(13\ \text{gpm})(1440\ \text{min/day}) = (21{,}000\ \text{gpd/ft})(.005)(w)$$

Solving for w, the width of natural flow which at some distance upgradient is influenced to the pumping well, is 178 feet, or a radius of influence of approximately 89 feet. Further proof of this calculation may be made by comparing this value to the values obtained using groundwater velocity equations for calculating maximum width of upgradient influence as presented by Keely and Chin[1].

Similarly, the width of influence of E-3 is found by setting its pumping rate equal to natural flow:

$$(5\ \text{gpm})(1440\ \text{min/day}) = (21{,}000\ \text{gpd/ft})(.005)w_e$$

$$w_e = 68.6\ \text{ft.}$$

From the plot (Figure 1) of these two widths of influence we can see that they do indeed overlap. As a result, these two wells can be expected to establish a flow divide between the two wells and that all groundwater lying between the two wells will be influenced either to B-7 or to E-3.

It should be noted that the calculations here show a theoretical capture width for B-7. In reality the width of capture is much greater than that depicted on Figure I. This can be seen clearly from the piezometric measurements made at the site. An example of this is shown on Plate IV-9 in the Part B Application.

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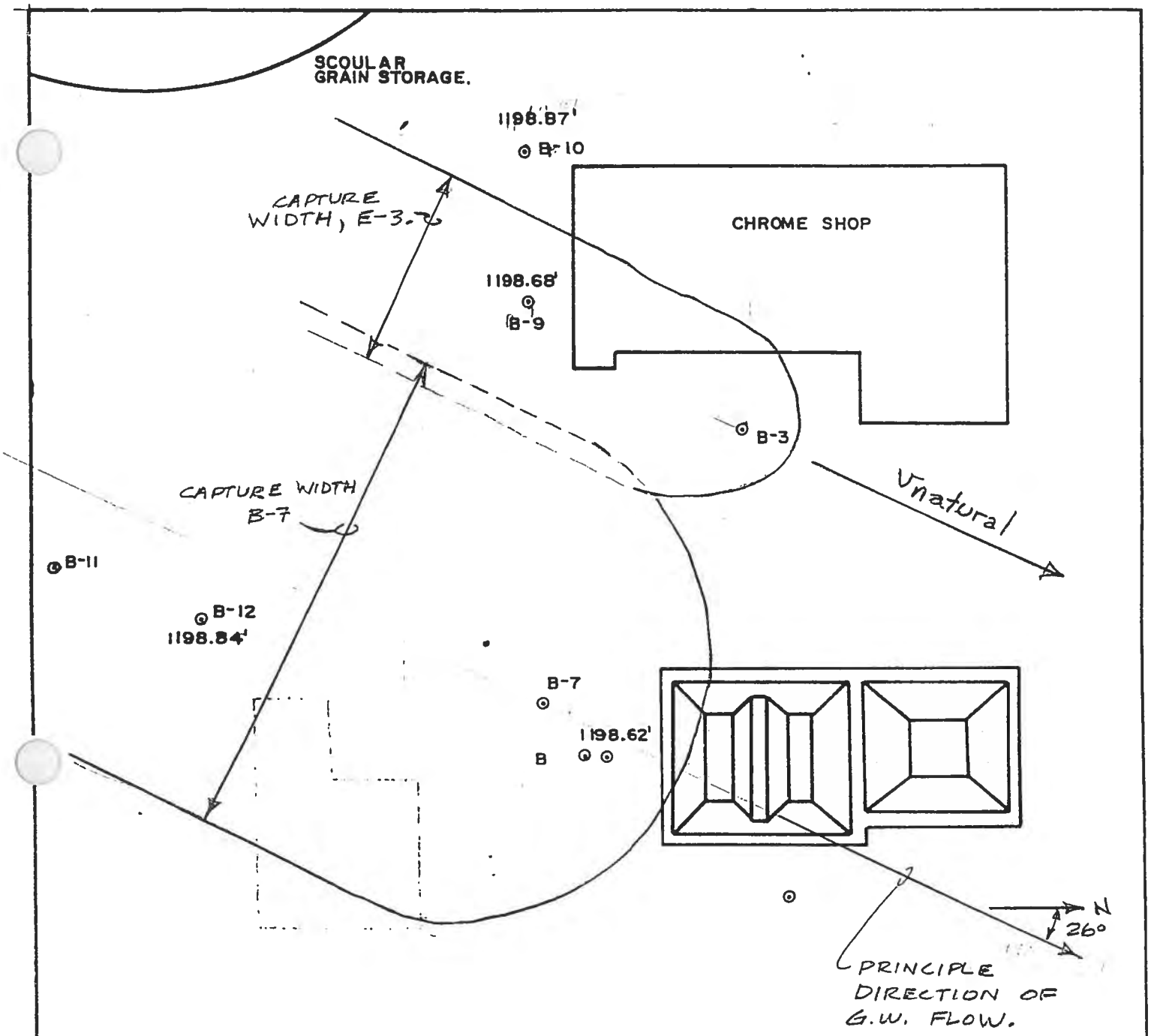
[1] Keely, J.F. and Chin F.T., 1983, Velocity Plots and Capture Zones of Pumping Centers for Groundwater Investigations, Ground Water, Vol. 21, No. 6, November-December 1983.



KEJR ENGINEERING, INC.		
SCALE	APPROVED BY	DRAWN BY DWG
DATE 6/89	TMC	
FIGURE I: CAPTURE WIDTHS		
		DRAWING NUMBER

ATTACHMENT 4-2

WELL BORING LOGS AND COMPLETION DETAILS

WELL LOGS - EXLINE, INC.

This document contains logs of wells constructed by Exline, Inc. for monitoring or pumping purposes. A well location map is shown on Plate I. Drawings have been made of completion details of some wells; these are attached and follow the text section of this document.

WELL LOG: A-2
STATUS AND USE: ACTIVE, MONITORING
DATE DRILLED: 1 FEB. 1968
DRILLED BY: HYDRAULIC DRILLING CO.
LOGGED BY: O.S. FENT
CASING ELEVATION: 1226.13'

LOG: A-2

PLEISTOCENE TERRACE:		
0	8	Silt and clay, tan.
8	11	Silt, tan.
11	31	Silt and clay, tan and gray.
31	40	Gravel, fine to medium, some gravel, coarse, much sand, fine.
40	43	Gravel and sand, silty.
43	47	Gravel, fine to medium, little gravel coarse; much sand, fine.
WELLINGTON SHALE:		
47	48	Shale, yellow and dark gray.

Well reamed and cased to 46.5 ft. 4" ID Plastic casing closed end, perforated 35 to 40 and 44 to 46.5, gravel packed in hole. Well air surged and pumped at 7.5 gallons per minute with 3.4 ft.drawdown from static water level at 28.5 ft. below land surface.

WELL LOG: B-1
STATUS AND USE: ACTIVE, MONITORING
DATE DRILLED: 29 APRIL-3 MAY 1982.
DRILLED BY: HYDRAULIC DRILLING CO.
LOGGED BY: O.S. FENT
CASING ELEVATION: 1226.77'

LOG B-1: 30 ft. northeast of NE Cor. security fence around disposal pond

0	3.5	Clay and silt fill.
COLLUVIUM and ALLUVIUM:		
3.5	4.5	Clay, silty, dark brown (Top soil).
4.5	18.5	Clay, silty, light brown mottled orange; contains much sandstone rubble, coarse. (open hole takes 7 gallons per minute at 13 ft.) Cased

		to 18 ft. with 4 in. PVC.
18.5	20	Clay, sandy, compact, light gray.
20	27	Clay, soft, light gray and brown.
27 -	29.5	Silt, blocky, light brown; interbedded with sand, fine.
29.5	35	Clay, compact, light gray-brown, firm.
35	48	Sand, medium to fine and gravel, fine to coarse.
40	54.5	Sand, medium to fine and gravel, fine to coarse.

WELLINGTON FORMATION:

54.5	57	Shale, fairly firm, light blue-gray.
57	59	Shale, firm, blue-gray.

Cased with 2-inch PVC to 55 ft. below land surface, lower 3 ft. perforated and gravel-packed. Water level 29 ft. below top of casing which is 1.5 ft. above surface.

WELL LOG: B-2
STATUS AND USE: INACTIVE: PLUGGED & ABANDONED.
DATE DRILLED: 29 APRIL-3 MAY 1982.
DRILLED BY: HYDRAULIC DRILLING CO.
LOGGED BY: O.S. FENT.
CASING ELEVATION: NA

LOG B-2: East of south line of disposal pit.
Fill:

0	7	Clay, wood, galss, plastic, metal etc. Water loss 20 gal. per min.

COLLUVIUM and ALLUVIUM:

7	13	Clay, silty, red-brown.
13	19.5	Clay, light gray-brown, soft; contains sandstone rubble.
19.5	20	Volcanic ash, cream.
20	25	Clay, firm, light brown. Water loss 75 gal. per min. at 23 ft. Cased with 4 in. PVC to 20 ft. Open hole 20-25.

WELL LOG: B-3
STATUS & USE: ACTIVE, MONITORING.
DATE DRILLED: 29 APRIL-3 MAY 1982.
DRILLED BY: HYDRAULIC DRILLING CO.
LOGGED BY: O.S. FENT.
CASING ELEVATION: 1226.36'

Log B-3: Adjacent to No. 1.
Fill:

0	3	Silt and clay fill.

COLLUVIUM and ALLUVIUM:

3	5.5	Clay, dark gray-brown (Soil A zone).
5.5	7	Silt, blocky, light brown (Soil B zone), water loss 10 ga. per min.
7	21	Clay, compact, light brown; contains sandstone rubble (water loss increased to 50 gal. per min. at 15 ft.
21	28.5	Silt, soft, yellow-gray.
28.5	30	Clay, compact, light gray-brown. Cased with 2-inch to 30 ft., lower 20 ft. perforated.

WELL LOG: B-4
STATUS & USE: ACTIVE UPGRADIENT MONITOR.
DATE DRILLED; 29 APRIL - 3 MAY 1982.
DRILLED BY: HYDRAULIC DRILLING CO.
LOGGED BY: O.S. FENT.
CASING ELEVATION: 1233.37'.

Log B-4: Southwest of disposal pond.
COLLUVIUM and ALLUVIUM:

0	5	Clay, dark gray.
5	10	Clay and silt, brown. (Water loss 75 gal. per min. at 10 ft.)
10	22	Silt, sandy, yellow-gray.
22	37.5	Clay, yellow-gray; interbedded with silt, sandy, light brown.
37.5	39	Silt, sandy, soft, yellow-gray.
39	42	Gravel, fine and sand.
42	45	Clay, gray-brown.
45	49	Gravel, fine to coarse and sand.
49	55	Clay, gray.
55	57	Gravel, medium to fine and sand.

WELLINGTON FORMATION:

57	58	Shale, light blue-gray, firm.

Cased to 22 ft. with 4 in. PVC. Cased with 2 in. PVC to 57 ft. below land surface. Water level 33.5 ft. below top of casing which is 2 ft. above land surface. Lower 3 ft. perforated.

WELL LOG: B-5
STATUS & USE: ACTIVE MONITOR WELL.
DATE DRILLED: 29 APRIL - 3 MAY 1982.
DRILLED BY: HYDRAULIC DRILLING CO.
LOGGED BY: O.S. FENT.
CASING ELEVATION: 1216.08'.

Log B-5: Southeast of pit. + 200 ft. southwest of grain shed as SW end of elevater lot.

COLLUVIUM and ALLUVIUM:

0	8	Clay, silty, soft, dark gray.
8	17	Clay, compact, light gray to light brown.
17	21	Clay, sandy, light gray-brown; contains sandstone pebbles.
21	23	Gravel, fine and sand.
23	26	Clay, sandy, light gray.
26	34	Gravel, fine to coarse and sand.
34	37	Clay, sandy, light gray.
37	39	Gravel, very coarse to fine & sand.
39	45	Clay, silty, light brown.
45	48.5	Gravel, medium to fine & sand.

WELLINGTON FORMATION:

46.5	55	Shale, gray-white and blue-gray, firm; Contains many thin hard siltstone zones.

Cased with 2 Inch PVC to 47 ft. Lower 3 ft. perforated. Water lever 13.5 ft. below land surface which is 2 ft. below top of casing.

WELL LOG: B-6
STATUS & USE: ACTIVE, MONITOR.
DATE DRILLED: 29 APRIL - 3 MAY 1982.
DRILLED BY: HYDRAULIC DRILLING CO.
LOGGED BY: O.S. FENT.
CASING ELEVATION: 1215.59'.

LOG: B-6:

Alluvium:

0	21	Clay, tan
21	27	Sand and gravel, fine to coarse
27	39	Clay, silty, tan
39	46	Sand and gravel, fine to medium

Wellington formation:

46+	Shale, light and dark gray

Cased with 5-inch PVC, perforated 23 to 27 and 42 to 46 ft. Air lift pumped at 20 gallons per minute. Static water level, 16.5'.

WELL LOG: B-7
STATUS AND USE: ACTIVE PUMPING
DATE DRILLED: 29 June 1982
DRILLED BY: Hydraulic Drilling Co.
LOGGED BY: O.S. Fent
CASING ELEVATION: NA

LOG: B-7

0	4	Clay & silt, dark gray & brown (Fill).
4	6	Silt brown, dark gray.
6	12	Clay, silty, yellow-brown, contains sandstone rubble.
12	15	Clay, silty, soft, light gray & brown.
15	21	Clay, silty, light brown, sporadic sandstone rubble.
21	29	Silt, soft, light brown.
29	35.5	Clay, compact, light brown, greenish-yellow.
35.5	50	Gravel, (medium to fine) & silt (local).
50	50.5	Clay, soft, light gray.
50.5	55.5	Gravel, (fine to coarse) & silt, (lower 2' slightly cemented).
55.5	60	Shale, white & light gray.

5" PVC casing to 56', 10' screen at bottom. Air lifted at 5gpm.

WELL LOG: B-8
STATUS AND USE: Active monitor
DATE DRILLED: 30 June 1982
DRILLED BY: Hydraulic Drilling Co.
LOGGED BY: O.S. Fent
CASING ELEVATION: 1225.51'

LOG: B-8

0	5	Clay, silty, sandy, tan, contains much sandstone rubble (Fill)?
5	14	Clay, compact, light gray & light brown.
14	16	Silt, sandy, red-brown & gray, (local sandstone)
16	24.5	Silt, soft, yellow-gray, more sandy toward base.
24.5	31	Clay, compact, light gray & light brown.
31	35	Silt, sandy, soft, tan.
35	39	Silt, (fine to medium) and some gravel (fine to coarse)
39	39.5	Clay, light gray.
39.5	44	Silt, (fine to medium), gravel, (fine to coarse).
44	45	Clay, light gray.
45	49	Gravel (fine to coarse), sand (fine to medium)

49	51	Shale, light & dark blue-gray.

5" Plastic Casing set to 49', 12' screen
Air lifted at 6 gpm.

WELL LOG: B-9
STATUS AND USE: Active Monitoring
DATE DRILLED: 28 June 1983
DRILLED BY: Hydraulic Drilling Co.
LOGGED BY: O.S. Fent
CASING ELEVATION: 1225.02'

LOG: B-9
COLLUVIUM AND ALLUVIUM:

0	3	Clay, silty, light brown.
3	5	Clay, fairly compact, light gray.
5	11	Silt, clayey, soft, light brown.
11	18.5	Silt, soft, light brown.
18.5	19	Sand, fine to medium.
19	21	Clay, light gray (Fluid changed to yellow-green stain at 20 ft.)
21	38	Clay, silty, sandy, light gray.
38	45	Sand, fine to meduim and gravel, fine to medium.
45	54.5	Sand, fine to medium and gravel, fine to coarse.

Wellington formation:

54.5	58	Shale, weathered, light gray.
58	59	Shale, soft, dark, gray.

Cased with 2-inch PVC to 54.5 ft. below land surface. Lower 16 ft perforated. Static water level 25 ft. below top of casing which is 2 ft. above land surface.

WELL LOG: B-10
STATUS AND USE: Active Monitoring
DATE DRILLED: 28 June 1983
DRILLED BY: Hydraulic Drilling
LOGGED BY: O.S. Fent
CASING ELEVATION: 1225.83

LOG: B-10
COLLUVIUM AND ALLUVIUM:

3.5	9	Clay, compact, gray.
9	17	Silt, friable, sandy, brown.
17	24	Sand, medium to fine, some gravel, fine to medium.
24	30	Silt, friable, light, gray-brown.
30	39	Clay, sandy, compact, light gray. Slightly cemented. (Hole takes 15 gallons per minute at 30 ft.)
39	43	Sand, fine, silty, some gravel, fine to medium; interbedded with

		clay, gray.
43	51	Sand, fine to medium and gravel fine to coarse.
51	52	Silt, sandy, light gray-brown.
52	54.5	Sand, medium to fine and gravel, fine to coarse.

Wellington formation:

54.5	56	Shale, soft, light blue-gray.
56	59	Shale, dark gray.

Cased with 2-inch PVC to 54.5 ft. below land surface. Perforate 18 to 24 and 40 to 54.5. Static water level 25 ft. below top of casing.

WELL LOG: B-11
STATUS AND USE: Active Monitoring
DATE DRILLED: 28 June 1983
DRILLED BY: Hydraulic Drilling Co.
LOGGED BY: O.S. Fent
CASING ELEVATION: 1225.03'

LOG: B-11
ALLUVIUM AND COLLUVIUM:

0	5	Clay, silty, light brown.
5	9	Silt, sandy, yellow-brown; some gravel, medium.
9	16	Silt, clayey, soft, yellow-brown.
16	23	Clay, silty, light gray. (Hole takes 5 gallons per minute at 20 ft.)
23	28	Silt, friable, slightly cemented, gray-brown.
28	38	Silt, sandy, light brown.
38	55	Sand, medium to fine and gravel, fine to coarse.

Wellington formation:

55	58	Shale, light blue-gray grading downward to dark blue-gray.

Cased with 2-inch PVC to 55 ft. below land surface. Lower 17 ft. perforated. Static water level 24.5 ft. below top of casing which is 1.5 ft. above land surface.

WELL LOG: B-12
STATUS AND USE: Active Monitoring
DATE DRILLED: June 1983
DRILLED BY: Hydraulic Drilling Co.
LOGGED BY: O.S. Fent
CASING ELEVATION: 1226.23'

LOG: B-12
COLLUVIUM AND ALLUVIUM:

0	4	Clay and silt.

4	7	Clay, silty, brown.
7	15	Silt, sandy, contains some gravel, coarse to fine.
15	24	Clay, light brown and light gray.
24	34	Silt, soft, sandy, light gray-brown.
34	41	Silt, friable, sandy, slightly cemented. (Hole takes 5 gallons per minute at 30 ft.)
41	44	Sand, medium to fine and gravel, fine to coarse.
44	45	Clay, light gray.
45	51	Sand, medium to fine and gravel, fine to coarse.
51	57.5	Clay, silty, light gray.
57.5	58	Sand, medium to fine and gravel, fine to medium.
Wellington formation:		
58	59	Shale, light blue-gray grading downward to dark gray.

Cased to 58.5 ft. below land surface with 2-inch PVC, lower 17 ft. perforated. Static water level 27.5 ft. below top of casing which is 1.5 ft. above land surface.

Well Logs
Revised: 16 March 1989

Logs of holed drilled for Exline, Inc. November and December, 1987

All "C" Series Wells have 2" PVC Casing.

C-1. 134.5 ft. E-SE of B-8. Drilled 11/16/87

Sanborn and Meade Formations:

0	7	Silt, clayey, brown. Rock rubble at top
7	22	Silt, soft, sandy, light brown
22	39	Clay, soft, sandy, light brown
39	44	Gravel, medium to fine and sand, silty

Wellington Formation:

44	50	Shale, soft, gray-green

Sample pumped from screen set 40 to 45 ft.
Static water level 11/19/87 - 20.52 ft. below top of casing 2 ft. above land surface.

C-2. 252.6 ft. E-NE of B-8. Drilled 11/16/87

Sanborn and Meade Formations:

0	5	Clay, silty, sandy, brown
5	10	Clay, silty, light brown and light gray
10	20	Clay, silty, light brown and light gray; contains sand, fine, increasing downward and sporadic gravel, fine
20	36	Clay, sillty, soft, light gray and light brown, some nodular caliche and thin volcanic ash at 23 ft.
36	52	Gravel, fine to coarse and sand, some clay, brown
52	53	Clay, light gray
53	54	Gravel, fine to coarse and sand

Wellington Formation:

54	60	Shale, blue-gray

Sample pumped from screen set 50 to 55 ft.
Static water level 11/19/87 - 21.78 ft. below top casing 2 ft. above LS

C-3. 114 ft. S+8W of C-1. Drilled 11/17/87

Fill:

0	4	Loam, dark gray, interbedded with clay, silty, brown

Sanborn and Meade Formations:

4	8	Clay, silty, sandy, soft, light brown
8	16	Clay, silty, light greenish-gray
16	22	Clay, silty, light greenish-gray and light brown mottled orange
22	23	Volcanic ash, white
23	38	Clay, partly silty and sandy, soft
38	46	Gravel, coarse to fine ;and sand, silty

Wellington Formation:

46	48	Shale, clayey, gray-green and white
48	50	Shale, fairly soft, dark blue-gray

Sample pumped from screen set 42 to 47 ft.
Static water level 11/19/87, 19.78 ft. below top casing 2 ft. above LS

C-4. 300 ft. N. of C-2. Drilled 11/18/87

Sanborn and Meade Formations:

0	5	Clay, silty, light brown. Some rock rubble at top
5	15	Silt, clayey, sandy, light brown
15	16	Gravel, coarse to fine and sand, silty
16	22	Clay, light greenish-gray mottled brown and orange
22	29	Silt, sandy, brown
29	48	Gravel, fine to medium and sand, some clay, brown

Wellington Formation:

	49	Shale, soft, light gray
49	50	Shale, fairly firm, dark blue-gray

Sample pumped from screen set 44 to 49 ft.
Static water level 11/19/87, 26.99 ft. below top casing 2 ft.above LS

C-5. 240 ft. S-SE of C-3. Drilled 11/18/87

	Fill:	
0	3	Clay, silty, dark gray and light brown
	Sanborn and Meade Formations:	
3	15	Clay, silty, light greenish-gray and light brown
15	24	Silt, sandy, brown, soft
24	30	Gravel, coarse to fine, sand and silt, brown
30	35	Clay, light gray and light brown, sandy
35	52	Gravel, coarse to fine ;and sand, litle clay, silty, brown
	Wellington Formation:	
52	55	Shale, white; grades downward to blue-gray

Sample pumped with screen set 47 to 52 ft.
Static water level 11/19/87, 16.42 ft. below top casing 2 ft. above LS

C-6. 183 ft. N-NW of C-4. Drilled 11/23/87

	Fill:	
0	4	Clay and rock rubble
	Sanborn and Meade Formations:	
4	33	Clay, silty, light brown and yellow-brown. Sandy 14 to 18 with some gravel rubble at 18 ft.
33	35	Gravel, fine to medium and sand
35	48	Gravel, fine to coarse and sand
	Wellington Formation:	
48	51	Shale, clayey, light greenish-gray
51	53	Shale, fairly soft, dark blue-gray

Sample pumped with screen 44 to 49 ft.
Static water level 11/25/87, 28.29 ft. below top casing 2 ft. above LS

C-7. 126 ft. NE of C-4. Drilled 11/23/87

	Fill:	
0	2	Silt, sand and rubble
	Sanborn and Meade Formations:	
2	14	Clay, silty, light brown
14	19	Silt, soft, sandy, light brown
19	27	Clay, alternating firm and soft, sandy, light gray
27	49	Gravel, coarse to fine and sand, some silt, brown
	Wellington Formation:	
49	50	Shale, yellow and light gray, grades downward to firm, dark gray

Sample pumped with screen at 44 to 49 ft.
Static water level 11/25/87, 28.32 ft. below top casing 2 ft. above LS

C-8. 216 ft. NE of C-2. Drilled 11/24/87

	Sanborn and Meade Formations:	
0	14	Clay, light brown and light gray. Much rock rubble at top
14	25	Silt, soft, light brown; contains sand fine and some gravel 21 to 25
25	37	Gravel, fine to coarse and sand
	Wellington Formation:	
37	40	Shale, clayey, soft, light gray
40	47	Shale, dark gray and white, fairly soft

Sample pumped with screen 33 to 38 ft.
Static water level 11/25/87, 24.67 ft. below top casing 2 ft. above LS

C-9. 15 ft. E of C-4. Drilled 12/01/87

	Sanborn and Meade Formations:	
0	5	Clay, silty, light brown. Some rock rubble at top
5	18	Clay, silty, sandy, light brown
18	19	Gravel, coarse to fine and sand, silty
19	27	Clay, light gray and yellow-brown
27	46	Gravel, medium to fine and sand, some clay, gray and brown
	Wellington Formation:	
46	48	Shale, clayey, light gray

Sample pumped with screen 42 to 47 ft.
Static water level 12/02/87, 27.52 ft. below top casing 2.3 ft. above LS

WELL LOG: E-1
STATUS AND USE: NOT CASED, GROUTED AND ABANDONNED
DATE DRILLED: 25 MAY 1989
DRILLED BY: PESTINGER PUMP SERVICE
LOGGED BY: STAN PESTINGER
CASING ELEVATION: NA

LOG: E-1, LOCATED 10'-9" east and 50' south from NE corner of chrome plating shop. 9" auger hole.

0	3	Topsoil.
3	15	Silt, sandy, tan, some clay.
15	23	Sand, fine.
23	53.5	Silt, brown.
53.5	54	Gravel, small, sandy.
54	55	Shale, gray.

Set temporary 5" PVC casing, rapidly pumped casing dry. Yields < 1 gpm. Removed casing, filled hole with bentonite/cement grout.

WELL LOG: E-2
STATUS AND USE: ACTIVE, MONITORING.
DATE DRILLED: 31 MAY 1989
DRILLED BY: PESTINGER PUMP SERVICE
LOGGED BY: T.M. CHRISTY
CASING ELEVATION: 1226.10'

LOG: E-2, Located 20' east of NE corner of chromium plating shop. 9" auger hole.

PLEISTOCENE TERRACE:

0	3	Topsoil.
3	10	Silt, sandy, tan.
10	27	Silt, clayey, tan.
27	29	Clay, tight, plastic.
29	46	Silt, clayey, sandy, brown.
46	55	Gravel, fine, with sand.

Wellington shale

55	58	Shale, light gray and soft at top, dark gray and hard at 58'.

Set 5" SDR 21 casing to 54', 6' of saw cut screen at bottom. Pumped will at 12 gpm for 45 minutes to develope. WL = 31'-8" below G.S. (recovered). Well is gravel packed with native materials (in-situ gravel), 46-55'. Filled annulus with volclay chips 18-46'. Filled annulus with bentonite/cement grout 18' to surface.

WELL LOG: E-3
STATUS AND USE: ACTIVE, MONITORING, PROPOSED PUMPING.
DATE DRILLED: 7 JUNE 1989
DRILLED BY: PESTINGER PUMP SERVICE
LOGGED BY: T.M. CHRISTY
CASING ELEVATION: 1225.84'

LOG: E-3, Located ~ 2.25" W. and 90' S. of NE corner of chrome shop. 9" wet rotary hole.

0	1	Gravel fill.

PLEISTOCENE TERRACE:

1	7	Clay, tan to gray.
7	10	Gravel, fine, with sand.
10	13	Clay, gray to tan.
13	18	Sand, fine.
18	23	Gravel, small (to 5 mm) with thin interbedded clays.
23	28	Clay, tan, drills loose.
28	38	Clay, gray, compact, some layers tan to buff, manganese nodules.
38	54	Gravel, medium (to 10 mm), subangular with fine sand, some thin interbedded clays.

WELLINGTON SHALE:

54	55	Shale, gray.

Set 5" SDR 21 mill slotted casing, screws at joints, 14' of .030 mill slotted screen at bottom. Gravel packed from bottom to 37' with washed river sand. Annulus filled with native material 34-37'. Grouted through tremie pipe, 4-34' using bentonite/cement grout. Developed by bailing for 1/2 hour with 10 gallon bailer, then pumped with submersible pump for 1 hour at 10 gpm.

ATTACHMENT IV-2
WELL LOGS
LIST OF FIGURES:

"B" Series Monitor Wells, Typical Completion.

"C" Series Monitor Wells, Typical Completion.

Well Completion Details, Well C-9

Pump Installation Details, Well C-9

Monitor Well D-1

Monitor Well D-2

Monitor Well D-3

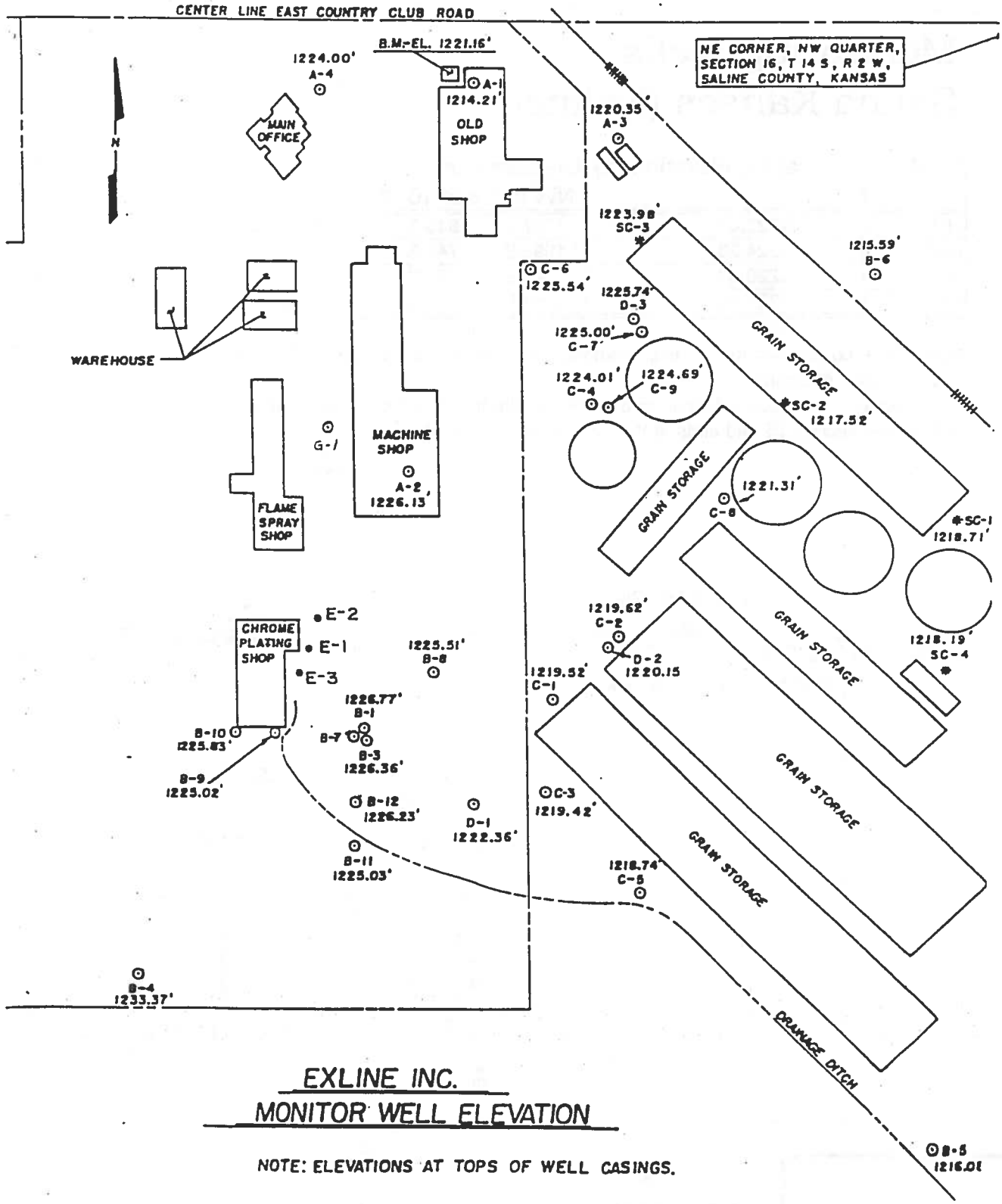
Monitor Well A-2

Well E-2

Well E-3

Well G-1

Note: Wells A-1, A-3, A-4, SC-1, SC-2, and SC-3 were constructed prior to the start of hydrogeological study at the site. No completion details are available for these wells.



EXLINE INC.
MONITOR WELL ELEVATION

NOTE: ELEVATIONS AT TOPS OF WELL CASINGS.

KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

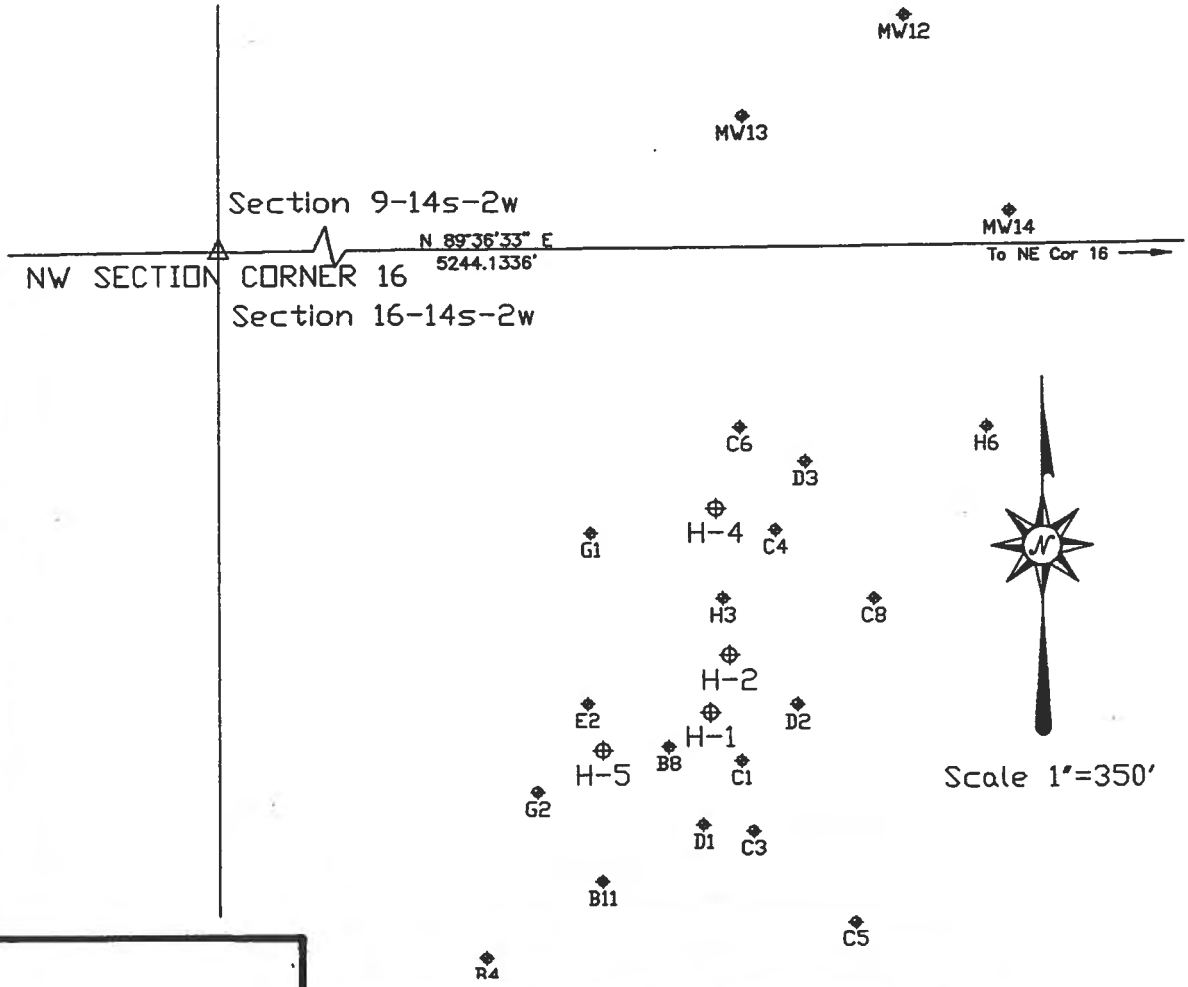
EXLINE, INC.
WELL LOCATIONS.
ATTACHMENT IV-2.

DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE
TMC		TMC		3-17-89	

Monitoring Wells
Salina Kansas (Exline)

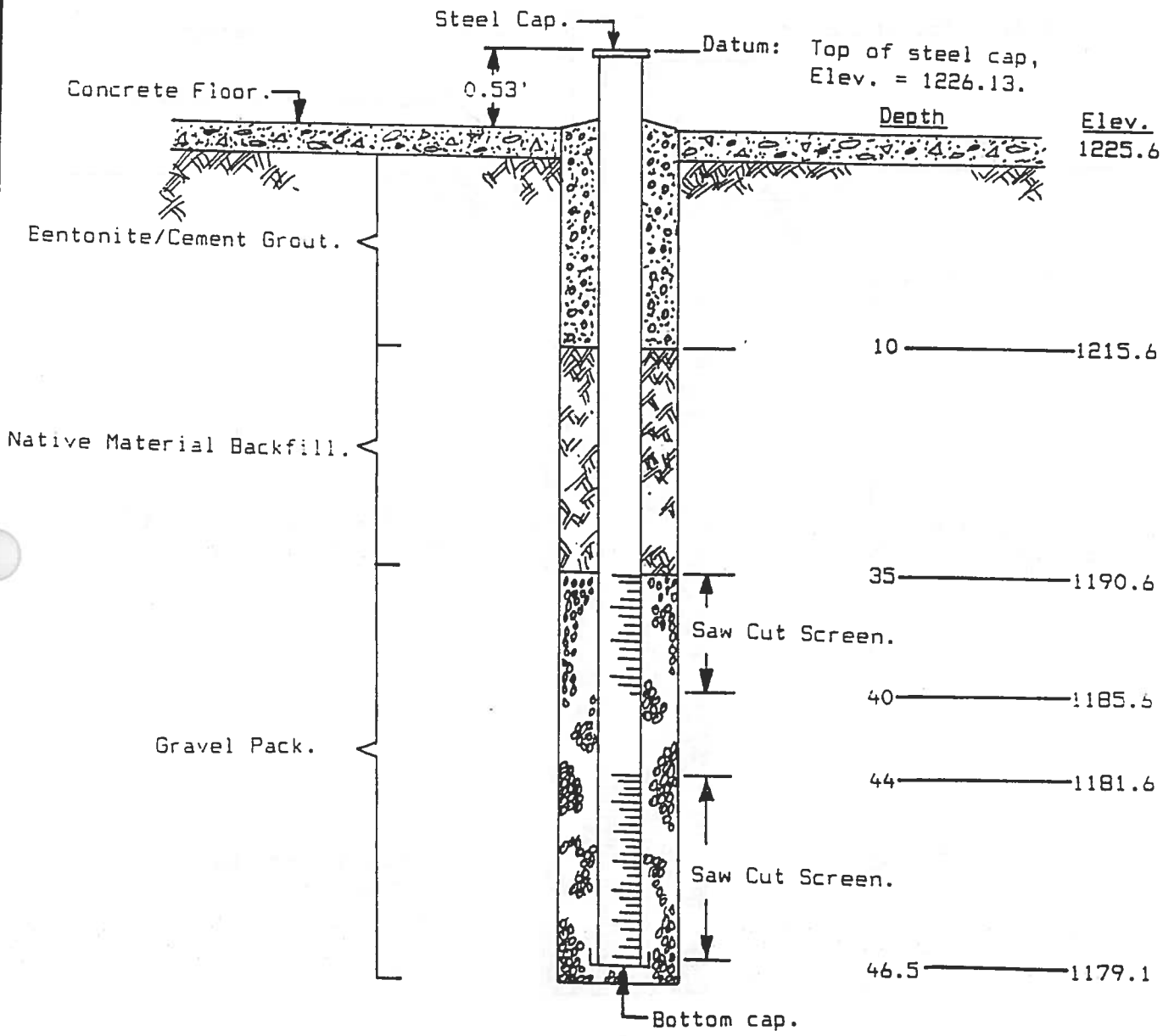
Well	Top casing elevation (ft)	Distance from NW cor, sec 16 (ft)	
H-1	1222.81	1957 E	843 S
H-2	1224.28	1992 E	740 S
H-4	1226.43	1971 E	473 S
H-5	1226.76	1761 E	911 S

North West corner, section 16, is in township 14 south, range 2 w, Saline County, KS near the town of Salina.
All distances are measured along and perpendicular to a line that begins at the NW corner section 16 and ends at the NE corner section 16.



SURVEYS, Inc.
ELLSWORTH, KANSAS 67439

PROJECT 03-40
DATE 10-28-03
BY JFH SH. 1 OF 1

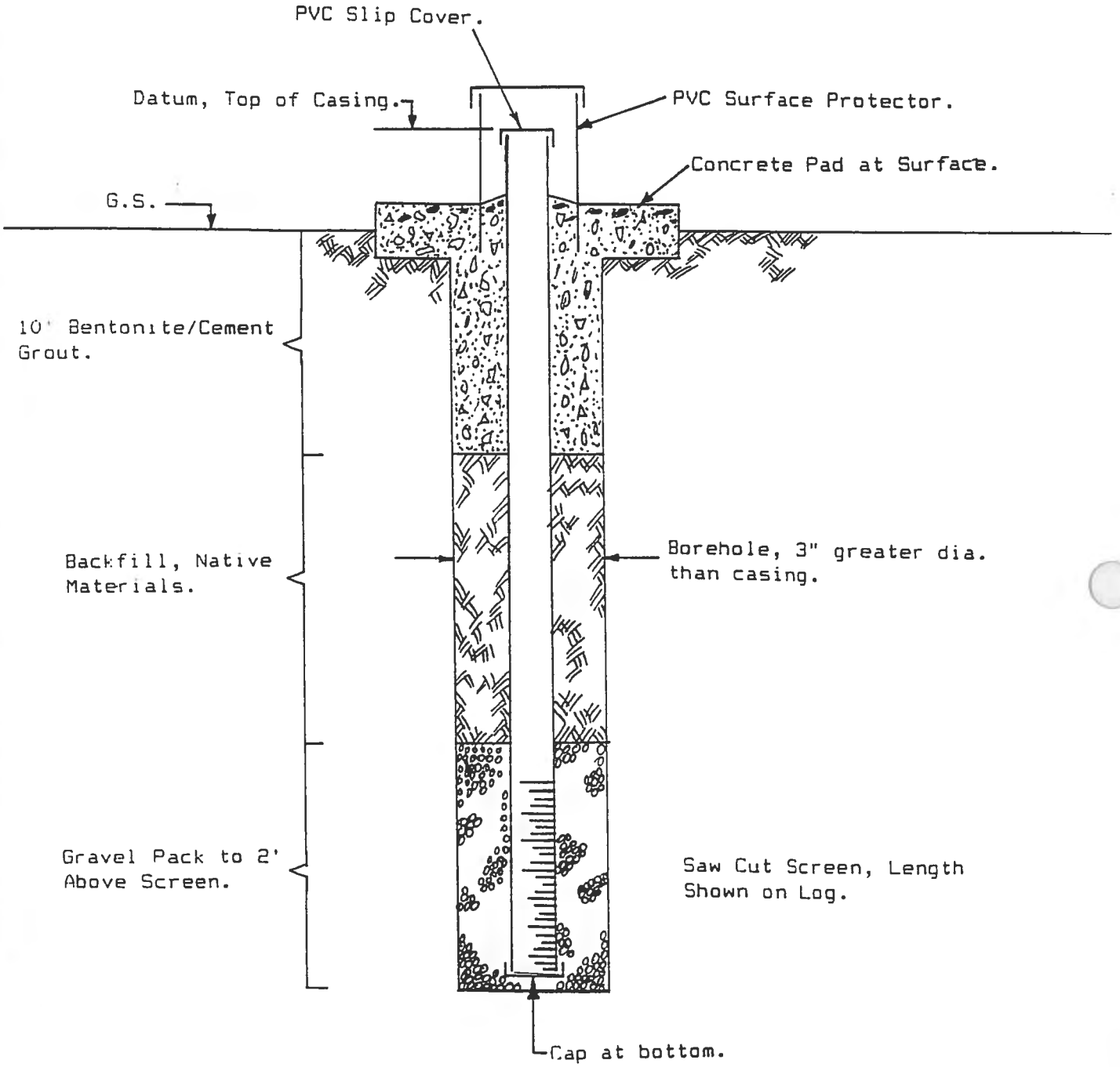


Not To Scale.

JR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

Exline, Inc.
Well Completion Details
Monitor Well A-2
Drilled: 2-1-68

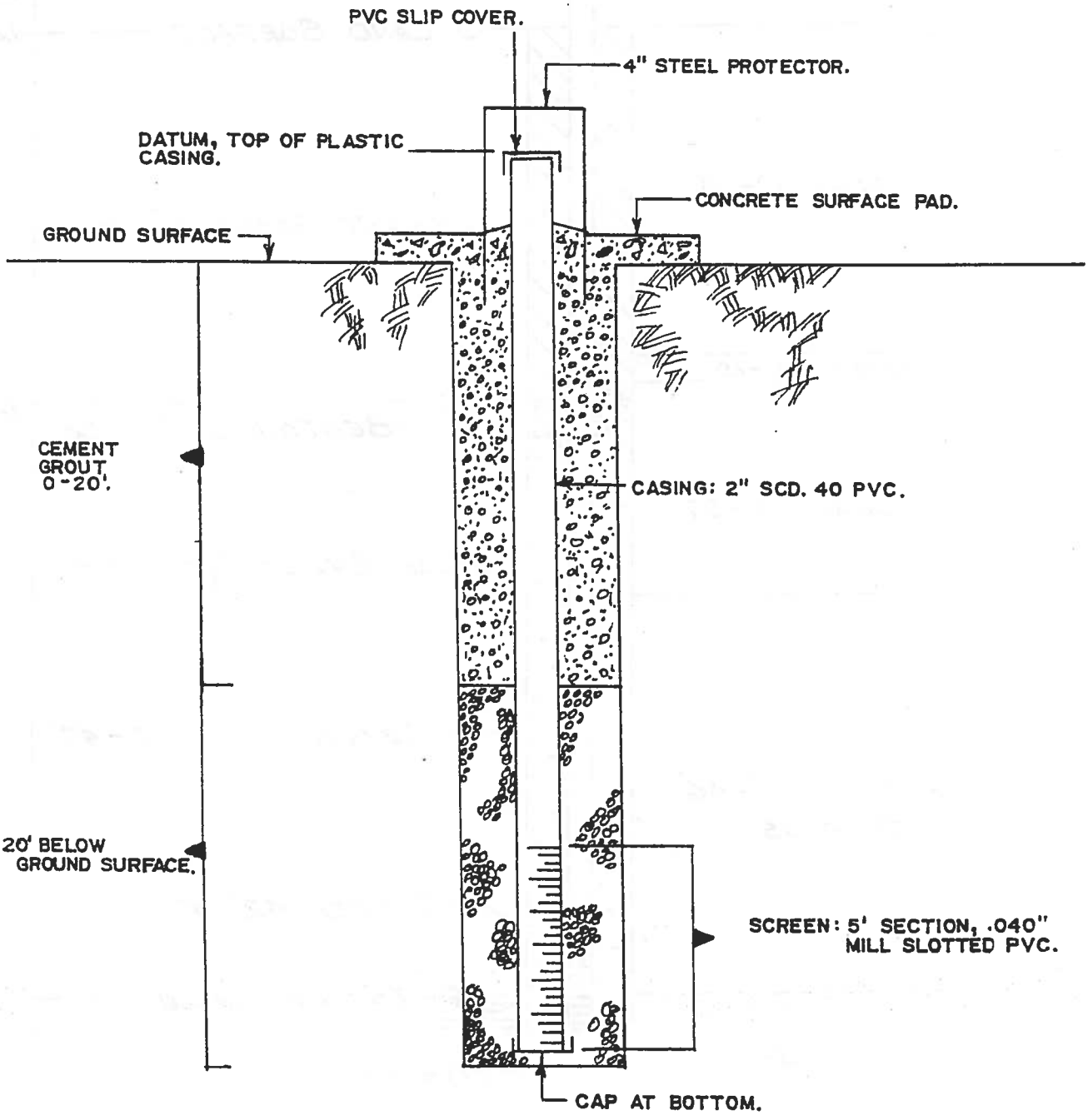
DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE
DWG		TMC	7-11-89		7-11-89



KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

Exline, Inc.
"B" Series Monitor Well
Typical Completion

DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE

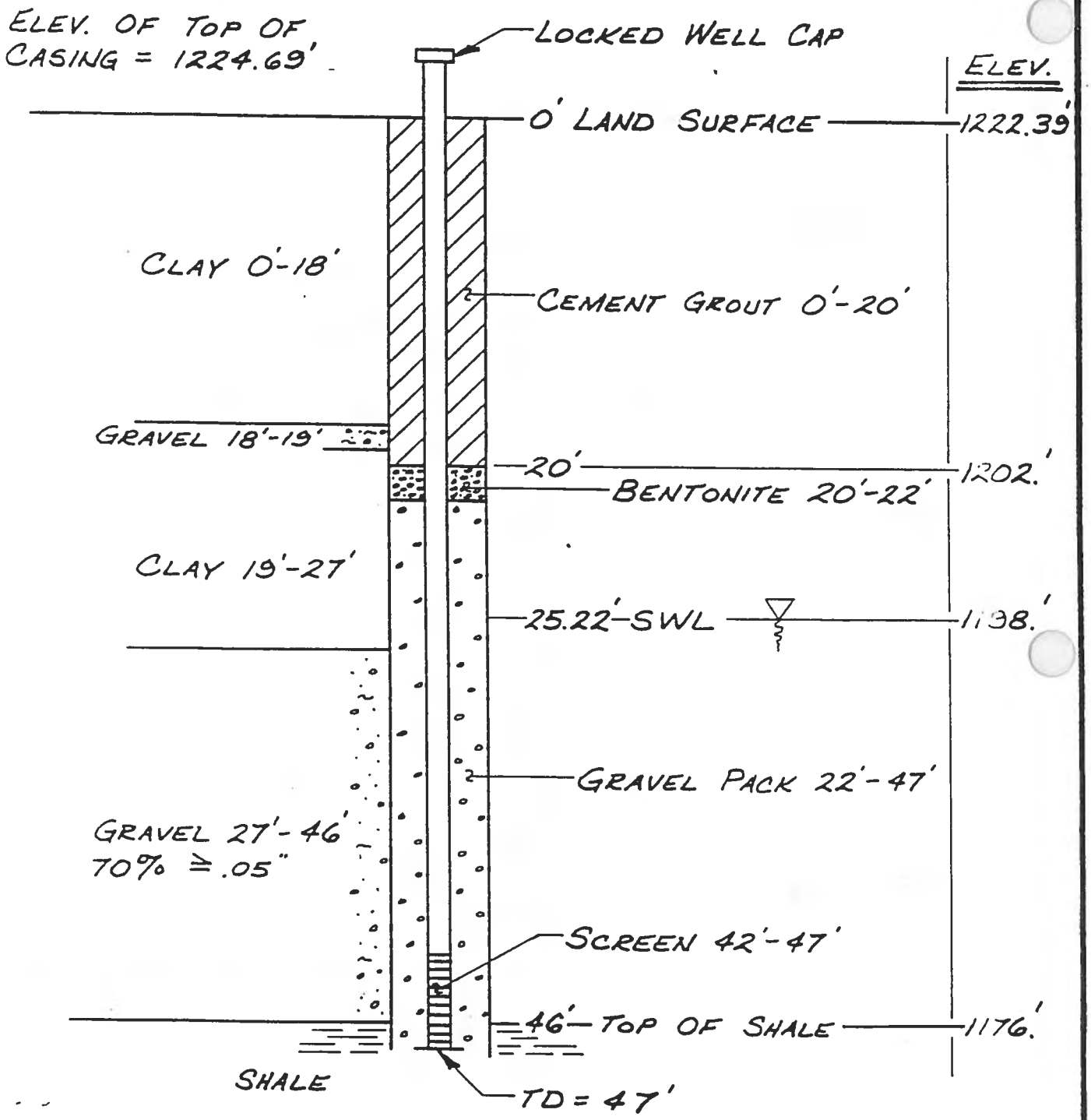


KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

EXLINE, INC.
WELL COMPLETION DETAILS
"C" SERIES WELLS
TYPICAL COMPLETION

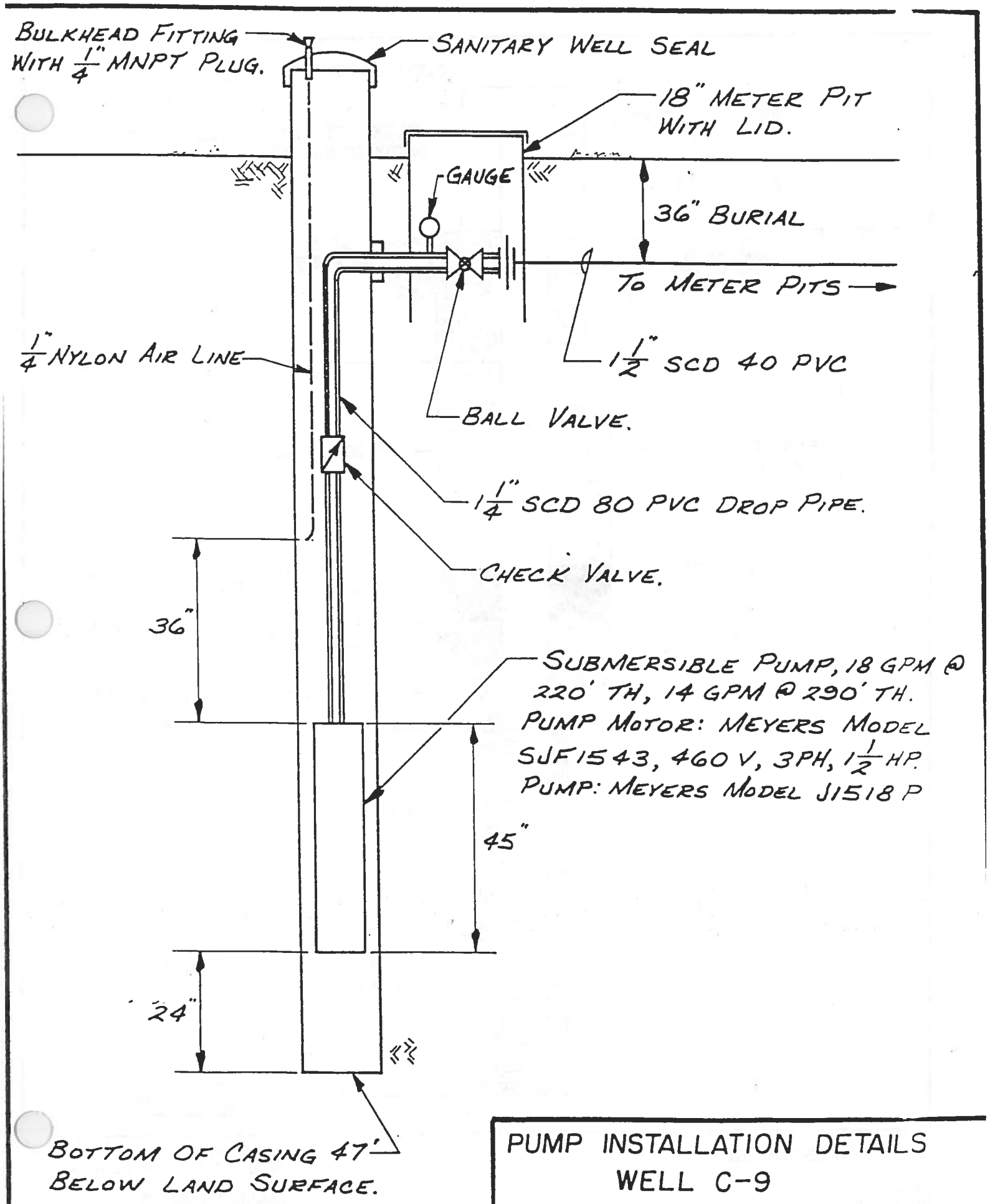
DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE
DWG		TMC	7-24-89		7-24-89

EXLINE C-9 WELL



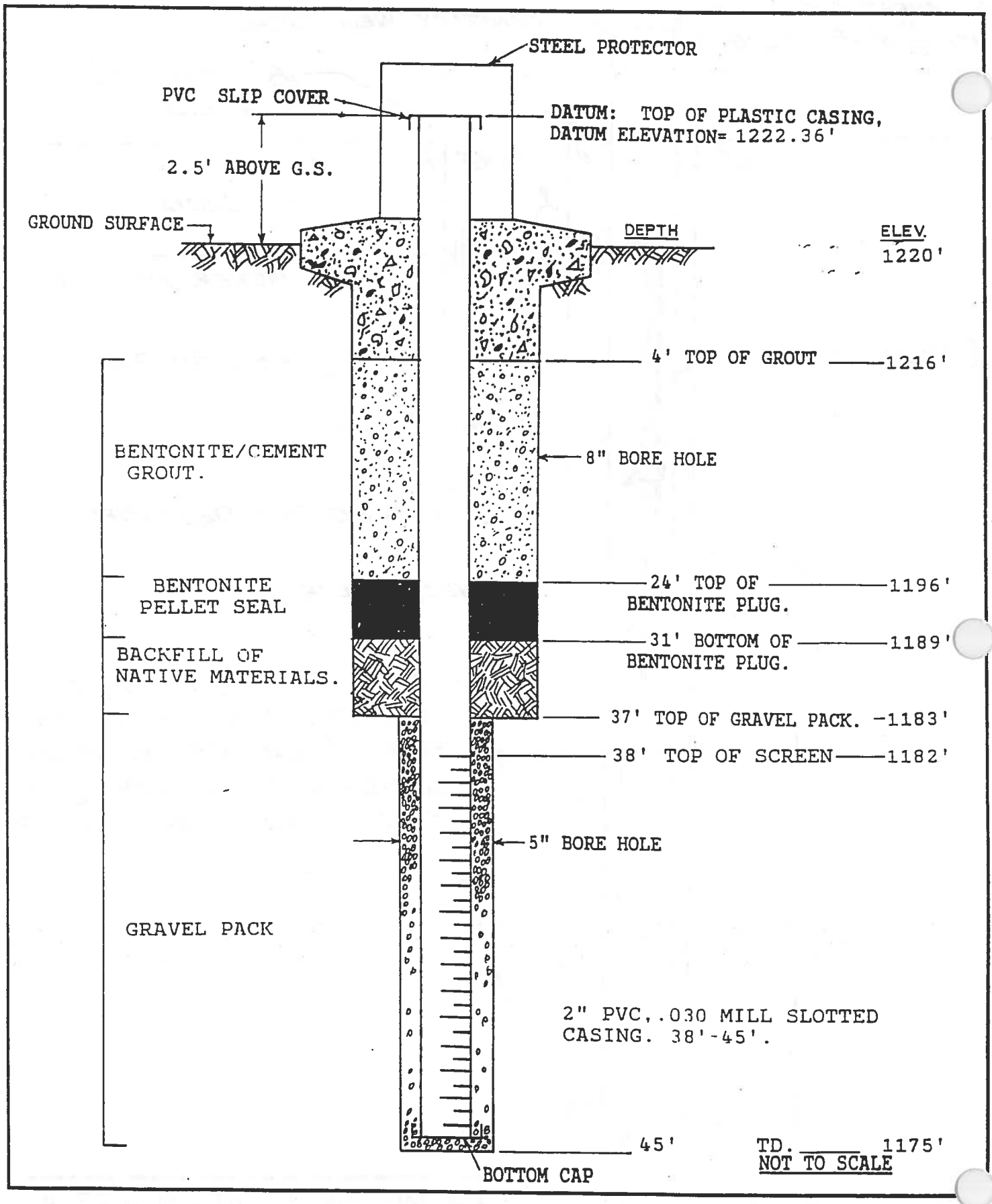
BOREHOLE: 8" Ø, 47' T.D. BOTTOM ELEV. = 1175'
CASING: 5" Ø PVC SDR 26
SCREEN: 5', 0.04" MILL SLOTTED PVC, 5" Ø.
TOP ELEV.: 1180'
BOTTOM ELEV.: 1175'
GRAVEL PACK: 70% ≥ .25"
TOP ELEV. = 1200'
BOTTOM ELEV.: 1175'

EXLINE INC.	
WELL COMPLETION DETAILS	
WELL C-9	NO SCALE
DSGN: TMC / OSE	DATE 4/88



PUMP INSTALLATION DETAILS
WELL C-9
EXLINE INC.

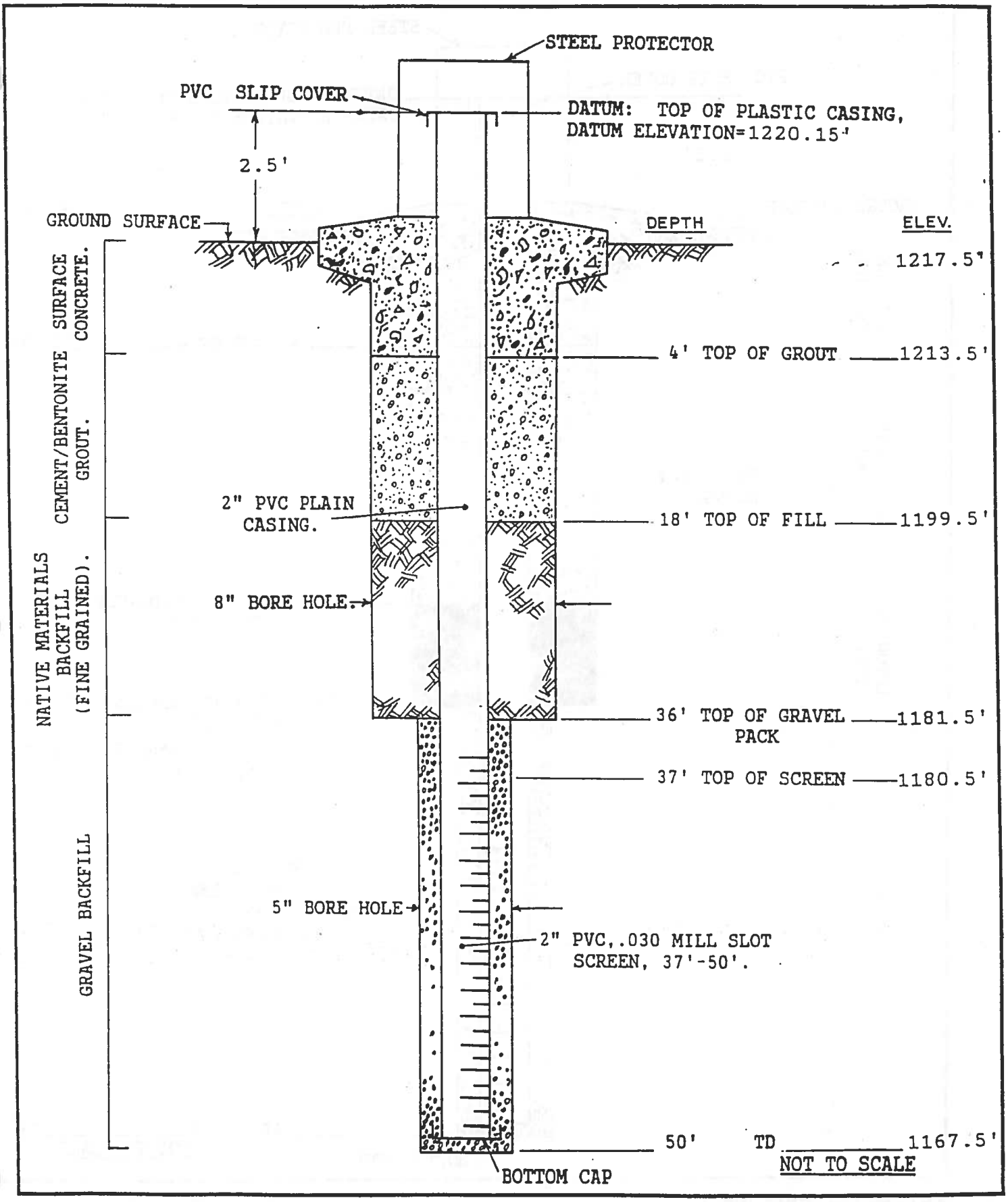
NOT TO SCALE



KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

EXLINE, INC.
WELL COMPLETION DETAILS
MONITOR WELL D-1
DRILLED: 2-22-89

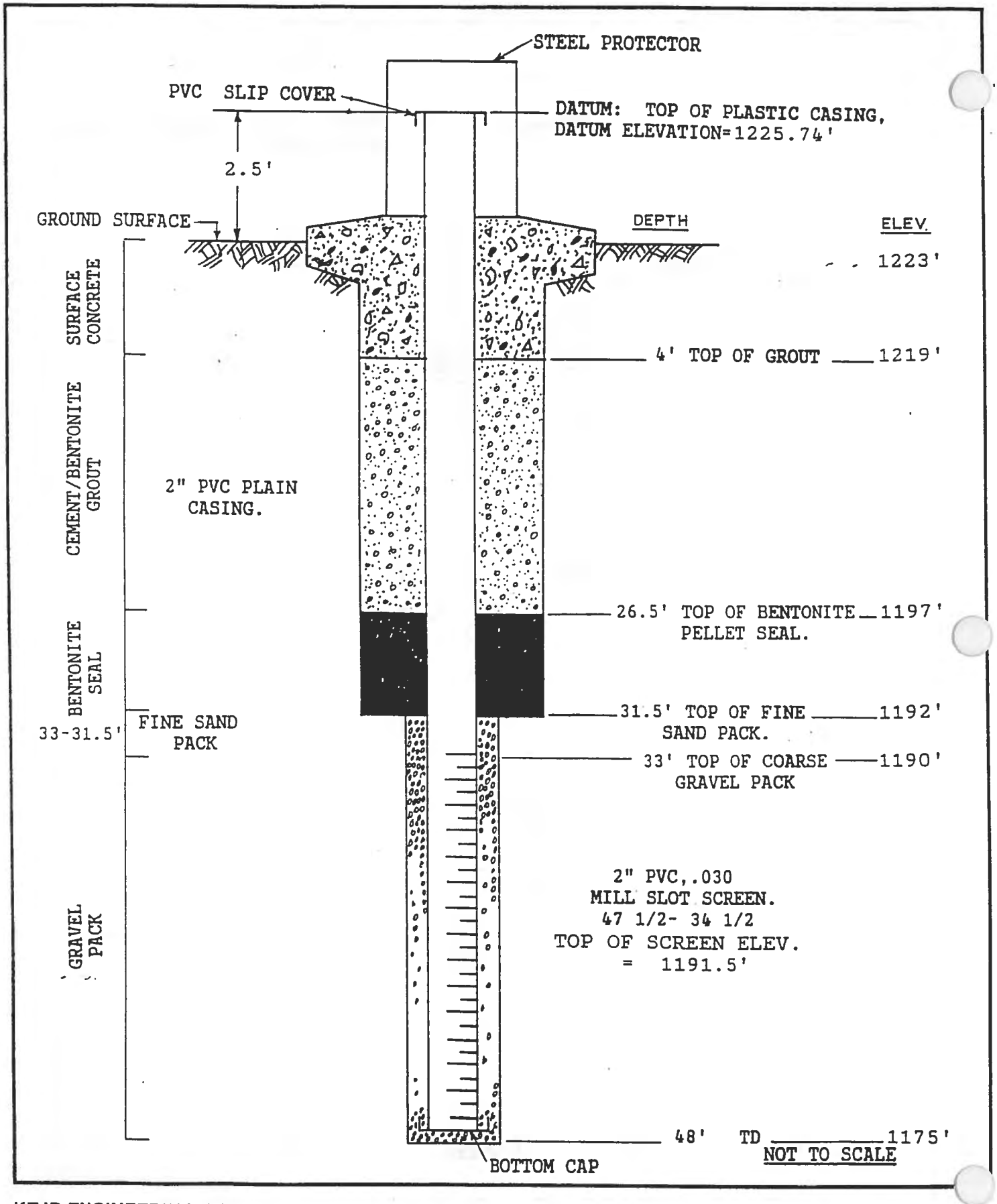
DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE



KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

EXLINE, INC.
WELL COMPLETION DETAILS
MONITOR WELL D-2
DRILLED: 23-24 FEB. 1989

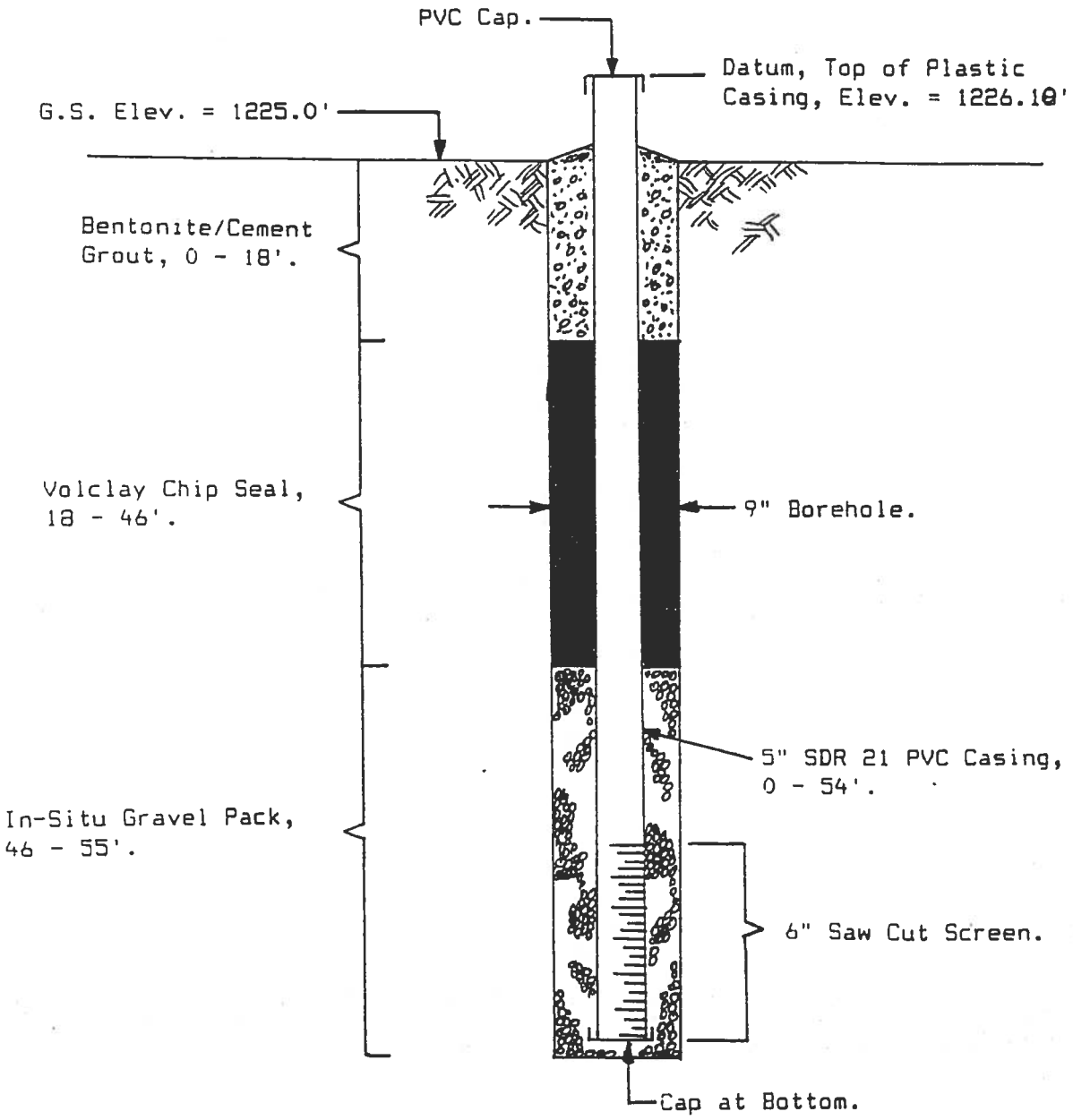
DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE



KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

EXLINE, INC.
WELL COMPLETION DETAILS
MONITOR WELL D-3
DRILLED: 2-25-89

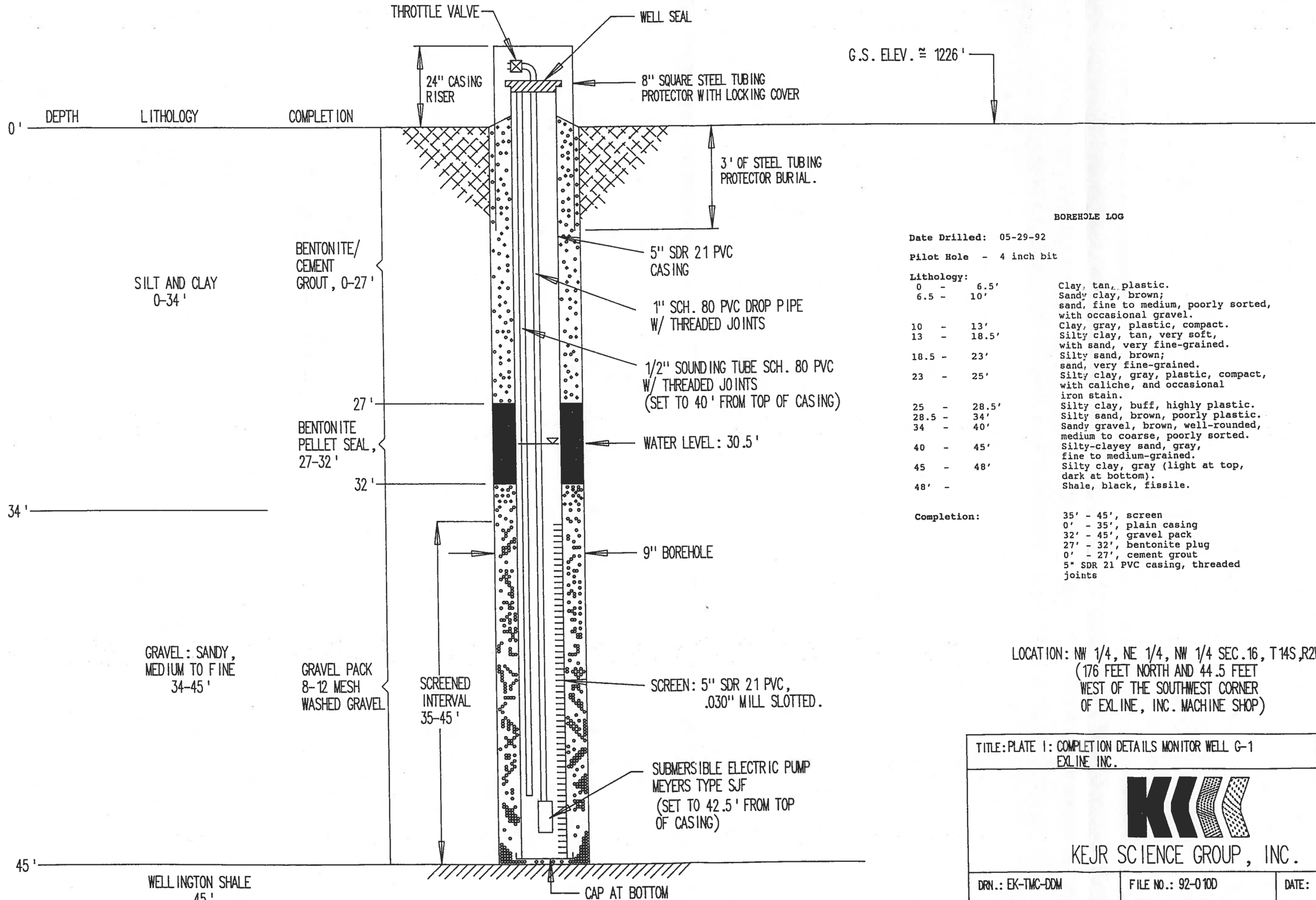
DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE
3-14-89	WELL MONITOR D-3				



EJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

Exline, Inc.
Well Completion
Monitor Well E-2
Drilled: 5/31/89

DRAWN	PROJECT	APPROVED	DATE	REVISED	DATE
DWG		TMC	7-11-89		7-11-89



BOREHOLE LOG

Date Drilled: 05-29-92

Pilot Hole - 4 inch bit

Lithology:

0 - 6.5'	Clay, tan, plastic.
6.5 - 10'	Sandy clay, brown; sand, fine to medium, poorly sorted, with occasional gravel.
10 - 13'	Clay, gray, plastic, compact.
13 - 18.5'	Silty clay, tan, very soft, with sand, very fine-grained.
18.5 - 23'	Silty sand, brown; sand, very fine-grained.
23 - 25'	Silty clay, gray, plastic, compact, with caliche, and occasional iron stain.
25 - 28.5'	Silty clay, buff, highly plastic.
28.5 - 34'	Silty sand, brown, poorly plastic.
34 - 40'	Sandy gravel, brown, well-rounded, medium to coarse, poorly sorted.
40 - 45'	Silty-clayey sand, gray, fine to medium-grained.
45 - 48'	Silty clay, gray (light at top, dark at bottom).
48' -	Shale, black, fissile.

Completion:

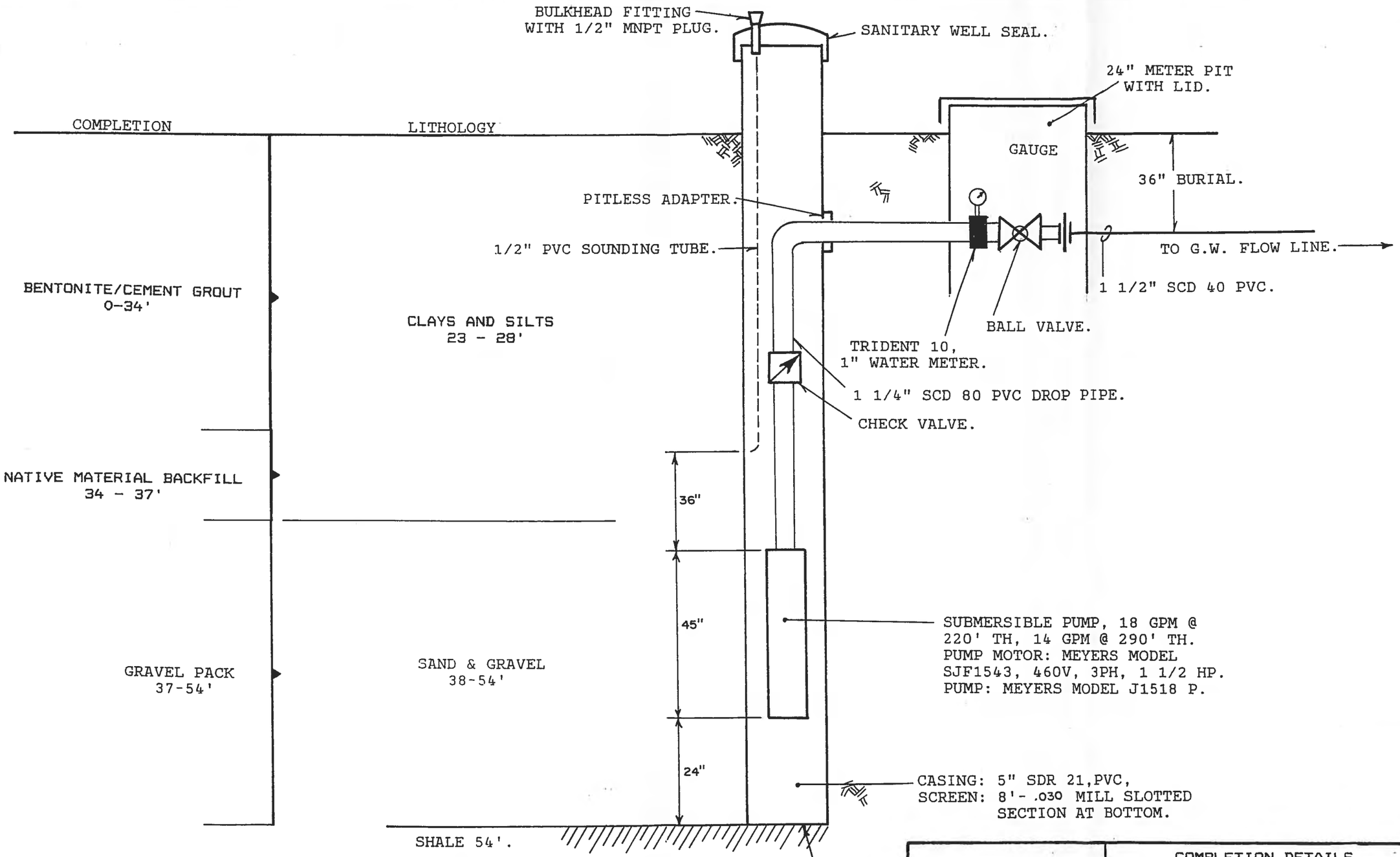
35' - 45', screen
0' - 35', plain casing
32' - 45', gravel pack
27' - 32', bentonite plug
0' - 27', cement grout
5" SDR 21 PVC casing, threaded joints

LOCATION: NW 1/4, NE 1/4, NW 1/4 SEC.16, T14S,R2W (176 FEET NORTH AND 44.5 FEET WEST OF THE SOUTHWEST CORNER OF EXLINE, INC. MACHINE SHOP)

TITLE: PLATE 1: COMPLETION DETAILS MONITOR WELL G-1 EXLINE INC.	SCALE: NTS

KEJR SCIENCE GROUP, INC.

DRN.: EK-TMC-DDM	FILE NO.: 92-010D	DATE: 6-2-92



KEJR ENGINEERING, INC.
607 Barney St.
Salina, KS 67401
(913) 825-1851

COMPLETION DETAILS
WELL E-3

SCALE NTS	APPROVED BY	DRAWN BY
DATE 3-22-89	TMC	TMC

DRAWING NUMBER

SHEPARD ENGINEERING, INC.
719 E. Crawford, Salina, Kansas

MONITOR WELL - DRILLING AND COMPLETION RECORD

PROJECT:	EXLINE, INC. - SALINA, KANSAS
FILE #:	99-010C
WELL NAME:	Monitor Well G-2
WELL LOCATION:	app. 850' FEL, 850' FNL NW1/4 Sec. 16, T14S, R2W Saline County, Kansas (app. half-way between MWs B-9 and B-10, on south side of chrome shop)
SPUD TIME:	7/28/1999 1400 hrs.
COMPLETION TIME:	7/29/1999 1100 hrs.
DRILLED BY:	Geocore Services, Salina, KS
EQUIPMENT:	Gus Pech Hollow-Stem Auger Drill, with 7 5/8" augers
LOGGED BY:	Robert Hopkins, SEI Geologist

0 - 5'	clay, dark gray, slightly silty (topsoil).
5 - 9.5'	clay, brown, silty.
9.5 - 15'	silt, brown, clayey, friable.
15 - 18.5'	sand, fine-grained, brown, silty.
18.5 - 20.5'	clay, sandy, dark brown.
20.5 - 21'	clay, sandy, white.
21 - 24'	sand, fine-grained, brown.
24 - 26'	clay, sandy, gray.
26 - 30'	sand, fine-grained, brown, clayey.
30 - 38'	clay, sandy, tan. (wet @ 25')
38 - 54'	sand to gravel, brown.
54 - 59'	clay, dark gray, grading into weathered shale (Wellington Shale).

59' TD @ 1600 hrs. Estimated Water Level 25'

Completion Information:

+1 - 44': plain (2" PVC Schedule 40)
44 - 54': screen (2" PVC with 0.010 mill slots)
(surface protection - above-ground steel cover)

PVC Annulus:	0 - 2':	cement pad
	2 - 41.5':	liquid bentonite grout
	41.5 - 59':	3 sax 10-20 sand, and heaved native sand

The liquid grout was mixed with 3 sax of Ben-Seal and 80 gal. of water. The PVC casing annulus capacity is approximately 2 gal/ft.

ENVIRO TECH SERVICES, INC..
361 North Ohio St., Salina, Kansas

MONITOR WELL COMPLETION RECORD

PROJECT:	EXLINE, INC. - SALINA, KANSAS
FILE #:	03-021 (SEI 03-010C)
WELL NAME:	Monitor Well H-1
WELL LOCATION:	app. 1970' FWL, 910' FNL, Sec. 16, T14S, R2W Saline County, Kansas
SPUD TIME:	10/27/2003 1030 hrs.
COMPLETION TIME:	10/27/2003 1210 hrs.
DRILLED BY:	Geocore Services, Salina, KS
EQUIPMENT:	Gus Pech Hollow-Stem Auger Drill, with 7 5/8" augers
LOGGED:	Geoprobe Conductivity Log 7/8/2002, by Plains Environmental Services, Salina, KS
41' TD @ 1045 hrs.	Estimated Water Level 30'

+2 - 31': plain (2" PVC Schedule 40)
31 - 41': screen (2" PVC with 0.010 mill slots)
surface protection - above-ground steel cover

PVC Annulus:	0 - 2':	cement pad
	2 - 29':	liquid bentonite grout; thick grout surface return
	29 - 41':	5 sax 10-20 sand

The liquid grout was mixed with 2 sax of Ben-Seal and 50 gal. of water. The PVC casing annulus capacity is approximately 2 gal/ft.

Well developed on 10-28-03; water level at start of development was 29.80'. Bailed 15 gal; pumped with Geosquirt pump 40 gal.; turbidity decreased at end.

ENVIRO TECH SERVICES, INC..
361 North Ohio St., Salina, Kansas

MONITOR WELL COMPLETION RECORD

PROJECT:	EXLINE, INC. - SALINA, KANSAS
FILE #:	03-021 (SEI 03-010C)
WELL NAME:	Monitor Well H-2
WELL LOCATION:	app. 2000' FWL, 805' FNL, Sec. 16, T14S, R2W Saline County, Kansas
SPUD TIME:	10/27/2003 1240 hrs.
COMPLETION TIME:	10/27/2003 1430 hrs.
DRILLED BY:	Geocore Services, Salina, KS
EQUIPMENT:	Gus Pech Hollow-Stem Auger Drill, with 7 5/8" augers
LOGGED:	Geoprobe Conductivity Log 7/8/2002, by Plains Environmental Services, Salina, KS
41' TD @ 1330 hrs.	Estimated Water Level 32'

+2 - 26': plain (2" PVC Schedule 40)
26 - 41': screen (2" PVC with 0.010 mill slots)
surface protection - above-ground steel cover

PVC Annulus:	0 - 2':	cement pad
	2 - 24':	liquid bentonite grout; thick grout surface return
	24 - 41':	6 sax 10-20 sand

The liquid grout was mixed with 2 sax of Ben-Seal and 48 gal. of water. The PVC casing annulus capacity is approximately 2 gal/ft.

Well developed on 10-28-03; water level at start of development was 31.57'. Bailed 15 gal; pumped with Geosquirt pump 38 gal.; turbidity decreased at end.

SHEPARD ENGINEERING, INC.
719 E. Crawford, Salina, Kansas

MONITOR WELL COMPLETION RECORD

PROJECT:	EXLINE, INC. - SALINA, KANSAS
FILE #:	02-010C
WELL NAME:	Monitor Well H-3
WELL LOCATION:	app. 2000' FWL, 700' FNL, Sec. 16, T14S, R2W Saline County, Kansas
SPUD TIME:	8/15/2002 1600 hrs.
COMPLETION TIME:	8/15/2002 1850 hrs.
DRILLED BY:	Geocore Services, Salina, KS
EQUIPMENT:	Gus Pech Hollow-Stem Auger Drill, with 7 5/8" augers
LOGGED:	Geoprobe Conductivity Log 7/8/2002, by Plains Environmental Services, Salina, KS
51' TD @ 1700 hrs.	Estimated Water Level 32'

+2 - 36': plain (2" PVC Schedule 40)
36 - 51': screen (2" PVC with 0.010 mill slots)
surface protection - above-ground steel cover

PVC Annulus:	0 - 2':	cement pad
	2 - 34':	liquid bentonite grout; thick grout surface return
	34 - 51':	8 sax 10-20 sand

The liquid grout was mixed with 3 sax of Ben-Seal and 60 gal. of water. The PVC casing annulus capacity is approximately 2 gal/ft.

Well developed on 8-19-02; water level at start of development was 32.30'. Bailed 20 gal; pumped with Geosquirt pump 50 gal.; turbidity decreased at end.

ENVIRO TECH SERVICES, INC..
361 North Ohio St., Salina, Kansas

MONITOR WELL COMPLETION RECORD

PROJECT:	EXLINE, INC. - SALINA, KANSAS
FILE #:	03-021 (SEI 03-010C)
WELL NAME:	Monitor Well H-4
WELL LOCATION:	app. 1975' FWL, 545' FNL, Sec. 16, T14S, R2W Saline County, Kansas
SPUD TIME:	10/27/2003 1515 hrs.
COMPLETION TIME:	10/27/2003 1700 hrs.
DRILLED BY:	Geocore Services, Salina, KS
EQUIPMENT:	Gus Pech Hollow-Stem Auger Drill, with 7 5/8" augers
LOGGED:	Geoprobe Conductivity Log 7/8/2002, by Plains Environmental Services, Salina, KS
45' TD @ 1600 hrs.	Estimated Water Level 35'

+2 - 35': plain (2" PVC Schedule 40)
35 - 45': screen (2" PVC with 0.010 mill slots)
surface protection - above-ground steel cover

PVC Annulus:	0 - 2':	cement pad
	2 - 33':	liquid bentonite grout; thick grout surface return
	33 - 45':	5 sax 10-20 sand

The liquid grout was mixed with 2 sax of Ben-Seal and 50 gal. of water. The PVC casing annulus capacity is approximately 2 gal/ft.

Well developed on 10-29-03; water level at start of development was 34.10'. Bailed 15 gal; pumped with Geosquirt pump 40 gal.; turbidity decreased at end.

ENVIRO TECH SERVICES, INC..
361 North Ohio St., Salina, Kansas

MONITOR WELL COMPLETION RECORD

PROJECT:	EXLINE, INC. - SALINA, KANSAS
FILE #:	03-021 (SEI 03-010C)
WELL NAME:	Monitor Well H-5
WELL LOCATION:	app. 1750' FWL, 970' FNL, Sec. 16, T14S, R2W Saline County, Kansas
SPUD TIME:	10/28/2003 0830 hrs.
COMPLETION TIME:	10/28/2003 1130 hrs.
DRILLED BY:	Geocore Services, Salina, KS
EQUIPMENT:	Gus Pech Hollow-Stem Auger Drill, with 7 5/8" augers
LOGGED:	Geoprobe Conductivity Log 7/8/2002, by Plains Environmental Services, Salina, KS
57' TD @ 0930 hrs.	Estimated Water Level 35'

+2 - 42': plain (2" PVC Schedule 40)
42 - 57': screen (2" PVC with 0.010 mill slots)
surface protection - above-ground steel cover

PVC Annulus:	0 - 2':	cement pad
	2 - 40':	liquid bentonite grout; thick grout surface return
	40 - 57':	7 sax 10-20 sand

The liquid grout was mixed with 2.5 sax of Ben-Seal and 60 gal. of water. The PVC casing annulus capacity is approximately 2 gal/ft.

Well developed on 10-29-03; water level at start of development was 34.08'. Bailed 15 gal; pumped with Geosquirt pump 40 gal.; turbidity decreased at end.

SHEPARD ENGINEERING, INC.
719 E. Crawford, Salina, Kansas

MONITOR WELL COMPLETION RECORD

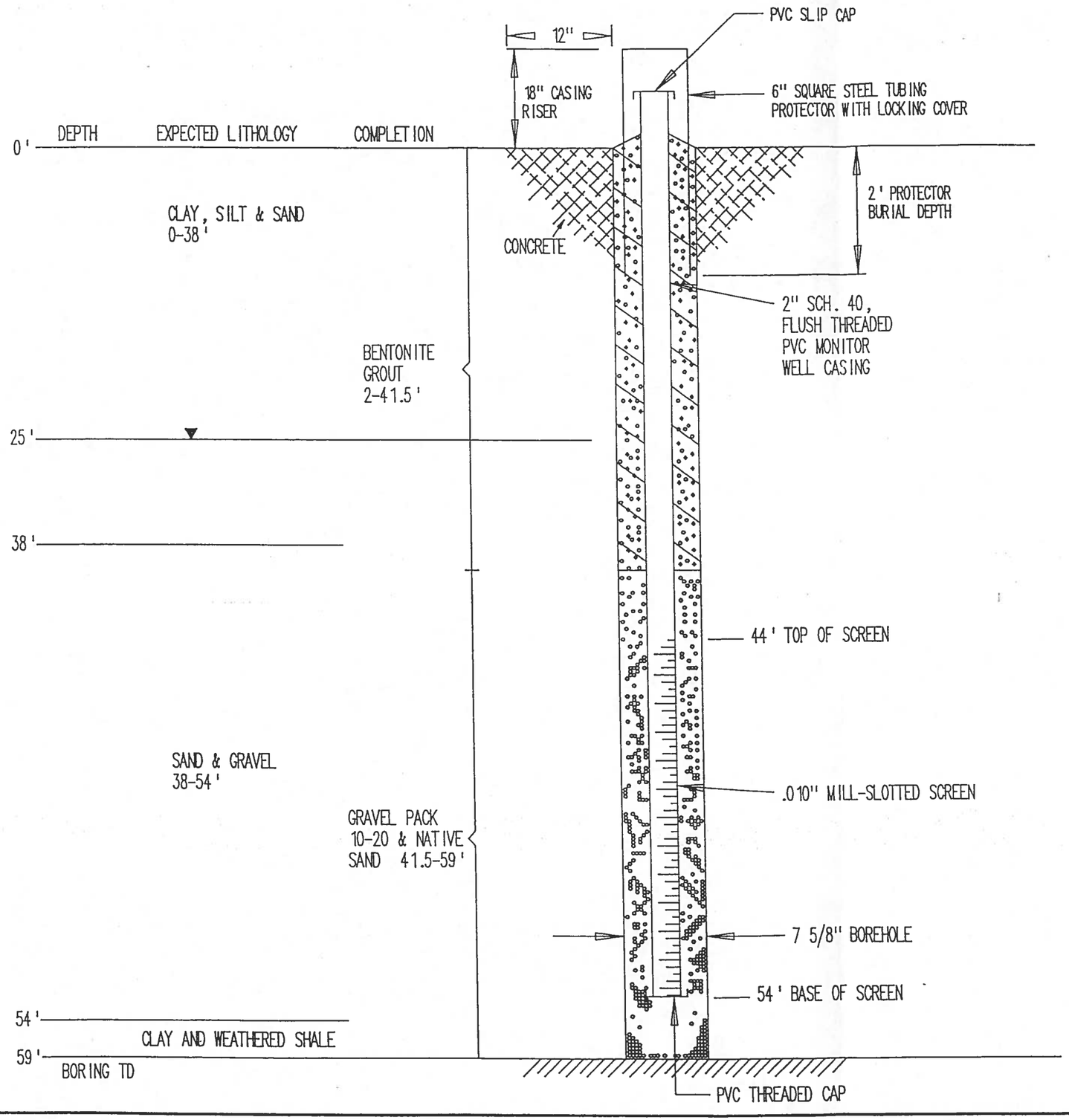
PROJECT:	EXLINE, INC. - SALINA, KANSAS
FILE #:	02-010C
WELL NAME:	Monitor Well H-6
WELL LOCATION:	app. 2400' FWL, 350' FNL, Sec. 16, T14S, R2W Saline County, Kansas
SPUD TIME:	8/15/2002 1130 hrs.
COMPLETION TIME:	8/15/2002 1500 hrs.
DRILLED BY:	Geocore Services, Salina, KS
EQUIPMENT:	Gus Pech Hollow-Stem Auger Drill, with 7 5/8" augers
LOGGED:	Geoprobe Conductivity Log 7/8/2002, by Plains Environmental Services, Salina, KS
46' TD @ 1230 hrs.	Estimated Water Level 23'

+2 - 31': plain (2" PVC Schedule 40)
31 - 46': screen (2" PVC with 0.010 mill slots)
surface protection - above-ground steel cover

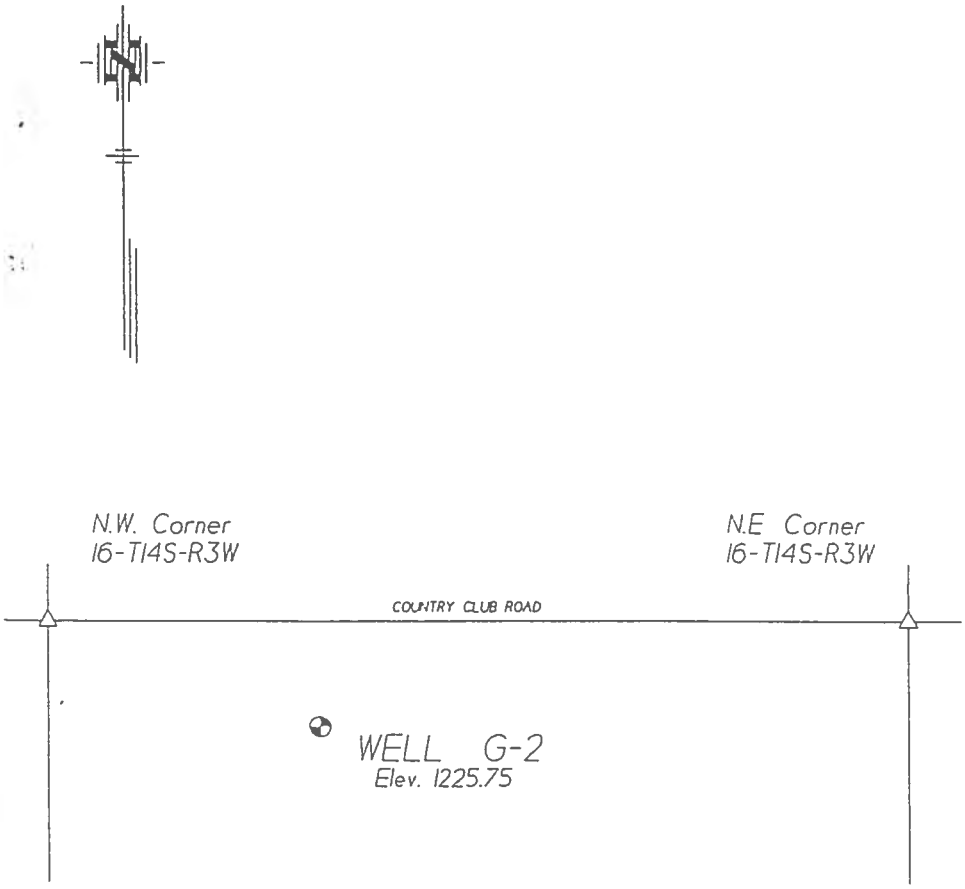
PVC Annulus:	0 - 2':	cement pad
	2 - 29':	liquid bentonite grout; thick grout surface return
	29 - 46':	8 sax 10-20 sand

The liquid grout was mixed with 3 sax of Ben-Seal and 60 gal. of water. The PVC casing annulus capacity is approximately 2 gal/ft.

Well was developed 8-16-02. Water level was 22.60' at start of development. Bailed 25 gal.; pumped 60 gal.; water turbidity decreased toward end of pumping.



TITLE: MONITOR WELL G-2 COMPLETION DETAILS EXLINE, INC., SALINA, KANSAS		SCALE: NTS
Shepard Engineering, Inc.		
DRN RTH	FILE NO.: 99-010C	DATE: August, 1999



G2 ..... 985' S & 3604' W. OF THE NE COR SEC. 16

This monitoring well is located in the N 1/2 of Section 16 T 14 S R 2 W of the 6th P.M. Saline Co. KS
Elevations are to top of PVC casing @ notch or groove

JERRY DEAN FROESE
LICENSED
LS-1214
KANSAS
LAND SURVEYOR

SURVEYS, Inc.
ELLSWORTH, KANSAS 67439

PROJECT	99-23
DATE	10-04-99
BY JDF	SH. 1 OF 2

FORM WWC-5 WELL COMPLETION RECORDS
EXLINE, INC.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

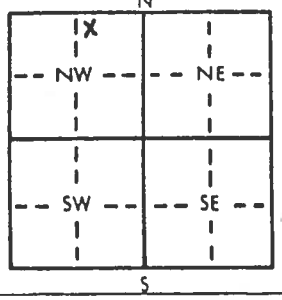
LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
County: Saline	NW NE ¼ NW ¼	16	T 14 S	R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well A-2

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 48' ft. ELEVATION: 1226.13'
Depth(s) Groundwater Encountered 1. 34' ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 28.68' ft. below land surface measured on mo/day/yr 5/13/93
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to 48 ft., and in. to ft.
WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Monitoring well 11 Injection well 12 Other (Specify below)
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel 2 PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued Clamped Welded Threaded
Blank casing diameter 4 in. to 35 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.
TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter 3 Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)
SCREEN-PERFORATED INTERVALS: From 35 ft. to 40 ft., From 44 ft. to 46.5 ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 30 ft. to 48 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other
Grout Intervals: From 0 ft. to 28 ft., From 28 ft. to 30 ft., From ft. to ft.
What is the nearest source of possible contamination:
1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well 16 Other (specify below) industrial impound.
Direction from well? S How many feet? 375

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	8	silt and clay			
8	11	silt			
11	31	silt and clay			
31	40	gravel and sand			
40	43	silty gravel			
43	47	gravel and sand			
47	48	yellow shale			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 2-1-1968 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993
under the business name of Kejr Science Group by (signature) Robert T. Hopkins

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

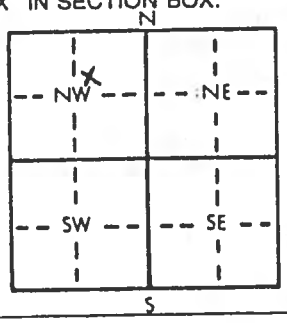
LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
County: Saline	SW ¼ NE ¼ NW ¼	16	T 14 S	R 2 W

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well B-1

WATER WELL OWNER: Exline, Inc.
RR #, St. Address, Box # : 3256 E. Country Club Rd.
City, State, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 59 ft. ELEVATION: 1226.77'
Depth(s) Groundwater Encountered 1. 27 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 25.30 ft. below land surface measured on mo/day/yr 5-27-93
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to 59 ft., and in. to ft.
WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel (2) PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued Clamped Welded Threaded
Blank casing diameter 2 in. to 52 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile (7) PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)
SCREEN-PERFORATED INTERVALS: From 52 ft. to 55 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 26 ft. to 59 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 24 ft., From 24 ft. to 26 ft., From ft. to ft.
What is the nearest source of possible contamination: 1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment
How many feet? 115
Direction from well? S

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	3.5	clay fill			
3.5	4.5	gray topsoil			
4.5	18.5	silty clay			
18.5	20	sandy clay			
20	27	clay			
27	29.5	silt and sand			
29.5	35	clay			
35	48	sand and gravel			
48	54.5	sand			
54.5	59	gray shale			

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 5-3-1982 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993
under the business name of Kejr Science Group by (signature) Robert Hopkins

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

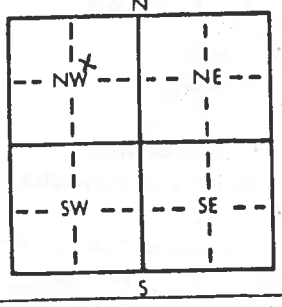
LOCATION OF WATER WELL: County: Saline | Fraction: SW NE ¼ NW ¼ | Section Number: 16 | Township Number: T 14 S | Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well B-2

WATER WELL OWNER: Exline, Inc.
RR #, St. Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 25 ft. ELEVATION:
Depth(s) Groundwater Encountered 1. ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to 25 ft., and in. to ft.
WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel (2) PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued Clamped Welded Threaded
Blank casing diameter 4 in. to 20 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) (12) None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter 3 Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) (11) None (open hole)
~~SCREEN~~-PERFORATED INTERVALS: From 20 ft. to 25 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 18 ft. to 25 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 16 ft., From 16 ft. to 18 ft., From ft. to ft.
What is the nearest source of possible contamination: 1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment
How many feet? 50
Direction from well? W

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	7	fill			
7	13	silty clay			
13	19.5	clay			
19.5	20	ash			
20	25	clay			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 5-3-1982 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993 under the business name of Kejr Science Group by (signature) Robert Hopkins

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

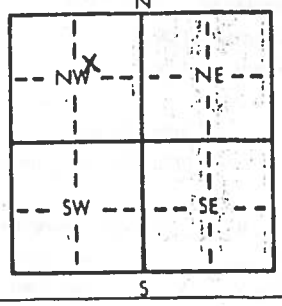
LOCATION OF WATER WELL: County: Saline	Fraction: SE ¼ NE ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 W

Distance and direction from nearest town or city street address of well if located within city? 3256 E. Country Club Rd. well B-3

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 30 ft. ELEVATION: 1226.36'

Depth(s) Groundwater Encountered 1. ..... ft. 2. ..... ft. 3. ..... ft.

WELL'S STATIC WATER LEVEL ..... ft. below land surface measured on mo/day/yr .....

Pump test data: Well water was ..... ft. after ..... hours pumping ..... gpm

Est. Yield ..... gpm: Well water was ..... ft. after ..... hours pumping ..... gpm

Bore Hole Diameter 6 in. to 30 ft., and ..... in. to ..... ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)

Was a chemical/bacteriological sample submitted to Department? Yes ..... No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED: 1 Steel (2) PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued ..... Clamped ..... Welded ..... Threaded .....

Blank casing diameter 2 in. to 10 ft., Dia ..... in. to ..... ft., Dia ..... in. to ..... ft.

Casing height above land surface 18 in., weight ..... lbs./ft. Wall thickness or gauge No. .....

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile (7) PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) ..... 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) ..... 11 None (open hole)

SCREEN-PERFORATED INTERVALS: From 10 ft. to 30 ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

GRAVEL PACK INTERVALS: From 8 ft. to 30 ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

6 GROUT MATERIAL: (1) Neat cement 2 Cement grout 3 Bentonite 4 Other .....

Grout Intervals: From 0 ft. to 8 ft., From ..... ft. to ..... ft., From ..... ft. to ..... ft.

What is the nearest source of possible contamination:
1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment

Direction from well? S How many feet? 25

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	3	silt and clay fill			
3	5.5	clay			
5.5	7	silt			
7	21	clay			
21	28.5	silt			
28.5	30	clay			

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 5-3-1982 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993 under the business name of Kejr Science Group by (signature) Robert Hopkins

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
County: Saline	S , NE ¼ NW ¼	16	T 14 S	R 2 W

Distance and direction from nearest town or city street address of well if located within city?

3256 E. Country Club Rd. well B-4

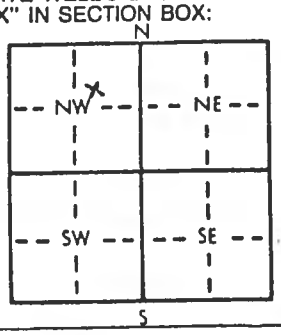
WATER WELL OWNER: Exline, Inc.

RR#, St. Address, Box # : 3256 E. Country Club Rd.

City, State, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 58 ft. ELEVATION: 1233.37'

Depth(s) Groundwater Encountered 1. 39 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 30.54 ft. below land surface measured on mo/day/yr 5-27-93

Pump test data: Well water was ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to 58 ft., and in. to ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel (2) PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued Clamped Welded Threaded

Blank casing diameter 4 in. to 22 ft., Dia 2 in. to 54 ft., Dia in. to ft.

Casing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile (7) PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)

SCREEN-PERFORATED INTERVALS: From 54 ft. to 57 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From 38 ft. to 58 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other

Grout Intervals: From 0 ft. to 36 ft., From 36 ft. to 38 ft., From ft. to ft.

What is the nearest source of possible contamination: 1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment

Direction from well? ne How many feet? 290

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	5	clay			
5	10	silt and clay			
10	22	sandy silt			
22	37.5	clay and silt			
37.5	39	sandy silt			
39	42	sand and gravel			
42	45	clay			
45	49	sand and gravel			
49	55	clay			
55	57	gravel			
57	58	gray shale			

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 5-3-1982 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993 under the business name of Kejr Science Group by (signature) Robert Hopkins

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form WWC-5

LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
County: Saline	SE ¼ NE ¼ NW ¼	16	T 14 S	R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well B-5

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:

N / NW X / NE / W / E / SW / SE / S

4 DEPTH OF COMPLETED WELL: 55 ft. ELEVATION: 1216.08'
Depth(s) Groundwater Encountered 1. 21 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 10.12 ft. below land surface measured on mo/day/yr 5-27-93
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to 55 ft., and in. to ft.
WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)
Was a chemical/bacteriological sample submitted to Department? Yes ..... No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel (2) PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued Clamped Welded Threaded
Blank casing diameter 2 in. to 44 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.
TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile (7) PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)
SCREEN-PERFORATED INTERVALS: From 44 ft. to 47 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 20 ft. to 55 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 18 ft., From 18 ft. to 20 ft., From ft. to ft.
What is the nearest source of possible contamination: 1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment
Direction from well? WNW How many feet? 820

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	8	silty clay			
8	17	clay			
17	21	sandy clay			
21	23	sand and gravel			
23	26	sandy clay			
26	34	sand and gravel			
34	37	sandy clay			
37	39	sand and gravel			
39	45	silty clay			
45	48.5	sand and gravel			
48.5	55	gray shale			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 5-3-1982 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993
under the business name of Kejr Science Group by (signature) Robert Hopkins

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form ...

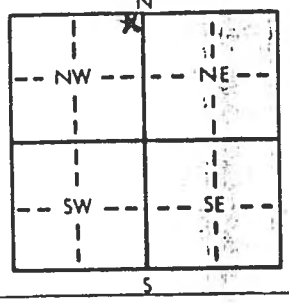
LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
nty: Saline	NE , NE ¼ NW ¼	16	T 14 S	R 2 W

ance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well B-6

WATER WELL OWNER: Exline, Inc.
Address, Box # : 3256 E. Country Club Rd.
City, State, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 46.5 ft. ELEVATION: 1215.59'
Depth(s) Groundwater Encountered 1. 21 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 15.92 ft. below land surface measured on mo/day/yr 5-27-1993
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to 46.5 ft., and in. to ft.
WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Monitoring well 11 Injection well 12 Other (Specify below)
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel 2 PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued Clamped Welded Threaded
nk casing diameter 5 in. to 23 ft., Dia in. to ft., Dia in. to ft.
sing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.
PE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)
REEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter 3 Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)
REEN-PERFORATED INTERVALS: From 23 ft. to 27 ft., From 42 ft. to 46 ft
From ft. to ft., From ft. to ft
GRAVEL PACK INTERVALS: From 20 ft. to 46.5 ft., From ft. to ft
From ft. to ft., From ft. to ft

GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other
out Intervals: From 0 ft. to 18 ft., From 18 ft. to 20 ft., From ft. to ft
hat is the nearest source of possible contamination: 1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well 16 Other (specify below) industrial impoundment
How many feet? 865
irection from well? SW

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	21	clay			
21	27	sand and gravel			
27	39	silty clay			
39	46	sand and gravel			
46	46.5	gray shale			

NTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 5-3-1982 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993
under the business name of Kejr Science Group by (signature) Robert Hopkins

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD

LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
unty: Saline	SW NE ¼ NW ¼	16	T 14 S	R 2 W

istance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well B-7

WATER WELL OWNER: Exline, Inc.
l# Address, Box # : 3256 E. Country Club Rd.
y, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:

N / NW (X) / NE / W / E / SW / SE / S

4 DEPTH OF COMPLETED WELL 60 ft. ELEVATION:
Depth(s) Groundwater Encountered 1. 35.5 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 7 in. to 60 ft., and in. to ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering (12) Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only 10 Monitoring well remediation well
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
(2) PVC 4 ABS 7 Fiberglass Threaded
ank casing diameter 5 in. to 46 ft., Dia in. to ft., Dia in. to ft.
asing height above land surface 12 in., weight lbs./ft. Wall thickness or gauge No.

YPE OF SCREEN OR PERFORATION MATERIAL: (7) PVC 10 Asbestos-cement
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

CREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

CREEN-PERFORATED INTERVALS: From 46 ft. to 56 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From 34 ft. to 60 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
rout Intervals: From 0 ft. to 32 ft., From 32 ft. to 34 ft., From ft. to ft.

hat is the nearest source of possible contamination: 10 Livestock pens 14 Abandoned water well
1 Septic tank 4 Lateral lines 7 Pit privy 11 Fuel storage 15 Oil well/Gas well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 12 Fertilizer storage (16) Other (specify below)
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 13 Insecticide storage industrial impoundment
irection from well? SW How many feet? 10

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	4	clay and silt fill			
4	6	silt			
6	12	silty clay			
12	15	clay			
15	21	silty clay			
21	29	silt			
29	35.5	clay			
35.5	50	gravel			
50	50.5	clay			
50.5	55.5	gravel and silt			
55.5	60	gray shale			

NTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and wa c on (mo/day/year) 6-29-1982 and this record is true to the best of my knowledge and belief. Kansa Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993
inder the business name of Kejr Science Group by (signature) [signature]

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

CATION OF WATER WELL: Fraction: SW NE ¼ NW ¼ | Section Number: 16 | Township Number: T 14 S | Range Number: R 2 E/W

ity: Saline

nce and direction from nearest town or city street address of well if located within city?

3256 E. Country Club Rd. well B-8

/ATER WELL OWNER: Exline, Inc.

Address, Box #: 3256 E. Country Club Rd.

ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources Application Number:

OCATE WELL'S LOCATION WITH N "X" IN SECTION BOX:

N / NW (X) / NE / W / E / SW / SE / S

4 DEPTH OF COMPLETED WELL 51 ft. ELEVATION: 1225.51'

Depth(s) Groundwater Encountered 1. 35 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 24.90 ft. below land surface measured on mo/day/yr 5-27-93

Pump test data: Well water was ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to 51 ft., and in. to ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

YPE OF BLANK CASING USED: 1 Steel (2) PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued Clamped Welded Threaded

k casing diameter 5 in. to 37' ft., Dia in. to ft., Dia in. to ft.

ing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.

E OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile (7) PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)

REEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)

REEN-PERFORATED INTERVALS: From 37 ft. to 49 ft., From ft. to ft.

From ft. to ft., From ft. to ft.

RAVEL PACK INTERVALS: From 34 ft. to 51 ft., From ft. to ft.

From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other

ut Intervals: From 0 ft. to 32 ft., From 32 ft. to 34 ft., From ft. to ft.

at is the nearest source of possible contamination:

1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment

ection from well? SW How many feet? 110

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	5	silty clay fill			
5	14	clay			
14	16	sandy silt			
16	24.5	silt			
4.5	31	clay			
1	35	sandy silt			
5	39	silty gravel			
9	39.5	clay			
9.5	44	silt and gravel			
4	45	clay			
5	49	sand and gravel			
9	51	gray shale			

TRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and wa d on (mo/day/year) 6-30-1982 and this record is true to the best of my knowledge and belief. Kansa ater Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-93

der the business name of Kejr Science Group by (signature) Robert Hyslin

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

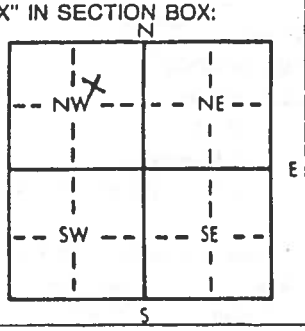
LOCATION OF WATER WELL: County: Saline	Fraction: SW NE ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city? 3256 E. Country Club Rd. well B-9

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box # : 3256 E. Country Club Rd.
City, State, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 59 ft. ELEVATION: 1225.02'
Depth(s) Groundwater Encountered 1. 18.5 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 24.44 ft. below land surface measured on mo/day/yr 5-27-93
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to 59 ft., and in. to ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well
Was a chemical/bacteriological sample submitted to Department? Yes ..... No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
(2) PVC 4 ABS 7 Fiberglass Threaded
Blank casing diameter 2 in. to 38.5 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: (7) PVC 10 Asbestos-cement
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

SCREEN-PERFORATED INTERVALS: From 38.5 ft. to 54.5 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From 17 ft. to 59 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 15 ft., From 15 ft. to 17 ft., From ft. to ft.

What is the nearest source of possible contamination: 10 Livestock pens 14 Abandoned water well
1 Septic tank 4 Lateral lines 7 Pit privy 11 Fuel storage 15 Oil well/Gas well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 12 Fertilizer storage (16) Other (specify below) industrial impoundment
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 13 Insecticide storage
Direction from well? e How many feet? 50

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	3	silty clay			
3	5	clay			
5	11	clayey silt			
11	18.5	silt			
18.5	19	sand			
19	21	clay			
21	38	silty to sandy clay			
38	45	sand and gravel			
45	54.5	gravel			
54.5	59	gray shale			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 6-28-1983 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993
under the business name of Kejr Science Group by (signature) Robert Hepburn

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD

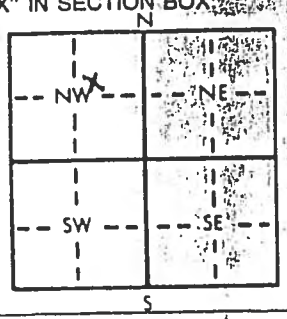
LOCATION OF WATER WELL: County: Saline	Fraction: SW NE ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city? 3256 E. Country Club Rd. well B-10

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 59 ft. ELEVATION: 1225.83'

Depth(s) Groundwater Encountered 1. 17 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 24.93 ft. below land surface measured on mo/day/yr 5-27-93

Pump test data: Well water was ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to 59 ft., and in. to ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel (2) PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued Clamped Welded Threaded

Blank casing diameter 2 in. to 18 ft., Dia in. to ft., Dia in. to ft.

Casing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile (7) PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)

SCREEN-PERFORATED INTERVALS: From 18 ft. to 24 ft., From 40 ft. to 54.5 ft.
From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From 16 ft. to 59 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other

Grout Intervals: From 0 ft. to 14 ft., From 14 ft. to 16 ft., From ft. to ft.

What is the nearest source of possible contamination:
1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment

Direction from well? e How many feet? 100

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	3.5	clay fill			
3.5	9	clay			
9	17	sandy silt			
17	24	sand and gravel			
24	30	silt			
30	39	clay			
39	43	sand and gravel			
43	51	sand and silt			
51	52	silt			
52	54.5	sand and gravel			
54.5	59	gray shale			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 6-28-1983 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993 under the business name of Kejr Science Group by (signature) Robert Kejr

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

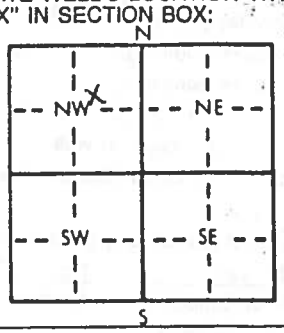
LOCATION OF WATER WELL: County: Saline	Fraction: ST ¼ NE ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 EW

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well B-11

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 58 ft. ELEVATION: 1225.03'
Depth(s) Groundwater Encountered 1. 38 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 23.22 ft. below land surface measured on mo/day/yr 5-27-93
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to 58 ft., and in. to ft.
WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED: 1 Steel (2) PVC 3 RMP (SR) 4 ABS 5 Wrought Iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued Clamped Welded Threaded
Blank casing diameter 2 in. to 38 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile (7) PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)
SCREEN-PERFORATED INTERVALS: From 38 ft. to 55 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 37 ft. to 55 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

6 GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 35 ft., From 35 ft. to 37 ft., From ft. to ft.
What is the nearest source of possible contamination: 1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment
Direction from well? n How many feet? 90

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	5	silty clay			
5	9	sandy silt			
9	16	clayey silt			
16	23	silty clay			
23	28	silt			
28	38	sandy silt			
38	55	sand and gravel			
55	58	gray shale			

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 6-28-1983 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993
under the business name of Kejr Science Group by (signature) [signature]

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

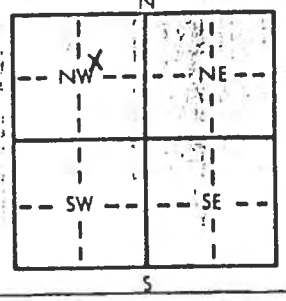
LOCATION OF WATER WELL: County: Saline | Fraction: S ¼ NE ¼ NW ¼ | Section Number: 16 | Township Number: T 14 S | Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well B-12

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resource
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 59 ft. ELEVATION: 1226.23
Depth(s) Groundwater Encountered 1. 41 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 25.00 ft. below land surface measured on mo/day/yr 5-27-93
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to 59 ft., and in. to ft.

WELL WATER TO BE USED AS:
1 Domestic 3 Feedlot 5 Public water supply 8 Air conditioning 11 Injection well
2 Irrigation 4 Industrial 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
7 Lawn and garden only (10) Monitoring well

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED:
1 Steel 3 RMP (SR) 5 Wrought iron 8 Concrete tile
(2) PVC 4 ABS 6 Asbestos-Cement 9 Other (specify below)
7 Fiberglass

CASING JOINTS: Glued Clamped
Welded
Threaded

Blank casing diameter 2 in. to 41.5 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 18 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL:
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) (7) PVC 10 Asbestos-cement
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 11 Other (specify)
12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE:
1 Continuous slot (3) Mill slot 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
2 Louvered shutter 4 Key punched 6 Wire wrapped 9 Drilled holes
7 Torch cut 10 Other (specify)

SCREEN-PERFORATED INTERVALS: From 41.5 ft. to 58.5 ft., From ft. to
From ft. to ft., From ft. to

GRAVEL PACK INTERVALS: From 40 ft. to 59 ft., From ft. to
From ft. to ft., From ft. to

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 38 ft., From 38 ft. to 40 ft., From ft. to

What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage (16) Other (specify below) industrial impoundment
13 Insecticide storage

Direction from well? n How many feet? 40

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	4	clay and silt			
4	7	silty clay			
7	15	gravelly silt			
15	24	clay			
24	34	sandy silt			
34	41	silt			
41	44	sand and gravel			
44	45	clay			
45	51	sand and gravel			
51	57.5	silty clay			
57.5	58	sand and gravel			
58	59	gray shale			

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 6-30-1983 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 7-8-1993
under the business name of Kejr Science Group by (signature) [signature]

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

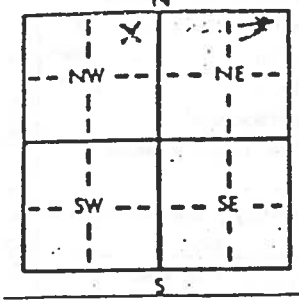
ATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
. . line	¼ ¼ ¼	16	T 1[illegible] S	R 2[illegible] E/W

ce and direction from nearest town or city street address of well if located within city?
.nc mile east of Salina, Ks.

TER WELL OWNER: Lxline Inc. Obsv. well No. C-1
Si ess, Box # : P O Box 1487
tate, ZIP Code : Salina, Ks 67402-1487

Board of Agriculture, Division of Water Resources
Application Number:

ATE WELL'S LOCATION WITH "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL ...45..... ft. ELEVATION: 1217.52.13

Depth(s) Groundwater Encountered 1. ....39..... ft. 2. ..... ft. 3. ..... ft.

WELL'S STATIC WATER LEVEL ..18.52.. ft. below land surface measured on mo/day/yr 11/19/87

Pump test data: Well water was ND ft. after ..... hours pumping ..... gpm

Est. Yield ..... gpm: Well water was ..... ft. after ..... hours pumping ..... gpm

Bore Hole Diameter ..6..... in. to ..... ft., and ..... in. to ..... ft.

WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only 10 Observation well .....

Was a chemical/bacteriological sample submitted to Department? Yes ..... No X ; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No X

OFFICE USE ONLY

PE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued ..... Clamped .....
Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded .....
PVC 4 ABS 7 Fiberglass ..... Threaded .....

casing diameter .....2.... in. to .....40..... ft., Dia ..... in. to ..... ft., Dia ..... in. to ..... ft.

height above land surface .....24..... in., weight SDR-26 ..... lbs./ft. Wall thickness or gauge No. .....

OF SCREEN OR PERFORATION MATERIAL: 7 PVC 10 Asbestos-cement
Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify) .....
Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

EN OR PERFORATION OF ENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
Continuous slot 3 Mill slot 6 Wire wrapped 9 Drilled holes
Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify) .....

EN-PERFORATED INTERVALS: From ...40..... ft. to .....45..... ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

VEL PACK INTERVALS: From ...20..... ft. to .....45..... ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

OUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other .....
Intervals: From .....0..... ft. to ..20..... ft., From ..... ft. to ..... ft., From ..... ft. to ..... ft.

s the nearest source of possible contamination: ND
Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below)
13 Insecticide storage .....

on from well? How many feet?

M	TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
	35	Clay and silt			
	44	Sand and gravel			
	50	Shale			
		See Detailed log attached			

TOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was ste (mo/day/year) .....11/16/87..... and this record is true to the best of my knowledge and belief. Kansas Well Contractor's License No. .....126..... This Water Well Record was completed on (mo/day/yr) ..11/7/87..... the business name of Hydraulic Drilling Co. by (signature)

TRUCTIONS. Use typewriter or ball point pen *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas artment of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320, Telephone: 913-862-9360. Send one to WATER WELL OWNER and retain one for your rds

WATER WELL RECORD Form WWC-5 KSA 82a-1212

ION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
alina	¼ ¼ ¼	16	T 14 S	R 2 E/W

and direction from nearest town or city street address of well if located within city?

mile east of Salina

WELL OWNER: Exline, Inc Obsv well No. C-2

ss, Box # : P O Bx. 1487

e, Code : Salina, KS 67402-1487

Board of Agriculture, Division of Water Resources Application Number:

TE WELL'S LOCATION WITH IN SECTION BOX: N X NW X NE SW SE E S

4 DEPTH OF COMPLETED WELL 55 ft. ELEVATION: 1217.62 Est

Depth(s) Groundwater Encountered 1. 36 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 19.78 ft. below land surface measured on mo/day/yr 11/16/87

Pump test data: Well water was ND ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to ft., and in. to ft.

WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well

1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)

2 Irrigation 4 Industrial 7 Lawn and garden only 10 Observation well X

Was a chemical/bacteriological sample submitted to Department? Yes No ; If yes, mo/day/yr sample was submitted X Water Well Disinfected? Yes No

OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped

teel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded

VC 4 ABS 7 Fiberglass Threaded X

sing diameter 2 in. to 50 ft., Dia in. to ft., Dia in. to ft.

eight above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SDR 26

SCREEN OR PERFORATION MATERIAL: 7 PVC 10 Asbestos-cement

teel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)

rass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)

ontinuous slot 3 Mill slot 6 Wire wrapped 9 Drilled holes

ouvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

PERFORATED INTERVALS: From 50 ft. to 55 ft., From ft. to ft.

From ft. to ft., From ft. to ft.

EL PACK INTERVALS: From 20 ft. to 55 ft., From ft. to ft.

From ft. to ft., From ft. to

UT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other

ervals: From 0 ft. to 20 ft., From ft. to ft., From ft. to ft.

the nearest source of possible contamination: ND

Septic tank	4 Lateral lines	7 Pit privy	10 Livestock pens
Sewer lines	5 Cess pool	8 Sewage lagoon	11 Fuel storage
Watertight sewer lines	6 Seepage pit	9 Feedyard	12 Fertilizer storage
			13 Insecticide storage
			14 Abandoned water well
			15 Oil well/Gas well
			16 Other (specify below)

from well? How many feet?

TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
36	Clay and silt			
54	Sand and gravel			
60	Shale			
	See detailed log attached			

OR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was (mo/day/year) 11/16/87 and this record is true to the best of my knowledge and belief. Kn

ell Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 12/7/87

e business name of Hydraulic Drilling Co. by (signature)

UCTIONS: Use typewriter or ball point pen PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas ment of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320. Telephone: 913-862-9360 Send one to WATER WELL OWNER and retain one for your

OFFICE USE ONLY T R E/W SEC.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

ATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
: Saline	NE ¼ NE ¼ ¼	11	T 14 S	R 2 E/W

e and direction from nearest town or city street address of well if located within city?

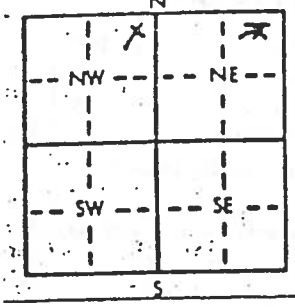
: mile east of Salina

TER WELL OWNER: Saline, Inc Obsv No. C-3 Board of Agriculture, Division of Water Resources

ress, Box # : P O Box 1487 Application Number:

ta Code : Salina, KS 67402-1487

ATE WELL'S LOCATION WITH "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL....47..... ft. ELEVATION: 1217.42 ft.

Depth(s) Groundwater Encountered 1. 38 ft. 2. ..... ft. 3. ..... ft.

WELL'S STATIC WATER LEVEL 17.78 ft. below land surface measured on mo/day/yr 11/19/87

Pump test data: Well water was ND ft. after ..... hours pumping ..... gpm

Est. Yield ..... gpm: Well water was ..... ft. after ..... hours pumping ..... gpm

Bore Hole Diameter 6 in. to ..... ft., and ..... in. to ..... ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Observation well 11 Injection well 12 Other (Specify below) .....

Was a chemical/bacteriological sample submitted to Department? Yes ..... No X; If yes, mo/day/yr sample was submitted ..... Water Well Disinfected? Yes ..... No X

OFFICE USE ONLY

PE OF BLANK CASING USED: 1 Steel 2 PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below) .....

CASING JOINTS: Glued ..... Clamped ..... Welded ..... Threaded .....

casing diameter 2 in. to 42 ft., Dia ..... in. to ..... ft., Dia ..... in. to ..... ft.

height above land surface 24 in., weight ..... lbs./ft. Wall thickness or gauge No. SDR 26

OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) ..... 12 None used (open hole)

EN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter 3 Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) ..... 11 None (open hole)

EN-PERFORATED INTERVALS: From 42 ft. to 47 ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

VEL PACK INTERVALS: From 20 ft. to 47 ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.

OUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other .....
Intervals: From 0 ft. to 20 ft., From ..... ft. to ..... ft., From ..... ft. to ..... ft.

s the nearest source of possible contamination: ND

1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well 16 Other (specify below) .....

tion from well? ..... How many feet? .....

OM	TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
	38	Clay and silt			
2	46	Sand and gravel			
	50	Shale			
		See detailed log attached			

O ACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was k (mo/day/year) 11/17/87 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 12/7/87 the business name of Public Drilling Inc by (signature) [signature]

STRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas partment of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320, Telephone: 913-862-9360. Send one to WATER WELL OWNER and retain one for your cords

WATER WELL RECORD

ON OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
Saline	¼ ¼ ¼	16	T 14 S	R 2 E/W

nd direction from nearest town or city street address of well if located within city?
mile east of Salina

WELL OWNER: Mxline, Inc. Obsv well No. C-4
Box # : P O Box 1487
Code : Salina, Ks. 67401-1487

Board of Agriculture, Division of Water Resources
Application Number:

WELL'S LOCATION WITHIN SECTION BOX:

N: X; NW; NE; W; E; SW; SE; S

4 DEPTH OF COMPLETED WELL 49 ft. ELEVATION: 1222.01 AS

Depth(s) Groundwater Encountered 1. 29 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 24.99 ft. below land surface measured on mo/day/yr 11/19/87

Pump test data: Well water was ND ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to ft., and in. to ft.

WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only 10 Observation well

Was a chemical/bacteriological sample submitted to Department? Yes No X; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No X

OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
el 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
C 4 ABS 7 Fiberglass Threaded
ng diameter 2 in. to 44 ft., Dia in. to ft., Dia in. to ft.
ight above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SDR 26

SCREEN OR PERFORATION MATERIAL: 7 PVC 10 Asbestos-cement
el 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)
ass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
ntinuous slot 3 Mill slot 6 Wire wrapped 9 Drilled holes
uvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

PERFORATED INTERVALS: From 44 ft. to 49 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

L PACK INTERVALS: From 20 ft. to 49 ft., From ft. to ft.
From ft. to ft., From ft. to

T MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other
rvals: From 0 ft. to 20 ft., From ft. to ft., From ft. to ft.

e nearest source of possible contamination: ND
ptic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
wer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
atertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below)
13 Insecticide storage
from well? How many feet?

TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
15	Clay and silt			
16	Gravel and sand			
29	Clay and silt			
48	Gravel and sand			
50	Shale			
	See detailed log			

OR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was (mo/day/year) 11/18/87 and this record is true to the best of my knowledge and belief. Kan
ll Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 12/8/87
business name of Hydraulic Drilling Co by (signature)

CTIONS: Use typewriter or ball point pen PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas ent of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320, Telephone: 913-862-9360. Send one to WATER WELL OWNER and retain one for your

OFFICE USE ONLY
T
H
E/W
SEC.
¼
¼
¼

WATER WELL RECORD Form WWC-5 KSA 82a-1212

ATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
[illegible]	¼ ¼ ¼	11	T 14 S	R 2 E/W

ce and direction from nearest town or city street address of well if located within city?

one mile east of Salina

WELL OWNER: xline, Inc Obsv. Well No. C-5

ess, Box # P O Box 1487

State, ZIP Code Salina, KS 67402-1487

Board of Agriculture, Division of Water Resources
Application Number:

CATE WELL'S LOCATION WITH "X" IN SECTION BOX:

N / NW / NE / W / E / SW / SE / S

4 DEPTH OF COMPLETED WELL 52 ft. ELEVATION: 1216.74 A.S.L.

Depth(s) Groundwater Encountered 1. 24 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 14.42 ft. below land surface measured on mo/day/yr 11/19/87

Pump test data: Well water was ND ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to ft., and in. to ft.

WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only 10 Observation well

Was a chemical/bacteriological sample submitted to Department? Yes No X; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No X

PE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
PVC 4 ABS 7 Fiberglass Threaded

casing diameter 2 in. to 47 ft., Dia in. to ft., Dia in. to ft.

height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No SDR 26

OF SCREEN OR PERFORATION MATERIAL: 7 PVC 10 Asbestos-cement
Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)
Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

EN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
Continuous slot 3 Mill slot 6 Wire wrapped 9 Drilled holes
Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

EN-PERFORATED INTERVALS: From 47 ft. to 52 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

VEL PACK INTERVALS: From 22.20 ft. to 22.52 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

OUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other
Intervals: From 0 ft. to 20 ft., From ft. to ft., From ft. to ft.

s the nearest source of possible contamination: ND
Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below)
13 Insecticide storage

on from well? How many feet?

M	TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
	24	Clay and silt			
	30	Gravel and sand			
	35	Clay			
	52	Gravel and sand			
	55	Shale			
		See detailed log			

OR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was ted on (mo/day/year) 11/18/87 and this record is true to the best of my knowledge and belief. Kansas Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 11/18/87 the business name of Hydraulic Drilling Co. by (signature)

TRUCTIONS. Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas artment of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320, Telephone: 913-862-9360. Send one to WATER WELL OWNER and retain one for your rds

OFFICE USE ONLY

WATER WELL RECORD Form WWC-5 KSA 82a-1212

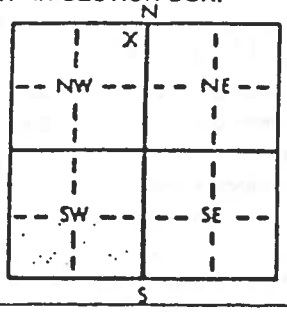
LOCATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
City: Salina	¼ ¼ ¼	16	T 14 S	R E/W

Distance and direction from nearest town or city street address of well if located within city?
One mile east of Salina

WATER WELL OWNER: Exline, Inc. Obev Well No. C-6
Address, Box #: P O Box 1487
City, State, ZIP Code: Salina, KS 67402-1487

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH A "X" IN SECTION BOX:



DEPTH OF COMPLETED WELL: 49 ft. ELEVATION: 1223.54 MSL
Depth(s) Groundwater Encountered 1. 33 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 26.29 ft. below land surface measured on mo/day/yr 11/25/87
Pump test data: Well water was ND ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 6 in. to ft., and in. to ft.
WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Observation well 11 Injection well 12 Other (Specify below)
Was a chemical/bacteriological sample submitted to Department? Yes No X; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No X

TYPE OF BLANK CASING USED: 1 Steel 2 PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued Clamped Welded Threaded
casing diameter 2 in. to 44 ft., Dia in. to ft., Dia in. to ft.
casing height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SDR 26

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter 3 Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)
SCREEN-PERFORATED INTERVALS: From 44 ft. to 49 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 20 ft. to 49 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other
Intervals: From 0 ft. to 20 ft., From ft. to ft., From ft. to ft.
What is the nearest source of possible contamination: ND
1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well 16 Other (specify below)
Direction from well? How many feet?

FROM	TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
	33	clay and silt			
	48	sand and gravel			
	53	shale			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 11/23/87 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 12/8/87
under the business name of Mid Valley Drilling Co by (signature)

INSTRUCTIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320. Telephone: 913-862-9360. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
ine	¼ ¼ ¼	16	T 14 S	R 2[illegible] E/W

direction from nearest town or city street address of well if located within city?

le east of Saline

OWNER: Saline Inc. Obsv well C-7

ox # : P O Box 1487

P : Saline, KS 67402-1487

Board of Agriculture, Division of Water Resources
Application Number:

WELL'S LOCATION WITH SECTION BOX: N / NW / NE / W / E / SW / SE / S — X

4 DEPTH OF COMPLETED WELL 49 ft. ELEVATION: 1223.00 LS

Depth(s) Groundwater Encountered 1 27 ft. 2 ft. 3 ft.

WELL'S STATIC WATER LEVEL 26.32 ft. below land surface measured on mo/day/yr 11/25/87

Pump test data: Well water was ND ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to 50 ft., and in. to ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Observation well 11 Injection well 12 Other (Specify below)

Was a chemical/bacteriological sample submitted to Department? Yes No X; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No X

BLANK CASING USED: 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued Clamped Welded Threaded X

diameter 2 in. to 44 ft., Dia in. to ft., Dia in. to ft.

t above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SDR 26

CREEN OR PERFORATION MATERIAL: 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)

PERFORATION OPENINGS ARE: nuous slot 3 Mill slot 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
ered shutter 4 Key punched 6 Wire wrapped 9 Drilled holes 7 Torch cut 10 Other (specify)

RFORATED INTERVALS: From 44 ft. to 49 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

A ACK INTERVALS: From 20 ft. to 45 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other

als: From 0 ft. to 20 ft., From ft. to ft., From ft. to ft.

nearest source of possible contamination: ND

ic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
er lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
ertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below) 13 Insecticide storage

m well? How many feet?

TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
27	Clay and silt			
4[illegible]	Gravel and sand			
50	Shale			
	See detailed log attached			

A S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was on (mo/day/year) 11/23/87 and this record is true to the best of my knowledge and belief. Kansas Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 12/5/87

usiness name of Hydraulic Drilling Co by (signature)

TIONS: Use typewriter or ball point pen. PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas t of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320. Telephone: 913-862-9360. Send one to WATER WELL OWNER and retain one for your

OFFICE USE ONLY T H E/W SEC. ¼ ¼ ¼

WATER WELL RECORD Form WWC-5 KSA 82a-1212

ATION OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
alina	¼ ¼ ¼		T 14 S	R E/W

e and direction from nearest town or city street address of well if located within city?

mile east of Salina, Kansas

WELL OWNER: Exline, Inc. Observ. Well No. C-8

ess, Box # : P O Box 1487

ate, ZIP Code : Salina, KS 67402-1487

Board of Agriculture, Division of Water Resources
Application Number:

ATE WELL'S LOCATION WITH X" IN SECTION BOX:

N: X | NW | NE
W: NW | SW
E: NE | SE
S: SW | SE

4 DEPTH OF COMPLETED WELL 33 ft. ELEVATION: 1,1.1.51 Av.

Depth(s) Groundwater Encountered 1. 25 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 22.67 ft. below land surface measured on mo/day/yr 11/25/87

Pump test data: Well water was ND ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to 47 ft., and in. to ft.

WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only 10 Observation well

Was a chemical/bacteriological sample submitted to Department? Yes No X; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No X

OFFICIAL USE ONLY

E OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
PVC 4 ABS 7 Fiberglass Threaded

asing diameter 2 in. to 33 ft., Dia in. to ft., Dia in. to ft.

height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SDR 26

OF SCREEN OR PERFORATION MATERIAL: 7 PVC 10 Asbestos-cement
Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)
Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

N OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
Continuous slot 3 Mill slot 6 Wire wrapped 9 Drilled holes
Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

N-PERFORATED INTERVALS: From 33 ft. to 33 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

VEL PACK INTERVALS: From 20 ft. to 33 ft., From ft. to ft.
From ft. to ft., From ft. to

OUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other
ntervals: From 0 ft. to 20 ft., From ft. to ft., From ft. to ft.

the nearest source of possible contamination: ND
Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage 16 Other (specify below)
13 Insecticide storage

n from well? How many feet?

TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
25	Clay and silt			
37	Gravel and sand			
47	Shale			
	See Detailed log attached			

TOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was led on (mo/day/year) 11/24/87 and this record is true to the best of my knowledge and belief. K s Well Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 12/28/87

he business name of Hydraulic Drilling Co by (signature)

RUCTIONS: Use typewriter or ball point pen PLEASE PRESS FIRMLY and PRINT clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas rtment of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320, Telephone 913-862-9360. Send one to WATER WELL OWNER and retain one for your s.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

ON OF WATER WELL:	Fraction	Section Number	Township Number	Range Number
aline	NE ¼ NE ¼ NW ¼	16	T 14 S	R 2 E/W

nd direction from nearest town or city street address of well if located within city?

mile east of Saline

OWNER: Saline, Inc. Well C-9

Box #: P.O. Box 1487

City, State, ZIP Code: Salina, KS 67402-1487

Board of Agriculture, Division of Water Resources Application Number:

WELL'S LOCATION WITH IN SECTION BOX: N; NW, NE, SW, SE

4 DEPTH OF COMPLETED WELL: 48 47 ft. ELEVATION: xxxxxxxx

Depth(s) Groundwater Encountered 1 25 27 ft. 2 ..... ft. 3 ..... ft.

WELL'S STATIC WATER LEVEL: 25.22 ft. below land surface measured on mo/day/yr 12/02/87

Pump test data: Well water was 28.42 ft. after 1 hours pumping 6.6 gpm

Est. Yield 19.8 gpm: Well water was ..... ft. after ..... hours pumping ..... gpm

Bore Hole Diameter 8 in. to 48 ft. and ..... in. to ..... ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Observation well 11 Injection well 12 Other (Specify below) recovery

Was a chemical/bacteriological sample submitted to Department? Yes ..... No X ; If yes, mo/day/yr sample was submitted ..... Water Well Disinfected? Yes ..... No X

F BLANK CASING USED: 1 Steel 2 Brass 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued Clamped Welded Threaded

g diameter 5 in. to 42 ft. Dia ..... in. to ..... ft. Dia ..... in. to ..... ft.

ht. above land surface 28 in. weight ..... lbs./ft. Wall thickness or gauge No. SDR 26

CREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)

R PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter 3 Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)

ATED INTERVALS: From 42 ft. to 47 ft., From ..... ft. to ..... ft.; From ..... ft. to ..... ft., From ..... ft. to ..... ft.

RAVEL PACK INTERVALS: From 20 ft. to 47 ft., From ..... ft. to ..... ft.; From ..... ft. to ..... ft., From ..... ft. to ..... ft.

MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other .....

alt: From 0 ft. to 20 ft., From ..... ft. to ..... ft., From ..... ft. to ..... ft.

nearest source of possible contamination: ND

c tank 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well 16 Other (specify below)

er lines

ortight sewer lines

m well? How many feet?

TO	LITHOLOGIC LOG	FROM	TO	LITHOLOGIC LOG
18	Clay and silt			
19	Gravel and sand			
27	Clay			
46	Gravel and sand			
48	Shale			
	See detailed log attached			

OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was (mo/day/year) 12/01/87 and this record is true to the best of my knowledge and belief. Kansas Contractor's License No. 126 This Water Well Record was completed on (mo/day/yr) 12/08/87

siness name of Hydraulic Drilling Co. by (signature) [signature]

ONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas of Health and Environment, Bureau of Water Protection, Topeka, Kansas 66620-7320, Telephone: 913-862-9360. Send one to WATER WELL OWNER and retain one for your

OFFICE USE ONLY

T R E/W SEC. ¼ ¼ ¼

LOCATION OF WATER WELL: Fraction: SW ¼ NE ¼ NW ¼ | Section: 16 | T 14 S | R 2 W

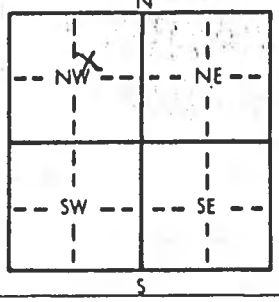
County: Saline

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well D-1

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box #: 3256 E. Country Club Rd
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 45 ft. ELEVATION: 1222 36!

Depth(s) Groundwater Encountered 1. 37 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 21.09 ft. below land surface measured on mo/day/yr 5-27-1993

Pump test data: Well water was ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 8 in. to 37 ft., and 5 in. to 45 ft.

WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below)
(2) PVC 4 ABS 7 Fiberglass

CASING JOINTS: Glued Clamped
Welded
Threaded

Blank casing diameter 2 in. to 38 ft., Dia in. to ft., Dia in. to ft.

Casing height above land surface 30 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: (7) PVC 10 Asbestos-cement
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

SCREEN-PERFORATED INTERVALS: From 38 ft. to 45 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From 37 ft. to 45 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other

Grout Intervals: From 0 ft. to 24 ft., From 24 ft. to 37 ft., From ft. to ft.

What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage (16) Other (specify below) industrial impoundment
13 Insecticide storage

Direction from well? W How many feet? 145

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	8	silty clay			
8	13	clay			
13	18	silt and clay			
18	25	silty sand			
25	37	sandy clay			
37	45	sand and gravel			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 2-22-1989 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 388 This Water Well Record was completed on (mo/day/yr) 7-9-1993
under the business name of Kejr Science Group by (signature) Robert Kejr

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD

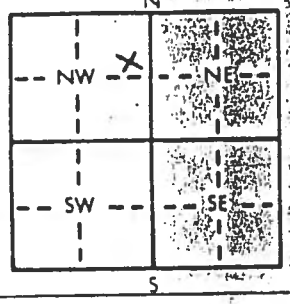
LOCATION OF WATER WELL: County: Saline	Fraction: SE NE ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 W

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well D-2

WATER WELL OWNER: Exline, Inc.
Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH A "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 50 ft. ELEVATION: 1220.15'
Depth(s) Groundwater Encountered 1. 36 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 19.48 ft. below land surface measured on mo/day/yr 5-27-1993
Pump test data: Well water was ft. after hours pumping gpm
Est. Yield gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 8 in. to 36 ft., and 5 in. to 50 ft.
WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Monitoring well 11 Injection well 12 Other (Specify below)
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel 2 PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)
CASING JOINTS: Glued Clamped Welded Threaded
Blank casing diameter 2 in. to 37 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 30 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter 3 Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)
SCREEN-PERFORATED INTERVALS: From 37 ft. to 50 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 36 ft. to 50 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other
Grout Intervals: From 0 ft. to 4 ft., From 4 ft. to 18 ft., From ft. to ft.
What is the nearest source of possible contamination:
1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well 16 Other (specify below) industrial impoundment
Direction from well? W How many feet? 360

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	5	silty clay			
5	10	clay to silty clay			
10	20	sandy clay			
20	36	silty clay			
36	50	sand and gravel			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 2-24-1989 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 388 This Water Well Record was completed on (mo/day/yr) 7-9-1993
under the business name of Kejr Science Group by (signature) Robert Hagen

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

OCATION OF WATER WELL: Fraction: N ¼ NE ¼ NW ¼ | Section Number: 16 | Township Number: T 14 S | Range Number: R 2 EW

nty: Saline

ance and direction from nearest town or city street address of well if located within city?

3256 E. Country Club Rd. well D-3

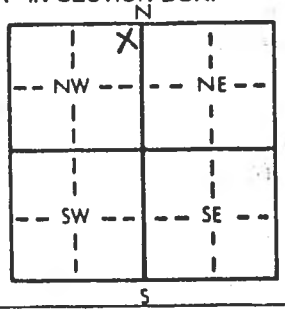
WATER WELL OWNER: Exline, Inc.

Address, Box # : 3256 E. Country Club Rd

, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources Application Number:

OCATE WELL'S LOCATION WITH N "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 48 ft. ELEVATION: 1225.74'

Depth(s) Groundwater Encountered 1. 27 ft. 2. ft. 3.

WELL'S STATIC WATER LEVEL 26.15' ft. below land surface measured on mo/day/yr 5-27-1993

Pump test data: Well water was ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 8 in. to 31.5 ft., and 5 in. to 48 ft.

WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well

1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)

2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped

1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded

(2) PVC 4 ABS 7 Fiberglass Threaded

nk casing diameter 2 in. to 34.5 ft., Dia in. to ft., Dia in. to ft.

sing height above land surface 30 in., weight lbs./ft. Wall thickness or gauge No.

PE OF SCREEN OR PERFORATION MATERIAL: (7) PVC 10 Asbestos-cement

1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)

2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

REEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)

1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes

2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

REEN-PERFORATED INTERVALS: From 34.5 ft. to 47.5 ft., From ft. to ft

From ft. to ft., From ft. to ft

GRAVEL PACK INTERVALS: From 31.5 ft. to 48 ft., From ft. to ft

From ft. to ft., From ft. to ft

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other

out Intervals: From 0 ft. to 4 ft., From 4 ft. to 31.5 ft., From ft. to ft

hat is the nearest source of possible contamination: 10 Livestock pens 14 Abandoned water well

1 Septic tank 4 Lateral lines 7 Pit privy 11 Fuel storage 15 Oil well/Gas well

2 Sewer lines 5 Cess pool 8 Sewage lagoon 12 Fertilizer storage (16) Other (specify below)

3 Watertight sewer lines 6 Seepage pit 9 Feedyard 13 Insecticide storage industrial impoundment

rection from well? SW How many feet? 705

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	2	rock fill			
2	14	silty clay			
14	19	sandy silt			
19	27	sandy clay			
27	49	sand and gravel			

NTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and w

.ed on (mo/day/year) 2-25-1989 and this record is true to the best of my knowledge and belief. Kans

Water Well Contractor's License No. 388 This Water Well Record was completed on (mo/day/yr) 7-9-1993

nder the business name of Kejr Science Group by (signature) Robert Hopkins

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

LOCATION OF WATER WELL: Fraction: SW ¼ NE ¼ NW ¼ | Section Number: 16 | Township Number: T 14 S | Range Number: R 2 E/W

County: Saline

Distance and direction from nearest town or city street address of well if located within city? 3256 E. Country Club Rd. well E-1

WATER WELL OWNER: Exline, Inc.

RR#, St. Address, Box #: 3256 E. Country Club Rd.

City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:

N / W / E / S — NW, NE, SW, SE — X

4 DEPTH OF COMPLETED WELL 55 ft. ELEVATION:

Depth(s) Groundwater Encountered 1. 15 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr

Pump test data: Well water was ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 6 in. to 55 ft., and in. to ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Monitoring well 11 Injection well 12 Other (Specify below)

Was a chemical/bacteriological sample submitted to Department? Yes No; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No

TYPE OF BLANK CASING USED: 1 Steel 2 PVC 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued Clamped Welded Threaded

Blank casing diameter none in. to ft., Dia in. to ft., Dia in. to ft.

Casing height above land surface in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter 3 Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)

SCREEN-PERFORATED INTERVALS: From none ft. to ft., From ft. to ft.

From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From ft. to ft., From ft. to ft.

From ft. to ft., From ft. to ft.

GROUT MATERIAL: 1 Neat cement 2 Cement grout 3 Bentonite 4 Other

Grout Intervals: From 0 ft. to 55 ft., From ft. to ft., From ft. to ft.

What is the nearest source of possible contamination: 1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well 6 Other (specify below) industrial impoundment

Direction from well? S How many feet? 110

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	3	topsoil	0	55	
3	15	sandy silt			
15	23	sand			
23	53.5	silt			
53.5	54	gravel			
54	55	gray shale			

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 5-25-1989 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 388 This Water Well Record was completed on (mo/day/yr) 7-9-1993 under the business name of Kejr Science Group by (signature) Robert Hyslum

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

LOCATION OF WATER WELL: Fraction: SW NE ¼ NW ¼ | Section Number: 16 | Township Number: T 14 S | Range Number: R 2 EW

County: Saline

Distance and direction from nearest town or city street address of well if located within city?

3256 E. Country Club Rd. well E-2

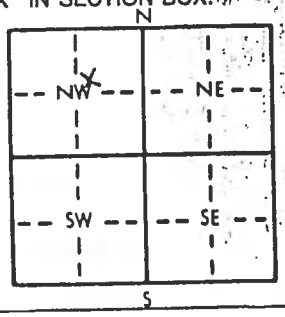
WATER WELL OWNER: Exline, Inc.

Address, Box #: 3256 E. Country Club Rd.

City, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL: 58 ft. ELEVATION: 1226.10'

Depth(s) Groundwater Encountered 1. 46 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 25.75' ft. below land surface measured on mo/day/yr 5-27-1993

Pump test data: Well water was ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 9 in. to 58 ft., and in. to ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering (10) Monitoring well 11 Injection well 12 Other (Specify below)

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel 2 (PVC) 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued Clamped Welded Threaded

Blank casing diameter 5 in. to 48 ft., Dia in. to ft., Dia in. to ft.

Casing height above land surface 13 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile (7) PVC 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)

SCREEN-PERFORATED INTERVALS: From 48 ft. to 54 ft., From ft. to ft.

From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From 46 ft. to 58 ft., From ft. to ft.

From ft. to ft., From ft. to ft.

GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other

Grout Intervals: From 0 ft. to 18 ft., From 18 ft. to 46 ft., From ft. to ft.

What is the nearest source of possible contamination: 1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment

Direction from well? S How many feet? 165

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	3	topsoil			
3	10	sandy silt			
10	27	clayey silt			
27	29	clay			
29	46	clayey silt			
46	55	sand and gravel			
55	58	gray shale			

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 5-31-1989 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 388 This Water Well Record was completed on (mo/day/yr) 7-9-1993 under the business name of Kejr Science Group by (signature) Robert Kejr

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

LOCATION OF WATER WELL: Fraction: SW NE ¼ NW ¼ | Section Number: 16 | Township Number: T 14 S | Range Number: R 2 E/W

County: Saline

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Rd. well E-3

WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box #: 3256 E. Country Club Rd.
City, State, ZIP Code: Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:

N / NW (X) / NE / W / E / SW / SE / S

4 DEPTH OF COMPLETED WELL: 55 ft. ELEVATION: 1225.84

Depth(s) Groundwater Encountered 1. 13 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL ft. below land surface measured on mo/day/yr

Pump test data: Well water was ft. after hours pumping gpm

Est. Yield gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 9 in. to 55 ft., and in. to ft.

WELL WATER TO BE USED AS: 1 Domestic 2 Irrigation 3 Feedlot 4 Industrial 5 Public water supply 6 Oil field water supply 7 Lawn and garden only 8 Air conditioning 9 Dewatering 10 Monitoring well 11 Injection well (12) Other (Specify below) remediation well

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

TYPE OF BLANK CASING USED: 1 Steel 2 (PVC) 3 RMP (SR) 4 ABS 5 Wrought iron 6 Asbestos-Cement 7 Fiberglass 8 Concrete tile 9 Other (specify below)

CASING JOINTS: Glued Clamped Welded Threaded

Blank casing diameter 5 in. to 40 ft., Dia in. to ft., Dia in. to ft.

Casing height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No.

TYPE OF SCREEN OR PERFORATION MATERIAL: 1 Steel 2 Brass 3 Stainless steel 4 Galvanized steel 5 Fiberglass 6 Concrete tile 7 (PVC) 8 RMP (SR) 9 ABS 10 Asbestos-cement 11 Other (specify) 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 1 Continuous slot 2 Louvered shutter (3) Mill slot 4 Key punched 5 Gauzed wrapped 6 Wire wrapped 7 Torch cut 8 Saw cut 9 Drilled holes 10 Other (specify) 11 None (open hole)

SCREEN-PERFORATED INTERVALS: From 40 ft. to 54 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From 37 ft. to 55 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GROUT MATERIAL: 1 Neat cement (2) Cement grout 3 Bentonite 4 Other

Grout Intervals: From 0 ft. to 34 ft., From ft. to ft., From ft. to ft.

What is the nearest source of possible contamination:
1 Septic tank 2 Sewer lines 3 Watertight sewer lines 4 Lateral lines 5 Cess pool 6 Seepage pit 7 Pit privy 8 Sewage lagoon 9 Feedyard 10 Livestock pens 11 Fuel storage 12 Fertilizer storage 13 Insecticide storage 14 Abandoned water well 15 Oil well/Gas well (16) Other (specify below) industrial impoundment

Direction from well? S How many feet? 75

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	1	road gravel			
1	7	clay			
7	10	sand			
10	13	clay			
13	18	sand			
18	23	gravel			
23	28	clay			
28	38	clay			
38	54	gravel			
54	55	gray shale			

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 6-7-1989 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 388 This Water Well Record was completed on (mo/day/yr) 7-9-1993 under the business name of Kejr Science Group by (signature) Robert Hylton

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

LOCATION: County: Saline	Fraction: ¼ ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
Exline, Inc., Salina, Kansas

WATER WELL OWNER: Exline Inc.
St. Address, Box # : 3256 E. Country Club Rd
City, State, ZIP Code : Salina, Kansas 67401

Board of Agriculture, Division of Water Resources
Application Number:

3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:

N / NW / NE / W / E / SW / SE / S — 1 Mile

4 DEPTH OF COMPLETED WELL ..... 59 ..... ft. ELEVATION: .....
Depth(s) Groundwater Encountered 1. ..... 25 ..... ft. 2. ..... ft. 3. ..... ft.
WELL'S STATIC WATER LEVEL ..... ft. below land surface measured on mo/day/yr .....
Pump test data: Well water was .... NA .... ft. after ..... hours pumping ..... gpm
Est. Yield .. NA ... gpm: Well water was ..... ft. after ..... hours pumping ..... gpm
Bore Hole Diameter .... 8 .... in. to ..... 59 ..... ft., and ..... in. to ..... ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well .....
Was a chemical/bacteriological sample submitted to Department? Yes ..... No ✓ ; If yes, mo/day/yr sample was submitted ✓
Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued ..... Clamped .....
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded .....
(2) PVC 4 ABS 7 Fiberglass ..... Threaded ✓
Blank casing diameter ..... 2 ..... in. to ..... 44 ..... ft., Dia ..... in. to ..... ft., Dia ..... in. to ..... ft.
Casing height above land surface ..... 12 ..... in., weight ..... Sch 40 ..... lbs./ft. Wall thickness or gauge No. .....
TYPE OF SCREEN OR PERFORATION MATERIAL (7) PVC 10 Asbestos-cement
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify) .....
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify) .....
SCREEN-PERFORATED INTERVALS: From ..... 44 ..... ft. to ..... 54 ..... ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to ..... ft.
GRAVEL PACK INTERVALS: From ..... 41.5 ..... ft. to ..... 59 ..... ft., From ..... ft. to ..... ft.
From ..... ft. to ..... ft., From ..... ft. to .....

6 GROUT MATERIAL: 1 Neat cement (2) Cement grout (3) Bentonite 4 Other .....
Grout Intervals: From ..... 0 ..... ft. to ..... 2 ..... ft., From ..... 2 ..... ft. to ..... 41.5 ..... ft., From ..... ft. to ..... ft.
What is the nearest source of possible contamination: 10 Livestock pens 14 Abandoned water well
1 Septic tank 4 Lateral lines 7 Pit privy 11 Fuel storage 15 Oil well/Gas well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 12 Fertilizer storage (16) Other (specify below)
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 13 Insecticide storage ... Unknown .....
Direction from well? How many feet?

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	5	Clay, Dark Gray			
5	9.5	Clay, Brown			
9.5	15	Silt, Brown			
15	18.5	Sand, Brown			
18.5	20.5	Clay, Dark Brown			
20.5	21	Clay, White			
21	24	Sand, Brown			
24	30	Sand, Brown			
30	38	Clay, Tan			
38	54	Sand to Gravel, Brown			
54	59	Clay, Dark Gray			
					G-2, Tag #, Abovegrade
					Project Name: Hopkins - Exline
					GeoCore # 534, #

CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) ..... 7/29/99 ..... and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. ..... 527 ..... This Water Well Record was completed on (mo/day/yr) ..... 7/30/99 ..... under the business name of GeoCore Services, Inc. by (signature) [signature]

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

OFFICE USE ONLY T R E/W SEC. ¼ ¼ ¼

WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL: County: Saline	Fracti SW ¼ NE ¼ NW ¼	Section Number 16	Township Number T 14 S	Range Number R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
1 mile E of Salina, Kansas

2 WATER WELL OWNER: Exline, Inc.
R, St. Address, Box # : 3256 E. Country Club Rd
City, State, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX

N / W / E / S / 1 Mile: NW X, NE, SW, SE

4 DEPTH OF COMPLETED WELL 41 ft. ELEVATION: 0
Depth(s) Groundwater Encountered 1. 30 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 30 ft. below land surface measured on mo/day/yr 10/27/2003
Pump test data: Well water was NA ft. after hours pumping gpm
Est. Yield NA gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 7 5/8 in. to 41 ft., and in. to ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
(2) PVC 4 ABS 7 Fiberglass Threaded ✓
Blank casing diameter 2 in. to 31 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SCH.40
TYPE OF SCREEN OR PERFORATION MATERIAL
1 Steel 3 Stainless steel 5 Fiberglass (7) PVC 10 Asbestos-cement
2 Brass 4 Galvanized steel 6 Concrete tile 8 RMP (SR) 11 Other (specify)
9 ABS 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)
SCREEN-PERFORATED INTERVALS: From 31 ft. to 41 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 29 ft. to 41 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

6 GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 2 ft., From 2 ft. to 29 ft., From ft. to ft.
What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage (16) Other (specify below)
13 Insecticide storage
Direction from well? How many feet? 0

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	4.5	Fill,			
4.5	7	Clay,			
7	15	Sand, silt,			
15	29	Silt, clay,			
29	39.5	Sand, gravel,			
39.5	40	Clay,			
40	41	Sand, gravel,			
					H-1, Tag #, Abovegrade
					Project Name: Exline
					GeoCore # 534, #

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 10/27/2003 and this record is true to the best of my knowledge and belief. This Water Well Contractor's License No 527 This Water Well Record was completed on (mo/day/yr) 10/29/2003 under the business name of GeoCore Services, Inc. by (signature)

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

OFFICE USE ONLY T R E/W SEC

WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL: County: Saline	Fract: ¼ NE ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
1 mile E of Salina, Kansas

2 WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box # : 3256 E. Country Club Rd
City, State, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:

N / NW X / NE / W / E / SW / SE / S — 1 Mile

4 DEPTH OF COMPLETED WELL 41 ft. ELEVATION: 0
Depth(s) Groundwater Encountered 1. 32 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 32 ft. below land surface measured on mo/day/yr 10/27/2003
Pump test data: Well water was NA ft. after hours pumping gpm
Est. Yield NA gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 7 5/8 in. to 41 ft., and in. to ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED
1 Steel 3 RMP (SR) 5 Wrought iron 8 Concrete tile
(2) PVC 4 ABS 6 Asbestos-Cement 9 Other (specify below)
7 Fiberglass
CASING JOINTS: Glued Clamped Welded Threaded ✓
Blank casing diameter 2 in. to 26 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SCH 40

TYPE OF SCREEN OR PERFORATION MATERIAL
1 Steel 3 Stainless steel 5 Fiberglass (7) PVC 10 Asbestos-cement
2 Brass 4 Galvanized steel 6 Concrete tile 8 RMP (SR) 11 Other (specify)
9 ABS 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE:
1 Continuous slot (3) Mill slot 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
2 Louvered shutter 4 Key punched 6 Wire wrapped 9 Drilled holes
7 Torch cut 10 Other (specify)
SCREEN-PERFORATED INTERVALS: From 26 ft. to 41 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 24 ft. to 41 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

6 GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 2 ft., From 2 ft. to 24 ft., From ft. to ft.
What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage (16) Other (specify below)
13 Insecticide storage
Direction from well? How many feet? 0

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	1	Fill,			
1	5	Clay, gravel,			
5	7	Clay,			
7	8	Sand,			
8	11	Clay,			
11	20	Gravel,			
20	23	Clay,			
23	41	Gravel,			
					H-2, Tag #, Abovegrade
					Project Name: Exline
					GeoCore # 534, #

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION. This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 10/27/2003 and this record is true to the best of my knowledge and belief. This Water Well Record was completed on (mo/day/yr) 10/29/2003 under the business name of GeoCore Services, Inc. by (signature) [signature]

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

OFFICE USE ONLY T R E/W SEC ¼ ¼ ¼

WATER WELL RECORD Form WWC-5 KSA [illegible]-1212

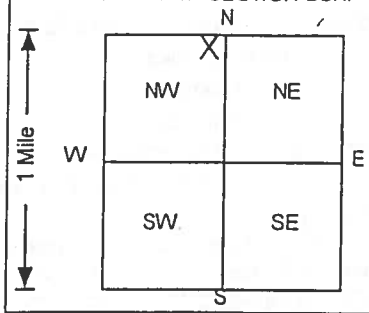
1 LOCATION OF WATER WELL: County: Saline	Fraction: NE ¼ NE ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Road, Salina, Kansas

2 WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box # : 3256 E. Country Club Road
City, State, ZIP Code : Salina, Kansas 67401

Board of Agriculture, Division of Water Resources Application Number:

3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 51 ft. ELEVATION: 0
Depth(s) Groundwater Encountered 1 ft. 2 ft. 3
WELL'S STATIC WATER LEVEL 32.3 ft. below land surface measured on mo/day/yr 8/19/02
Pump test data: Well water was NA ft. after hours pumping gpm
Est. Yield NA gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 8 in. to 51 ft., and in. to ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well
Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded
(2) PVC 4 ABS 7 Fiberglass Threaded ✓
Blank casing diameter 2 in. to 36 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface in., weight lbs./ft. Wall thickness or gauge No. Sch. 40
TYPE OF SCREEN OR PERFORATION MATERIAL
1 Steel 3 Stainless steel 5 Fiberglass (7) PVC 10 Asbestos-cement
2 Brass 4 Galvanized steel 6 Concrete tile 8 RMP (SR) 11 Other (specify)
9 ABS 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)
SCREEN-PERFORATED INTERVALS: From 36 ft. to 51 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS: From 34 ft. to 51 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

6 GROUT MATERIAL: 1 Neat cement (2) Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 2 ft., From 2 ft. to 34 ft., From ft. to ft.
What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage (16) Other (specify below)
13 Insecticide storage Unknown
Direction from well? How many feet? 0

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	1	Fill Gravel			
1	4	Clay			
4	5	Sand			
5	13	Clay			
13	21	Clayey Sand to Ironstone Gravel			
21	25	Clay.			
25	45.5	Sand and Gravel with Thin Clay Layers			
45.5	50	Clayey Ironstone Gravel			
50	51	Clay Grading Down to Shale			
					113 Above Grade
					Project Name: Hopkins - Exline
					GeoCore # 534

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 8/15/02 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 527 This Water Well Record was completed on (mo/day/yr) 8/30/02 under the business name of GeoCore Inc. by (signature) [signature]

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

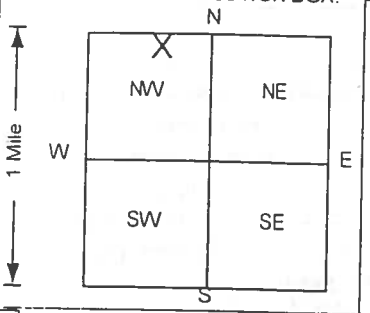
1 LOCATION OF WATER WELL: County: Saline | Fract: NW ¼ NE ¼ NW ¼ | Section Number: 16 | Township Number: T 14 S | Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city? 1 mile E of Salina, Kansas

2 WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box # : 3256 Country Club Rd
City, State, ZIP Code : Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL 45 ft. ELEVATION: 0

Depth(s) Groundwater Encountered 1. 35 ft. 2. ft. 3. ft.

WELL'S STATIC WATER LEVEL 34.1 ft. below land surface measured on mo/day/yr 10/27/2003

Pump test data: Well water was NA ft. after hours pumping gpm

Est. Yield NA gpm: Well water was ft. after hours pumping gpm

Bore Hole Diameter 7 5/8 in. to 45 ft., and in. to ft.

WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well

Was a chemical/bacteriological sample submitted to Department? Yes No ✓; If yes, mo/day/yr sample was submitted

Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below)
(2) PVC 4 ABS 7 Fiberglass

CASING JOINTS: Glued Clamped
Welded
Threaded ✓

Blank casing diameter 2 in. to 35 ft., Dia in. to ft., Dia in. to ft.

Casing height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SCH.40

TYPE OF SCREEN OR PERFORATION MATERIAL: (7) PVC 10 Asbestos-cement
1 Steel 3 Stainless steel 5 Fiberglass 8 RMP (SR) 11 Other (specify)
2 Brass 4 Galvanized steel 6 Concrete tile 9 ABS 12 None used (open hole)

SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify)

SCREEN-PERFORATED INTERVALS: From 35 ft. to 45 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

GRAVEL PACK INTERVALS: From 33 ft. to 45 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

6 GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other

Grout Intervals: From 0 ft. to 2 ft., From 2 ft. to 33 ft., From ft. to ft.

What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage (16) Other (specify below)
13 Insecticide storage

Direction from well? How many feet? 0

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	1	Fill,			
1	6.5	Clay,			
6.5	8.5	Silt, sand,			
8.5	10	Clay,			
10	15	Clay, sand,			
15	19.5	Clay,			
19.5	21.5	Sand,			
21.5	34.5	Clay,			
34.5	45	Gravel,			
					H-4, Tag #, Abovegrade
					Project Name: Exline
					GeoCore # 534, #

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 10/27/2003 and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. 527 This Water Well Record was completed on (mo/day/yr) 10/29/2003 under the business name of GeoCore Services, Inc. by (signature)

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

OFFICE USE ONLY T R E/W SEC.

WATER WELL RECORD Form WWC-5 KSA 82a-1212

1 LOCATION OF WATER WELL:	Fract	Section Number	Township Number	Range Number
County: Saline	SW ¼ NE ¼ NW ¼	16	T 14 S	R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
1 mile E of Salina, Kansas

2 WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box # 3256 Country Club Rd
City, State, ZIP Code Salina, KS 67401

Board of Agriculture, Division of Water Resources
Application Number:

3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX

N
NW X | NE
W | E
SW | SE
S
1 Mile

4 DEPTH OF COMPLETED WELL 57 ft. ELEVATION: 0
Depth(s) Groundwater Encountered 1. 35 ft. 2. ft. 3. ft.
WELL'S STATIC WATER LEVEL 34.1 ft. below land surface measured on mo/day/yr 10/28/2003
Pump test data: Well water was NA ft. after hours pumping gpm
Est. Yield NA gpm: Well water was ft. after hours pumping gpm
Bore Hole Diameter 7 5/8 in. to 57 ft., and in. to ft.
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well
Was a chemical/bacteriological sample submitted to Department? Yes ..... No ✓ ; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED
1 Steel 3 RMP (SR) 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued Clamped
(2) PVC 4 ABS 6 Asbestos-Cement 9 Other (specify below) Welded
7 Fiberglass Threaded ✓
Blank casing diameter 2 in. to 42 ft., Dia in. to ft., Dia in. to ft.
Casing height above land surface 24 in., weight lbs./ft. Wall thickness or gauge No. SCH.40
TYPE OF SCREEN OR PERFORATION MATERIAL
1 Steel 3 Stainless steel 5 Fiberglass (7) PVC 10 Asbestos-cement
2 Brass 4 Galvanized steel 6 Concrete tile 8 RMP (SR) 11 Other (specify)
9 ABS 12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE:
1 Continuous slot (3) Mill slot 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
2 Louvered shutter 4 Key punched 6 Wire wrapped 9 Drilled holes
7 Torch cut 10 Other (specify)
SCREEN-PERFORATED INTERVALS From 42 ft. to 57 ft., From ft. to ft.
From ft. to ft., From ft. to ft.
GRAVEL PACK INTERVALS From 40 ft. to 57 ft., From ft. to ft.
From ft. to ft., From ft. to ft.

6 GROUT MATERIAL: (1) Neat cement 2 Cement grout (3) Bentonite 4 Other
Grout Intervals: From 0 ft. to 2 ft., From 2 ft. to 40 ft., From ft. to ft.
What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage (16) Other (specify below)
13 Insecticide storage
Direction from well? How many feet? 0

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	2	Soil,			
2	5.5	Clay,			
5.5	9	Silt, sand,			
9	23	Gravel, clay,			
23	26	Clay,			
26	30	Gravel,			
30	36	Clay,			
36	48	Gravel,			
48	52	Clay, gravel,			
52	57	Gravel,			
					H-5, Tag #, Abovegrade
					Project Name: Exline
					GeoCore # 534, #

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) 10/28/2003 and this record is true to the best of my knowledge and belief. This Water Well Contractor's License No. 527 This Water Well Record was completed on (mo/day/yr) 10/29/2003 under the business name of GeoCore Services, Inc. by (signature)

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

OFFICE USE ONLY T R E/W SEC

WATER WELL RECORD Form WWC-5 KS/ 1-1212

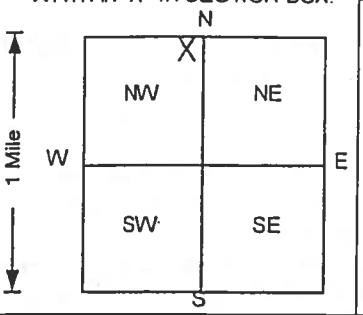
1 LOCATION OF WATER WELL: County: Saline	Fraction: NE ¼ NE ¼ NW ¼	Section Number: 16	Township Number: T 14 S	Range Number: R 2 E/W

Distance and direction from nearest town or city street address of well if located within city?
3256 E. Country Club Road, Salina, Kansas

2 WATER WELL OWNER: Exline, Inc.
RR#, St. Address, Box # : 3256 E. Country Club Road
City, State, ZIP Code : Salina, Kansas 67401

Board of Agriculture, Division of Water Resources Application Number:

3 LOCATE WELL'S LOCATION WITH AN "X" IN SECTION BOX:



4 DEPTH OF COMPLETED WELL ..... 46 ..... ft. ELEVATION: ..... 0 .....
Depth(s) Groundwater Encountered 1. ..... ft. 2. ..... ft. 3. .....
WELL'S STATIC WATER LEVEL ... 22.6 ... ft. below land surface measured on mo/day/yr .... 8/16/02 ...
Pump test data: Well water was .... NA .... ft. after ..... hours pumping ..... g
Est. Yield .. NA ... gpm: Well water was ..... ft. after ..... hours pumping ..... g
Bore Hole Diameter .... 8 .... in. to ..... 46 ..... ft., and ..... in. to .....
WELL WATER TO BE USED AS: 5 Public water supply 8 Air conditioning 11 Injection well
1 Domestic 3 Feedlot 6 Oil field water supply 9 Dewatering 12 Other (Specify below)
2 Irrigation 4 Industrial 7 Lawn and garden only (10) Monitoring well .....
Was a chemical/bacteriological sample submitted to Department? Yes.....No ✓.....; If yes, mo/day/yr sample was submitted
Water Well Disinfected? Yes No ✓

5 TYPE OF BLANK CASING USED: 5 Wrought iron 8 Concrete tile CASING JOINTS: Glued ..... Clamped ....
1 Steel 3 RMP (SR) 6 Asbestos-Cement 9 Other (specify below) Welded .....
(2) PVC 4 ABS 7 Fiberglass ..... Threaded ✓.....
Blank casing diameter ..... 2 ..... in. to ..... 31 ..... ft., Dia ..... in. to ..... ft., Dia ..... in. to .....
Casing height above land surface ..... in., weight ..... lbs./ft. Wall thickness or gauge No. .... Sch. 40 ....
TYPE OF SCREEN OR PERFORATION MATERIAL
1 Steel 3 Stainless steel 5 Fiberglass (7) PVC 10 Asbestos-cement
2 Brass 4 Galvanized steel 6 Concrete tile 8 RMP (SR) 9 ABS 11 Other (specify) .....
12 None used (open hole)
SCREEN OR PERFORATION OPENINGS ARE: 5 Gauzed wrapped 8 Saw cut 11 None (open hole)
1 Continuous slot (3) Mill slot 6 Wire wrapped 9 Drilled holes
2 Louvered shutter 4 Key punched 7 Torch cut 10 Other (specify) .....
SCREEN-PERFORATED INTERVALS: From ..... 31 ..... ft. to ..... 46 ..... ft., From ..... ft. to .....
From ..... ft. to ..... ft., From ..... ft. to .....
GRAVEL PACK INTERVALS: From ..... 29 ..... ft. to ..... 46 ..... ft., From ..... ft. to .....
From ..... ft. to ..... ft., From ..... ft. to .....

6 GROUT MATERIAL: 1 Neat cement (2) Cement grout (3) Bentonite 4 Other .....
Grout Intervals: From ..... 0 ..... ft. to ..... 2 ..... ft., From ..... 2 ..... ft. to ..... 29 ..... ft., From ..... ft. to .....
What is the nearest source of possible contamination:
1 Septic tank 4 Lateral lines 7 Pit privy 10 Livestock pens 14 Abandoned water well
2 Sewer lines 5 Cess pool 8 Sewage lagoon 11 Fuel storage 15 Oil well/Gas well
3 Watertight sewer lines 6 Seepage pit 9 Feedyard 12 Fertilizer storage (16) Other (specify below)
13 Insecticide storage ...Unknown.....
Direction from well? How many feet? 0

FROM	TO	LITHOLOGIC LOG	FROM	TO	PLUGGING INTERVALS
0	4.5	Topsoil			
4.5	14.5	Clay			
14.5	16.5	Gravel and Clay			
16.5	17.5	Clay			
17.5	20	Silt			
20	26	Sand and Ironstone Gravel			
26	31	Clay			
31	46	Sand and Gravel with Clay			
					116 Above Grade
					Project Name: Hopkins - Exline
					GeoCore # 534

7 CONTRACTOR'S OR LANDOWNER'S CERTIFICATION: This water well was (1) constructed, (2) reconstructed, or (3) plugged under my jurisdiction and was completed on (mo/day/year) ..... 8/15/02 ..... and this record is true to the best of my knowledge and belief. Kansas Water Well Contractor's License No. ..... 527 ..... This Water Well Record was completed on (mo/day/yr) ..... 8/30/02 ..... under the business name of GeoCore Inc. by (signature) [signature]

INSTRUCTIONS: Use typewriter or ball point pen. *PLEASE PRESS FIRMLY* and *PRINT* clearly. Please fill in blanks, underline or circle the correct answers. Send top three copies to Kansas Department of Health and Environment, Bureau of Water, Topeka, Kansas 66620-0001. Telephone: 913-296-5545. Send one to WATER WELL OWNER and retain one for your records.

ATTACHMENT 4-3

SAMPLING AND ANALYSIS PLAN

GROUNDWATER MONITORING SYSTEM
AND
GROUNDWATER RECOVERY SYSTEM

September, 2012

SAMPLING AND ANALYSIS PLAN

GROUNDWATER MONITORING SYSTEM
AND
GROUNDWATER RECOVERY SYSTEM

EXLINE, INC.
SALINA, KANSAS

September, 2012

EXLINE, INC. SAMPLING AND ANALYSIS PLAN
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EXLINE, INC. SAMPLING AND ANALYSIS PLAN
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ATTACHMENTS

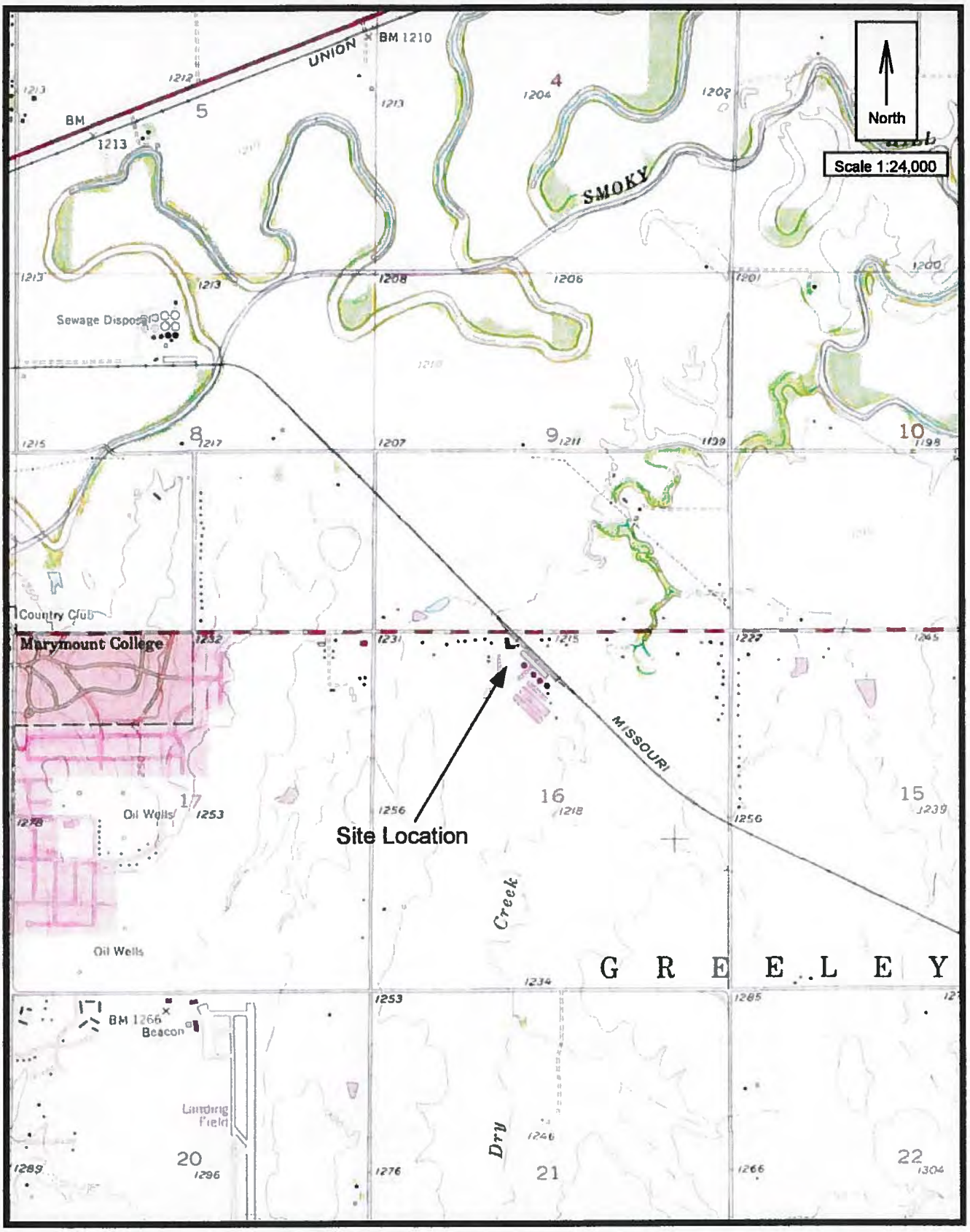
ATTACHMENT A: WELL SAMPLING DATA FORM
ATTACHMENT B: MONITOR WELL SAMPLING SOP-GWS-04
ATTACHMENT C: TYPICAL CHAIN OF CUSTODY FORM
ATTACHMENT D: TYPICAL QA/QC DATA REPORT DESCRIPTION

1. General.

This sampling and analysis plan (SAP) has been prepared to document the procedures for static water level measurement, purging, sample collection, chemical analysis, and reporting requirements relative to the groundwater monitoring and recovery system at the Exline, Inc. site in Salina, Kansas. In order to provide consistent and reliable analytical data, the integrity of each well and each sample must be maintained from the time of opening the well to the time of sample analysis. These goals are best met by the use of EPA-approved sampling equipment, containers, sampling, and analytical procedures. Quality assurance/quality control (QA/QC) procedures are also specified in order to validate the analytical data.

Field activities described in this Plan shall be conducted by personnel that have been trained to perform groundwater sampling. This may include Exline, Inc. personnel and/or outside contractors. All data generated by the field activities shall be reviewed and reported to the Kansas Department of Health and Environment (KDHE) - Bureau of Waste Management (BWM) by Exline, Inc.'s consultant.

The Exline, Inc. facility and surrounding area (also designated the "site" in this SAP) are located near the City of Salina, Kansas, as shown on a site topographic map (Plate 1.1). Plate 1.2 is a well location map, which shows wells, buildings, and the regulated unit. Plate 1.3 shows the three private wells (Bernhardt, Weber, and O'Neil) that are included as part of the Exline, Inc. groundwater sampling program.



Map Source: USGS 7.5 Minute Topographic Map, Salina, 1978

Plate 1.1: Site Location Map

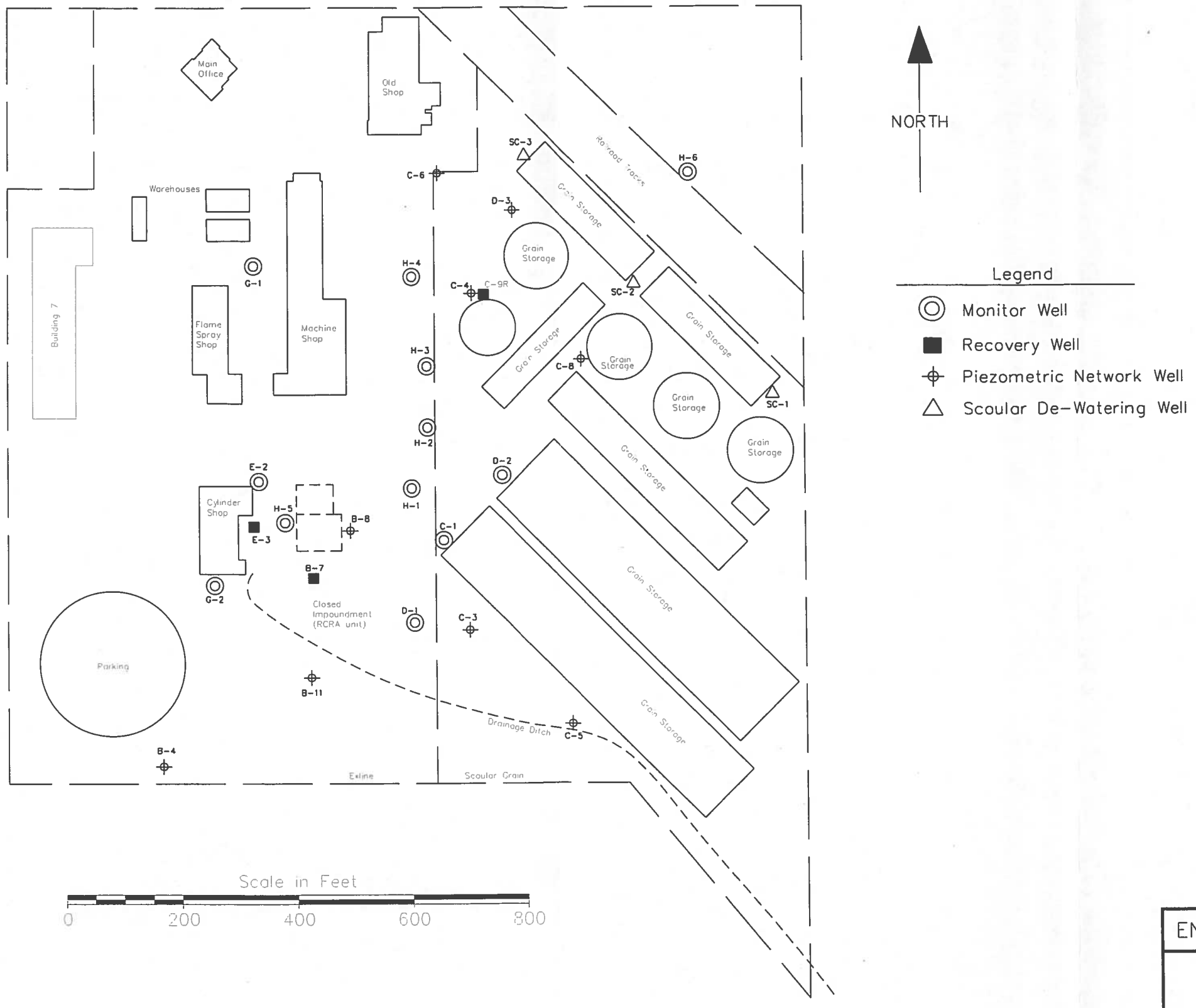
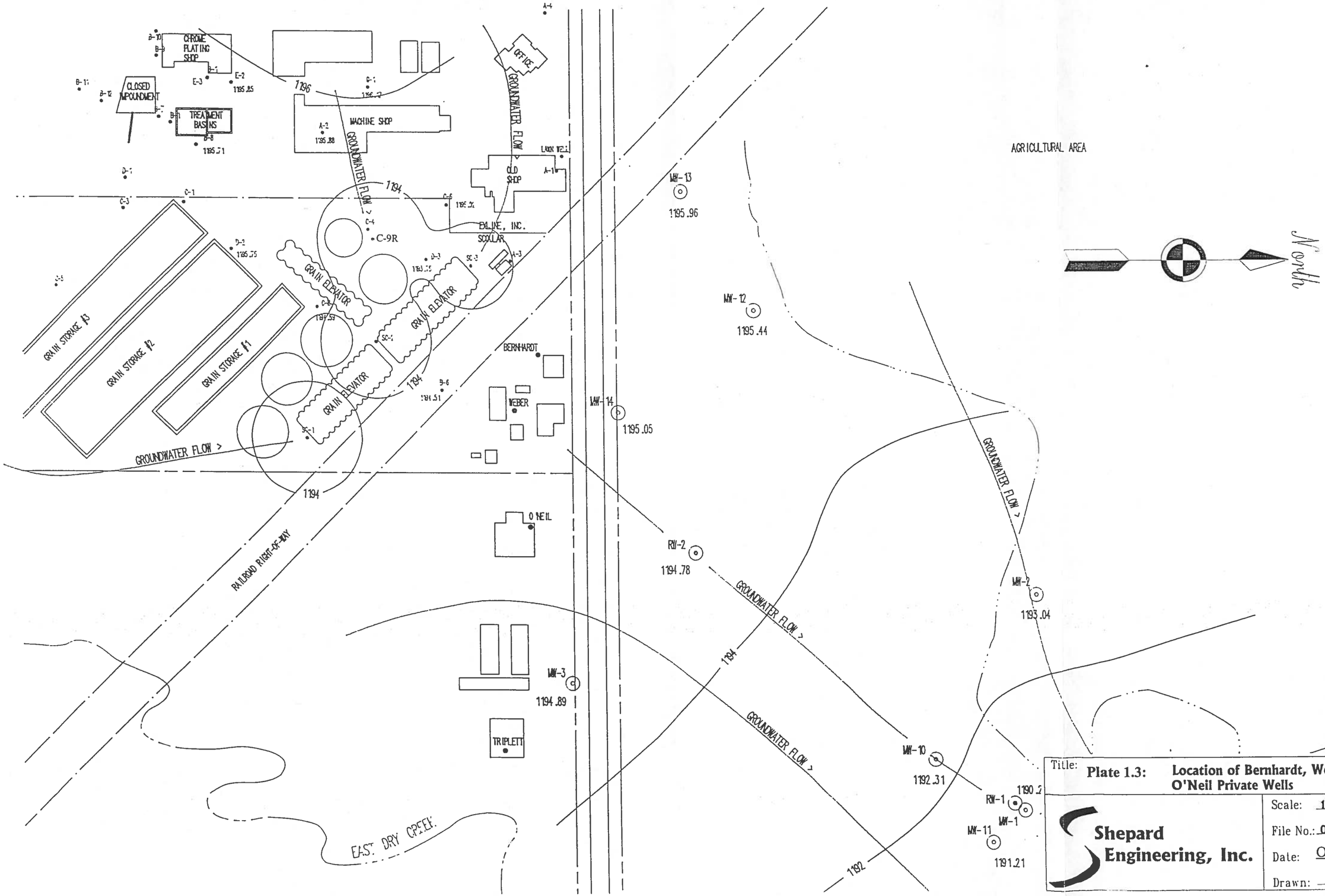


Plate 1.2:

Well Location Map

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
File Number: 13-010G	Date: Jan., 2013	Drawn By: Jack Eslick



Title: **Plate 1.3: Location of Bernhardt, Weber, O'Neil Private Wells**

Shepard Engineering, Inc.

Scale: 1" = 200'

File No.: 00-010G

Date: Oct., 2012

Drawn:

2. Sample Container Preparation.

Table 2.1 summarizes the well sampling schedule, the analyses to be conducted, and the measurements to be taken. All samples for chromium analysis shall be collected in new, 125 or 250 ml. polyethylene containers, which are supplied by the analytical laboratory. The laboratory shall adhere to the following procedures to assure contaminant-free, preserved containers:

1. Rinse bottles and caps with hot tap water.
2. Rinse bottles and caps with (1:1) nitric acid.
3. Rinse bottles and caps with deionized or distilled water.
4. Invert bottles and allow to air dry.
5. Add 1 ml. of (1:1) nitric acid to the bottles to be used for total chromium analysis. Nitric acid is a required preservative for total chromium analysis.
6. Attach caps and deliver to Exline, Inc.

TABLE 2.1: WELL SAMPLING SCHEDULE
Exline, Inc., Salina, Kansas

WELL TYPE	WELL NUMBER	CHEMICAL ANALYSIS * AND SAMPLING FREQUENCY	WATER LEVEL MEASUREMENT
Groundwater Recovery	B-7, C-9R, E-3	total chromium, semi-annual	none
Corrective Action Performance	C-1, D-1, D-2, E-2, G-1, G-2, H-1, H-2, H-3, H-4, H-5, H-6	total chromium, semi-annual	yes
Supplemental Information	B-4, B-8, B-11 C-3, C-4, C-5 C-6, C-8, D-3	no analyses semi-annual	yes
Residential	Bernhardt, Weber, O'Neil	total chromium, annual	none

* Analyses shall be completed by a laboratory which is certified by the KDHE, for the subject parameter.

3. Monitor Well Preparation.

3.1. General. Prior to commencing a project measurement and/or sampling event, sampling personnel shall wear clean clothes (not stored on-site). If sampling personnel enter the Cylinder (formerly Chrome) shop during the sampling event, he/she shall don a new Tyvek suit and wash hands before re-commencing the sampling program. Wearing a suit in the Cylinder shop will minimize potential cross-contamination of wells and/or samples.

In addition, before water level measurement and sampling at each well, a new set of disposable plastic gloves shall be used.

3.2. Static Water Level Determination. The static water level shall be measured in each monitor well as specified in Table 2.1. Exline, Inc. shall use a Solinst Model 101 Water Level Meter (or equivalent) for well sounding measurements. All static water level measurements shall be made in one calendar day. The following description outlines the well sounding procedure:

1. The well protective cover shall be opened and the casing cap removed. The cap shall be stored in such a manner as to prevent contamination from the surrounding ground.

2. The sounder shall be lowered slowly down the well casing alongside the marked point on the casing until the water signal registers.

3. The tape shall be read to the nearest 0.01' at the marked edge of the well casing. This measurement shall be recorded in the appropriate column on the "Well Sampling Data" Form (Attachment A). The water datum shall be calculated by subtracting the current static water level from the surveyed casing elevation (Table 3.1). The water datum shall be recorded on the "Well Sampling Data" form.

4. The sounder shall be removed and decontaminated as follows. That portion of the sounder, which entered the well, shall be removed from the well by hand (not rolled onto the reel), and washed in detergent water. After washing in Alconox (or equivalent) detergent, the sounder tape shall be rinsed in deionized water. The tape shall then be wiped off as it is rolled back onto the reel for use at the next well.

5. Care shall be taken to insure that well sounder tape does not contact the ground or any material, which has been in the Cylinder Shop. The well sounder shall not be stored in the Cylinder Shop.

TABLE 3.1: MONITOR WELL CASING DATA
Exline, Inc., Salina, Kansas

WELL NO.	CASING SIZE	SURVEYED CASING ELEVATION	APPROX. WELL SCREEN INTERVAL	MEAS. CASING DEPTH	WELL POSITION (gradient)
B-4	2"	1234.99'	54-57'	59.30'	up
B-8	5"	1225.51'	37-49'	50.56'	cross
B-11	2"	1225.03'	38-55'	56.50'	up
C-1	2"	1219.71'	40-45'	46.93'	cross
C-3	2"	1219.42'	42-47'	47.60'	up
C-4	2"	1224.03'	44-49'	49.58'	interior
C-5	2"	1218.77'	47-52'	53.70'	up
C-6	2"	1225.81'	44-49'	51.88'	down
C-8	2"	1221.32'	33-38'	40.30'	cross
D-1	2"	1222.34'	38-45'	47.50'	up
D-2	2"	1220.17'	37-50'	53.38'	cross
D-3	2"	1225.80'	34.5-47.5'	48.03'	down
E-2	5"	1226.02'	48-54'	52.75'	cross
G-1	5"	1225.65'	35-45'	47.00'	cross
G-2	2"	1225.85'	44-54'	56.13'	cross
H-1	2"	1222.81'	31-41'	43.34'	down
H-2	2"	1224.28'	26-41'	43.76'	down
H-3	2"	1225.71'	36-51'	52.65'	interior
H-4	2"	1226.43'	35-45'	46.50'	down
H-5	2"	1226.76'	42-57'	59.50'	down
H-6	2"	1215.02'	31-46'	47.52'	down

7. Static water levels shall be measured, generally starting with the least contaminated wells and proceeding in the order of increasing water contamination using the results of the previous sampling event. At the time that this Sampling Plan was revised (September of 2012), the order of measurement is as follows:

1) G-2
2) G-1
3) E-2
4) H-6
5) C-6
6) C-5
7) B-11
8) B-8
9) D-2
10) B-4
11) C-8
12) C-1
13) D-3
14) C-3
15) C-4
16) D-1
17) H-4
18) H-2
19) H-1
20) H-3
21) H-5

8. The casing cap shall be replaced and the monitor well protective cover closed.

9. Wastewater from decontamination of the well sounder shall be containerized. This water shall be disposed by discharge to the City of Salina sanitary sewer.

The wells shall be sampled in the same order as the static water level measurements, shown above.

4. Recovery and Residential Well Preparation.

Exline recovery wells B-7, E-3, C-9, and the Bernhardt, Weber, and O'Neil residential wells are equipped with permanent submersible pumps and sealed wellheads. The Exline recovery wells run continuously and the residential wells run intermittently for lawn and garden watering or veterinary clinic use. Measurement of water levels in these wells is not possible due to the sealed wellheads. Access to the recovery and residential well flow lines are provided by valves so that samples can be collected.

The Exline, Inc. recovery wells pump continuously, unless shut down for repairs. Therefore, these wells are sampled without purging. This also applies to the residential wells, if those wells are pumping during the sampling event. If shut down, the residential wells shall be started and purged for five (5) minutes prior to sample collection. As indicated in Section 3 above, purge water generated from the residential wells shall be collected and disposed by discharge to the City of Salina sanitary sewer.

Typical flow rates of the recovery and residential wells are:

Recovery Well	Flow Rate (gpm)	Residential Well	Flow Rate (gpm)
B-7	15	Bernhardt	7
C-9	10	Weber	10
E-3	10	O'Neil	11

5. Monitor Well Sample Collection.

5.1. Frequency and Parameters. Sampling frequency and analysis parameters were presented earlier in Table 2.1.

5.2. Sample Containers. Sample containers shall be prepared as follows. A clean, 250 ml polyethylene sample bottle, preserved for total chromium, shall be obtained from the laboratory for each well to be sampled. An additional bottle shall be filled at one well for the duplicate sample.

5.3. Sample Collection for Monitoring Wells. As specified in Section 3.1 above, the wells shall be sampled in the same order as the static water level measurements. The procedures for monitoring well sample collection are set forth in the following document, which is included as Attachment B:

"Standard Operating Procedure – Monitor Well Sampling Procedures Using a Hydrasleeve® Sampler", Enviro Tech Services, Inc. SOP No.: SOP-GWS-04, October 15, 2012.

As noted in that document, the sample volume from the Hydrasleeve® sampler is 600 ml. The sample volume required for the total chromium analysis, including all laboratory quality assurance/quality control analyses, is 250 ml. Therefore, the Hydrasleeve® sampler will generate sufficient volume for the sample analysis and laboratory QA/QC analyses, as well as, sample duplicates.

The "pull" distance to fill the Hydrasleeve® is three (3) feet, as measured from the top of the sampler. Since each sampler will be set one foot from the bottom of the well, a minimum well screen interval of 6.5 ft. (1 ft. from bottom of well + 2.5 ft. sampler length + 3 ft. pull) is required using the standard sampler retrieval method. With the exception of monitoring well C-1, all Exline monitoring well screen intervals are 7 ft. or greater.

The screen interval for monitoring well C-1 is 5 ft. Therefore, monitoring well C-1 will be sampled using the procedure set forth in the Attachment B SOP for monitoring wells with screen intervals less than 6.5 ft.

6. Recovery and Residential Well Sample Collection.

6.1. Frequency and Parameters. Sampling frequency and analysis parameters were specified in Table 2.1.

6.2. Sample Containers. Sample containers to be used for recovery and residential well sampling shall consist of one clean sample bottle, preserved for total chromium, for each well.

6.3. Sample Collection. Since no equipment is handled during the sampling of the recovery and residential wells, any sampling order will suffice. The sample collection procedure for the recovery wells (and residential wells, if pumping), is as follows:

1. The sample shall be collected by slightly opening the hydrant valve and allowing the water to discharge at a controlled, low flow rate, to avoid overfilling or splashing. Approximately 1 quart of water shall be cleared from the sampling valve prior to filling the sample container. Any recovery well that is not pumping during the sampling event, shall not be sampled for that particular sampling event. The water cleared from the sampling valve prior to recovery well sample collection shall be containerized and disposed in the Exline groundwater recovery system.

2. Water shall be added to the correctly-labeled (well or duplicate ID, date, time, site, analysis) sample bottle until the bottle is nearly full. Care shall be taken to avoid overfilling the bottle, which could dilute the preservative. After filling, the bottle shall be capped.

3. The time of sampling shall be recorded on the laboratory chain-of-custody.

4. The sampling tap shall be closed and the well pump shut off.

5. The sample containers shall be placed in a cooler for delivery to the Contract Laboratory.

The sample collection procedure for the residential wells, if shut down at the time of intended sampling, is as follows:

1. The well pump shall be started. After purging for five (5) minutes, with the pump still running, the correctly labeled (well ID, date, time, site, analysis) sample bottle shall be filled until the bottle is nearly full. Care shall be taken to avoid overfilling the bottle, which could dilute the preservative. After filling, the bottle shall be capped.

2. The time of sampling shall be recorded on the laboratory chain-of-custody form.

3. The well pump shall be shut down after sample collection.

4. The sample containers shall be placed in a cooler for delivery to the Contract Laboratory.

7. Sample Collection for Discharge to City Sewer.

The groundwater treatment system effluent was formerly discharged to a surface drainage-way, under the regulation of an NPDES permit. During that time period, Exline, Inc. analyzed the treatment system effluent on a weekly basis for hexavalent chromium, in-house. In addition, the treatment system effluent was analyzed twice monthly for total suspended solids, total iron, sulfate, hexavalent chromium, and total chromium, in accordance with requirements set forth in the Exline, Inc. NPDES permit. The effluent was also analyzed on a daily basis for pH, as required by the NPDES permit. The analyses required by the NPDES permit were completed by a laboratory certified by the KDHE.

In November, 1996, the treatment system effluent began discharging to the City of Salina sanitary sewer system. Since that time, Exline's discharge has been regulated by an Industrial Wastewater Permit administered by the City of Salina. Beginning in early 2004, the recovered groundwater bypassed the treatment system and began discharging directly to the City sewer since the untreated groundwater chromium concentrations have decreased well below the permit discharge limit.

7.1. Frequency and Parameters. As required by Exline's industrial wastewater discharge permit, one grab sample of the recovered groundwater discharge shall be collected and analyzed for total chromium and pH on a monthly basis.

7.2. Sampling Equipment. The grab sample for pH and total chromium analysis shall be transferred to a plastic, non-preserved container and a 125 ml. plastic bottle preserved as described in Section 2 for pH and total chromium analysis, respectively.

8. Verification of Monitor Well Depth.

Fine-grained sediment has the potential to accumulate in the bottom of monitoring wells over time. Therefore, verification of monitor well depth shall be conducted on a semi-annual basis. These measurement events shall be conducted prior to sampling and shall include Corrective Action Performance monitoring wells in the current sampling program (C-1, D-1, D-2, E-2, G-1, G-2, H-1, H-2, H-3, H-4, H-5, H-6).

The depth measurements shall be completed by lowering the weighted tape to the casing bottom and measuring from the casing mark to the nearest 0.01'. The tape shall be decontaminated between wells using the water level sounder decontamination procedure in Section 3.1. The current well depth measurements shall be recorded on the 'Well Sampling Data" form.

The measurement for each well shall be checked against the known casing depth and well screen interval (Table 3.1). If more than 10 % of the well screen length is filled with sediment, the sediment shall be removed before the next semi-annual sampling event for that well. Sediment removal shall be completed by pumping. Immediately following clean-out, each well shall be checked with the weighted tape to verify the depth increase.

9. Chain-of-Custody Records.

Chain-of-custody (COC) procedures provide tracking documentation for samples sent to an off-site laboratory. Information on this form includes: company name, site name, sampler, sample identification, date and time of sample collection, type of sample (grab or composite), number of containers, preservatives, sample matrix (groundwater), analysis turn-around time requested, analysis parameters, special instructions, and sample transfer signatures. This information assists in maintaining sample integrity and communication with laboratory personnel. A copy of a typical COC form is included in Attachment C. This form shall be completed and signed by the sampler at the time of sample collection. The completed form shall then be sealed in a plastic bag and placed in the cooler with the samples (packed in ice). The cooler shall be immediately delivered to the laboratory by the sampling technician(s). The laboratory shall complete the sample transfer signatures upon receipt of the sample cooler(s). Any discrepancies on the chain-of-custody form, bottle damage observed by the laboratory, or holding time exceedances shall be reported to Exline, Inc. Exline shall then determine if re-sampling is required, and if so, propose such action to the KDHE.

10. Record Keeping.

Sampling personnel are responsible for accurate and complete information on the "Well Sampling Data" form, the sample container labels, the chain of custody form, and other pertinent records. The documentation becomes a part of the permanent record of each sampling event and shall be kept on file with the analysis results.

Any deviations from the measurement, purging, sampling, or analysis protocol specified in this plan shall be documented by Exline field personnel on the "Well Sampling Data" form, and so included in the subsequent semi-annual or annual project reports.

11. Sample Analysis.

Table 2.1 specifies total chromium analysis for groundwater samples collected from monitoring, recovery, and private wells. In addition, total chromium and pH analyses are specified for the monthly groundwater treatment system effluent (grab) sample. All analyses shall be performed by a KDHE-certified laboratory. The total chromium analysis method specified below is referenced in "Test Methods for Evaluating Solid Waste", USEPA SW-846, third edition, September, 1986. The pH analysis method is from Standard Methods for the Evaluation of Water and Wastewater, 18th Edition, 1992.

Analyte	EPA Method	Detection Limit	Holding Time
total chromium	6010B	0.010 mg/L	6 months
pH	4500 H^+	not applicable	approx. 2 hrs.

12. Quality Assurance/Quality Control.

QA/QC procedures are required in order to assess the validity of the analytical data. Included in quality assurance procedures are provisions for sample duplicates, sample blanks, and rinseate samples. Information regarding bottle cleanliness, sampling procedures, and analytical accuracy can be provided by analysis of these samples.

Each monitoring well sampling event shall include one sample of each of the following:

12.1. Sample Duplicate. A monitoring well shall be selected for collecting a duplicate sample. This duplicate sample shall be collected by filling a second clean container, which has been prepared in the same fashion as the initial container. This sample shall then be capped and submitted with the other samples for identical analysis. The duplicate sample shall be identified by a different (from the well) letter; for example, a duplicate of monitoring well G-1 might be labeled "Z-1".

12.2. Trip Blank. This sample shall consist of a cleaned sample container filled with reagent-grade water by the laboratory. This prepared container shall remain in the cooler until removed at the laboratory for analysis preparation. This sample shall be submitted with the other samples for identical analysis.

12.3. Rinseate sample. This sample is prepared by pouring deionized water over the recently decontaminated water level indicator, into a clean sample container. This sample shall then be capped and submitted with the other samples for identical analysis.

Field spikes are difficult to administer, and will not be used for this project. However, additional QA/QC samples shall be analyzed by the laboratory under what is typically designated Level 1 QA/QC. A description of the report for these QA/QC analyses is included as Attachment D. This QA/QC includes spikes, duplicates, blanks, and surrogates, as required by USEPA SW-846 protocol.

13. Project Reports.

Exline, Inc. shall prepare semi-annual project reports which include the following:

1. A brief summary of the adequacy of the generated data.
2. All laboratory sample and QA/QC reports, chains-of-custody, field forms, and a summary table of all year-to-date analytical results and groundwater elevations.
3. A discussion of any significant deviations from project protocols.

14. Maintenance Procedures.

As set forth in the Hazardous Waste Permit Renewal Application (Section 3, Attachment 3-2 – Inspection and Maintenance Plan), Exline, Inc. shall complete the following document as part of each semi-annual sampling event:

"Groundwater Monitoring System and Recovery Well Inspection and Maintenance Checklist".

The following is a typical list of monitor well maintenance procedures to be followed for this project:

1. The well designations on the well protective covers and the well casing measurement marks shall be re-marked, when faded.

2. Grass and weeds around all wells shall be mowed.

3. Sturdy well protective posts shall be maintained around the wells in traffic areas to prevent vehicular damage.

4. Metal well covers shall be kept painted, and shall be checked periodically for rust holes, which could allow surface water to infiltrate into the well casing. Any well covers with rust holes or vehicular damage shall be replaced. If vehicular damage occurs to the PVC well casing, the casing shall be cut off, and a new piece glued on with a collar. The casing will either be replaced to the same height (to 0.01'), or the well casing elevation shall be re-surveyed.

ATTACHMENT A

WELL SAMPLING DATA FORM

EXLINE, INC., SALINA, KANSAS

Well Sampling & Measurement Data

Sampling Event Date: _____

Sampling Personnel: _____

_____

WELL	TOP OF CASING ELEVATION	MEASURED WATER LEVEL	WATER DATUM	DATE & TIME SAMPLED (or measured)	TOTAL CR CONC (mg/L)	ACTUAL CASING DEPTH	MEASURED CASING DEPTH
H-1	1222.81					43.34	
H-2	1224.28					43.76	
H-3	1225.71					52.60	
H-4	1226.43					46.50	
H-5	1226.76					59.50	
H-6	1215.02					47.52	
C-1	1219.71					46.93	
D-1	1222.34					47.50	
D-2	1220.17					53.00	
E-2	1226.02					52.60	
G-1	1226.65					46.99	
G-2	1225.85					56.10	
B-4	1234.99						
B-8	1225.51						
B-11	1225.03						
C-3	1219.42						
C-4	1224.03						
C-5	1218.77						
C-6	1225.81						
C-8	1221.32						
D-3	1225.80						
Z-1: duplicate of trip							
blank rinse sample							
Bernhardt							
Weber							
O'Neil							

Equipment:

Weather:

Form Created - 9/10/12

ATTACHMENT B

MONITOR WELL SAMPLING SOP-GWS-04

SOP Application:

This Standard Operating Procedure (SOP) is to be used to sample groundwater monitoring wells using a Hydrasleeve® sampler. The manufacturer description of the Hydrasleeve® sampler follows (GeoInsight, 2006).

> *The Hydrasleeve® groundwater sampler can be used to collect a representative sample for most physical and chemical parameters without purging the well. It collects a whole water sample from a user defined interval (typically within the well screen), without mixing fluid from other intervals. One or more Hydrasleeves® are placed in the screened interval of the monitoring well and a period of time is allocated for the well to re-equilibrate. Hours to months later, the sealed Hydrasleeve® can be activated for sample collection. When activated, the Hydrasleeve® collects a sample with no drawdown and minimal agitation or displacement of the water column. Once the sampler is full, the one-way reed valve collapses, preventing mixing of extraneous, non-representative fluid during recovery.*

References:

The following documents may be applicable to this procedure:

Project Work Plan
Project Quality Assurance / Quality Control Plan
Project Health and Safety Plan

Safety Notes:

Groundwater may have chemicals present that are detrimental to health. Read and follow the Project Health and Safety Plan. Prevent dermal contact with water. Air monitoring may be required if an inhalation risk is present.

Equipment and Material Requirements:

The following list gives the equipment and materials that may be required to purge and sample groundwater monitoring wells. Where the need for an item may vary based on project specific requirements the item is identified with a dagger (†). All other items should be considered mandatory.

- Padlock keys with which to access the wells
- Well Level Indicator
- Total Depth Tape†
- Disposable Sampling Gloves
- Decontamination Supplies (for water level and total depth gauge, if used)
- Sample Containers with appropriate preservatives
- Sample Labels
- Sample Coolers
- Ice
- Pens, with water-proof ink
- Chain-of-Custody Records
- Chain-of-Custody Seals
- Hydrasleeve® Specific Materials
  - Standard 2-inch Hydrasleeve® (625 milliliter)
  - One-liter Hydrasleeve® (optional, use if more than 625 milliliter is required)
  - Bullet weight – 5 ounce
  - Weight Clip
  - Spring Clip (for tether attachment)
  - ¼-inch Calibrated Tether or other appropriate cordage
  - Hydra Clamps

Procedure:

1. Inspect the visible portions of the well and well completion for damage.

2. Open the well. If required, collect a headspace reading with the photoionization detector.

3. Collect a static water level measurement. In some circumstances, the groundwater elevation may continue to increase after the well is initially opened. Verify the reading to ensure that the static water level measurement has stabilized.

4. If required, use the total depth tape to determine the total depth of the well.

5. Assemble the Hydrasleeve®.

    a. Remove the Hydrasleeve® for the package and inspect for obvious damage.
    b. Squeeze the side of the top reinforcement together so that an opening is formed in the top of the Hydrasleeve®
    c. Attach the spring clip to the top of the sampler
    d. Fastener the tether cord to the top of the spring clip, a bowline knot is recommended
    e. Fold the bottom of the sampler together so that the right and left holes are aligned
    f. Insert the weight clip with the attached weight through the holes.

6. Lower the Hydrasleeve® to the proper depth. If the Work Plan does not state the installation depth, install the Hydrasleeve® so that the bottom of the sampler is about one foot above the bottom of the well.

7. Secure the tether cord to the well cap.

8. Allow the sampler to remain in the well for the specified time period. The minimum time period shall be 24 hours. There is no maximum time period.

9. For monitoring wells with screen intervals 6.5 ft. or greater, retrieve the sampler by pulling the tether cord at a rate of 1 to 2 feet per second, which is the approximate rate that a bailer would normally be retrieved.

10. For monitoring wells with screen intervals less than 6.5 ft., cycle the Hydrasleeve® up and down using short rapid strokes – 6 inch cycle at a minimum of 1 cycle per second – 5 to 8 times, before retrieving the sampler.

11. If sediment is visible in the Hydrasleeve® and it is desirable to collect a sample with minimal turbidity, install a Hydra clamp toward to the bottom of the sample at a location above the sediment. This will prevent the sediment from being introduced into the collected sample.

12. Push the discharge tube through the Hydrasleeve® approximately 3 to 4 inches below the white reinforcing strips at the top of the sampler.

13. Fill the sample bottle(s) from the discharge of the discharge tube.

14. If groundwater samples are being collected for analysis of volatile organic compounds (VOCs) then the VOC vials should be collected in a matter that will minimize the potential for volatilization of the VOCs. Water should flow into the sample vial in a laminar fashion to minimize the potential for release of the VOCs from the water. The vial should be completely filled with water such that all air in the vial is displaced by the water sample. The vial should be slightly overfilled such that a meniscus is present above the top of the vial. The vial cap should then be tightly secured on the vial. The vial should be inverted and checked for air. If an air bubble large than approximately 1/8-inch in diameter is present, the vial and sample must be discarded and a new vial filled.

15. Place filled sample containers in cooler with ice in order to lower and maintain the sample temperature at approximately four degrees Celsius.

16. Complete chain-of-custody record.

17. Maintain samples under chain-of-custody control at all times.

18. Record any pertinent observations in the field notebook.

19. Install a new Hydrasleeve® sampler for the next sampling event in accordance with steps 5 through 7 above.

ATTACHMENT C

TYPICAL CHAIN-OF-CUSTODY FORM

CHAIN OF CUSTODY RECORD

ENVIRO TECH SERVICES, INC.
2323 North 20th Road, Glasco, Kansas 67445
(785) 593-6616 FAX (785) 593-6619 jackeslick@gmail.com

Project #: | **Project Name:**

Sampler's Name: | **Sampler's Signature**

Analytical Parameters

Sample Information															
Date	Time	Sample ID	Sample Point Identification	Matrix	Number of Containers										Comments

		Time	Date			Time	Date
#1 Relinquished by:	Printed Name: / Signature:			#1 Received By:	Printed Name: / Signature:		
#2 Relinquished by:	Printed Name: / Signature:			#2 Received By:	Printed Name: / Signature:		

Send Report To:

Special Instructions/Comments:

Page _____ of _____

ATTACHMENT D

TYPICAL QA/QC DATA REPORT DESCRIPTION

Continental
Analytical Services, Inc.

Re: Continental File Number:
Continental Order Number:
Continental Project Manager:
Your P.O./Project No.:

Enclosed are the Quality Control Reports for the referenced order number. A general description of the information contained in each report is presented below.

METHOD BLANK DATA
A method blank is a matrix similar to that of the sample which has been prepared and analyzed by the same method as the sample. The method blank is used to assure that the preparation and analysis method has not introduced contamination. The Method Blank Data Report provides the analytical results for each method blank prepared and analyzed from the same quality control batch as that of the client's samples.

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE DATA
A laboratory control sample is a matrix similar to that of the sample which has been spiked with known concentrations of analytes and prepared and analyzed by the same method as the sample. The Laboratory Control Sample (LCS) percent recovery is a measure of the accuracy of the preparation and analysis method. The Laboratory Control Sample Duplicate (LCSD) is a duplicate preparation and analysis of the LCS. The LCS and LCSD are used to calculate the relative percent difference, which is a measure of the precision of the preparation and analysis method. The LCS/LCSD Report provides the analytical results for all laboratory control samples prepared and analyzed from the same quality control batch as that of the client's samples.

SURROGATE DATA
A surrogate is a compound that is similar to the compounds of interest, but is not normally found in environmental samples. Surrogates are added to the sample prior to preparation and analysis. The surrogate percent recovery is a measure of the effectiveness of the preparation and analysis method on the individual sample. The Surrogate Data Report provides the surrogate recoveries for each sample that required organic analysis.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE DATA
A matrix spike is an aliquot of a sample spiked with compounds of interest and prepared and analyzed by the same method as the sample. The Matrix Spike (MS) percent recovery is a measure of the effectiveness of the preparation and analysis method on the specific sample matrix. The Matrix Spike Duplicate (MSD) is a duplicate preparation and analysis of the MS. The MS and MSD are used to calculate the relative percent difference, which is a measure of the precision of the preparation and analysis method. The MS/MSD Report provides the analytical results for all matrix spike and matrix spike duplicate analyses performed either on samples from the client's order or on samples from the same quality control batch as that of the client's sample.

POST DIGESTION SPIKE DATA
A post digestion spike (PDS) is performed only on samples requiring analysis for metals. A portion of the sample, after preparation by digestion with acid, is spiked with known concentrations of the metals of interest and analyzed. Acceptable recovery of the spike indicates that a matrix interference does not exist in the sample for the metal analyzed.

International Association of Environmental Testing Laboratories
ETHICS SERVICE QUALITY
SEAL OF EXCELLENCE PROGRAM

1804 GLENDALE ROAD • SALINA, KANSAS 67401-6675
785-827-1273 • 800-535-3076 • FAX 785-823-7830

ATTACHMENT 4-4

STATISTICAL ANALYSIS METHODS FOR COMPLIANCE MONITORING

AND

1999 RESULTS

STATISTICAL METHODS FOR COMPLIANCE MONITORING

The statistical procedures outlined in this section were developed in accordance with 40 CFR, part 264, subpart F. Guidance for developing the specific statistical methods presented herein was obtained from the document entitled "Statistical Analysis of Ground Water Monitoring Data at RCRA Facilities", published by the Environmental Protection Agency, April, 1989.

The overall objective of the procedures outlined in the attached Flowchart (Figure 1) is to determine if there is statistically significant evidence of increased contamination in the compliance monitoring wells. This will be accomplished by sampling each compliance monitoring well on a semi-annual basis. In lieu of sampling a background well, it will be presumed that the background chromium concentration is less than 0.01 mg/L (the method detection limit). Each compliance monitoring well sample will be analyzed for total chromium. Evidence of statistically significant contamination will be determined in one of four ways depending on the percentage of non-detects in the sample data base (see Figure 1).

1. One-Way Parametric Analysis of Variance (ANOVA) if the number of non-detects (ND's) is less than 15 percent and the data or the natural logarithm of the data are normally distributed.

2. One-Way Nonparametric ANOVA using ND's as ties if 15 % < ND's < 50 %, or the data and the natural logarithm of the data are not normally distributed.

3. Test of Proportions if 50 % < ND's < 90 %.

4. Poisson Distribution Method if ND's > 90 %.

For each of the methods listed above, if there is no statistically significant difference between background and compliance wells, then the sampling, analysis, and statistical evaluation will continue as outlined. If there is a statistically significant difference between the detection limit (0.01 mg/L) and the compliance wells, then the compliance well concentrations will be compared with the Maximum Concentration Limit (MCL) of 0.10 mg/L using a tolerance interval with 95 percent coverage and 95 percent confidence.

)2/21/2000

ACCURACY AND PRECISION LIMITS
The accuracy and precision limits are method or laboratory determined limits indicating acceptable accuracy or precision for a given matrix. The accuracy limits are expressed with units of percent recovery. The precision limits are expressed with units of relative percent difference (RPD). Accuracy and/or precision limits are provided on the LCS/LCSD Report, MS/MSD Report and the Surrogate Data Report.

QUALITY CONTROL BATCH
Each batch of twenty or fewer samples of the same matrix, prepared and analyzed by the same method, is assigned a Quality Control Batch number. The Quality Control Batch number for each sample is provided on the Laboratory Report. With each batch, a method blank, two laboratory control samples and a matrix spike/matrix spike duplicate are prepared and analyzed. The analytical results for the method blank, laboratory control and matrix spike/matrix spike duplicate samples are provided on the Method Blank Data Report, LCS/LCSD Report and MS/MSD Report, respectively.

DATE PREPARED
The date prepared is the date the sample was extracted or digested in preparation for analysis. If the extraction or digestion is performed as part of the analysis, "NA" is reported for the date prepared. The date prepared for each sample is provided on the Laboratory Report.

DATE ANALYZED
The date analyzed is the date the analysis was performed on the sample. The date analyzed for each sample is provided on the Laboratory Report.

If you have any questions regarding this data, please contact me or your Continental Project Manager at (800)535-3076.

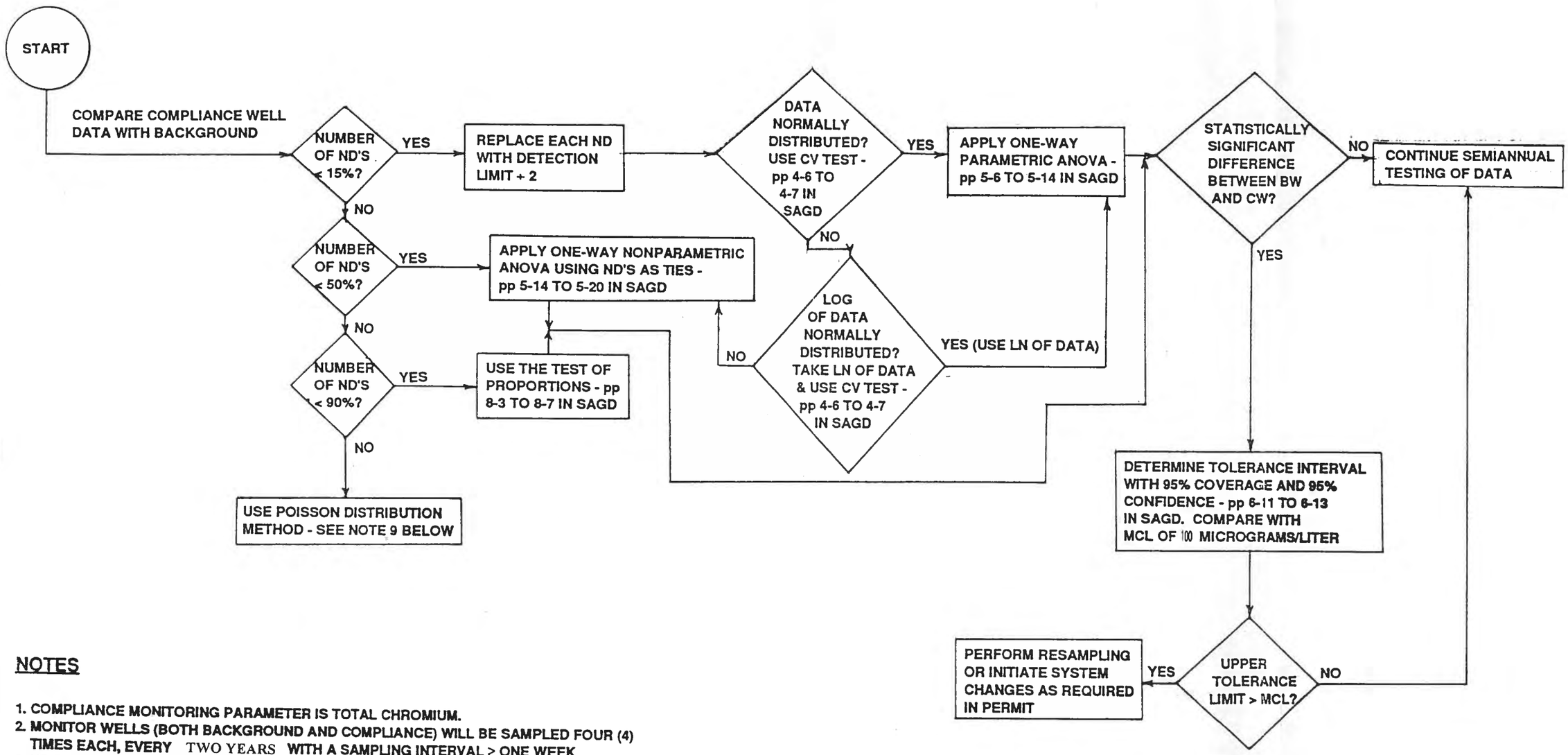
CONTINENTAL ANALYTICAL SERVICES, INC.

Clifford J. Baker

Clifford J. Baker
Laboratory Director

Enclosures
Quality Control Reports:
Method Blank Data
Laboratory Control Sample/Laboratory Control Sample Duplicate Data
Matrix Spike/Matrix Spike Duplicate Data

FLOWCHART FOR COMPLIANCE MONITORING STATISTICAL METHODS
EXLINE INC., SALINA, KANSAS



NOTES

1. COMPLIANCE MONITORING PARAMETER IS TOTAL CHROMIUM.
2. MONITOR WELLS (BOTH BACKGROUND AND COMPLIANCE) WILL BE SAMPLED FOUR (4) TIMES EACH, EVERY TWO YEARS WITH A SAMPLING INTERVAL ≥ ONE WEEK.
3. ND DENOTES NOT DETECTED.
4. CV DENOTES COEFFICIENT OF VARIANCE.
5. SAGD DENOTES STATISTICAL ANALYSIS GUIDANCE DOCUMENT ENTITLED "STATISTICAL ANALYSIS OF GROUNDWATER MONITORING DATA AT RCRA FACILITIES", UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, APRIL,1989.
6. ANOVA DENOTES ANALYSIS OF VARIANCE.
7. BW DENOTES BACKGROUND WELL.
8. CW DENOTES COMPLIANCE WELL.
9. POISSON DISTRIBUTION DISCUSSED IN "STATISTICAL METHODS", SNEDECOR AND COCHRAN, 6th ED, IOWA STATE UNIVERSITY PRESS, pp 223-226.
10. MCL DENOTES MAXIMUM CONCENTRATION LIMIT.

FIGURE 1 OF ATTACHMENT IV-4

KEJR ENGINEERING, INC.		
SCALE NTS	APPROVED BY	DRAWN BY LMS
DATE 7-7-89		DWG
COMPLIANCE MONITORING STATISTICAL METHODS		
EXLINE, INC		DRAWING NUMBER

STATISTICAL ANALYSIS OF EXLINE, INCORPORATED
COMPLIANCE MONITORING DATA

for the period
November, 1998 through April, 1999

The analysis presented below fulfills the reporting requirements outlined in IV.I.3 of the Exline Hazardous Waste Permit. The statistical analysis was performed in accordance with Section IV.G of this permit.

Table 1 presents the background and compliance well groundwater monitoring data generated during the period from November, 1998 through April, 1999. The data in this table were analyzed with the objective of determining whether a statistically significant difference exists between background (upgradient) wells and compliance (downgradient) monitoring wells.

TABLE 1: EXLINE, INC. GROUNDWATER DATA COMPLIANCE MONITORING

(for the compliance period - November, 1998 through April, 1999)

		Chromium Concentrations - mg/L			
Well	Well Type	11/16/98	1/14/99	2/9/99	4/20/99
B-4	BW	ND(0.01)	ND(0.01)	ND(0.01)	0.033
C-5	BW	ND(0.01)	ND(0.01)	ND(0.01)	0.030
B-6	CW	ND(0.01)	ND(0.01)	0.011	0.023
SC-1	CW	0.017	ND(0.01)	ND(0.01)	0.025
D-3	CW	ND(0.01)	ND(0.01)	0.012	0.039
G-1	CW	0.014	ND(0.01)	0.020	0.023

Notes:

BW - denotes background monitoring well
CW - denotes downgradient compliance monitoring well
ND - denotes that the parameter was not detected, with the detection limit in parenthesis.

Chromium was detected once in each of the upgradient background wells, B-4 and C-5, at concentrations of 0.033 mg/L and 0.030 mg/L, respectively. Chromium was also detected nine times in the downgradient compliance wells. The number of non-detects is, therefore, equal to 13 out of 24 total samples; and the percentage of non-detects equals 54 percent.

The Test of Proportions was used to analyze the data for a statistically significant difference between the background and compliance well sampling results. This statistical analysis method is outlined on pages 8-3 through 8-7 in the "Statistical Analysis Guidance Document" (SAGD), published by the U.S. EPA, April, 1989). The following calculations document the application of the Test of Proportions to the Exline data:

x = number of background samples with detectable Cr concentrations = 2
y = number of compliance well samples with detectable Cr concentrations = 9
n = number of samples = 24
n_B = number of background samples = 8
n_C = number of compliance well samples = 16
P_B = fraction of background well samples with detectable Cr concentrations
P_C = fraction of compliance well samples with detectable Cr concentrations

$P_B = 2 / 8 = 0.25$ $\qquad$ $P_C = 9 / 16 = 0.5625$

$$S_D = [((x + y) / n) * (1 - (x + y) / n) * (P_B + P_C)] \wedge 0.5 = 0.45$$

$$Z = | (P_B - P_C) | / S_D = 0.69$$

Application of the Test of Proportions results in the calculation of a Z statistic which is equal to 0.69. This is less than the Z value of 1.96 at the 97.5 percentile from the standard normal distribution. This is evidence that no statistically significant difference exists between the compliance wells and background wells.

STATISTICAL ANALYSIS OF EXLINE, INCORPORATED
COMPLIANCE MONITORING DATA

for the period
May, 1999 through October, 1999

The analysis presented below fulfills the reporting requirements outlined in IV.I.3 of the Exline Hazardous Waste Permit. The statistical analysis was performed in accordance with Section IV.G of this permit.

Table 1 presents the background and compliance well groundwater monitoring data generated during the period from May, 1999 through October, 1999. The data in this table were analyzed with the objective of determining whether a statistically significant difference exists between background (upgradient) wells and compliance (downgradient) monitoring wells.

TABLE 1: EXLINE, INC. GROUNDWATER DATA COMPLIANCE MONITORING
(for the compliance period - May, 1999 through October, 1999)

		Chromium Concentrations - mg/L			
Well	Well Type	5/12/99	7/23/99	8/23/99	10/26/99
B-4	BW	ND(0.01)	0.020	ND(0.01)	0.010
C-5	BW	ND(0.01)	0.020	ND(0.01)	ND(0.01)
B-6	CW	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
SC-1	CW	ND(0.01)	0.010	ND(0.01)	ND(0.01)
D-3	CW	ND(0.01)	0.020	0.010	0.016
G-1	CW	ND(0.01)	0.010	ND(0.01)	ND(0.01)

Notes:

BW - denotes background monitoring well
CW - denotes downgradient compliance monitoring well
ND - denotes that the parameter was not detected, with the detection limit in parenthesis.

Chromium was detected a total of three (3) times in the upgradient background wells, B-4 and C-5. Chromium was also detected five (5) times in the downgradient compliance wells. The number of non-detects is; therefore, equal to 16 out of 24 total samples; and the percentage of non-detects equals 67 percent.

The Test of Proportions was used to analyze the data for a statistically significant difference between the background and compliance well sampling results. This statistical analysis method is outlined on pages 8-3 through 8-7 in the "Statistical Analysis Guidance Document" (SAGD), published by the U.S. EPA, in April, 1989. The following calculations document the application of the Test of Proportions to the Exline data:

x = number of background samples with detectable Cr concentrations = 3
y = number of compliance well samples with detectable Cr concentrations = 5
n = total number of samples = 24
n_B = number of background samples = 8
n_C = number of compliance well samples = 16
P_B = fraction of background well samples with detectable Cr concentrations = 0.375
P_C = fraction of compliance well samples with detectable Cr concentrations = 0.3125

The standard deviation, S_D for the data set is calculated to be:

$$S_D = [((x + y)/n) * (1 - (x + y)/n) * (P_B + P_C)]^{0.5} = 0.39$$

$$Z = |(P_B - P_C)|/S_D = (0.375 - 0.3125)/0.39 = 0.16$$

Application of the Test of Proportions thus results in the calculation of a Z statistic, which is equal to 0.16. This is less than the Z value of 1.96 at the 97.5 percentile from the standard normal distribution. This is evidence that no statistically significant difference exists between the compliance wells and background wells.

ATTACHMENT 4-5

MORRISON VENTURES – EXLINE, INC. ACCESS AGREEMENT

AGREEMENT FOR ACCESS TO PROPERTY

OWNER OF PROPERTY: Morrison Ventures, Inc.

ADDRESS OF PROPERTY: 3339 East Country Club Road, Salina, Kansas 67401

The owners of the above described property grant to Exline, Inc., its employees, agents, or other authorized representatives, the right and privilege to enter on the above described property for the purpose of conducting groundwater investigation and remediation activities, including, but not limited to:

1. The boring of holes for subsurface investigation including the use of hydraulic boring equipment.

2. Installation and sampling of groundwater monitoring wells.

3. Installation and operation of groundwater recovery wells.

4. Other actions, which may be necessary, relating to the investigation and remediation of groundwater.

This Agreement shall terminate upon the completion of the above stated activities.

Exline, Inc. assures the Owner that prior to termination of this Agreement, all materials and equipment shall be removed from the property and the property shall be restored, to the extent reasonably possible, to its condition at the time that this Agreement was executed.

12-11-01
Date

Morrison Ventures
Owner Signature

1/2/02
Date

Exline, Inc. Signature

SECTION 5 – CORRECTIVE ACTION PLAN

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

SECTION 5 – CORRECTIVE ACTION PLAN
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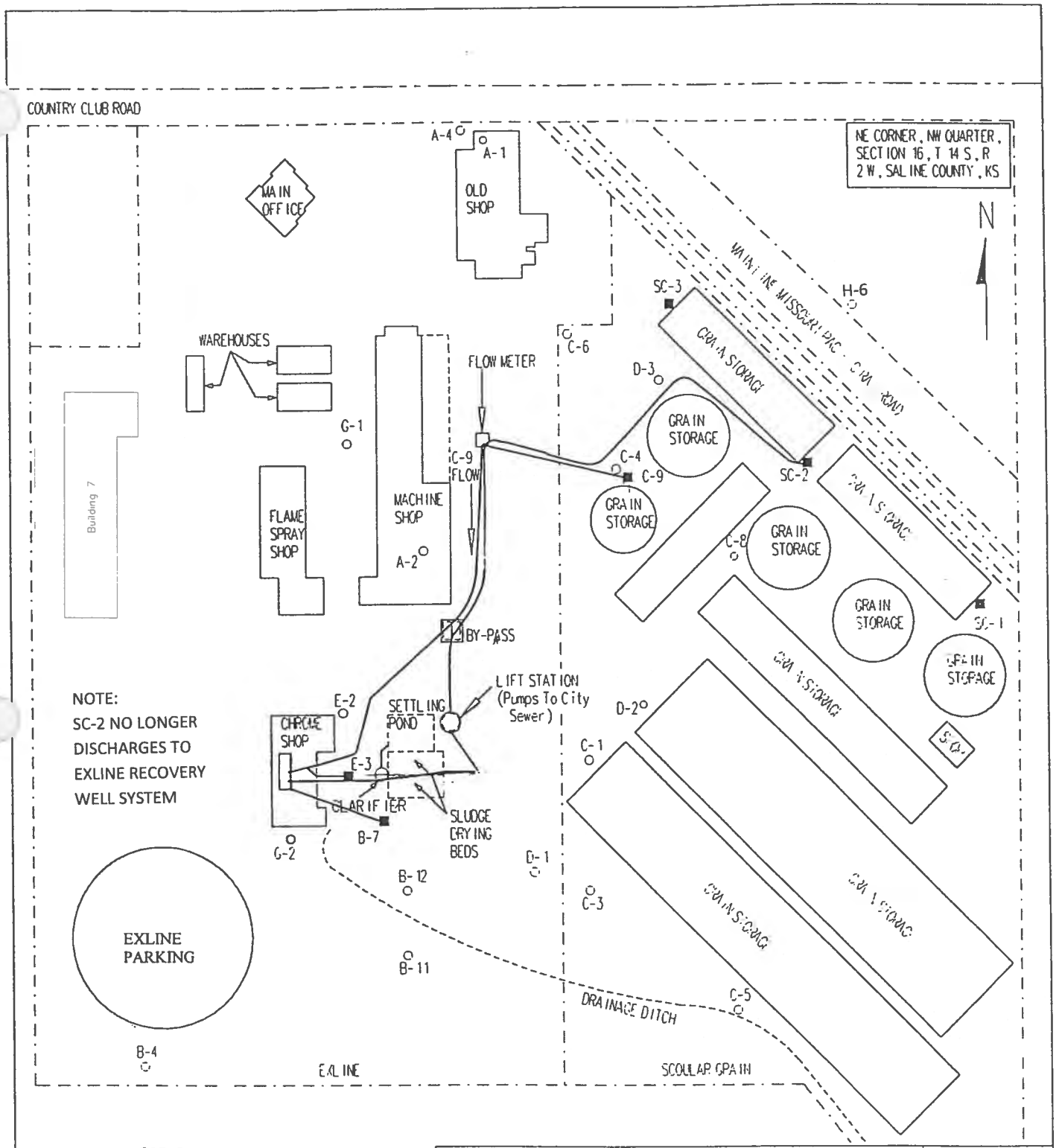
5. CORRECTIVE ACTION PLAN

5.1. Introduction. This Corrective Action Plan has been prepared to meet requirements set forth by 40 CFR § 270.14 (c) (8) (iii), which states that Exline must submit "Detailed plans and an Engineering Report describing the corrective action to be taken."

The corrective action program for the former surface impoundment shall consist of a program to ensure that groundwater quality will achieve compliance with the groundwater protection standard (GWPS) in a reasonable time period. This program shall consist of continuous operation of the groundwater containment and recovery system and groundwater monitoring in accordance with the facility Sampling and Analysis Plan (Permit Attachment 4-3). The recovery system shall continue to operate until the GWPS has not been exceeded for a period of three consecutive years at and beyond the point of compliance.

The location of the system withdrawal wells, piping and treatment system is shown on Plate 5-1. A schematic diagram of the groundwater treatment system is shown on Plate 5-2. The groundwater treatment system was bypassed in early 2004, due to the fact that the untreated groundwater chromium concentrations were well below the Exline Industrial Wastewater Discharge limits. The bypass will continue unless and until the discharge permit limits are reduced and/or the recovered groundwater chromium concentrations increase. In the unlikely event that such circumstances occur and treatment is required, the former treatment system (pH adjustment, chromium reduction, and solids settling) will no longer be utilized. Rather, hexavalent chromium would be removed by ion exchange. When the ion exchange resin is exhausted, it would be replaced with new resin and the exhausted resin disposed off-site.

5.2. History of Corrective Action Program. The contaminant of concern at the Exline site is hexavalent chromium. This contaminant, which is extremely soluble in water, entered the saturated zone from the former surface impoundment and from soil adjacent to the chrome shop. After reaching the water table, this contaminant traveled down-gradient with groundwater flow. The furthest measured horizontal extent of contamination above the GWPS of 0.10 mg/L is approximately 830 feet northeast of the former surface impoundment, in the vicinity of Scoular de-watering well, SC-2 (the location of well SC-2 is shown on Plate 5-1). This assessment regarding the furthest downgradient extent of chromium is based on historical monitor and pumping well data. Monitor well B-6, located downgradient of pumping well SC-2 has been typically non-detect (88 non-detects out of 95 samples) with respect to total chromium and has never exceeded the GWPS of 0.10 mg/L. Monitor well H-6, which replaced monitoring well B-6 in August, 2002, has been sampled on a semi-annual basis from May, 2003 through December, 2011 – 18 samples. Most of the total chromium sample concentrations have been non-detect during that period. The highest total chromium concentration measured in monitor well H-6 during that time has been 0.016 mg/L. Scoular de-watering well SC-2 has historically exhibited detectable concentrations of total chromium; these concentrations have decreased slowly over time. SC-2 chromium concentrations have been slightly above or at the detection limit of 0.01 mg/L since 1999. For that reason, SC-2 was removed from the Exline recovery well network in 2008.



LEGEND:

■ RECOVERY WELL

○ MONITOR WELL

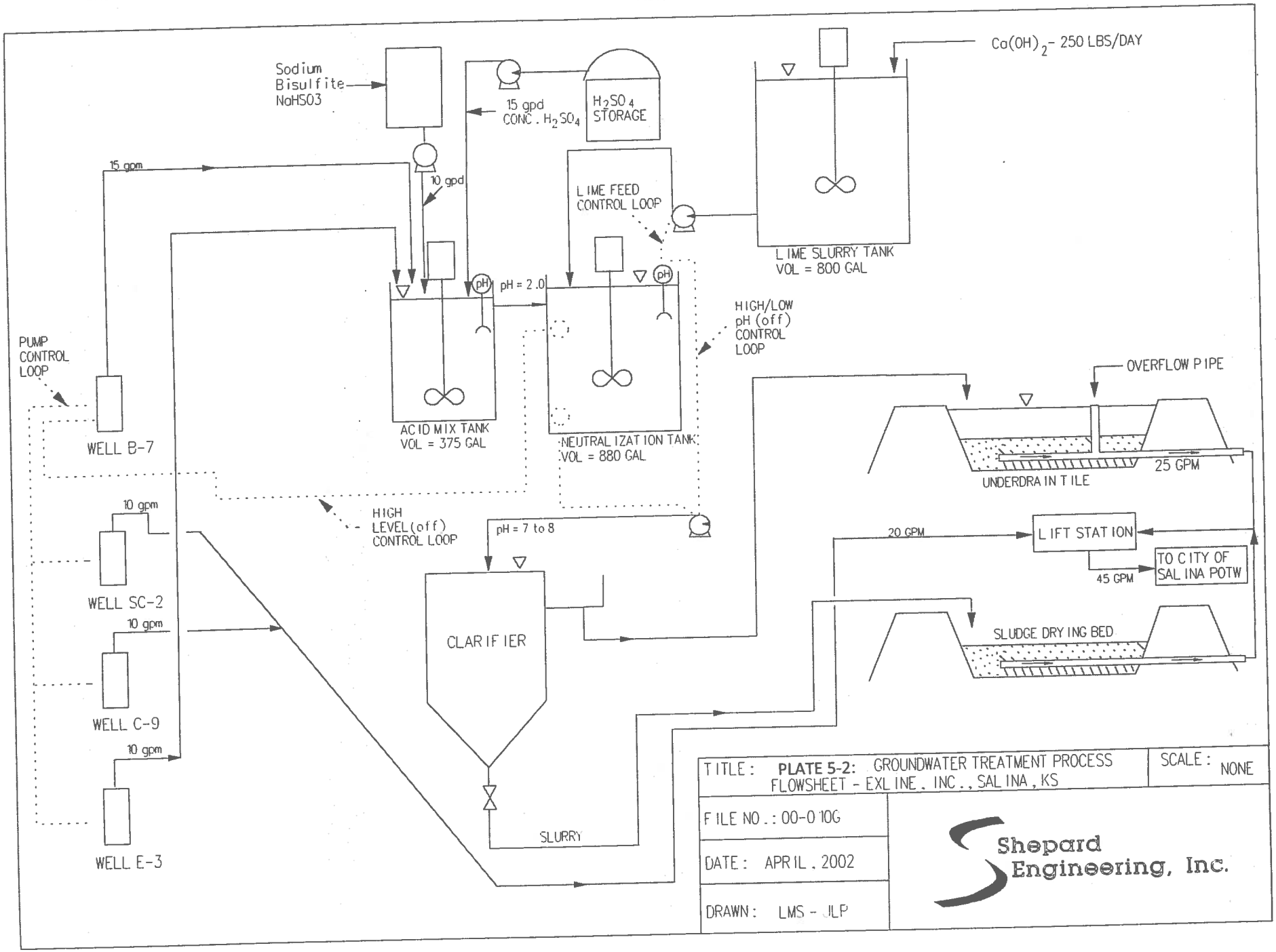
—— GROUNDWATER COLLECTION AND TREATMENT SYSTEM PIPING

PLATE 5-1: GROUNDWATER TREATMENT SYSTEM SITE PLAN EXLINE, INC., SALINA, KANSAS	SCALE: 1' = 200'

Shepard Engineering, Inc.

DRAWN: JLP-LMS	FILE NO.: 08-010G	DATE FEBRUARY, 2008

Revised February, 2008


Sodium Bisulfite NaHSO3
15 gpd CONC. H2SO4
H2SO4 STORAGE
Ca(OH)2 - 250 LBS/DAY
15 gpm
10 gpd
LIME FEED CONTROL LOOP
LIME SLURRY TANK VOL = 800 GAL
pH = 2.0
HIGH/LOW pH (off) CONTROL LOOP
PUMP CONTROL LOOP
WELL B-7
ACID MIX TANK VOL = 375 GAL
NEUTRALIZATION TANK VOL = 880 GAL
OVERFLOW PIPE
UNDERDRAIN TILE
25 GPM
10 gpm
HIGH LEVEL (off) CONTROL LOOP
pH = 7 to 8
20 GPM
LIFT STATION
TO CITY OF SALINA POTW
45 GPM
WELL SC-2
10 gpm
CLARIFIER
SLUDGE DRYING BED
WELL C-9
10 gpm
SLURRY
WELL E-3
TITLE: PLATE 5-2: GROUNDWATER TREATMENT PROCESS FLOWSHEET - EXLINE, INC., SALINA, KS
SCALE: NONE
FILE NO.: 00-0106
DATE: APRIL, 2002
DRAWN: LMS - JLP
Shepard Engineering, Inc.

The Exline, Inc. facility has been operating a corrective action program since February, 1984. The objective of this program was and is to remove and treat chromium contaminated groundwater in order to remediate the aquifer at the site to a condition, which will meet the groundwater protection standard for chromium.

Remediation well installation dates and flow rates are summarized below (it should be noted that C-9R replaced C-9 in December of 2006):

Recovery Well	Current Flow Rate (gpm)	Startup Date
B-7	15	February, 1984
C-9R*	10	May, 1988
E-3	10	August, 1989

Well, E-3 was operated at 5 gpm was from August, 1989 through December, 1989. Well B-7 was operated around 7 gpm from February, 1984 through April, 1985. In May, 1985, the flow rate from B-7 was increased to 15 gpm and has remained at that rate through the present. The pumping rate for C-9 (and its replacement – C-9R) has remained at 10 gpm since startup in May of 1988. It should also be noted that Scoular de-watering well was operated at a flow rate of 10 gpm within the Exline recovery well system from 1988 through 2008. SC-2 is no longer operated as part of the Exline recovery well network.

The groundwater treatment system was started up in February, 1984. With the exceptions noted below, the basic components and operation of the system have remained essentially the same since system startup until such time that the treatment system was bypassed in early 2004. Significant changes that occurred from 1984 through 2004 include the following:

- The chemical reducing agent was changed from sulfur dioxide to liquid sodium bisulfite in 1998.

- An air stripper treated wastewater for VOC removal from September of 1991 through December, 1996. During that time, water was pumped to the air stripper following the pH adjustment (reduction) step with sulfuric acid. Water from the air stripper was then pumped back to the chromium removal system. This VOC removal process was discontinued after the treated effluent began being discharged to the City Sewer (in lieu of surface discharge under an NPDES permit), which was initiated in November of 1996. Air stripper treatment was no longer needed since VOC discharge limits are 2 to 3 orders-of-magnitude higher for discharge to the City sewer compared to surface discharge. The effluent continues to be discharged to the City of Salina sewer system under the regulation of an Industrial Wastewater Discharge Permit.

- In October of 2003, the City of Salina of Salina agreed to allow Exline to bypass the groundwater treatment system. This change was made due to the fact that the untreated groundwater chromium concentration had decreased well below the permit discharge limit of 3.35 mg/L. The bypass was subsequently initiated in early 2004.

5.3. Recovery System Operation and Monitoring. This section sets forth schedules and procedures for operation and monitoring of the remediation system. An Operation and Maintenance Plan for the groundwater treatment system was used when the treatment system was in operation. However, as discussed in more detail below, that Plan is no longer needed, since the former groundwater treatment system is no longer in use. The recovered groundwater chromium concentrations are well below Exline's Industrial Wastewater Discharge limits, therefore groundwater treatment is no longer required. The current chromium discharge limit is mass-based – 5.404 lb/day, which is equivalent to 12.86 mg/L, based on a groundwater recovery well flow rate of 35 gpm (50,400 gal/day).

In its present configuration, the Exline, Inc. corrective action program includes withdrawal wells, pumps, and piping system. Prior to November 12, 1996, the recovered groundwater was treated and discharged to the surface, under an NPDES permit. Since November 12, 1996, the treated groundwater has been discharged to the City of Salina sanitary sewer system, via a lift station near the Exline cylinder (formerly chrome) shop.

Exline, Inc.'s NPDES permit was scheduled to be renewed in 1995. At that time, the new permit proposed to reduce the chromium discharge limit from 1.0 mg/L to 0.1 mg/L. The cost for retrofitting the groundwater treatment system to meet the proposed limit would have been enormous. Therefore, Exline initiated discussions with the City of Salina to explore the possibility to discharge treated groundwater to the City's Public Owned Treatment Works. The City agreed to accept Exline's wastewater under the regulation of an Industrial Wastewater Discharge Permit. The chromium discharge limit under this permit was established at 3.35 mg/L at that time. The City of Salina developed that limit (with assistance from the KDHE) using a technically-based local limits analysis.

As noted earlier, the location of the system withdrawal wells, piping and (former) treatment system is shown on Plate 5-1. A schematic diagram of the (former) groundwater treatment system is shown on Plate 5-2. As discussed earlier, the groundwater treatment system is no longer used since the recovered groundwater concentration is well below the City discharge permit limit (i.e., without treatment).

Beginning in early 2004, groundwater from the four (4) recovery wells began discharging directly to the City sewer since the chromium concentration in the recovered groundwater is well below the 3.35 mg/L permit discharge limit (written approval was obtained from the City of Salina for such bypass in late 2003). Prior to the complete system bypass, groundwater from recovery wells B-7 and E-3 was pumped to an acid mix tank where sulfuric acid was added to reduce the pH (to around 2.0) and sodium bisulfite was added to reduce the chromium from the hexavalent to the trivalent form. The water then flowed to a neutralization tank, where lime slurry was added to increase the pH and precipitate chromium hydroxide. The pH of the neutralization tank was maintained between 7 and 8. The neutralized effluent was pumped to the sludge clarifier for separation of settleable solids. Clarifier overflow was directed to the settling pond and finally to the lift station. Thickened solids from the bottom of the clarifier were sent to one of two drying beds. Recovered groundwater is currently sent directly to the City sewer without treatment.

5.4. Recovery Well (Influent) and System Effluent Concentrations. The groundwater recovery well system typically removes approximately 18 million gallons of water per year (instantaneous pumping rate in the range of 35 gpm). The groundwater recovery rate was decreased by approximately 10 gpm when Scoular Elevator de-watering well SC-2 was removed from the Exline recovery well network in 2008.

The flow rate and pumping well influent chromium concentrations can be used to calculate the mass of chromium removed from the aquifer. This calculation has been completed each year since system start-up, and is summarized in Table 5-1.

Chromium concentrations in the three currently operating recovery wells as a function of time are presented in the following graphs:

Figure 5.1: B-7
Figure 5.2: E-3
Figure 5.3: C-9R

Water elevations at the site rapidly increased and then decreased in 1993, as a result of record precipitation in the spring and summer of 1993. The temporary higher water level in finer-grained sediments above the normal top of the aquifer in 1993 is the apparent cause of the subsequent increased chromium concentrations in recovery wells B-7 and E-3 (the wells nearest the chromium sources) in 1993 – as shown in Figures 5.1 and 5.2.

5.5. Capture Zone Analysis. A capture zone analysis was completed by Shepard Engineering, Inc. on behalf of Exline, Inc. in October, 2001. The analysis was completed using QuickFlow, an interactive analytical model that simulates two-dimensional, steady-state and transient groundwater flow. The steady-state module simulates two-dimensional groundwater flow in a horizontal plane using analytical functions developed by Strack (Groundwater Mechanics, Prentice Hall, Englewood Cliffs, New Jersey, 1989).

The capture zone analysis was conducted using two hydraulic conductivity values, which have been generated at the site: 35 ft/day and 128 ft/day. The analysis shows that the entire chromium plume is being captured, using the 35 ft/day hydraulic conductivity value. Based on the 128 ft/day hydraulic conductivity value, a small width (approximately 60 ft. wide) of the chromium plume would be escaping.

The KDHE, in a February 12, 2002 letter, proposed that analytical results from the down-gradient monitoring well (H-6), which replaced monitoring well B-6, should be reviewed before taking action to further evaluate the capture zone. If on-going data generated by H-6 indicate that the recovery wells are capturing the chromium plume, then additional action may not be required. If chromium concentrations are detected in monitoring well H-6 above the MCL (0.10 mg/L), then an aquifer test will be proposed using recovery well C-9R to more accurately determine the hydraulic conductivity in that part of the aquifer. The hydraulic conductivity value would then be used to calculate the pumping rate that would be required in well C-9R to completely capture the chromium plume.

Down-gradient monitoring well H-6 chromium concentrations (May, 2003 to December, 2012) have ranged from < 0.005 mg/L to 0.016 mg/L. In addition, down-gradient private wells (Bernhardt, Weber, and O'Neil) have all exhibited chromium concentrations at or

TABLE 5-1: RECOVERY WELL FLOW AND CHROMIUM REMOVAL - 1984 TO 2011
EXLINE, INC., SALINA, KANSAS

Year	Total Flow (MG)	Chromium Removed (pounds)
1984	2.9	1571
1985	4.12	1812
1986	5.36	1641
1987	5.44	1154
1988	12.62	1292
1989	19.25	878.4
1990	17.66	513.8
1991	23.35	439.4
1992	23.57	191.1
1993	22.88	9831.3
1994	23.55	1360.5
1995	20.68	665.8
1996	20.11	696.2
1997	19.59	414
1998	18.76	275
1999	21.57	476.8
2000	21.45	391.2
2001	22.08	219.3
2002	22.53	212
2003	22.86	154.6
2004	22.69	107.2
2005	23.06	203
2006	20.09	138.5
2007	19.18	172
2008	19.71	336.5
2009	16.71	273.7
2010	18.78	265.2
2011	18.97	128
Totals:	509.52	25813.5

Figure 5.1: Exline Recovery Well B-7 Chromium Concentration as a Function of TIme

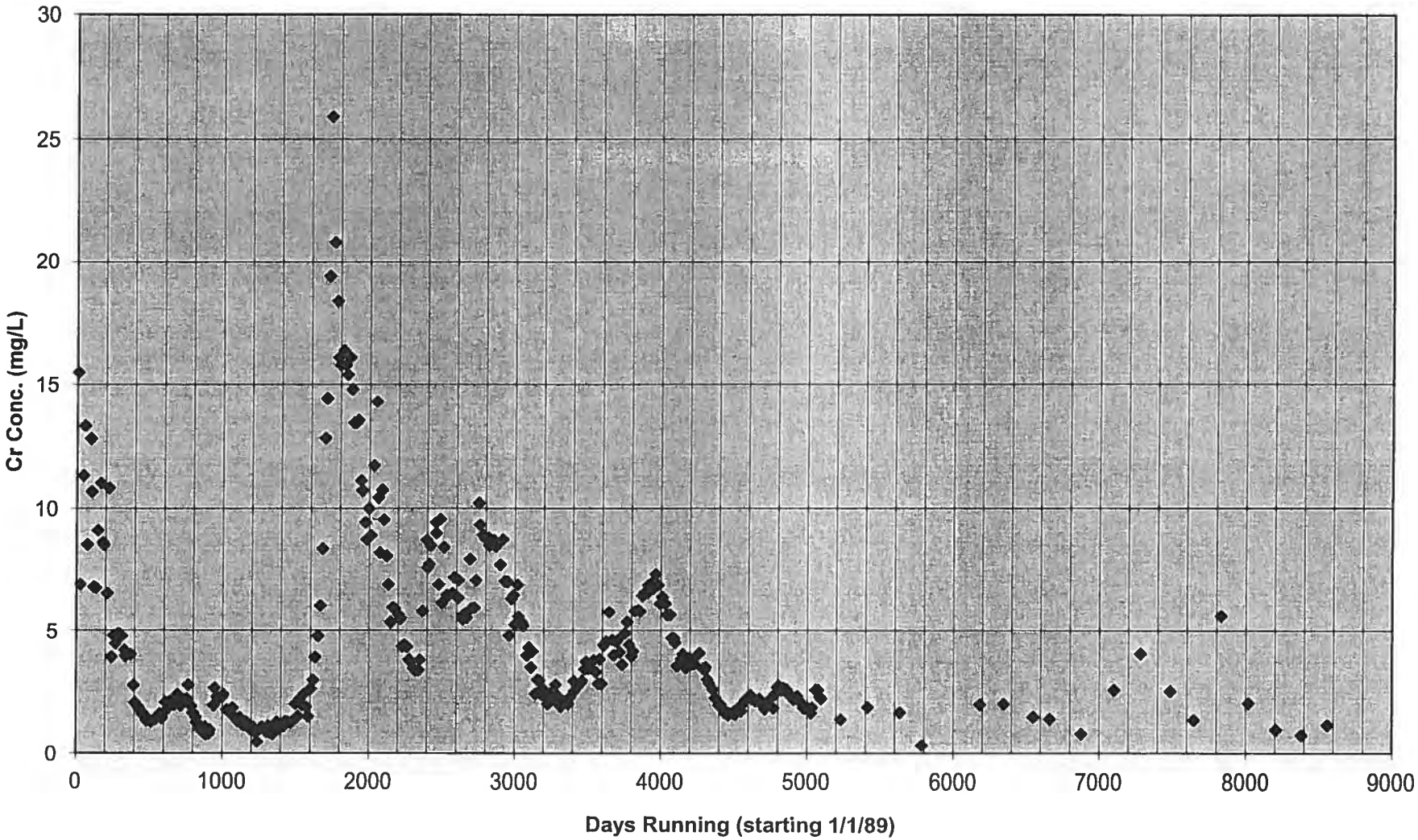


Figure 5.2: Exline Recovery Well E-3 Chromium Concentration as a Function of TIme

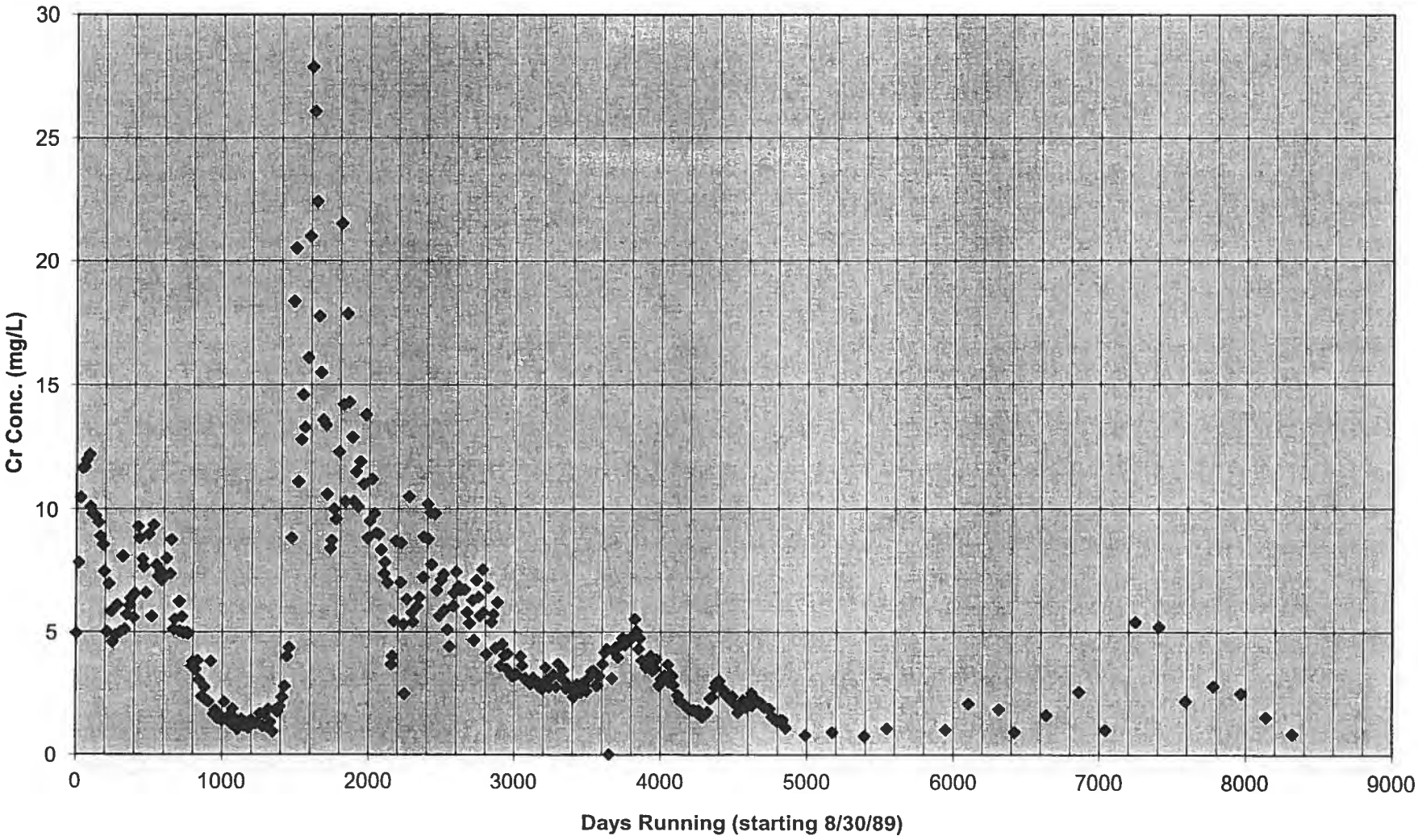
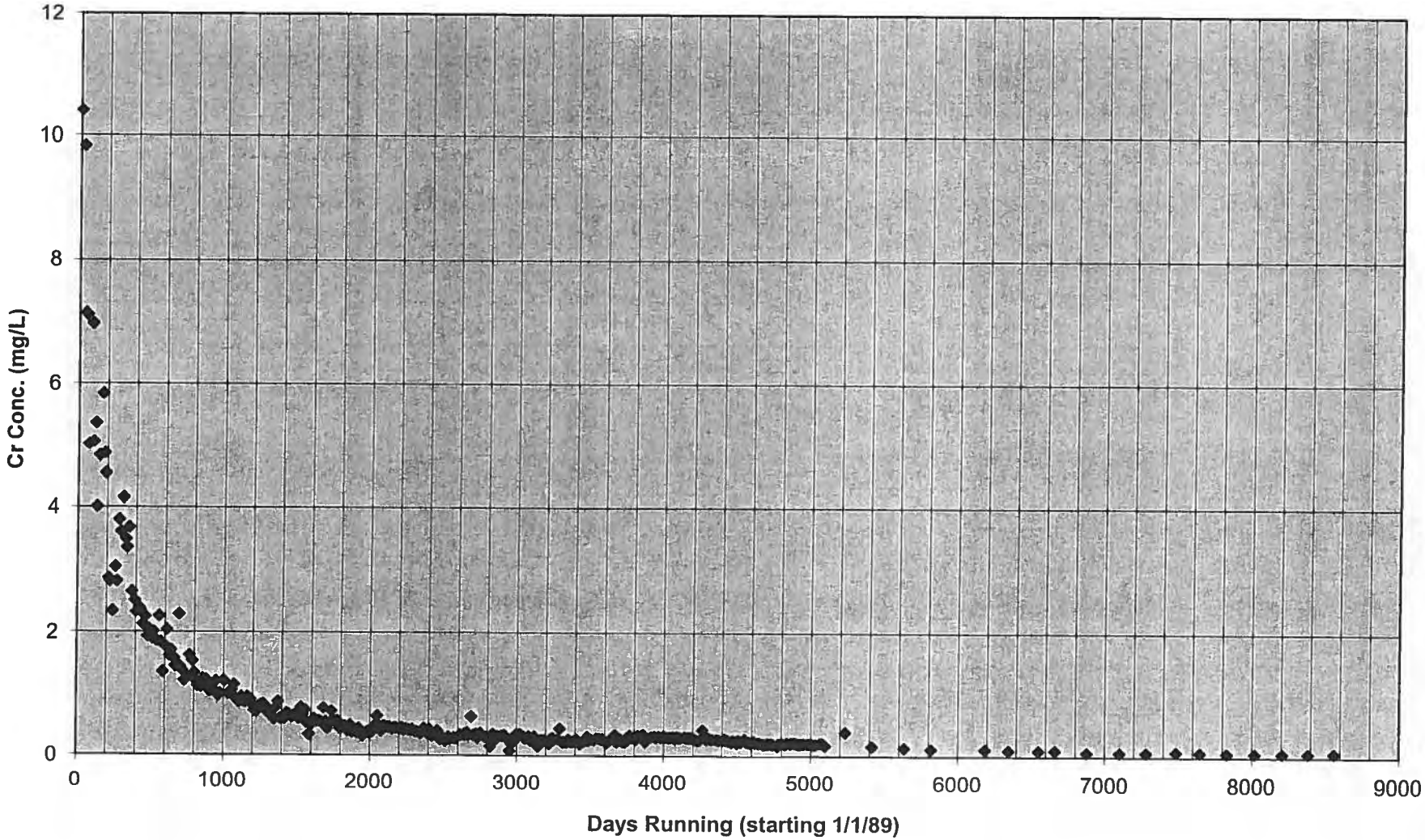


Figure 5.3: Exline Recovery Well C-9R Chromium Concentration as a Function of TIme



near non-detect levels (0.005 mg/L to 0.010 mg/L). These data indicate that the recovery well network is effectively capturing the chromium plume.

5.6. Unsaturated Zone Flushing – Impoundment Area. Beginning March 1 1990, water was applied on a routine basis to the ground surface in the area of the closed surface impoundment. The objective of this watering is to increase infiltration through the unsaturated zone, thereby enhancing the downward movement of contamination from the former surface impoundment still retained in the vadose zone.

The un-saturated zone flushing system was operated from 1990 through 2005, at which time it was dis-continued. The decision to shut the system down was based on a review of the concentration data in recovery well B-7. That review demonstrated that the flushing system operation was not producing an increase in the mass of chromium that was recovered from that well.

5.7. Corrective Action Reporting. Corrective Action reporting requirements were presented earlier in Section 4.6. This information is presented again in this section.

Exline, Inc. shall report the following information to the KDHE Hazardous Waste Section, Bureau of Waste Management:

5.7.1. Semi-annual Reports. Exline shall submit the following information on a semi-annual basis for the preceding six-month period (i.e., January- June and July-December):

1. Copies of all analytical data from Exline's semi-annual groundwater sampling events for the monitoring wells and groundwater remediation system.

2. Field parameter measurement results, copies of field sampling and well inspection log sheets, well repair documentation, volumes of groundwater extracted and other relevant groundwater-related information.

3. Iso-concentration contour maps will be evaluated and compared with previous maps to make sure that the plume size is being reduced over time.

4. Graphs of the monitor well and recovery well chromium concentrations as a function of time will be reviewed. These graphs should show that the chromium concentrations are exhibiting a general decrease over time.

The semi-annual groundwater corrective action reports shall be submitted to the KDHE by September 1 of each year for the preceding 6 month period. Information included in the September 1 semi-annual report may be combined with the Annual Report.

The corrective action efficiency will be evaluated by examining information, which is included in the semi-annual report.

5.7.2. Annual Reports. The annual groundwater corrective action report shall include, but not be limited to (the Annual Report is due by March 1 each year):

1. A narrative discussion of the nature and evolution of Exline's groundwater monitoring and corrective action programs as well as conclusions regarding the overall adequacy of the programs. The evaluation shall include demonstration of the recovery and containment system's efficiency.

2. The groundwater flow rate and direction of groundwater movement in the underlying aquifer and potential effects on any component of the corrective action monitoring program to evaluate the effectiveness of the corrective action program.

3. The horizontal and vertical extent and concentrations of any hazardous constituents throughout the Site as evaluated from the data obtained from Exline's groundwater monitoring system.

4. Any surface and/or subsurface well integrity problems and their potential or actual influence on the groundwater data or efficiency of the corrective action monitoring program.

5. The conclusions and summary of analytical results from the groundwater corrective action monitoring program.

6. The conclusions on the adequacy of the groundwater monitoring system, as it relates to its intended purpose.

7. Contaminant trend analyses from year to year to help evaluate the effectiveness of the corrective action in removing subsurface contaminants, to track the overall progress/trends in cleaning up the groundwater, and to provide the basis for future decisions regarding operation of and/or ultimately, cessation of pumping. The groundwater analytical results from recovery wells B-7, E-3, and C-9R will be statistically analyzed with trend analyses. The indicator compound concentrations (i.e., total chromium) will be plotted on time-concentration graphs to monitor trends in water quality.

5.8. Corrective Action Contingency Plan. The following contingencies will be implemented in the event that the groundwater recovery and treatment system fails to operate within the desired specifications.

1. Groundwater Treatment System Failure. This contingency is no longer applicable since the Exline treatment system is no longer operating

2. Recovery Well Pump Failure. Exline, Inc. personnel monitor the recovery well system on a daily basis. If a recovery well fails, then Exline, Inc. maintenance personnel or a local water well pump contractor will repair or replace the pump within 48 hours. The pumps used in the Exline recovery wells are in stock locally.

3. Lift Station Pump Failure. If a list station pump(s) fails, then Exline, Inc. maintenance personnel and/or a local well pump contractor will repair or replace the pump(s). Turnaround time for a lift station pump is typically 5 days or less.

4. Failure of Recovery Wells to Capture the Chromium Plume. If the recovery wells are not achieving complete capture of the chromium plume, then elevated chromium concentrations would be detected in either the downgradient monitor well H-6 or one of the three down-gradient private wells. If this occurs, then Exline, Inc. will increase the pumping rate of the downgradient recovery well C-9R in order to increase the capture zone width.

5.9. Future System Changes. Several potential changes could be implemented over time in the system. For example, Exline, Inc. could from time to time make changes in the withdrawal program within the plume. Changes to the system, which will increase withdrawal rates, will be reported to the KDHE as part of the routine data submittal.

Any proposed system change will be submitted to the KDHE for approval prior to implementation. Possible changes include, but are not limited to, the following:

1. Reduction of chromium levels in the area of influence of well C-9R to below the Groundwater Protection Standard (0.10 mg/L). This would eliminate C-9R from the corrective action area and permit reduction of the plume perimeter to exclude C-9R.

5.10. Cessation of Corrective Action Activities. The objective of the corrective action program is remediation of the aquifer such that chromium levels in the plume area do not exceed the groundwater protection standard. In accordance with 40 CFR § 264.94, the groundwater protection standard for chromium is 0.10 mg/L.

The recovery system shall continue to operate until the GWPS has not been exceeded for a period of three consecutive years at and beyond the point of compliance. It should be noted that certain recovery wells (e.g., C-9R) may discontinue operation before the entire system is shut down, if it can be demonstrated that the operation of such wells is not contributing to the corrective action process.

SECTION 6 – SOLID WASTE MANAGEMENT UNIT INFORMATION

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

POST-CLOSURE PERMIT APPLICATION
EXLINE, INC., SALINA, KANSAS

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Attachment 6-2: "Solid Waste Management Unit Summary Report", July, 2008, Revised January, 2013
Attachment 6-3: "Corrective Measures Study Report", July, 2008, Revised November, 2008
Attachment 6-4: "RFI Addendum Report", September, 2011

6. SOLID WASTE MANAGEMENT UNIT INFORMATION

6.1. Background Information.

This section has been prepared in order to fulfill requirements set forth by 40 CFR § 270.14 (d).

Information is provided with respect to nineteen (19) solid waste management units (SWMUs) and two (2) areas of concern (AOCs) at the Exline facility. The following information is provided for each SWMU:

1. General description of unit.
2. Type(s) of waste placed in unit.
3. Dates of operation.
4. Potential for release of waste into the environment.
5. Quantities and concentrations of waste(s) placed in unit (where known).
6. Dates of waste disposal.
7. Releases of waste.

This information is provided in the following attachments:

Attachment 6-1: "RFI Report", February, 2007
Attachment 6-2: "Solid Waste Management Unit Summary Report", February, 2008
Attachment 6-3: "Corrective Measures Study Report", November, 2008
Attachment 6-4: "RFI Addendum Report", September, 2011

6.2. Remedial Goals.

The remedial goals for the site, as established by EPA in the permit effective November 12, 2002, are summarized below.

Table 6.1: Exline, Inc. Vadose Zone Soil Remediation Goals – mg/kg

Constituent of Concern	Industrial Use	Un-Restricted Use
Arsenic	18	8.8
Chromium (III)	100,000	100,000
Chromium (VI)	38	0.29
Lead	1067	448

Remedial goals going forward will be based on the most current version of KDHE's *Risk-Based Standards for Kansas Manual*, the latest EPA guidance, or as otherwise directed or approved by KDHE.

6.3. Final Remedy Decision.

The EPA has identified two (2) solid waste management units (SWMUs) and two (2) areas of concern (AOCs), which require corrective action. The SWMUs and AOCs, which require corrective action and their respective remedies are:

SWMU-16: Chrome Plating Bath Ventilation Discharge Area. SWMU-16 consists of two areas – Area A and Area B. Area A includes soil, which would likely be hazardous waste upon excavation. Area B includes soil, which will not likely be hazardous waste, upon excavation. The final remedy for these areas is:

Area A – In-situ treatment of soil containing hexavalent chromium and excavation.

Area B – Excavation and off-site disposal of soil containing hexavalent chromium at or above the remedial goal of 38 mg/kg.

SWMU-19: Deionizer Column Discharge Area. The final remedy for this SWMU is excavation and off-site disposal of soil with a hexavalent chromium concentration at or above the remedial goal of 38 mg/kg.

AOC-1: Concrete Culvert Excavation Area. The final remedy for this SWMU is excavation and off-site disposal of soil with a hexavalent chromium concentration at or above the remedial goal of 38 mg/kg.

AOC-2: Brown Stained Soil Area. The final remedy for this SWMU is excavation and off-site disposal at or above the remedial goal for the specified parameters of concern.

Plate 6.1 is a Facility Layout Map, which shows the SWMUs (# 16 and # 19) and the AOCs (# 1 and # 2), as well as, the facility property boundary and adjacent property-owners.

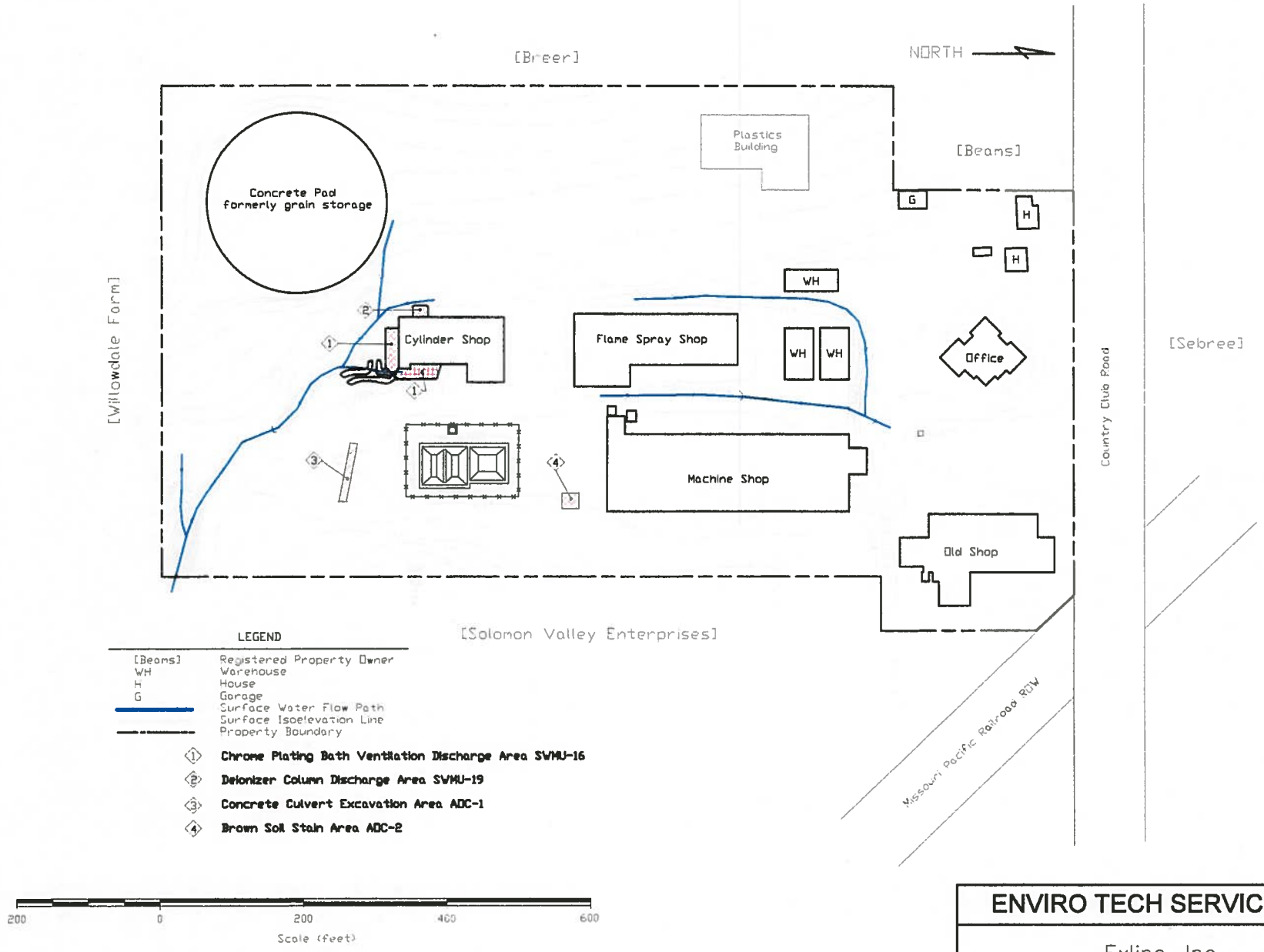

Plate 6.1: Facility Layout Map

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
Project Number: 10-0101	Date: March 2010	Drawn by: Jack Eslick

ATTACHMENT 6-1

RFI REPORT
FEBRUARY, 2007

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1. Introduction.

This RFI Report has been prepared in accordance with requirements set forth in Exline, Inc.'s hazardous waste permit – Part II, Section C.8. RCRA Facility Investigation Report.

Prior to the execution of the RFI sampling program, which is detailed herein, the following documents were submitted to and approved by EPA Region VII:

"RCRA Facility Investigation (RFI) Work Plan Addendum", April, 2005

"Sampling and Analysis Plan/Quality Assurance Project Plan", October, 2005

Both documents were prepared on behalf of Exline, Inc. by Shepard Engineering, Inc., Bennington, Kansas.

A "pre-RFI" sampling program was conducted at the Exline facility on November 22, 2005. Six (6) soil samples were collected at two (2) locations (3 samples at each location) in the chromium plating ventilation discharge area solid waste management unit (SWMU). These samples were analyzed for pH and ORP in the field and the laboratory, and for total and hexavalent chromium in the laboratory. This "pre-RFI" sampling program was conducted in order to evaluate the feasibility of the hexavalent chromium analysis method, which had been specified for soil samples. The results of this preliminary study were submitted to EPA Region VII in a February 22, 2006 letter report.

The remainder of the soil sampling program was completed at the site in May, 2006 (as outlined in the aforementioned Work Plans). In addition, a stormwater run-off sampling event was conducted at the site on April 28, 2006.

This Report will include the following:

- Sample collection procedures.
- Chemical analysis methods and summary of results.
- Interpretation and discussion of results.
- Summary and discussion of field and laboratory quality assurance/quality control results.
- Recommendations for follow-up action.

Finally, a first Draft of this report was prepared in July, 2006 and submitted to EPA Region VII and the KDHE for review. A comment letter was subsequently prepared by EPA Region VII and submitted to Exline, Inc. on October 24, 2006. Shepard Engineering, Inc. (SEI) submitted a response letter to EPA Region VII on December 7, 2006. EPA Region VII submitted a final comment letter to Exline, Inc. on January 8, 2007. This RFI Report has been revised to address the EPA Region VII comments set forth in the aforementioned 10/24/06 and 1/8/07 letters.

2. Facility Description.

Most of the following description of the Exline, Inc. facility was previously presented in the April, 2005 RFI Work Plan Addendum.

Exline, Inc. manufactures and rebuilds large stationary industrial engines and engine parts. A chrome plating shop was constructed in the late 1960s for the purpose of plating large stationary engine parts (typically cylinders).

Waste chrome plating solution was discharged to an unlined surface impoundment at the facility from around 1970 to 1980. Other waste streams discharged to the surface impoundment included steam cleaning rinse water, wastewater from deionizer column regeneration, reverse strip-sodium chromate waste and caustic cleaner waste. Outside dimensions of the lagoon were 66' by 82', with an approximate working depth of 3 feet. Installation of a synthetic liner in 1980 revealed that infiltration had occurred, resulting in groundwater contamination with respect to hexavalent chromium.

A Closure Plan was subsequently prepared by Wilson Laboratories, on behalf of Exline, Inc., in November of 1983. This Closure Plan was submitted to the KDHE, and subsequently approved. The Plan was executed in 1984. The liquid waste was removed and the surface impoundment closed in August of 1984. The surface impoundment closure was certified by Exline, Inc. on January 17, 1985.

Exline, Inc. entered into a Consent Agreement with the KDHE in 1987 to conduct additional hydrogeologic investigations at the site. These investigations were completed and a summary report submitted to the KDHE in late 1987.

In July of 1987, KDHE called in a Part B application based on the fact that the surface impoundment was not clean closed. Clean closure was not obtained due to the fact that chromium contamination remained in the subsurface (i.e., groundwater).

Exline submitted Part A and Part B permit applications in March of 1989. A Hazardous Waste permit was issued in October of 1989. The surface impoundment is currently regulated by the Hazardous Waste Post-Closure Permit, which became effective on October 29, 1989, and was re-issued on December 16, 2002.

As required by the Hazardous and Solid Waste Amendments (HSWA) of 1984, releases from Solid Waste Management Units (SWMUs) have been evaluated at the Exline facility. Part of this evaluation consisted of a RCRA Facility Assessment (RFA). The RFA was conducted in 1989 and consisted of a Preliminary Review (PR) and a Visual Site Inspection (VSI). The VSI was completed on May 19, 1989. The RFA findings were documented in a report titled: "RCRA Facility Assessment at Exline", July 14, 1989. The RFA was completed by Metcalf & Eddy, Inc. under contract to US EPA Region VII. The RFA Report included recommendations for further action at certain SWMUs and AOCs that were identified during the evaluation process.

The Exline Part B permit issued in October of 1989 identified four (4) SWMUs, which required additional investigation. Exline, Inc. completed a sampling and analysis project for these 4 SWMUs and surface water run-off in October of 1992. The results of that sampling effort were summarized in a document entitled: "Solid Waste Management Unit RCRA Facility Investigation Final Report", dated December, 1993. As a follow-up to that RFI Report, Exline, Inc. submitted a Work Plan to the EPA entitled: "Sampling and Analysis Work Plan For Background Metals Concentrations", dated September, 1994. US EPA Region VII commented on that Work Plan in August of 2000. Following Exline's development of a Quality Assurance Project Plan and resolution of a limited number of other issues, the subject Work Plan was approved by EPA Region VII in May of 2001. Exline, Inc. completed the sampling in May of 2001. The sampling project results were summarized in a report titled: "RCRA Facility Investigation Sampling Program Report – Background Soil and Hexavalent Chromium Analysis". That Report was submitted to U.S. EPA Region VII in August, 2001.

In April of 1993, Exline, Inc. installed a dual wet scrubber control system, which was designed to remove chromium particulate from the north chrome plating tank ventilation discharge (ventilation system controls were not installed on the south chromium plating tank since operation of that tank was discontinued circa 1982). In January of 1994, Exline installed a mist eliminator on the ventilation discharge from a chromium strip tank. In August of 1997, Exline replaced the wet scrubber system with a state-of-the-art composite mesh pad ventilation control system. That system was sampled in August of 1997, as required by Clean Air Act regulations and exhibited an average chromium concentration in the discharge of 0.00188 mg/dscm. That concentration was well below the discharge standard of 0.010 mg/dscm. The composite mesh pad scrubber system was operated until the north chrome plating tank was shut down in early 2001.

The chromium strip process was moved to the tank that was serviced by the composite mesh pad scrubber system in February of 2003. The chromium stripping process was subsequently discontinued in October of 2003.

At present, monitor wells have been placed at the facility and on adjacent property to monitor the rate of movement and extent of chromium contamination. In addition, Exline is performing corrective action to remediate the uppermost aquifer beneath the site. This corrective action effort includes the construction of four (4) groundwater withdrawal wells, which are currently removing groundwater at a total rate of approximately 45 gallons per minute, on a 24 hours per day, 7 days per week basis. This recovered groundwater is discharged to the City of Salina sanitary sewer. The groundwater discharge is regulated by an Industrial Wastewater Discharge permit, which has been issued by the City of Salina (permit No. 0002).

An industrial wastewater batch pretreatment system was constructed and started up in February 1985, for the purpose of treating industrial wastewater generated in the Cylinder (formerly Chrome) Shop. The treated wastewater was discharged to the City of Salina sanitary sewer in accordance with the Industrial Wastewater Discharge permit discussed earlier (permit No. 0002). Most of the sludge generated by the pretreatment system was

F006 listed hazardous waste and was de-watered using a plate and frame filter press. This de-watered sludge was transported off-site to a permitted hazardous waste disposal company. This sludge was stored on-site for a period less than 90 days.

The industrial wastewater treatment system discharge is no longer regulated by the City of Salina Industrial Wastewater Discharge Permit since Exline, Inc. discontinued chrome plating operations in early 2001.

Both the groundwater and industrial wastewater treatment systems were located in the Cylinder (formerly Chrome) shop, with the exception of the groundwater treatment system clarifier, settling pond, and sludge drying beds, which are located east of the Cylinder shop. The City of Salina agreed to allow Exline to bypass the groundwater treatment system beginning on January 1, 2004, due to the fact that the chromium concentrations in the recovery wells (typically less than 1 mg/L) were well below the permit discharge limits of 3.35 mg/L. Therefore, the groundwater treatment system is no longer operating and is in the process of being dismantled.

As discussed earlier, chrome plating is no longer conducted at the facility (hence the name change from "Chrome Plating shop" to "Cylinder shop"). Plating was discontinued in early 2001. As a result, chromium-bearing waste is no longer generated.

Plate 2.1 is a facility layout map. This map includes the following features (with a scale of 1 inch = 200 ft.):

1) Facility property including the property boundary.
2) Names of adjacent property owners, including property use.
3) Ground surface topography shown at contour intervals of 1 foot.
4) Surface water drainage patterns.
5) Existing buildings and tanks.

The EPA conducted a RCRA Facility Assessment (RFA) at the Exline facility in order to identify SWMUs and AOCs, as well as, any releases or potential releases, which may have occurred from these SWMUs and AOCs. The EPA prepared an RFA Report on July 14, 1989. This RFA Report identified the eighteen (18) SWMUs listed above and one (1) AOC (the "Brown Stain Soil Area" was subsequently identified as a 2nd AOC).

The EPA subsequently required that Exline prepare an RFI Work Plan designed to investigate the following SWMUs and AOCs:

1) SWMU-16: Surface Water Run-off Area (area south and east of the chrome shop ventilation discharge stacks). This SWMU will henceforth be identified as the "Chrome Plating Ventilation Discharge Area".

2) SWMU-19: Deionizer Column Regeneration Area (this SWMU was identified subsequent to the aforementioned RFA and was included in the RFI Work Plan).

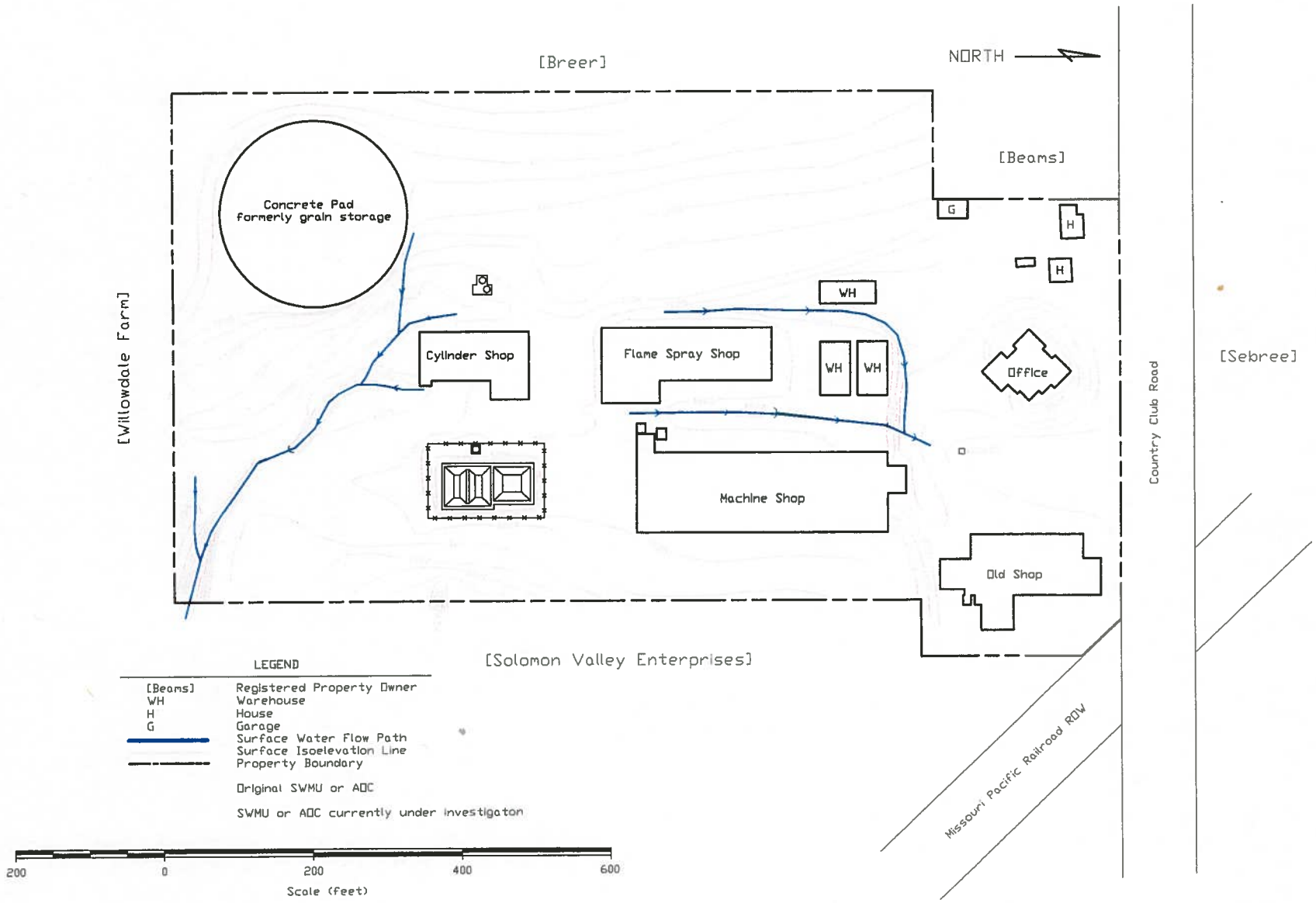


Plate 2.1: Facility Layout Map

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
Project Number: 05-0101	Date: April 2005	Drawn by: Jack Eslick

3) AOC-1: Concrete Culvert Excavation Area.

4) AOC-2: Brown Soil Stain Area.

In addition, the RFI Work Plan, which was prepared in July of 1992, addressed the investigation of surface water run-off pathways.

The sampling program outlined in the RFI Work Plan was conducted in October of 1992. An RFI Report was subsequently submitted to the EPA in December of 1993.

3. Sampling Program.

3.1. Soil Sampling.

Soil sampling was conducted at the Exline facility on November 22, 2005, from May 22 through May 25, 2006, and June 1, 2006 (one sample that was inadvertently omitted from the May, 2006 sampling event).

Soil sampling was conducted in accordance with specifications set forth in the aforementioned Work Plan and SAP/QAPP. All soil samples were collected by Enviro Tech Services, Inc. personnel. Field notes for the soil sampling effort are included as Attachment A. These notes include:

- Field log book hand-written notes.
- Geologic Log Form (both hand-written and typed).
- Field Soil pH and ORP Measurements Form.

It should also be noted that Exline, Inc. installed a gravel road on the south side of the Cylinder Shop within a portion of the Chrome Plating Ventilation system SWMU prior to the sampling effort. As indicated in pre-sampling correspondence with the EPA, it was Exline's intent to survey the affected area where samples were to be collected and use that information to determine sampling depths in the affected area. However, the decision was made in the field that it would be more accurate to collect samples at the appropriate depths based on visual inspection of the samples.

At three locations (CS-ES-11, CS-ES-16, and CS-ES-17) where soil sampling was conducted, the elevation of the land surface had been altered after the elevation survey was conducted. The sample depths in the approved Work Plan referenced the soil sample collection depths based on the original surface elevations; therefore, the sample collection depths were adjusted to compensate for the elevation changes. The elevations of the sample locations were measured but did not prove useful in determining the original land surface because the degree of elevation change was not large compared to the mapped contour intervals.

The site geologist (Jack Eslick with Enviro Tech Services, Inc.) visually inspected the soil cores from the sample locations where the surface elevations had been modified. At location CS-ES-11, 0.4 feet of new concrete and 0.5 feet of gravel were present above the original land surface. At location CS-ES-16, 0.8 feet of gravel were present above the original land surface. At location CS-ES-17, 0.6 feet of gravel were present above the original land surface. At the referenced locations, the original ground surface appeared to be at the soil/gravel interface. As discussed above, these determinations were made by the site geologist.

3.2. Surface Water Run-off Sampling.

A surface water run-off sample was collected on April 28, 2006 from the ditch, which collects stormwater run-off from the chrome plating ventilation discharge area. The surface water run-off sample was collected in accordance with the approved Work Plan, with the following exceptions.

An ISCO 3700 wastewater sampler was set up at the site on April 26, 2006. The sampler was interfaced with an ISCO Model 1640 liquid level actuator, which was located in the ditch. The sampler was programmed to start a time-proportional sampling sequence when the actuator became wet. The sampler was programmed to collect 130 ml of sample volume every 5 minutes for 6 hours.

Following installation, the sampler and actuator were tested by pouring water over the actuator. This preliminary test was successful as the actuator started the sampling sequence.

On the morning of April 28, a precipitation event started at the Exline site. And, although the actuator was clearly immersed in water, the sampling sequence had not started. Therefore, on April 28, 2006 at 12:38 PM, the sampling sequence was started manually. A composite sample was subsequently collected at 7:30 PM on April 28.

Although not specified in the Work Plan, a grab sample was also collected from the ditch and submitted to the lab for total and hexavalent chromium analysis. The grab sample was collected (immediately following collection of the composite sample) in order to compare the composite sample concentrations with the concentrations in the stormwater after run-off had occurred for several hours.

Also, both the composite and grab samples were analyzed by the laboratory for hardness. This parameter was included in order to determine the surface water quality standard for trivalent chromium, which is hardness dependent.

The total amount of rainfall that was received during the sampling event was approximately 1 inch.

4. Chemical Analysis Results.

Before presenting the 2005 and 2006 RFI sampling results, it is appropriate to summarize the 1992 RFI sampling data results. These data are summarized in Table IV-1 and on the following maps:

Plate IV-1: Soil Analysis Results – Concrete Culvert Area
Plate IV-2: Soil Analysis Results – Brown Soil Stain Area
Plate IV-3: Soil Analysis Results – DI Regeneration Discharge Area
Plate IV-4: Soil Analysis Results – Chrome Plating Ventilation Stacks
Plate IV-5: Soil and Water Analysis Results – Surface Water Runoff Area

The table and maps were previously included in the December, 1993 "Solid Waste Management Unit RCRA Facility Investigation Final Report".

In addition to the table and maps, a copy of the laboratory report for the 1992 sampling effort is included as Attachment E.

4.1. Soil.

Chemical analysis results for the areas that were sampled are presented in five (5) tables (Tables 4.1 through 4.5) and maps (Plates 4.1 through 4.5). Results for each SWMU are presented in a separate table and map. All analyses were completed by Continental Analytical Services Laboratory, Salina, Kansas. Copies of laboratory reports are included as Attachment B.

It should also be noted that the data included in Tables 4.1 through 4.5 were qualified using the following notations (source: EPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review – 2004).

U: The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J: The associated numerical value is the approximate concentration of the analyte in the sample. The result is an estimated quantity.

J+: The result is an estimated quantity, but the result may be biased high.

J-: The result is an estimated quantity, but the result may be biased low.

R: The sample results are rejected due to serious deficiencies in meeting quality control criteria. The data are unusable. The analyte may or may not be present in the sample.

UJ: The reported quantitation limit is approximate and may be inaccurate or imprecise. The analyte was analyzed for, but was not detected.

TABLE IV-1: RFI SAMPLING SUMMARY
EXLINE, INC., SALINA, KANSAS
Analyses performed by Continental Analytical Services, Salina, Kansas.
Sampling performed by Plains Environmental Services, Salina, Kansas.
Table prepared by Max Shepard, P.E., Kejr Science Group, Salina, Kansas, on November 10, 1992.

Sample I.D.	Time	Date	Sample Depth	Sample Location	Sample Description	Total Cr (mg/kg)	Hex Cr (mg/kg)	Total Arsenic (mg/kg)	Total Lead (mg/kg)	VOCs (ug/kg)	pH
EXSW 1010	9:12	10/9/92	0 to 2 feet	Concrete Culvert Area	red to brown clay and sand	68	ND (50)	NA	NA	NA	NA
EXSW 1020	9:12	10/9/92	0 to 2 feet	Duplicate of EXSW 1010	red to brown clay and sand	33	ND (50)	NA	NA	NA	NA
EXSW 1030	9:24	10/9/92	0 to 2 feet	Concrete Culvert Area	red to brown clay and sand	30	ND (50)	NA	NA	NA	NA
EXSW 1040	9:39	10/9/92	0 to 2 feet	Concrete Culvert Area	red to brown sandy clay	86	ND (50)	NA	NA	NA	NA
EXSW 1052	9:53	10/9/92	2'-8" to 4'-8"	Concrete Culvert Area	red to brown sandy clay	40	ND (50)	NA	NA	NA	NA
EXSW 1062	10:45	10/9/92	2'-8" to 4'-8"	Concrete Culvert Area	medium to dark brown clay	56	ND (50)	NA	NA	NA	NA
EXSW 1072	10:07	10/9/92	2'-8" to 4'-8"	Concrete Culvert Area	medium to dark brown clay	160	ND (50)	NA	NA	NA	NA
EXSW 1082	10:18	10/9/92	2'-8" to 4'-8"	Concrete Culvert Area	dark brown topsoil	63	ND (50)	NA	NA	NA	NA
EXSW 1092	10:26	10/9/92	2'-8" to 4'-8"	Concrete Culvert Area	brown to tan soil	39	ND (50)	NA	NA	NA	NA
EXSW 1102	10:38	10/9/92	2'-8" to 4'-8"	Concrete Culvert Area	medium brown clay	90	ND (50)	NA	NA	NA	NA
EXSW 1112	10:45	10/9/92	2'-8" to 4'-8"	Duplicate of EXSW 1062	medium to dark brown clay	76	ND (50)	NA	NA	NA	NA
EXSW 2000	11:05	10/8/92	0 to 2 feet	Brown Soil Stain	brown (composite)	320	ND (50)	18	300	NA	NA
EXSW 2010	9:45	10/8/92	0 to 2 feet	Brown Soil Stain	dark soil	580	ND (50)	24	110	**	NA
EXSW 2020	10:00	10/8/92	0 to 2 feet	Brown Soil Stain	soil with clay and gravel	410	ND (50)	24	100	NA	NA
EXSW 2030	10:28	10/8/92	0 to 2 feet	Brown Soil Stain	dark soil with sand	160	ND (50)	8	69	NA	NA
EXSW 2040	10:36	10/8/92	0 to 2 feet	Brown Soil Stain	dark brown soil	600	ND (50)	38	300	NA	NA
EXSW 2050	10:48	10/8/92	0 to 2 feet	Brown Soil Stain	dark brown soil	320	ND (50)	13	26	NA	NA
EXSW 2060	11:02	10/8/92	0 to 2 feet	Brown Soil Stain	dark brown soil with sand	210	ND (50)	8	170	NA	NA
EXSW 3010	14:11	10/9/92	0 to 1 foot	D. I. Regeneration Discharge	rock with brown soil	210	ND (50)	NA	NA	NA	8.9
EXSW 3020	14:21	10/9/92	0 to 1 foot	D. I. Regeneration Discharge	rock with brown soil	580	ND (50)	NA	NA	NA	NA
EXSW 3030	14:31	10/9/92	0 to 1 foot	D. I. Regeneration Discharge	tan gravel	1300	ND (50)	NA	NA	NA	8.8
EXSW 3040	14:47	10/9/92	0 to 1 foot	D. I. Regeneration Discharge	brown soil with gravel	200	ND (50)	NA	NA	NA	NA
EXSW 4010	11:24	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil	2600	ND (50)	NA	NA	NA	NA
EXSW 4015	11:30	10/9/92	3 to 5 feet	Plating Bath Ventilation	red to brown sandy clay	65	51	NA	NA	NA	NA
EXSW 4020	11:34	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil	660	ND (50)	NA	NA	NA	NA
EXSW 4025	11:40	10/9/92	3 to 5 feet	Plating Bath Ventilation	brown to tan sandy clay	52	ND (50)	NA	NA	NA	NA
EXSW 4030	11:52	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil	410	ND (50)	NA	NA	NA	NA
EXSW 4035	11:58	10/9/92	3 to 5 feet	Plating Bath Ventilation	tan to brown clay	16	ND (50)	NA	NA	NA	NA
EXSW 4040	11:58	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil	590	ND (50)	NA	NA	NA	NA
EXSW 4045	12:06	10/9/92	3 to 5 feet	Plating Bath Ventilation	tan to brown clay	51	ND (50)	NA	NA	NA	NA
EXSW 4050	12:17	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil	730	ND (50)	NA	NA	NA	NA
EXSW 4055	12:25	10/9/92	3 to 5 feet	Plating Bath Ventilation	tan sandy clay	190	68	NA	NA	NA	NA
EXSW 4065	12:25	10/9/92	3 to 5 feet	Duplicate of EXSW 4055	tan sandy clay	180	110	NA	NA	NA	NA
EXSW 4070	10:55	10/12/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown sandy topsoil	420	57	NA	NA	NA	NA
EXSW 4075	11:22	10/12/92	3 to 5 feet	Plating Bath Ventilation	brown sandy topsoil	3400	4300	NA	NA	NA	NA
EXSW 4080	10:55	10/12/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil	630	ND (50)	NA	NA	NA	NA
EXSW 4085	11:12	10/12/92	3 to 5 feet	Plating Bath Ventilation	light brown sandy topsoil	440	61	NA	NA	NA	NA
EXSW 4090	11:31	10/12/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil	500	ND (50)	NA	NA	NA	NA
EXSW 4095	11:43	10/12/92	3 to 5 feet	Plating Bath Ventilation	light brown sandy soil	180	95	NA	NA	NA	NA
EXSW 4100	15:10	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	topsoil with roots	380	ND (50)	NA	NA	NA	NA
EXSW 4105	11:53	10/12/92	3 to 5 feet	Plating Bath Ventilation	light brown sandy soil	21	ND (50)	NA	NA	NA	NA
EXSW 4110	15:08	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	gravel and topsoil	130	ND (50)	NA	NA	NA	NA
EXSW 4115	12:05	10/12/92	3 to 5 feet	Plating Bath Ventilation	light brown clay	16	ND (50)	NA	NA	NA	NA
EXSW 4120	15:17	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil	8900	53	NA	NA	NA	NA
EXSW 4125	12:35	10/12/92	3 to 5 feet	Plating Bath Ventilation	medium brown topsoil	38	ND (50)	NA	NA	NA	NA
EXSW 4130	15:13	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	dark brown topsoil and rock	3600	ND (50)	NA	NA	NA	NA
EXSW 4135	12:18	10/12/92	3 to 5 feet	Plating Bath Ventilation	light brown clay	24	ND (50)	NA	NA	NA	NA
EXSW 4140	15:19	10/9/92	Surface (0 to 1 inch)	Plating Bath Ventilation	brown topsoil with roots	3900	ND (50)	NA	NA	NA	NA
EXSW 4145	12:26	10/12/92	3 to 5 feet	Plating Bath Ventilation	light brown clay	20	ND (50)	NA	NA	NA	NA
EXSW 4155	11:43	10/12/92	3 to 5 feet	Duplicate of EXSW 4095	light brown sandy soil	250	ND (50)	NA	NA	NA	NA
EXSW 4165	12:35	10/12/92	3 to 5 feet	Duplicate of EXSW 4125	medium brown topsoil	36	ND (50)	NA	NA	NA	NA

TABLE IV-1 (continued)

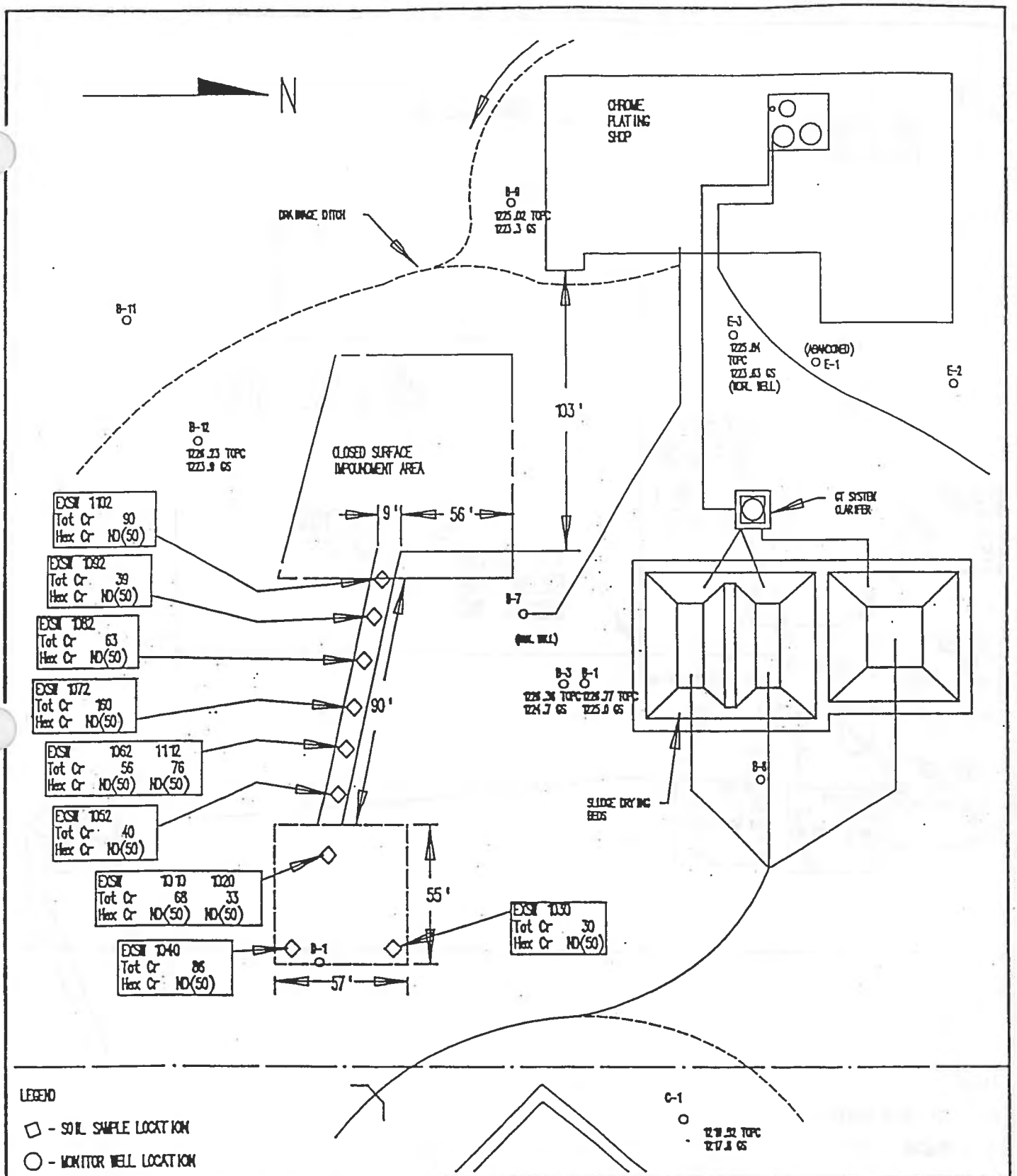
Sample I.D.	Time	Date	Sample Depth	Sample Location	Sample Description	Total Cr (mg/kg)	Hex Cr (mg/kg)	Total Arsenic (mg/kg)	Total Lead (mg/kg)	VOCs (ug/kg)	pH
EXSW 5010	12:49	10/12/92	0 to 6 inches	Surface Water Pathways (Soil)	dark brown topsoil	570	ND (50)	NA	NA	NA	NA
EXSW 5012	12:57	10/12/92	2 to 4 feet	Surface Water Pathways (Soil)	dark brown clay	58	ND (50)	NA	NA	NA	NA
EXSW 5020	13:03	10/12/92	0 to 6 inches	Surface Water Pathways (Soil)	dark brown topsoil	250	ND (50)	NA	NA	NA	NA
EXSW 5022	13:09	10/12/92	2 to 4 feet	Surface Water Pathways (Soil)	red to brown sandy clay	71	ND (50)	NA	NA	NA	NA
EXSW 5030	13:23	10/12/92	0 to 6 inches	Surface Water Pathways (Soil)	dark brown topsoil	1000	ND (50)	NA	NA	NA	NA
EXSW 5032	13:33	10/12/92	2 to 4 feet	Surface Water Pathways (Soil)	reddish brown sandy clay	34	ND (50)	NA	NA	NA	NA
EXSW 5040	13:39	10/12/92	0 to 6 inches	Surface Water Pathways (Soil)	dark brown topsoil	500	ND (50)	NA	NA	NA	NA
EXSW 5042	13:46	10/12/92	2 to 4 feet	Surface Water Pathways (Soil)	red to brown sandy clay	83	ND (50)	NA	NA	NA	NA
EXSW 5050	14:02	10/12/92	0 to 6 inches	Surface Water Pathways (Soil)	dark brown topsoil	800	ND (50)	NA	NA	NA	NA
EXSW 5052	14:07	10/12/92	2 to 4 feet	Surface Water Pathways (Soil)	medium brown clay	15	ND (50)	NA	NA	NA	NA
EXSW 5062	13:33	10/12/92	2 to 4 feet	Duplicate of EXSW 5032	reddish brown sandy clay	36	ND (50)	NA	NA	NA	NA
EXSW 6010	18:30	10/7/92	Surface (0 to 1 inch)	Surface Water Pathways (Water)		0.04 mg/L	ND (0.05) mg/L	NA	NA	NA	NA
EXSW 6010	18:30	10/7/92	Surface (0 to 1 inch)	Surface Water Pathways (Water)		ND (0.01) mg/L*	ND (0.05) mg/L*	NA	NA	NA	NA
EXSW 6020	18:40	10/7/92	Surface (0 to 1 inch)	Surface Water Pathways (Water)		0.05 mg/L	0.10 mg/L	NA	NA	NA	NA
EXSW 6020	18:40	10/7/92	Surface (0 to 1 inch)	Surface Water Pathways (Water)		0.03 mg/L*	0.09 mg/L*	NA	NA	NA	NA
EXSW 6030	18:50	10/7/92	Surface (0 to 1 inch)	Surface Water Pathways (Water)		0.05 mg/L	0.07 mg/L	NA	NA	NA	NA
EXSW 6030	18:50	10/7/92	Surface (0 to 1 inch)	Surface Water Pathways (Water)		0.05 mg/L*	0.07 mg/L*	NA	NA	NA	NA
Rinsate Samples											
EXSW 7010	10:19	10/8/92	Brown Soil Stain			ND (0.01)	ND (0.05)	NA	NA	NA	NA
EXSW 7020	9:29	10/9/92	Concrete Culvert Area			ND (0.01)	ND (0.05)	NA	NA	NA	NA
EXSW 7030	12:12	10/9/92	Plating Bath Ventilation			ND (0.01)	ND (0.05)	NA	NA	NA	NA
EXSW 7040	14:37	10/9/92	D I Regeneration Discharge			ND (0.01)	ND (0.05)	NA	NA	NA	NA
EXSW 7050	13:19	10/12/92	Surface Water Pathways (Soil)			ND (0.01)	ND (0.05)	NA	NA	NA	NA

* - denotes that sample was filtered using a 0.45 micron filter prior to analysis therefore, concentrations shown represent soluble parameter results.

** - all parameters were non-detected with the exception of methylene chloride which was detected at a concentration of 6.7 ug/kg.

NA - sample not analyzed for this parameter.

ND() - analyte not detected with the detection limit in parenthesis.



LEGEND

- SOIL SAMPLE LOCATION
- MONITOR WELL LOCATION

Cr - CHROMIUM

ND - DENOTES NOT DETECTED WITH THE DETECTION LIMIT IN PARENTHESES

NOTE: ALL SAMPLES GIVEN IN mg/kg.

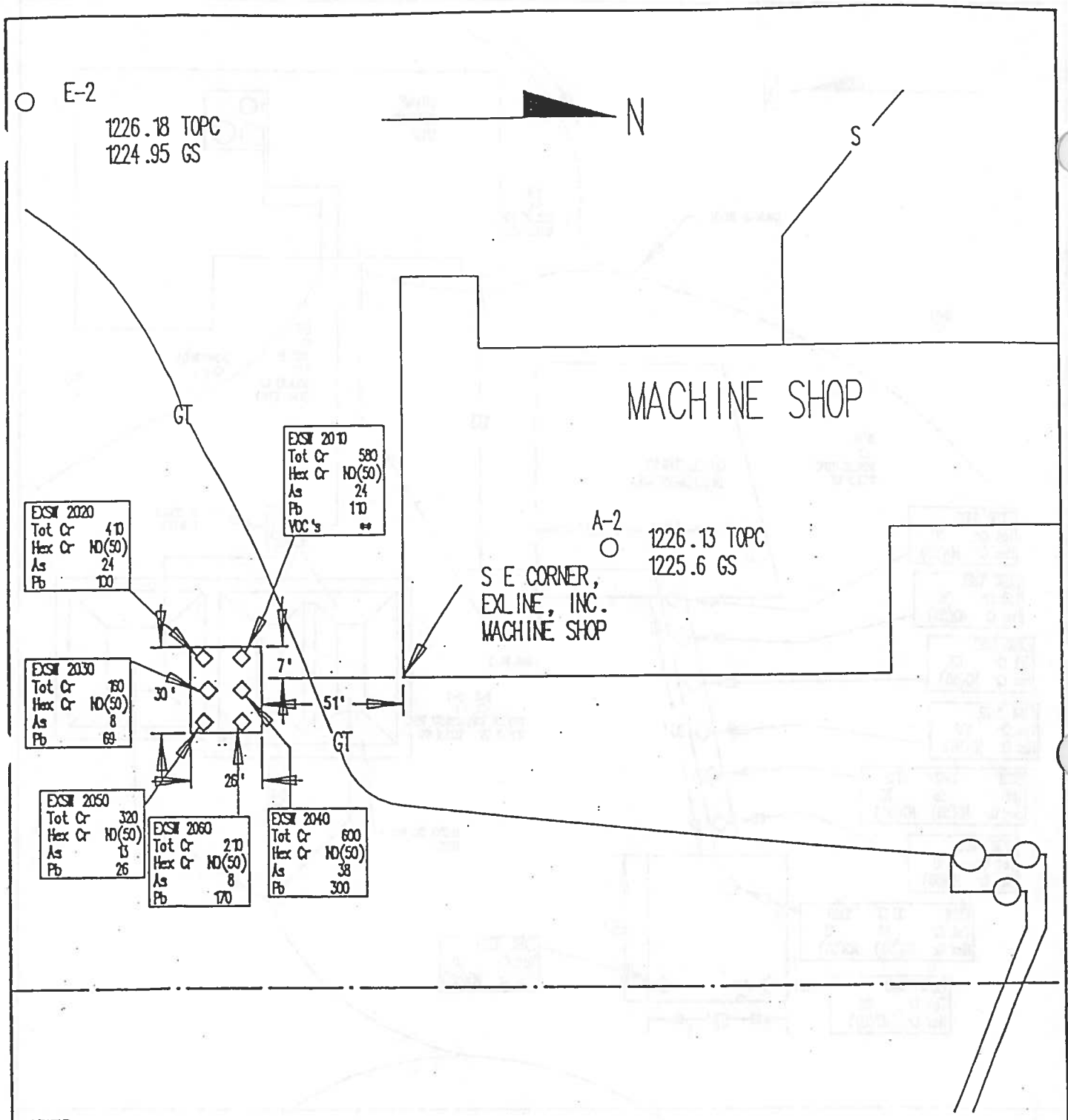
SOIL SAMPLE NUMBERS ENDING IN 0 WERE TAKEN AT 0 - 2'
SOIL SAMPLE NUMBERS ENDING IN 2 WERE TAKEN AT 2'-6" - 4'-6"

SAMPLE NUMBERS 1020 AND 1112 ARE DUPLICATES OF 1010 AND 1062 RESPECTIVELY

TITLE: PLATE IV-1: SOIL ANALYSIS RESULTS - CONCRETE CULVERT AREA.	SCALE: 1"=50'

KEJR SCIENCE GROUP, INC.

DRN LMS-DDM	FILE NO.: 91-010D	DATE: 12-92



LEGEND

◇ - SOIL SAMPLE LOCATION

Cr - CHROMIUM

As - ARSENIC

Pb - LEAD

ND - DENOTES NOT DETECTED WITH THE DETECTION LIMIT IN PARENTHESES

** - ALL PARAMERERS WERE NON-DETECTED WITH THE EXCEPTION OF METHYLENE CHLORIDE WHICH WAS MEASURED AT A CONCENTRATION OF 6.7 ug/kg.

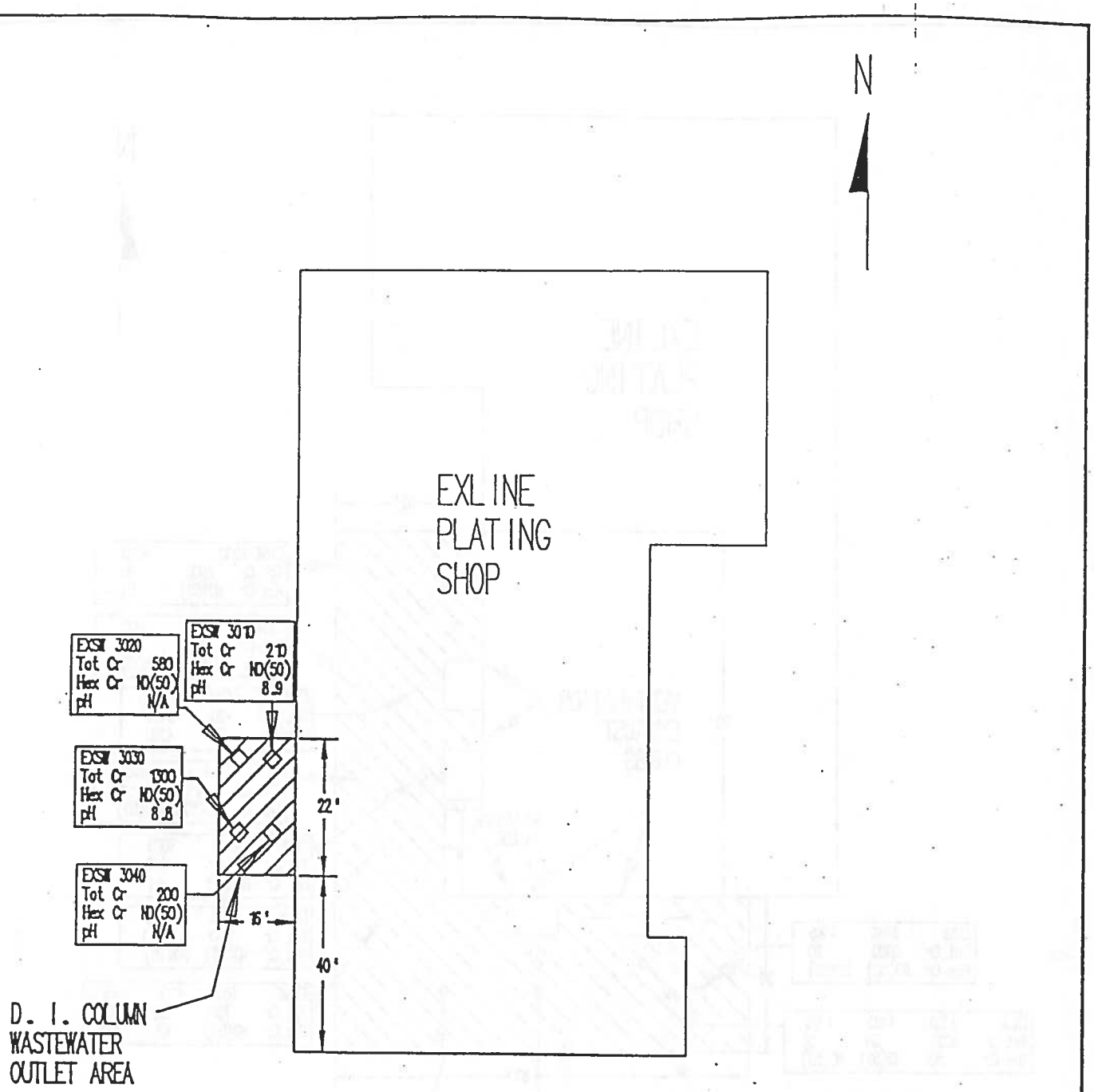
NOTE: ALL RESULTS ARE GIVEN IN mg/kg.

SOIL SAMPLES TAKEN AT 0 - 2'

TITLE: PLATE IV-2: SOIL ANALYSIS RESULTS - BROWN SOIL STAIN AREA	SCALE: 1"=50'

KEJR SCIENCE GROUP, INC.

DRN LMS - DOM	FILE NO.: 92-0101	DATE: DEC., 1992



LEGEND

◇ - SOIL SAMPLE LOCATION

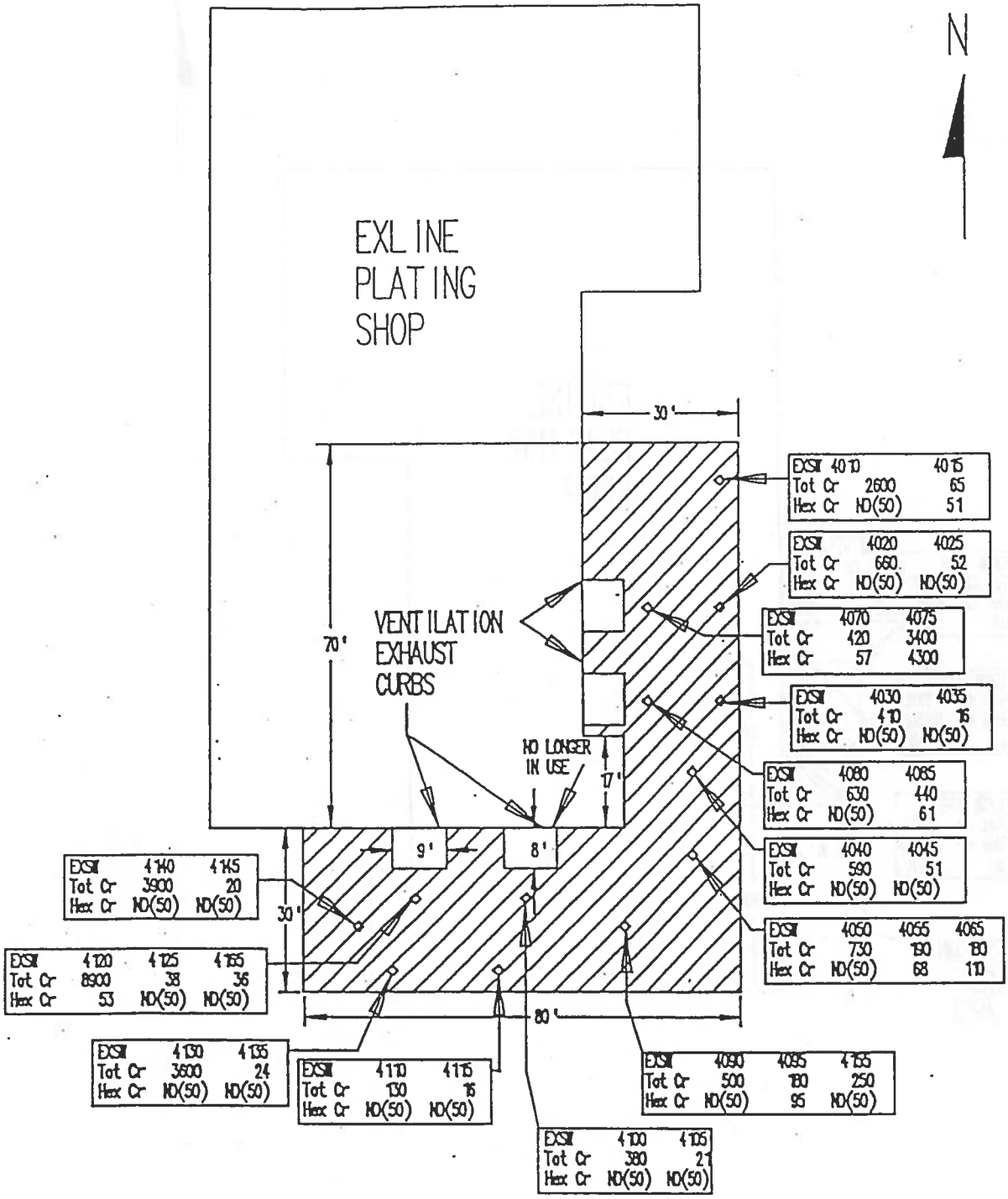
Cr - CHROMIUM

ND - DENOTES NOT DETECTED WITH THE DETECTION LIMIT IN PARENTHESES

NOTE: ALL RESULTS ARE GIVEN IN mg/kg EXCEPT pH WHICH IS IN STANDARD pH UNITS.

ALL SOIL SAMPLES WERE TAKEN AT 0 - 1'

TITLE: PLATE IV-3: SOIL ANALYSIS RESULTS - D. I. REGENERATION DISCHARGE AREA		SCALE: 1"=30'
KEJR SCIENCE GROUP, INC.		
DRN LMS - DDM	FILE NO.: 92-0101	DATE: DECEMBER, 1992



LEGEND

◇ - SOIL SAMPLE LOCATION

Cr - CHROMIUM

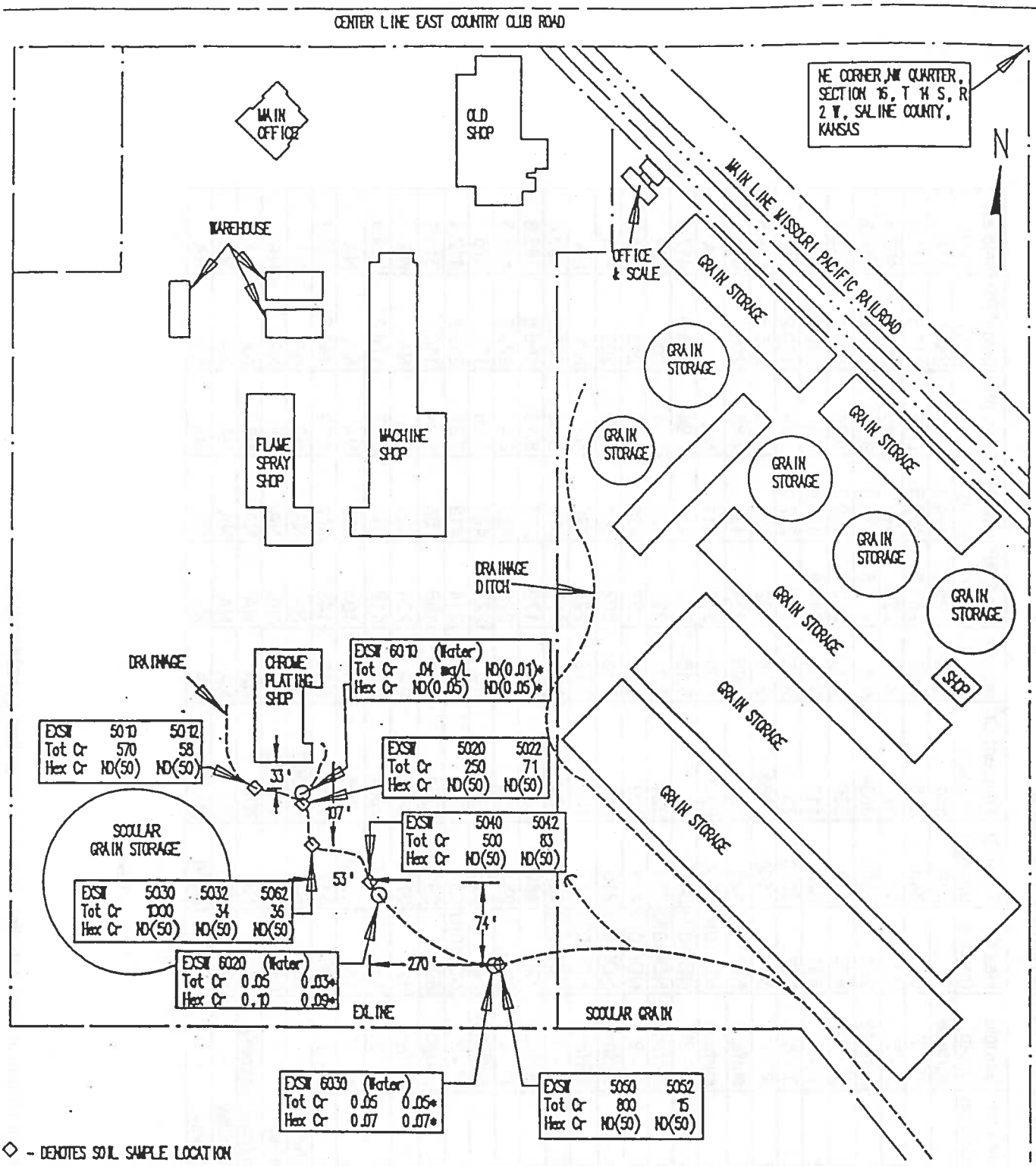
ND - DENOTES NOT DETECTED AT THE DETECTION LIMIT IN PARENTHESES

NOTE: ALL RESULTS ARE GIVEN IN mg/kg.

SOIL SAMPLE NUMBERS ENDING IN 0 WERE TAKEN AT 0 - 1'
SOIL SAMPLE NUMBERS ENDING IN 5 WERE TAKEN AT 3 - 5'

SAMPLE NUMBERS 4065, 4155 AND 4165 ARE DUPLICATES OF EXSM 4055, 4095 AND 4125 RESPECTIVELY

TITLE: PLATE IV-4: SOIL ANALYSIS RESULTS - CHROME PLATING VENTILATION STACKS		SCALE: 1"=30'
KEJR SCIENCE GROUP, INC.		
DRN LMS - DOM	FILE NO.: 92-0101	DATE: DECEMBER, 1992



◇ - DENOTES SOIL SAMPLE LOCATION

○ - DENOTES SURFACE WATER RUN-OFF SAMPLE LOCATION

Cr - CHROMIUM

ND - DENOTES NOT DETECTED WITH THE DETECTION LIMIT IN PARENTHESES

* - DENOTES THAT SAMPLE WAS FILTERED PRIOR TO ANALYSIS.

NOTE: ALL RESULTS ARE GIVEN IN mg/kg EXCEPT WATER SAMPLES WHICH ARE IN mg/L.

SOIL SAMPLE NUMBERS ENDING IN 0 WERE TAKEN AT 0 - 6"
SOIL SAMPLE NUMBERS ENDING IN 2 WERE TAKEN AT 2 - 4'

SAMPLE NUMBER EXSW 5062 IS A DUPLICATE OF EXSW 5032

TITLE: PLATE IV - 5: SOIL AND WATER ANALYSIS RESULTS - SURFACE WATER RUNOFF AREA	SCALE: 1"=200'

KEJR SCIENCE GROUP, INC.

DRN LMS - DOM	FILE NO.: 92-0101	DATE: DECEMBER, 1992

TABLE 4.1: RFI SOIL SAMPLING RESULTS - EXLINE, INC., SALINA, KANSAS
CHROME PLATING BATH VENTILATION DISCHARGE AREA

Sample Date	Sample ID	Sample Location	Sample Depth	Hex Cr (mg/kg)	Total Cr (mg/kg)	Trivalent Cr[6] (mg/kg)	lab pH (S.U.)	lab ORP (mV)	lab eH (mV)	field pH (S.U.)	field ORP (mV)	field eH (mV)
11/22/2005	# 1 - Surface	1	surface	7	318	311	8.14	295.3	494.3	7.71	235.5	434.5
11/22/2005	# 1 - Intermediate	1	1" - 3'	8	343	335	8.68	251.5	450.5	8.45	212.3	411.3
11/22/2005	# 1 - Deep	1	3' - 5'	< 1	17	17	8.78	223	422	8.48	209.8	408.8
11/22/2005	# 2 - Surface	2	surface	246	3880	3634	9.6	174.5	373.5	9.49	167.2	366.2
11/22/2005	# 2 - Intermediate	2	1" - 3'	476	715	239	9.1	200.3	399.3	9.24	168.1	367.1
11/22/2005	# 3 - Intermediate[1]	2	1" - 3'	531	648	117	9.06	217.6	416.6	NA	NA	NA
11/22/2005	# 2 - Deep	2	3' - 5'	937	1010	73	9.06	198.3	397.3	9.18	170.2	369.2
5/24/2006	CS-ES-2-7	2	5' - 7'	34	1100	1066	9.38	192	391	9.13	205.5	404.5
5/23/2006	CS-ES-3-Surf	3	surface	ND(10)U	126	126	7.98	234	433	7.86	206	405
5/23/2006	CS-ES-B[2]	3	surface	ND(10)U	99.2	99.2	8.03	212	411	NA	NA	NA
5/24/2006	CS-ES-3-3	3	1" - 3'	ND(10)U	84	84	8.16	234	433	7.94	218.9	417.9
5/23/2006	CS-ES-4-Surf	4	surface	ND(10)U	324	324	7.9	221	420	7.71	202	401
5/24/2006	CS-ES-4-3	4	1" - 3'	ND(10)U	402	402	8.06	237	436	7.75	215.7	414.7
5/23/2006	CS-ES-5-Surf	5	surface	ND(10)U	215	215	8.18	202	401	7.92	202	401
5/23/2006	CS-ES-C[3]	5	surface	ND(10)U	184	184	7.98	221	420	NA	NA	NA
5/24/2006	CS-ES-5-3	5	1" - 3'	ND(10)U	23.6	23.6	8.2	169	368	8.03	201.8	400.8
5/23/2006	CS-ES-6-Surf	6	surface	12J-	480	468	8.16	178	377	8.13	186.5	385.5
5/24/2006	CS-ES-6-3	6	1" - 3'	22J-	254	232	8.57	229	428	8.4	220.3	419.3
5/23/2006	CS-ES-7-Surf	7	surface	33	849	816	8.2	222	421	8.16	177	376
5/24/2006	CS-ES-7-3	7	1" - 3'	ND(10)U	337	337	8.1	214	413	7.81	213.4	412.4
5/23/2006	CS-ES-8-Surf	8	surface	89	2810	2721	9.33	166	365	9.24	116.1	315.1
5/23/2006	CS-ES-D[4]	8	surface	121	2770	2649	9.2	224	423	NA	NA	NA
5/24/2006	CS-ES-8-3	8	1" - 3'	126	2630	2504	8.99	118	317	8.67	170.8	369.8
5/24/2006	CS-ES-G[5]	8	1" - 3'	145	1250	1105	7.92	194	393	NA	NA	NA
5/24/2006	CS-ES-8-5	8	3' - 5'	199	317	118	8.18	143	342	7.79	190.3	389.3
EPA Region IX PRG residential soil pathway				30	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG industrial soil pathway				64	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG migration to groundwater pathway				38	NA	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK residential soil pathway				NA	390	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK industrial soil pathway				NA	4000	NA	NA	NA	NA	NA	NA	NA

[1] - duplicate of # 2 - Intermediate
[2] - duplicate of CS-ES-3-Surf.
[3] - duplicate of CS-ES-5-Surf.
[4] - duplicate of CS-ES-8-Surf.
[5] - duplicate of CS-ES-8-3.
[6] - calculated by subtracting hexavalent chromium concentration from total chromium concentration.

TABLE 4.1: (continued)

Sample Date	Sample ID	Sample Location	Sample Depth	Hex Cr (mg/kg)	Total Cr (mg/kg)	Trivalent Cr[6] (mg/kg)	lab pH (S.U.)	lab ORP (mV)	lab eH (mV)	field pH (S.U.)	field ORP (mV)	field eH (mV)
5/23/2006	CS-ES-9-Surf	9	surface	45	1410	1365	8.39	172	371	8.23	178	377
5/24/2006	CS-ES-9-3	9	1" - 3'	ND(10)U	753	753	8.23	173	372	7.99	218.6	417.6
5/23/2006	CS-ES-10-Surf	10	surface	18	181	163	7.76	176	375	7.8	163.3	362.3
5/24/2006	CS-ES-10-3	10	1" - 3'	17	253	236	8.03	188	387	7.79	211.8	410.8
5/24/2006	CS-ES-10-5	10	3' - 5'	22	231	209	8.16	184	383	8.02	226.5	425.5
5/24/2006	CS-ES-11-Surf	11	surface	ND(10)U	24.8	24.8	10.14	184	383	10.54	165.9	364.9
5/24/2006	CS-ES-11-3	11	1" - 3'	31	305	274	8.64	217	416	8.75	199.8	398.8
5/24/2006	CS-ES-11-5	11	3' - 5'	ND(10)U	55.7	55.7	8.5	184	383	8.78	221.5	420.5
5/24/2006	CS-ES-12-Surf	12	surface	ND(10)U	16.8	16.8	8.27	271	470	7.92	222.8	421.8
5/24/2006	CS-ES-12-3	12	1" - 3'	29	292	263	8.11	142	341	7.76	228.3	427.3
5/24/2006	CS-ES-12-5	12	3' - 5'	ND(10)U	30.1	30.1	8.18	236	435	7.92	214.4	413.4
5/24/2006	CS-ES-13-Surf	13	surface	ND(10)U	75.1	75.1	7.72	174	373	7.88	192.6	391.6
5/24/2006	CS-ES-13-3	13	1" - 3'	ND(10)U	49.4	49.4	6.11	233	432	6.9	232.5	431.5
5/24/2006	CS-ES-14-Surf	14	surface	ND(10)U	68.8	68.8	8.08	179	378	8.06	200.5	399.5
5/24/2006	CS-ES-14-3	14	1" - 3'	35	179	144	7.87	180	379	7.42	214.8	413.8
5/23/2006	CS-ES-15-Surf	15	surface	ND(10)U	275	275	8.17	216	415	7.97	195	394
5/24/2006	CS-ES-15-3	15	1" - 3'	75J-	1990	1915	7.61	179	378	6.94	230.7	429.7
5/24/2006	CS-ES-16-Surf	16	surface	38	611	573	7.85	185	384	7.42	228.6	427.6
5/24/2006	CS-ES-16-3	16	1" - 3'	ND(10)U	45.9	45.9	7.93	164	363	7.71	247.5	446.5
5/24/2006	CS-ES-17-Surf	17	surface	38	1310	1272	7.75	182	381	7.57	241.3	440.3
5/24/2006	CS-ES-17-3	17	1" - 3'	33	338	305	7.82	169	368	7.72	211.7	410.7
5/24/2006	CS-ES-F[7]	17	1" - 3'	51	699	648	7.76	203	402	NA	NA	NA
5/24/2006	CS-ES-18-Surf	18	surface	16	158	142	7.74	184	383	7.48	226.4	425.4
5/24/2006	CS-ES-18-3	18	1" - 3'	ND(10)U	90.4	90.4	7.53	172	371	7.54	224.8	423.8
5/24/2006	CS-ES-E[8]	18	1" - 3'	ND(10)U	89.6J	89.6	7.8	275	474	NA	NA	NA
5/23/2006	CS-ES-19-Surf	19	surface	143	4470	4327	7.61	243	442	7.74	190	389
5/24/2006	CS-ES-19-3	19	1" - 3'	23	539	516	7.74	193	392	7.42	206.3	405.3
EPA Region IX PRG residential soil pathway				30	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG industrial soil pathway				64	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG migration to groundwater pathway				38	NA	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK residential soil pathway				NA	390	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK industrial soil pathway				NA	4000	NA	NA	NA	NA	NA	NA	NA

[6] - calculated by subtracting hexavalent chromium concentration from trivalent chromium concentration.

[7] - duplicate of CS-ES-17-3.

[8] - duplicate of CS-ES-18-3.

TABLE 4.2: RFI SOIL SAMPLING RESULTS - EXLINE, INC., SALINA, KANSAS
DEIONIZER COLUMN DISCHARGE AREA

Sample Date	Sample ID	Sample Location	Sample Depth	Hex Cr (mg/kg)	Total Cr (mg/kg)	Trivalent Cr[1] (mg/kg)	lab pH (S.U.)	lab ORP (mV)	lab eH (mV)	field pH (S.U.)	field ORP (mV)	field eH (mV)
5/23/2006	CW-1-Surf	1	surface	38	1270	1232	8.44	190	389	8.41	202	401
5/23/2006	CW-2-Surf	2	surface	ND(10)U	74.8	74.8	8.4	204	403	8.27	203	402
5/23/2006	CW-3-Surf	3	surface	ND(10)U	106	106	9.1	222	421	9.07	186	385
5/23/2006	CW-4-Surf	4	surface	54	1430	1376	9.13	205	404	9.03	172	371
5/23/2006	CW-1-3	1	1" - 3'	ND(10)U	39	39	7.9	266	465	7.96	211	410
5/23/2006	CW-2-3	2	1" - 3'	ND(10)U	18.9	18.9	8.08	241	440	7.87	200	399
5/23/2006	CW-3-3	3	1" - 3'	12	116	104	8.76	233	432	8.64	169	368
5/23/2006	CW-4-3	4	1" - 3'	ND(10)U	25.6	25.6	8.09	235	434	7.9	185	384
EPA Region IX PRG residential soil pathway				30	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG industrial soil pathway				64	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG migration to groundwater pathway				38	NA	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK residential soil pathway				NA	390	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK industrial soil pathway				NA	4000	NA	NA	NA	NA	NA	NA	NA

[1] - calculated by subtracting hexavalent chromium concentration from total chromium concentration.

TABLE 4.3: RFI SOIL SAMPLING RESULTS - EXLINE, INC., SALINA, KANSAS
BROWN SOIL STAIN AREA

Sample Date	Sample ID	Sample Location	Sample Depth	Hex Cr (mg/kg)	Total Cr (mg/kg)	Trivalent Cr[4] (mg/kg)	Total Lead (mg/kg)	Total Arsenic (mg/kg)	lab pH (S.U.)	lab ORP (mV)	lab eH (mV)	field pH (S.U.)	field ORP (mV)	field eH (mV)	PCE (mg/kg)
5/22/2006	MS-1-Surf[1]	1	surface	ND(10)U	46.2	46.2	59.1	13.5	8.14	222	421	7.96	211	410	< 0.005
5/22/2006	MS-1-2[2]	1	1" - 2'	ND(10)U	23.4J	23.4J	15.3J	7.4J	7.97	224	423	7.63	238	437	< 0.0056
5/23/2006	MS-2-Surf	2	surface	ND(10)UJ	2180	2180	2720	48.8	8.29	226	425	8.00	162.6	361.6	NA
5/23/2006	MS-2-2	2	1" - 2'	ND(10)U	915	915	485	34.4	7.29	158	357	6.71	174	373	NA
5/23/2006	MS-A[3]	2	1" - 2'	ND(10)U	1050	1050	403	55.6J	7.19	130	329	NA	NA	NA	NA
5/23/2006	MS-3-Surf	3	surface	ND(10)U	24.5	24.5	25.2	11.5	9.61	206	405	9.63	209	408	NA
5/23/2006	MS-3-2	3	1" - 2'	ND(10)U	16.9	16.9	9.7	4.9	8.2	250	449	8.09	216	415	NA
EPA Region IX PRG residential soil pathway				30	NA	100000	400	0.39	NA	NA	NA	NA	NA	NA	0.48
EPA Region IX PRG industrial soil pathway				64	NA	100000	800	1.6	NA	NA	NA	NA	NA	NA	1.3
EPA Region IX PRG migration to groundwater path				38	NA	NA	NA	29	NA	NA	NA	NA	NA	NA	0.06
KDHE Tier 2 RSK residential soil pathway				NA	390	NA	400	11	NA	NA	NA	NA	NA	NA	79
KDHE Tier 2 RSK industrial soil pathway				NA	4000	NA	1000	38	NA	NA	NA	NA	NA	NA	140
KDHE Tier 2 RSK migration to groundwater pathwa				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.18

[1] - Sample was also analyzed for 8260B VOCs by GC. All results were less than 0.005 mg/kg except for m&p xylenes, which were less than 0.010 mg/kg.
[2] - Sample was also analyzed for 8260B VOCs by GC. All results were less than 0.005 mg/kg except for m&p xylenes, which were less than 0.010 mg/kg, and tetrachloroethylene, which was measured at a concentration of 0.0056 mg/kg, as noted in the table.
[3] - duplicate of MS-2-2.
[4] - calculated by subtracting hexavalent chromium concentration from total chromium concentration.

TABLE 4.4: RFI SOIL SAMPLING RESULTS - EXLINE, INC., SALINA, KANSAS
SURFACE WATER RUN-OFF AREA SOIL SAMPLES

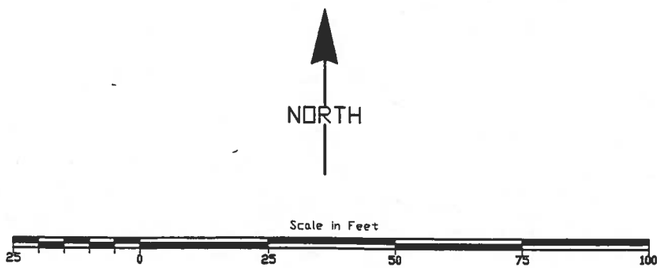
Sample Date	Sample ID	Sample Location	Sample Depth	Hex Cr (mg/kg)	Total Cr (mg/kg)	Trivalent Cr[2] (mg/kg)	lab pH (S.U.)	lab ORP (mV)	lab eH (mV)	field pH (S.U.)	field ORP (mV)	field eH (mV)
5/25/2006	DA-1-Surf	1	surface	ND(10)U	36.3	36.3	7.69	177	376	7.76	242.5	441.5
5/25/2006	DA-1-3	1	1" - 3'	ND(10)U	14.5	14.5	7.53	170	369	7.17	271.8	470.8
5/25/2006	DA-H[1]	1	1" - 3'	ND(10)U	23.2	23.2	7.17	189	388	NA	NA	NA
5/25/2006	DA-2-Surf	2	surface	ND(10)U	41.5	41.5	7.78	170	369	7.74	189.8	388.8
5/25/2006	DA-2-3	2	1" - 3'	ND(10)U	15.4	15.4	6.9	181	380	6.93	270.6	469.6
5/25/2006	DA-3-Surf	3	surface	ND(10)UJ	173	173	7.65	169	368	7.54	211.7	410.7
5/25/2006	DA-3-3	3	1" - 3'	ND(10)U	57.7	57.7	7.79	159	358	7.6	236.5	435.5
5/25/2006	DA-4-Surf	4	surface	ND(10)U	316	316	7.68	237	436	7.52	200.6	399.6
5/25/2006	DA-4-3	4	1" - 3	ND(10)U	49.8	49.8	7.87	230	429	7.57	253.2	452.2
5/25/2006	DA-5-Surf	5	surface	11	416	405	7.63	199	398	7.56	242.1	441.1
5/25/2006	DA-5-3	5	1" - 3'	16	393	377	7.59	191	390	7.2	267.3	466.3
EPA Region IX PRG residential soil pathway				30	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG industrial soil pathway				64	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG migration to groundwater pathway				38	NA	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK residential soil pathway				NA	390	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK industrial soil pathway				NA	4000	NA	NA	NA	NA	NA	NA	NA

[1] - duplicate of DA-1-3.
[2] - calculated by subtracting hexavalent chromium concentration from total chromium concentration.

TABLE 4.5: RFI SOIL SAMPLING RESULTS - EXLINE, INC., SALINA, KANSAS
CONCRETE CULVERT AREA

Sample Date	Sample ID	Sample Location	Sample Depth	Hex Cr (mg/kg)	Total Cr (mg/kg)	Trivalent Cr[1] (mg/kg)	lab pH (S.U.)	lab ORP (mV)	lab eH (mV)	field pH (S.U.)	field ORP (mV)	field eH (mV)
5/22/2006	SI-1-4.7	1	2.7' - 4.7'	ND(10)U	18.6	18.6	7.71	245	444	7.32	234	433
5/22/2006	SI-2-4.7	2	2.7' - 4.7'	263	317	54	7.74	255	454	7.47	243	442
5/22/2006	SI-3-Surf	3	surface	ND(10)U	1460	1460	8.01	202	401	7.72	203	402
6/1/2006	SI-3-2	3	1" - 2'	ND(10)UJ	119	119	7.95	223	422	7.9	260.5	459.5
EPA Region IX PRG residential soil pathway				30	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG industrial soil pathway				64	NA	100000	NA	NA	NA	NA	NA	NA
EPA Region IX PRG migration to groundwater pathway				38	NA	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK residential soil pathway				NA	390	NA	NA	NA	NA	NA	NA	NA
KDHE Tier 2 RSK industrial soil pathway				NA	4000	NA	NA	NA	NA	NA	NA	NA

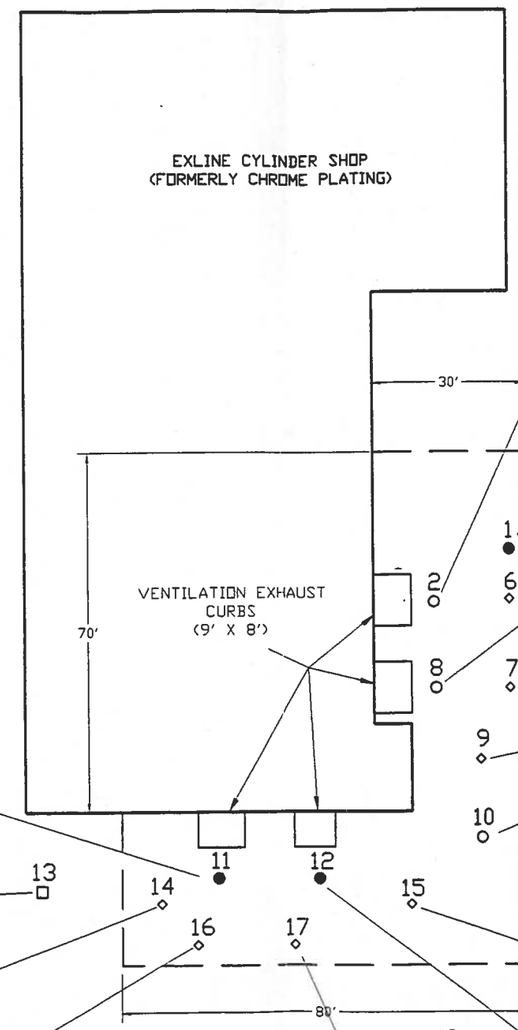
[1] - calculated by subtracting hexavalent chromium concentration from total chromium concentration.



Note: Concentration units are in milligrams per kilogram (mg/kg). ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.

Soil samples collected in May 2006, with the following exceptions (collected in November 2005):

1) All location #1 samples;
2) All location #2 samples - except for 5' to 7' depth.



Depth	Chromium, Hex	Chromium, Total
Surface	246	3880
1' to 3'	476	715
1' to 3' (dup)	531	648
3' to 5'	937	1010
5' to 7'	34	1100

Depth	Chromium, Hex	Chromium, Total
Surface	7	318
1' to 3'	8	343
3' to 5'	ND(1)	17

Depth	Chromium, Hex	Chromium, Total
Surface	12	480
1' to 3'	22	254

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	126
Surface (dup)	ND(10)	99.2
1' to 3'	ND(10)	84

Depth	Chromium, Hex	Chromium, Total
Surface	89	2810
Surface (dup)	121	2770
1' to 3'	126	2630
1' to 3' (dup)	145	1250
3' to 5'	199	317

Depth	Chromium, Hex	Chromium, Total
Surface	33	849
1' to 3'	ND(10)	337

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	324
1' to 3'	ND(10)	402

Depth	Chromium, Hex	Chromium, Total
Surface	45	1410
1' to 3'	ND(10)	753

Depth	Chromium, Hex	Chromium, Total
Surface	18	181
1' to 3'	17	253
3' to 5'	22	231

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	215
Surface (dup)	ND(10)	184
1' to 3'	ND(10)	23.6

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	275
1' to 3'	75	1990

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	16.8
1' to 3'	29	292
3' to 5'	ND(10)	30.1

Depth	Chromium, Hex	Chromium, Total
Surface	143	4470
1' to 3'	23	539

Depth	Chromium, Hex	Chromium, Total
Surface	38	1310
1' to 3'	33	338
1' to 3'(dup)	51	699

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	24.8
1' to 3'	31	305
3' to 5'	ND(10)	55.7

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	75.1
1' to 3'	ND(10)	49.4

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	68.8
1' to 3'	35	179

Depth	Chromium, Hex	Chromium, Total
Surface	38	611
1' to 3'	ND(10)	45.9

Depth	Chromium, Hex	Chromium, Total
Surface	16	158
1' to 3'	ND(10)	90.4
1' to 3' (dup)	ND(10)	89.6

Plate 4.1
RFI Soil Sampling Results
Chrome Plating Bath
Ventilation Discharge Area

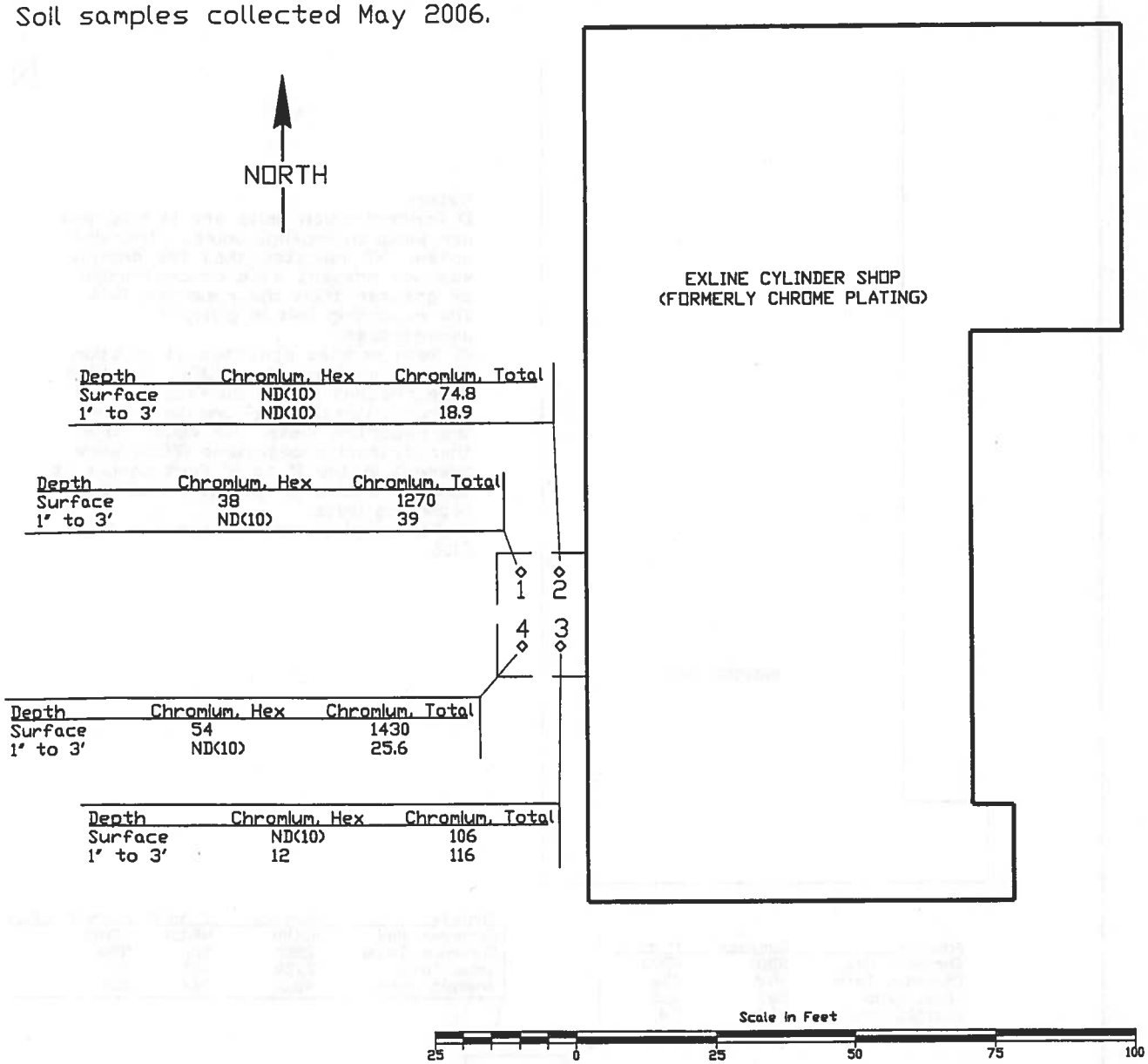
ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
05-0101	July 2006	Jack Eslick

Note: Concentration units are in milligrams per kilogram (mg/kg). ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.

Soil samples collected May 2006.



Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	74.8
1' to 3'	ND(10)	18.9

Depth	Chromium, Hex	Chromium, Total
Surface	38	1270
1' to 3'	ND(10)	39

Depth	Chromium, Hex	Chromium, Total
Surface	54	1430
1' to 3'	ND(10)	25.6

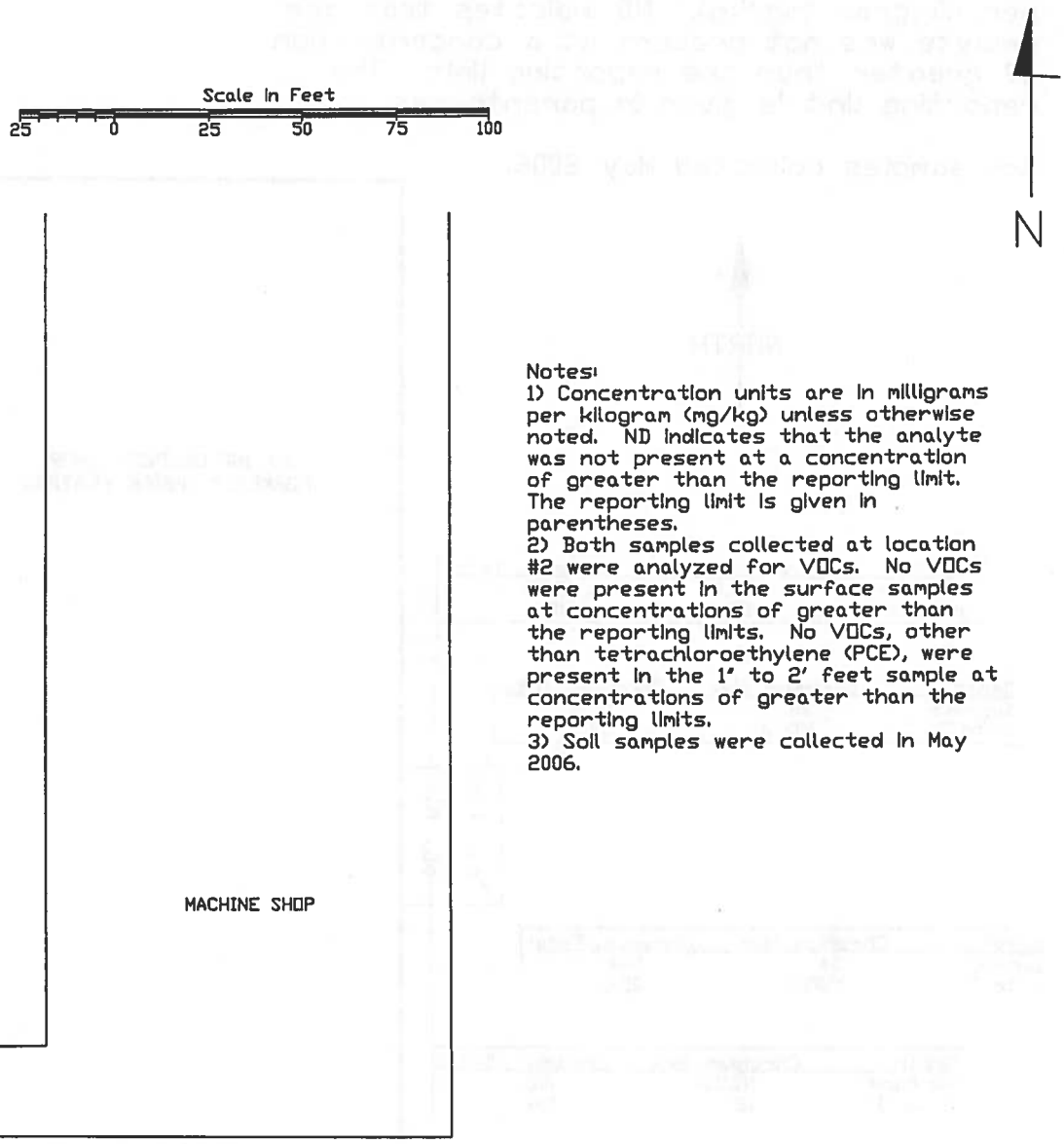
Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	106
1' to 3'	12	116

Plate 4.2
RFI Soil Sampling Results
Deionizer Column Discharge Area

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
05-0101	July 2006	Jack Eslick



Notes:
1) Concentration units are in milligrams per kilogram (mg/kg) unless otherwise noted. ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.
2) Both samples collected at location #2 were analyzed for VOCs. No VOCs were present in the surface samples at concentrations of greater than the reporting limits. No VOCs, other than tetrachloroethylene (PCE), were present in the 1' to 2' feet sample at concentrations of greater than the reporting limits.
3) Soil samples were collected in May 2006.

Analyte	Surface	1' to 2'
Chromium, Hex	ND(1)	ND(1)
Chromium, Total	46.2	23.4
Lead, Total	59.1	15.3
Arsenic, Total	13.5	7.4
PCE (ug/kg)	ND(5)	5.6

Analyte	Surface	1' to 2'	1' to 2' (dup)
Chromium, Hex	ND(10)	ND(10)	ND(10)
Chromium, Total	2180	915	1050
Lead, Total	2720	485	403
Arsenic, Total	48.8	34.4	55.6

Analyte	Surface	1' to 2'
Chromium, Hex	ND(10)	ND(10)
Chromium, Total	24.5	16.9
Lead, Total	25.2	9.7
Arsenic, Total	11.5	4.9

Plate 4.3
RFI Soil Sampling Results
Brown Soil Stain Area

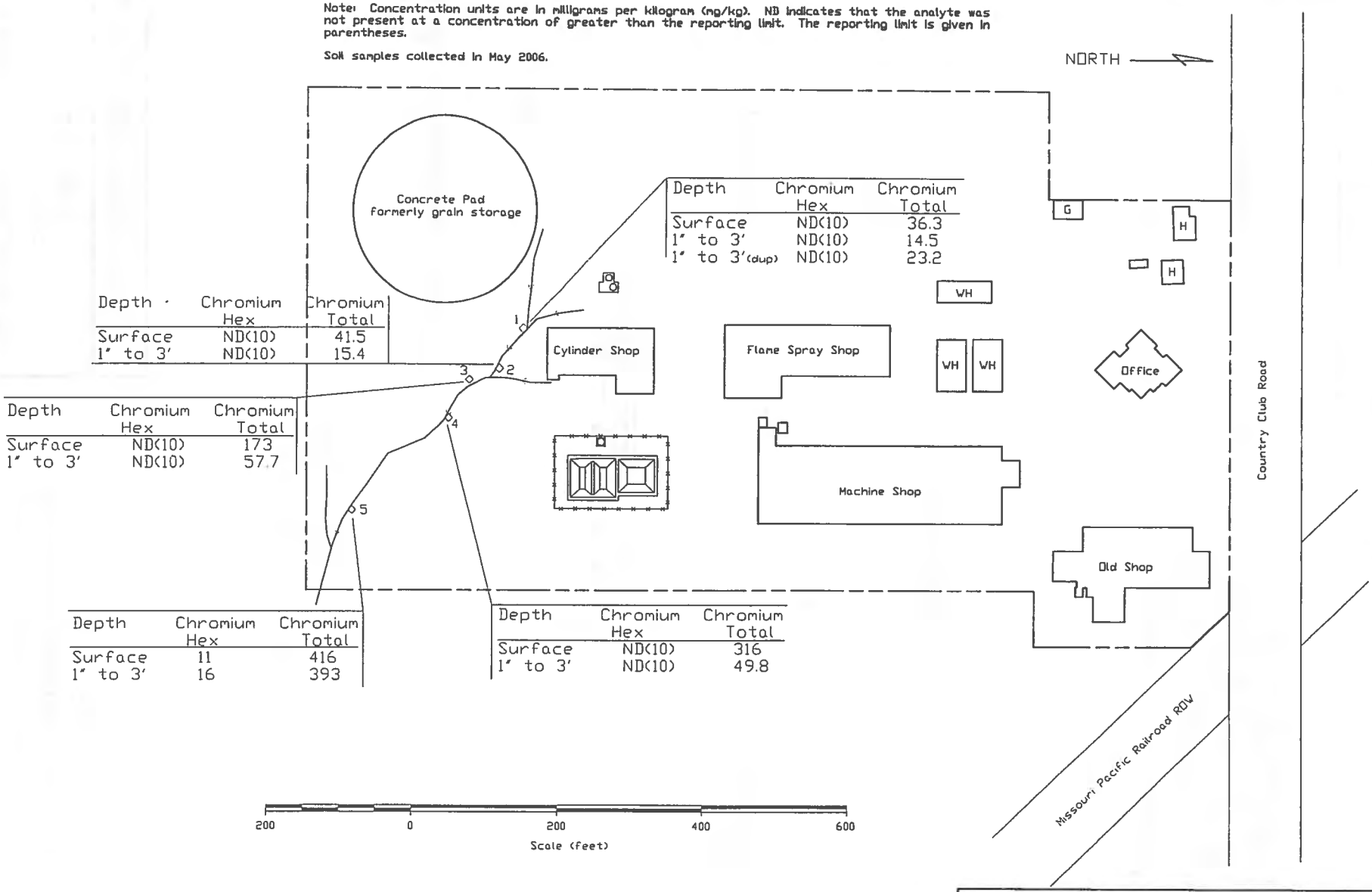
ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
05-0101	July 2006	Jack Eslick

Note: Concentration units are in milligrams per kilogram (mg/kg). ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.

Soil samples collected in May 2006.



Depth	Chromium Hex	Chromium Total
Surface	ND(10)	41.5
1' to 3'	ND(10)	15.4

Depth	Chromium Hex	Chromium Total
Surface	ND(10)	173
1' to 3'	ND(10)	57.7

Depth	Chromium Hex	Chromium Total
Surface	11	416
1' to 3'	16	393

Depth	Chromium Hex	Chromium Total
Surface	ND(10)	316
1' to 3'	ND(10)	49.8

Depth	Chromium Hex	Chromium Total
Surface	ND(10)	36.3
1' to 3'	ND(10)	14.5
1' to 3'(dup)	ND(10)	23.2

Plate 4.4
RFI Soil Sampling Results
Surface Water Run-off Area

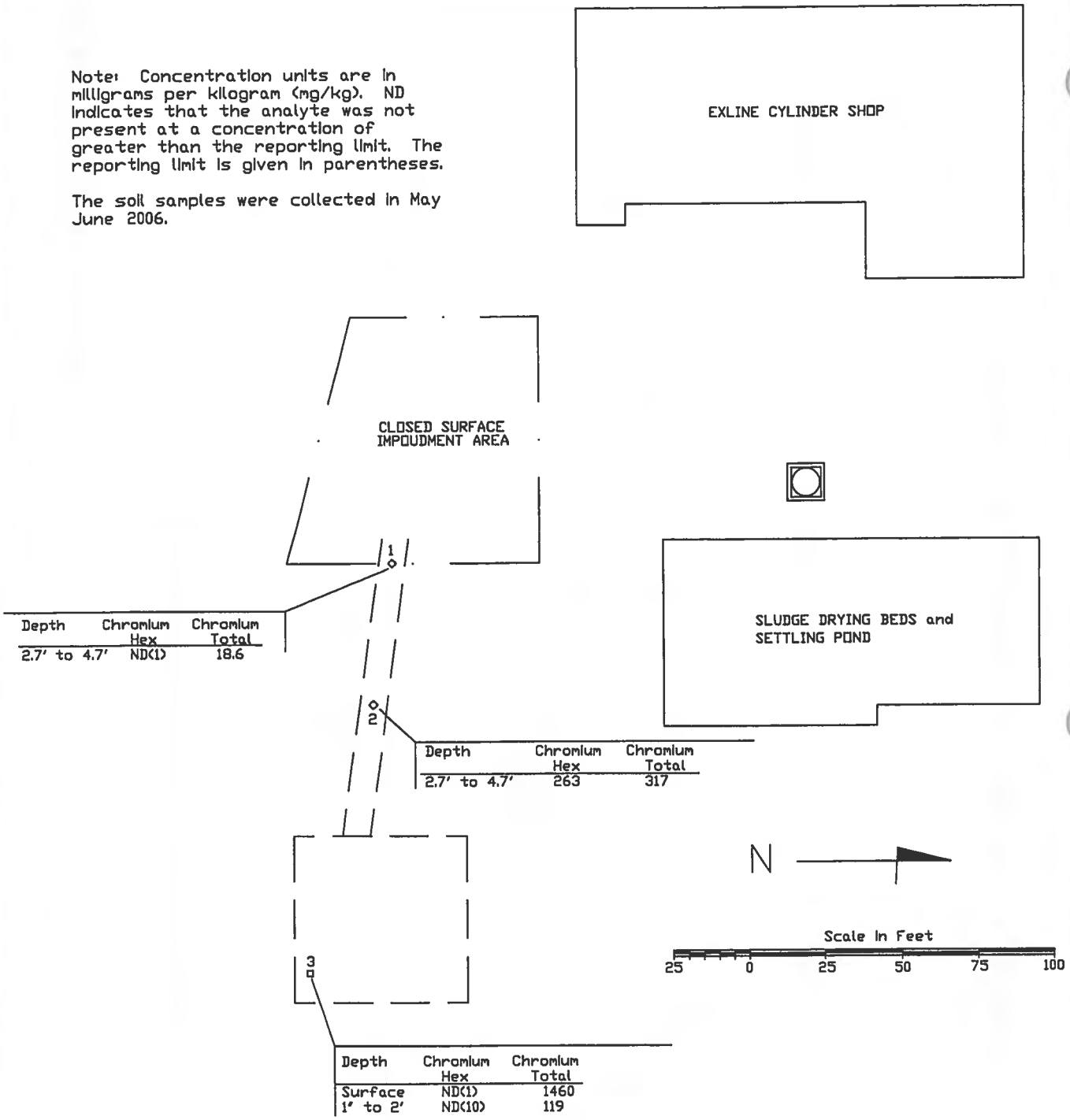
ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
05-0101	July 2006	Jack Eslick

Note: Concentration units are in milligrams per kilogram (mg/kg). ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.

The soil samples were collected in May June 2006.



Depth	Chromium Hex	Chromium Total
2.7' to 4.7'	ND(1)	18.6

Depth	Chromium Hex	Chromium Total
2.7' to 4.7'	263	317

Depth	Chromium Hex	Chromium Total
Surface	ND(1)	1460
1' to 2'	ND(10)	119

Plate 4.5
RFI Soil Sampling Results
Concrete Culvert Area

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
05-0101	July 2006	Jack Eslick

4.2. Surface Water Run-Off.

Chemical analysis results for the stormwater run-off sampling event are summarized below. As discussed earlier, the stormwater run-off samples were collected on April 28, 2006. Copies of the CAS Laboratory reports are included as Attachment C.

TABLE 4.6: STORMWATER RUN-OFF CHEMICAL ANALYSIS RESULTS EXLINE, INC. FACILITY

Sample ID	Hexavalent Cr (mg/L)	Total Cr (mg/L)	Trivalent Cr (mg/L)*
Exline Stormwater Composite # 1	0.027	0.032	0.005
Exline Stormwater Composite # 2	0.026	0.033	0.007
Exline Stormwater Grab # 1	0.020	0.020	0
Exline Stormwater Grab # 2	0.019	0.025	0.006

* The trivalent chromium concentration was calculated by subtracting the hexavalent chromium concentration from the total chromium concentration.

The samples identified as # 2 in Table 4.6 are duplicates of the respective composite and grab samples identified as # 1.

It should also be noted that the composite and grab samples (# 1 only) were analyzed for two additional parameters that were not specified in the Work Plan – specific conductance and hardness. Specific conductance was analyzed in an attempt to determine why the liquid level actuator did not initiate the sampling sequence. The measured specific conductance values (shown below) were at a level, which, according to the liquid level manufacturer, should have initiated sampling. Therefore, the cause of the sampler malfunction is unknown. Hardness was measured since trivalent chromium surface water quality standards are dependent on hardness. Sample results were:

Composite # 1 hardness – 103 mg/L as $CaCO_3$.
Grab # 1 hardness – 105 mg/L as $CaCO_3$.
Composite # 1 specific conductance – 284 μmhos/cm.
Grab # 1 specific conductance – 277 μmhos/cm.

5. Quality Assurance/Quality Control.

The project Quality Assurance Assessment Report is included as Attachment D.

6. Discussion of Results and Recommended Follow-up Action.

Before presenting a discussion of results, it is appropriate to include a summary of the remedial guidelines, which may be used for screening at the site and/or developing preliminary cleanup standards.

Table 6.1 summarizes the PRGs and KDHE Tier 2 Standards for the following parameters, which were measured in the soil at the Exline, Inc. site:

- total chromium
- trivalent chromium
- hexavalent chromium
- total arsenic
- total lead
- tetrachloroethylene (PCE)

Table 6.1 includes values for the soil protection pathway (both residential and industrial scenarios) and the soil to groundwater protection pathway, where applicable.

6.1. Soil.

Each parameter will be evaluated with respect to the concentrations measured in the soil from the various SWMUs relative to the guidelines summarized in Table 6.1.

6.1.1. Total Chromium.

One soil sample exceeded the KDHE Tier 2 standard for total chromium – industrial setting and a number of samples exceeded the KDHE Tier 2 standard for total chromium – residential setting. However, it should be noted that the KDHE standards do not distinguish between the hexavalent and trivalent forms of chromium. Moreover, the KDHE Tier 2 standards were developed based on the assumption that all of the chromium is in the hexavalent form.

6.1.2. Trivalent Chromium.

All trivalent chromium concentrations were well below both the residential and industrial EPA Region IX PRG of 100,000 mg/kg.

6.1.3. Hexavalent Chromium.

As indicated in Table 6.1, three hexavalent chromium standards exist within the EPA Region IX PRGs:

1) Residential soil pathway – 30 mg/kg.
2) Industrial soil pathway – 64 mg/kg.
3) Soil to groundwater pathway – 38 mg/kg.

TABLE 6.1: PARAMETER PRG AND KDHE TIER 2 RISK-BASED STANDARD SUMMARY
All values are mg/kg.

	Total Chromium	Trivalent Chromium	Hexavalent Chromium	Total Arsenic	Total Lead	PCE
EPA Region IX PRGs						
Residential Soil Pathway	NA	100000	30	0.39	400	0.480
Industrial Soil Pathway	NA	100000	64	1.6	800	1.3
Migration to Groundwater Pathway	NA	NA	38	29	NA	0.060
KDHE Tier 2 Risk-Based Standards						
Residential Soil Pathway	390	NA	NA	11	400	79
Industrial Soil Pathway	4000	NA	NA	38	1000	140
Migration to Groundwater Pathway	NA	NA	NA	NA	NA	0.180

Notes:
1. NA - denotes not applicable.
2. PCE - tetrachloroethylene.
3. The EPA Region IX PRG values for the "Migration to Groundwater Pathway" assumes a Dilution Attenuation Factor of 20.

The Exline, Inc. facility is located outside the City limits of Salina. In addition, with respect to the EPA Region IX soil to groundwater pathway limit of 38 mg/kg for hexavalent chromium (which is based on an assumed dilution attenuation factor of 20), Exline has implemented and is operating a comprehensive groundwater recovery system and monitoring well network. The groundwater recovery system includes four (4) pumping wells and the monitoring well network includes ten (10) monitoring wells and ten (10) wells that are used for measuring water levels.

The subject groundwater monitoring network and recovery system were installed as part of the Post-Closure obligations related to the surface impoundment, which was closed with waste in place. As such, the system was not designed to address the full requirements for HSWA Corrective Action with respect to groundwater.

Plate 6.1 shows the monitoring and recovery well network in relation to the solid waste management units discussed in this report.

6.1.4. Total Arsenic.

Total arsenic concentrations were generated at the Brown Soil Stain SWMU. All concentrations measured at this location exceeded the EPA Region IX PRG for both residential and industrial scenarios. However, factors to consider with respect to arsenic include:

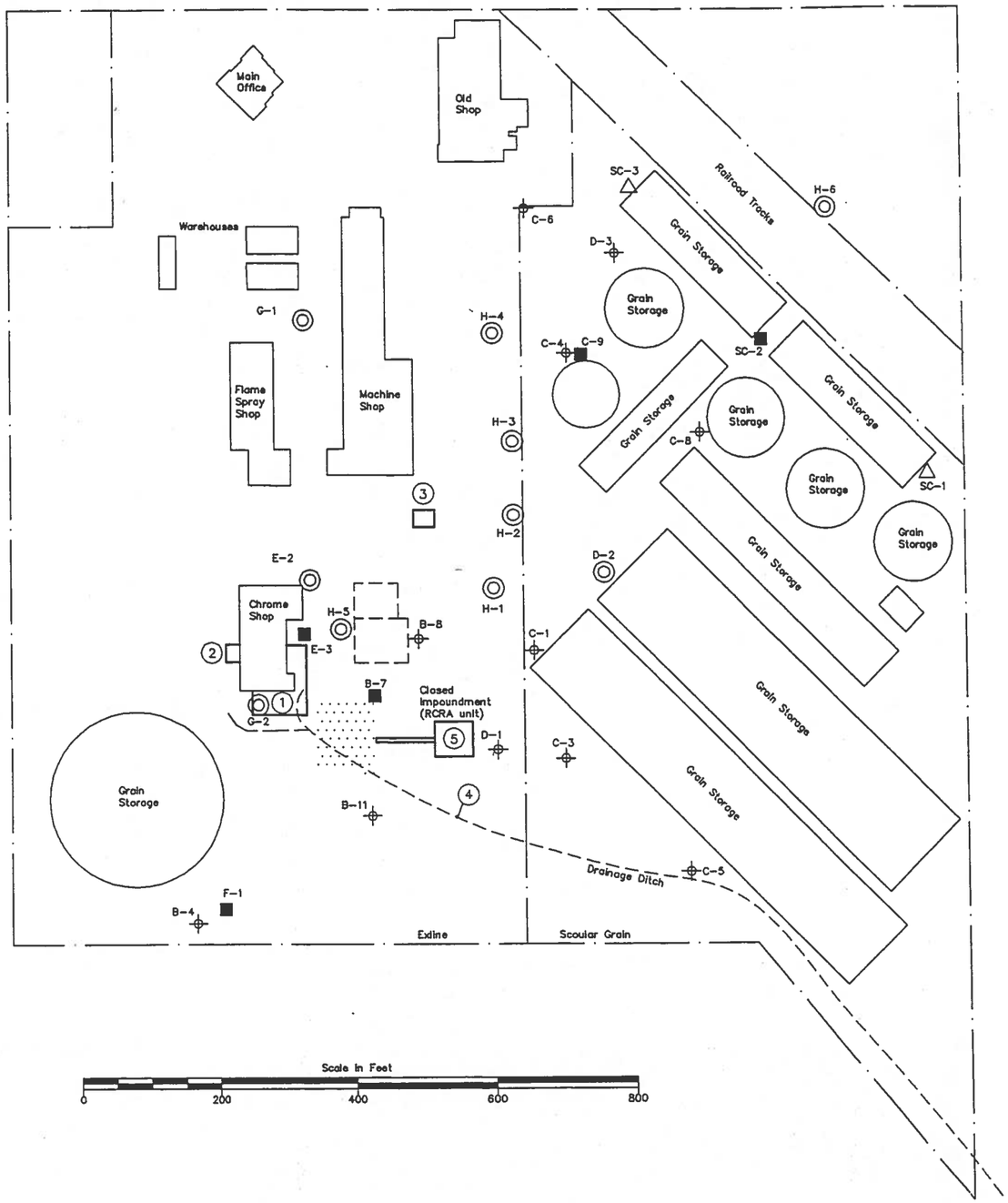
1) The KDHE Tier 2 Standards are based on a 10^{-5} cancer risk while the EPA Region IX PRGs are based on a 10^{-6} cancer risk.

2) The KDHE Bureau of Environmental Remediation (BER) has indicated that they will no longer be using the soil to groundwater protection pathway value of 5.84 mg/kg for arsenic. This decision will be formally reflected when the KDHE "Risk-Based Standards Manual" is up-dated.

Since Exline, Inc. is not in a residential setting, it is proposed that the KDHE industrial soil pathway protection standard of 38 mg/kg should be used for determining the vertical and horizontal extent of contamination at the site.

6.1.5. Total Lead.

Total lead concentrations were generated at the Brown Soil Stain SWMU. Elevated levels were measured at sample location number 2 with respect to this SWMU, both at the surface and the 1" to 2' depth. The surface sample at this location exceeded the EPA Region IX PRG and KDHE Tier 2 standard for the industrial scenario. The 1" to 2' sample at this location exceeded the EPA Region IX PRG and KDHE Tier 2 standard for the residential scenario.



NORTH

Legend

- Monitor Well
- Recovery Well
- Piezometric Network Well
- Scoular De-Watering Well
- (1) Chrome Plating Bath Ventilation Discharge Area SWMU
- (2) Deionizer Column Discharge Area SWMU
- (3) Brown Soil Stain Area SWMU
- (4) Surface Water Run-off Area SWMU
- (5) Concrete Culvert Area SWMU

PLATE 6.1:
SWMUs, Monitor Wells, and Recovery Wells

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn By:
SEI 06-0101	Nov. 2006	Jack Eslick

6.1.6. Tetrachloroethylene.

Tetrachloroethylene (PCE) was measured at a concentration of 0.0056 mg/kg within the Brown Soil Stain SWMU: sample location # 2 – 1" to 2' depth. This value was slightly above the detection limit of 0.005 mg/kg. This measured concentration was 10 times lower than the lowest EPA Region IX PRG (0.060 mg/kg – soil to groundwater protection pathway) for PCE.

6.2. Surface Water Run-off.

Surface water run-off sampling data were presented earlier in Section 4 – Table 4.6. Those data are summarized again below.

Sample ID	Hexavalent Cr (mg/L)	Total Cr (mg/L)	Trivalent Cr (mg/L)*
Exline Stormwater Composite # 1	0.027	0.032	0.005
Exline Stormwater Composite # 2	0.026	0.033	0.007
Exline Stormwater Grab # 1	0.020	0.020	0
Exline Stormwater Grab # 2	0.019	0.025	0.006

* The trivalent chromium concentration was calculated by subtracting the hexavalent chromium concentration from the total chromium concentration.

Surface water quality standards have been developed in Kansas for the following designated uses:

1) Aquatic life – chronic and acute.
2) Agriculture – livestock and irrigation.
3) Public health – food procurement and domestic water supply.

The most stringent water quality standards with respect to hexavalent, trivalent, and total chromium are those, which address protection of aquatic life. Those standards are summarized below.

TABLE 6.2: KANSAS SURFACE WATER QUALITY STANDARDS – PROTECTION OF AQUATIC LIFE

Parameter	Acute (mg/L)	Chronic (mg/L)
Hex Cr	0.016	0.011
Trivalent Cr	1.847	0.088
Total Cr	none	0.040

The equations used to calculate the trivalent chromium surface water quality standards listed above are (taken from the Kansas Surface Water Quality Standards Table 1.b, December, 2004):

Acute (µg/L): WER x (exp((0.819) x (LN(hardness))) + 3.7256]] (I)

Chronic (µg/L): WER x (exp((0.819) x (LN(hardness))) + 0.6848]] (II)

The hardness values are in mg/L as calcium carbonate.

The hardness value of 103 mg/L (as calcium carbonate) was used in the respective equations. That value is the hardness concentration that was measured in the surface water run-off composite sample, which was collected on April 28, 2006.

A WER value of 1.0 was used in both equations.

Inserting these values into equations (I) and (II) yields the following:

Acute trivalent chromium standard = 1847 mg/L = 1.847 mg/L.

Chronic trivalent chromium standard = 88 mg/L = 0.088 mg/L.

KDHE Bureau of Water (BOW) personnel have indicated that they would review the stormwater discharge data in view of receiving stream flows in order to determine whether the Exline stormwater discharge could have an impact on the "first protected classified stream". Therefore, surface water quality data generated during this RFI investigation were submitted to the KDHE BOW on December 1, 2006. All surface water quality issues are being addressed by the KDHE BOW.

The EPA has also indicated that surface water run-off sampling should be considered relative to the Brown Soil Stain SWMU. Exline believes that surface water run-off sampling is not necessary from this area, based on the following analysis.

Based on a review of Plate 2.1 (Facility Layout Map), which shows the facility surface topographic contours, the drainage area (on the Exline facility) including the Brown Soil Stain Area is approximately 90,000 ft^2. The Brown Soil Stain area is approximately 750 ft^2.

The arithmetic average surface concentrations for the three metals that were sampled within the Brown Soil Stain SWMU are:

Trivalent chromium – 750 mg/kg
Total lead – 935 mg/kg
Total arsenic – 24.6 mg/kg

If one assumes that the surface soil concentrations for these three parameters is the same as the 95 % upper confidence level values that were generated in 2001 during the Exline background soil sampling project, then the estimated surface soil concentrations for the drainage area outside the Brown Soil Stain SWMU would be:

Trivalent chromium – 15.9 mg/kg
Total lead – 13.2 mg/kg
Total arsenic – 6.2 mg/kg

The average surface soil concentrations for the drainage area would then be calculated using the following equation:

$$C_{AVGi} = (89250\ ft^2)x(C_{Bi}) + (750\ ft^2)x(C_{BSi})/(90000\ ft^2) \qquad \text{(III)}$$

Where:

C_{AVGi} = average surface soil concentration for parameter i in mg/kg
C_{Bi} = background surface soil concentration for parameter i in mg/kg
C_{BSi} = average surface soil concentration within the brown soil stain SWMU for parameter i in mg/kg

Inserting the values identified earlier for the respective parameters into equation (III) yields the following values for the surface soil concentrations within the 90,000 ft^2 drainage area:

Trivalent chromium – 22 mg/kg
Total lead – 20.9 mg/kg
Total arsenic – 6.4 mg/kg

These values will then be used in conjunction with the Kansas Surface Water Quality Standards to calculate the TSS concentration in surface water run-off that would result in a concentration that is equal to (the most stringent) surface water quality standard.

The most stringent surface water quality standards are for protection of aquatic life – chronic toxicity. These are:

Arsenic – 0.048 mg/L
Chromium (total) – 0.040 mg/L
Lead – 0.003 mg/L (based on a water hardness of 104 mg/L as calcium carbonate)

The TSS concentration that would theoretically generate a surface water run-off concentration is calculated using the following equation:

$$TSS_i = [(CSW_i)/(CSS_i)]x(10^6\ mg/kg) \qquad \text{(IV)}$$

Where:

TSS_i = total suspended solids concentration (mg/L) that would produce a surface water run-off concentration equal to the surface water quality standard for protection of aquatic life (chronic toxicity)

CSW_i = surface water quality standard for parameter i (mg/L) based on protection of aquatic life (chronic toxicity)

CSS_i = concentration of parameter i in surface soil (mg/kg) for drainage area

Inserting the values identified earlier for the respective parameters into equation (II) yields the following TSS values that would theoretically result in surface water concentrations equal to the most stringent surface water quality standard:

Arsenic – 7500 mg/L
Chromium – 1820 mg/L
Lead – 143 mg/L

These are extremely high TSS concentrations for surface water run-off samples. Therefore, these calculations indicate that the most stringent Kansas surface water quality standard would not likely be exceeded in the surface water runoff at the Exline facility. As a result, surface water run-off sampling is not recommended.

ATTACHMENT 6-2

SOLID WASTE MANAGEMENT UNIT SUMMARY REPORT
FEBRUARY, 2008
REVISED JANUARY, 2013

Solid Waste Management Unit Summary Report
Exline, Inc. Facility – Salina, Kansas
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1. Introduction.

Section C.2. of the Exline, Inc. Hazardous Waste Permit (HSWA – Part II) identifies eighteen (18) solid waste management units (SWMUs), which are located at the Exline facility. As stated in the permit:

The EPA conducted a RCRA Facility Assessment (RFA) to identify SWMUs and AOCs and any releases or potential releases from them at the Facility. EPA's RFA Report is dated July 14, 1989. A RCRA Facility Investigation Report (RFI) was submitted on December 1, 1993 listing one additional SWMU and one additional AOC. Pursuant to Section 3005 (c)(3) of RCRA, 42 USC § 6925 (c) (3), EPA can require additional investigation and remediation if the Administrator determines it necessary to protect human health and the environment. The SWMUs identified and requiring further action are:

1. *Flash Mix Tank*
2. *Retention Tank*
3. *Neutralization Tank*
4. *Clarifier*
5. *Sludge Drying Beds*
6. *Solids Settling Basin/Filter Bed*
7. *Industrial Wastewater Collection Tank*
8. *Industrial Wastewater Chromium Reduction Treatment Tank*
9. *Sludge Drying/Storage Beds*
10. *Designated Drum Storage Area*
11. *Designated Soil Storage Area*
12. *Collection Sump for Grit Blaster Wastewater overflow*
13. *Sludge Dewatering Filter Press*
14. *Four (4 Vertical Storage Tanks*
15. *Waste Oil Skimmer and Temporary Oil Storage Drum*
16. *Chrome Plating Bath Ventilation Discharge Area (formerly known as Surface Water Runoff Area)*
17. *Waste Pile*
18. *General Purpose Collection Sump*
19. *Deionizer Column Discharge Area*

The AOCs identified and requiring further action are:

1. *Concrete Culvert Excavation Area*
2. *Brown Stained Soil Area*

With the exceptions noted below, this Report will provide current information with respect to each of the 19 SWMUs. SWMU-16 – "Chrome Plating Bath Ventilation Discharge Area" and SWMU-19 – "Deionizer Column Discharge Area" have been included as part of the on-going RCRA Facility Investigation (RFI) at the facility.

The AOCs listed above ("Concrete Culvert Excavation Area" and "Brown Stained Soil Area") have also been included as part of the on-going RFI at the facility. Detailed information with respect to these two (2) SWMUs and two (2) AOCs is included in the February, 2007 RFI Report for the Exline facility. Therefore, additional information with respect to these SWMUs and AOCs will not be included within this Report.

2. Solid Waste Management Units (SWMUs).

As discussed in Section 1, information will be provided below with respect to seventeen (17) SWMUs. Each SWMU will be identified by the name and number set forth in the Exline, Inc. Hazardous Waste permit. In addition, Plates 2.1 and 2.2 show the locations of each SWMU. Plate 2.1 shows the SWMUs that are (were) located outside of the Cylinder (formerly Chrome) Shop. Plate 2.2 shows the SWMUs that are (were) located inside the Cylinder (formerly Chrome) Shop. As will be discussed in more detail below, it should be noted that certain SWMUs are no longer present at the site (e.g., tanks have been disposed off-site).

Before presenting specific information with respect to each of the SWMUs, it should be noted that there have been no known releases of hazardous waste or hazardous waste constituents from any of these SMWUs.

2.1. Flash Mix Tank – SWMU-1 (Plate 2.2). This is a 120 gallon, fiberglass tank that was located in the Cylinder (formerly Chrome) Shop. Recovered groundwater and treatment chemicals (sulfuric acid and sodium bisulfite) were fed to this tank, which was part of the groundwater treatment system. The tank received recovered groundwater, which contained hexavalent chromium at a rate of approximately 45 gallons per minute. This tank was used from 1985 to the late 1990s, at which time, it was determined that this tank was no longer needed, due to the fact that the Retention Tank (see # 2 below) provided sufficient treatment of the groundwater. This tank was subsequently removed and discarded at that time.

2.2. Retention Tank – SWMU-2 (Plate 2.2). This is a 375 gallon fiberglass tank that is located in the Cylinder Shop. This tank has been in use from 1985 to the present. The tank has been used for providing wastewater retention time for the treatment of chromium-bearing groundwater. From 1985 to the late 1990s, the tank was used to provide wastewater retention time only (i.e., the groundwater fed to the tank already contained the required chemicals for reducing hexavalent chromium). In the late 1990s, the decision was made to no longer use the Flash Mix Tank (SWMU-1) and the treatment chemicals were then fed to the Retention Tank at that time.

The City of Salina approved Exline's request to discontinue use of the groundwater treatment system in a letter dated December 29, 2003. Exline subsequently discontinued the treatment system operation in early 2004. As a result, sulfuric acid and sodium bisulfite feed (to the Retention Tank) was discontinued at that time. The tank is still located in the Cylinder Shop and groundwater from recovery wells B-7 and E-3 is being fed to this tank at a combined rate of approximately 25 gpm. The tank is still in place as the groundwater is being used for non-contact cooling water on an as-need basis in a thermal spray process. Exline has long-range plans to eliminate the need for cooling water by purchasing a chiller. At that time, the retention tank will no longer be needed and will be disposed. Piping modifications will be made such that the recovered groundwater from B-7 and E-3 will be fed directly to the lift station located east of the Cylinder shop.

2.3. Neutralization Tank – SWMU-3 (Plate 2.1). This is an 880 gallon polyethylene tank that is located in the Cylinder Shop. This tank was used for pH adjustment from 1995 to early 2004. Lime slurry was fed to this tank in order to increase the pH from around 2.5 to 7-8 and precipitate chromium hydroxide. An 880 gallon steel tank was used for this process from 1984 to 1995. That steel tank was disposed when the polyethylene tank was installed.

As discussed earlier, the groundwater treatment process was discontinued in early 2004. At that time, the lime slurry feed was discontinued. Recovered groundwater from B-7 and E-3 are still fed to the tank at a combined rate of 25 gpm. This water is subsequently pumped from the tank to a lift station located east of the Cylinder Shop.

2.4. Clarifier – SWMU-4 (Plate 2.1). This is a 1200 gallon steel tank that is located east of the Cylinder Shop. This tank was used for solids settling as part of the groundwater treatment system from 1984 until its use was discontinued in early 2004 at which time piping was installed to bypass the tank. During that time period, the clarifier received treated groundwater at a rate, which varied from 10 gpm (initially) to a peak flow of 45 gpm. The tank contents have been removed (i.e., there are no solids or liquids inside the tank.

2.5. Sludge Drying Beds – SWMU-5 (Plate 2.1). These drying beds consist of a 2-cell surface impoundment that was used for de-watering solids generated as part of the groundwater treatment system. Use of the drying beds was discontinued in early 2004 (i.e., when treatment of recovered groundwater was discontinued). The drying beds are currently in place. Exline, Inc. has proposed to the KDHE that these drying beds should be closed – likely some time in 2008. The closure process will involve the submission of a Closure Plan to the KDHE for review and approval. This Closure Plan will include specifications for sampling and analysis of the underlying soils. Disposition of underlying soils will be completed depending on the results of the analyses. After underlying soil has been removed (if required), the drying beds will be back-filled with clean soil, graded to drain, and seeded with native grass.

As a precursor to the closure process, the groundwater treatment system sludge that is present in the drying beds was sampled and analyzed in June of 2007. These analyses demonstrated that the subject sludge is non-hazardous waste (the TCLP chromium concentration was 0.79 mg/L and the TCLP chromium hazardous waste limit is 5 mg/L). Those analyses were submitted to the KDHE Bureau of Waste Management (BOWM) as an attachment to a "Special Waste Disposal Request" form in August of 2007. The KDEH BOWM subsequently approved Exline's request for disposal of this non-hazardous material in the City of Salina landfill. This material will be removed before the closure process is initiated.

Finally, it should be noted that the sludge, which has been removed from the drying beds in the past (from 1984 to the present), has been tested for TCLP chromium prior to disposal. In each case, the TCLP chromium concentration has been less than the

hazardous waste limit of 5 mg/L. As a result, all sludge, which has ever been removed from the drying beds, has been disposed as a non-hazardous special waste in the City of Salina Landfill.

2.6. Solids Settling Basin/Filter Bed – SWMU-6 (Plate 2.1). This impoundment was used for settling solids that were generated as part of the groundwater treatment system operation. Use of this basin was discontinued in early 2004. The basin currently contains no water and approximately 1 ft. of sludge. Sludge was last removed from the basin in 2001. Historically, sludge was transferred from the settling basin to one of the adjacent sludge drying beds.

Exline has proposed to the KDHE that the settling basin be closed. As discussed above with respect to the sludge drying beds, a Closure Plan will be submitted to the KDHE (closure of both the drying beds and settling basin will likely be addressed in one Closure Plan document) for review and approval. Sludge has been sampled and analyzed and demonstrated to be non-hazardous waste (see discussion above with respect to drying bed sludge). This sludge will be removed and disposed in the City of Salina landfill prior to execution of the Closure Plan sampling process.

2.7. Industrial Wastewater Collection Tank – SWMU-7 (Plate 2.2). This tank was a 1900 gallon steel tank with a hypalon liner and was located in the Cylinder shop basement. The tank was used to collect industrial wastewater that was generated in the chrome shop from 1985 to 2005. Wastewater collected in this tank was pumped to the Industrial Wastewater Chromium Reduction Tank (SWMU-8) for treatment. Wastewater generation was discontinued in 2005. The tank was subsequently removed and disposed off-site in the fall of 2005 when Exline renovated and filled in most of the Cylinder Shop basement.

2.8. Industrial Wastewater Chromium Reduction Treatment Tank – SWMU-8 (Plate 2.2). A 2200 gallon steel tank with an acid-resistant coating was used for batch treatment of industrial wastewater from 1985 to 1997. That tank was disposed off-site in 1997 and replaced with an 1100 gallon fiberglass tank. The fiberglass tank was used for batch treatment of industrial wastewater from 1997 to the fall of 2005 at which time, it was also disposed off-site. Exline discontinued generating industrial wastewater that required treatment in the fall of 2005.

The industrial wastewater that was generated in the Cylinder Shop from 1985 to 2005 was typically treated on a batch basis by pH adjustment with sulfuric acid, chromium reduction by the addition of a reducing agent such as sulfur dioxide or sodium metabisulfite, pH adjustment with sodium hydroxide, and solids settling. The settled solids were then pumped to a filter press (SWMU-13) for de-watering and the supernatant discharged to the City sewer.

2.9. Sludge Drying/Storage Beds – SWMU-9 (Plate 2.2). This was an area approximately 4 ft. by 8 ft. in plan view that was constructed using plywood and 2 by 4s. The wooden structure was constructed on the concrete floor in the vicinity of the batch

wastewater treatment system in the chrome shop. The structure was used for storage and drying of sludge that was generated in the batch wastewater treatment process. The structure was used from 1985 to the early 1990s, at which time, the process was discontinued. After that date, sludge drying (if required) was accomplished by blowing air through the filter press. The material used to construct the drying bed was disposed off-site in the early 1990s, following the decision to discontinue the drying process.

2.10. Designated Drum Storage Area – SWMU-10 (Plate 2.2). This area is located in the northwest corner of the Cylinder Shop and is the designated hazardous waste storage area for the Exline facility. Hazardous waste that was stored in 55 gallon drums at the facility has been stored in this area. Types of waste stored in drums in this area have included chrome plating wastewater treatment sludge, solvent waste, and chromium-contaminated debris.

Very little hazardous waste is currently being generated at the Exline, Inc. facility. For example, the total quantity of hazardous waste generated at the facility in 2007 was approximately 1500 pounds.

Finally, it should be noted that most of the drums shown in the photograph of SWMU-10, which is included in Section 3, are non-hazardous waste.

2.11. Designated Soil Storage Area – SWMU-11 (Plate 2.2). This area is located in the northeast corner of the chrome shop. Approximately 126,000 pounds of soil were stored on the concrete floor of the chrome shop in this area from May, 1984 to January, 1985. This soil was generated from closure of the chromium waste storage impoundment. The soil was subsequently disposed off-site as hazardous waste.

2.12. Collection Sump for Grit Blaster Wastewater Overflow – SWMU-12 (Plate 2.2). This was a 60 gallon steel sump with a plastic liner that was used to collect overflow wastewater from the grit blaster. The sump was equipped with a pump and float, which transferred the wastewater to the industrial wastewater collection tank (SWMU-7). The process was discontinued in the fall of 2005. At that time, the sump was cleaned and filled in with concrete as part of the Cylinder Shop basement renovation.

2.13. Sludge Dewatering Filter Press – SWMU-13 (Plate 2.2). As discussed earlier, this filter press was used to dewater solids generated in the industrial wastewater treatment process. The press was used from 1985 to 2005, at which time; industrial wastewater generation was discontinued at the facility. The filter press was sold to another facility in 2006 for use in de-watering sludge generated from a batch wastewater treatment process.

2.14. Four (4) Vertical Storage Tanks – SWMU-14 (Plate 2.1). These tanks were located west of the Cylinder Shop in a bermed area. The tanks were used to store wastewater that was re-processed for use as makeup water in the Exline chrome plating baths. The water in these tanks was ultimately disposed off-site as hazardous waste in the mid-1990s. The tanks were then removed in the summer of 2005 and the area back-filled (see May 18, 2005 letter to EPA Region VII).

2.15. Waste Oil Skimmer and Temporary Oil Storage Drum – SWMU-15 (Plate 2.2). This oil skimmer is located just outside the west side of the Cylinder Shop. The system, which is located below grade, consists of a concrete settling section and a steel drum located inside a concrete discharge section. The system was installed in 1986 and was designed to skim oil from wastewater that was generated from washing parts. Wastewater overflow from the system was discharged to the sanitary sewer. The system is still present, but is no longer used for collecting wastewater and skimming oil.

The temporary oil storage drum is no longer present, since the system is no longer in use.

2.16. Surface Water Runoff Area – SWMU-16. This is the area that is currently identified as the chrome plating bath ventilation discharge area. This SWMU has been investigated and is currently included as part of the up-coming corrective measures study. Therefore, this SWMU is not included as part of this document.

2.17. Waste Pile – SWMU-17 (Plate 2.1). This is an area located south of the Machine Shop (Building No. 2) that was identified by the EPA as part of the 1989 RCRA Facility Assessment (RFA). Scrap wood and metal were identified at that time as "Waste Piles". Scrap wood and metal are no longer stored on the ground in this area.

2.18. General Purpose Collection Sump – SWMU-18 (Plate 2.2). This plastic sump was located in the Cylinder Shop basement. The sump was installed in 1985 and was used to collect any water, which would enter the basement. The water would then be pumped to the industrial wastewater collection tank (SWMU-7). This sump was cleaned and filled in with concrete as part of the Cylinder Shop basement renovation in the fall of 2005.

Two areas of concern (AOCs) are also identified on page 16 of the Exline permit (Part II). These are:

1. Concrete Culvert Excavation Area. This area is currently included in the on-going RFI.

2. Brown Stained Soil Area. This area is currently included in the on-going RFI.

3. Site Photographs.

With the exceptions noted below, photographs are included for each of the SWMUs that were discussed in Section 2. Photos are not included for the following:

- SWMU-7: Industrial Wastewater Collection Tank.
- SWMU-12: Collection Sump for Grit Blaster Wastewater Overflow.
- SWMU-18: General Purpose Collection Sump.

These SWMUs were all located in the Cylinder (formerly Chrome) shop basement, and have subsequently been removed and the basement filled in.

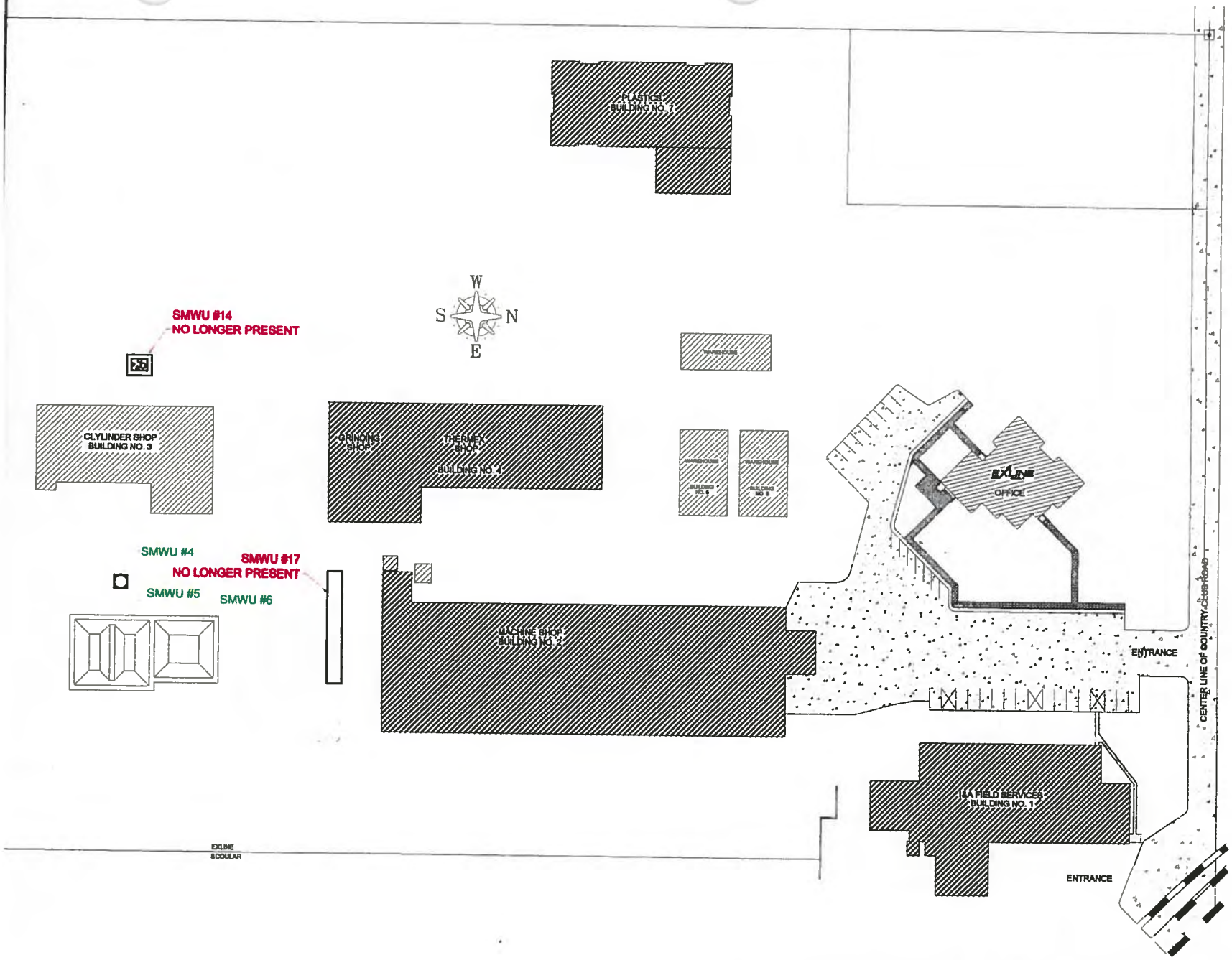
In certain other cases, the SWMU has been removed; however, photos are included of the area, where the SWMU was previously located. These include:

- SWMU-1: Flash Mix Tank.
- SWMU-8: Industrial Wastewater Chromium Reduction Treatment Tank.
- SWMU-11: Designated Soil Storage Area.
- SWMU-13: Sludge De-watering Filter Press.
- SWMU-14: Four (4) Vertical Storage Tanks.
- SWMU-15: Waste Oil Skimmer and Temporary Oil Storage Drum (the waste oil skimmer is still present but the oil storage drum is not).
- SWMU-17: Waste Pile.

With the exceptions noted below, photos were taken in October of 2007. Photos of SWMU-9 and SWMU-10 were taken in February, 2008.

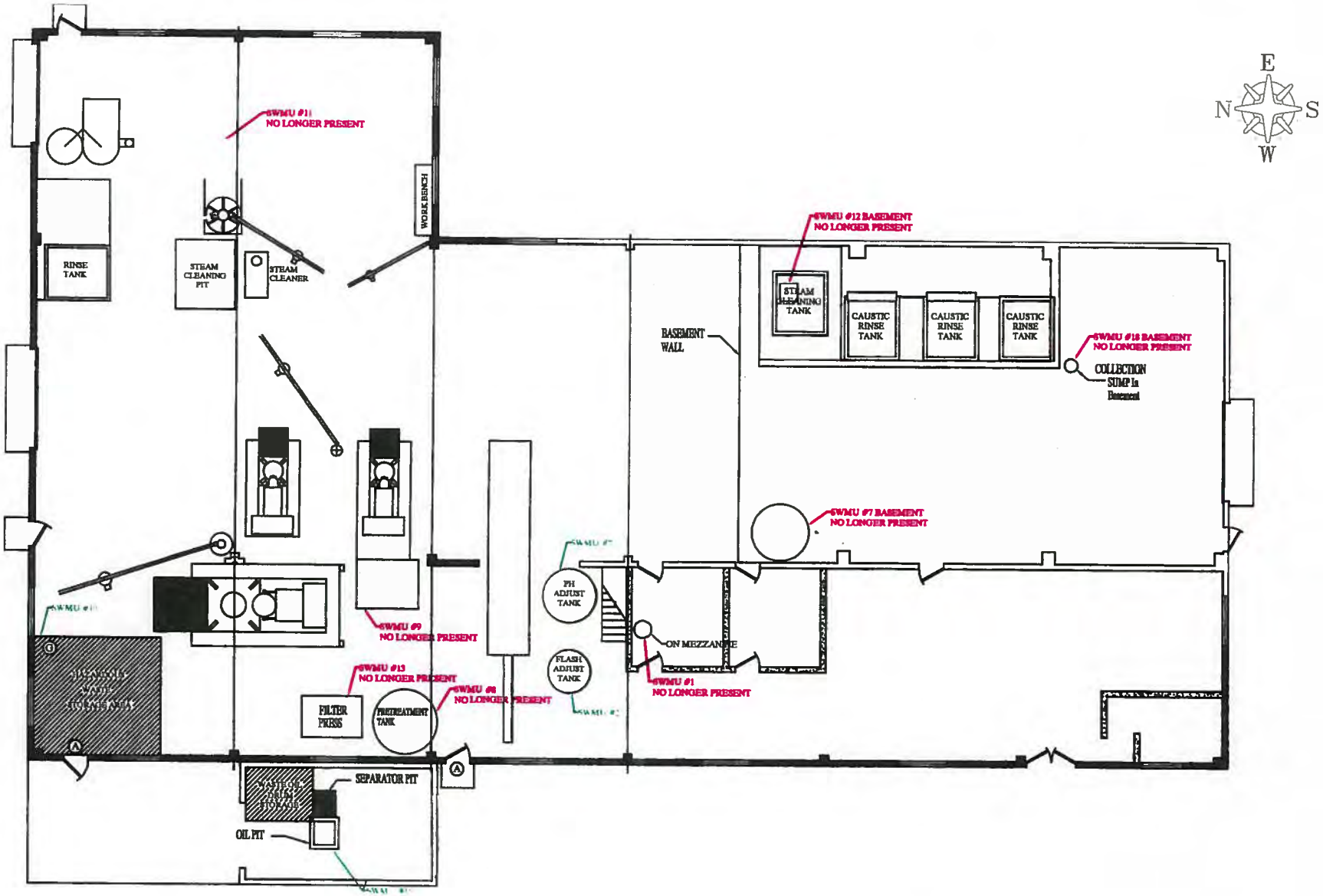
SMWU LOCATION

REV



REFERENCE O.E.M. PART NO.		EXLINE PART NO.			
JOB NO. THAT THIS DWG. WAS MADE FROM	WC. NO.	APP'D	SH OF	DATE 02/20/08	EXLINE INC.®
BARE MAT'L OF PART FOR THIS JOB NO	PROG NO	WEIGHT	DRAWN BY HC	SCALE NONE	
TITLE PLATE 2.1 SWMU LOCATIONS, OUTSIDE FORMER CHROME SHOP					DRAWING NO. SMWU LOCATIONS REV.

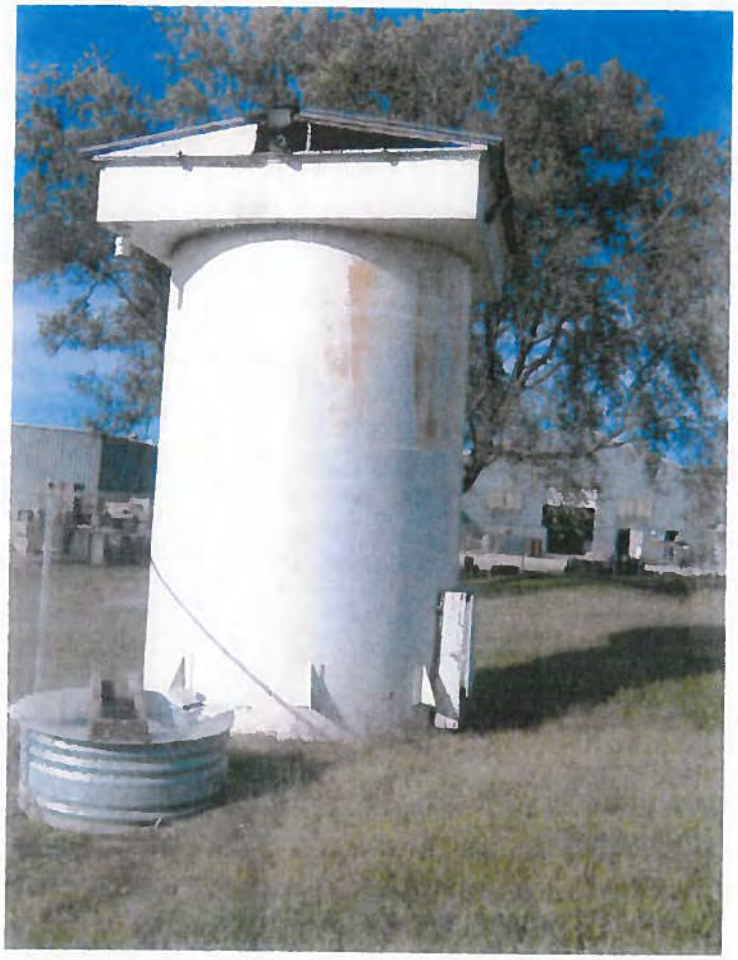
SMWU LOCATIONS



REFERENCE OEM. PART NO.		EXLINE PART NO.				
JOB NO. THAT THIS DWG. WAS MADE FROM	WC. NO.	APP'D.	SH. OF	DATE	02/20/08	EXLINE INC.
BASE MAT'L OF PART FOR THIS JOB NO.	PROG. NO.	WEIGHT	DRAWN BY HC	SCALE	NONE	
TITLE PLATE 2.2 SWMU LOCATIONS, INSIDE FORMER CHROME SHOP				DRAWING NO. SMWU LOCATIONS		REV

SWMU-1: Flash Mix Tank (no longer present) was located on mezzanine. √

SWMU # 2 – Retention Tank and SWMU # 3 – Neutralization Tank. √



SWMU-4: Clarifier. ✓

SWMU-5: Sludge Drying Bed – North Cell. ✓

SWMU-5: Sludge Drying Bed – South Cell. √

√

SWMU-6: Solids Settling Basing/Filter Bed. √

Former Location of SWMU-8 (Industrial Wastewater Chromium Reduction Treatment Tank) and SWMU-13 (Sludge Dewatering Filter Press).

Former Location of SWMU-9: Sludge Drying/Storage Beds.

SWMU-10: Designated Drum Storage Area. ✓

Former Location of SWMU-11: Designated Soil Storage Area. ✓

Former Location of SWMU-14 – Four (4) Vertical Storage Tanks.

SWMU-15: Waste Oil Skimmer and (former) Temporary Oil Storage Drum. ✓

Former Location (West Side) of SWMU-17 – Waste Pile. √

Former Location (East Side) of SWMU-17 – Waste Pile. ✓

ATTACHMENT 6-3

CORRECTIVE MEASURES STUDY REPORT
JULY, 2008

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Exline, Inc., Salina, Kansas
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Attachment C – April 4, 2008 EPA Region VII Letter – Exline Site Remediation Goals

Attachment D – Exline, Inc. Groundwater Recovery System Capture Zone Analysis

Variable Dictionary

A – area (ft^2)
A_{Cr} – area of chromium plume (ft^2)
AOC – annual operating cost ($/yr)
b – aquifer thickness (ft)
C_i – concentration of parameter i (mg/kg)
C_{Cr} – groundwater chromium concentration (mg/L)
CC – capital cost ($)
d – soil bulk density ((g/ml)
d_V – depth interval in vadose zone (ft)
K_d – sorption coefficient (ml/g)
M_{CrA} – mass of chromium in the aqueous phase of the saturated zone (lb)
M_{CrS} – mass of chromium sorbed to aquifer solids (lb)
M_i – mass of parameter i (lb)
n – aquifer porosity (dimensionless)
N – number of years of operation (years)
P_S – percent saturation expressed as a decimal (dimensionless)
PW – present worth ($)
ROR – rate of return as a decimal (dimensionless)
ρ_s – vadose zone soil (wet) density (lb/ft^3)

1. Introduction/Purpose.

This Corrective Measures Study (CMS) Report has been prepared for the Exline, Inc. facility, Salina, Kansas. The Report has been prepared in accordance with requirements set forth in the Exline, Inc. Hazardous Waste Permit (Section C.9 – Corrective Measures Study Work Plan and Section C.10 – Corrective Measures Study Report). A RCRA Facility Investigation (RFI), which was conducted by Exline, Inc., has led to the determination by EPA that there has been a release of hazardous waste and/or hazardous waste constituents from each of the following Solid Waste Management Units/Areas of Concern (SWMUSs/AOCs) in excess of human health based risk levels:

- Deionizer Column Regeneration Discharge Area.
- Brown Soil Stain Area.
- Chrome Plating Bath Ventilation Discharge Area.
- Concrete Culvert Area.

The purpose of this CMS Report is to summarize the findings with respect to the evaluation of corrective measures for each of the above-listed SWMUs. Each corrective measure has been evaluated using the following four (4) threshold criteria:

1) Protection of human health and the environment.
2) Attainment of media cleanup standards set by EPA.
3) Controlling the sources of releases to reduce or eliminate further releases that may pose a threat to human health and the environment.
4) Compliance with applicable standards for management of wastes.

Each corrective measure was also evaluated using the following five (5) balancing criteria:

1) Long-term reliability and effectiveness.
2) Reduction of toxicity, mobility, or volume of wastes.
3) Short-term effectiveness.
4) Implementability.
5) Cost.

Finally, the corrective action alternatives, which are evaluated in this Report, have been developed in order to meet the following corrective action objectives:

1) Control the contaminant sources across the entire site to prevent continued contaminant leaching to groundwater that could result in migration or exceedance of groundwater quality standards.

2) For site-wide groundwater, prevent off-site migration of contamination.

3) Restore groundwater quality to levels that are protective of beneficial uses (i.e., constituent of concern concentrations less than or equal to MCLs for drinking water).

4) Prevent human exposure to surface and sub-surface soils containing contaminants of concern above specified media cleanup standards.

5) In the event that remediation objectives are based on the industrial use scenario, then Institution Controls prohibiting the property for residential use will be imposed.

6) Achieve soil cleanup standards, which meet the Remediation Goals established by EPA (Section 4)

2. Description of Current Conditions.

A site location map and facility layout map are included as Plates 2.1 and 2.2, respectively.

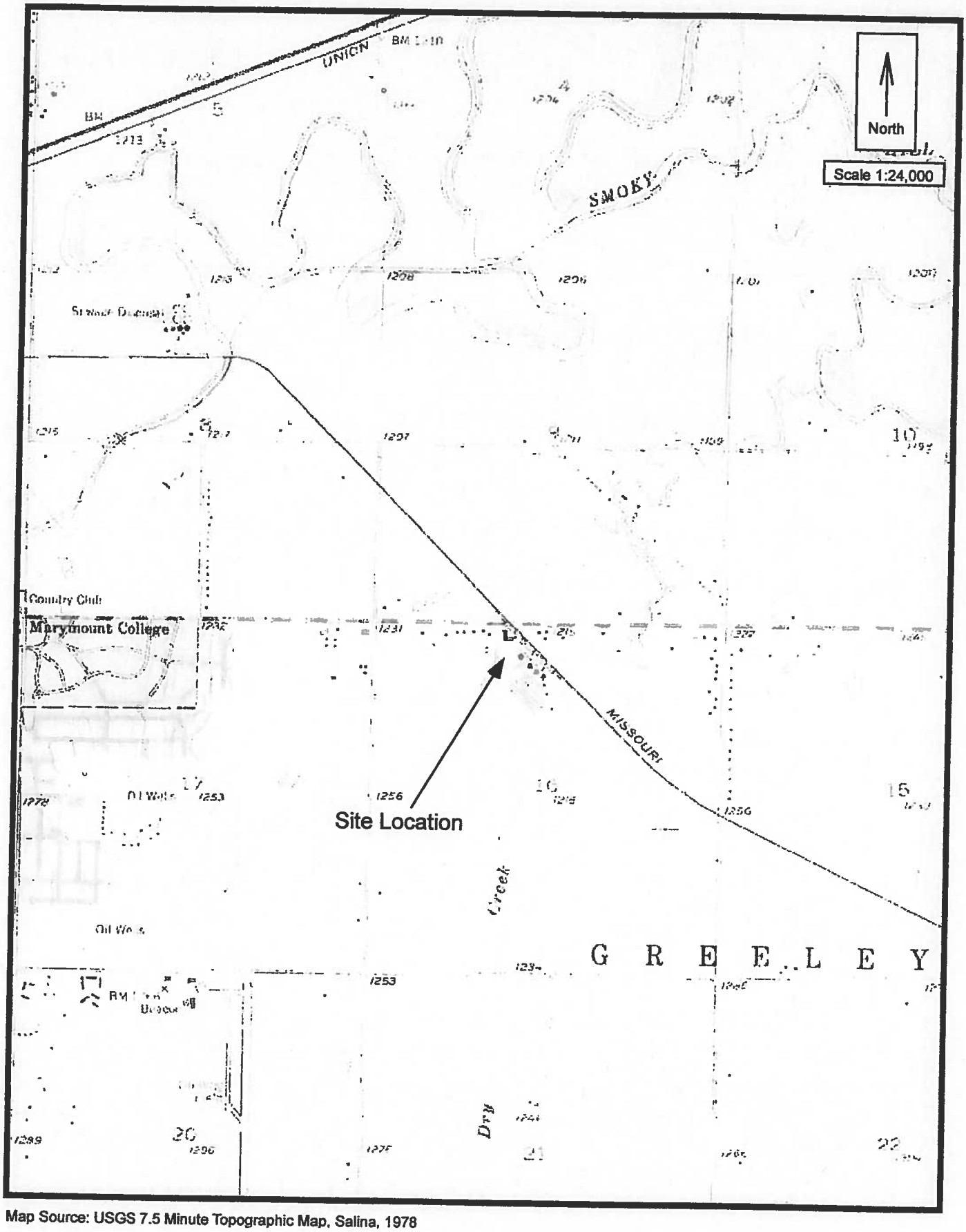
A RCRA Facility Investigation (RFI) has been conducted at the Exline, Inc. facility. Sampling projects were conducted at the site as follows:

1) Soil sampling – October, 1992.
2) Soil sampling – November, 2005.
3) Surface water run-off sampling – April, 2006.
4) Soil sampling – May and June, 2006.

The results of these sampling events are summarized in the following document, which was prepared by Shepard Engineering, Inc., on behalf of Exline, Inc.:

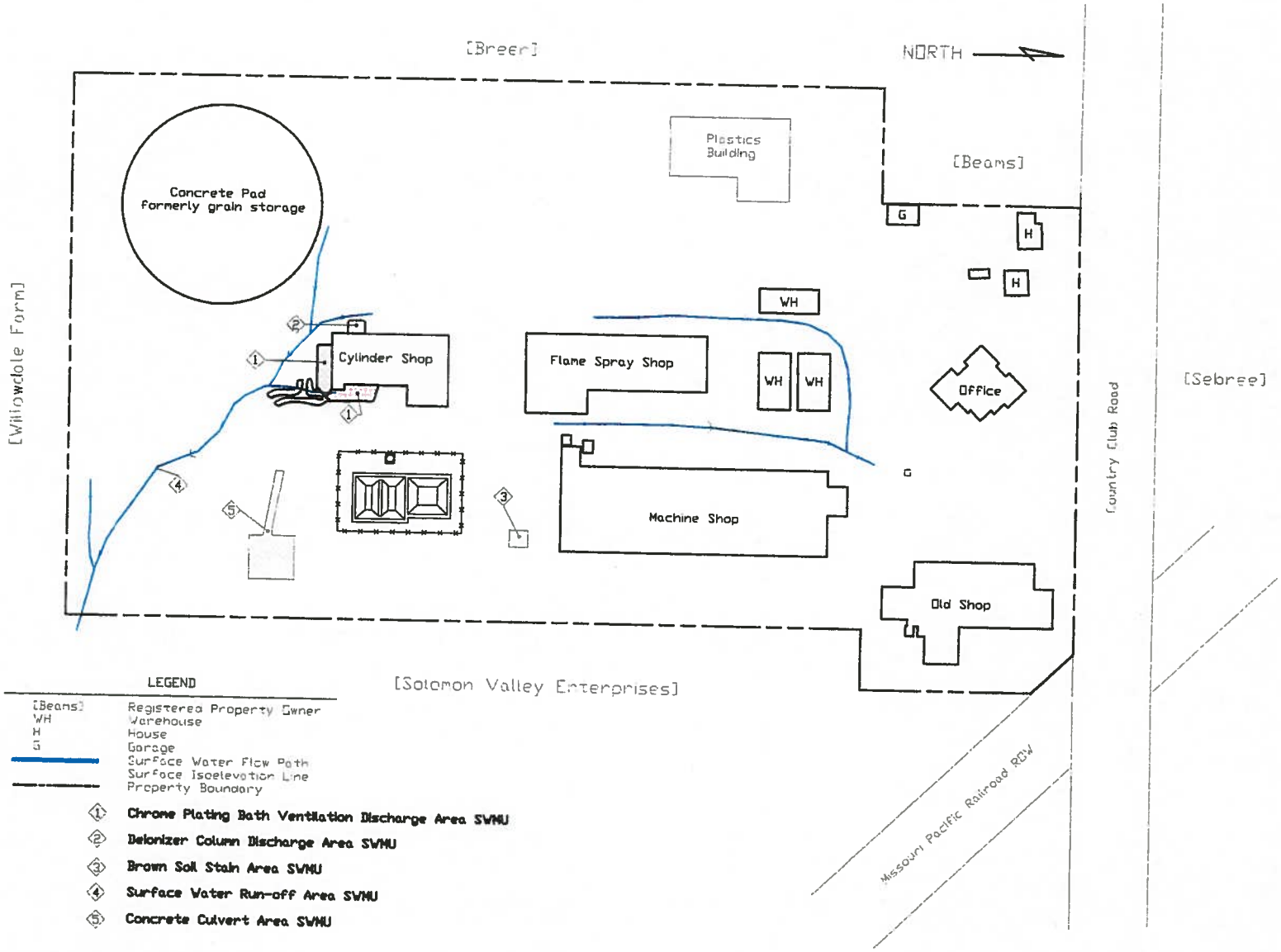
"RFI Report", Exline, Inc., Salina, Kansas, February, 2007.

As discussed in more detail in a subsequent section, additional soil sampling was conducted at the site on March 18, 2008 as part of the Corrective Measures Study (CMS).



Map Source: USGS 7.5 Minute Topographic Map, Salina, 1978

Plate 2.1: Site Location Map



LEGEND

[Beans]	Registered Property Owner
WH	Warehouse
H	House
G	Garage
	Surface Water Flow Path
	Surface Isoelevation Line
	Property Boundary

1. **Chrome Plating Bath Ventilation Discharge Area SWMU**
2. **Deionizer Column Discharge Area SWMU**
3. **Brown Soil Stain Area SWMU**
4. **Surface Water Run-off Area SWMU**
5. **Concrete Culvert Area SWMU**

200 0 200 400 600
Scale (Feet)

Plate 2.2: Facility Layout Map

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
05-0101	May 2008	Jack Eslick

3. Summary of Additional Data Generated.

3.1. Background.

Additional soil sampling data were generated during a March 18, 2008 sampling event at the Exline, Inc. site. This sampling was conducted with two objectives:

1) Evaluate total chromium concentrations in the soil at and just beyond the Exline, Inc. property line. This sampling was conducted since the RFI sampling in the surface water run-off ditch located in the southeast part of the facility had exhibited chromium concentrations slightly above the KDHE Tier 2 risk-based level of 390 mg/kg (soil pathway – residential scenario).

2) Generate TCLP chromium and TCLP lead concentration data from select sample locations. These TCLP data will be used to assist in evaluating whether excavated soil would likely require disposal as hazardous or non-hazardous waste. As discussed in the December, 2007 CMS Work Plan, the TCLP analysis generated as part of the CMS will <u>not</u> be used to determine whether any excavated soil (should soil excavation be selected as a corrective measure) is or is not hazardous waste. That determination would be made by collecting and analyzing representative samples of the excavated soil. Rather, the TCLP data generated as part of the CMS will be used solely for the purpose of estimating the quantities of soil, which would likely be hazardous and non-hazardous, upon excavation. This information will then be used to more accurately estimate costs that would be associated with the excavation remedial alternative.

3.2. Sampling to Evaluate Off-Site Chromium Concentrations in Soil.

Samples were collected on March 18, 2008 by Enviro Tech Services, Inc. personnel at the locations identified on Plate 5.1 in the December, 2007 Corrective Measures Study Work Plan. The soil samples were collected by Enviro Tech Services, Inc. personnel in accordance with procedures set forth in Section 6 of the RFI Work Plan Addendum dated November, 2005. Samples were submitted to Continental Analytical Services (CAS) Laboratory, Salina, Kansas for analysis.

Sample results are summarized in Table 3.1 and are shown on Plate 3.1. Table 3.1 also includes a summary of the KDHE Tier 2 standards for total chromium. A copy of the CAS laboratory report is included as Attachment A.

These results demonstrate that off-site soil total chromium concentrations have not exceeded the KDHE Tier 2 risk-based standard (soil pathway – residential scenario) of 390 mg/kg.

There is a significant difference in the duplicate sample results for sample ID DA-6-3, which represents the sample collected from 1" to 3' at sample location # 6. The duplicate sample is identified as "Soil B" on the CAS laboratory report. However, both soil sample

results collected at sample location # 7 (adjacent to the Exline property) were well below the KDHE standard of 390 mg/kg.

As shown on the CAS Lab report and QA/QC report, no data qualifiers were identified with respect to the subject analyses.

3.3. Sampling to Evaluate Hazardous vs. Non-Hazardous Nature of Soil.

Soil samples were collected by Enviro Tech Services personnel on March 18, 2008 in accordance with the December, 2007 CMS Work Plan. As noted in a March 5, 2008 letter to EPA Region VII, three (3) additional soil samples were added to the sampling program in order to satisfy EPA concerns regarding the identification of soils, which could be hazardous waste upon excavation (if soil excavation is a selected remedy). As a result, a total of ten (10) soil samples plus one (1) duplicate were collected at the site.

Soil samples were collected by Enviro Tech Services, Inc. personnel in accordance with procedures set forth in Section 6 of the RFI Work Plan Addendum, November, 2005. Samples were submitted to CAS Laboratories, Salina, Kansas for analysis.

Sample results are summarized in Table 3.2. A copy of the CAS laboratory report is included as Attachment B.

Based on the results that are summarized in Table 3.2, it appears likely that only the soil around sample location # 2 would be hazardous waste, if excavated. These results are not unexpected since the soil at sample location # 2 previously exhibited the highest hexavalent chromium concentrations. Hexavalent chromium is generally quite soluble, whereas, trivalent chromium is generally insoluble. Since the TCLP test is a 24 hour leaching process using pH 5 acetic acid, it is logical that the soil samples with the higher hexavalent chromium concentrations (i.e., around sample location # 2) would exhibit the highest TCLP concentrations.

The results also indicate that total chromium is not a good predictor with respect to TCLP results. For example, several of the samples exhibited high total chromium concentrations and low TCLP chromium concentrations.

The sample (collected from the Brown Soil Stain SWMU), which was analyzed for TCLP lead was non-detect. That sample was collected from an area, which was expected to exhibit a high total lead concentration, based on previous sample results. However, the measured total lead concentration was only 106 mg/kg. The TCLP concentration for that sample was less than 0.05 mg/L. However, as shown below, even if one assumed that a higher lead concentration would leach a proportional amount of lead, it is not likely that the sample TCLP concentration would exceed the 5 mg/L TCLP hazardous waste limit:

[(2720 mg/kg)/(106 mg/kg)] x (0.05 mg/L) = 1.3 mg/L

TABLE 3.1: SURFACE WATER RUN-OFF AREA SOIL SAMPLE CHEMICAL ANALYSIS RESULTS
EXLINE, INC., SALINA, KANSAS

Sample ID	Sample Depth	Total Chromium (mg/kg)	Sample Location Property
DA-6-Surf	surface	276	Exline
DA-6-3	1" - 3'	839	Exline
Soil B	1" - 3'	186	Exline
DA-7-Surf	surface	150	Scoular
DA-7-3	1" - 3'	205	Scoular

Notes:
1. Soil sample collected by Enviro Tech Services, Inc. personnel on March 18, 2008.
2. Analyses completed by CAS Laboratories, Salina, Kansas.
3. "Soil B" is a duplicate of "DA-6-3".
4. KDHE Tier 2 Standards are:
   Residential Scenario Soil Pathway - 390 mg/kg.
   Industrial Scenario Soil Pathway - 4000 mg/kg.

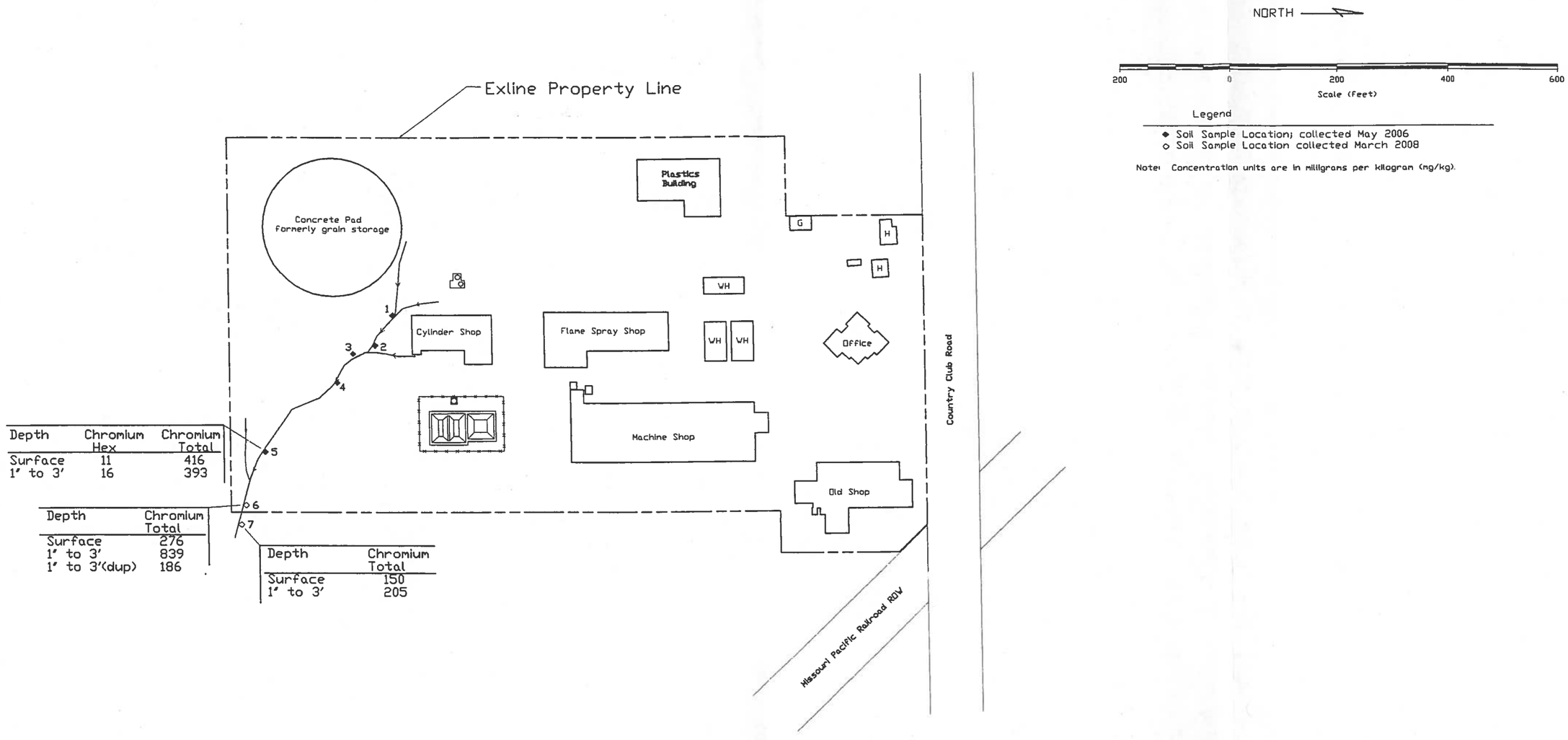


Plate 3.1
Addtional Surface Water Run-off Area
Soil Sample Locations Chemical
Analysis Results

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
Project Number: 08-0101	Date: May 2008	Drawn by: Jack Eslick

TABLE 3.2: SOIL SAMPLE CHEMICAL ANALYSIS RESULTS-EVALUATION OF HAZARDOUS WASTE STATUS
EXLINE, INC., SALINA, KANSAS

SWMU ID	Sample ID	Sample Depth	March 18, 2008 Results		Previous Sample Results	
			Total Cr (mg/kg)	TCLP Cr (mg/L)	Total Cr (mg/kg)	Hexavalent Cr (mg/kg)
CPBVDA	#2 - Surface (R)	surface	848	< 0.10	3880	246
CPBVDA	#2 - Deep (R)	3' - 5'	1090	44.5	1010	937
CPBVDA	CS-ES-6-Surf (R)	surface	484	< 0.10	480	12
CPBVDA	CS-ES-8-3 (R)	1" - 3'	1370	2.68	2630	126
CPBVDA	CS-ES-17-surf (R)	surface	754	2.08	1310	38
CPBVDA	CS-ES-10-5 (R)	3' - 5'	209	0.47	231	22
DCDA	CW-4-Surf (R)	surface	721	< 0.10	1430	54
BSSA	MS-2-Surf (R)	surface	532	< 0.10	2180	< 10
BSSA	MS-2-Surf (R)	surface	106 (Pb)	< 0.05 (Pb))	2720 (Pb)	NA
SWROA	DA-5-Surf (R)	surface	2080	0.17	416	11
CPBVDA	Soil A	3' - 5'	949	44.7	1010	937

Notes:

1. Each sample location was previously sampled -(R)denotes collection of a re-sample on 3/18/08.
2. SWMU IDs are:
   - CPBVDA - chrome plating bath ventilation discharge area.
   - DCDA - deionizer column discharge area.
   - BSSA - brown soil stain area.
   - SWROA - surface water run-off area.
3. "Soil A" is a duplicate sample of "# 2 - Deep (R)".
4. TCLP hazardous waste limits are 5.0 mg/L for both chromium and lead.
5. Previous sample results were generated in 2005 and 2006.

This information will be used in subsequent evaluations of the disposal cost that would be associated with excavation and off-site disposal of soil.

4. Summary of Media Cleanup Standards.

4.1. Soil.

In an April 4, 2008 letter to Exline, Inc., EPA Region VII outlined remediation goals (RGs) for soil at the Exline, Inc. site (a copy of the 4/4/08 EPA letter is included as Attachment C). The remediation goals (RGs), which have been established by the EPA and background information set forth in the EPA letter, are summarized in Table 4.1. The RGs are:

- Arsenic – 8.8 mg/kg.
- Chromium III – 100,000 mg/kg.
- Chromium VI – 38 mg/kg.
- Lead – 1,067 mg/kg.

4.2. Groundwater.

Remediation goals (RGs) for groundwater are the maximum contaminant levels (MCLs) for the respective parameters. Groundwater remediation goals are also included for lead despite the fact that there is no soil to groundwater pathway value for that parameter. The groundwater remediation goal is listed only for total chromium, since the MCL is based on total chromium (i.e., not hexavalent or trivalent chromium).

Parameter	RG (mg/L)
Arsenic	0.010
Chromium	0.10
Lead	0.015

It should be noted that neither arsenic nor lead have been routinely analyzed in the groundwater at the Exline, Inc. site. Samples were collected from monitoring wells H-2, H-3, and H-4 and analyzed for arsenic as part of the June 14, 2005 monitor well sampling event. These three (3) wells are located at the down-gradient edge of the Exline, Inc. property. Arsenic sample concentrations were less than 0.010 mg/L with respect to all three (3) samples.

Samples were collected for arsenic and lead analysis in October of 2006 (as part of the Appendix IX parameter sampling event). Samples were collected from monitoring wells H-3 and H-5. Arsenic concentrations were less than 0.010 mg/L for both wells. The lead concentration was less than 0.005 mg/L for both wells. These limited data indicate that the arsenic and lead groundwater RGs have not been exceeded at the Exline, Inc. site.

TABLE 4.1: EXLINE, INC. SOIL REMEDIATION GOALS

Parameter	Industrial Soil Risk-Based PRGs	Background[1]	Migration to Groundwater PRG	Soil Remediation Goal
Arsenic	1.8 c 280 nc	8.8	5.8	8.8
Chromium III	100000 C_{max}[2]	19.1	> C^{max}	100000
Chromium VI	75 c 3300 nc	NA	38	38
Lead	1067[3]	17.6	NA	1067

Table 4.1 Notes:
All concentration units are in mg/kg.
Soil remediation goals set forth in April 4, 2008 letter from EPA Region VII to Exline, Inc.
c: cancer risk of 1×10^{-6}.
nc: non-cancer hazard index (HI) of 1.
C_{max}: ceiling limit concentration.

[1] Derived using ProUCL 4.0 (USEPA, 2007) and background data in the *RCRA Facility Investigation Sampling Program Report: Background Soil and Hexavalent Chromium Analysis Sampling* (Shepard Engineering, Inc., 2001)

[2] A ceiling limit of 10^{+5} mg/kg, equivalent to a chemical representing 10 % by weight of the soil sample, is used as a cleanup goal for chemicals whose risk-based cleanup goal approaches or exceeds unity. When concentrations exceed 10 % by weight in soil, the assumptions for soil contact may be violated (USEPA, 2004b).

[3] Derived using the Adult Lead Methodology (ALM).

5. Evaluation of Chromium Mass in Vadose Zone and Saturated Zone.

This section will calculate the mass of chromium in the vadose zone and saturated zone at the Exline site. This information will be used in subsequent evaluations of corrective measures alternatives.

5.1. Chromium Mass in Vadose Zone.

The mass of chromium in the vadose zone will be calculated for each solid waste management unit with the exception of the "Brown Soil Stain" area. The chromium mass for that area will not be calculated since both hexavalent and trivalent chromium concentrations present at levels below the remediation goals of 38 mg/kg and 100,000 mg/kg, respectively, which have been established by the EPA.

For the other SWMUs (deionizer column discharge area, chrome plating bath ventilation discharge area, and concrete culvert area), mass estimates will be developed for both total chromium and hexavalent chromium. The trivalent chromium mass will then be calculated as the difference between the total chromium mass and the hexavalent chromium mass. Concentration data will be used for these calculations from the 2005 and 2006 soil sampling events.

5.1.1. Vadose Zone Parameters.

One of the parameters needed for estimating the mass of chromium in the vadose zone is the soil density. Based on a review of the lithologic logs generated during the 1992, 2005, and 2006 vadose zone sampling events, it appears that most of the soil samples, which have been characterized at the site, are primarily mixtures of silt and clay. Bulk densities of clays[1] typically range from 0.9 g/cm^3 to 1.4 g/cm^3. The bulk density is defined as:

Bulk density = mass of solids/volume of soil

In order to determine the mass of chromium in the vadose zone, the porosity and percent moisture must also be determined. The porosity is defined as:

Porosity = void volume/total volume

The porosity of clays and silty clays are typically in the range of 0.4 to 0.5[1]. If a soil contains no moisture, then the soil density would be equal to the bulk density, i.e., would be in the range of 0.9 g/cm^3 to 1.4 g/cm^3. For the purpose of estimating the soil density at the Exline site, it will be assumed that the bulk density is 1.4 g/cm^3, the porosity is 0.45, and the moisture content is 50 % saturated (i.e., 50 % of the void space is filled with water). For that case, the soil density would be:

$[1.4 + (0.5) \times (0.45) \times (1)]$ g/(1 cm^3)

$= 1.62\ g/cm^3 = 101\ lb/ft^3$

This value will be used to calculate the mass of chromium in the vadose zone, as well as, the mass of soil, which may be excavated, at the Exline site.

5.1.2. Methodology.

The mass of a given parameter in the vadose zone will be calculated using the following equation:

$$M_i = (A) \times (d_V) \times (\rho_s) \times (C_i)]/(10^6) \qquad (5\text{-}1)$$

Where:

M_i = mass of parameter i in lb.
A = area in ft^2.
d_V = depth interval in vadose zone in ft.
ρ_s = vadose zone soil (wet) density = 101 lb/ft^3.
C_i = concentration of parameter i in mg/kg.

5.1.3. Deionizer Column Discharge Area.

Using the data shown on Plate 4.2 in the February, 2007 Exline, Inc. RFI Report, the following parameters will be inserted into Equation 5.1:

A = 352 ft^2.

d_V = 0.083 ft. for surface samples and 2.92 ft. for samples collected from 1" to 3'.

The hexavalent chromium concentration will be calculated as the arithmetic average for the parameter at the given depth. For example, the hexavalent chromium concentration for the 0 to 1" depth will be (for cases where the parameter concentration is non-detect, a value equal to ½ the detection limit will be used):

(5 + 38 + 54 + 5)/(4) mg/kg = 25.5 mg/kg (ppm)

The mass of hexavalent chromium in the 0 to 1" depth interval is then calculated using equation 5-1:

(352 ft^2) x (0.083 ft) x (101 lb/ft^3) x (25.5 ppm) x (1 $lb/10^6$ lb-ppm)

= 0.075 lb hexavalent chromium

Similar calculations for hexavalent chromium at the 1" to 3' depth and for total chromium at the 0 to 1" depth and the 1" to 3' depth yield the following data with respect to the Deionizer Column Discharge Area SMWU.

Hexavalent chromium: 1" to 3' depth:

- Area = 352 ft^2.
- Depth = 2.92 ft.
- Average concentration = 5.2 mg/kg.
- Mass = 0.54 lb.

Total chromium: 0 to 1" depth:

- Area = 352 ft^2.
- Depth = 0.083 ft.
- Average concentration = 720 mg/kg.
- Mass = 2.1 lb.

Total chromium: 1" to 3' depth:

- Area = 352 ft^2.
- Depth = 2.92 ft.
- Average concentration = 49.9 mg/kg.
- Mass = 5.2 lb.

Summary:

Hexavalent chromium mass @ 0 – 1" depth = 0.075 lb.
Hexavalent chromium mass @ 1" – 3' depth = 0.54 lb.
Hexavalent chromium mass (total) = 0.62 lb.
Total chromium mass @ 0 – 1" depth = 2.1 lb.
Total chromium mass @ 1" – 3' depth = 5.2 lb.
Total chromium mass (total) = 7.3 lb.

These data are summarized in Table 5.1.

Table 5.1 also shows the hexavalent chromium mass as a percentage of the total chromium mass. Since the chromium used at the Exline facility has been essentially 100 % hexavalent chromium, these data show that a significant percentage of the hexavalent chromium released at the Deionizer Column Discharge Area SWMU has been naturally reduced to trivalent chromium. Specifically, approximately 8.5 % of the total chromium at this SMWU remains in the form of hexavalent chromium.

The approximate volume and mass of impacted soil at this SWMU are calculated below.

In-situ volume = (352 ft^2) x (3 ft) x (1 yd^3/27 ft^3) = 39 yd^3

Assuming a 25 % increase in volume upon excavation, the excavated volume would be:

(39 yd^3) x (1.25) = 49 yd^3

The estimated mass of impacted soil is:

(352 ft^2) x (3 ft) x (101 lb/ft^3)/(1 ton/2000 lb.) = 53 tons

5.1.4. Chrome Plating Bath Ventilation Discharge Area.

Equation 5-1 will be used to calculate the hexavalent chromium and total chromium mass in the chrome plating batch ventilation discharge area SWMU. For this SWMU, the total area is relatively large. Therefore, the SWMU will be broken into sub-areas for purposes of calculating the mass. Plate 5.1 shows the sub-areas for this SWMU. Each sub-area represents a given sample location or group of sample locations (where the sample location concentrations within an area are similar). For those areas where more than one sample location exists, the arithmetic average concentration will be used in calculating the mass for that area. In general, only those sample locations, which exhibited a hexavalent chromium concentration exceeding the remediation goal of 38 mg/kg, will be included in the mass calculation estimates. An exception to that rule is sample location 12. That sample location did not exhibit a hexavalent chromium concentration in excess of 38 mg/kg, but is located near the former chrome shop and is located near two sample locations (15 and 17), which did exceed the 38 mg/kg hexavalent chromium RG.

As shown on Plate 5.1, five (5) areas are included within the chrome plating bath ventilation discharge area SWMU. These areas are designated as "A", "B", "C", "D", and "E".

A sample calculation will be presented using area "A". For the 0 to 1" depth within this area, the arithmetic average hexavalent chromium concentration is:

$(38 + 5 + 5)/3 = 29$ mg/kg = 16 mg/kg

The area is equal to 1700 ft^2.

Inserting these values into equation 5-1 yields:

$(1720\ ft^2) \times (0.083\ ft) \times (101\ lb/ft^3) \times (16\ mg/kg) \times (1\ lb/10^6\ lb\text{-}ppm)$

= 0.2 lb hexavalent chromium

Similar calculations were conducted for all five areas within this SWMU. The parameters used in the calculations and the calculation results are summarized in Tables 5.2 and 5.3 for hexavalent chromium and total chromium, respectively.

Table 5.4 summarizes the calculated hexavalent and total chromium mass values for each sub-area within the chrome plating bath ventilation discharge area for each of the sample depths. The hexavalent chromium concentration as a percentage of the total chromium concentration is also presented. Since essentially all of the chromium was released from the chrome plating ventilation discharge stacks in the hexavalent form, the percentages in Table 5.4 provide an indication regarding the amount of hexavalent chromium, which has been naturally converted to the trivalent form in the vadose zone. These data show that with the exception of Areas D and E, a very high percentage (generally greater than

90 %) of hexavalent chromium has been converted to trivalent chromium by the organic matter in the vadose zone soil. Areas D and E are located immediately adjacent to the chrome plating ventilation stacks, which were operated from the late 1960s through the early 1990s with limited ventilation system discharge controls (during that time period).

Table 5.5 provides another summary of the calculated hexavalent chromium and total chromium mass for the chrome plating bath ventilation discharge area. This table does not provide mass quantities as a function of depth, but does show the following for each area:

- Hexavalent chromium mass.
- Total chromium mass.
- Hexavalent chromium as a percentage of total chromium
- Total volume (both in-situ and excavated) and mass of impacted soil.

5.1.5. Concrete Culvert Area.

Only one sample exhibited a hexavalent chromium concentration above the remedial goal of 38 mg/kg – sample number SI-2-4.7 exhibited a hexavalent chromium concentration of 263 mg/L. All other samples from this SMWU (both 1992 and 2006 sampling events) exhibited non-detect hexavalent chromium concentrations – although it should be noted that the 1992 sample result detection limit was 50 mg/kg. The 2006 sample result detection limit for hexavalent chromium was 10 mg/kg.

For purposes of estimating the hexavalent chromium mass, it will be assumed that the impacted soil area is 10 ft. by 30 ft. with a total depth of 5 ft. Inserting these values into equation 5.1 yields:

$(300\ ft^2) \times (5\ ft) \times (101\ lb/ft^3) \times (263\ ppm) \times (1\ lb/10^6\ lb\text{-}ppm)$

= 39.8 lb. hexavalent chromium

The estimated volume and mass of impacted soil would be 56 cubic yards and 76 tons, respectively.

5.2. Chromium Mass in Saturated Zone.

The mass of dissolved hexavalent chromium in the saturated zone will be calculated using the following equation:

$$M_{CrA} = (A_{Cr}) \times (b) \times (7.48) \times (n) \times (C_{Cr}) \times (8.34 \times 10^{-6}) \qquad (5\text{-}2)$$

Where:

M_{CrA} = mass of chromium in the aqueous phase of the saturated zone (lb)

A_{Cr} = area of chromium plume (ft^2)

b = aquifer thickness (ft)

n = aquifer porosity (dimensionless) = 0.44 (typical value for sand[1])

C_{Cr} = groundwater chromium concentration (mg/L)

It will be assumed that all of the mass of chromium in the groundwater is in the hexavalent form. This assumption is based on previous sampling and analysis, which have been conducted at the site, as well as, the fact that hexavalent chromium is extremely soluble and trivalent chromium is generally insoluble.

Equation 5-2 will calculate the mass of hexavalent chromium in the aqueous (dissolved) phase. A percentage of the hexavalent chromium will also be sorbed to the soil particles in the aquifer. The mass of hexavalent chromium that is sorbed to solids can be calculated from the following equation:

$$M_{CrS} = (M_{CrA}) \times (K_d) \times (d) \times [(1 - (n) \times (P_S)/(d)]/[(n) \times (P_S)] \qquad (5\text{-}3)$$

Where:

M_{CrS} = mass of chromium sorbed to aquifer solids (lb)

M_{CrA} = mass of chromium in aqueous phase (lb)

K_d = sorption coefficient (ml/g)

d = soil bulk density = 1.65 g/ml (typical value for sand[1])

n = soil porosity (dimensionless) = 0.44 (typical value for sand[1])

P_S = percent saturation expressed as a decimal = 1.0 for saturated zone

The mass of hexavalent chromium in the aqueous phase is calculated as follows.

Plate 5.2 is a map, which shows the hexavalent chromium plume outline using the groundwater monitoring data generated at the site from the December, 2007 monitoring event. The equation 5-2 variables, which have not yet been identified are:

Area of chromium plume – from Plate 5.2, the plume is broken into two areas – identified as Area A and Area B. The areas are 21,200 ft^2 and 74,000 ft^2 for areas A and B, respectively. Based on water levels and well depths, the approximate average aquifer thicknesses for the respective areas are:

Area A – 27 ft.
Area B – 24 ft.

The average chromium concentration for Area A will be taken as the chromium concentration of the two recovery wells within that part of the plume (B-7 at 2.59 mg/L and E-3 at 2.58 mg/L). Inserting these values into equation 5-2 for area A yields a dissolved chromium mass of:

$(21200\ ft^2) \times (27\ ft) \times (0.44) \times (7.48\ gal/ft^3) \times (2.585\ ppm) \times (8.34 \times 10^{-6}\ lb/gal\text{-}ppm)$

= 40.6 lb. of dissolved chromium in Area A

The average chromium concentration for Area B will be assumed to be equal to the average of the concentration of the one monitoring well located within the plume area (H-3 at 0.97 mg/L) and the concentration of the outer plume outline (0.10 mg/L). This average concentration is 0.54 mg/L. Inserting the Area B values into equation 5-2 yields a dissolved chromium mass of:

$(74000\ ft^2) \times (24\ ft) \times (0.44) \times (7.48\ gal/ft^3) \times (0.54\ ppm) \times (8.34 \times 10^{-6}\ lb/gal\text{-}ppm)$

26.3 lb. of dissolved chromium in Area B

The total mass of dissolved chromium in the saturated zone is:

40.6 + 26.3 = 66.9 lb.

The mass of sorbed hexavalent chromium in the saturated zone is calculated using equation 5-3. The one variable, which has not yet been identified in Equation 5-3 is the sorption coefficient, K_d. Literature[2] sorption coefficients (K_d) for hexavalent chromium measured in six (6) different soil types ranged from 3.41 ml/g to 62.8 ml/g with a mean value of 11.2 ml/g. Using the mean value of 11.2 ml/g, the estimated mass of hexavalent chromium sorbed to the solids in the saturated zone is:

$M_{CrS} = (66.9\ lb.) \times (11.2\ ml/g) \times (1.65\ g/ml) \times [(1 - (0.44) \times (1)/(1.65)]/[(0.44) \times (1)]$

= 2060 lb. of hexavalent chromium sorbed to the soil in the saturated zone.

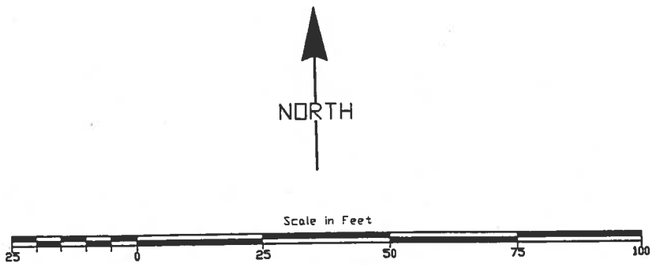
The total mass of hexavalent chromium in the saturated zone is then estimated to be:

2060 lb. + 66.9 lb. = 2127 lb.

This information will be used in subsequent calculations, which evaluate estimated cleanup times.

TABLE 5.1: DEIONIZER COLUMN DISCHARGE AREA HEXAVALENT AND TOTAL CHROMIUM MASS SUMMARIES

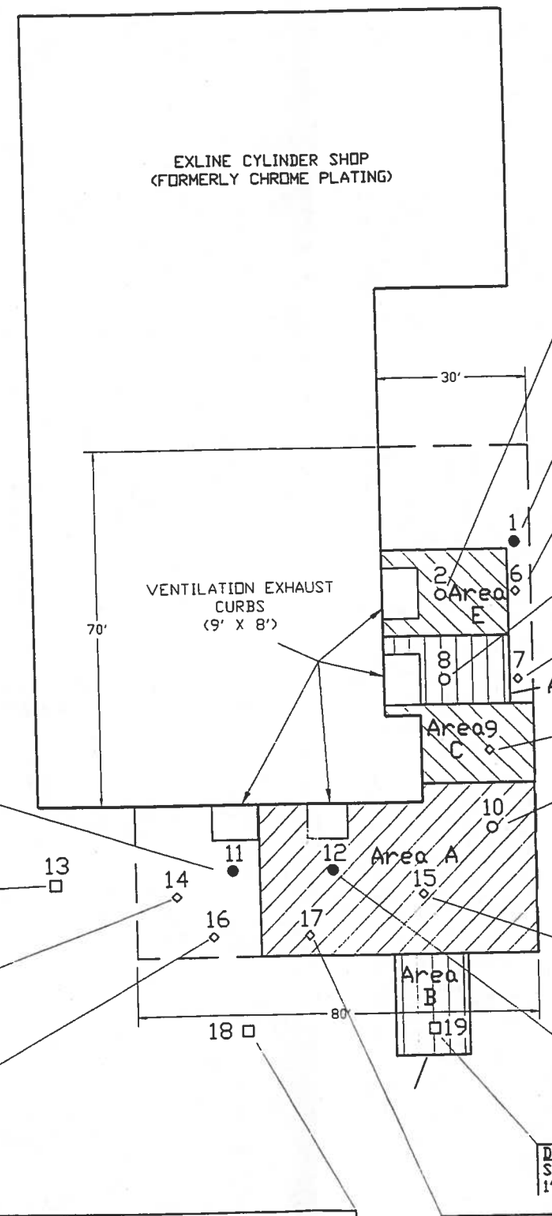
Area	Hexavalent Chromium Mass (lb)	Total Chromium Mass (lb)	Hex Cr as a % of Tot Cr
0 to 1" depth	0.075	2.1	3.6
1" to 3" depth	0.54	5.2	10.4
Total	0.62	7.3	8.5



Note: Concentration units are in milligrams per kilogram (mg/kg). ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.

Soil samples collected in May 2006, with the following exceptions (collected in November 2005):

1) All location #1 samples;
2) All location #2 samples - except for 5' to 7' depth.



Depth	Chromium, Hex	Chromium, Total
Surface	246	3880
1' to 3'	476	715
1' to 3' (dup)	531	648
3' to 5'	937	1010
5' to 7'	34	1100

Depth	Chromium, Hex	Chromium, Total
Surface	7	318
1' to 3'	8	343
3' to 5'	ND(1)	17

Depth	Chromium, Hex	Chromium, Total
Surface	12	480
1' to 3'	22	254

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	126
Surface (dup)	ND(10)	99.2
1' to 3'	ND(10)	84

Depth	Chromium, Hex	Chromium, Total
Surface	89	2810
Surface (dup)	121	2770
1' to 3'	126	2630
1' to 3' (dup)	145	1250
3' to 5'	199	317

Depth	Chromium, Hex	Chromium, Total
Surface	33	849
1' to 3'	ND(10)	337

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	324
1' to 3'	ND(10)	402

Depth	Chromium, Hex	Chromium, Total
Surface	45	1410
1' to 3'	ND(10)	753

Depth	Chromium, Hex	Chromium, Total
Surface	18	181
1' to 3'	17	253
3' to 5'	22	231

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	215
Surface (dup)	ND(10)	184
1' to 3'	ND(10)	23.6

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	275
1' to 3'	75	1990

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	16.8
1' to 3'	29	292
3' to 5'	ND(10)	30.1

Depth	Chromium, Hex	Chromium, Total
Surface	143	4470
1' to 3'	23	539

Depth	Chromium, Hex	Chromium, Total
Surface	38	1310
1' to 3'	33	338
1' to 3'(dup)	51	699

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	24.8
1' to 3'	31	305
3' to 5'	ND(10)	55.7

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	75.1
1' to 3'	ND(10)	49.4

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	68.8
1' to 3'	35	179

Depth	Chromium, Hex	Chromium, Total
Surface	38	611
1' to 3'	ND(10)	45.9

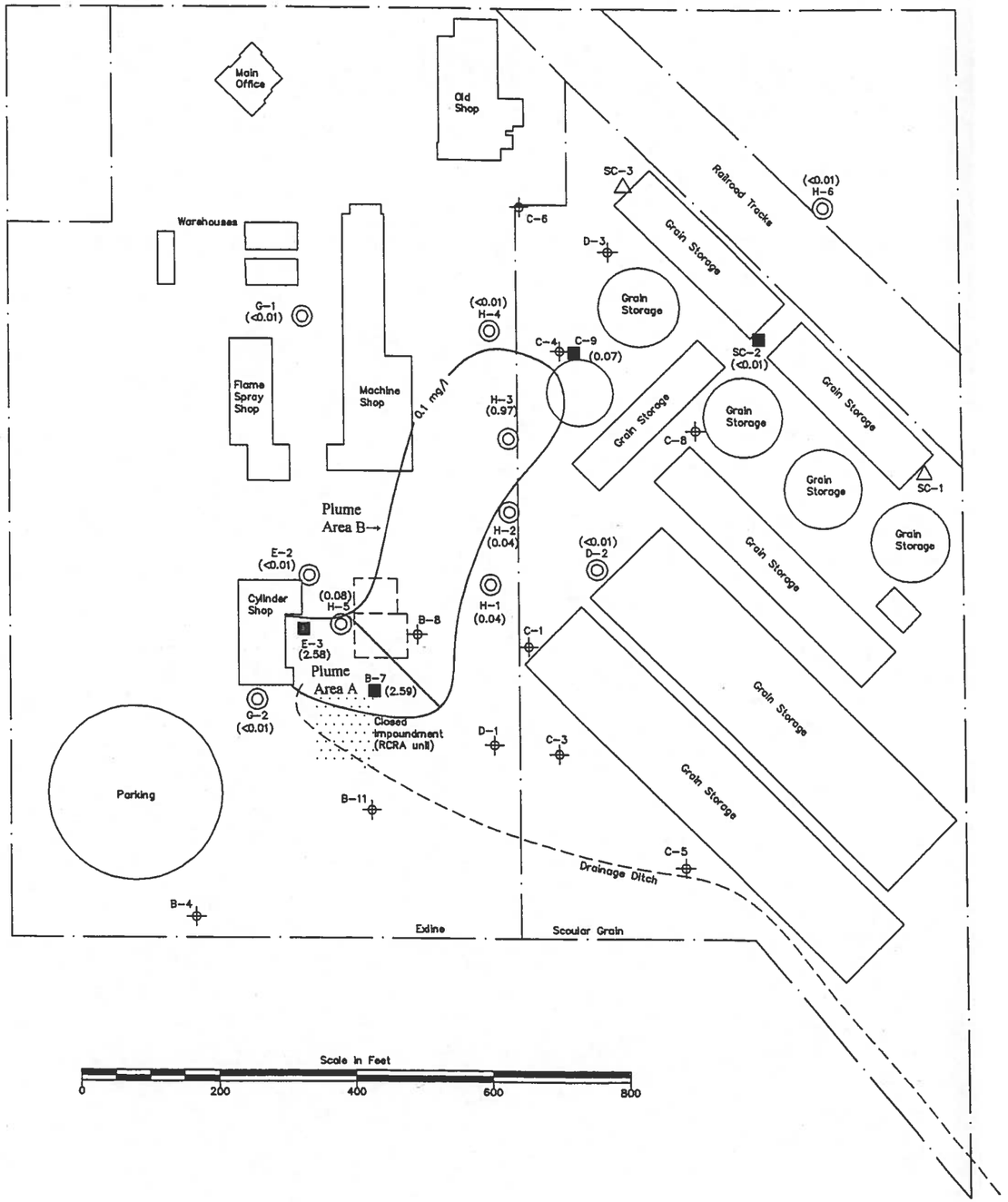
Depth	Chromium, Hex	Chromium, Total
Surface	16	158
1' to 3'	ND(10)	90.4
1' to 3' (dup)	ND(10)	89.6

Plate 5.1
RFI Areas Used for
Chromium Mass Calculations
Chrome Plating Bath
Ventilation Discharge Area

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
08-0101	May 2008	Jack Eslick



NORTH

Legend

- Monitor Well
- Recovery Well
- Piezometric Network Well
- Scoular De-Watering Well

Plate 5.2:
December, 2007 Chromium
Iso-concentration
Contour Map

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn By:
08-0101	May 2008	Jack Eslic

6. Estimated Mass and Volume of Impacted Soil.

The estimated mass and volume of impacted soil was partially addressed in section 5. Estimated values of the impacted mass and volume of soil will be summarized for each SMWU in this section for use in evaluating cleanup alternatives. The mass and volumes of impacted soil are summarized in Table 6.1 for each SWMU. An in-situ wet density of 101 lb/ft^3 was used in estimating the mass of impacted soil. In addition, it was assumed that the volume of soil would increase by 25 % upon excavation. Finally, the volume and mass of impacted soil within the Brown Soil Stain SWMU was estimated using an area of 30 ft. by 25 ft. (750 ft^2) and a depth of 3 ft.

TABLE 6.1: ESTIMATED MASS AND VOLUME OF IMPACTED SOIL
EXLINE, INC. SOLID WASTE MANAGEMENT UNITS

Solid Waste Management Unit	In-Situ Volume (yd^3)	Excavated Volume (yd^3)	Soil Mass (tons)
Deionizer column discharge area	39	49	53
Chrome plating bath ventilation discharge area - non HW	262	328	357
Chrome plating bath ventilation discharge area - HW	169	211	230
Concrete culvert area	56	70	76
Brown soil stain area	83	104	113

1750

Table 6.1 Notes:

1. A soil density of 101 lb/ft^3 was used to estimate the impacted soil mass.
2. It was assumed that the in-situ soil volume would increase by 25 % upon excavation.

7. Identification, Screening, and Development of Corrective Measures Alternatives.

As discussed in Section 1, each corrective measures alternative will be evaluated with respect to the following threshold criteria:

1) Protection of human health and the environment.
2) Attainment of media cleanup standards set by EPA.
3) Controlling the sources of releases to reduce or eliminate further releases that may pose a threat to human health and the environment.
4) Compliance with applicable standards for management of wastes.

For each corrective measure alternative, which satisfies the all of the threshold criteria, those alternatives will also be evaluated using the following five (5) balancing criteria:

1) Long-term reliability and effectiveness.
2) Reduction of toxicity, mobility, or volume of wastes.
3) Short-term effectiveness.
4) Implementability.
5) Cost.

The following corrective measures were identified in the Corrective Measures Study Work Plan as potential remediation technologies with respect to the respective solid waste management units:

1) Excavation and disposal off-site as non-hazardous waste.
2) Excavation and disposal off-site as hazardous waste.
3) Excavation and on-site treatment followed by disposal off-site as non-hazardous waste.
4) Excavation and on-site treatment followed by placement of material on-site.
5) In-situ treatment:
    a) Injection of liquid chromium reducing agent into the vadose zone.
    b) Injection of gaseous chromium reducing agent into the vadose zone.
6) Implementation of physical access restriction in combination with institutional controls.

7.1. General.

Before presenting a more detailed discussion with respect to the various corrective measures alternatives, it is appropriate to provide and discuss general information relative to the respective SWMUs. As identified in Section 1, the four (4) SWMUs, which will be evaluated herein, include:

- Deionizer Column Regeneration Discharge Area.
- Brown Soil Stain Area.
- Chrome Plating Bath Ventilation Discharge Area.
- Concrete Culvert Area.

With the exception of the "Brown Soil Stain Area" all of the SWMUs have exhibited hexavalent chromium concentration above the remediation goal (RG) of 38 mg/kg at the site. The Brown Soil Stain area SWMU has exhibited lead and arsenic concentrations above the RGs for those parameters – 1067 mg/kg and 8.8 mg/kg, respectively. None of the SWMUs has exhibited a trivalent chromium concentration above the RG (100,000 mg/kg) for that parameter.

Since the Brown Soil Stain SWMU has exhibited arsenic and lead concentrations above their respective RGs, and both of these parameters are conservative (i.e., they cannot be chemically destroyed), then the only potential remedial alternative for the soil at that SWMU will be excavation and off-site disposal. Conversely, the other SWMUs have only exhibited hexavalent chromium concentrations above the RG for that parameter. And, since hexavalent chromium can be eliminated by chemical reduction to trivalent chromium, several alternatives are available with respect to the SWMUs, which exhibit hexavalent chromium concentrations at or above the RG (38 mg/kg) for that parameter.

Also, based on the TCLP sampling and analysis data, which were generated in March of 2008 at select SWMU locations, it appears likely that the only soil, which would be hazardous waste upon excavation, would be Areas "D" and "E" within the Chrome Plating Ventilation Discharge Area SWMU. All of the other areas within the SWMUs would likely be non-hazardous waste upon excavation. This information will be used when evaluating the cost of the various remedial alternatives.

7.2. Corrective Measures Alternatives.

The following Corrective Measures alternatives will be evaluated using the four (4) threshold criteria and the five (5) balancing criteria (for those cases where the four threshold criteria are met), which were identified earlier.

7.2.1. Excavation and Off-Site Disposal – CMA-1.

This corrective measures alternative involves excavation of soil, which has exhibited parameter concentrations above the Remediation Goal (RG), with respect to one or more parameters. The approximate areas and depths of impacted soil for each of the SWMUs are shown on the following maps:

Plate 7.1: Chrome Plating Bath Ventilation Discharge Area
Plate 7.2: Deionizer Column Discharge Area
Plate 7.3: Brown Soil Stain Area
Plate 7.4: Concrete Culvert Area

Each of these maps includes the parameter concentrations generated during the RFI sampling program that was conducted in 2005 and 2006.

With the exception of an area within the Chrome Plating Bath Ventilation Discharge Area (shown on Plate 7.1), the excavated soil would likely disposed off-site as a non-hazardous waste in the City of Salina Landfill. The soil area shown on Plate 7.1 would likely need to be disposed off-site as a hazardous waste. These conclusions are based on the TCLP chemical analysis results that were presented earlier in Section 3 (see Table 3.2).

Soil would be excavated using a back-hoe and front end loader. For those areas, which would likely be disposed as non-hazardous waste, 20 cubic yard roll-off containers would be used to store the excavated soil prior to disposal (i.e., during the time that the soil is characterized to determine if it is hazardous or non-hazardous waste). Each container of excavated soil would be characterized by mixing grab samples into a single composite and submitting that composite sample for TCLP chromium analysis. In addition, soil generated from the Brown Soil Stain SWMU would be analyzed for TCLP lead. Based on the estimated volume of soil that would be generated from each area (see Table 6.1), the following approximate number of containers would be needed:

DI Column Discharge Area – 3
Chrome Plating Bath Ventilation Discharge Area (non-hazardous waste) – 17
Chrome Plating Bath Ventilation Discharge Area (hazardous waste) – 11
Concrete Culvert Area – 4
Brown Soil Stain Area – 6

It is anticipated that a select number of containers would be rented by Exline for the project (e.g., 5 or 6) and those containers would be filled with soil from a given area. The

material would be tested (i.e., TCLP analysis) to determine its hazardous waste status and the material would then be disposed accordingly. The containers would then be used again at the site following disposition of the material.

Confirmation soil sampling would be conducted in each area. Sidewall and bottom samples would be collected and analyzed for those parameters, which have exceeded cleanup standards, within the given area (i.e., hexavalent chromium for all areas except for Brown Soil Stain SWMU, which would be analyzed for total lead and total arsenic). If a sidewall or bottom sample exceeded the cleanup standard, then additional soil would be excavated in the horizontal or vertical direction, respectively. Confirmation sampling would then be repeated until such time that the cleanup standard was met.

7.2.2. Excavation and On-site Treatment – CMA-2.

This corrective measures alternative would only apply to soil, which requires remediation due to the presence of hexavalent chromium. Therefore, this alternative would only apply to the following SWMUs:

1) Deionizer column discharge area.
2) Chrome plating bath ventilation discharge area.
3) Concrete culvert area.

This alternative would not apply to the Brown Soil Stain SWMU since the parameters of concern at that SMWU are arsenic and lead, which are not amenable to treatment. That is, total arsenic and total lead are present at the Brown Soil Stain SWMU at levels above their respective remediation goals (RGs). Any form of treatment would not reduce the concentration or mass of total arsenic or total lead (unlike treatment of hexavalent chromium, which reduces that parameter to the much less toxic trivalent form). Therefore, this corrective measure alternative, if selected, would need to be implemented in combination with another alternative (i.e., excavation and off-site disposal as non-hazardous waste) for addressing the contaminated soil at the Brown Soil Stain SWMU.

It should also be noted that this corrective measures alternative may require that Exline, Inc. obtain a hazardous waste treatment permit from the Kansas Department of Health and Environment (KDHE) for the soil, which would be hazardous waste prior to treatment. This would include the soil that is located adjacent to the Cylinder Shop on the east side – as identified on Plate 7.1.

This alternative will include the evaluation of two options for disposal following treatment of the soil:

- CMA-2-A: Off-site disposal as non-hazardous waste.
- CMA-2-B: Placement of the material on-site (as fill material in the excavated areas).

With respect to the first alternative, only the soil, which would be hazardous waste (upon excavation), would need to be treated prior to off-site disposal. Soil, which was not hazardous waste, but which exhibited soil concentrations above 38 mg/kg, could be disposed off-site (as non-hazardous waste) without treatment following excavation. However, if the material were to be placed on-site as backfill, treatment would be required to reduce the hexavalent chromium concentration of all soil below the RG of 38 mg/kg.

Soil would be excavated using a backhoe and front end loader. For those areas, which would likely be disposed as non-hazardous waste, 20 cubic yard roll-off containers would be used to store the excavated soil prior to disposal (i.e., during the time that the soil is characterized to determine if it is hazardous or non-hazardous waste). Each container of excavated soil would be characterized by mixing grab samples into a single composite

and submitting that composite sample for TCLP chromium analysis. In addition, soil generated from the Brown Soil Stain SWMU would also be analyzed for TCLP lead. Based on the estimated volume of soil that would be generated from each area (see Table 6.1), the following approximate number of containers would be needed:

DI Column Discharge Area – 3
Chrome Plating Bath Ventilation Discharge Area (non-hazardous waste) – 17
Chrome Plating Bath Ventilation Discharge Area (hazardous waste) – 11
Concrete Culvert Area – 4
Brown Soil Stain Area – 6

It is anticipated that a select number of containers would be rented by Exline for the project (e.g., 5 or 6) and those containers would be filled with soil from a given area. The material would be tested to determine its hazardous waste status (i.e., TCLP) and the material would then be disposed accordingly. The containers would be used again at the site following disposition of the material.

Confirmation soil sampling would be conducted in each area. Sidewall and bottom samples would be collected and analyzed for those parameters, which have exceeded cleanup standards, within the given area (i.e., hexavalent chromium for all areas except for Brown Soil Stain SWMU, which would be analyzed for total lead and total arsenic). If a sidewall or bottom sample exceeded the cleanup standard, then additional soil would be removed in the horizontal or vertical direction, respectively. Confirmation sampling would then be repeated until such time that the cleanup standard was met.
Finally, it should be noted that this alternative would require bench-scale testing using representative soil samples in order to determine chemical dose rates and demonstrate the technical and economic feasibility of the process. A reducing agent such as calcium polysulfide, ferrous sulfate, or sodium metabisulfite would be mixed into representative soil samples in order to reduce the hexavalent chromium to the trivalent form.

Full-scale ex-situ soil treatment would likely utilize a device such as a pug mill to mix the reducing agent into the soil.

7.2.3. In-Situ Treatment – CMA-3.

In-situ treatment involves the injection of a liquid reducing agent, such as calcium polysulfide, ferrous sulfate, or sodium metabisulfite into the contaminated soil vadose zone to reduce hexavalent chromium to trivalent chromium. The goal of the treatment process would be to reduce the hexavalent chromium concentration below the RG of 38 mg/kg. Two cases will be evaluated.

Case 1 (CMA-3-A) would include only in-situ treatment of the soil, which would be hazardous waste upon excavation (area shown on Plate 7.1). The treated soil would then remain in place. The remaining soils (non-hazardous waste soils with hexavalent chromium concentrations at or above the 38 mg/kg RG and the soil from the Brown Soil Stain SWMU) would be excavated and disposed off-site in the City of Salina Landfill as non-hazardous waste.

Should the in-situ treatment process fail to reduce the hexavalent chromium concentration to a level below the RG of 38 mg/kg, then soil would be excavated and disposed off-site as hazardous or non-hazardous waste. It is possible that the in-situ treatment would reduce the hexavalent chromium to a level such that the excavated soil would be rendered non-hazardous waste, but not below the 38 mg/kg RG. As will be the case with respect to the "non-hazardous waste" hexavalent chromium-bearing soils (identified on Plate 7.1) and the Brown Soil Stain area soil, the hazardous vs. non-hazardous nature of excavated soil, which has been treated in-situ, will be determined by TCLP testing.

It should also be noted that more than one application of treatment chemical may be required in order to achieve the desired results (i.e., hexavalent chromium concentrations below the RG of 38 mg/kg).

Case 2 (CMA-3-B) includes the in-situ treatment of all hexavalent chromium contaminated soil at or above the RG of 38 mg/kg (both hazardous waste and non-hazardous waste soils). This treatment would be completed with the objective of reducing the hexavalent chromium concentration below the RG of 38 mg/kg. Those treated soils would then remain in place. Soil from the Brown Soil Stain SWMU would be excavated and disposed in the City of Salina Landfill as non-hazardous waste.

In-situ treatment of hexavalent chromium using gaseous reducing agents (hydrogen sulfide) will not be evaluated due to the following:

1) A review of the literature indicates that in-situ chromium treatment using a gaseous reducing agent (hydrogen sulfide) has only been conducted in a field test whereas in-situ treatment using the injection of liquid reducing agents have been completed at several full-scale sites.

2) Hydrogen sulfide is a poisonous gas.

3) The field study report[3] indicated that the treatment process was less effective in silt and clay lithology, which is the type of lithology present at the Exline site.

As was the case with respect to ex-situ treatment, bench-scale tests would need to be conducted in order to demonstrate the technical feasibility of the in-situ treatment process for the purpose of reducing the hexavalent chromium. The bench tests would determine chemical dosing rates and demonstrate that the process could reduce the hexavalent chromium concentration below the RG of 38 mg/kg. These bench tests would be conducted using representative soil core samples collected from the area to be treated (i.e., the area noted as hazardous waste on Plate 7.1).

The in-situ hexavalent chromium reduction process would be conducted by Environmental Bio-Systems, Inc. (EBS and FAST-TEK). EBS has successfully completed in-situ hexavalent chromium treatment projects at a number of sites over the past decade. The injection chemical of choice (as determined by the bench tests) would be delivered to the subsurface using direct-push (GeoProbe®) technology. As an example, hexavalent chromium was reduced (below the 38 mg/kg RG at the Exline site) in the vadose zone at an Electronic Manufacturing site in Van Nuys, California. This project was conducted in late 2007 and early 2008. Chemical injections were made on five (5) foot centers. Hexavalent chromium field and laboratory analyses were conducted in order to verify the treatment effectiveness.

Also, soil from the Brown Soil Stain SWMU would need to be excavated and disposed off-site as a non-hazardous waste due to the fact that the contaminants of concern (arsenic and lead) at that SWMU are not amenable to treatment.

With respect to the soil that would be excavated and transferred off-site for disposal (non-hazardous hexavalent chromium bearing soil and Brown Soil Stain SWMU soil for CMA-3-A and Brown Soil Stain SWMU soil for CMA-3-B), soil would be excavated using a backhoe and/or front end loader. For those areas, which would likely be disposed as non-hazardous waste, 20 cubic yard roll-off containers would be used to store the excavated soil prior to disposal (i.e., during the time that the soil is characterized to determine if it is hazardous or non-hazardous waste). Each container of excavated soil would be characterized by mixing grab samples into a single composite and submitting that composite sample for TCLP chromium analysis. In addition, soil generated from the Brown Soil Stain SWMU will also be analyzed for TCLP lead. Based on the estimated volume of soil that would be generated from each area (see Table 6.1), the following number of containers would be needed:

DI Column Discharge Area – 3 (CMA-3-A)
Chrome Plating Bath Ventilation Discharge Area (non-haz. waste) – 17 (CMA-3-A)
Concrete Culvert Area – 4 (CMA-3-A)
Brown Soil Stain Area – 6 (CMA-3-A and CMA-3-B)

It is anticipated that a select number of containers would be rented by Exline for the project (e.g., 5 or 6) and those containers would be filled with soil from a given area. The

material would be tested to determine its hazardous waste status (i.e., TCLP) and the material would then be disposed accordingly. The containers would be used again at the site following disposition of the material.

Confirmation soil sampling would be conducted in each area. Sidewall and bottom samples would be collected and analyzed for those parameters, which have exceeded cleanup standards, within the given area (i.e., hexavalent chromium for all areas except for Brown Soil Stain SWMU, which would be analyzed for total lead and total arsenic). If a sidewall or bottom sample exceeded the cleanup standard, then additional soil would be removed in the horizontal or vertical direction, respectively. Confirmation sampling would then be repeated and additional soil would be excavated (if required) until such time that the cleanup standard was met.

7.2.4. Leave Soil in Place and Restrict Access (CMA-4).

This corrective measures alternative involves the following elements:

1) Leave part of the hexavalent chromium-contaminated soil (hazardous waste soil) in place and allow chromium to migrate to groundwater where it would be captured and removed in the existing groundwater recovery system.

2) Restrict access to areas, which exhibit concentrations above the hexavalent chromium soil pathway standard of 75 mg/kg. It should be noted that the 75 mg/kg standard would be used for this alternative since this is the "Industrial Soil Risk-Based Standard" (see Table 4.1). Since for this case, the hexavalent chromium would be allowed to migrate to groundwater, the 38 mg/kg "Migration to Groundwater PRG" would not apply.

Access would be restricted by constructing a fence around the restricted area (Areas D and E shown on Plate 5.1 and the soil identified as hazardous waste soil on Plate 7.1). Also, since soil would be left in place at levels above the RG of 38 mg/kg hexavalent chromium, some type of institutional control (e.g., a deed restriction) would be required to insure that the property use was controlled and that the impacted soil was not disturbed without proper controls (e.g., sampling and analysis followed by proper disposal).

3) Excavate soil in two areas, which exhibit hexavalent chromium concentrations above the soil pathway standard of 75 mg/kg and dispose soil as non-hazardous waste in the City of Salina landfill. These areas would include Area B shown on Plate 5.1 and the concrete culvert area shown on Plate 7.4. The (excavated) volume and mass of these two areas are:

Area B – 42 yd^3 = 45 tons
Concrete culvert area – 70 yd^3 = 76 tons

These two areas are relatively small and would be more difficult to restrict access. In addition, the soil generated by excavation of these areas would likely be non-hazardous waste.

4) Excavate soil at the Brown Soil Stain SWMU and dispose as non-hazardous waste in the City of Salina Landfill. Since this soil would most likely be non-hazardous waste, the excavation and disposal alternative would be much more cost-effective and practical than attempting to restrict access.

This alternative presumes that the hexavalent chromium, which is present in the soil above the RG of 38 mg/kg, would be captured in the groundwater remediation system recovery wells. A capture zone analysis was conducted in 2001 with respect to the pumping wells at the Exline site. The information generated by this analysis was submitted to the KDHE in a letter and attachments dated October 31, 2001. A copy of that letter and the attachments is included as Attachment D. It should be noted that the KDHE reviewed and approved this evaluation.

This capture zone analysis demonstrates that any of the hexavalent chromium that would be released to the groundwater from the vadose zone (from any of the hexavalent chromium-bearing SWMUs) would be captured by the Exline recovery wells (B-7, E-3, and C-9). Drawings identified as Plate IVA-1 and Plate IVA-2 were attached to the October 31, 2001 letter. These drawings show the capture zone for two cases – hydraulic conductivity of 35 ft/day and 128 ft/day, respectively. These drawings show that even under the most conservative scenario (hydraulic conductivity value of 128 ft/day shown on Plate IVA-2), the Exline recovery wells (B-7, C-9, and E-3) would capture hexavalent chromium released from the Chrome Plating Bath Ventilation Discharge Area SWMU at the Exline, Inc. site.

For those areas where soil would be excavated (as described above), 20 cubic yard roll-off containers would be used to store the excavated soil prior to disposal (i.e., during the time that the soil is characterized to determine if it is hazardous or non-hazardous waste). Each container of excavated soil would be characterized by mixing grab samples into a single composite and submitting that composite sample for TCLP chromium analysis. In addition, soil generated from the Brown Soil Stain SWMU would be analyzed for TCLP lead. Based on the estimated volume of soil that would be generated from each area (see Table 6.1), the following number of containers would be needed:

Chrome Plating Bath Ventilation Discharge Area B (non-haz. waste) – 2
Concrete Culvert Area – 4
Brown Soil Stain Area – 6

It is anticipated that a select number of containers would be rented by Exline for the project (e.g., 5 or 6) and those containers would be filled with soil from a given area. The material would be tested to determine its hazardous waste status (i.e., TCLP) and the material would then be disposed accordingly. The containers would be used again at the site following disposition of the material.

Confirmation soil sampling would be conducted in each area. Sidewall and bottom samples would be collected and analyzed for those parameters, which have exceeded cleanup standards, within the given area (i.e., hexavalent chromium for all areas except for the Brown Soil Stain SWMU, which would be analyzed for total lead and total arsenic). If a sidewall or bottom sample exceeded the cleanup standard, then additional soil would be removed in the horizontal or vertical direction, respectively. Confirmation sampling would then be repeated until such time that the cleanup standard is met.

TABLE 5.2: CHROME PLATING BATH VENTILATION DISCHARGE AREA HEXAVALENT CHROMIUM MASS SUMMARIES

Area ID	0 to 1" depth interval		1" to 3' depth interval		3' to 5' depth interval		5' to 7' depth interval		Total Hex Cr Mass (lb)
	Avg. Hex Cr Conc. (mg/kg)	Hex Cr Mass (lb)	Avg. Hex Cr Conc. (mg/kg)	Hex Cr Mass (lb)	Avg. Hex Cr Conc. (mg/kg)	Hex Cr Mass (lb)	Avg. Hex Cr Conc. (mg/kg)	Hex Cr Mass (lb)	
A	16	0.2	49	24.9	NA	NA	NA	NA	25.1
B	143	0.4	23	2.0	NA	NA	NA	NA	2.4
C	45	0.1	5	0.5	NA	NA	NA	NA	0.6
D	105	0.3	136	14.0	199	14.1	NA	NA	28.4
E	246	0.8	504	59.5	937	75.7	34	2.7	138.7
	Totals:	1.9		100.9		89.8		2.7	195.3

Parameters Used In Calculations:

soil bulk density	101 lb/ft^3
"A" area	1720 ft^2
"B" area	300 ft^2
"C" area	340 ft^2
"D" area	350 ft^2
"E" area	400 ft^2

TABLE 5.3: CHROME PLATING BATH VENTILATION DISCHARGE AREA TOTAL CHROMIUM MASS SUMMARIES

	0 to 1" depth interval		1" to 3' depth interval		3' to 5' depth interval		5' to 7' depth interval		Total
Area ID	Avg. Tot Cr Conc. (mg/kg)	Tot Cr Mass (lb)	Avg. Tot Cr Conc. (mg/kg)	Tot Cr Mass (lb)	Avg. Tot Cr Conc. (mg/kg)	Tot Cr Mass (lb)	Avg. Tot Cr Conc. (mg/kg)	Tot Cr Mass (lb)	Tot Cr Mass (lb)
A	534	7.7	934	473.8	NA	NA	NA	NA	481.5
B	4470	11.2	539	47.7	NA	NA	NA	NA	58.9
C	1410	4.0	753	75.5	NA	NA	NA	NA	79.5
D	2790	8.2	1940	200.3	317	22.4	NA	NA	230.8
E	3880	13.0	682	80.5	1010	81.6	1100	88.9	264.0
	Totals:	44.2		877.7		104.0		88.9	1114.7

Parameters Used In Calculations:

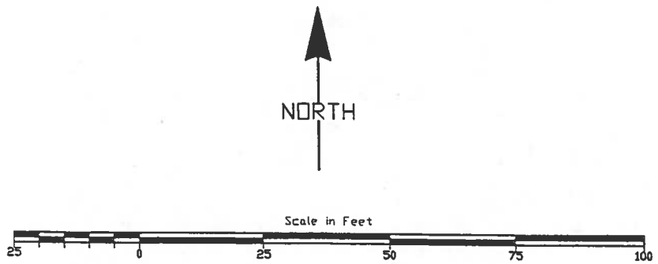
soil bulk density	101 lb/ft^3
"A" area	1720 ft^2
"B" area	300 ft^2
"C" area	340 ft^2
"D" area	350 ft^2
"E" area	400 ft^2

TABLE 5.4: CHROME PLATING BATH VENTILATION DISCHARGE AREA
HEXAVALENT CHROMIUM MASS AS A FUNCTION OF TOTAL CHROMIUM MASS

	0 to 1" depth interval			1" to 3' depth interval			3' to 5' depth interval			5' to 7' depth interval		
Area ID	Hex Cr Mass (lb)	Tot Cr Mass (lb)	Hex Cr as % of Tot Cr	Hex Cr Mass (lb)	Tot Cr Mass (lb)	Hex Cr as % of Tot Cr	Hex Cr Mass (lb)	Tot Cr Mass (lb)	Hex Cr as % of Tot Cr	Hex Cr Mass (lb)	Tot Cr Mass (lb)	Hex Cr as % of Tot Cr
A	0.2	7.7	2.6	24.9	473.8	5.3	NA	NA	NA	NA	NA	NA
B	0.4	11.2	3.6	2.0	47.7	4.2	NA	NA	NA	NA	NA	NA
C	0.1	4.0	2.5	0.5	75.5	0.7	NA	NA	NA	NA	NA	NA
D	0.3	8.2	3.7	14.0	200.3	7.0	14.1	22.40	62.9	NA	NA	NA
E	0.8	13.0	6.2	59.5	80.5	73.9	75.7	81.60	92.8	2.7	88.9	3.0
Totals:	1.8	44.1	4.1	100.9	877.8	11.5	89.80	104.00	86.3	2.7	88.9	3.0

TABLE 5.5: CHROME PLATING BATH VENTILATION DISCHARGE AREA HEXAVALENT CHROMIUM AND TOTAL CHROMIUM MASS SUMMARY

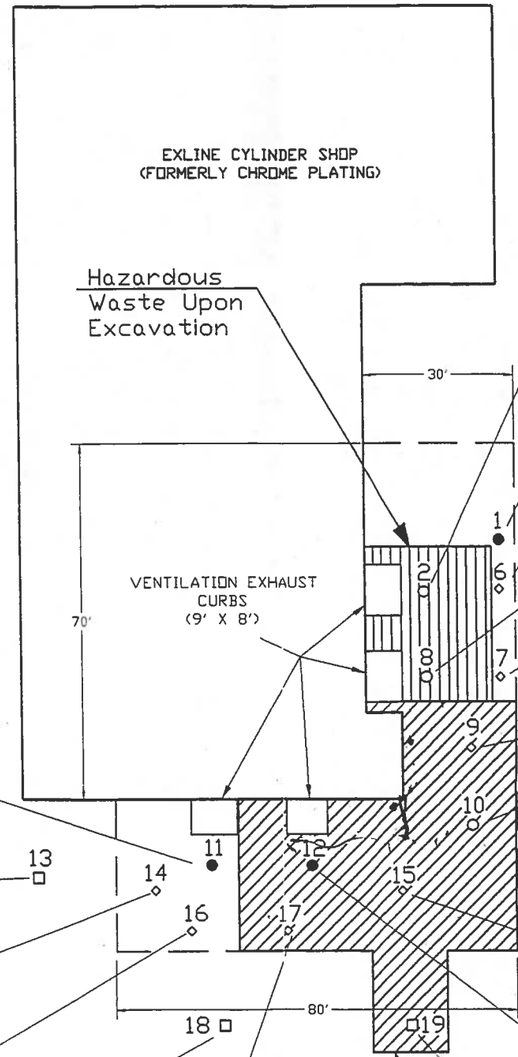
Area ID	Hex Cr Mass (lb)	Tot Cr Mass (lb)	Hex Cr as % of Tot Cr	Soil Depth (ft)	Area (ft^2)	In-Situ Soil Vol (yd^3)	Excavated Soil Vol (yd^3)	Soil Mass (tons)
A	25.1	481.5	5.2	3	1720	191	239	261
B	2.4	58.9	4.1	3	300	33	42	45
C	0.6	79.5	0.8	3	340	38	47	52
D	28.4	230.8	12.3	5	350	65	81	88
E	138.7	264.0	52.5	7	400	104	130	141
Totals:	195.2	1114.7	17.5			431	538	587



Note: Concentration units are in milligrams per kilogram (mg/kg). ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.

Soil samples collected in May 2006, with the following exceptions (collected in November 2005):

1) All location #1 samples;
2) All location #2 samples - except for 5' to 7' depth.



Depth	Chromium, Hex	Chromium, Total
Surface	246	3880
1' to 3'	476	715
1' to 3' (dup)	531	648
3' to 5'	937	1010
5' to 7'	34	1100

Depth	Chromium, Hex	Chromium, Total
Surface	7	318
1' to 3'	8	343
3' to 5'	ND(1)	17

Depth	Chromium, Hex	Chromium, Total
Surface	12	480
1' to 3'	22	254

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	126
Surface (dup)	ND(10)	99.2
1' to 3'	ND(10)	84

Depth	Chromium, Hex	Chromium, Total
Surface	89	2810
Surface (dup)	121	2770
1' to 3'	126	2630
1' to 3' (dup)	145	1250
3' to 5'	199	317

Depth	Chromium, Hex	Chromium, Total
Surface	33	849
1' to 3'	ND(10)	337

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	324
1' to 3'	ND(10)	402

Depth	Chromium, Hex	Chromium, Total
Surface	45	1410
1' to 3'	ND(10)	753

Depth	Chromium, Hex	Chromium, Total
Surface	18	181
1' to 3'	17	253
3' to 5'	22	231

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	215
Surface (dup)	ND(10)	184
1' to 3'	ND(10)	23.6

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	275
1' to 3'	75	1990

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	16.8
1' to 3'	29	292
3' to 5'	ND(10)	30.1

Depth	Chromium, Hex	Chromium, Total
Surface	143	4470
1' to 3'	23	539

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	24.8
1' to 3'	31	305
3' to 5'	ND(10)	55.7

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	75.1
1' to 3'	ND(10)	49.4

Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	68.8
1' to 3'	35	179

Depth	Chromium, Hex	Chromium, Total
Surface	38	611
1' to 3'	ND(10)	45.9

Depth	Chromium, Hex	Chromium, Total
Surface	16	158
1' to 3'	ND(10)	90.4
1' to 3' (dup)	ND(10)	89.6

Depth	Chromium, Hex	Chromium, Total
Surface	38	1310
1' to 3'	33	338
1' to 3'(dup)	51	699

Plate 7.1
Impacted Soil Areas
Chrome Plating Bath
Ventilation Discharge SWMU

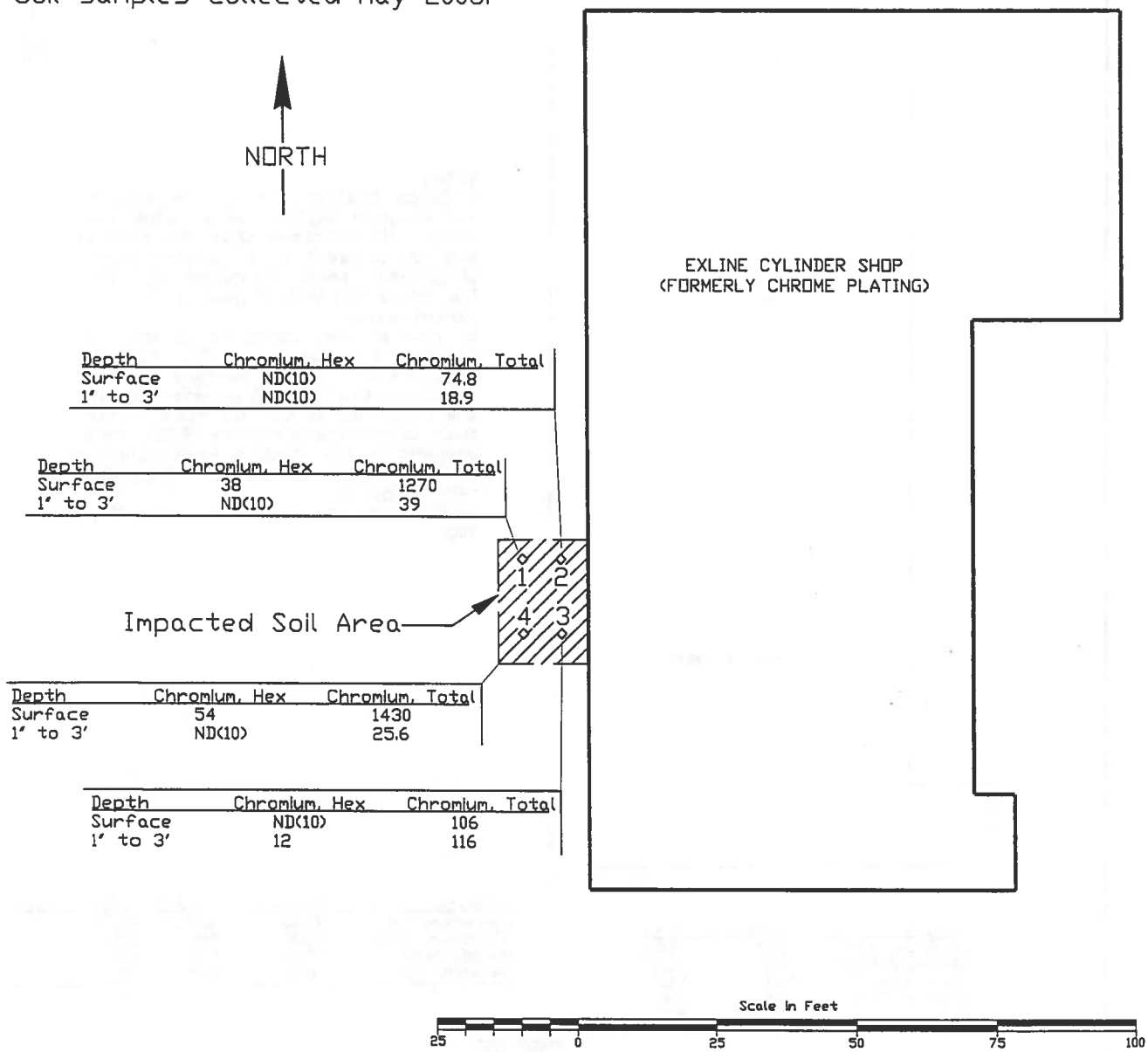
ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
08-0101	June 2008	Jack Eslick

Note: Concentration units are in milligrams per kilogram (mg/kg). ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.

Soil samples collected May 2006.



Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	74.8
1' to 3'	ND(10)	18.9

Depth	Chromium, Hex	Chromium, Total
Surface	38	1270
1' to 3'	ND(10)	39

Depth	Chromium, Hex	Chromium, Total
Surface	54	1430
1' to 3'	ND(10)	25.6

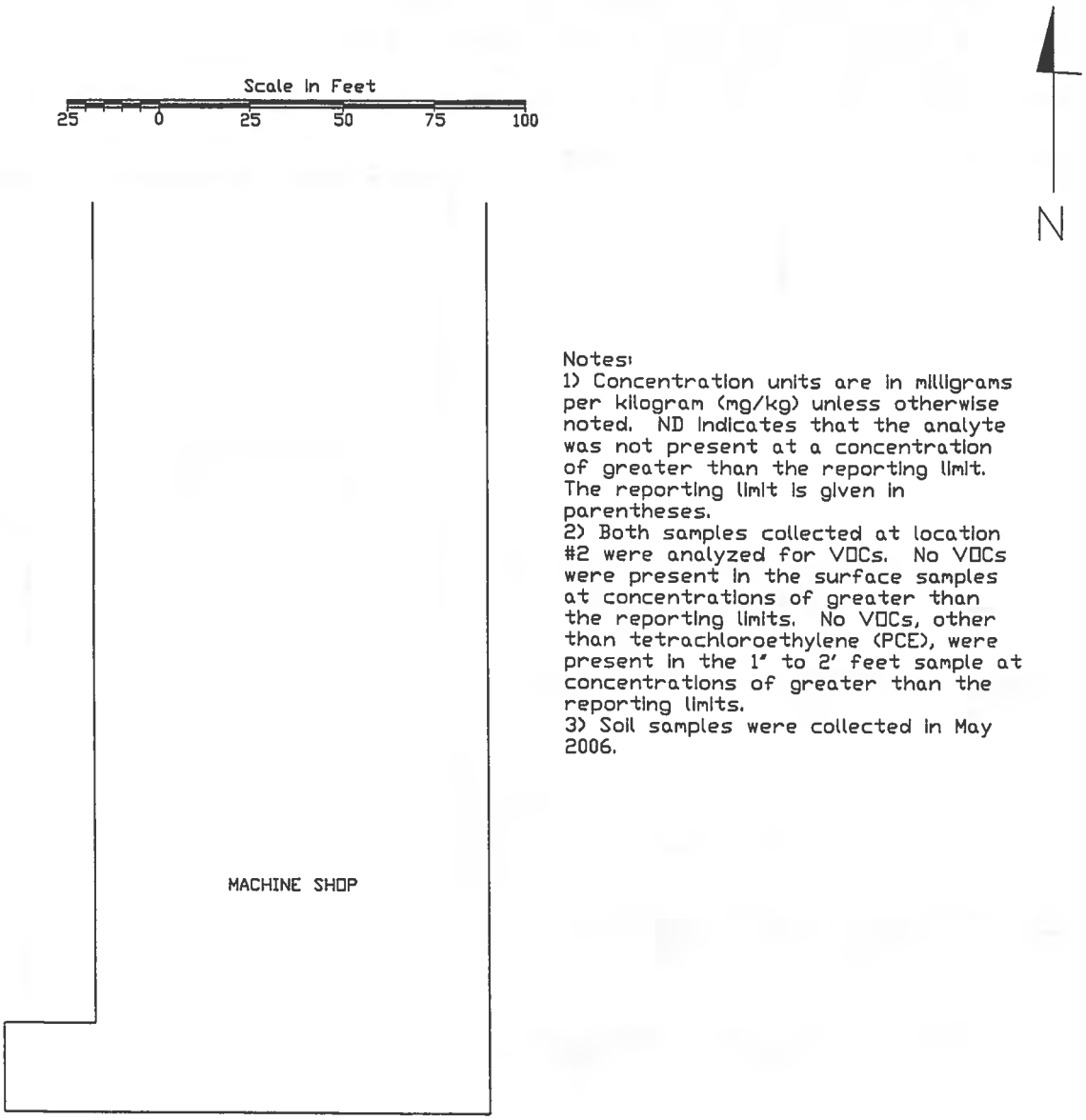
Depth	Chromium, Hex	Chromium, Total
Surface	ND(10)	106
1' to 3'	12	116

Plate 7.2
Impacted Soil Area
Deionizer Column Discharge SWMU

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
08-0101	June 2008	Jack Eslick



Notes:
1) Concentration units are in milligrams per kilogram (mg/kg) unless otherwise noted. ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.
2) Both samples collected at location #2 were analyzed for VOCs. No VOCs were present in the surface samples at concentrations of greater than the reporting limits. No VOCs, other than tetrachloroethylene (PCE), were present in the 1' to 2' feet sample at concentrations of greater than the reporting limits.
3) Soil samples were collected in May 2006.

Analyte	Surface	1' to 2'
Chromium, Hex	ND(1)	ND(1)
Chromium, Total	46.2	23.4
Lead, Total	59.1	15.3
Arsenic, Total	13.5	7.4
PCE (ug/kg)	ND(5)	5.6

Analyte	Surface	1' to 2'	1' to 2' (dup)
Chromium, Hex	ND(10)	ND(10)	ND(10)
Chromium, Total	2180	915	1050
Lead, Total	2720	485	403
Arsenic, Total	48.8	34.4	55.6

Analyte	Surface	1' to 2'
Chromium, Hex	ND(10)	ND(10)
Chromium, Total	24.5	16.9
Lead, Total	25.2	9.7
Arsenic, Total	11.5	4.9

Plate 7.3
Impacted Soil Area
Brown Soil Stain SWMU

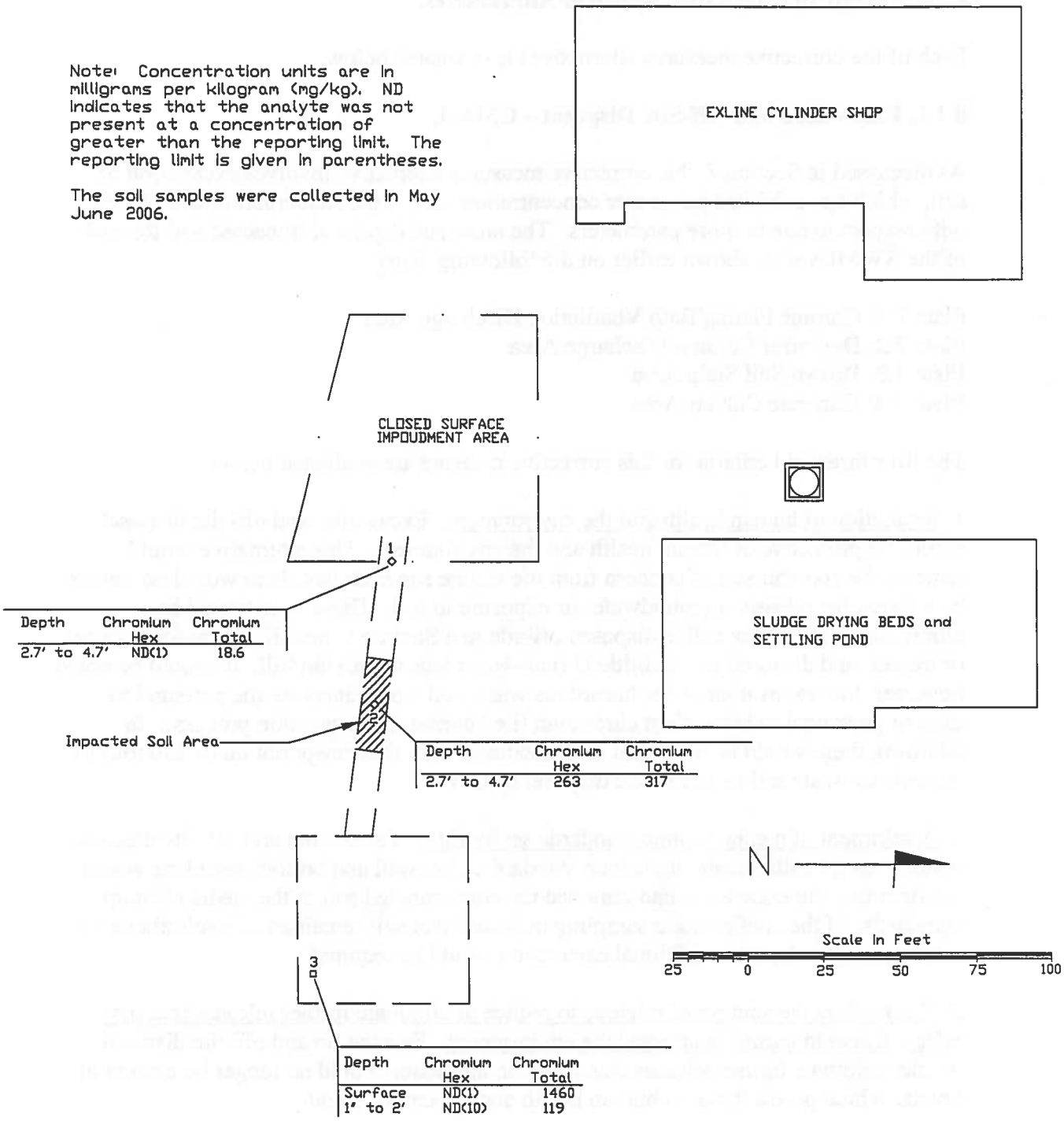
ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
08-0101	June 2008	Jack Eslick

Note: Concentration units are in milligrams per kilogram (mg/kg). ND indicates that the analyte was not present at a concentration of greater than the reporting limit. The reporting limit is given in parentheses.

The soil samples were collected in May June 2006.



Depth	Chromium Hex	Chromium Total
2.7' to 4.7'	ND(1)	18.6

Depth	Chromium Hex	Chromium Total
2.7' to 4.7'	263	317

Depth	Chromium Hex	Chromium Total
Surface	ND(1)	1460
1' to 2'	ND(10)	119

Plate 7.4
Impacted Soil Area
Concrete Culvert SWMU

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn by:
08-0101	June 2008	Jack Eslick

8. Evaluation of Corrective Measures Alternatives.

Each of the corrective measures alternatives is evaluated below.

8.1.1. Excavation and Off-Site Disposal – CMA-1.

As discussed in Section 7, this corrective measures alternative involves excavation of soil, which has exhibited parameter concentrations above the Remediation Goal (RG), with respect to one or more parameters. The areas and depths of impacted soil for each of the SWMUs were shown earlier on the following maps:

Plate 7.1: Chrome Plating Bath Ventilation Discharge Area
Plate 7.2: Deionizer Column Discharge Area
Plate 7.3: Brown Soil Stain Area
Plate 7.4: Concrete Culvert Area

The four threshold criteria for this corrective measure are evaluated below.

1. Protection of human health and the environment. Excavation and off-site disposal would be protective of human health and the environment. This alternative would remove the contaminant of concern from the Exline site such that there would no longer be a threat for release to groundwater or exposure to soil. These risks would be eliminated whether the soil is disposed off-site in a Subtitle C landfill (hazardous waste) or treated and disposed in a Subtitle D (non-hazardous waste) landfill. It should be noted, however, that excavation of the hazardous waste soil would increase the potential to expose personnel to hexavalent chromium (i.e., during the excavation process). In addition, there would be increased risk associated with the transportation of 230 tons of hazardous waste soil to an off-site disposal facility.

2. Attainment of media cleanup standards set by EPA. Excavation and off-site disposal would result in attainment of cleanup standards. Sidewall and bottom sampling would confirm that the excavation had removed the contaminated soil to the media cleanup standards. If the confirmation sampling indicated that soil remained at levels above the cleanup standards, then additional excavation would be required.

3. Controlling the sources of releases to reduce or eliminate further releases that may pose a threat to human health and the environment. Excavation and off-site disposal would eliminate further releases since the contamination would no longer be present at levels, which pose a threat to human health and the environment.

4. Compliance with applicable standards for management of wastes. All waste generated from the excavation process (i.e., excavated soil) would be managed in accordance with applicable waste management standards. Specifically, excavated soil would be analyzed using TCLP analysis with respect to chromium, lead, and arsenic, as applicable. The excavated soil would then be disposed as non-hazardous waste for those soils, which pass the TCLP test and hazardous waste for those soils, which fail the TCLP test.

One issue of concern with respect to the excavation and off-site disposal alternative relates to the potential for difficulty in removing the contaminant to the required cleanup standards in areas immediately adjacent to buildings. Specifically, this issue could impact excavation in the Deionizer Column Discharge Area SWMU and the Chrome Plating Ventilation Discharge Area SWMU. Difficulties could be encountered especially with respect to the latter SWMU as greater excavation depths would be required (i.e., in the range of 7 ft.). Structural concerns could result in the need to leave a certain amount of impacted soil in place.

The five (5) balancing criteria for this alternative are evaluated below.

1. Long-term reliability and effectiveness. Excavation and off-site disposal would be a reliable and effective long-term approach to addressing the soil contamination at the site subject to the possibility that structural issues could require that a certain amount of soil located immediately adjacent to the Cylinder shop would need to be left in place.

2. Reduction of toxicity, mobility, or volume of wastes. The toxicity, mobility, and volume of hazardous waste constituents would all be eliminated by removing the impacted soil from the site.

3. Short-term effectiveness. Excavation and off-site disposal of impacted soil would be effective in the short-term since the removal would be immediate.

4. Implementability. Excavation and off-site disposal of impacted soil could be readily implemented with the exception of the difficulty that would be encountered in attempting to remove soil immediately adjacent to the Cylinder Shop building. Without conducting a detailed structural evaluation, a certain amount of soil would need to be left in place in order to avoid structural issues at the site, i.e., immediately adjacent to the building.

It is also possible that soil would need to be excavated to a greater depth in the area of higher hexavalent chromium concentrations on the east side of the Cylinder Shop (Chrome Plating Bath Ventilation Discharge Area). The 5 to 7 ft. sample depth at sample location # 2 was 34 mg/kg hexavalent chromium, which is below the RG (38 mg/kg) for that parameter. However, the hexavalent chromium concentration was 199 mg/kg at sample location # 8 – 3 to 5 ft. depth. Therefore, it is possible that soil would need to be excavated to a greater depth than 7 ft., depending on the confirmation sampling results. If such additional excavation were required, the cost would be impacted, as discussed below.

5. Cost. As discussed earlier, costs will vary with respect to the disposal of impacted soil, depending on whether the material is hazardous or non-hazardous waste. The (excavated) volume and mass of the respective waste streams are (Table 6.1):
Non-hazardous waste soil – 551 yd^3 = 599 tons
Hazardous waste soil – 211 yd^3 = 230 tons

These quantities could vary due to the need to excavate additional soil following confirmation sampling or due to re-classification of the soil (i.e., hazardous waste vs. non-hazardous waste) following TCLP analysis of the excavated soil.

Costs for this corrective measures alternative would be incurred for:

1) Excavation.
2) Sampling and analysis (confirmation and TCLP).
3) Backfill.
4) Transportation and disposal.
5) Decontamination of equipment used to handle hazardous waste soil.

The cost for the first three items will be approximately the same regardless whether the soil is non-hazardous or hazardous waste. The cost for the 4th item (transportation and disposal) will depend on the waste stream status. Transportation and disposal of hazardous waste soil will be significantly more costly than for non-hazardous waste soil.

Based on recent similar projects and contractor estimates, the estimated cost for excavation, backfill, and transportation of non-hazardous waste soil would be in the range of $ 30 per ton.

Sampling and analysis costs would be incurred for confirmation and TCLP sampling and analysis. Sampling and analysis costs are estimated to be in the range of $ 22,500. This figure is based on the estimate that 33 samples would be collected for TCLP chromium analysis, 5 samples would be collected for TCLP chromium and lead analysis, and 75 samples would be collected for hexavalent chromium analysis.

Disposal cost estimates are summarized below.

The unit disposal cost for non-hazardous waste soil is $ 29/ton (based on disposal in the City of Salina landfill). The unit disposal cost for hazardous waste soil is $ 461/ton (includes transportation to and disposal in a hazardous waste landfill).

Based on these values, the estimated costs for excavation and disposal of soil at the Exline, Inc. facility are:

Non-Hazardous Waste Soil:

1. Excavation, transportation, and backfill: ($ 30/ton) x (599) tons = $ 17,970

2. Sampling and analysis (assume proportional to the total estimated cost based on volume of soil excavated):

(0.72) x ($ 22,500) = $ 16,200

3. Disposal: ($ 29/ton) x (599 tons) = $ 17,370

Total estimated cost for remediation of non-hazardous waste soil using excavation and off-site disposal:

$ 51,540

This is equivalent to a unit cost of approximately $ 86/ton.

Hazardous Waste Soil:

1. Excavation and backfill:

($ 30/ton) x (230) ton = $ 6,900

2. Sampling and analysis (assume proportional to the total estimated cost based on volume of soil excavated):

(0.28) x ($ 22,500) = $ 6,300

3. Disposal:

($ 461/ton) x (230 tons) = $ 106,030

4. Decon: $ 20,000

Total estimated cost for remediation of hazardous waste soil using excavation and off-site disposal:

$ 139,230

This is equivalent to a unit cost of approximately $ 605/ton.

Based on these estimated costs, it is clear that the cost for excavation and off-site disposal of contaminated soil is highly dependent on the hazardous vs. non-hazardous nature of the soil.

The total estimated cost for excavation and off-site disposal of soil is:

$ 51,540 + $ 139,230

= $ 190,770

As discussed earlier, these estimates are based on excavation to a given depth. If confirmation sampling indicated levels, which remained at or above the RG, then additional soil may need to be removed in the horizontal and/or vertical direction. Such additional excavation would increase the remediation cost and this increase would likely increase at a greater rate (e.g., more than $ 605/ton) if such excavation was required in the vertical direction in the area where hazardous waste soil is located.

8.1.2. Excavation and On-Site Treatment – CMA-2.

As discussed in Section 7, this alternative would apply to the following SWMUs:

1) Deionizer column discharge area.
2) Chrome plating bath ventilation discharge area.
3) Concrete culvert area.

This alternative would not apply to the Brown Soil Stain SWMU since the parameters of concern at that SMWU are arsenic and lead, which are not amenable to treatment. Therefore, soil from the Brown Soil Stain area would need to be excavated and disposed off-site – most likely as non-hazardous waste.

This alternative will include the evaluation of two disposal options following treatment of the soil:

- CMA-2-A: Off-site disposal as non-hazardous waste.
- CMA-2-B: Placement of the material on-site (as fill material in the excavated areas).

With respect to CMA-2-A, only the soil, which would be hazardous waste (upon excavation), would need to be treated prior to off-site disposal. Soil, which was not hazardous waste, but which exhibited soil concentrations greater than or equal to 38 mg/kg, could be disposed off-site as non-hazardous waste without treatment following excavation. However, if the material were to be placed on-site as backfill (CMA-2-B), treatment would be required to reduce the hexavalent chromium concentration of all soil below the RG of 38 mg/kg.

Finally, as discussed in Section 7, this alternative would require bench-scale testing using representative soil samples in order to determine chemical dose rates and demonstrate the technical and economic feasibility of the process.

The four threshold criteria for this corrective measure are evaluated below.

1. Protection of human health and the environment. Excavation and on-site treatment would be protective of human health and the environment. This alternative would remove the contaminant of concern (hexavalent chromium) from the Exline site by chemical reduction to the trivalent form. As such, there would no longer be a threat for release to groundwater or exposure to soil since the hexavalent chromium concentration would be below the remediation goal of 38/mg/kg. It should be noted, however, that excavation of the hazardous waste soil would increase the potential to expose personnel to hexavalent chromium (i.e., during the excavation process).

2. Attainment of media cleanup standards set by EPA. Excavation and on-site treatment would result in attainment of cleanup standards, subject to the demonstration that such treatment could be demonstrated to be technically feasible. Sampling and analysis of the treated soil would be conducted (following treatment) in order to demonstrate that ex-situ treatment had reduced the hexavalent chromium concentration to a level below the RG of 38 mg/kg. In addition, sidewall and bottom (confirmation) sampling of the excavated

area would be conducted in order to demonstrate that the soil had been excavated to a level, which met the hexavalent chromium RG of 38 mg/kg.

3. Controlling the sources of releases to reduce or eliminate further releases that may pose a threat to human health and the environment. Excavation and on-site treatment would eliminate further releases since the contamination would no longer be present at levels, which would pose a threat to human health and the environment.

4. Compliance with applicable standards for management of wastes. All waste generated from the excavation process (i.e., excavated soil) would be managed in accordance with applicable waste management standards. Specifically, excavated soil would be analyzed for TCLP chromium in order to determine if the material was hazardous waste. If the soil was shown to be hazardous waste, then it would be treated in accordance with the standards set forth in the hazardous waste treatment permit. A representative number of samples would also be collected after treatment in order to demonstrate that the material was non-hazardous waste (if the soil is to be disposed off-site) or the hexavalent chromium concentration is below 38 mg/kg (if the soil is to be placed on-site).

One issue of concern with respect to the excavation and on-site treatment alternative relates to the potential for difficulty in removing the contaminant to the required cleanup standards in areas immediately adjacent to buildings. Specifically, this issue could impact excavation in the Deionizer Column Discharge Area SWMU and the Chrome Plating Ventilation Discharge Area SWMU. Difficulties could be encountered especially with respect to the latter SWMU as greater excavation depths would be required (i.e., in the range of 7 ft.). Structural concerns could result in the need to leave a certain amount of impacted soil in place, i.e., immediately adjacent to the building.

The five (5) balancing criteria for this alternative are evaluated below.

1. Long-term reliability and effectiveness. Excavation and on-site treatment would be a reliable and effective long-term approach to addressing the soil contamination at the site subject to the following potential issues:

a. Structural concerns may require that a certain amount of soil immediately adjacent to the Cylinder Shop may preclude excavation of that soil.

b. The effectiveness of the on-site treatment of excavated soil would need to be demonstrated by bench-scale testing of representative soil samples.

2. Reduction of toxicity, mobility, or volume of wastes. The toxicity, mobility, and volume of hazardous waste constituents (i.e., hexavalent chromium) would all be reduced by treating the impacted soil to levels and either disposing the soil off-site or placing it back in the excavated area.

3. Short-term effectiveness. Excavation and treatment of impacted soil would be effective in the short-term since it is anticipated that the process could be completed in a relatively short time frame.

4. Implementability. Excavation and on-site treatment of impacted soil could be readily implemented subject to consideration of the following potential issues of concern:

a. Bench tests would be required to demonstrate the technical and economic feasibility of treatment.
b. A hazardous waste treatment permit could be required by the KHDE for treatment of any soil, which would otherwise be hazardous waste if disposed off-site following excavation.
c. A certain amount of soil may need to be left in place immediately adjacent to the Cylinder Shop building in order to address structural issues.

5. Cost. Costs will be incurred for excavation, treatment, and disposal of soil. Costs will be developed for the two (2) cases identified earlier:

Case 1 – CMA-2-A: Excavation and treatment of hazardous waste soil on-site followed by disposal of treated soil off-site in a non-hazardous waste landfill. Non-hazardous waste soil would also be excavated and disposed off-site in a non-hazardous waste landfill, but would not require treatment since it is already non-hazardous waste.

Case 2 – CMA-2-B: Excavation and treatment of hazardous waste soil and (hexavalent chromium-bearing) non-hazardous waste soil on-site followed by disposal of treated soil on-site in the excavated area. For this case, the hexavalent chromium-bearing hazardous waste and non-hazardous waste soil would both need to be treated to a level below 38 mg/kg (the hexavalent chromium RG).

For both cases, non-hazardous waste soil from the Brown Soil Stain SWMU would be excavated and disposed off-site in a non-hazardous waste landfill. As discussed earlier, on-site treatment of the soil from that SWMU is not possible due to the fact that the contaminants of concern (arsenic and lead) are not amenable to treatment.

Quantities to be used in estimating costs are (volumes shown are excavated volumes):

Non-hazardous waste soil – 104 yd^3 = 113 tons
Hexavalent chromium-bearing non-hazardous waste soil – 447 yd^3 = 486 tons
Hazardous waste soil – 211 yd^3 = 230 tons

These quantities could vary due to the need to excavate additional soil following confirmation sampling or due to re-classification of the soil (i.e., hazardous waste vs. non-hazardous waste) following TCLP analysis of the excavated soil.Costs for this corrective measures alternative would be incurred for:

1) Excavation.
2) Sampling and analysis (confirmation and TCLP).
3) Backfill.
4) Transportation and disposal.
5) Treatment.
6) Decontamination of equipment.

Case 1 (CMA-2-A) Costs: Excavation and treatment of hazardous waste soil on-site followed by disposal of treated soil off-site in a non-hazardous waste landfill. Non-hazardous waste soil would simply be excavated and disposed in a non-hazardous waste landfill without treatment.

The unit cost for excavation, transportation, disposal of non-hazardous waste (in the City of Salina Landfill), and backfill was previously indicated to be in the range of $ 59/ton. The total estimated cost for these activities would then be:

(829 tons) x ($ 59/ton) = $ 48,900

In addition, costs would be incurred for treatment of the 230 tons of hazardous waste soil. The estimated unit cost for ex-situ treatment of the hexavalent chromium contaminated soil is $ 380/ton. Therefore, the estimated cost for ex-situ treatment of the hazardous waste soil is:

(230 tons) x ($ 380/ton) = $ 87,400

The estimated cost for sampling and analysis is $ 22,500. This figure is based on the estimate that 33 samples would be collected for TCLP chromium analysis, 5 samples would be collected for TCLP chromium and lead analysis, and 75 samples would be collected for hexavalent chromium analysis.
The estimated cost for equipment decontamination is $ 20,000.

The estimated cost for modifying the Exline Hazardous Waste TSD permit as required to treat excavated soil on-site is $ 15,000.

The total cost for Case 1 (CMA-2-A) is then:

$ 48,900 + $ 87,400 + $ 22,500 + $ 20,000 + $ 15,000

= **$ 193,800**

Case 2 (CMA-2-B) Costs: Excavation and treatment of hazardous waste soil and (hexavalent chromium-bearing) non-hazardous waste soil on-site followed by disposal of treated soil on-site in the excavated area. Soil from the Brown Soil Stain SWMU would need to be disposed in a non-hazardous waste landfill following excavation (with no treatment).

The unit cost for excavation, transportation, disposal of non-hazardous waste (in the City of Salina Landfill) and backfill is estimated to be in the range of $ 59/ton. The estimated cost for these activities for the Brown Soil Stain soil would then be:

(113 tons) x ($ 59/ton) = $ 6,670

The estimated cost for excavation of and backfilling the remaining site soils (i.e., those which exhibit hexavalent chromium concentrations greater than or equal to the 38 mg/kg RG level and are treated on-site) would be approximately $ 25/ton. This results in the following estimated cost for excavating soil and backfilling with the treated soil:

(716 tons) x ($ 25/ton) = $ 17,900

The treatment cost was calculated earlier for the hazardous waste soil:

(230 tons) x ($ 380/ton) = $ 87,400

The unit treatment cost for the non-hazardous waste soil is less due to the fact that chemical dosage rates would be lower, mobilization/demobilization costs would already be incurred, etc. The unit cost for ex-situ treatment of the hexavalent chromium-contaminated soil (non-hazardous waste) is $ 155/ton. The cost for treating the non-hazardous waste soil is then:

(486 tons) x ($ 155/ton) = $ 75,330

The estimated cost for sampling and analysis is $ 22,500. This figure is based on the estimate that 33 samples would be collected for TCLP chromium analysis, 5 samples would be collected for TCLP chromium and lead analysis, and 75 samples would be collected for hexavalent chromium analysis.

The estimated cost for equipment decontamination is $ 20,000.

The estimated cost for modifying the Exline Hazardous Waste TSD permit as required to treat excavated soil on-site is $ 15,000.

The total cost for Case 2 (CMA-2-B) is then estimated to be (including the chemical analysis costs):

$ 6,670 + $ 17,900 + $ 87,400 + 75,330 + $ 20,000 + $ 22,500 + $ 15,000

= **$ 244,800**

8.1.3. In-Situ Treatment – CMA-3.

In-situ treatment involves the injection of a liquid reducing agent, such as calcium polysulfide, ferrous sulfate, or sodium metabisulfite, into the contaminated soil zone to reduce hexavalent chromium to trivalent chromium. The goal of the treatment process would be to reduce the hexavalent chromium concentration below the RG of 38 mg/kg. Two cases will be evaluated.

As discussed in Section 7, case 1 (CMA-3-A) would include only in-situ treatment of the soil, which would be hazardous waste upon excavation (area shown on Plate 7.1). The treated soil would then remain in place. The remaining soils (non-hazardous waste soils with hexavalent chromium concentrations greater than or equal to the 38 mg/kg RG and the soil from the Brown Soil Stain SWMU) would be excavated and disposed off-site in the City of Salina Landfill as non-hazardous waste.

Case 2 (CMA-3-B) will include the in-situ treatment of all hexavalent chromium contaminated soil greater than or equal to the RG of 38 mg/kg (both hazardous waste and non-hazardous waste soils). This treatment would be completed with the objective of reducing the hexavalent chromium concentration below the RG of 38 mg/kg. These treated soils would then remain in place.

As was also discussed in Section 7, should the in-situ treatment process fail to reduce the hexavalent chromium concentration below the 38 mg/kg RG, then the impacted soil would be excavated and disposed off-site as hazardous or non-hazardous waste, as determined by TCLP analysis of representative samples.

Soil from the Brown Soil Stain SWMU would be excavated and disposed in the City of Salina Landfill as non-hazardous waste for both cases.

The four threshold criteria for this corrective measure alternative are evaluated below.

1. Protection of human health and the environment. In-situ treatment of hexavalent chromium would be protective of human health and the environment. This alternative would remove the contaminant of concern (hexavalent chromium) from the Exline site by chemical reduction to the trivalent form. As such, there would no longer be a threat for release to groundwater or exposure to soil since the hexavalent chromium concentration would be below the remediation goal of 38/mg/kg.

2. Attainment of media cleanup standards set by EPA. In-situ treatment would result in attainment of cleanup standards subject to the demonstration that such treatment could be demonstrated to be technically feasible. Sampling and analysis of the treated soil would be conducted (following treatment) in order to demonstrate that in-situ treatment had reduced the hexavalent chromium concentration to a level below the RG of 38 mg/kg.

3. Controlling the sources of releases to reduce or eliminate further releases that may pose a threat to human health and the environment. In-situ treatment would eliminate further releases since the hexavalent chromium would no longer be present at levels, which would pose a threat to human health and the environment.

4. Compliance with applicable standards for management of wastes. No waste would be generated from the in-situ treatment process.

The five (5) balancing criteria for this alternative are evaluated below.

1. Long-term reliability and effectiveness. In-situ treatment would be a reliable and effective long-term approach to addressing the soil contamination at the site subject to the ability to demonstrate the treatment effectiveness by bench-scale testing of representative soil samples.

2. Reduction of toxicity, mobility, or volume of wastes. The toxicity, mobility, and volume of hazardous waste constituents (i.e., hexavalent chromium) would all be reduced by treating the impacted soil to levels below the hexavalent chromium RG of 38 mg/kg.

3. Short-term effectiveness. In-situ treatment of impacted soil would be effective in the short-term since it is anticipated that the process could be completed in a relatively short time frame.

4. Implementability. In-situ treatment of impacted soil could be readily implemented subject to the completion of bench-scale tests, which demonstrate the technical and economic feasibility of in-situ treatment.

5. Cost. Costs will be developed for the two (2) cases identified earlier:

Case 1 (CMA-3-A): In-situ treatment of hexavalent chromium-contaminated soil, which would be hazardous waste upon excavation to levels below the RG of 38 mg/kg. This soil would be left in place following treatment. Non-hazardous waste soil (both hexavalent chromium-contaminated soil and soil from the Brown Soil Stain SWMU) would be excavated and disposed off-site in the City of Salina Landfill.

Case 2 (CMA-3-B): In-situ treatment of all hexavalent chromium-contaminated (above 38 mg/kg) soil. The treated soil would be left in place. For this case, the hexavalent chromium-bearing hazardous waste and non-hazardous waste soil would need to be treated below the 38 mg/kg level (the hexavalent chromium RG).

Non-hazardous waste soil from the Brown Soil Stain SWMU would be excavated and disposed off-site in the City of Salina landfill. As discussed earlier, on-site treatment of the soil from the Brown Soil Stain SWMU is not possible due to the fact that the contaminants of concern (arsenic and lead) are not amenable to treatment.

Quantities to be used in estimating costs are (volumes given are the excavated volumes):

Non-hazardous waste soil – 104 yd^3 = 113 tons
Hexavalent chromium-bearing non-hazardous waste soil – 447 yd^3 = 486 tons
Hazardous waste soil – 211 yd^3 = 230 tons

It should be noted that these quantities could vary due to the need to treat additional soil following post-treatment (confirmation) sampling.

Costs for this corrective measures alternative will be incurred for:

1) Excavation.
2) Sampling and analysis (confirmation and TCLP).
3) Backfill.
4) Transportation and disposal.
5) In-situ treatment.

Case 1 (CMA-3-A) Costs: In-situ treatment of hazardous waste soil (soil left in place) and excavation and disposal of non-hazardous waste soil in a non-hazardous waste landfill without treatment.

The unit cost for excavation, transportation, disposal of non-hazardous waste (in the City of Salina Landfill), and backfill was previously indicated to be in the range of $ 59/ton. The total estimated cost for these activities would then be:

(599 tons) x ($ 59/ton) = $ 35,340

In addition, costs would be incurred for in-situ treatment of the 230 tons of hazardous waste soil. The estimated unit cost for in-situ treatment of the hexavalent chromium contaminated soil is $ 300/ton. This cost is based on vendor estimates and includes bench testing, site mobilization, treatment chemical, and the direct-push contractor fees. Therefore, the estimated cost for in-situ treatment of the hazardous waste soil is:

(230 tons) x ($ 300 /ton) = $ 69,000

The estimated cost for sampling and analysis is $ 21,000. This figure is based on the estimate that 22 samples would be collected for TCLP chromium analysis, 5 samples would be collected for TCLP chromium and lead analysis, and 85 samples would be collected for hexavalent chromium analysis.

Should the in-situ treatment process prove to be unsuccessful (based on sampling and analysis of the treated soil), then the affected soil would be excavated and disposed off-site as hazardous or non-hazardous waste – as determined by representative sampling and TCLP analysis. It should be noted that the in-situ treatment process would be fully implemented before the excavation process was proposed. For example, if the in-situ treatment process reduced the hexavalent chromium concentration below the 38 mg/kg RG, with the exception of one or two samples, or the treated soil exhibited generally low levels following treatment (but not quite below the RG), then follow-up treatment would likely be employed in an attempt to meet the RG.

The total estimated cost for Case 1 (CMA-3-A) is:

$ 35,340 + $ 69,000 + $ 21,000

= $ 125,340

Case 2 (CMA-3-B) Costs: In-situ treatment of all hexavalent chromium-contaminated soil above 38 m/kg (both hazardous waste soil and non-hazardous waste soil). In-situ treated soil would be left in place. Soil from the Brown Soil Stain SWMU would need to be disposed in a non-hazardous waste landfill following excavation (with no treatment).

The unit cost for excavation, transportation, and disposal of non-hazardous waste (in the City of Salina Landfill) with backfill is estimated to be in the range of $ 59/ton. The estimated cost for these activities for the Brown Soil Stain soil would then be:

(113 tons) x ($ 59/ton) = $ 6,670

The estimated cost for in-situ treatment of the hazardous waste (higher concentration) hexavalent chromium-contaminated soil would be:

(230 tons) x ($ 300/ton) = $ 69,000

The unit cost for in-situ treatment of the non-hazardous waste contaminated soil would be significantly less since the treatment chemical use would be much lower and certain costs (e.g., overhead, site mobilization) would already be incurred. The unit cost for treating the non-hazardous waste soil is estimated to be in the range of $ 80/ton. Therefore, the estimated cost for treating the non-hazardous waste soil is:

(486 tons) x ($ 80/ton) = $ 38,900

Sampling and analysis costs are estimated to be $ 22,600. These costs would be incurred for confirmation sampling and analysis (hexavalent chromium for the area treated to remove hexavalent chromium and lead and arsenic for the excavated Brown Soil Stain SWMU area) and TCLP analysis (for the excavated soil from the Brown Soil Stain SWMU). This figure is based on the estimate that 5 samples would be collected for TCLP chromium and lead analysis, 6 samples would be collected for total lead and arsenic analysis, and 150 samples would be collected for hexavalent chromium analysis.

As discussed earlier, with respect to alternative CMA-3-A, if the in-situ treatment process was not able to reduce the hexavalent chromium concentrations below the 38 mg/kg RG, then the affected soil would be excavated and disposed off-site as hazardous or non-hazardous waste.

The total cost for Case 2 (CMA-3-B) is then estimated to be (including chemical analysis costs):

$ 6,670 + $ 69,000 + $ 38,900 + $ 22,600

= $ 137,170

8.1.4. Leave Soil in Place and Restrict Access (CMA-4).

As discussed in Section 7, this corrective measures alternative includes the following elements:

1) Leave part of the hexavalent chromium-contaminated soil (hazardous waste soil) in place and allow chromium to migrate to groundwater where it would be captured and removed in the existing groundwater recovery system.

2) Restrict access to areas, which exhibit chromium concentrations greater than or equalt to the hexavalent chromium soil pathway standard of 75 mg/kg.

Access would be restricted by constructing a fence around the restricted area (Areas D and E shown on Plate 5.1 and the soil identified as hazardous waste soil on Plate 7.1). Also, since soil would be left in place at levels above the RG of 38 mg/kg hexavalent chromium, some type of institutional control (e.g., a deed restriction) would be required to insure that the property use was controlled and that the impacted soil was not disturbed without proper controls (e.g., sampling and analysis followed by proper disposal).

3) Excavate soil in two areas, which exhibit hexavalent chromium concentrations, above the soil pathway standard of 75 mg/kg and dispose soil in City of Salina non-hazardous waste landfill. These areas would include Area B shown on Plate 5.1 and the concrete culvert area shown on Plate 7.4. The (excavated) volume and mass of these two areas are:

Area B – 42 yd^3 = 45 tons
Concrete culvert area – 70 yd^3 = 76 tons

These two areas are relatively small and would be more difficult to restrict access. In addition, the soil generated by excavation of these areas would likely be non-hazardous waste.

4) Excavate soil at the Brown Soil Stain SWMU and dispose as non-hazardous waste in the City of Salina Landfill. Since this soil would most likely be non-hazardous waste, the excavation and disposal alternative would be much more cost-effective and practical than attempting to restrict access.

The four threshold criteria for this corrective measure alternative are evaluated below.

1. <u>Protection of human health and the environment</u>. This corrective measures alternative would not be completely protective of human health and the environment. With the exception of soil adjacent to the Cylinder Shop, this alternative would remove the contaminants of concern (hexavalent chromium, arsenic, and lead) from the Exline site by excavation and disposal. However, despite the fact that Exline, Inc.'s groundwater recovery system would capture hexavalent chromium (remaining in the soil above the RG of 38 mg/kg), which could migrate to the groundwater (per the capture zone analysis included as Attachment D), this alternative would allow the continued migration of hexavalent chromium to the groundwater.

Access would be restricted to the soil, which remained in place adjacent to the Cylinder Shop. Access to the soil with hexavalent chromium concentrations above the soil exposure pathway of 75 mg/kg would be restricted by constructing a fence around the subject area.

2. Attainment of media cleanup standards set by EPA. The media cleanup standards would not be met immediately with respect to hexavalent chromium for those areas where soil is not excavated. However, it is anticipated that the media cleanup standards would be met over time via process of natural reduction from hexavalent to trivalent chromium in the vadose zone soil and migration of hexavalent chromium from the vadose zone to the saturated zone.

As shown in Section 5, significant percentages of the total chromium in the vadose zone are in the form of trivalent chromium, despite the fact that essentially all of the chromium that was released at the Exline facility has been in the form of hexavalent chromium. In addition, a capture zone analysis demonstrated that any of the hexavalent chromium released from the vadose zone adjacent to the Cylinder Shop would be captured by the groundwater recovery system.

3. Controlling the sources of releases to reduce or eliminate further releases that may pose a threat to human health and the environment. The sources of release would be controlled indirectly by continuing to operate the groundwater recovery and monitoring system such that hexavalent chromium that was released to the groundwater would be captured by the groundwater recovery system. And, any soil, which exhibited a parameter concentration above the soil pathway cleanup standard, would either be excavated and disposed off-site or access to such soil would be restricted by construction of a fence. In addition, hexavalent chromium, which was allowed to remain in the soil at levels above the soil to groundwater pathway RG (i.e., 38 mg/kg), would migrate to the groundwater and be captured by the existing Exline groundwater recovery system.

4. Compliance with applicable standards for management of wastes. Excavated soil would be analyzed (TCLP test) in order to determine the waste status of the material (hazardous or non-hazardous). Excavated material would then be disposed accordingly.

The five (5) balancing criteria will not be evaluated since all of the threshold criteria were not met with respect to this alternative..

8.1.5. Corrective Measures Alternative Evaluation Summary.

Table 8.1 summarizes the corrective measures alternative evaluation with respect to the six (6) corrective measures alternatives, the four (4) threshold criteria and the five (5) balancing criteria.

Tables 8.2 through 8.6 provide additional details in tabular form with respect to the alternatives and the evaluation criteria:

Table 8.2: Detailed Comparison of Threshold Criteria.
Table 8.3: Detailed Comparison of Long-Term Reliability and Effectiveness.
Table 8.4: Detailed Comparison of Toxicity, Mobility, or Volume of Waste Reduction.
Table 8.5: Detailed Comparison of Short-Term Effectiveness.
Table 8.6: Detailed Comparison of Implementability.
Table 8.7: Detailed Comparison of Cost.

TABLE 8.1: CORRECTIVE MEASURES ALTERNATIVES EVALUATION SUMMARY
EXLINE, INC., SALINA, KANSAS

Evaluation Criteria	CMA-1 Excavation and Off-site Disposal[a]	CMA-2-A Excavation and On-Site Treatment Disposal Off-Site[c]	CMA-2-B Excavation and On-Site Treatment Disposal On-Site[d]	CMA-3-A In-Situ Treatment of Hazardous Waste Soil[e]	CMA-3-B In-Situ Treatment of All Hex Cr Contaminated Soil[f]	CMA-4: Leave Soil in Place and Restrict Access[g]
Protection of human health and the environment	Yes	Yes	Yes	Yes	Yes	No
Attainment of cleanup standards set by EPA	Yes	Yes	Yes	Yes	Yes	Yes
Source control to reduce or eliminate further releases	Yes	Yes	Yes	Yes	Yes	Yes
Compliance with standards for management of wastes	Yes	Yes	Yes	Yes	Yes	Yes
Long-term reliability and effectiveness	Yes	Yes	Yes	Yes	Yes	NA
Reduction of toxicity, mobility, or volume of wastes	Yes	Yes	Yes	Yes	Yes	NA
Short-term effectiveness	Yes	Yes	Yes	Yes	Yes	NA
Implementability	Yes	Yes	Yes	Yes	Yes	NA
Cost	$ 190,770[b]	$ 193,800	$ 244,800	$ 125,340	$ 137,170	NA

Table 8.3 General Notes:

1. Excavated soil that is disposed off-site will be sent to either hazardous or non-hazardous waste landfill, depending on TCLP analysis results.
2. For all cases, soil from the Brown Soil Stain SWMU will be excavated and disposed off-site - most likely in a non-hazardous waste landfill.
3. For all cases, confirmation sampling and analysis would be conducted to document that cleanup levels have been achieved.

Table 8.1 Specific Notes:

[a] - Excavation adjacent to building may be problematic with respect to structural concerns. Some soil may need to be left in place.

[b] - Cost could increase significantly depending on confirmation sampling and analysis results.

[c] - Only hazardous waste soil would be treated to levels, which render it non-hazardous waste. Other soils would be excavated and disposed off-site without treatment. Bench tests would be required to demonstrate technical and economic feasibility of treatment.

[d] - Hexavalent chromium contaminated soil would be treated to levels below remediation goal of 38 mg/kg.

[e] - Hazardous waste soil would be treated to hexavalent chromium levels below 38 mg/kg and left in place. All other soils would be excavated and disposed off-site as non-hazardous waste.

[f] - All hexavalent chromium-contaminated soil would be treated in-situ to levels below 38 mg/kg.

[g] - In addition to Brown Soil Stain SWMU, soil from Concrete Culvert SWMU and small soil area south of Cylinder Shop would be excavated and disposed off-site as non-hazardous waste.

[h] - Estimated cost includes additional time required for operation of groundwater corrective action system.

TABLE 8.2: CORRECTIVE MEASURES ALTERNATIVES EVALUATION - DETAILED COMPARISON OF THRESHOLD CRITERIA
EXLINE, INC., SALINA, KANSAS

Remedial Action Alternative	Description	Protection of Human Health and Environment	Attainment of Cleanup Standards	Source Control to Reduce or Eliminate Further Releases	Standards for Management of Wastes
CMA-1: Excavation and Off-Site Disposal	All soil above RG would be excavated and disposed off-site. Soil would be tested to determine hazardous vs. non-hazardous waste status. Confirmation sampling would be conducted to determine that soil was removed to RG.	Yes. Soil above RG would be removed from the site.	Yes.	Yes. Source areas above RG would be moved off-site.	Yes. Soil would be disposed as determined by TCLP characterization.
CMA-2-A: Excavation and On-Site Treatment - Disposal of Soil Off-site.	All soil above RG would be excavated. Non-hazardous waste soil would be disposed off-site. Hazardous waste soil would be treated and disposed off-site as non-hazardous waste.	Yes. Soil above RG would be removed from the site.	Yes.	Yes. Source areas above RG would be moved off-site.	Yes. Soil would be characterized by TCLP and non-haz waste would be disposed off-site. Hazardous waste would be treated prior to off-site disposal.
CMA-2-B: Excavation and On-Site Treatment - Disposal of Soil On-site.	All soil above RG would be excavated. All soil would then be treated to reduce hexavalent chromium concentration below RG of 38 mg/kg. Exception is Brown Soil Stain SWMU soil, which would be excavated and disposed off-site - most likely as non-hazardous waste.	Yes. Soil above RG for hexavalent Cr would be treated below RG and lead and arsenic contaminated soil would be disposed off-site.	Yes.	Yes. Source areas above RG would be moved off-site or treated to levels below RG (for hexavalent Cr) and used for back-fill.	Yes. Soil would be characterized by TCLP and non-haz waste would be disposed off-site. Hazardous waste would be disposed off-site as required.
CMA-3-A: In-situ treatment of Hazardous Waste Soil.	Soil that would likely be hazardous waste upon excavation would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU and remaining soil above hex Cr RG of 38 mg/kg would be excavated and disposed off-site - likely as non-hazardous waste.	Yes. Soil above RG for hex Cr would be treated below RG or excavated. And lead and arsenic contaminated soil would be disposed off-site.	Yes.	Yes. Source areas above RG would be moved off-site or treated to levels below RG (for hexavalent Cr) and left in place.	Yes. Soil would be characterized by TCLP and non-haz waste would be disposed off-site. And, haz waste would be disposed off-site as required.
CMA-3-B: In-situ treatment of all Hex Cr Contaminated Soil.	All soil above hexavalent chromium RG of 38 mg/kg would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU would be excavated and disposed off-site - likely as non-hazardous waste.	Yes. Soil above RG for hex Cr would be treated below RG. And lead and arsenic contaminated soil would be disposed off-site.	Yes.	Yes. Source areas above RG would be treated to levels below RG (for hexavalent Cr) or excavated and moved off-site	Yes. Soil would be characterized by TCLP and non-haz waste would be disposed off-site. Hazardous waste would be disposed off-site as required.
CMA-4: Leave hex Cr contaminated soil in place and restrict access. Excavate and dispose soil from Brown Soil Stain area off-site.	Most soil above hex Cr concentration of 75 mg/kg would be left in place and the hex Cr allowed to migrate to GW where it would be capture in existing groundwater recovery system. Soil above 75 mg/kg hex Cr and soil from Brown Soil Stain area would be excavated and disposed off-site - likely as non-hazardous waste.	No. Hex Cr would continue to migrate to groundwater.	No - not immediate.	No.	Excavated soil would be characterized by TCLP and non-haz waste would be disposed off-site. Hazardous waste would be disposed off-site as required.

TABLE 8.3: CORRECTIVE MEASURES ALTERNATIVES EVALUATION - DETAILED COMPARISON OF LONG-TERM RELIABILITY AND EFFECTIVENESS EXLINE, INC., SALINA, KANSAS

Remedial Action Alternative	Description	Long-Term Reliability and Effectiveness Considerations.
CMA-1: Excavation and Off-Site Disposal	All soil above RG would be excavated and disposed off-site. Soil would be tested to determine hazardous vs. non-hazardous waste status. Confirmation sampling would be conducted to determine that soil was removed to RG.	Alternative would be reliable and effective in the long-term since soil above RG would be removed from site.
CMA-2-A: Excavation and On-Site Treatment - Disposal of Soil Off-site.	All soil above RG would be excavated. Non-hazardous waste soil would be disposed off-site. Hazardous waste soil would be treated and disposed off-site as non-hazardous waste.	Alternative would be reliable and effective in the long-term since soil above RG would be removed from site. Even if on-site treatment were not effective (i.e. to render all soil non-hazardous waste), soil would stille beremoved from site - as a hazardous waste.
CMA-2-B: Excavation and On-Site Treatment - Disposal of Soil On-site.	All soil above RG would be excavated. All soil would then be treated to reduce hexavalent chromium concentration below RG of 38 mg/kg. Exception is Brown Soil Stain SWMU soil, which would be excavated and disposed off-site - most likely as non-hazardous waste.	Alternative would be reliable and effective in the long-term assuming that treatment method could be developed and implemented to reduce hex Cr concentrations below RG. If such a treatment method could not be developed, then this alternative could not be implemented; would need to implement CMA-1.
CMA-3-A: In-situ treatment of Hazardous Waste Soil.	Soil that would likely be hazardous waste upon excavation would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU and remaining soil above hex Cr RG of 38 mg/kg would be excavated and disposed off-site - likely as non-hazardous waste.	Alternative would be reliable and effective in the long-term assuming that in-situ treatment method could be developed and implemented to reduce hex Cr concentrations below RG. If such a treatment method could not be developed, then this alternative could not be implemented: would need to implement CMA-1.
CMA-3-B: In-situ treatment of all Hex Cr Contaminated Soil.	All soil above hexavalent chromium RG of 38 mg/kg would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU would be excavated and disposed off-site - likely as non-hazardous waste.	Alternative would be reliable and effective in the long-term assuming that in-situ treatment method could be developed and implemented to reduce hex Cr concentrations below RG. If such a treatment method could not be developed, then this alternative could not be implemented: would need to implement CMA-1.

TABLE 8.4: CORRECTIVE MEASURES ALTERNATIVES EVALUATION - DETAILED COMPARISON OF TOXICITY, MOBILITY OR VOLUME OF WASTE REDUCTION
EXLINE, INC., SALINA, KANSAS

Remedial Action Alternative	Description	Reduction of Toxicity, Mobility, or Volume of Waste Considerations.
CMA-1: Excavation and Off-Site Disposal	All soil above RG would be excavated and disposed off-site. Soil would be tested to determine hazardous vs. non-hazardous waste status. Confirmation sampling would be conducted to determine that soil was removed to RG.	Alternative would be reduce volume of waste on-site by moving contaminants off-site to non-hazardous waste and hazardous waste disposal facilities.
CMA-2-A: Excavation and On-Site Treatment - Disposal of Soil Off-site.	All soil above RG would be excavated. Non-hazardous waste soil would be disposed off-site. Hazardous waste soil would be treated and disposed off-site as non-hazardous waste.	Alternative would be reduce volume of waste on-site by moving contaminants off-site to non-hazardous waste facility. Toxicity and mobility of hexavalent chromium would also be reduced by treatment (reduction to trivalent chromium).
CMA-2-B: Excavation and On-Site Treatment - Disposal of Soil On-site.	All soil above RG would be excavated. All soil would then be treated to reduce hexavalent chromium concentration below RG of 38 mg/kg. Exception is Brown Soil Stain SWMU soil, which would be excavated and disposed off-site - most likely as non-hazardous waste.	Alternative would reduce toxicity, mobility, and volume of waste by treatment (reduction of hexavalent chromium to trivalent chromium). Lead and arsenic waste volume would be reduced by excavation and off-site disposal.
CMA-3-A: In-situ treatment of Hazardous Waste Soil.	Soil that would likely be hazardous waste upon excavation would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU and remaining soil above hex Cr RG of 38 mg/kg would be excavated and disposed off-site - likely as non-hazardous waste.	Alternative would reduce volume of waste by excavation and off-site disposal of waste, as well as, in-situ treatment of hexavalent chromium by reduction to trivalent chromium.
CMA-3-B: In-situ treatment of all Hex Cr Contaminated Soil.	All soil above hexavalent chromium RG of 38 mg/kg would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU would be excavated and disposed off-site - likely as non-hazardous waste.	Alternative would reduce toxicity, mobility, and volume of waste by treatment (reduction of hexavalent chromium to trivalent chromium). Lead and arsenic waste volume would be reduced by excavation and off-site disposal.

TABLE 8.5: CORRECTIVE MEASURES ALTERNATIVES EVALUATION - DETAILED COMPARISON OF SHORT-TERM EFFECTIVENESS
EXLINE, INC., SALINA, KANSAS

Remedial Action Alternative	Description	Short-Term Effectiveness Considerations.
CMA-1: Excavation and Off-Site Disposal	All soil above RG would be excavated and disposed off-site. Soil would be tested to determine hazardous vs. non-hazardous waste status. Confirmation sampling would be conducted to determine that soil was removed to RG.	Alternative would be effective in the short-term as excavation process could be conducted in a relatively short time frame.
CMA-2-A: Excavation and On-Site Treatment - Disposal of Soil Off-site.	All soil above RG would be excavated. Non-hazardous waste soil would be disposed off-site. Hazardous waste soil would be treated and disposed off-site as non-hazardous waste.	Alternative would be effective in the short-term as excavation and treatment processes could be conducted in a relatively short time frame.
CMA-2-B: Excavation and On-Site Treatment - Disposal of Soil On-site.	All soil above RG would be excavated. All soil would then be treated to reduce hexavalent chromium concentration below RG of 38 mg/kg. Exception is Brown Soil Stain SWMU soil, which would be excavated and disposed off-site - most likely as non-hazardous waste.	Alternative would be effective in the short-term as excavation and treatment processes could be conducted in a relatively short time frame.
CMA-3-A: In-situ treatment of Hazardous Waste Soil.	Soil that would likely be hazardous waste upon excavation would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU and remaining soil above hex Cr RG of 38 mg/kg would be excavated and disposed off-site - likely as non-hazardous waste.	Alternative would be effective in the short-term as excavation process and in-situ treatment process could be conducted in a relatively short time frame.
CMA-3-B: In-situ treatment of all Hex Cr Contaminated Soil.	All soil above hexavalent chromium RG of 38 mg/kg would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU would be excavated and disposed off-site - likely as non-hazardous waste.	Alternative would be effective in the short-term as excavation process and in-situ treatment process could be conducted in a relatively short time frame.

TABLE 8.6: CORRECTIVE MEASURES ALTERNATIVES EVALUATION - DETAILED COMPARISON OF IMPLEMENTABILITY
EXLINE, INC., SALINA, KANSAS

Remedial Action Alternative	Description	Implementability Considerations.
CMA-1: Excavation and Off-Site Disposal	All soil above RG would be excavated and disposed off-site. Soil would be tested to determine hazardous vs. non-hazardous waste status. Confirmation sampling would be conducted to determine that soil was removed to RG.	Alternative could likely be implemented with one primary issue: 1) Excavation next to building and associated structural issues.
CMA-2-A: Excavation and On-Site Treatment - Disposal of Soil Off-site.	All soil above RG would be excavated. Non-hazardous waste soil would be disposed off-site. Hazardous waste soil would be treated and disposed off-site as non-hazardous waste.	Alternative could likely be implemented with two primary issues: 1) Excavation next to building and associated structural issues. 2) Development of technically and economically feasible ex-situ treatment process.
CMA-2-B: Excavation and On-Site Treatment - Disposal of Soil On-site.	All soil above RG would be excavated. All soil would then be treated to reduce hexavalent chromium concentration below RG of 38 mg/kg. Exception is Brown Soil Stain SWMU soil, which would be excavated and disposed off-site - most likely as non-hazardous waste.	Alternative could likely be implemented with two primary issues: 1) Excavation next to building and associated structural issues. 2) Development of technically and economically feasible ex-situ treatment process.
CMA-3-A: In-situ treatment of Hazardous Waste Soil.	Soil that would likely be hazardous waste upon excavation would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU and remaining soil above hex Cr RG of 38 mg/kg would be excavated and disposed off-site - likely as non-hazardous waste.	Alternative could likely be implemented with one primary issue: 1) Development of technically and economically feasible in-situ treatment process.
CMA-3-B: In-situ treatment of all Hex Cr Contaminated Soil.	All soil above hexavalent chromium RG of 38 mg/kg would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU would be excavated and disposed off-site - likely as non-hazardous waste.	Alternative could likely be implemented with one primary issue: 1) Development of technically and economically feasible in-situ treatment process.

TABLE 8.7: CORRECTIVE MEASURES ALTERNATIVES EVALUATION - DETAILED COMPARISON OF COST
EXLINE, INC., SALINA, KANSAS

Remedial Action Alternative	Description	Estimated Costs
CMA-1: Excavation and Off-Site Disposal	All soil above RG would be excavated and disposed off-site. Soil would be tested to determine hazardous vs. non-hazardous waste status. Confirmation sampling would be conducted to determine that soil was removed to RG.	Excavation, transportation, backfill, and disposal of non-HW - $ 35,340. Excavation, transportation, backfill, and disposal of HW - $ 112,930. Equipment decon - $ 20,000. Sampling and analysis - $ 22,500. Total - $ 190,770.
CMA-2-A: Excavation and On-Site Treatment - Disposal of Soil Off-site.	All soil above RG would be excavated. Non-hazardous waste soil would be disposed off-site. Hazardous waste soil would be treated and disposed off-site as non-hazardous waste.	Excavation, transportation, backfill, and disposal of non-HW - $ 48,900. On-site (ex-situ) treatment of excavated HW soil - $ 87,400. Equipment decon - $ 20,000. Permit modification cost (to treat HW) - $ 15,000. Sampling and analysis - $ 22,500. Total - $ 193,800.
CMA-2-B: Excavation and On-Site Treatment - Disposal of Soil On-site.	All soil above RG would be excavated. All soil would then be treated to reduce hexavalent chromium concentration below RG of 38 mg/kg. Exception is Brown Soil Stain SWMU soil, which would be excavated and disposed off-site - most likely as non-hazardous waste.	Excavation, transportation, backfill, and disposal of non-HW - $ 6,670. Excavation and backfill of treated soil - $ 17,900. Treatment of HW soil - $ 87,400. Treatment of non-HW soil - $ 75,330. Equipment decon - $ 20,000. Permit modification cost (to treat HW) - $ 15,000. Sampling and analysis - $ 22,500. Total - $ 244,800.
CMA-3-A: In-situ treatment of Hazardous Waste Soil.	Soil that would likely be hazardous waste upon excavation would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU and remaining soil above hex Cr RG of 38 mg/kg would be excavated and disposed off-site - likely as non-hazardous waste.	Excavation, transportation, backfill, and disposal of non-HW - $ 35,340. In-situ treatment of HW soil - $ 69,000. Sampling and analysis - $ 21,000. Total - $ 125,340.
CMA-3-B: In-situ treatment of all Hex Cr Contaminated Soil.	All soil above hexavalent chromium RG of 38 mg/kg would be treated in-situ to reduce the hex Cr concentration below RG of 38 mg/kg. Soil from Brown Soil Stain SWMU would be excavated and disposed off-site - likely as non-hazardous waste.	Excavation, transportation, backfill, and disposal of non-HW - $ 6,670. In-situ treatment of HW soil - $ 69,000. In-situ treatment of non-HW soil - $ 38,900. Sampling and analysis - $ 22,600. Total - $ 137,170.

9. Evaluation of Existing Groundwater Corrective Action Program.

The existing groundwater corrective action at the Exline site includes the following elements:

1. Recovery wells. Three (3) recovery wells are operated with discharge of the untreated water to the City of Salina sewer system. SC-2 was recently removed from the groundwater recovery system due to the fact that this well has exhibited chromium concentrations at or near the detection limit of 0.01 mg/L for several years.

Recovery wells are sampled and analyzed for total chromium on a semi-annual basis.

2. Monitoring wells. Ten (10) monitoring wells are sampled and analyzed on a semi-annual basis for total chromium. Water levels are also measured in these wells.

3. Piezometers. Water levels are measured in ten (10) piezometers at the Exline site. The water level data for the piezometers and the monitoring wells are used to develop piezometric contour maps.

As discussed in the annual Corrective Action Reports, which are submitted to the KDHE and EPA, the Corrective Action program has been and continues to be successful in preventing further migration of the chromium plume and in removing significant quantities of chromium from the saturated zone. This conclusions are based on the monitoring and recovery well data, which show that the monitoring well (H-6) and three (3) private wells located down-gradient from the recovery system, exhibit non-detect (0.010 mg/L) chromium concentrations and on the mass removal data, which are calculated on an annual basis.

The present worth of the costs associated with the groundwater recovery and monitoring system operation, the following information will be calculated below.

Table 9.1 and Figure 9.1 summarize the calculated mass of hexavalent chromium, which has been removed from the aquifer on an annual basis. These data have been included in the groundwater monitoring reports, which have been submitted to the KDHE and EPA on an annual basis.

Based on a review of Figure 9.1, two distinct curves appear to be present from the operating time period from 1984 through 2007. The first curve runs from 1984 through 1992. During that time period, the rate of chromium mass recovery as a function of time appears to represent a straight-line decrease in the mass of chromium recovered each year. In 1993, the chromium mass recovery increased from 191 lb/yr. (1992) to 1311 lb/yr. (1993). This increase was almost certainly caused by a near record year of precipitation, which in turn, caused significant increases in the water table level at the site. As a result of the water level increase, the chromium concentrations increased significantly in recovery wells B-7 and E-3. The functionality of the chromium mass recovered as a function of time from 1993 through 2007 appears to represent an

exponential decay. Figure 9.2 shows the annual rate of chromium removal from 1993 through 2007. This Figure shows that the rate of chromium mass removal appears to be approaching an asymptotic value in the range of 100 to 150 lb/year.

The mass of hexavalent chromium remaining in the saturated zone was calculated earlier (Section 5) to be 2127 lb. In order to calculate the mass of chromium that would need to be removed in order to achieve cleanup to the groundwater protection standard of 0.10 mg/L, the mass of chromium in the aquifer at a concentration of 0.10 mg/L (the chromium MCL) must be calculated. This mass is calculated as follows:

The dissolved mass is (equation 5-2):

Area A:

$(21200\ ft^2) \times (27\ ft) \times (0.44) \times (7.48\ gal/ft^3) \times (0.1\ ppm) \times (8.34 \times 10^{-6}\ lb/gal\text{-}ppm)$

= 1.6 lb.

Area B:

$(74000\ ft^2) \times (24\ ft) \times (0.44) \times (7.48\ gal/ft^3) \times (0.1\ ppm) \times (8.34 \times 10^{-6}\ lb/gal\text{-}ppm)$

= 4.9 lb.

Total mass of chromium in the aqueous phase = 6.5 lb.

As shown earlier in Section 5, the ratio of the sorbed chromium mass to the dissolved chromium mass is 30.8 to 1. Therefore, the total estimated mass of chromium in the groundwater for a concentration of 0.1 mg/L is:

$(30.8) \times (6.5) + (6.5)$

= 207 lb.

The estimated mass of chromium, which would need to be removed from the aquifer in order to meet the groundwater cleanup standard of 0.1 mg/L, is then:

(2127 - 207) lb.

= 1920 lb.

The time required to complete the groundwater cleanup can be estimated by using the (conservative) asymptotic removal rate of 100 lb/year chromium. Based on that removal rate, the estimated groundwater cleanup time would be:

(1920 lb.)/(100 lb./yr) = 19 years

The most recent post-closure cost estimate was prepared on April 9, 2008. These costs are summarized in Table 9.2. These costs have been modified slightly from the April 9, 2008 submittal. Changes include:

- Increase in chemical analysis costs for sampling discharge to City sewer.
- Increase in system operation and maintenance costs.
- Decrease in City sewer disposal costs (due to elimination of recovery well SC-2 from Exline groundwater recovery system).

It should also be noted that the "Site Soil Investigation and Remediation" item was not included in Table 9.2, since that item is not part of the on-going costs associated with the long-term operation of the groundwater recovery and monitoring system.

As shown in Table 9.2, the estimated annual cost associated with the operation and maintenance of the groundwater recovery and monitoring system is $ 48,700 per year (based on 2008 dollars).Based on these estimates, the present worth for operating the groundwater recovery and monitoring system (for an additional 19 years) can be calculated using the following equation:

$$PW = CC + (AOC/ROR) \times [1 - (1 + ROR)^{-N}] \qquad (9\text{-}1)$$

Where:

PW = present worth CC = capital cost
AOC = annual operating cost = $ 48,700/yr.
ROR = rate of return (as a decimal) – use 0.08
N = number of years of operation = 19 years

For this evaluation, the capital cost will be zero since the groundwater recovery and monitoring system is already in place.

Inserting these values into equation 9-1 yields the following present worth for the groundwater corrective action system:

$$PW = (48{,}700)/(0.08) \times [1 - (1 + 0.08)^{-19}]$$

$$= \$\ 467{,}700$$

TABLE 9.1: MASS OF CHROMIUM RECOVERED BY EXLINE, INC. PUMPING WELLS ON AN ANNUAL BASIS

Year	Chromium Mass (lb)
1984	1571
1985	1812
1986	1641
1987	1154
1988	1292
1989	878
1990	514
1991	439
1992	191
1993	1311
1994	1360
1995	666
1996	696
1997	414
1998	275
1999	477
2000	391
2001	219
2002	212
2003	155
2004	107
2005	203
2006	138
2007	172
Total:	16288

Figure 9.1: Annual Chromium Mass Removal as a Function of Time - Exline, Inc. GW Recovery System

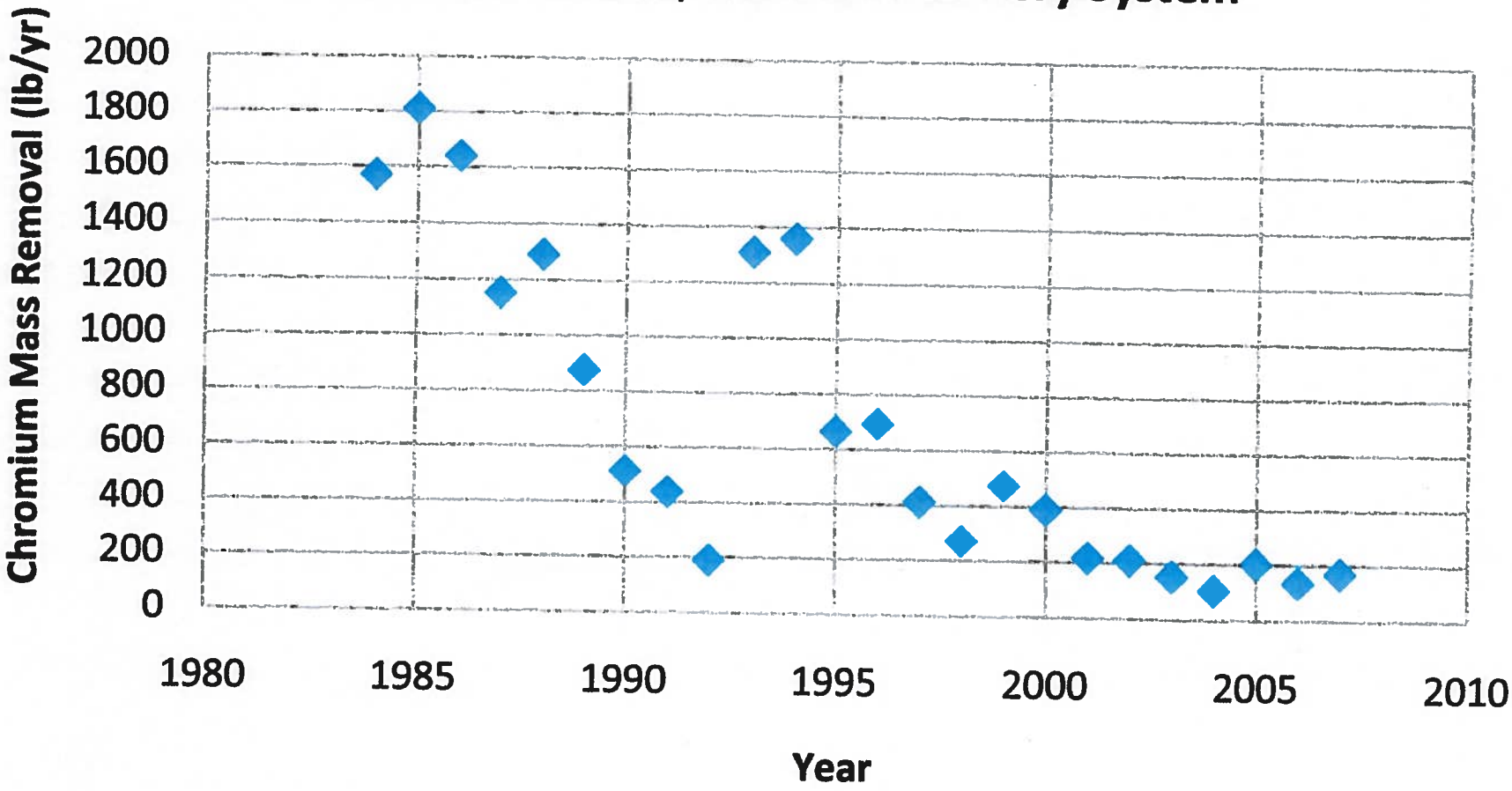


Figure 9.2: Chromium Mass Removal as a Function of Time
Exline, Inc. GW Recovery System: 1993 through 2007

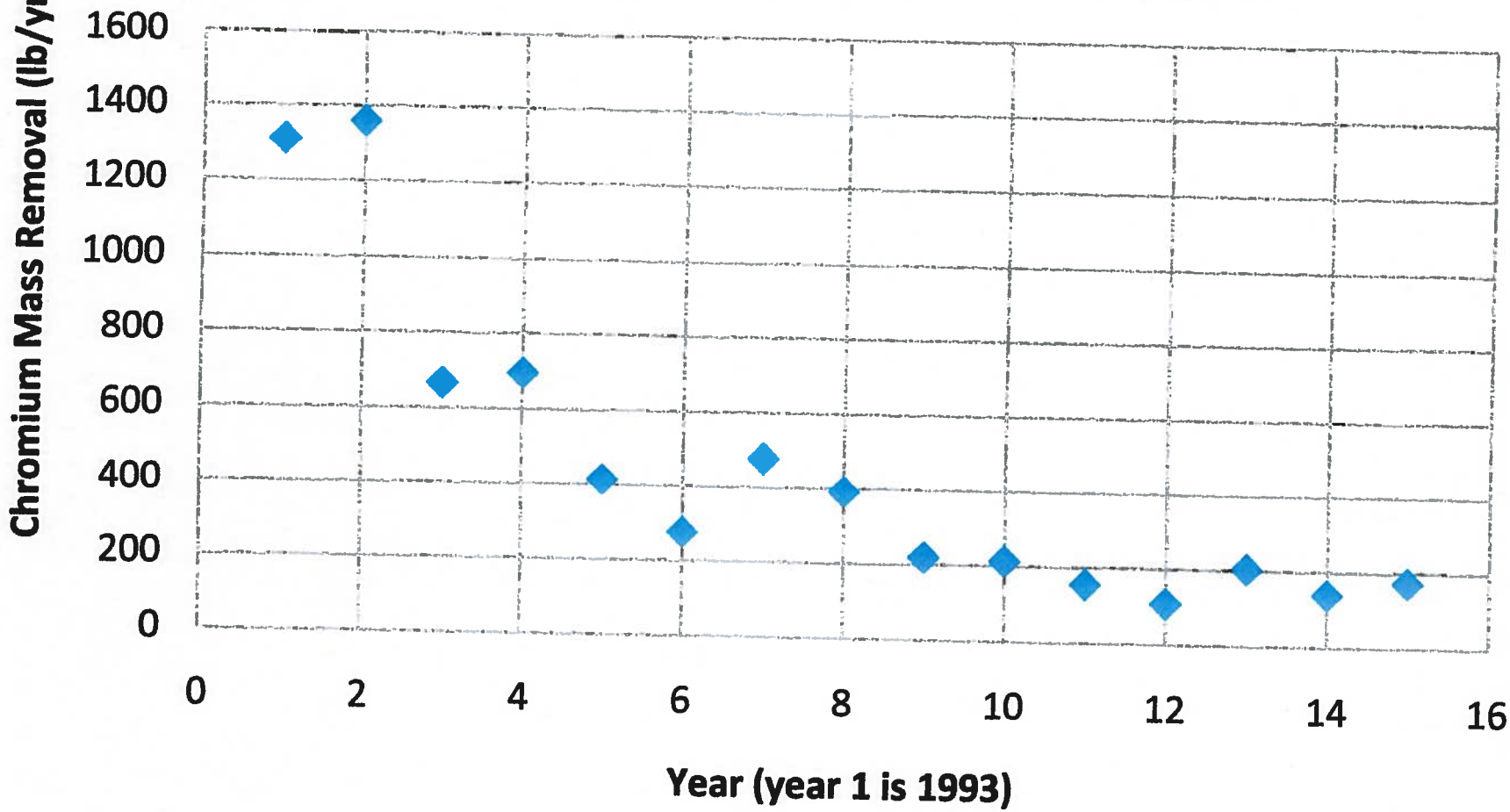


TABLE 9.2: GROUNDWATER CORRECTIVE ACTION ANNUAL OPERATING AND MAINTENANCE COSTS

Item	Estimated Annual Cost ($)
Groundwater sampling labor	$4,000
Groundwater monitoring chemical analyses	$1,000
Preparation of semi-annual and annual GW monitoring reports	$2,000
City wastewater discharge monthly sampling and reporting	$3,000
City discharge chemical analyses	$1,000
GW recovery and monitoring system O&M costs	$8,400
Recovery well power costs	$1,300
Sewer disposal fees	$12,000
Consulting services fees	$1,000
Hazardous waste permit engineering, administration, and overhead	$5,000
KDHE monitoring permit fee	$10,000
Total	$48,700

10. Recommended Final Corrective Measures Alternative.

The recommended Corrective Measures Alternative for the Exline Solid Waste Management Units is CMA-3-A. This corrective measure is:

1) In-situ treatment of the soil, which exhibits hexavalent chromium concentrations at or above the RG of 38 mg/kg and which would likely be hazardous waste, if excavated. This soil is part of the Chromium Plating Bath Ventilation discharge area located on the east side and immediately adjacent to the Cylinder Shop. Estimated quantities of soil that would be treated are:

211 yd^3 = 230 tons

This soil would be treated by injecting a liquid reducing agent into the contaminated soil zone. The hexavalent chromium would be reduced to trivalent chromium such that remaining hexavalent chromium concentrations would be less than the RG goal of 38 mg/kg.

A bench-scale test would be conducted using representative soil samples in order to demonstrate the technical and economic feasibility of the treatment process, as well as, determine the most effective treatment chemical and required dosage.

Confirmation sampling would be conducted following treatment. This sampling would be completed using direct-push sampling techniques to demonstrate that the hexavalent chromium concentration has been reduced to levels below the 38 mg/kg RG.

2) Excavation and off-site disposal of non-hazardous waste soil. This includes soil from all other SMWUs at the Exline facility. Representative samples of excavated soil would be sampled and analyzed for TCLP chromium in order to confirm the non-hazardous waste nature of the material.

Confirmation sampling would be conducted to demonstrate that the soil has been removed to the respective RGs for hexavalent chromium, arsenic, and lead.

The excavated areas would be back-filled with clean soil.

The total estimated cost for the recommended remedial alternative is $ 125,340.

This alternative would meet all of the Corrective Action Objectives identified in Section 1. In addition, as shown in Tables 8.1 through 8.7, this alternative compares favorably with the other alternatives relative to the nine (9) evaluation criteria. In-situ treatment of the high concentration chromium soil would also reduce the potential for personnel exposure to high concentrations of hexavalent chromium, which would occur, if the hazardous waste soil were excavated.

11. Public Involvement Plan.

The following activities are proposed in order to provide information to the public with respect to Corrective Action activities that will be implemented at the Exline, Inc. site. These activities may include the following:

1. Public Availability Session. This would include an informal meeting at a public location (e.g., City of Salina Library). The purpose of this meeting would be to provide the public an opportunity to discuss the project with regulatory officials and Exline, Inc. representatives.

2. Fact Sheets. Fact sheets will be prepared as appropriate. These documents will summarize proposed corrective action at the site.

3. Repository. A repository will be set up at the City of Salina Public Library. This repository will include applicable Corrective Action documents such as the facility permit, approved Work Plans, Reports, etc.

4. Comment Period. A 45 day comment period will be provided for the Statement of Basis. The Statement of Basis will present to the public, EPA's proposed remedy and draft permit modification for public review.

12. Bibliography.

1. Handbook of Soil Science, Sumner, CRC Press, 2000.
2. Reactivity and Transport of Heavy Metals in Soils, Selim and Amacher, CRC Lewis Publishers, 1997.
3. "Treatment of a Chromate-Contaminated Soil by in-situ Gaseous Reduction, Thornton, Gilmore, Olsen, Giblin, and Phelan, Groundwater Monitoring and Remediation, Volume 27, Issue 1, pages 56-64, Winter, 2007.

ATTACHMENT A

CAS LABORATORY REPORT
SURFACE WATER RUN-OFF AREA SOIL SAMPLE RESULTS

Continental
Analytical Services, Inc.

03/25/2008

Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Received: 03/18/2008
Continental File No.: 5030
Continental Order No.: 31789
P.O./Project No: Exline

Dear Mr. Puttbrese:

This laboratory report, consisting of 8 pages, contains the analytical and quality control results for the following samples:

CAS LAB ID #	SAMPLE DESCRIPTION	SAMPLE TYPE	DATE SAMPLED
08031577	DA-6-Surf	Solid	3/18/2008
08031578	DA-6-3	Solid	3/18/2008
08031579	DA-7-Surf	Solid	3/18/2008
08031580	DA-7-3	Solid	3/18/2008
08031581	Soil B	Solid	3/18/2008

Continental is accredited by the State of Kansas through the National Environmental Laboratory Accreditation Program (NELAP). The results contained in this report were obtained using Continental's Standard Operating Procedures. These procedures are in substantial compliance with the approved methods referenced and the standards published by NELAP unless otherwise noted in the Appendix and Quality Control sections of this report.

The Appendix and Quality Control sections are an integral part of this report and may contain important data qualifiers. The chain of custody and sample receipt form are also included as attachments to this report.

All results are reported on a wet weight basis unless otherwise stated.

Samples will be retained for thirty days unless Continental is otherwise notified.

Thank you for choosing Continental for this project. If you have any questions please contact me at (800)535-3076.

This report may not be reproduced, except in full, without written approval from Continental Analytical Services, Inc.

CONTINENTAL ANALYTICAL SERVICES, INC.

Clifford J. Baker
Technical Manager

Petra M. Craddock
Project Manager

P.O. Box 3737 - 525 N. Eighth St. - Salina, KS 67402-3737
785-827-1273 800-535-3076 Fax 785-823-7830

KDHE Environmental Laboratory Accreditation No. E-10146

Continental
Analytical Services, Inc.

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 03/25/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31789

Lab Number: 08031577
Sample Description: DA-6-Surf

Date Sampled: 03/18/2008
Time Sampled: 1525

Analysis	Concentration	Units	Book/Page
Chromium, Total	276.	mg/kg	6466/20

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total	03/21/2008	03/24/2008	080321-1	4IP2084	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 08031577

Lab Number: 08031578
Sample Description: DA-6-3

Date Sampled: 03/18/2008
Time Sampled: 1535

Analysis	Concentration	Units	Book/Page
Chromium, Total	839.	mg/kg	6466/20

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total	03/21/2008	03/24/2008	080321-1	4IP2084	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 08031578

Lab Number: 08031579
Sample Description: DA-7-Surf

Date Sampled: 03/18/2008
Time Sampled: 1550

Analysis	Concentration	Units	Book/Page
Chromium, Total	150.	mg/kg	6466/20

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)

-Continued-

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 03/25/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31789

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total	03/21/2008	03/24/2008	080321-1	4IP2084	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 08031579

Lab Number: 08031580
Sample Description: DA-7-3

Date Sampled: 03/18/2008
Time Sampled: 1555

Analysis	Concentration	Units	Book/Page
Chromium, Total	205.	mg/kg	6466/20

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total	03/21/2008	03/24/2008	080321-1	4IP2084	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 08031580

Lab Number: 08031581
Sample Description: Soil B

Date Sampled: 03/18/2008
Time Sampled: 1500

Analysis	Concentration	Units	Book/Page
Chromium, Total	186.	mg/kg	6466/20

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total	03/21/2008	03/24/2008	080321-1	4IP2084	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 08031581

ND(), where noted, indicates none detected with the reporting limit in parentheses.

Continental
Analytical Services, Inc.

APPENDIX

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 03/25/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31789

All samples were received at the recommended temperature of less than 6 degrees Celsius.

No analysis with a holding time of seventy-two hours or less was performed in this Continental order.

Continental Analytical Services, Inc.

Continental Analytical Services, Inc.
Non-Accredited Analyte Summary Report

Client: Exline, Inc.
CAS Order Number: 31789

Continental does not currently have NELAP accreditation for the analyte and method combination presented in the table below. In most cases NELAP accreditation is not available for the analyte and method combination listed in the table.

Test	Analysis	Matrix-Regulatory Program	Method
CAS is accredited for all analytes.			

Continental Analytical Services, Inc.

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Quality Control Report
Batch Summary

Date Reported: 03/25/2008
Date Sample Received: 03/18/2008
Continental File No: 5030
Continental Order No: 31789

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
SL308	Chromium, Total	080321-1	080321BLK1	080321LCS1	

Lab numbers associated with this batch:
08031577 08031578 08031579 08031580 08031581

Quality Control Report
Method Blank, LCS, MS/MSD Data

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 03/25/2008
Date Sample Received: 03/18/2008
Continental File No: 5030
Continental Order No: 31789

Analysis	Blank Data	% Rec LCS	Limits	Spike Level	Units	Spiked Sample (% Recovery) MS	MSD	Limits	Spike Level	Units	Spiked Sample Precision Data RPD	Limit
QC Batch: 080321-1	For samples prepared on: 03/21/2008					Spiked sample:						
Chromium, Total	ND(1.0)	102	85.0-115	50.0	mg/kg	MN	MN	70.6-122			**	21.5

Data Qualifiers:

MN - The MS/MSD sample analyses were not performed on a sample from this Continental order number.

** - RPD cannot be calculated.

-Conclusion Quality Control Report-

Quality Control Report
Continuing Calibration Verification Data Summary

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 03/25/2008
Date Sample Received: 03/18/2008
Continental File No: 5030
Continental Order No: 31789

Analysis	Date of Analysis	Instrument Batch ID	Amount in Standard	Amount Detected	Units	Percent Recovery
Chromium	03/24/2008	4IP2084	No data qualifiers present for this analysis.			
Chromium	03/24/2008	5IP2084	No data qualifiers present for this analysis.			

- Laboratory Report Conclusion -

CAS ORDER NO: 31789

CHAIN OF CUSTODY RECORD

ENVIRO TECH SERVICES, INC.
361 North Ohio Street, Salina, Kansas 67401
(785) 827-1682 FAX (785) 827-8765

Project #:

Project Name: Exline

Sampler's Name: Jack Eshck

Sampler's Signature: [signature]

Analytical Parameters

Sample Information

Date	Time	Sample ID	Sample Point Identification	Matrix	Number of Containers	Chrome (total)								Comments
3/18	1525		DA-6-Surf	Soil	1	✓								
3/18	1555		DA-6-3	Soil	1	✓								
3/18	1550		DA-7-Surf	Soil	1	✓								
3/18	~~1550~~	1555	DA-7-3	Soil	1	✓								
3/18	1500		Soil B	Soil	1	✓								

		Time	Date			Time	Date
#1 Relinquished by:	Printed Name: Jack Eshck	1615	3/18/08	#1 Received By:	Printed Name:	1615	3/18/08
	Signature: [signature]				Signature: [signature]		
#2 Relinquished by:	Printed Name:	Time	Date	#2 Received By:	Printed Name:	Time	Date
	Signature:				Signature:		

Send Report To: Mal Shepard @ SEI

Special Instructions/Comments:

Page 1 of 1

Figure 2: Chain-of-Custody Form

ATTACHMENT B

CAS LABORATORY REPORT
TOTAL METAL AND TCLP SOIL SAMPLE RESULTS

Continental
Analytical Services, Inc.

04/09/2008

Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Received: 03/18/2008
Continental File No.: 5030
Continental Order No.: 31788
P.O./Project No: Exline

Dear Mr. Puttbrese:

This laboratory report, consisting of 13 pages, contains the analytical and quality control results for the following samples:

CAS LAB ID #	SAMPLE DESCRIPTION	SAMPLE TYPE	DATE SAMPLED
08031567	#2-Surface (R)	Solid	3/18/2008
08031568	#2-Deep (R)	Solid	3/18/2008
08031569	CS-ES-6-Surf(R)	Solid	3/18/2008
08031570	CS-ES-8-3(R)	Solid	3/18/2008
08031571	CS-ES-17-Surf(R)	Solid	3/18/2008
08031572	CS-ES-10-5(R)	Solid	3/18/2008
08031573	CW-4-Surf-(R)	Solid	3/18/2008
08031574	MS-2-Surf(R)	Solid	3/18/2008
08031574R	MS-2-Surf(R)	Solid	3/18/2008
08031575	DA-5-Surf(R)	Solid	3/18/2008
08031576	Soil A	Solid	3/18/2008

The Appendix and Quality Control Report are integral parts of this laboratory report and may contain important data qualifiers. The original chain of custody and cooler/sample receipt form are enclosed as separate documents to this report.

All results are reported on a wet weight basis unless otherwise stated.

Samples will be retained for thirty days unless Continental is otherwise notified.

Continental is accredited by the State of Kansas through the National Environmental Laboratory Accreditation Program (NELAP). The results contained in this report were obtained using Continental's Standard Operating Procedures. These procedures are in substantial compliance with the approved methods referenced and the standards published by NELAP unless otherwise noted in the Appendix and Quality Control sections of this report.

This report may not be reproduced, except in full, without written approval from Continental Analytical Services, Inc.

Thank you for choosing Continental for this project. If you have any questions please contact me at (800)535-3076.

P.O. Box 3737 - 525 N. Eighth St. - Salina, KS 67402-3737
785-827-1273 800-535-3076 Fax 785-823-7830

KDHE Environmental Laboratory Accreditation No. E-10146

CONTINENTAL ANALYTICAL SERVICES, INC.

Clifford J. Baker
Technical Manager

Petra M. Craddock
Project Manager

P.O. Box 3737 - 525 N. Eighth St. - Salina, KS 67402-3737
785-827-1273 800-535-3076 Fax 785-823-7830

KDHE Environmental Laboratory Accreditation No. E-10146

Continental Analytical Services, Inc.

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 04/09/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Lab Number: 08031567
Sample Description: #2-Surface (R)

Date Sampled: 03/18/2008
Time Sampled: 1330

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	ND(0.10)	mg/L	6466/18
Chromium, Total	848.	mg/kg	6466/22

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/20/2008	03/21/2008	080320-1	12IP2080	KMW	6010B
Chromium, Total	03/21/2008	03/25/2008	080321-1	7IP2085	KMW	6010B
TCLP Preparation	03/19/2008		080319-2		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031567

Lab Number: 08031568
Sample Description: #2-Deep (R)

Date Sampled: 03/18/2008
Time Sampled: 1345

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	44.5	mg/L	6466/18
Chromium, Total	1090.	mg/kg	6466/22

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/20/2008	03/21/2008	080320-1	12IP2080	KMW	6010B
Chromium, Total	03/21/2008	03/25/2008	080321-1	7IP2085	KMW	6010B
TCLP Preparation	03/19/2008		080319-1		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031568

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 04/09/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Lab Number: 08031569
Sample Description: CS-ES-6-Surf(R)

Date Sampled: 03/18/2008
Time Sampled: 1400

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	ND(0.10)	mg/L	6466/18
Chromium, Total	484.	mg/kg	6466/22

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/20/2008	03/21/2008	080320-1	12IP2080	KMW	6010B
Chromium, Total	03/21/2008	03/25/2008	080321-1	7IP2085	KMW	6010B
TCLP Preparation	03/19/2008		080319-2		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031569

Lab Number: 08031570
Sample Description: CS-ES-8-3(R)

Date Sampled: 03/18/2008
Time Sampled: 1425

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	2.68	mg/L	6466/18
Chromium, Total	1370.	mg/kg	6466/22

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/20/2008	03/21/2008	080320-1	12IP2080	KMW	6010B
Chromium, Total	03/21/2008	03/25/2008	080321-1	7IP2085	KMW	6010B
TCLP Preparation	03/19/2008		080319-1		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031570

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 04/09/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Lab Number: 08031571
Sample Description: CS-ES-17-Surf(R)

Date Sampled: 03/18/2008
Time Sampled: 1445

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	2.08	mg/L	6466/18
Chromium, Total	754.	mg/kg	6466/22

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/20/2008	03/21/2008	080320-1	13IP2080	KMW	6010B
Chromium, Total	03/21/2008	03/26/2008	080321-1	7IP2085	KMW	6010B
TCLP Preparation	03/19/2008		080319-1		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031571

Lab Number: 08031572
Sample Description: CS-ES-10-5(R)

Date Sampled: 03/18/2008
Time Sampled: 1440

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	0.47	mg/L	6466/18
Chromium, Total	209.	mg/kg	6466/22

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/20/2008	03/21/2008	080320-1	13IP2080	KMW	6010B
Chromium, Total	03/21/2008	03/25/2008	080321-1	7IP2085	KMW	6010B
TCLP Preparation	03/19/2008		080319-1		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031572

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 04/09/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Lab Number: 08031573
Sample Description: CW-4-Surf-(R)

Date Sampled: 03/18/2008
Time Sampled: 1450

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	ND(0.10)	mg/L	6466/18
Chromium, Total	721.	mg/kg	6466/22

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/20/2008	03/21/2008	080320-1	13IP2080	KMW	6010B
Chromium, Total	03/21/2008	03/26/2008	080321-1	8IP2085	KMW	6010B
TCLP Preparation	03/19/2008		080319-2		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031573

Lab Number: 08031574
Sample Description: MS-2-Surf(R)

Date Sampled: 03/18/2008
Time Sampled: 1505

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	ND(0.10)	mg/L	6466/24
Lead, TCLP	ND(0.05)	mg/L	6466/24
Chromium, Total	532.	mg/kg	6466/22
Lead, Total (ICP)	106. QC	mg/kg	6466/23

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/27/2008	03/27/2008	080327-2	2IP2087	KMW	6010B
Lead, TCLP	03/27/2008	03/27/2008	080327-2	2IP2087	KMW	6010B
Chromium, Total	03/21/2008	03/26/2008	080321-1	8IP2085	KMW	6010B
Lead, Total (ICP)	03/21/2008	03/26/2008	080321-1	4IP2086	KMW	6010B
TCLP Preparation	03/25/2008		080325-2		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031574

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 04/09/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Lab Number: 08031574R
Sample Description: MS-2-Surf(R)

Date Sampled: 03/18/2008
Time Sampled: 1505

Laboratory numbers ending with an R are from a second preparation and/or analysis of the sample.

Analysis	Concentration	Units	Book/Page
Lead, Total (ICP)	238. QC	mg/kg	6466/35

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Lead, Total (ICP)	04/02/2008	04/08/2008	080402-3	8IP2098	KMW	6010B
ICP Metals Total Preparation Method						3050B

Conclusion of Lab Number: 08031574R

Lab Number: 08031575
Sample Description: DA-5-Surf(R)

Date Sampled: 03/18/2008
Time Sampled: 1515

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	0.17	mg/L	6466/24
Chromium, Total	2080.	mg/kg	6466/22

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/27/2008	03/27/2008	080327-2	2IP2087	KMW	6010B
Chromium, Total	03/21/2008	03/26/2008	080321-1	8IP2085	KMW	6010B
TCLP Preparation	03/25/2008		080325-1		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031575

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 04/09/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Lab Number: 08031576
Sample Description: Soil A

Date Sampled: 03/18/2008
Time Sampled: 1200

Analysis	Concentration	Units	Book/Page
Chromium, TCLP	44.7	mg/L	6466/24
Chromium, Total	949.	mg/kg	6466/20

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, TCLP	03/27/2008	03/27/2008	080327-2	3IP2087	KMW	6010B
Chromium, Total	03/21/2008	03/24/2008	080321-1	4IP2084	KMW	6010B
TCLP Preparation	03/25/2008		080325-1		ADK	1311
ICP Metals Total Preparation Method						3050B
ICP Metals TCLP Preparation Method						3051

Conclusion of Lab Number: 08031576

ND(), where noted, indicates none detected with the reporting limit in parentheses.

APPENDIX

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 04/09/2008
Date Sample Recd: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

All samples were received at the recommended temperature of less than 6 degrees Celsius.

No analysis with a holding time of seventy-two hours or less was performed in this Continental order.

QC - QC data qualifiers were noted. See the Quality Control Report.

Continental Analytical Services, Inc.
Non-Accredited Analyte Summary Report

Client: Exline, Inc.
CAS Order Number: 31788

Continental does not currently have NELAP accreditation for the analyte and method combination presented in the table below. In most cases NELAP accreditation is not available for the analyte and method combination listed in the table.

Test	Analysis	Matrix-Regulatory Program	Method
	CAS is accredited for all analytes.		

Continental Analytical Services, Inc.

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Quality Control Report
Batch Summary

Date Reported: 04/09/2008
Date Sample Received: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
SL708	Chromium, TCLP	080320-1	080320BLK1	080320LCS1	08031568MS
Lab numbers associated with this batch: 08031567 08031568 08031569 08031570 08031571 08031572 08031573					
SL708	Chromium, TCLP	080327-2	080327BLK2	080327LCS2	08031575MS
Lab numbers associated with this batch: 08031574 08031575 08031576					
SL728	Lead, TCLP	080327-2	080327BLK2	080327LCS2	08031575MS
Lab numbers associated with this batch: 08031574					
SL601	TCLP Prep	080319-1	080319BLK1		
Lab numbers associated with this batch: 08031568 08031570 08031571 08031572					
SL601	TCLP Prep	080319-2	080319BLK2		
Lab numbers associated with this batch: 08031567 08031569 08031573					
SL308	Chromium, Total	080321-1	080321BLK1	080321LCS1	08031574MS
Lab numbers associated with this batch: 08031567 08031568 08031569 08031570 08031571 08031572 08031573 08031574 08031575 08031576					
SL311	Lead, Total (ICP)	080321-1	080321BLK1	080321LCS1	08031574MS
Lab numbers associated with this batch: 08031574					
SL601	TCLP Prep	080325-1	080325BLK1		
Lab numbers associated with this batch: 08031575 08031576					
SL601	TCLP Prep	080325-2	080325BLK2		
Lab numbers associated with this batch: 08031574					
SL311	Lead, Total (ICP)	080402-3	080402BLK3	080402LCS3	08031574RS
Lab numbers associated with this batch: 08031574R					

Quality Control Report
Method Blank, LCS, MS/MSD Data

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 04/09/2008
Date Sample Received: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Analysis	Blank Data	% Rec LCS	Limits	Spike Level	Units	Spiked Sample (% Recovery) MS	MSD	Limits	Spike Level	Units	Spiked Sample Precision Data RPD	Limit
QC Batch: 080320-1	For samples prepared on: 03/20/2008					Spiked sample: 08031568+						
Chromium, TCLP	ND(0.10)	104	85.0-115	5.0	mg/L	97.1	97.2	80.0-120	5.0	mg/L	0.1	20.0
QC Batch: 080321-1	For samples prepared on: 03/21/2008					Spiked sample: 08031574+						
Chromium, Total	ND(1.0)	102	85.0-115	50.0	mg/kg	I	I	70.6-122	25.0	mg/kg	**	21.5
Lead, Total (ICP)	ND(0.5)	98.7	85.0-115	50.0	mg/kg	309. MH	221. MH MP	61.7-116	25.0	mg/kg	33.2	16.1
QC Batch: 080327-2	For samples prepared on: 03/27/2008					Spiked sample: 08031575+						
Chromium, TCLP	ND(0.10)	103	85.0-115	5.0	mg/L	103	103	80.0-120	5.0	mg/L	0.0	20.0
Lead, TCLP	ND(0.05)	98.4	85.0-115	5.0	mg/L	99.0	98.6	80.0-120	5.0	mg/L	0.4	20.0
QC Batch: 080402-3	For samples prepared on: 04/02/2008					Spiked sample: 08031574R+						
Lead, Total (ICP)	ND(5.0)	98.2	85.0-115	50.0	mg/kg	(0.0) MI	OC.	61.7-116	25.0	mg/kg	**	16.1

Data Qualifiers:

I - Due to the concentration of analyte in the sample, the spike level is too low to allow accurate quantification of the spike recovery.

MH - The matrix spike and/or matrix spike duplicate recovery for this analyte was above the method or laboratory control limit. See LCS data for the basis for acceptance of this sample. The reported sample concentration is estimated.

MP - The MS/MSD recoveries for this analyte exceeded the method or laboratory precision control limit. The reported sample concentration is estimated.

MI - Due to sample heterogeneity and/or sample matrix interferences, the MS and/or MSD recovery for this analyte did not meet the method or laboratory control limits. The reported sample concentration is estimated.

** - RPD cannot be calculated.

+ - The MS/MSD sample analyses were performed on this sample from this Continental order number.

-Conclusion Quality Control Report-

Quality Control Report
Continuing Calibration Verification Data Summary

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 04/09/2008
Date Sample Received: 03/18/2008
Continental File No: 5030
Continental Order No: 31788

Analysis	Date of Analysis	Instrument Batch ID	Amount in Standard	Amount Detected	Units	Percent Recovery
Chromium	03/21/2008	12IP2080	No data qualifiers present for this analysis.			
Chromium	03/21/2008	13IP2080	No data qualifiers present for this analysis.			
Chromium	03/21/2008	14IP2080	No data qualifiers present for this analysis.			
Chromium	03/27/2008	2IP2087	No data qualifiers present for this analysis.			
Chromium	03/27/2008	3IP2087	No data qualifiers present for this analysis.			
Chromium	03/24/2008	4IP2084	No data qualifiers present for this analysis.			
Chromium	03/27/2008	4IP2087	No data qualifiers present for this analysis.			
Chromium	03/24/2008	5IP2084	No data qualifiers present for this analysis.			
Chromium	03/25/2008	7IP2085	No data qualifiers present for this analysis.			
Chromium	03/26/2008	8IP2085	No data qualifiers present for this analysis.			
Chromium	03/26/2008	9IP2085	No data qualifiers present for this analysis.			
Lead (ICP)	03/27/2008	2IP2087	No data qualifiers present for this analysis.			
Lead (ICP)	03/27/2008	3IP2087	No data qualifiers present for this analysis.			
Lead (ICP)	03/26/2008	4IP2086	No data qualifiers present for this analysis.			
Lead (ICP)	03/26/2008	5IP2086	No data qualifiers present for this analysis.			
Lead (ICP)	04/08/2008	8IP2098	No data qualifiers present for this analysis.			
Lead (ICP)	04/08/2008	9IP2098	No data qualifiers present for this analysis.			

- Laboratory Report Conclusion -

WS ORDER NO. 3780

CHAIN OF CUSTODY RECORD

ENVIRO TECH SERVICES, INC.
361 North Ohio Street, Salina, Kansas 67401
(785) 827-1682 FAX (785) 827-8765

Project #:

Project Name: Exline

Sampler's Name: JACK Eslick

Sampler's Signature:

Sample Information

Analytical Parameters

Date 2008	Time	Sample ID	Sample Point Identification	Matrix	Number of Containers	Chrome (total)	Lead (total)	Chrome (tclp)	Lead (tclp)					Comments
3/18	1330		#2 - Surface (R)	Soil	1	✓		✓						
3/18	1345		#2 - Deep (R)	Soil	1	✓		✓						
3/18	1400		CS-ES-6-Surf (R)	Soil	1	✓		✓						
3/18	1425		CS-ES-8-3 (R)	Soil	1	✓		✓						
3/18	1445		CS-ES-17-Surf (R)	Soil	1	✓		✓						
3/18	1440		CS-ES-10-5 (R)	Soil	1	✓		✓						
3/18	1450		CW-4-Surf (R)	Soil	1	✓		✓						
3/18	1505		MS-2-Surf (R)	Soil	1	✓	✓	✓	✓					
3/18	1515		DA-5-Surf (R)	Soil	1	✓		✓						
3/18	1200		Soil A	Soil	1	✓		✓						

		Time	Date			Time	Date
#1 Relinquished by:	Printed Name: Jack Eslick Signature:	1615	3/18/08	#1 Received By:	Printed Name: Signature:	1615	3-18-08
#2 Relinquished by:	Printed Name: Signature:	Time	Date	#2 Received By:	Printed Name: Signature:	Time	Date

Send Report To:

Special Instructions/Comments:

Page 1 of 1

ATTACHMENT C

APRIL 4, 2008 EPA REGION VII LETTER
EXLINE SITE REMEDIATION GOALS (RGS)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

Rob Exline
Exline, Inc.
P.O. Box 1487
Salina, KS 67402

04 APR 2008

RE: Corrective Measures Study Soil Remediation Goals
Exline, Inc.
Salina, Kansas
EPA RCRA ID No. KSD007127327

Dear Mr. Exline:

The U.S. Environmental Protection Agency (EPA) has calculated specific soil remediation goals (RGs) for the Exline facility to be included as Corrective Action Objectives in the forthcoming Corrective Measures Study Report. The EPA has calculated RGs for trivalent chromium (chromium III), hexavalent chromium (chromium VI), arsenic, and lead in soil at Exline. These compounds were identified as chemicals of potential concern (COCs) in Exline's *Corrective Measures Study Work Plan*, dated December 2007.

The methodologies used to derive the RGs are consistent with U.S. EPA risk assessment guidance. With the exception of the arsenic RG, which considers area background soil concentrations, the recommended RGs in the table below are based on migration to groundwater RGs with an excess lifetime cancer risk of 1 x10^{-6} (i.e., 1 in million) and/or hazard index (HI) of 1 . The risk-based RGs are based on the industrial worker exposure scenario. In regards to lead, the adult lead methodology (ALM) was used to develop the RG. Where applicable, default migration to groundwater pathway RGs were also developed for the COCs based on a dilution attenuation factor (DAF) of 20. The supporting documentation, including formulas, exposure parameters, toxicity values, and references is provided in the attachments.

Soil Preliminary Remediation Goals (mg/kg)

COCs	Industrial Soil (Outdoor) Risk-Based PRGs	Background (1)	Migration to Groundwater PRG	RG
Arsenic	1.8 c 280 nc	8.8	5.8	8.8
Chromium III	100,000 C_{max} (2)	19.1	> C_{max}	100,000
Chromium VI	75 c 3300 nc	-	38	38
Lead	1067 (3)	17.6	-	1067

c: cancer risk of 1.0 x 10^{-6}.
nc: non-cancer hazard index (HI) of 1.
ne: not evaluated.
C_{max}: Ceiling limit concentration

GLOBE RECYCLED 100% FIBER

(1) Derived using ProUCL 4.0 (USEPA, 2007) and background data in the *RCRA Facility Investigation Sampling Program Report: Background Soil and Hexavalent Chromium Analysis Sampling* (Shepard Engineering, Inc., 2001). See Attachment 2.

(2) A ceiling limit of 10^{+5} mg/kg, equivalent to a chemical representing 10% by weight of the soil sample, is used to as a cleanup goal for chemicals whose risk-based cleanup goal approach or exceeded unity. When concentrations exceed 10% by weight in soil, the assumptions for soil contact may be violated (USEPA, 2004b).

(3) Derived using the Adult Lead Methodology (ALM) (see Attachment 1 and 3)

If you have any questions pertaining to the information provided above, please contact me at (913) 551-7210. The EPA appreciates your cooperation in this matter.

Sincerely,

Lisa A. Gotto

Lisa A. Gotto
Environmental Protection Specialist
RCRA Corrective Action and Permits Branch
Air and Waste Management Division

cc: Ryan Pfeiffer, KDHE/BWM
Max Shepard, SEI., Inc.

Enclosures

ATTACHMENT D

OCTOBER 31, 2001 EXLINE, INC. GROUNDWATER RECOVERY SYSTEM CAPTURE ZONE ANALYSIS

Shepard Engineering, Inc.

719 E. Crawford • Salina, KS 67401 • (785) 825-1855 • Fax: (785) 825-5925

October 31, 2001

Lisa A. Kirk
Environmental Geologist
Post-Closure Facilities Unit
Bureau of Waste Management
Kansas Department of Health and Environment
1000 SW Jackson, Suite 320
Topeka, KS 66612-1367

Re: Part B Permit Application Revisions – Additional Information
Exline, Inc., Salina
SEI File No. 00-010G

Dear Lisa:

This letter and attachments will provide additional information, relative to the October 12, 2001 submittal for Exline, Inc.

1. WWC-5 Form for Monitor Well G-1.

Comment # 82 in your July 10, 2001 letter requested that Exline provide a copy of the WWC-5 form for monitor well G-1. A copy of this form is attached.

2. Capture Zone Analysis for Exline Recovery Wells.

Comment # 84 in your July 10, 2001 letter requested that Exline conduct a capture zone analysis for the Exline recovery wells. SEI has completed this analysis using QuickFlow. QuickFlow is an interactive analytical model that simulates two-dimensional steady-state and transient groundwater flow. The steady-state module simulates groundwater flow in a horizontal plane using analytical functions developed by Strack (Groundwater Mechanics, Prentice Hall, Englewood Cliffs, New Jersey, 1989).

The modeling was conducted using the following aquifer parameters:

Hydraulic conductivity: 35 ft/day and 128 ft/day.
Direction of regional groundwater flow: 50 degrees north of east.
Aquifer thickness: 23.5 feet.
Porosity: 0.35.
Storage Coefficient: 0.00173.
Hydraulic gradient: 0.0046.

Two values for hydraulic conductivity were used in order to bracket the capture zones, which are being affected by the pumping wells at the site. Transmissivity data that were

generated in the 1980s at the site have been documented in earlier correspondence and Part B permit applications. These data have indicated that the transmissivity of the aquifer is in the range of 22,500 gpd/ft. Using an average aquifer thickness of 23.5 ft, the hydraulic conductivity would be 128 ft/day.

I recently located a February 28, 1986 letter prepared by O.S. Fent (Exline's geologist in the 1980s), which indicates that an aquifer test was conducted at the site in the mid-1980s. This test resulted in a calculated transmissivity in the range of 6,000 gpd/ft (a copy of the 2/28/86 Fent letter is attached). Based on these recently discovered data, a lower bound for transmissivity at the site would be 6,000 gpd/ft, with the corresponding hydraulic conductivity of 35 ft/day.

Based on these data, two models were run; one with the hydraulic conductivity of 35 ft/day and one with the hydraulic conductivity of 128 ft/day. These model runs are depicted on Plates IVA-1 and IVA-2, respectively. Plate IVA-1 indicates that the chromium plume is being completely captured based on the lower conductivity value. Plate IVA-2 indicates that a small width (approximately 60 feet) of low concentration chromium is escaping based on the higher conductivity value. However, as shown on Plate IVA-2, if chromium was escaping, it would have been detected in down-gradient monitor well B-6. Based on a review of the B-6 historical data, there has been no indication that chromium is escaping the recovery wells.

Nonetheless, in order to provide additional assurance that the existing recovery well system is adequately capturing the chromium plume, Exline, Inc. proposes to conduct an aquifer test using recovery well C-9. In general, this test would include the following procedures. Well C-9 would be shut down and the water level would be measured in nearby monitoring well C-4. After a specified period of time (probably not to exceed 24 hours), well C-4 would be re-started at a flow rate of 10 gpm. The water level as a function of time would again be recorded. These data (both recovery and drawdown) would be used to calculate the transmissivity around pumping well C-9. It is anticipated that the Theis method would be used to calculate the transmissivity. Following KDHE approval of this concept, SEI would provide more detailed information regarding the proposed test procedures and data evaluation methods.

I trust that this additional information will adequately address these issues. If you have any comments or questions, please contact me.

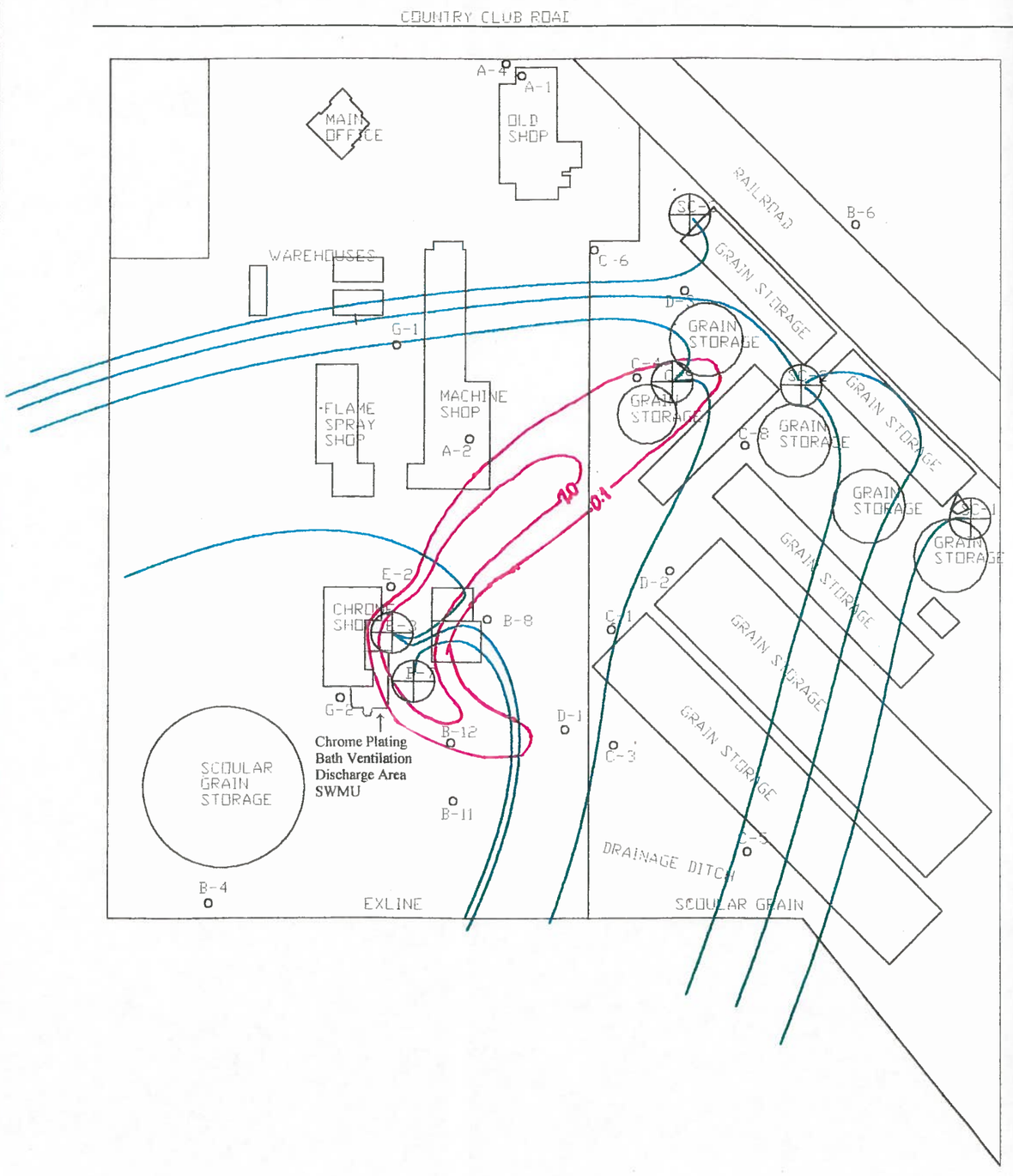
SHEPARD ENGINEERING, INC.

Max Shepard

Max Shepard, P.E.
President

cc: Rob Exline – Exline, Inc. (letter and attachments)
Keith Kempton – Exline, Inc. (letter and attachments)

Enc.



Hydraulic Conductivity (K)
35 ft/day

Saturated Thickness (b)
23 ft.

Hydraulic Gradient (I)
0.0046

Hydraulic Gradient Direction
50 degrees from east

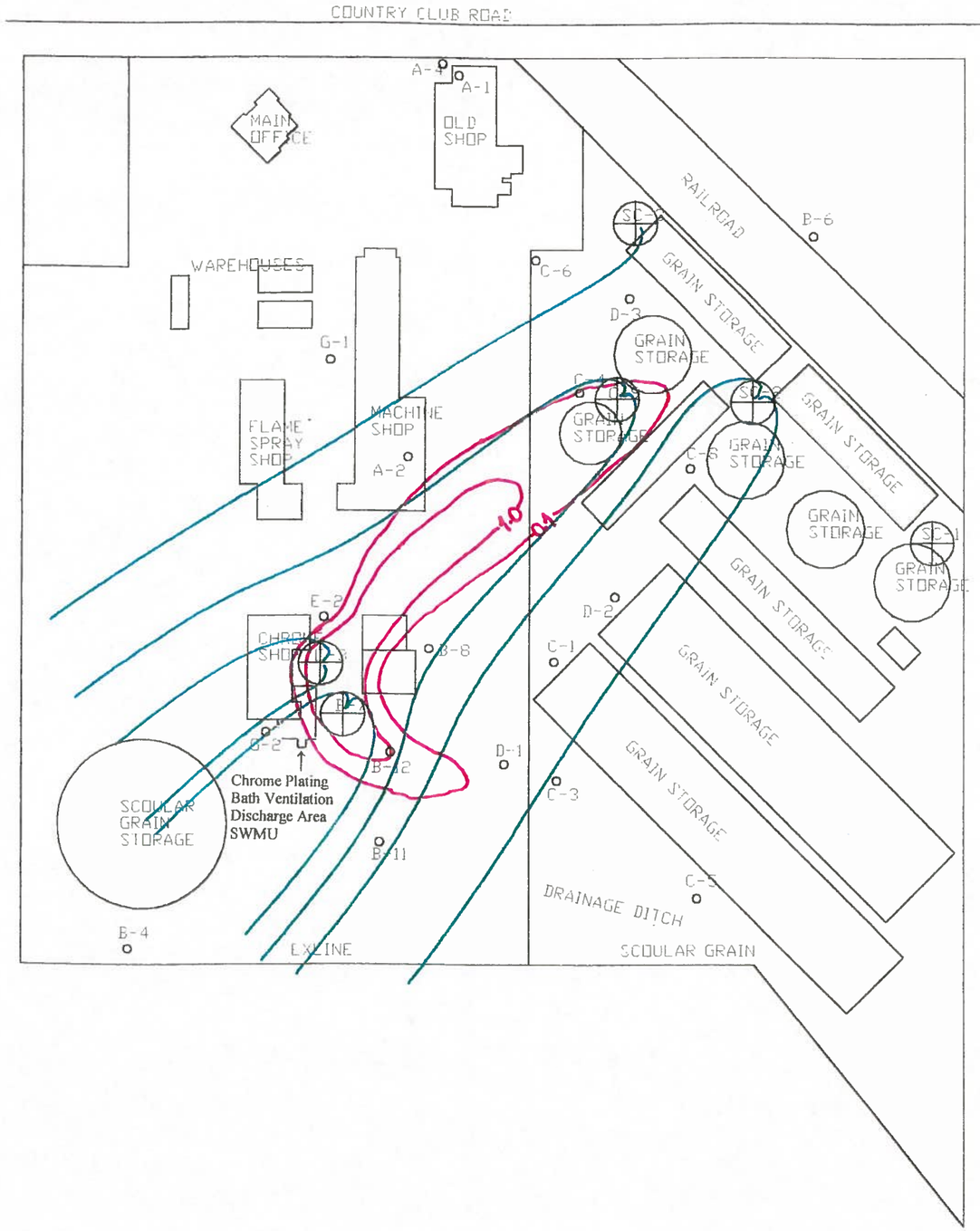
Storage Coefficient (S)
.00173

Porosity (n)
0.35

Title: Plate IVA-1: Exline Capture Zone Analysis.
Hydraulic Conductivity = 35 ft\day

Shepard Engineering, Inc.

Scale: 1" = 200'
File No: 01-011G
Date: Oct. 2001
Drawn: LMS - JLP



Hydraulic Conductivity (K)
128 ft/day

Saturated Thickness (b)
23 ft.

Hydraulic Gradient (I)
0.0046

Hydraulic Gradient Direction
50 degrees from east

Storage Coefficient (S)
.00173

Porosity (n)
0.35

Title: Plate IVA-2: Exline Capture Zone Analysis.
Hydraulic Conductivity = 128 ft\day

Shepard Engineering, Inc.

Scale: 1" = 200'
File No: 01-011G
Date: Oct. 2001
Drawn: LMS - JLP

ATTACHMENT 6-4

RFI ADDENDUM REPORT
SEPTEMBER, 2011

EXLINE, INC. RFI ADDENDUM REPORT
SOIL SAMPLING
SLUDGE DRYING BEDS (SWMU-5) AND SETTLING BASIN/FILTER BED (SWMU-6)
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EXLINE, INC. RFI ADDENDUM REPORT
SOIL SAMPLING
SLUDGE DRYING BEDS (SWMU-5) AND SETTLING BASIN/FILTER BED (SWMU-6)
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Attachments
Attachment A – Field Notes
Attachment B – Soil Sampling Laboratory Report

1. Introduction.

This RFI Report has been prepared in accordance with requirements set forth in Exline, Inc.'s hazardous waste permit – Part II, Section C.8. RCRA Facility Investigation Report.

Prior to the execution of the RFI sampling program, which is detailed herein, the following documents were submitted to and approved by EPA Region VII:

"RCRA Facility Investigation Addendum – Sludge Drying Beds (SWMU-5) and Solids Settling Basin/Filter Bed (SWMU-6)", June, 2009, Revised February, 2011

"Sampling and Analysis Plan/Quality Assurance Project Plan", October, 2005

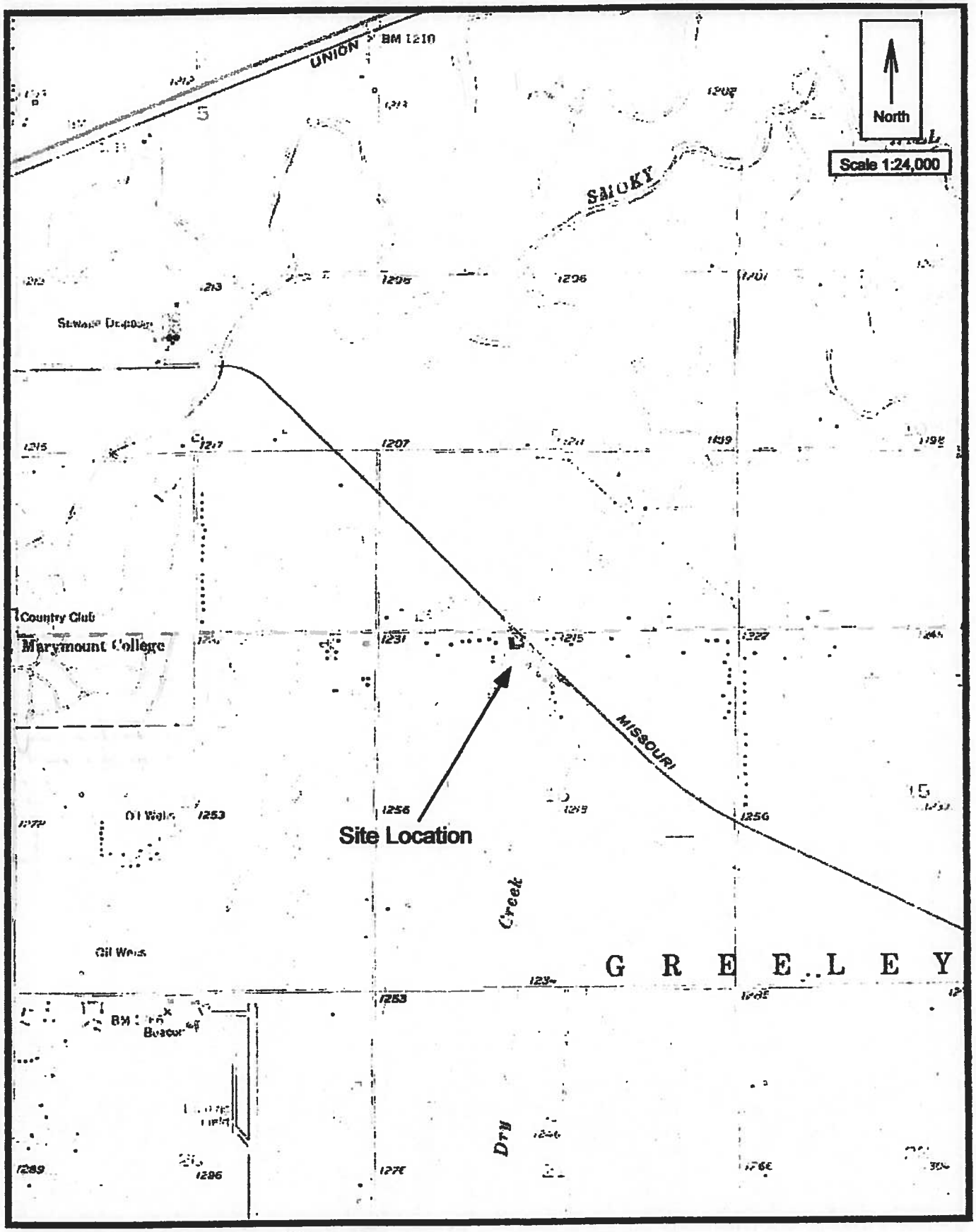
Both documents were prepared on behalf of Exline, Inc. by Shepard Engineering, Inc., Bennington, Kansas.

Figure 1.1 is a Site Location Map and Figure 1.2 is a Facility Layout Map, which shows the locations of the respective solid waste management units (SWMUs) that were sampled in accordance with the RFI Work Plan Addendum.

The SWMUs were sampled on May 30, 2011 by Enviro Tech Services, Inc. personnel in accordance with the approved Work Plan.

This Report will include the following information:

- Sample collection procedures.
- Chemical analysis methods and summary of results.
- Interpretation and discussion of results.
- Summary and discussion of field and laboratory quality assurance/quality control results.
- Recommendations for follow-up action.



Map Source: USGS 7.5 Minute Topographic Map, Salina, 1978

Figure 1.1: Site Location Map

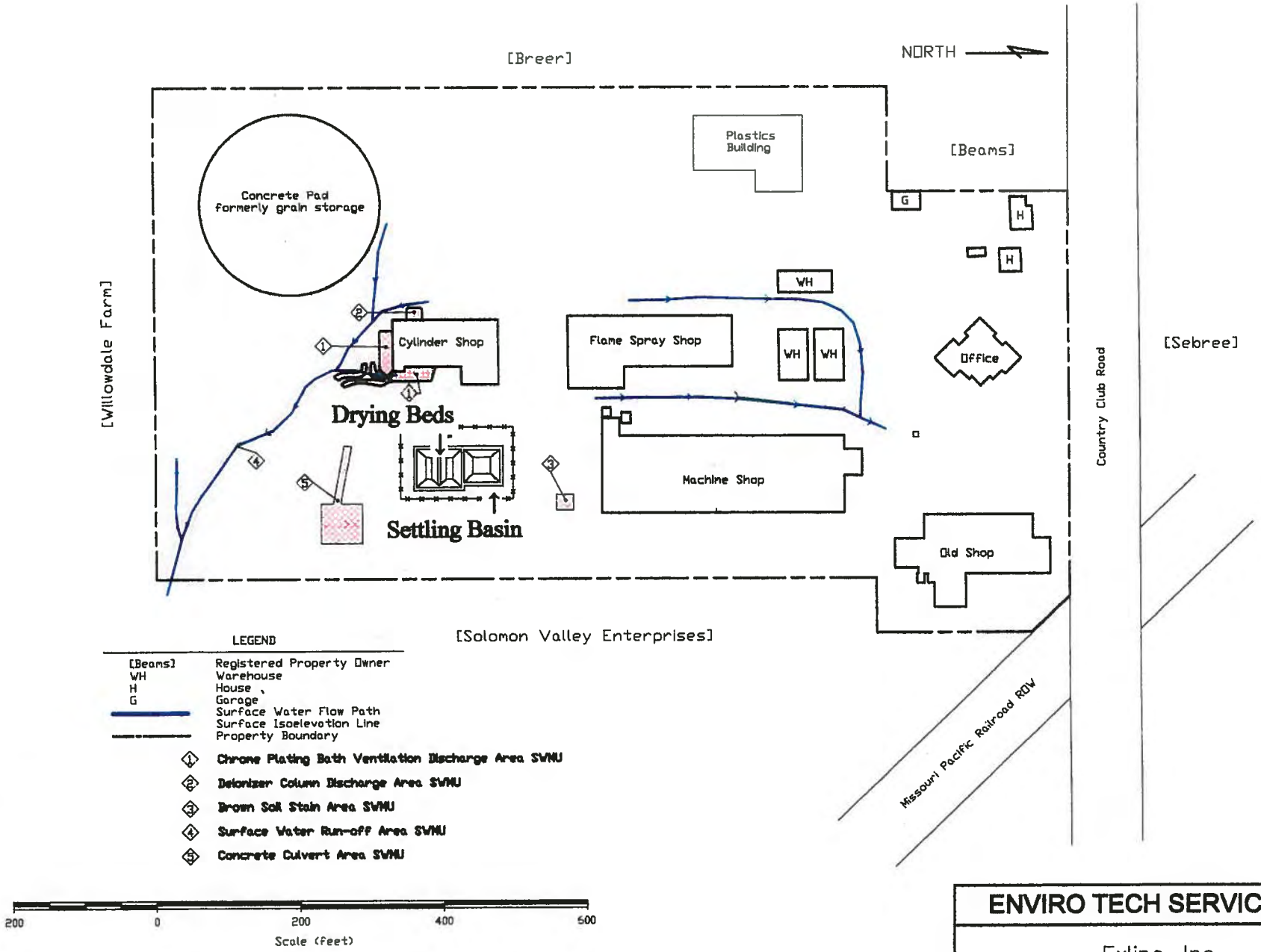


Figure 1.2: Facility Layout Map – Location of Settling Basin and Drying Beds

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
Project Number: 05-0101	Date: May 2008	Drawn by: Jack Eslick

2. General Facility and Solid Waste Management Unit Description.

2.1. General Facility Description.

Most of the following description of the Exline, Inc. facility was previously presented in the April, 2005 RFI Work Plan Addendum.

Exline, Inc. manufactures and rebuilds large stationary industrial engines and engine parts. A chrome plating shop was constructed in the late 1960s for the purpose of plating large stationary engine parts (typically cylinders).

Waste chrome plating solution was discharged to an unlined surface impoundment at the facility from around 1970 to 1980. Other waste streams discharged to the surface impoundment included steam cleaning rinse water, wastewater from deionizer column regeneration, reverse strip-sodium chromate waste and caustic cleaner waste. Outside dimensions of the lagoon were 66' by 82', with an approximate working depth of 3 feet. Installation of a synthetic liner in 1980 revealed that infiltration had occurred, resulting in groundwater contamination with respect to hexavalent chromium.

A Closure Plan was subsequently prepared by Wilson Laboratories, on behalf of Exline, Inc., in November of 1983. This Closure Plan was submitted to the KDHE, and subsequently approved. The Plan was executed in 1984. The liquid waste was removed and the surface impoundment closed in August of 1984. The surface impoundment closure was certified by Exline, Inc. on January 17, 1985.

Exline, Inc. entered into a Consent Agreement with the KDHE in 1987 to conduct additional hydrogeologic investigations at the site. These investigations were completed and a summary report submitted to the KDHE in late 1987.

In July of 1987, KDHE called in a Part B application based on the fact that the surface impoundment was not clean closed. Clean closure was not obtained due to the fact that chromium contamination remained in the subsurface (i.e., groundwater).

Exline submitted Part A and Part B permit applications in March of 1989. A Hazardous Waste permit was issued in October of 1989. The surface impoundment is currently regulated by the Hazardous Waste Post-Closure Permit, which became effective on October 29, 1989, and was re-issued on December 16, 2002.

As required by the Hazardous and Solid Waste Amendments (HSWA) of 1984, releases from Solid Waste Management Units (SWMUs) have been evaluated at the Exline facility. Part of this evaluation consisted of a RCRA Facility Assessment (RFA). The RFA was conducted in 1989 and consisted of a Preliminary Review (PR) and a Visual Site Inspection (VSI). The VSI was completed on May 19, 1989. The RFA findings were documented in a report titled: "RCRA Facility Assessment at Exline", July 14, 1989. The RFA was completed by Metcalf & Eddy, Inc. under contract to US EPA

Region VII. The RFA Report included recommendations for further action at certain SWMUs and AOCs that were identified during the evaluation process.

The Exline Part B permit issued in October of 1989 identified four (4) SWMUs, which required additional investigation. Exline, Inc. completed a sampling and analysis project for these 4 SWMUs and surface water run-off in October of 1992. The results of that sampling effort were summarized in a document entitled: "Solid Waste Management Unit RCRA Facility Investigation Final Report", dated December, 1993. As a follow-up to that RFI Report, Exline, Inc. submitted a Work Plan to the EPA entitled: "Sampling and Analysis Work Plan For Background Metals Concentrations", dated September, 1994. US EPA Region VII commented on that Work Plan in August of 2000. Following Exline's development of a Quality Assurance Project Plan and resolution of a limited number of other issues, the subject Work Plan was approved by EPA Region VII in May of 2001. Exline, Inc. completed the sampling in May of 2001. The sampling project results were summarized in a report titled: "RCRA Facility Investigation Sampling Program Report – Background Soil and Hexavalent Chromium Analysis". That Report was submitted to U.S. EPA Region VII in August, 2001.

In April of 1993, Exline, Inc. installed a dual wet scrubber control system, which was designed to remove chromium particulate from the north chrome plating tank ventilation discharge (ventilation system controls were not installed on the south chromium plating tank since operation of that tank was discontinued circa 1982). In January of 1994, Exline installed a mist eliminator on the ventilation discharge from a chromium strip tank. In August of 1997, Exline replaced the wet scrubber system with a state-of-the-art composite mesh pad ventilation control system. That system was sampled in August of 1997, as required by Clean Air Act regulations and exhibited an average chromium concentration in the discharge of 0.00188 mg/dscm. That concentration was well below the discharge standard of 0.010 mg/dscm. The composite mesh pad scrubber system was operated until the north chrome plating tank was shut down in early 2001.

The chromium strip process was moved to the tank that was serviced by the composite mesh pad scrubber system in February of 2003. The chromium stripping process was subsequently discontinued in October of 2003.

At present, monitor wells have been placed at the facility and on adjacent property to monitor the rate of movement and extent of chromium contamination. In addition, Exline is performing corrective action to remediate the uppermost aquifer beneath the site. This corrective action effort includes the construction of three (3) groundwater withdrawal wells, which are currently removing groundwater at a total rate of approximately 35 gallons per minute, on a 24 hours per day, 7 days per week basis. This recovered groundwater is discharged to the City of Salina sanitary sewer. The groundwater discharge is regulated by an Industrial Wastewater Discharge permit, which has been issued by the City of Salina (permit No. 0002).

An industrial wastewater batch pretreatment system was constructed and started up in February 1985, for the purpose of treating industrial wastewater generated in the Cylinder

(formerly Chrome) Shop. The treated wastewater was discharged to the City of Salina sanitary sewer in accordance with the Industrial Wastewater Discharge permit discussed earlier (permit No. 0002). Most of the sludge generated by the pretreatment system was F006 listed hazardous waste and was de-watered using a plate and frame filter press. This de-watered sludge was transported off-site to a permitted hazardous waste disposal company. This sludge was stored on-site for a period less than 90 days.

The industrial wastewater treatment system discharge is no longer regulated by the City of Salina Industrial Wastewater Discharge Permit since Exline, Inc. discontinued chrome plating operations in early 2001.

Both the groundwater and industrial wastewater treatment systems were located in the Cylinder (formerly Chrome) shop, with the exception of the groundwater treatment system clarifier, settling pond, and sludge drying beds, which are located east of the Cylinder shop. The City of Salina agreed to allow Exline to bypass the groundwater treatment system beginning on January 1, 2004, due to the fact that the chromium concentrations in the recovery wells (typically less than 1 mg/L) were well below the permit discharge limits of 3.35 mg/L. Therefore, the groundwater treatment system is no longer operating and is in the process of being dismantled.

As discussed earlier, chrome plating is no longer conducted at the facility (hence the name change from "Chrome Plating shop" to "Cylinder shop"). Plating was discontinued in early 2001. As a result, chromium-bearing waste is no longer generated.

2.2. SWMU Description.

2.2.1. SWMU Locations Relative to Chromium Groundwater Plume.

A map is included (Figure 2.1), which shows the locations of the respective solid waste management units relative to the most recent groundwater plume.

2.2.2. Sludge Drying Beds – SWMU-5.

The drying beds were used to de-water sludge that was removed from the groundwater treatment system settling basin. Sludge was also added to the drying beds from the treatment system clarifier. De-watering was accomplished by gravity filtration and ambient evaporation.

De-watered solids were removed from the drying bed on an as-need basis, following TCLP chromium analysis. In all cases over the 20 year operating period of the drying beds, the solids were demonstrated to be non-hazardous waste based on the TCLP chromium analysis (i.e., all sample results were less than 5 mg/L TCLP chromium). Table 2.1 summarizes the drying bed sludge TCLP analytical data that were generated from 1996 through 2007.

Table 2.1: TCLP Cr Results – Exline, Inc. Groundwater Treatment System Sludge

Date	TCLP Cr Conc. (mg/L)
Sept., 1996	0.42
Nov., 1999	< 0.1
June, 2001	1.21
Aug., 2007	0.79

The drying bed depth (both units) was approximately 4 ft. Free liquid was not maintained in either drying bed. The maximum depth of sludge in both drying beds was approximately 2 ft.

2.2.3. Solids Settling Basin/Filter Bed – SWMU-6.

This SWMU was constructed in 1984. The impoundment was originally designed to filter solids generated in the Exline groundwater treatment system. Figure 2.2 shows the groundwater treatment process conducted at the facility from 1984 through 2004. As noted on the diagram, Figure 2.2 reflects the treatment process operations that were conducted in 2002. However, the general treatment process was similar to that conducted during the entire 20 year period of operation (i.e., 1984 to 2004). Groundwater treatment was discontinued in 2004 as the groundwater chromium concentrations had decreased well below the City permit limits and the recovered groundwater began being discharged to the City sewer without treatment (following approval by the City of Salina).
The following table summarizes the Exline remedial well startup dates and flow rates:

Recovery Well	Current Flow Rate (gpm)	Startup Date
B-7	15	February, 1984
C-9R	10	May, 1988*
SC-2	10	May, 1988**
E-3	10	August, 1989

* C-9R replaced C-9 on December 18, 2006.
** SC-2 was removed from the Exline corrective action program on September 26, 2008.

Well, E-3 was operated at 5 gpm from August, 1989 through December, 1989. Well B-7 was operated around 7 gpm from February, 1984 through April, 1985. In May, 1985, the flow rate from B-7 was increased to 15 gpm and has remained at that rate through the present. Pumping rates for C-9R and SC-2 have been 10 gpm since their respective startup in May of 1988.

As discussed earlier, the groundwater recovery and treatment system was started up in February, 1984. With the exceptions noted below, the basic components and operation of the system remained essentially the same since the system operation was discontinued in 2004. Significant changes, which occurred during the period from 1984 to 2004 include the following:

- The chemical reducing agent was changed from sulfur dioxide to liquid sodium bisulfite in 1998.

- An air stripper treated wastewater for VOC removal from September, 1991 through December, 1996. During that time, water was pumped to the air stripper following the pH adjustment step with sulfuric acid. Water from the air stripper was pumped back to the chromium removal system. This VOC removal process was discontinued after the treated effluent began being discharged to the City Sewer (in lieu of surface discharge under an NPDES permit), which was initiated in November of 1996. Air stripper treatment was no longer needed since VOC discharge limits are 2 to 3 orders-of-magnitude higher for discharge to the City sewer compared to surface discharge.

- In late 2003, the City of Salina agreed to accept the recovered groundwater from Exline without treatment. This decision was based on the fact that the untreated groundwater chromium concentration was well below the discharge limit of 3.35 mg/L. The recovered groundwater continues to be discharged to the City of Salina sewer system under the regulation of an Industrial Wastewater Discharge Permit. Beginning on January 1, 2004, the required minimum effluent monitoring frequency increased to monthly (in lieu of quarterly).

The settling basin/filter bed was originally designed to filter solids, which might have carried over from the clarifier. However, as additional recovery wells were added to the system and the clarifier settling capacity was exceeded, the unit evolved into its primary use as a settling basin.

Solids that were settled in the basin were removed and transferred to the adjacent drying beds (SWMU-5) on an as-need basis. These solids consisted primarily of chromium hydroxide and calcium sulfate. The solids from the drying bed were analyzed for TCLP chromium prior to each disposal event. As discussed earlier, for each case, the solids were demonstrated to be non-hazardous waste since the TCLP chromium concentration was always less than 5 mg/L. As a result, all solids removed from the drying beds were disposed in the City of Salina landfill as non-hazardous waste.

As shown in Figure 2.2, the treatment process reduced hexavalent chromium to the trivalent form (using either sulfur dioxide or sodium metabisulfite) before the groundwater was discharged to the settling basin.

The settling basin depth is approximately 6 ft. and a 2 ft. freeboard was typically maintained in that unit. The maximum sludge depth in that unit was never measured, but probably did not typically exceed one foot.

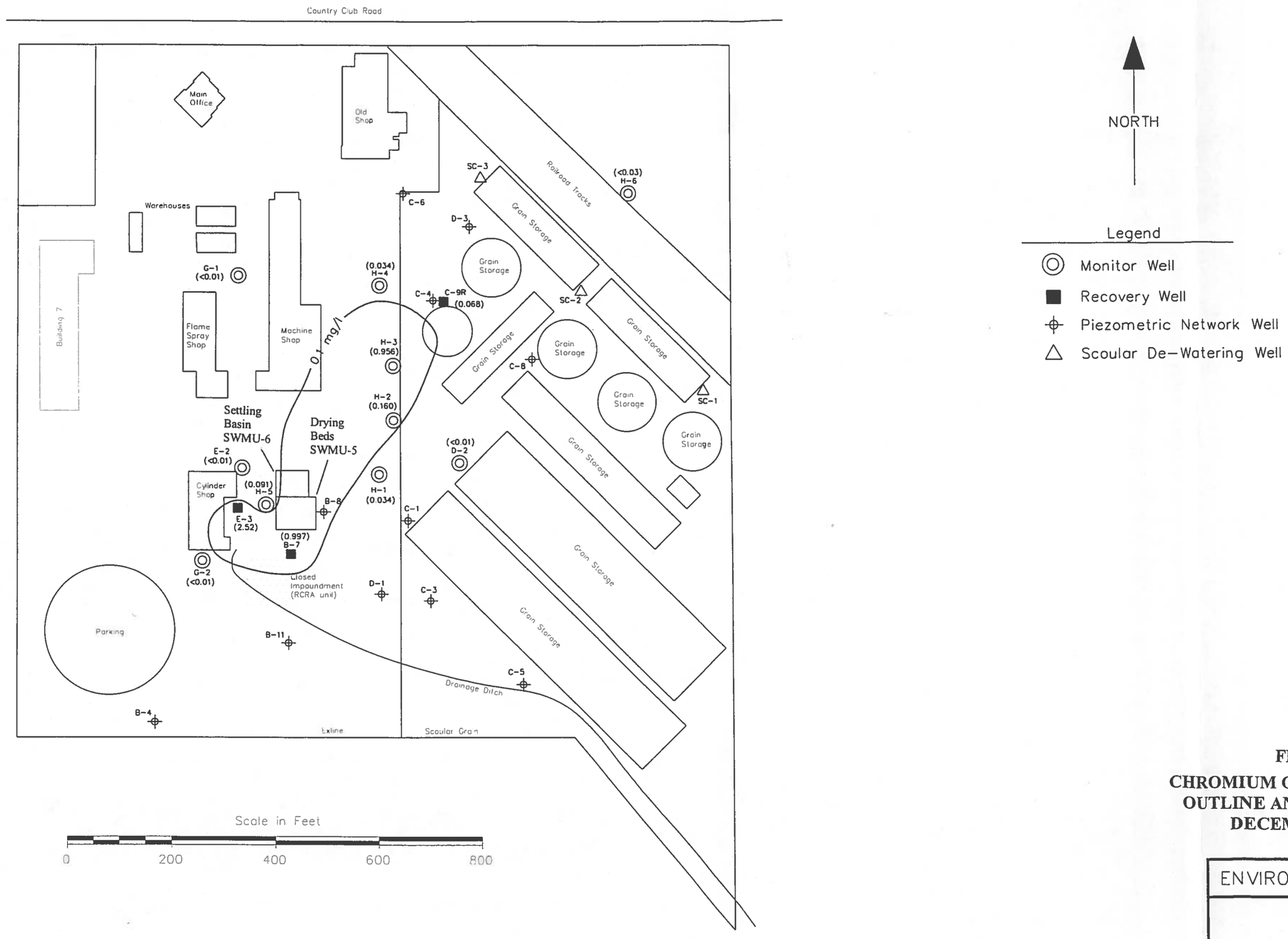
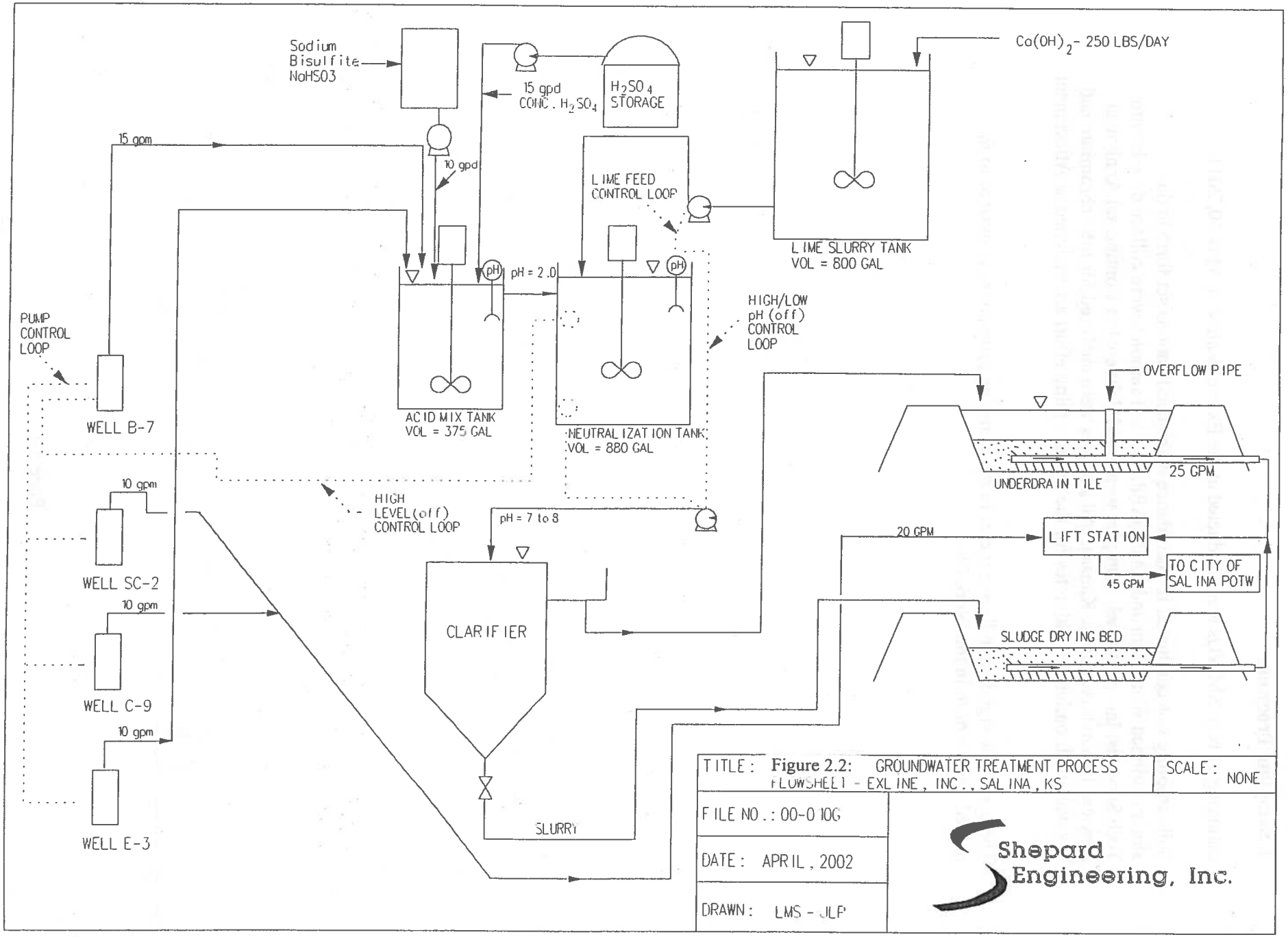


FIGURE 2.1:
CHROMIUM GROUNDWATER PLUME OUTLINE AND CONCENTRATIONS DECEMBER, 2010 DATA

ENVIRO TECH SERVICES, INC.

Exline, Inc.
Salina, Kansas

Project Number:	Date:	Drawn By:
SEI 10-010C	February 2011	Jack Eslick


Sodium Bisulfite NaHSO3
15 gpd CONC. H2SO4
H2SO4 STORAGE
Ca(OH)2 - 250 LBS/DAY
15 gpm
10 gpd
LIME FEED CONTROL LOOP
LIME SLURRY TANK VOL = 800 GAL
pH = 2.0
HIGH/LOW pH (off) CONTROL LOOP
PUMP CONTROL LOOP
WELL B-7
ACID MIX TANK VOL = 375 GAL
NEUTRALIZATION TANK VOL = 880 GAL
OVERFLOW PIPE
UNDERDRAIN TILE
25 GPM
10 gpm
HIGH LEVEL (off) CONTROL LOOP
pH = 7 to 8
20 GPM
LIFT STATION
TO CITY OF SALINA POTW
45 GPM
WELL SC-2
10 gpm
CLARIFIER
SLUDGE DRYING BED
WELL C-9
10 gpm
WELL E-3
SLURRY
TITLE: Figure 2.2: GROUNDWATER TREATMENT PROCESS FLOWSHEET - EXLINE, INC., SALINA, KS
SCALE: NONE
FILE NO.: 00-0 10G
DATE: APRIL, 2002
DRAWN: LMS - JLP
Shepard Engineering, Inc.

3. Sampling Program.

Sampling of both SMWUs was conducted at the Exline facility on May 30, 2011.

Soil sampling was conducted in accordance with specifications set forth in the aforementioned Work Plan and SAP/QAPP. All soil samples were collected by Enviro Tech Services, Inc. personnel. Samples were hand-delivered to Continental Analytical Services Laboratory, Salina, Kansas. All samples were analyzed for total chromium and hexavalent chromium. Field notes for the soil sampling effort are included as Attachment A.

There were no significant discrepancies in the sampling program as compared to the procedures set forth in the Work Plan.

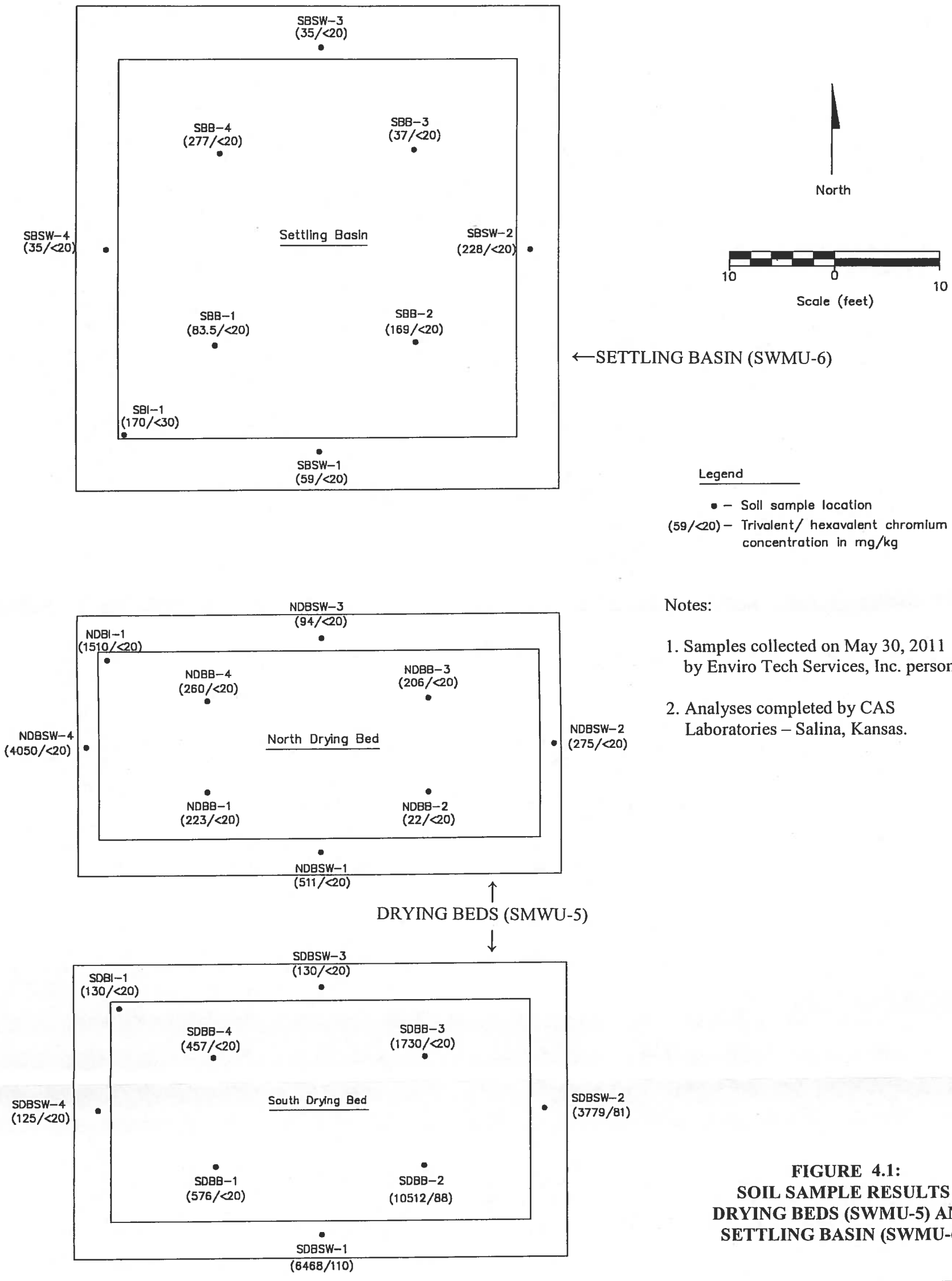
4. Chemical Analysis Results.

Chemical analysis results for the respective SMWUs are summarized in Table 4.1. The trivalent and hexavalent chromium results are also shown on Figure 4.1. Field and Laboratory supplemental data (pH and Eh) are summarized in Table 4.2. All laboratory analyses were completed by Continental Analytical Services Laboratory, Salina, Kansas. Copies of the laboratory data report, as well as, the laboratory QA/QC report, are included as Attachment B.

TABLE 4.1: SETTLING BASIN AND DRYING BED CHROMIUM CONCENTRATION DATA
EXLINE, INC., SALINA, KANSAS

Sample Location	Tot Cr Conc. (mg/kg)	Trivalent Cr Conc. (mg/kg)	Hex Cr Conc. (mg/kg)
SDBI-1	130	130	< 20[QC]
SDBSW-1	6560	6468	**110**
SDBSW-2	3860	3779	**81**
SDBSW-3	130	130	< 20
SDBSW-4	125	125	< 20
SDBB-1	576	576	< 20
SDBB-2	10600	10512	**88**
SDBB-3	1730	1730	< 20
SDBB-4	457	457	< 20
NDBI-1	1510	1510	< 20
NDBSW-1	511	511	< 20[QC]
NDBSW-2	275	275	< 20
NDBSW-3	94	94	< 20
NDBSW-4	4050	4050	< 20
NDBB-1	223	223	< 20
NDBB-2	22	22	< 20
NDBB-3	206	206	< 20
NDBB-4	260	260	< 20
SBI-1	170	170	< 30
SBSW-1	59	59	< 20
SBSW-2	228	228	< 20
SBSW-3	35	35	< 20
SBSW-4	35	35	< 20
SBB-1	83.5	83.5	< 20
SBD-1	80.1	80.1	< 20
SBB-2	169	169	< 20
SBD-2	157	157	< 20
SBB-3	37	37	< 20
SBD-3	36	36	< 20
SBB-4	277	277	< 20

Table 4.1 Notes:
1. Samples collected on May 30, 2011 by Enviro Tech Services, Inc. personnel.
2. Analyses completed by CAS Laboratories, Salina, KS.
3. EPA Trivalent Cr cleanup standard for industrial setting = 100,000 mg/kg.
4. EPA Hexavalent Cr cleanup standard for industrial setting = 38 mg/kg.
5. Trivalent chromium concentration calculated by subtracting hexavalent chromium from total chromium.
6. [QC] - see CAS Laboratory QA/QC Report.
7. SBD-1 is a blind duplicate of SBB-1.
8. SBD-2 is a blind duplicate of SBB-2.
9. SBD-3 is a blind duplicate of SBB-3.



Notes:

1. Samples collected on May 30, 2011 by Enviro Tech Services, Inc. personnel.
2. Analyses completed by CAS Laboratories – Salina, Kansas.

FIGURE 4.1:
SOIL SAMPLE RESULTS
DRYING BEDS (SWMU-5) AND
SETTLING BASIN (SWMU-6)

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
Project Number: 09-0101	Date: June 2011	Drawn By: Jack Eslick

TABLE 4.2: SETTLING BASIN AND DRYING BED pH and Eh DATA
EXLINE, INC., SALINA, KANSAS

Sample Location	Field Data		CAS Lab Data	
	pH (SU)	Eh (mV)	pH SU	Eh (mV)
SDBI-1	8.14	413	8	570
SDBSW-1	8	424	8.24	560
SDBSW-2	8	378	8.19	560
SDBSW-3	8.05	380	8.26	560
SDBSW-4	8.21	379	8.13	560
SDBB-1	7.88	380	7.85	570
SDBB-2	8.19	368	8.32	570
SDBB-3	8.26	357	8.44	570
SDBB-4	8.3	357	7.98	570
NDBI-1	7.86	383	7.96	570
NDBSW-1	8.16	402	7.85	560
NDBSW-2	8.13	371	7.95	560
NDBSW-3	8.11	369	7.83	560
NDBSW-4	8.26	380	7.76	570
NDBB-1	8.54	367	8.13	560
NDBB-2	8.56	359	8.79	550
NDBB-3	8.78	382	8.14	580
NDBB-4	8.74	386	8.39	580
SBI-1	8.18	339	7.92	560
SBSW-1	7.45	389	7.75	570
SBSW-2	8.18	361	7.80	580
SBSW-3	8.13	362	8.03	570
SBSW-4	8.02	367	7.78	560
SBB-1	8.38	351	7.87	570
SBB-2	8.67	343	8.39	560
SBB-3	8.43	347	8.19	560
SBB-4	8.3	355	7.73	570

Table 4.2 Notes:
1. Samples collected on May 30, 2011 by Enviro Tech Services, Inc. personnel.
2. Field analyses complete by Enviro Tech Services, Inc. personnel.
3. Laboratory analyses completed by CAS Laboratories, Salina, KS.
4. Field Eh was determined by adding 222 mV to the measured ORP value.

5. Quality Assurance/Quality Control.

5.1. General.

As discussed earlier, 27 soil samples and three (3) duplicate samples were collected from the Exline, Inc. Sludge Drying Beds (SWMU-5) and Settling Basin/Filter Bed (SWMU-6) on May 30, 2011 by Enviro Tech Services, Inc. personnel. These samples were submitted to CAS Laboratories for total chromium and hexavalent chromium analysis. Samples were collected using hand tools since all were collected from the surface.

5.2. Sampling Project Documentation.

The following project documentation was recorded:

5.2.1. Sample Locations. Sample locations are shown on Figure 4.1. All samples were collected at the locations and depths that were specified in the approved Work Plan.

5.2.2. Field Notes. A copy of the project field notes is included as Attachment A. Those field notes document the following information:

- Preparation of pH and ORP standards for field analyses.
- Calibration of pH and ORP instruments used in field analyses.
- Calibration of balance used in field analyses.
- Date and time of sampling.
- Field analysis values (pH and ORP).

5.2.3. Chain-of-Custody. Chain-of-custody (COC) forms were completed for each sample collected during the sampling project. The COC included the following information:

- Sampler Name.
- Sampler Signature.
- Project Name.
- Sample Identification.
- Sample Matrix.
- Sample Date.
- Sample Collection Time.
- Total Number of Containers.
- Analysis Parameters.
- Sample Relinquishment and Receipt Documentation.

Copies of the completed COC forms are included with the laboratory report – Attachment B.

5.3. Data Quality Objectives.

The objectives of this sampling program are:

1) To evaluate the ability of the specified hexavalent chromium analysis method for soil to generate useful data.

2) To characterize soil (i.e., generate "highest quality" soil concentration data) at the Exline facility for use in developing corrective action and risk-management decisions.

"Highest quality" data are those data resulting from the employment of proper sampling techniques. The data generated from the May 30, 2011 sampling event appear to be of the highest quality based on a review of the following criteria:

1) Analyses were conducted in accordance with methods specified in the EPA-approved Work Plan.

2) Analyses were performed by CAS Laboratories, which is accredited by the State of Kansas through the National Environmental Accreditation Program (NELAP).

3) Samples were collected at the desired locations from the Exline, Inc. property.

4) Soil samples were collected during good weather conditions, i.e., no rainfall or excessive wind.

5) Soil samples appeared to have normal moisture content.

In addition to these criteria, other data quality indicators include:

Representativeness. This indicator considers the extent to which the measurements actually depict the true environmental population that is being evaluated. The samples collected during the May 30, 2011 sampling event appear to be representative since they were collected within clearly defined areas of potential hazardous constituent release (i.e., within solid waste management units, which were used to treat groundwater for approximately 20 years). In addition, samples were collected using appropriate methodology.

Completeness. The % completeness is calculated using the following equation:

% completeness = (# of valid results)/(number of possible results)

Exline, Inc. believes that the two sample results, which were noted in the QA/QC Lab Report (SBDI-1 and NDBSW-1) are valid, despite the fact that the soluble hexavalent chromium MS/MSD percent recovery for those spiked samples was outside (slightly below) the laboratory control limit. This conclusion is based on the fact that the LCS for

these samples was less than 100 % and the MS/MSD % recoveries were within the laboratory control limit for both samples with respect to insoluble hexavalent chromium.

Comparability. This indicator is a qualitative measure of the confidence with which one data set can be compared to another data set. As discussed in the October, 2005 project QAPP, the samples collected during the May 30, 2011 sampling event are comparable to data generated during previous sampling events at the site due to the fact that those samples were collected at the specified depths and analyzed using approved methods set forth in the Sampling and Analysis Work Plan.

5.4. Field Quality Control Samples.

5.4.1. Field Duplicates.

Three (3) field duplicate soil samples were collected; all duplicates were collected as splits and submitted to the laboratory as blind duplicates. Results are summarized below.

TABLE 5.1: DUPLICATE SOIL SAMPLE RESULTS - EXLINE SETTLING BASIN AND DRYING BED SOIL SAMPLING

Sample ID	Tot Cr. Conc. (mg/kg)	Hex Cr Conc. (mg/kg)	Percent Difference	
			Tot Cr	Hex Cr
SBB-1	83.5	< 20		
SBD-1 (dup)	80.1	< 20	4.1	0
SBB-2	169	< 20		
SBD-2 (dup)	157	< 20	7.1	0
SBB-3	37	< 20		
SBD-3 (dup)	36	< 20	2.8	0

The results demonstrate excellent agreement with respect to the duplicate soil sample results – for both total chromium and hexavalent chromium.

5.5. Data Review and Validation.

Procedures for data review and validation are set forth in Section D of the October, 2005 Project QAPP. Based on the items enumerated below, the data generated during the May 30, 2011 sampling event at the Exline, Inc. facility appear to be valid.

5.5.1. Sample Collection. Samples were collected, handled, and submitted to the laboratory in accordance with the approved (by the EPA and KDHE) RFI Work Plan Addendum and the QAPP. This conclusion is based on field observation of the sampling and sample handling methods, as well as, a review of the project field notes (see Attachment A).

5.5.2. Laboratory Quality Assurance/Quality Control. Laboratory quality assurance/quality control (QA/QC) results were within method control limits for accuracy and precision with respect to most parameters. A detailed discussion of the laboratory QA/QC results is presented below, including a discussion of those QA/QC parameters, which did not meet the laboratory-derived or method quality control limit.

5.5.2.1. Hexavalent Chromium MS/MSD Percent Recoveries.

As will be discussed below, the QA/QC issue of concern for the hexavalent chromium analysis in soil relates to two (2) MS/MSD percent recoveries, which were below the method or laboratory control limit for soluble hexavalent chromium. Those MS/MSD percent recoveries were:

Lab # 1105384 (sample ID: SDBI-1) – 65.9 % and 58.8 %
Lab # 11052394 (sample ID: NDBSW-1) – 57.4 % and 58.2 %

The laboratory control limit is 75 % – 125 %.

These low percent recoveries can most likely be attributed to organic matter that is present in the soil matrix.

The LCS % recovery for these respective QC batches was 89.9 % and 85.5 %.

Finally, the insoluble hexavalent chromium MS/SD data were within the laboratory control limits for both sample matrices:

Lab # 1105384 (sample ID: SDBI-1) – 88.8 % and 90.2 %
Lab # 11052394 (sample ID: NDBSW-1) – 95.9 % and 87.6 %

5.5.2.2. Laboratory Duplicate Data. All MS/MSD samples were within the relative percent difference (RPD) laboratory control limits.

5.5.2.3. Additional Laboratory Quality Control Data. Additional laboratory quality control data with respect to the May 30, 2011 CAS Laboratory soil analysis report are summarized in the associated CAS Laboratory QA/QC Reports. These data include laboratory control sample (LCS) blanks and spikes. These summaries show that the LCS blanks were all non-detect. And, all LCS spike recoveries were within the method percent recovery range limits.

6. Discussion of Results and Recommended Follow-up Action.

Before presenting a discussion of results, it is appropriate to summarize the media cleanup standards that are set forth in Section C.12.2.1. of the Exline, Inc. hazardous waste permit. These standards are set forth in Table 6.1:

Table 6.1: Exline, Inc. Vadose Zone Soil Remediation Goals – mg/kg

Constituent of Concern	Industrial Use	Un-Restricted Use
Arsenic	18	8.8
Chromium (III)	100,000	100,000
Chromium (VI)	38	0.29
Lead	1067	448

6.1. Discussion of Results.

The data summarized in Table 4.1 and shown on Figure 4.1 demonstrate that all of the trivalent chromium concentrations are well below both the "Industrial Use" and "Un-Restricted Use" remedial goals.

With the exception of three samples discussed below, all of the hexavalent chromium concentrations were non-detect. Three (3) of the hexavalent chromium soil concentrations were above the Industrial Use remediation goal of 38 mg/kg:

SDBSW-1 – 110 mg/kg
SDBSW-2 – 81 mg/kg
SDBB-2 – 88 mg/kg

As shown on Figure 4.1, all three of these samples were collected from the southern-most drying bed (SWMU-5). Moreover, all three samples were collected from the southeast corner of the south drying bed. Based on these results, remediation efforts should focus on that specific area of the drying bed.

6.2. Recommended Follow-up Action.

As discussed above, there is one area, which exhibited hexavalent chromium concentrations above the Industrial Use remedial goal of 38 mg/kg. It is recommended that this area should be remediated by excavation. Figure 6.1 shows the recommended excavation area. The subject area would be excavated to a 1 ft. depth. Excavated soil will be transferred to a 20 cubic yard roll-off container. The excavated soil will be characterized in the same manner as set forth in the January, 2011 CMI Work Plan.

Specifically, excavated soil will be sampled and analyzed for TCLP chromium in order to determine if the material is hazardous waste. If the TCLP chromium concentration is

greater than 5 mg/L, then the material will be disposed off-site by Innovative Waste Management, Inc., Summerville, SC. If the TCLP chromium concentration is less than or equal to 5 mg/L, then the material will be disposed in the City of Salina landfill, following approval from the KDHE Bureau of Waste Management and City of Salina Landfill officials.

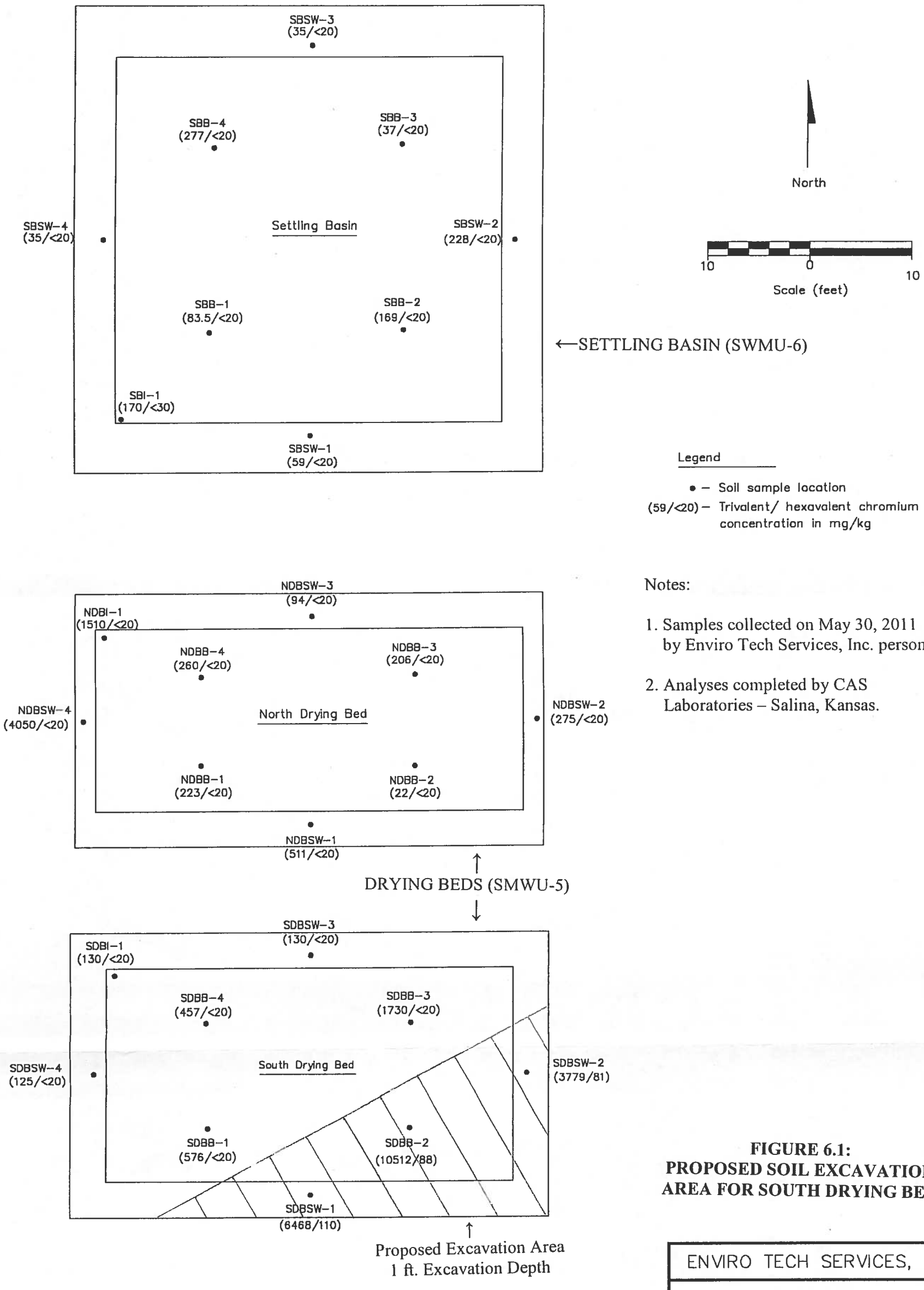
TCLP data generated from the excavated soil will also be submitted to the EPA.

Ten (10) discrete soil samples will be collected and composited into a single sample for each roll-off container of soil that is generated. Samples will be collected by Enviro Tech Services, Inc. personnel and delivered to CAS Laboratories, Salina, Kansas for TCLP chromium analysis. Based on the area to be excavated (see Figure 6.1), it is projected that each foot of excavated soil will fill one (1) roll-off container.

Following the one-foot excavation process, confirmation soil samples will be collected for hexavalent chromium analysis at each of the three (3) locations, which exhibited concentrations, above the 38 mg/kg standard:

- SDBSW-1
- SDBSW-2
- SDBB-2

If one or more of the confirmation soil sample hexavalent chromium concentrations are equal to or greater than the 38 mg/kg cleanup standard, then additional soil (1 ft.) will be excavated from the area surrounding the sample, which exhibited the elevated concentration. This process will continue until such time that the hexavalent chromium soil concentrations are all below the 38 mg/kg cleanup standard.



Notes:

1. Samples collected on May 30, 2011 by Enviro Tech Services, Inc. personnel.
2. Analyses completed by CAS Laboratories – Salina, Kansas.

FIGURE 6.1:
PROPOSED SOIL EXCAVATION AREA FOR SOUTH DRYING BED

ENVIRO TECH SERVICES, INC.		
Exline, Inc. Salina, Kansas		
Project Number: 09-0101	Date: June 2011	Drawn By: Jack Eslick

ATTACHMENT A

FIELD NOTES FOR MAY 30, 2011 SAMPLING EVENT

30 May 2011
Moby to Site; on site @ 0920
Jack Eblick / Patrick Eblick

Set up lab trailer
Record instrument calibrations and readings on data form

Collect soil samples from surface (top 1") using plastic scoops

Set orange surface @ each location with sample ID.

SBD-1 is a blind dup of SBB-1
SBD-2 is a blind dup of SBB-2
SBD-3 is a blind dup of SBB-3

Sample Times & Material

South Drying Basin (SDB)

SDBI-1	1010	(Inlet)
SDBSW-1	1015	(Side)
SDBSW-2	1018	(Side)
SDBSW-3	1021	(Side)
SDBSW-4	1024	(Side)
SDBB-1	1027	(Bottom)
SDBB-2	1030	(Bottom)
SDBB-3	1033	(Bottom)
SDBB-4	1037	(Bottom)

Samples were sand to silty sand

Weather @ 1100 85°F ± Clear

North Drying Bed (NDB)

NDBI-1	1300	(Inlet)
NDBSW-1	1305	(Side)
NDBSW-2	1308	(Side)
NDBSW-3	1311	(Side)
NDBSW-4	1314	(Side)
NDBB-1	1317	(Bottom)
NDBB-2	1320	(Bottom)
NDBB-3	1323	(Bottom)
NDBB-4	1326	(Bottom)

Samples were sand to siltysand

Settling Basin (SB)

SBI-1	~~1435~~ 1430	(Inlet)
SBSW-1	1435	(Side)
SBSW-2	1438	(Side)
SBSW-3	1441	(Side)
SBSW-4	1444	(Side)
SBB-1	1447	(Bottom)
SBB-2	1450	(Bottom)
SBB-3	1453	(Bottom)
SBB-4	1456	(Bottom)

Soil pH and ORP Data Sheet

Project: Exline - Salina, KS	Date: 30 May 2011
ORP Instrument: Hach Sension 1	
pH Instrument: Hach Sension 1	
ORP Probe: Oakton WD-35805-15 ~~(Calomel)~~ (Ag/AgCl)	
pH Probe: Cole-Parmer 05993-11	
pH Standards: 4.01 Lot 2004187 exp 3/2012; 7.00 Lot 2005245 exp 4/2012	
ORP Standard: YSI Lot 10A100387 exp 28 Oct 2011	

Instrument Calibrations and Checks

2011 Date	Time	Instrument	Standard	Reading	Recalibrated (Y/N)	Initials
5/30	0940	pH	7.00	—	Y	E
5/30	0942	pH	4.00	—	Y	E
5/30	0945	ORP		219.9 @ 23°C		E
5/30	1210	pH	7.00	7.02	N	E
5/30	1215	ORP		211.1 @ 30°C		E
5/30	1345	ORP		206.1 @ 33°C		E
5/30	1350	pH	7.00	6.96	Y	E
5/30	1350	pH	4.01	3.95	Y	E
5/30	1605	pH	7.00	7.04	N	E

end of day

Ohaus HH120D Balance 20mg standard mass = 20.0g @ 0950 5/30

Soil ID	Flask	Soil Mass (grams)	Water Vol. (ml)	Start Time	Reading Time	pH	ORP
SDBI-1	1	20	20	1055	1200	8.14	+191 @ 33°C
SDBSW-1	2	20	20	1055	1201	8.00	+202 @ 33°C
SDBSW-2	3	20	20	1055	1202	8.06	+156 @ 33°C
SDBSW-3	4	20	20	1055	1203	8.05	+158 @ 33°C
SDBSW-4	5	20	20	1055	1204	8.21	+157 @ 33°C
SDBB-1	6	20	20	1055	1205	7.88	+158 @ 33°C
SDBB-2	7	20	20	1100	1206	8.19	+146 @ 33°C
SDBB-3	8	20	20	1100	1208	8.26	+135 @ 33°C
SDBB-4	9	20	20	1100	1209	8.30	+135 @ 33°C
NDBI-1	10	20	20	1345	1450	7.86	+161 @ 33°C
NDBSW-1	11	20	20	1345	1451	8.16	+180 @ 33°C
NDBSW-2	12	20	20	1345	1452	8.13	+149 @ 33°C
NDBSW-3	13	20	20	1345	1453	8.11	+147 @ 33°C
NDBSW-4	14	20	20	1345	1454	8.26	+158 @ 33°C
NDBB-1	15	20	20	1345	1455	8.54	+145 @ 33°C
NDBB-2	16	20	20	1350	1456	8.56	+137 @ 33°C
NDBB-3	17	20	20	1350	1457	8.78	+160 @ 33°C
NDBB-4	18	20	20	1350	1458	8.74	+164 @ 33°C
SBI-1	1	20	20	1450	1555	8.18	+117 @ 33°C
SBSW-1	2	20	20	1450	1556	7.45	+162 @ 33°C
SBSW-2	3	20	20	1450	1557	8.18	+139 @ 33°C
SBSW-3	4	20	20	1450	1558	8.13	+140 @ 33°C
SBSW-4	5	20	20	1450	1559	8.02	+145 @ 33°C
SBB-1	6	20	20	1450	1600	8.38	+129 @ 33°C
SBB-2	7	20	20	1455	1601	8.67	+121 @ 33°C
SBB-3	8	20	20	1455	1602	8.43	+125 @ 33°C
SBB-4	9	20	20	1455	1603	8.30	+133 @ 33°C

Technician: Jack Esbeck Signature: [signature] Date: 5/30/11

ATTACHMENT B

SOIL SAMPLING CAS LABORATORY REPORT

Continental
Analytical Services, Inc.

06/20/2011

Exline, Inc.
Attn: Cindi Mills
P.O. Box 1487
Salina, KS 67402-1487

Date and Time Received: 05/31/2011 09:17
Continental File No.: 5030
Continental Order No.: 56222
Project ID: SEI-03-010

Dear Ms. Mills:

This laboratory report containing the samples indicated below, includes 25 pages for the analytical report, 3 page(s) for the chain of custody and/or analysis request, and 1 page(s) for the sample receipt form.

CAS LAB ID #	SAMPLE DESCRIPTION	SAMPLE TYPE	DATE SAMPLED
11052384	SDBI-1	Solid	5/30/2011
11052385	SDBSW-1	Solid	5/30/2011
11052386	SDBSW-2	Solid	5/30/2011
11052387	SDBSW-3	Solid	5/30/2011
11052388	SDBSW-4	Solid	5/30/2011
11052389	SDBB-1	Solid	5/30/2011
11052390	SDBB-2	Solid	5/30/2011
11052391	SDBB-3	Solid	5/30/2011
11052392	SDBB-4	Solid	5/30/2011
11052393	NDBI-1	Solid	5/30/2011
11052394	NDBSW-1	Solid	5/30/2011
11052395	NDBSW-2	Solid	5/30/2011
11052396	NDBSW-3	Solid	5/30/2011
11052397	NDBSW-4	Solid	5/30/2011
11052398	NDBB-1	Solid	5/30/2011
11052399	NDBB-2	Solid	5/30/2011
11052400	NDBB-3	Solid	5/30/2011
11052401	NDBB-4	Solid	5/30/2011
11052402	SBI-1	Solid	5/30/2011
11052403	SBSW-1	Solid	5/30/2011
11052404	SBSW-2	Solid	5/30/2011
11052405	SBSW-3	Solid	5/30/2011
11052406	SBSW-4	Solid	5/30/2011
11052407	SBB-1	Solid	5/30/2011
11052408	SBB-2	Solid	5/30/2011
11052409	SBB-3	Solid	5/30/2011
11052410	SBB-4	Solid	5/30/2011
11052411	SBD-1	Solid	5/30/2011
11052412	SBD-2	Solid	5/30/2011
11052413	SBD-3	Solid	5/30/2011

The Appendix and Quality Control sections are integral parts of this laboratory report and may contain important data qualifiers.

All results are reported on a wet weight basis unless otherwise stated.

Samples will be retained for thirty days unless Continental is otherwise notified.

Continental is accredited by the State of Kansas through the National Environmental Laboratory Accreditation Program (NELAP). The results contained in this report were obtained using Continental's Standard Operating Procedures. These procedures are in substantial compliance with the approved methods referenced and the standards published by NELAP unless otherwise noted in the Appendix and Quality Control sections of this report.

This report may not be reproduced, except in full, without written approval from Continental Analytical Services, Inc.

Thank you for choosing Continental for this project. If you have any questions please contact me at (800)535-3076.

CONTINENTAL ANALYTICAL SERVICES, INC.

Clifford J. Baker
Technical Manager

Petra M. Craddock
Project Manager

525 N. Eighth St. - P.O. Box 3737 - Salina, KS 67402-3737
785-827-1273 800-535-3076 Fax 785-823-7830

KDHE Environmental Laboratory Accreditation No. E-10146

Client: Exline, Inc.
Attn: Cindi Mills
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Lab Number: 11052384
Sample Description: SDBI-1

Date Sampled: 05/30/2011
Time Sampled: 1010

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	150	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20) QC	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	8@23C	Std. units	7049/139
Solids, Total	87.8	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1913	110603-2	7IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-1	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1415	110609-1	110609-1	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1400	110609-1	110609-1	WFN	9045D
Solids, Total	N/A	06/07/11 1458	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052384

Lab Number: 11052385
Sample Description: SDBSW-1

Date Sampled: 05/30/2011
Time Sampled: 1015

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	7690	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	110.	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	8.24@23C	Std. units	7049/139
Solids, Total	85.3	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1918	110603-2	7IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1432	110609-1	110609-1	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1418	110609-1	110609-1	WFN	9045D
Solids, Total	N/A	06/07/11 1459	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B

-Continued-

Client: Exline, Inc.
Attn: Cindi Mills
P.O. Box 1487
Salina, KS 67402-1487

Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Alkaline Digestion-Cr+6 Preparation Method 3060A

Conclusion of Lab Number: 11052385

Lab Number: 11052386
Sample Description: SDBSW-2

Date Sampled: 05/30/2011
Time Sampled: 1018

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	4170	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	87	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	8.19@24C	Std. units	7049/139
Solids, Total	92.6	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1922	110603-2	7IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1437	110609-1	110609-1	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1424	110609-1	110609-1	WFN	9045D
Solids, Total	N/A	06/07/11 1459	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052386

Lab Number: 11052387
Sample Description: SDBSW-3

Date Sampled: 05/30/2011
Time Sampled: 1021

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	150	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	8.26@23C	Std. units	7049/139
Solids, Total	89.1	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1926	110603-2	7IP4158	KMW	6010B

-Continued-

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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1439	110609-1	110609-1	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1430	110609-1	110609-1	WFN	9045D
Solids, Total	N/A	06/07/11 1459	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052387

Lab Number: 11052388
Sample Description: SDBSW-4

Date Sampled: 05/30/2011
Time Sampled: 1024

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	144	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	8.13@23C	Std. units	7049/139
Solids, Total	87.0	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1930	110603-2	7IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1440	110609-1	110609-1	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1431	110609-1	110609-1	WFN	9045D
Solids, Total	N/A	06/07/11 1500	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052388

Client: Exline, Inc.
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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Lab Number: 11052389
Sample Description: SDBB-1

Date Sampled: 05/30/2011
Time Sampled: 1027

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	711	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	7.85@23C	Std. units	7049/139
Solids, Total	81.1	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1934	110603-2	7IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1442	110609-1	110609-1	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1433	110609-1	110609-1	WFN	9045D
Solids, Total	N/A	06/07/11 1500	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052389

Lab Number: 11052390
Sample Description: SDBB-2

Date Sampled: 05/30/2011
Time Sampled: 1030

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	12500	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	100.	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	8.32@23C	Std. units	7049/139
Solids, Total	85.0	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1947	110603-2	8IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1446	110609-1	110609-1	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1436	110609-1	110609-1	WFN	9045D
Solids, Total	N/A	06/07/11 1501	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B

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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Alkaline Digestion-Cr+6 Preparation Method 3060A

Conclusion of Lab Number: 11052390

Lab Number: 11052391
Sample Description: SDBB-3

Date Sampled: 05/30/2011
Time Sampled: 1033

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	1850	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	8.44@23C	Std. units	7049/139
Solids, Total	93.4	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1951	110603-2	8IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1457	110609-1	110609-1	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1439	110609-1	110609-1	WFN	9045D
Solids, Total	N/A	06/07/11 1501	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052391

Lab Number: 11052392
Sample Description: SDBB-4

Date Sampled: 05/30/2011
Time Sampled: 1037

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	498	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	7.98@24C	Std. units	7049/139
Solids, Total	91.8	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1955	110603-2	8IP4158	KMW	6010B

-Continued-

Client: Exline, Inc.
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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1520	110609-1	110609-2	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1507	110609-2	110609-2	WFN	9045D
Solids, Total	N/A	06/07/11 1502	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052392

Lab Number: 11052393
Sample Description: NDBI-1

Date Sampled: 05/30/2011
Time Sampled: 1300

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	1710	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/8
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	7.96@23C	Std. units	7049/139
Solids, Total	88.5	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1959	110603-2	8IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/07/11 1400	110607-1	110607-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1522	110609-1	110609-2	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1509	110609-2	110609-2	WFN	9045D
Solids, Total	N/A	06/07/11 1502	110607-1	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052393

Client: Exline, Inc.
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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Lab Number: 11052394
Sample Description: NDBSW-1

Date Sampled: 05/30/2011
Time Sampled: 1305

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	598	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20) QC	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	7.85@23C	Std. units	7049/139
Solids, Total	85.5	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0314	110603-2	21IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1300	110613-1	110613-1	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1530	110609-1	110609-2	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1512	110609-2	110609-2	WFN	9045D
Solids, Total	N/A	06/07/11 1503	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052394

Lab Number: 11052395
Sample Description: NDBSW-2

Date Sampled: 05/30/2011
Time Sampled: 1308

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	308	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	7.95@23C	Std. units	7049/139
Solids, Total	89.2	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0318	110603-2	21IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1301	110613-1	110613-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1532	110609-1	110609-2	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1517	110609-2	110609-2	WFN	9045D
Solids, Total	N/A	06/07/11 1504	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B

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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Alkaline Digestion-Cr+6 Preparation Method 3060A

Conclusion of Lab Number: 11052395

Lab Number: 11052396
Sample Description: NDBSW-3

Date Sampled: 05/30/2011
Time Sampled: 1311

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	100	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	7.83@23C	Std. units	7049/139
Solids, Total	93.6	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0322	110603-2	21IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1301	110613-1	110613-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1540	110609-1	110609-2	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1519	110609-2	110609-2	WFN	9045D
Solids, Total	N/A	06/07/11 1505	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052396

Lab Number: 11052397
Sample Description: NDBSW-4

Date Sampled: 05/30/2011
Time Sampled: 1314

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	4910	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	7.76@23C	Std. units	7049/139
Solids, Total	82.5	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 2003	110603-2	8IP4158	KMW	6010B

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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	06/13/11 1301	110613-1	110613-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1542	110609-1	110609-2	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1523	110609-2	110609-2	WFN	9045D
Solids, Total	N/A	06/07/11 1505	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052397

Lab Number: 11052398
Sample Description: NDBB-1

Date Sampled: 05/30/2011
Time Sampled: 1317

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	234	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	8.13@23C	Std. units	7049/139
Solids, Total	95.4	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 2007	110603-2	8IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1301	110613-1	110613-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1544	110609-1	110609-2	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1525	110609-2	110609-2	WFN	9045D
Solids, Total	N/A	06/07/11 1505	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052398

Client: Exline, Inc.
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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Lab Number: 11052399
Sample Description: NDBB-2

Date Sampled: 05/30/2011
Time Sampled: 1320

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	22	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	550.	mV	7047/2
pH, (1:1 Water Extraction)	8.79@23C	Std. units	7049/139
Solids, Total	99.6	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0334	110603-2	21IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1301	110613-1	110613-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1546	110609-1	110609-2	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1527	110609-2	110609-2	WFN	9045D
Solids, Total	N/A	06/07/11 1506	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052399

Lab Number: 11052400
Sample Description: NDBB-3

Date Sampled: 05/30/2011
Time Sampled: 1323

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	210	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	580.	mV	7047/2
pH, (1:1 Water Extraction)	8.14@23C	Std. units	7049/139
Solids, Total	97.9	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0339	110603-2	21IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1301	110613-1	110613-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1602	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1533	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1506	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B

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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Alkaline Digestion-Cr+6 Preparation Method 3060A

Conclusion of Lab Number: 11052400

Lab Number: 11052401
Sample Description: NDBB-4

Date Sampled: 05/30/2011
Time Sampled: 1326

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	260	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	580.	mV	7047/2
pH, (1:1 Water Extraction)	8.39@23C	Std. units	7049/139
Solids, Total	99.4	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0343	110603-2	21IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1301	110613-1	110613-2	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1608	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1539	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1507	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052401

Lab Number: 11052402
Sample Description: SBI-1

Date Sampled: 05/30/2011
Time Sampled: 1430

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	210	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(30)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	7.92@23C	Std. units	7049/139
Solids, Total	80.0	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0347	110603-2	21IP4157	KMW	6010B

-Continued-

Client: Exline, Inc.
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Date Sample Rptd: 06/20/2011
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Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	06/13/11 1302	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1610	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1540	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1508	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052402

Lab Number: 11052403
Sample Description: SBSW-1

Date Sampled: 05/30/2011
Time Sampled: 1435

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	68.8	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	7.75@23C	Std. units	7049/139
Solids, Total	85.7	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0416	110603-2	22IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1302	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1612	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1541	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1508	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052403

Client: Exline, Inc.
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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Lab Number: 11052404
Sample Description: SBSW-2

Date Sampled: 05/30/2011
Time Sampled: 1438

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	244	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	580.	mV	7047/2
pH, (1:1 Water Extraction)	7.8@23C	Std. units	7049/139
Solids, Total	93.5	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0014	110603-1	17IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1302	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1633	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1549	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1508	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052404

Lab Number: 11052405
Sample Description: SBSW-3

Date Sampled: 05/30/2011
Time Sampled: 1441

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	38	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	8.03@23C	Std. units	7049/139
Solids, Total	91.9	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0043	110603-1	18IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1302	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1637	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1552	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1509	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B

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Date Sample Rptd: 06/20/2011
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Continental Order No: 56222

Alkaline Digestion-Cr+6 Preparation Method 3060A

Conclusion of Lab Number: 11052405

Lab Number: 11052406
Sample Description: SBSW-4

Date Sampled: 05/30/2011
Time Sampled: 1444

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	38	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	7.78@24C	Std. units	7049/139
Solids, Total	93.0	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0048	110603-1	18IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1302	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1640	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1553	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1509	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052406

Lab Number: 11052407
Sample Description: SBB-1

Date Sampled: 05/30/2011
Time Sampled: 1447

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	90.0	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	7.87@24C	Std. units	7049/139
Solids, Total	92.8	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0052	110603-1	18IP4157	KMW	6010B

-Continued-

Client: Exline, Inc.
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Date Sample Rptd: 06/20/2011
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Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	06/13/11 1302	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1642	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1554	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1510	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052407

Lab Number: 11052408
Sample Description: SBB-2

Date Sampled: 05/30/2011
Time Sampled: 1450

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	171	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	8.39@23C	Std. units	7049/139
Solids, Total	98.6	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0056	110603-1	18IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1302	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1644	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1557	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1510	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052408

Client: Exline, Inc.
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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Lab Number: 11052409
Sample Description: SBB-3

Date Sampled: 05/30/2011
Time Sampled: 1453

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	40	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	8.19@22C	Std. units	7049/139
Solids, Total	91.6	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0100	110603-1	18IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1302	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1646	110609-1	110609-3	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1559	110609-2	110609-3	WFN	9045D
Solids, Total	N/A	06/07/11 1510	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052409

Lab Number: 11052410
Sample Description: SBB-4

Date Sampled: 05/30/2011
Time Sampled: 1456

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	318	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	7.73@23C	Std. units	7049/139
Solids, Total	87.0	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0104	110603-1	18IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1303	110613-1	110613-3	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1649	110609-1	110609-4	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1602	110609-2	110609-4	WFN	9045D
Solids, Total	N/A	06/07/11 1511	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B

-Continued-

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Date Sample Rptd: 06/20/2011
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Alkaline Digestion-Cr+6 Preparation Method 3060A

Conclusion of Lab Number: 11052410

Lab Number: 11052411
Sample Description: SBD-1

Date Sampled: 05/30/2011
Time Sampled: 1459

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	80.1	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	7.32@22C	Std. units	7049/139
Solids, Total	92.9	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0108	110603-1	18IP4157	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1303	110613-1	110613-4	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1651	110609-1	110609-4	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1604	110609-2	110609-4	WFN	9045D
Solids, Total	N/A	06/07/11 1511	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052411

Lab Number: 11052412
Sample Description: SBD-2

Date Sampled: 05/30/2011
Time Sampled: 1302

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	157	mg/kg dry wt.	7143/4
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	560.	mV	7047/2
pH, (1:1 Water Extraction)	8.57@22C	Std. units	7049/139
Solids, Total	99.6	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 0113	110603-1	18IP4157	KMW	6010B

-Continued-

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Date Sample Rptd: 06/20/2011
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Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	06/13/11 1303	110613-1	110613-4	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1653	110609-1	110609-4	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1606	110609-2	110609-4	WFN	9045D
Solids, Total	N/A	06/07/11 1512	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052412

Lab Number: 11052413
Sample Description: SBD-3

Date Sampled: 05/30/2011
Time Sampled: 1305

Analysis	Concentration	Units	Book/Page
Chromium, Total, ICP	36	mg/kg dry wt.	7143/5
Chromium, Hexavalent, Soil	ND(20)	mg/kg dry wt.	7045/11
Eh, by ORP [Soil]	570.	mV	7047/2
pH, (1:1 Water Extraction)	8.21@22C	Std. units	7049/139
Solids, Total	91.0	% by weight	7059/267

Analysis	Date Prepared	Date Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Total, ICP	06/03/11 800	06/07/11 1840	110603-1	6IP4158	KMW	6010B
Chromium, Hexavalent, Soil	N/A	06/13/11 1303	110613-1	110613-4	JND	7196A
Eh, by ORP [Soil]	N/A	06/09/11 1654	110609-1	110609-4	WFN	SM 2580B
pH, (1:1 Water Extraction)	N/A	06/09/11 1607	110609-2	110609-4	WFN	9045D
Solids, Total	N/A	06/07/11 1512	110607-2	110607-1	ASK	ASTM D2216(Mod)
ICP Metals Total Preparation Method						3050B
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 11052413

APPENDIX

Client: Exline, Inc.
Attn: Cindi Mills
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Date Sample Rptd: 06/20/2011
Date Sample Recd: 05/31/2011
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ND(), where reported, indicates the analyte was not detected above the limit of quantitation (LOQ). The concentration of the limit of quantitation is inside the parentheses.

All samples which require cooling were received at a temperature of less than 6 degrees Celsius.

No analysis with a holding time of seventy-two hours or less was performed in this Continental order.

QC - QC data qualifiers were noted. See the Quality Control Report.

Continental Analytical Services, Inc.
Accreditation Summary Report

Client: Exline, Inc.
CAS Order Number: 56222

NELAP accreditation is issued under each EPA regulatory program for a given matrix/analyte/method combination. Continental is NELAP accredited for each matrix/analyte/method and EPA program cited in this Laboratory Report, except for those listed in the table below and analysis performed in the field. For most of the analyses listed in the table, NELAP accreditation is not offered under the listed EPA program and Continental is NELAP accredited for the analysis, using the same analytical technology, but under a different EPA program. Continental's full NELAP accreditation status may be viewed at www.kdheks.gov/envlab. Note that unless qualified otherwise in the Laboratory Report, Continental performs all analyses, including each analysis listed in the table below, utilizing NELAP protocol.

Test	Analysis	Matrix-Regulatory Program	Method	CAS NELAP Accredited in Other Reg. Program
GL244	Solids, Total	S-RCRA	ASTM D2216(Mod)	Y
GL778	Eh, by ORP [Soil]	S-RCRA	SM 2580B	N

Continental Analytical Services, Inc.

Quality Control Report
Batch Summary

Client: Exline, Inc.
Attn: Cindi Mills
P.O. Box 1487
Salina, KS 67402-1487

Page: 23
Date Reported: 06/20/2011
Date Sample Received: 05/31/1
Continental File No: 5030
Continental Order No: 56222

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
SL308	Chromium, Total, ICP	110603-1	110603BLK1	110603LCS1	11052404MS

Lab numbers associated with this batch:
11052404 11052405 11052406 11052407 11052408 11052409 11052410 11052411 11052412 11052413

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
SL308	Chromium, Total, ICP	110603-2	110603BLK2	110603LCS2	11052402MS

Lab numbers associated with this batch:
11052384 11052385 11052386 11052387 11052388 11052389 11052390 11052391 11052392 11052393 11052394
11052395 11052396 11052397 11052398 11052399 11052400 11052401 11052402 11052403

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
GL341	Chromium, Hexavalent, Soil	110607-1	110607BLK1	110607LCS1	11052384MS 11052384RS

Lab numbers associated with this batch:
11052384 11052385 11052386 11052387 11052388 11052389 11052390 11052391 11052392 11052393

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
GL341	Chromium, Hexavalent, Soil	110613-1	110613BLK1	110613LCS1	11052394MS 11052394RS

Lab numbers associated with this batch:
11052394 11052395 11052396 11052397 11052398 11052399 11052400 11052401 11052402 11052403 11052404
11052405 11052406 11052407 11052408 11052409 11052410 11052411 11052412 11052413

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
GL778	Eh, by ORP [Soil]	110609-1	110609BLK1	110609LCS1	11052384MS 11052394MS

Lab numbers associated with this batch:
11052384 11052385 11052386 11052387 11052388 11052389 11052390 11052391 11052392 11052393 11052394
11052395 11052396 11052397 11052398 11052399 11052400 11052401 11052402 11052403 11052404 11052405 11052406 11052407

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
GL212	pH, (1:1 Water Extraction)	110609-1	110609BLK1	110609LCS1	11052384MS

Lab numbers associated with this batch:
11052384 11052385 11052386 11052387 11052388 11052389 11052390 11052391

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
GL212	pH, (1:1 Water Extraction)	110609-2	110609BLK2	110609LCS2	11052394MS

Lab numbers associated with this batch:
11052392 11052393 11052394 11052395 11052396 11052397 11052398 11052399 11052400 11052401 11052402
11052403 11052404 11052405 11052406 11052407 11052408 11052409 11052410 11052411 11052412 11052413

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
GL244	Solids, Total	110607-1	110607BLK1	110607LCS1	11060502MS

Lab numbers associated with this batch:
11052384 11052385 11052386 11052387 11052388 11052389 11052390 11052391 11052392 11052393

Test	Testname	QC Batch	Method Blank	LCS	MS Lab No.
GL244	Solids, Total	110607-2	110607BLK2	110607LCS2	11052394MS

Lab numbers associated with this batch:
11052394 11052395 11052396 11052397 11052398 11052399 11052400 11052401 11052402 11052403 11052404
11052405 11052406 11052407 11052408 11052409 11052410 11052411 11052412 11052413

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Date Reported: 06/20/2011
Date Sample Received: 05/31/2011
Continental File No: 5030
Continental Order No: 56222

Analysis	Blank Data	% Rec LCS	Limits	Spike Level	Units	Spiked Sample (% Recovery) MS	MSD	Limits	Spike Level	Units	Spiked Sample Precision Data RPD	Limit
QC Batch: 110603-1	For samples prepared on: 06/03/2011					Spiked sample: 11052404						
Chromium, Total, ICP	ND(0.5)	96.3	80.0-120	25.0	mg/kg	I	I	75.0-125	25.0	mg/kg	**	20.0
QC Batch: 110603-2	For samples prepared on: 06/03/2011					Spiked sample: 11052402						
Chromium, Total, ICP	ND(0.5)	96.8	80.0-120	25.0	mg/kg	I	I	75.0-125	25.0	mg/kg	**	20.0
QC Batch: 110607-1	For sample analyzed on: 06/07/2011					Spiked sample: 11052384						
Chromium, Hexavalent, Soil	ND(20)	89.9	84.2-111	60.0	mg/kg	65.9 ML	58.8 ML	75.0-125	60.0	mg/kg	11.4	20.0
QC Batch: 110607-1	For sample analyzed on: 06/07/2011					Spiked sample: 11052384R						
Chromium, Hexavalent, Soil	ND(20)	89.9	84.2-111	60.0	mg/kg	88.8 RI	90.2 RI	75.0-125	1290	mg/kg	1.6	20.0
QC Batch: 110607-1	For sample analyzed on: 06/07/2011					Spiked sample: 11060502						
Solids, Total	ND(0.1)	N/A			% by we	MN	MN	#		% by we	**	4.4
QC Batch: 110607-2	For sample analyzed on: 06/07/2011					Spiked sample: 11052394						
Solids, Total	ND(0.1)	N/A			% by we	85.5 T	84.7 T	#		% by we	0.9	4.4
QC Batch: 110609-1	For sample analyzed on: 06/09/2011					Spiked sample: 11052384						
pH, (1:1 Water Extraction)	N/A	100.	99.0-101	7.0	Std. u	8.02@23C	T8.02@23C	T#		Std. un	0.0	3.1
Eh, by ORP [Soil]	N/A	97.2	90.0-110	420	mV	560 T	560 T	#		mV	0.0	11.8
QC Batch: 110609-1	For sample analyzed on: 06/09/2011					Spiked sample: 11052394						
Eh, by ORP [Soil]	N/A	97.2	90.0-110	420	mV	560 T	560 T	#		mV	0.0	11.8
QC Batch: 110609-2	For sample analyzed on: 06/09/2011					Spiked sample: 11052394						
pH, (1:1 Water Extraction)	N/A	100.	99.0-101	7.0	Std. u	7.81@23C	T7.81@23C	T#		Std. un	0.0	3.1
QC Batch: 110613-1	For sample analyzed on: 06/13/2011					Spiked sample: 11052394						
Chromium, Hexavalent, Soil	ND(20)	89.5	84.2-111	60.0	mg/kg	57.4 ML	58.2 ML	75.0-125	60.0	mg/kg	1.4	20.0
QC Batch: 110613-1	For sample analyzed on: 06/13/2011					Spiked sample: 11052394R						
Chromium, Hexavalent, Soil	ND(20)	89.5	84.2-111	60.0	mg/kg	95.9 RI	87.6 RI	75.0-125	1290	mg/kg	9.0	20.0

Data Qualifiers:

I - Due to the concentration of analyte in the sample, the spike level is too low to allow accurate quantification of the spike recovery.

ML - The matrix spike and/or matrix spike duplicate recovery for this analyte was below the method or laboratory control limit. See LCS data for the basis for acceptance of this sample. The reported sample concentration is estimated.

RI - This lab number with the "R" suffix is used to provide the insoluble hexavalent chromium matrix spike recoveries. The spike level is normally 1290 mg/kg.

N/A - Not Applicable

MN - The MS/MSD sample analyses were not performed on a sample from this Continental order number.

T - MS/MSD cannot be performed for this analysis. The MS result is the same as the sample result. The MSD result is a duplicate of the sample.

- Limits not available.

** - RPD cannot be calculated.

Continental Analytical Services, Inc.

Quality Control Report

Continuing Calibration Verification Data Summary

Client: Exline, Inc.
Attn: Cindi Mills
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 06/20/2011
Date Sample Received: 05/31/
Continental File No: 5030
Continental Order No: 56222

Analysis	Date of Analysis	Instrument Batch ID	Amount in Standard	Amount Detected	Units	Percent Recovery
Chromium, Total, ICP	06/06/2011	17IP4157	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	18IP4157	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	19IP4157	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	21IP4157	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	22IP4157	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	23IP4157	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	6IP4158	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	7IP4158	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	8IP4158	CCV recovery acceptable for this Instrument Batch.			
Chromium, Total, ICP	06/07/2011	9IP4158	CCV recovery acceptable for this Instrument Batch.			
pH, (1:1 Water Extraction)	06/09/2011	110609-1	CCV recovery acceptable for this Instrument Batch.			
pH, (1:1 Water Extraction)	06/09/2011	110609-2	CCV recovery acceptable for this Instrument Batch.			
pH, (1:1 Water Extraction)	06/09/2011	110609-3	CCV recovery acceptable for this Instrument Batch.			
pH, (1:1 Water Extraction)	06/09/2011	110609-4	CCV recovery acceptable for this Instrument Batch.			
pH, (1:1 Water Extraction)	06/09/2011	110609-5	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/07/2011	110607-1	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/07/2011	110607-2	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/07/2011	110607-3	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/07/2011	110607-4	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/13/2011	110613-1	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/13/2011	110613-2	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/13/2011	110613-3	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/13/2011	110613-4	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	06/13/2011	110613-5	CCV recovery acceptable for this Instrument Batch.			
Eh, by ORP [Soil]	06/09/2011	110609-1	CCV recovery acceptable for this Instrument Batch.			
Eh, by ORP [Soil]	06/09/2011	110609-2	CCV recovery acceptable for this Instrument Batch.			
Eh, by ORP [Soil]	06/09/2011	110609-3	CCV recovery acceptable for this Instrument Batch.			
Eh, by ORP [Soil]	06/09/2011	110609-4	CCV recovery acceptable for this Instrument Batch.			

- Laboratory Report Conclusion -

CAS ORDER NO. [illegible]

CHAIN OF CUSTODY RECORD

ENVIRO TECH SERVICES, INC.
361 North Ohio Street, Salina, Kansas 67401
(785) 827-1682 FAX (785) 827-8765

Project #: SEI-03-010
Project Name: Exline – Salina, Kansas
Sampler's Name: Jack Eslick
Sampler's Signature: [signature]

Analytical Parameters

Date 2011	Time	Sample ID	Sample Point Identification	Matrix	Number of Containers	Chromium, Total	Chromium, Hex	pH	ORP					Comments
5/30	1010		SDBI-1	soil	1	✓	✓	✓	✓					
5/30	1015		SDBSW-1	soil	1	✓	✓	✓	✓					
5/30	1018		SDBSW-2	soil	1	✓	✓	✓	✓					
5/30	1021		SDBSW-3	soil	1	✓	✓	✓	✓					
5/30	1024		SDBSW-4	soil	1	✓	✓	✓	✓					
5/30	1027		SDBB-1	soil	1	✓	✓	✓	✓					
5/30	1030		SDBB-2	soil	1	✓	✓	✓	✓					
5/30	1033		SDBB-3	soil	1	✓	✓	✓	✓					
5/30	1037		SDBB-4	soil	1	✓	✓	✓	✓					
5/30	1300		NDBI-1	soil	1	✓	✓	✓	✓					
5/30	1305		NDBSW-1	soil	1	✓	✓	✓	✓					
5/30	1308		NDBSW-2	soil	1	✓	✓	✓	✓					

		Time	Date			Time	Date
#1 Relinquished by:	Printed Name: Jack Eslick	0917	5-31-11	#1 Received By:	Printed Name:		
	Signature: [signature]				Signature:		
#2 Relinquished by:	Printed Name: Paulette Gilzman	0917	5-31-11	#2 Received By:	Printed Name:		
	Signature: [signature]				Signature:		

Send Report To: Max Shepard

Special Instructions/Comments:

CHAIN OF CUSTODY RECORD

ENVIRO TECH SERVICES, INC.
361 North Ohio Street, Salina, Kansas 67401
(785) 827-1682 FAX (785) 827-8765

Project #: SEI-03-010
Project Name: Exline – Salina, Kansas
Sampler's Name: Jack Eslick
Sampler's Signature:

Sample Information / Analytical Parameters

Date 2011	Time	Sample ID	Sample Point Identification	Matrix	Number of Containers	Chromium, Total	Chromium, Hex	pH	ORP					Comments
5/30	1311		NDBSW-3	soil	1	✓	✓	✓	✓					
5/30	1314		NDBSW-4	soil	1	✓	✓	✓	✓					
5/30	1317		NDBB-1	soil	1	✓	✓	✓	✓					
5/30	1320		NDBB-2	soil	1	✓	✓	✓	✓					
5/30	1323		NDBB-3	soil	1	✓	✓	✓	✓					
5/30	1326		NDBB-4	soil	1	✓	✓	✓	✓					
5/30	1430		SBI-1	soil	1	✓	✓	✓	✓					
5/30	1435		SBSW-1	soil	1	✓	✓	✓	✓					
5/30	1438		SBSW-2	soil	1	✓	✓	✓	✓					
5/30	1441		SBSW-3	soil	1	✓	✓	✓	✓					
5/30	1444		SBSW-4	soil	1	✓	✓	✓	✓					
5/30	1447		SBB-1	soil	1	✓	✓	✓	✓					

		Time	Date			Time	Date
#1 Relinquished by:	Printed Name: Jack Eslick Signature:	0917	5-31-11	#1 Received By:	Printed Name: Signature:		
#2 Relinquished by:	Printed Name: Paulette Gizman Signature:	0917	5-31-11	#2 Received By:	Printed Name: Signature:		

Send Report To: Max Shepard

Special Instructions/Comments:

CHAIN OF CUSTODY RECORD

ENVIRO TECH SERVICES, INC.
361 North Ohio Street, Salina, Kansas 67401
(785) 827-1682 FAX (785) 827-8765

Project #: SEI-03-010
Project Name: Exline – Salina, Kansas
Sampler's Name: Jack Eslick
Sampler's Signature:

Analytical Parameters

Date 2011	Time	Sample ID	Sample Point Identification	Matrix	Number of Containers	Chromium, Total	Chromium, Hex	pH	ORP					Comments
5/30	1450		SBB-2	soil	1	✓	✓	✓	✓					
5/30	1453		SBB-3	soil	1	✓	✓	✓	✓					
5/30	1456		SBB-4	soil	1	✓	✓	✓	✓					
5/30	1459		SBD-1	soil	1	✓	✓	✓	✓					
5/30	1302		SBD-2	soil	1	✓	✓	✓	✓					
5/30	1305		SBD-3	soil	1	✓	✓	✓	✓					
				soil	1									
				soil	1									
				soil	1									
				soil	1									
				soil	1									
				soil	1									

		Time	Date			Time	Date
#1 Relinquished by:	Printed Name: Jack Eslick Signature:	0917	5/31/11	#1 Received By:	Printed Name: Signature:		
#2 Relinquished by:	Printed Name: Paulette Gizman Signature:	0917	5/31/11	#2 Received By:	Printed Name: Signature:		

Send Report To: Max Shepard

Special Instructions/Comments:

Continental Analytical Services Cooler/Sample Receipt Form

CAS Order No. S6222

Client Name: Exline

CAS File No.: 5030

Sample ID's in cooler: 500 WC

Cooler 1 of 1 for this CAS Order No.

Cooler Identification: CAS Cooler #: _____ Client's Cooler/Box/Letter/Hand Delivered
Other: _____

Date/Time Cooler Received: 5/31/11 09:17

Delivered By: UPS/FedX/AB Express/ASAP/Land Air Exp/Field Svcs/Mail/Walk-In/Other: _____

Custody Seal: Present: Intact / Broken Absent: X Seal No: _____
Seal Name: _____ Seal Date: _____
Seal matches Chain of Custody: Yes / No / N/A

Type of Packing Material: Blue Ice/Ice/Melted Ice/Bubble/Foam/Paper/Peanuts/Vermiculite/ None/Other: _____

Cooler Temperature (°C): Original Reading (°C) 3.1 Corrected Reading (°C) 3.4
Temp. By: Temp. Blank Surface: Glass/Plastic/Metal/Other: _____ Cooler
Thermo. ID No.: 885 Thermo. Correction Factor (°C): 0.3
☐ Evidence of Cooling: date received=date sampled

Sample Receipt Discrepancies: ☒ No ☐ *Yes (see below for discrepancies)*

Note: CAS will proceed with sample analyses, addressing each discrepancy as shown, until/unless directed otherwise by the client.

☐ Chain of Custody not present information taken from:
Cover Letter ☐ Container ☐
PO ☐ CAS Proj. Mgr. ☐
☐ Container label absent
☐ Chain of Custody incomplete [see detail below]
☐ Chain of Custody missing date/time sampled (excl. TB or Dup)
☐ Date or Time sampled obtained from container label
☐ Chain of Custody missing sampler's name
☐ Chain of Custody missing matrix (sample type)
☐ Missing relinquished information: signature date time

☐ Sample excluded from Chain of Custody
☐ Sample listed on Chain of Custody, not received
☐ Sample description on container and Chain of Custody do not agree
☐ Air bubbles in Aqueous VOA vials larger than pea-size [approx. 6 mm]
☐ Cooler temperature exceeded 0.1 - 6.0 °C requirement
[Do not mark if samples do not require cooling to 0.1 - 6.0 °C.]
☐ Broken or leaking containers (detail actions below)
☐ Sample container type or labeled chemical preservation inappropriate
☐ Other discrepancies: _____

Detail to discrepancies/comments:

Completed by: PG Date Completed: 5-31-11

59-2946(n) creates an ambiguity regarding the location for performing the mental evaluation, the legislative intent is that the physician or psychologist performing the evaluation determines the location to conduct the mental evaluation based upon the welfare of the detained person; however, such location may not include a non-medical facility used to detain persons charged with or convicted of a crime such as a jail or a law enforcement patrol vehicle. Cited herein: K.S.A. 59-2945; 59-2946; 59-2953; 59-2958; 59-2960; 59-2961; 65-425; K.S.A. 1977 Supp. 65-4027 (Repealed); 65-4031 (Repealed); K.S.A. 75-704. JLA (Issued January 2, 2013)

Opinion 2013-2

Re: Cities and Municipalities—General Provisions—Collection of Certain Unpaid Special Assessments; Action in District Court for Debt.

Cities and Municipalities—Buildings, Structures and Grounds—Unsafe or Dangerous Structures and Abandoned Property.

Synopsis: K.S.A. 12-1,115 authorizes a city to both levy a special assessment *and* file a civil action to collect the demolition costs from the property owner of an unsafe and dangerous structure. Furthermore, a city is not required to remit to the county any amount recovered in a lawsuit to recoup the moneys expended to remove or raze the unsafe or dangerous structure. Cited herein: K.S.A. 12-1,115; K.S.A. 2012 Supp. 12-1755; and 79-2015. AEA (Issued January 2, 2013)

Opinion 2012-3

Re: Cities and Municipalities—Consolidation of Municipalities—Unification of Governmental Units in Greeley County; Unification Plan; Unified City-County Powers, Duties, Limitations.

Counties and County Officers—County Clerk—County Clerk; Deputies and Assistants; Budget; Limitation on Personnel Policies and Practices.

Counties and County Officers—County Treasurer—County Treasurer; Deputy Treasurers; Budget; Limitation of Personnel Action.

Counties and County Officers—Sheriff—Sheriff; Deputies and Undersheriffs; Budget; Limitation of Personnel Action.

Counties and County Officers—Register of Deeds—Register of Deeds; Deputy Registers of Deed; Budget; Limitation of Personnel Action.

Synopsis: The authority of county elected officials to pay bonuses to their employees is subject to any county-wide pay plan adopted by the board of county commissioners. When a pay plan establishes specific salaries for county employees and is silent on the issue of bonuses, the pay plan should generally be read as prohibiting bonuses. County elected officials whose salaries are set by the board of county commissioners may not pay themselves bonuses without the board's approval. Cited herein: K.S.A. 2011 Supp. 12-365; 19-101a; K.S.A. 19-302; 19-503; 19-805; 19-1202; 79-2934. DC (Issued January 3, 2013)

Derek Schmidt
Attorney General

Doc. No. 041224

State of Kansas

Department of Health and Environment

Notice of Major Administrative Actions at Hazardous Waste Facilities

The Hazardous Waste Permits Section of the Bureau of Waste Management has available for review a list of all permit modifications and major administrative actions for facilities that treat, store or dispose of hazardous waste in Kansas that were finalized or approved from January 1, 2012 through December 31, 2012. The publication of this list fulfills the requirement of 40 CFR 270.42(i).

For more information contact Mostafa Kamal, Hazardous Waste Permits Section, at 785-296-1609.

Ash Grove Cement Company — EPA I.D. KSD031203318

03/14/12	Class 1 Modification regarding changes to Emergency Contingency Plan
06/06/12	Class 1 Modification updating Emergency Contacts, drawings and schematics
09/20/12	Class 1 Modification regarding updating drawings for replacement equipment
11/30/12	Class 1a Modification allowing a Temporary Extension of a 10-day unloading requirement

Chemical Waste Management — EPA I.D. KSD070902952

03/08/12	Remedy Enhancement Study Report approved
06/27/12	Class I Permit Modification to reflect modification to the Contingency Plan
07/27/12	Surface Water Drainage Improvement Work Plan approved
10/10/12	Class I Permit Modification to reflect addition and replacement of wells to the monitoring network
10/11/12	Pre-Design Data Acquisition and Remedial Design Work Plan approved

Clean Harbor — Coffeyville — EPA I.D. KSD981506025

09/20/12	Class 1a Permit Modification regarding transformer dismantling process

Clean Harbor — Wichita — EPA I.D. KSD007246846

07/18/12	Public Notice for Draft Renewal Permit
08/29/12	Completeness Determination of Part A and Part B renewal Application
09/28/12	Hazardous Waste Permit Renewal
11/13/12	Class 1 Permit Modification to reflect change in emergency coordinator

DuPont — EPA I.D. KSD133579698

10/12/12	Revised Sampling and Analysis Plan approved
10/31/12	Consent Agreement amended for cost reimbursement of oversight

Exline, Inc. — EPA I.D. KSD007127327

08/17/12	Operation and Maintenance Inspection Report finalized
10/29/12	Revised Sampling and Analysis Plan approved

Great Plain Development Authority (formerly known as KAAP) — EPA I.D. KS0213820467

08/27/12	Permit transfer for Former Kansas Army Ammunition Plant (KAAP)
09/11/12	Operation and Maintenance Inspection Report finalized
11/20/12	Clean Closure Approved for selected units

(continued)

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Kansas State University — EPA I.D. KSD980632772

01/23/12 Landfill Corrective Measures Implementation Plan-Vol. 3 approved
01/26/12 Waste Characterization and Building Decontamination Report approved
09/11/12 Completion of Excavation Report approved
11/26/12 Additional monitoring wells installed

Kansas Army Ammunition Plant (KAAP) — EPA I.D. KS0213820467

08/27/12 Permit transfer and split into Great Plains Development Authority (EPA I.D. KS0213820467) and Day & Zimmerman Kansas LLC (KSR000511964)

Koch Nitrogen Company, LLC — EPA I.D. KSD044625010

05/31/12 Temporary Authorization to shut down groundwater recovery wells for system maintenance
09/28/12 Temporary Authorization to shut down groundwater recovery wells for system maintenance
11/27/12 Permit Modification to change the state of operation from Delaware to Kansas

Lafarge Corporation — EPA I.D. KSD007148034

09/24/12 Closure of Hazardous Waste Derived Fuel Pyroprocessing Units (kilns), including the closure of the fuel feed system

MRP Properties Company, LLC — EPA I.D. KSD087418695

02/24/12 Temporary Authorization to Discontinue Operation Recovery Well RW-80A
07/23/12 Public Notice for Draft Permit Renewal
07/26/12 Temporary Authorization to Discontinue LTU SVA/AS System
08/23/12 Renew Temporary Authorization to Discontinue Operation Recovery Well RW-80A
08/29/12 Availability Session and Public Hearing on Draft Permit Renewal
09/28/12 Permit Renewal Issued

Safety Kleen — Wichita — EPA I.D. KSD000809723

01/11/12 Class 1 Permit Modification to reflect change in emergency coordinator
11/26/12 Class 1 Permit Modification to reflect change in legal owner address

The Sherwin-Williams Company — Andover — EPA I.D. KSD056577810

06/07/12 Quality Assurance Project Plan approved
08/08/12 RCRA Facility Investigation Work Plan approved

The Sherwin-Williams Company — Coffeyville — EPA I.D. KSD007163355

06/04/12 Class 1a Permit Modification to remove the requirements to maintain coverage for sudden and non-sudden accidental occurrences

Solomon Corporation — EPA I.D. KS0002431880

06/26/12 Joint KDHE/EPA Compliance Inspection for reissuance if TSCA/PCB coordinated approval for commercial storage

Systech Environmental Corp. — EPA I.D. KSD980633259

04/30/12 Class 1 Modification regarding administrative corrections for Part B Application
05/01/12 Class 1 Modification regarding storage tank repair
06/11/12 Class 1a Modification for minor tank system piping changes and schematic updates
12/28/12 Class 1a Modification regarding Administrative Part B Application Update

Williams Petroleum Services (WPS), LLC — EPA I.D. KSD007235138

05/12/12 Revised Solid Waste Management units 1 and 2 Sampling and Analysis Plan to allow changes to the sampling method
11/28/12 Part A Application revised to reflect change in facility contact

Robert Moser, M.D.
Secretary of Health
and Environment

Doc. No. 041227

State of Kansas

Department of Health and Environment

Notice Concerning Kansas/Federal Water Pollution Control Permits and Applications

In accordance with Kansas Administrative Regulations 28-16-57 through 63, 28-18-1 through 17, 28-18a-1 through 33, 28-16-150 through 154, 28-46-7, and the authority vested with the state by the administrator of the U.S. Environmental Protection Agency, various draft water pollution control documents (permits, notices to revoke and reissue, notices to terminate) have been prepared and/or permit applications have been received for discharges to waters of the United States and the state of Kansas for the class of discharges described below.

The proposed actions concerning the draft documents are based on staff review, applying the appropriate standards, regulations and effluent limitations of the state of Kansas and the Environmental Protection Agency. The final action will result in a Federal National Pollutant Discharge Elimination System Authorization and/or a Kansas Water Pollution Control permit being issued, subject to certain conditions, revocation and reissuance of the designated permit or termination of the designated permit.

Public Notice No. KS-AG-13-010/013
Pending Permits for Confined Feeding Facilities

Name and Address of Applicant	Legal Description	Receiving Water
Lone Tree Livestock, LLC Dennis Allen 5380 S. Hwy. 83 Scott City, KS 67871	NW/4 and SE/4 of Section 15, T20S, R32W, Scott County	Upper Arkansas River Basin

Kansas Permit No. A-UASC-H005 Federal Permit No. KS0094854

This is a modification and reissuance of a permit for an existing swine facility with a maximum capacity of 54,000 head (21,600 animal units) of swine weighing more than 55 pounds. There is no change in the permitted animal unit capacity from the previous permit. The synthetic liner of the evaporation pond at site #4 will be modified for use as embankment erosion control only. No additional buildings or waste facilities are being proposed. This facility has an approved Nutrient Management Plan on file with KDHE.

Name and Address of Applicant	Legal Description	Receiving Water
Tiffany Cattle Co., Inc. Shane and Shawn Tiffany 1333 S. 2500 Road Herington, KS 67449-5021	E/2 of Section 31 & W/2 of Section 32, T15S, R06E & NW/4 of Section 5, T16S, R06E, Morris County	Neosho River Basin

Kansas Permit No. A-NEMR-C001 Federal Permit No. KS0117218

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Bureau of Waste Management
Curtis State Office Building
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Robert Moser, MD, Secretary.

Kansas
Department of Health & Environment

phone: 785-296-1600
fax: 785-296-1592
email: bwmweb@kdheks.gov
www.kdheks.gov/waste

Sam Brownback, Governor

December 28, 2012

Mr. Rob Exline, President
Exline, Inc.
P.O. Box 1487
Salina, Kansas 67402

RE: Exline's Response to 2012 O&M Report Required Actions
Exline, Inc. – Salina, Kansas
EPA ID NO. KSD007127327

Dear Mr. Exline:

The Kansas Department of Health and Environment (KDHE) conducted a follow-up inspection to the August 2012 Groundwater Monitoring System Operation and Maintenance Inspection Report (O&M Report) on December 27, 2012. The purpose of this inspection was to evaluate Exline's compliance regarding required action item 2 listed in the 2012 O&M Report. This letter will also evaluate Exline's compliance regarding required action items 1 and 3. The three required actions noted in the 2012 O&M Report are listed below in bold type and are followed by Exline's response:

1. **Section 4.1.5 – Exline must implement consistent sampling methods for all monitoring wells and revise the SAP accordingly. [40 CFR 264.97(d)].** Exline has implemented no-purge sampling methods using HydraSleeves. The SAP was revised to reflect this change in sampling method. KDHE approved the revised SAP in a letter dated October 29, 2012.

2. **Section 4.1.5 – The sampling team must possess a copy of the most current KDHE approved SAP during all future sampling events. [40 CFR 264.97(d)].** During the December 27th follow-up inspection, KDHE confirmed that the sampling team possessed a copy of the most current KDHE approved SAP (dated September 2012).

3. **Section 4.1.8 – Exline must begin sampling monitoring wells C-1 and D-1 during the 2nd semi-annual monitoring event of 2012 and revise the SAP accordingly. [40 CFR 264.97(a)(1)].** Exline revised the SAP to reflect the addition of wells C-1 and D-1 to the monitoring well network. The revised SAP was approved in a KDHE letter dated October 29, 2012.

Based upon KDHE's observations during the follow-up inspection and review of Exline's response to required action items 1 and 3, KDHE finds the required actions listed in the August 2012 O&M Inspection Report have been adequately addressed. If you have any questions regarding this letter, please call me at (785) 291-3132.

Sincerely,

Ryan Pfeiffer

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permits Section

cc: Max Shepard – Shepard Engineering
Lisa Gotto – EPA Region 7/AWMD/RCAP
Jennifer Nichols – KDHE/NCDO
Bill Bider – BWM

Bureau of Waste Management
Curtis State Office Building
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Robert Moser, MD, Secretary.

Kansas
Department of Health & Environment

phone: 785-296-1600
fax: 785-296-1592
email: bwmweb@kdheks.gov
www.kdheks.gov/waste

Sam Brownback, Governor

December 19, 2012

Mr. Rob Exline, President
Exline, Inc.
P.O. Box 1487
Salina, KS 67402

RE: RCRA Post-Closure Permit Renewal Application – Determination of Completeness
Exline, Inc. – Salina, Kansas
EPA RCRA ID No. KSD007127327

Dear Mr. Exline,

The Kansas Department of Health and Environment (KDHE) has reviewed Part A and Part B of the RCRA Post-Closure Permit application that was submitted on June 18, 2012 by Shepard Engineering, Inc. (SEI) on behalf of Exline, Inc. (Exline). The renewal application is comprised of these documents for the EPA permit number KSD007127327 issued to the Exline Facility in Salina. The review process for approval of a RCRA permit application consists of two parts. The first part is a completeness review to determine if the applicant has submitted sufficient information as defined in federal regulations 40 CFR 270.10 thru 270.14. The second part is a technical review that focuses on procedures and technical accuracy of the information provided in the application. KDHE has concluded the completeness review of the RCRA permit application and has identified the following deficiencies with the Part A and Part B applications:

1. Section 2, Part A Permit Application, Page 4, item 7 – Please include a brief description of the nature of your business (e.g., products produced or services provided). If more space is needed, please attach additional sheets.
2. Section 3, Page 3-8 – The first paragraph states that detailed sampling data for the private wells are presented in Section 4 (Table 4-4); however Table 4-4 does not contain any private well analytical data. Please revise accordingly. (Should be Table 4-6).
3. General – In accordance with 40 CFR 270.14(b)(19)(x), please update all applicable Plates to include the location of the new building that was recently constructed east of the spray shop.
4. Section 3 – Please include a delineation of the point of compliance on Plates 3-1 & 3-2 as required by 40 CFR 270.14(c)(3).
5. General – Please ensure that all applicable figures are updated to include the location of C-9R which was installed in 2006 to replace C-9.
6. Section 4 – Please update Plate 4-9 to reflect current groundwater contours, flow direction, and flow rate as required by 40 CFR 270.14(c)(2) and (3).
7. Section 4 – Plate 4-2 indicated SC-2 is a recovery well. This well has been removed from the recovery well network and is now a Scouler de-watering well. Please revise accordingly.

8. Section 5.1 – The second paragraph indicates the corrective action program shall consist of a soil vadose zone flushing system; however, vadose zone flushing was discontinued to 2005. Please revise the text accordingly.
9. Section 5.3 – The second paragraph states that an O&M Plan for the groundwater recovery system is included as Attachment 5-1; however no such attachment was included. The text further states that the O&M Plan is no longer necessary since the groundwater is not treated on-site. Please revise the text accordingly.
10. Section 5.4 – The first paragraph states the GW recovery well system typically removes approximately 1.8 million gallons of water per year; however Table 5-1 appears to indicate total flow is much higher (ranging from 23.06 to 16.71 million gallons per year since 2002). Please revise the text accordingly.
11. Attachment 4-3 – Exline has recently revised the Sampling and Analysis Plan (SAP) to reflect a change in sampling methods. KDHE approved the revised SAP in a letter dated October 29, 2012. Please submit a copy of the recently approved SAP for incorporation into KDHE's copy of the Part B.
12. Plate 4-2 – Please update the figure to indicate SC-2 is now a Scouler de-watering well and well C-9 was replaced with C-9R. Also, revise the figure so that wells C-1 and D-1 are depicted as Monitor Wells instead of Piezometer Wells.
13. Section 6 – Item I of this Section is an excerpt from the approved RCRA Facility Investigation Report, containing a list of the Solid Waste Management Units (SWMUs). In November 2009, the facility Hazardous Waste Management Permit list of SWMUs requiring further action (Section C.2) was amended to include the Deionizer Column Discharge Area (SWMU 19). Although the text later discusses the Deionizer Column Discharge Area, leaving it off the list of SWMUs may be confusing to the public. Please amend the list in the Part B permit application to include SWMU 19 – Deionizer Column Discharge Area.
14. Section 6 – In August 2009, the EPA made a final decision to select corrective measures for the Chrome Plating Ventilation Discharge Area (SWMU 16), the Deionizer Column Regeneration Area (SWMU 19), the Concrete Culvert Excavation Area (AOC 1), and the Brown Soil Stain Area (AOC 2). Please provide a section in the permit application which outlines the corrective measures required at these SWMUs and AOCs, along with the media cleanup standards the facility is required to meet for residential and industrial uses.
15. Please submit a CD with an electronic copy of the complete Permit Application. Be sure the Permit Application includes all revisions in response to the above comments.

Please submit the requested information by January 25, 2012. If you have any questions regarding this letter, please call me at (785) 291-3132.

Sincerely,

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permits Section

cc: Max Shepard – Shepard Engineering
Lisa Gotto – EPA Region 7/AWMD/RCAP
Jennifer Nichols – KDHE/NCDO
Bill Bider – KDHE/BWM

Note: This checklist may be used for review of a permit application for a post-closure facility with no active hazardous waste management units. It provides a guideline to the basic requirements of a Part B post-closure permit application. Optional elements (contingency plan and personnel training) are indicated by italics. If a post-closure unit is present at a facility seeking a permit for active hazardous waste management units, the post-closure unit must be incorporated in the permit application like an operating unit in all appropriate sections.

CHECKLIST FOR REVIEW OF FEDERAL RCRA PERMIT APPLICATIONS

POST-CLOSURE FACILITY REQUIREMENTS

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-1	Description of Activities Conducted which Require Facility to Obtain a Permit under the Resource Conservation and Recovery Act (RCRA) and Brief Description of Nature of the Business	270.13(a),(m)		Section 2, Form 8700-12, #10	1
PC-2	Name, Mailing Address, and Location of Facility for which the Application is Submitted, including a Topographic Map	270.13(b),(1)		Section 2, Form 8700-12, #3 & 4	-
PC-3	Up to four Standard Industrial Classification Codes (SIC) which Best Reflect the Products or Services Provided by the Facility	270.13(c)		Section 2, Form 8700-12, #6	-
PC-4	Operator/Owner's Name, Address, Telephone Number, and Ownership Status	270.13(d),(e)	Ownership status must include status as federal, state, private, public, or other entity.	Section 2, Form 8700-12, #8 & 9	-
PC-5	Facility is New, Existing, or Located on Indian Lands	270.13(f),(g)	Description must include information on whether this is a first or revised application with date of last signed permit application.	Section 2, Form 8700-23, #9	-
PC-6	Description of Processes for Disposing of Hazardous Waste	270.13(i)	Description must include design capacity for these items.	Section 2, Form 8700-23, #8	-
PC-7	Specification of the Hazardous Wastes Listed or Designated Under Title 40 of the Code of Federal Regulations (40 CFR) Part 261	270.13(j)	Specifications must include estimate on quantity of waste to be disposed of.	Section 2, Form 8700-23, #8	-
PC-8	Listing of all Permits or Construction Approvals Received or Applied for	270.13(k)	Permits include the following programs: Hazardous Waste Management under RCRA; Underground Injection Control under Solid Waste Disposal Act; Prevention of Significant Deterioration, Nonattainment Program, and National Emissions Standards for Hazardous Pollutants under the Clean Air Act; ocean dumping permits under the Marine Protection Research and Sanctuaries Act; dredge and fill permits under Section 404 of the Clean Water Act; or other relevant environmental permits including state permits.	Section 2, Form 8700-23, pg 4, #6	-

Reviewer: Ryan Pfeiffer 12-18-12

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-9	Part B General Description	270.14(b)(1)		Section 3	-
PC-10a	Topographic Map	270.14(b)(19)	Show distance of 1,000 feet around unit at a scale of 1 inch to not more than 200 feet (multiple maps may be submitted at this scale), and should be similar to Part A topographic map.	Section 3, Plate 3-1	-
PC-10a(1)	Scale and Date	270.14(b)(19)(i)	Other scales may be used if justified.	Section 3, Plate 3-1	-
PC-10a(2)	The 100-Year Flood Plain Area	270.14(b)(19)(ii)		Section 3, Plate 3-1	-
PC-10a(3)	Surface Waters	270.14(b)(19)(iii)		Section 3, Plate 3-2	-
PC-10a(4)	Surrounding Land Use	270.14(b)(19)(iv)		Section 3, Plaste 3-1 & 3-2	-
PC-10a(5)	Wind Rose	270.14(b)(19)(v)		Section 3, Plate 3-1	-
PC-10a(6)	Map Orientation	270.14(b)(19)(vi)		Section 3, all Plates	-
PC-10a(7)	Legal Boundaries	270.14(b)(19)(vii)		Section 3, Plate 3-1	-
PC-10a(8)	Access Control	270.14(b)(19)(viii		Section 3, Plate 3-1	-
PC-10a(9)	Injection and Withdrawal Wells (on site and off site)	270.14(b)(19)(ix)		Section 3, Plate 3-1	-
PC-10a(10)	Buildings and Other Structures	270.14(b)(19)(x)		Section 3, Plate 3-1	3
PC-10a(11)	Drainage and Flood Control Barriers	270.14(b)(19)(xi)		Section 3, Plate 3-1	-
PC-10a(12)	Location of the Disposal Unit(s)	270.14(b)(19)(xii)		Section 3, Plate 3-1	-
PC-10a(13)	Location of Solid Waste Management Units	270.14(d)(1)(i)		Attachement 6-1, Plate 2.1 & 2.2	-
PC-10b	Additional Information on the Topographic Map for Land Disposal Facilities	270.14(c)(3)		Section 3	-
PC-10b(1)	Waste Management Areas	270.14(c)(3)		NA	-
PC-10b(2)	Property Boundaries	270.14(c)(3)		Section 3, Plate 3-1	-
PC-10b(3)	Point-of-Compliance Location	270.14(c)(3); 264.95	Point of compliance is defined in 264.95 (Also see guidance in the Federal Register, Vol.1 No. 85, May 1, 1996, p 19432. Advanced Notice of Proposed Rulemaking)	Section 3, Plate 3-1 & 3-2	4
PC-10b(4)	Location of Groundwater Monitoring Wells	270.14(c)(3); 264.97		Plate 4-2	5
PC-10c	Uppermost Aquifer and Hydraulically Connected Aquifers Beneath Facility Property	270.14(c)(2)		Plate 4-4 and 4-5	-
PC-10d	Groundwater Flow Direction	270.14(c)(2), (3)	Should be included on the topographic map, if possible.	Plate 4-9	6
PC-11a	Seismic Requirements			Section 3.12.1	-
PC-11a(1)	Political Jurisdiction in which Facility is Proposed to be Located	270.14(b)(11)(i)	Reference source used to determine whether facility is located in 100-year flood plain.	Section 3.12.1	-
PC-11a(2)	Indication of Whether Facility is Listed in Appendix VI of 264 (New Facilities)	270.14(b)(11)(i)	Flood plain requirements applicable if facility is located in 100-year flood plain.	Section 3.12.1 & 3.12.2	-

Reviewer:_____

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-11a(3)	New Facility must be Located at Least 200 feet from a Fault which has had Displacement in Holocene Time	270.14(b)(11)(ii); 264.18(a)	If facility location is listed in Appendix VI of 264, this information is required.	NA	-
PC-11b	Flood Plain Requirements	270.14(b)(11)(iii), (iv); 264.18(b)		3.12.2	-
PC-11b(1)	Copy of Federal Insurance Administration or other Flood Map	270.14(b)(11)(iii)	Reference source used to determine whether facility is located in 100-year flood plain.	Plate 3-5	-
PC-11b(2)	Engineering Analysis to Indicate the Various Hydrodynamic and Hydrostatic Forces Expected to Result from the 100-	270.14(b)(11)(iv)(A); 264.18(b)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	-
PC-11b(3)	Structural or other Engineering Studies showing the Design of Operational Units and Flood Protection Devices and how these will Prevent Washout	270.14(b)(11)(iv)(B); 264.18(b)	Flood plain requirements applicable if facility is located in 100-year flood plain.	NA	-
PC-11b(4)	Plan and Schedule for Future Compliance	270.14(b)(11)(v)	Flood plain requirements applicable if facility is located in 100-year flood plain and not in compliance with 264.18(b).	NA	-
PC-11c	Interim Status Groundwater Monitoring Data	270.14(c)(1)		Section 4	-
PC-11c(1)	Description of Wells	270.14(c)(1)	A copy of topographic map required by 270.14(b) on which location and identification of each interim status monitoring well is indicated. Details of design and construction of each interim status monitoring well.	Section 4 & Plate 4-2	5, 7
PC-11c(2)	Description of Sampling and Analysis Procedures	270.14(c)(1); 265.92	A copy of facility's groundwater sampling and analysis plan.	Attachement 4-3	-
PC-11c(3)	Monitoring Data	270.14(c)(1); 265.92	Provide all interim status monitoring results.	Table 4-2 and 4-3	-
PC-11c(4)	Statistical Procedures	270.14(c)(1); 265.93	Provide information relating to statistical procedures.	IM	-
PC-11c(5)	Groundwater Assessment Plan	270.14(c)(1); 265.93(d)(2)	If required, based on statistical comparison results, provide plan implemented for groundwater quality assessment program along with results obtained from implementation of plan.	NA	-
PC-12	General Hydrogeologic Information	270.14(c)(2)	Include description of the regional and sitespecific geologic and hydrogeological setting.	Sectoin 4.3	-
PC-13	Contaminant Plume Description	270.14(c)(2), (4), (7); Part 261, Appendix VIII	In some cases, contaminant plumes may have been defined under groundwater quality assessment programs carried out during the interim status period which may not address the complete list of Appendix IX constituents as required under 270.14(c)(4). Additional monitoring may be required to identify the concentration of each Appendix VIII constituent in the plume.	Section 4.4, Plate 4-19 & 4-20	-

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Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-14	General Monitoring Program Requirements	270.14(c)(5); 264.90(b)(4); 264.97		Section 4	-
PC-14a	Description of Wells	270.14(c)(5); 264.97(a),(b),(c)		Section 4	-
PC-14b	Description of Sampling and Analysis Procedures	270.14(c)(5); 264.97(d),(e),(f)		Section 4, Att. 4-3	-
PC-14c	Procedures for Establishing Background Quality	270.14(c)(5); 264.97(a)(1),(g)		Section 4	-
PC-14d	Statistical Procedures	270.14(c)(5); 264.97(h), (i)(1),(5),(6)		Section 5.7	-
PC-14d(1)	Parametric Analysis of Variance (ANOVA)	270.14(c)(5); 264.97(h)(1), (i)(2)		NA	-
PC-14(2)	Nonparametric ANOVA	270.14(c)(5); 264.97(h)(2), (i)(2)		NA	-
PC-14d(3)	Tolerance or Prediction Interval Procedure	270.14(c)(5); 264.97(h)(3), (i)(4)		NA	-
PC-14d(4)	Control Chart Approach	270.14(c)(5); 264.97(h)(4), (i)(3)		NA	-
PC-14d(5)	Alternative Approach	270.14(c)(5); 264.97(h)(5),(i)		Section 5.7	-
PC-15	Detection Monitoring Program	270.14(c)(6); 264.91(a)(4); 264.98		NA	-
PC-15a	Indicator Parameters, Waste Constituents, Reaction Products to be Monitored	270.14(c)(6) (i); 264.98(a)		NA	-
PC-15b	Groundwater Monitoring System	270.14(c)(6) (ii); 264.97(a) (2),(b),(c); 264.98(b)	Identify number, location, and depth of each well, and describe well construction materials.	NA	-
PC-15c	Background Groundwater Concentration Values for Proposed Parameters	270.14(c)(6) (iii); 264.97 (g); 264.98(c), (d)		NA	-

Reviewer:_____

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-15d	Proposed Sampling and Analysis Procedures	270.14(c)(6)(iv); 264.97(d),(e),(f); 264.98(d),(e),(f)		NA	-
PC-15e	Statistically Significant Increase in any Constituent or Parameter Identified at any Compliance Point Monitoring Well	270.14(c)(6); 264.98(g); Part 264 Appendix IX		NA	-
PC-16	Compliance Monitoring Program	270.14(c)(7); 264.99		Section 4.5.2	-
PC-16a	Waste Description	270.14(c)(7)(i)	Description must include historical records of volumes, types, and chemical composition of waste placed in units in waste management areas.	Section 3.2	-
PC-16b	Characterization of Contaminated Groundwater	270.14(c)(7)(ii)	For each well at point of compliance and for each background well, provide concentrations of each constituent in 261 Appendix VIII, major cations and anions, and constituents listed in Table 1 of 264.94, if not already mentioned above.	Tables 4-3 and 4-4	-
PC-16c	Hazardous Constituents to be Monitored in Compliance Program	270.14(c)(7) (iii); 264.98 (g)(3); 264.99 (a)(1)		Section 4.5.2	-
PC-16d	Concentration Limits	270.14(c)(7) (iv); 264.94, 264.97(g),(h); 264.99(a)(2)		Section 4.5.2	-
PC-16e	Alternate Concentration Limits	270.14(c)(7) (iv); 264.94(b); 264.99 (a)(2)	Provide justification for establishing alternate concentration limits. Justification must address the following two factors.	NA	-
PC-16e(1)	Adverse Effects on Groundwater Quality	270.14(c)(7)(iv); 264.94(b)(1)		Section 3	-
PC-16e(2)	Potential Adverse Effects	270.14(c)(7)(iv); 264.94(b)(2)		Section 3	-
PC-16f	Engineering Report Describing Groundwater Monitoring Systems	270.14(c)(7)(v); 264.95; 264.97(a)(2), (b),(c); 264.99(b)	Provide details supporting representative nature of groundwater quality at background monitoring points and compliance monitoring point.	Section 4	-
PC-16g	Groundwater Monitoring Well Design	264.97(c)	Wells must be designed in accordance with American Society for Testing and Materials standards. Any well within loess must be designed to minimize turbidity.	Section 4	-
PC-16h	Proposed Sampling and Statistical Analysis Procedures for Groundwater Data	270.14(c)(7) (vi); 264.97 (d),(e),(f); 264.99(c) - (g)		Section 4, Att. 4-4	-

Reviewer:_____

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-17	Groundwater Protection Standard Exceeded at Compliance Point	270.14(c)(8); 264.99(h),(i)		Section 4.5.3; Section 5	-
PC-17a	Corrective Action Program	270.14(c)(8); 264.99(j); 264.100	If hazardous constituents have been detected in the groundwater, an owner or operator must submit sufficient information, supporting data, etc., to establish a corrective action program that meets the requirements of 264.100.	Section 5	8, 9, 10
PC-17b	Characterization of Contaminated Groundwater	270.14(c)(8)(i)	For each well at point of compliance and for each background well, provide concentrations of each constituent in 261 Appendix VIII, major cations and anions, and constituents listed in Table 1 of 264.94, if not already determined by the above.	NA	-
PC-17c	Concentration Limits	270.14(c)(8)(ii); 264.94; 264.100(a)(2)	Specify the proposed concentration limits for each hazardous constituent in groundwater.	Section 5.10	-
PC-17d	Alternate Concentration Limits	270.14(c)(8)(ii); 264.94(b); 264.100(a)(2)	Provide a justification for establishing alternate concentration limits. This justification must address each of the following two factors.	NA	-
PC-17d(1)	Adverse Effects on Groundwater Quality	270.14(c)(8); 264.94(b)(1)		NA	-
PC-17d(2)	Potential Adverse Effects	270.14(c)(8); 264.94(b)(2)		NA	-
PC-17e	Corrective Action Plan	270.14(c)(8) (iii); 264.100(b)	Provide detailed plans and engineering report on corrective actions proposed for facility, including maps of engineered structures, construction details, plans for removing waste, description of treatment technologies, effectiveness of correction program, description of reinjection system, additional hydrogeologic data, operation and maintenance plans, and closure and post-closure plans.	Section 5	-
PC-17f	Groundwater Monitoring Program	270.14(c)(8) (iv); 264.100(d)		Section 4.5	-
PC-17f(1)	Description of Monitoring System	270.14(c)(7)(v), (8)		Section 4.5.3.2	-
PC-17f(2)	Description of Sampling and Analysis Procedures	270.14(c)(7)(v), (8)		Attachment 4-3	11
PC-17f(3)	Monitoring Data and Statistical Analysis Procedures	270.14(c)(7)(v), (8)		Attachment 4-4	-
PC-18	Security	270.14(b)(4); 264.14	Demonstrate that ongoing post-closure use does not allow disturbance of the integrity of the final cover, liner(s), or any other components of the containment system, or the function of the facility's monitoring system.	Section 3.5	-
PC-18a	Security Procedures and Equipment	270.14(b)(4); 264.14	Unless waiver is granted, facility must have surveillance system or barrier or other means to control entry.	Section 3.5	-
PC-18b	Warning Signs	270.14(b)(4); 264.14(c)	Signs in English must be posted at each entrance, and be legible from 25 feet.	Section 3.5	-

Reviewer:_____

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-19	Inspection Schedule	270.14(b)(5); 264.15	Include where applicable, as part of the postclosure inspection schedule, specific requirements for each type of disposal facility. These specific requirements and the schedule should be included as part of the post-closure plan.	Section 3.6 & Attachment 3-2	-
PC-19a	General Inspection Requirements	270.14(b)(5); 264.15(a), (b); 264.33	Describe the inspections to be conducted during the post-closure care period, their frequency, the inspection procedure, and the logs to be kept. Inspection is required for monitoring equipment, safety emergency equipment, communication and alarm systems, decontamination equipment, security devices, and operating and structural equipment. Should be included as part of post-closure plan.	Attachment 3-2	-
PC-19b	Types of Problems	270.14(b)(5); 264.15(b)(3)	Inspection checklist should be included as part of post-closure plan and must identify types of problem.	Attachment 3-2	-
PC-19c	Frequency of Inspections	270.14(b)(5); 264.15(b)(4)	The rationale for determining the length of time between inspections should be provided as part of the post-closure plan.	Attachment 3-2	-
PC-19d	Schedule of Remedial Action	264.15(c)	Owner/operator must immediately remedy any deterioration or malfunction of equipment or structures to ensure problem does not lead to environmental or human health hazard.	Section 3.2	-
PC-19e	Inspection Log	264.15(d)	Provide example log or summary. Should be included as part of the post-closure plan	Attachment 3-2	-
PC-20	Waiver or Documentation of Preparedness and Prevention Requirements	270.14(b)(6) 264.32(a) - (d)	Facility must submit justification for any waiver to requirements of this section.	Section 3.7.3, Section 3.9 - 3.11	-
PC-21	Emergency Equipment	270.14(a); 264.32©	Demonstrate that portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment are available, if necessary.	Section 3.7; Plate 3-3	-
PC-21a	Water and Fire Control	270.14(a); 264.32(d)	Demonstrate facility has adequate fire control systems, water volume and pressure, foaming equipment, automatic sprinklers, etc., if necessary	Section 3.7, Plate 3-3	-
PC-21b	Testing and Maintenance of Equipment	270.14(a); 264.33	Demonstrate communication, alarm, fire control equipment, spill control equipment, and decontamination equipment are tested and maintained, if applicable	Section 3.7	-
PC-22	Documentation of Arrangements with Emergency Agencies	270.14(a); 264.37	Owner/operator must make arrangements, as appropriate, with type of waste and hazard potential, for the potential need for services.	Section 3.7.3	-
PC-22a	Document Agreement Refusal	270.14(a); 264.37(b)	Document refusal to enter into a coordination agreement.	NA	-
PC-22b	Equipment and Power Failure	270.14(b)(8) (iv)	Describe procedure used to mitigate the effects of equipment failure and power outages, if applicable.	Attachment 3-3, Section VI.C.	-
PC-23	Closure Plans	270.14(b)(13); 264.112(a)(1),(2)	Include an approved closure plan consistent with the requirements of 264.112. This plan is included for post-closure facilities as a description of how the facility was closed.	Attachement 3-4	-
PC-23a	Post-Closure Plan	270.14(b)(13)	Submit a copy of the approved post-closure plan.	Attachement 3-5	-
PC-23b	Post-Closure Care Contact	270.14(b)(13); 264.118(b)(3)	Provide the name, address, and phone number of the person or office to contact about the hazardous waste disposal unit or facility during the post-closure care period.	Attachment 3-5	-

Reviewer:_____

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-24	Notices Required for Disposal Facilities	270.14(b)(14)	Provide a certification of closure, a survey plat, and a post-closure certification. Also include a statement that the post-closure notices required by 270.149(b)(14) will be filed and submitted appropriately.	Attachment 3-1	-
PC-25	Post-Closure Cost Estimate	270.14(b)(16) 264.144	Provide a copy of the most recent post-closure cost estimate, calculated to cover the cost, in current dollars, of post-closure monitoring and maintenance of the facility in accordance with the applicable post-closure plan. Estimate must be based on the third party performing the postclosure activities. The cost estimate must be adjusted annually for inflation pursuant to 264.144(b).	Attachment 3-6	-
PC-25a	Financial Assurance Mechanism for Post-Closure Care	270.14(b)(16); 264.145; 264.151	Provide a copy of the established financial assurance mechanism for post-closure care of the facility. The mechanism must be one of the following: -trust fund -surety bond -letter of credit -insurance -financial test and corporate guaranteefor post-closure care -use of multiple financial mechanisms -use of financial mechanism for multiple facilities	Attachment 3-7	-
PC-25b	Use of State-Required Mechanisms	270.14(b)(18); 264.149	When state has regulations that provide equivalent or greater liability requirements for financial assurance for closure post-closure, submit copy of state-required financial mechanism.	NA	-
PC-25c	State Assumption of Responsibility	270.14(b)(18); 264.150	If state assumes legal responsibility for compliance with closure, post-closure, or liability requirements there must be a letter submitted from the state specifying assumption of responsibilities and amounts of liability coverage assured by state.	NA	-
PC-26	Solid Waste Management Units (SWMU)	270.14(d)(1); 264.101	Identify all SWMUs at the facility including hazardous and nonhazardous waste units, as well as active and inactive units, if known.	Section 6	-
PC-26a	Characterize the SWMU	270.14(d)(1)	Submit SWMU information including: type of each unit; location on a topographic map; engineering drawings, if available, dimensions; dates of operation; description of wastes in each unit; and quantity or volume of waste, if known.	Section 6	-
PC-26b	No SWMUs		Describe methodology used to determine that no existing or former SWMUs exist at the facility.	NA	-
PC-26c	Releases	270.14(d)(2)		Section 6\	-
PC-26c(1)	Characterize Releases	270.14(d)(3)	Provide following information concerning releases: date of release; type, quantity, and nature of release; groundwater monitoring and other analytical data; physical evidence of stressed vegetation; historical evidence of releases; any state, local, or federal enforcement action that may address releases; any public citizen complaints that indicate a release; and any other information showing the migration of the release.	Section 6	-
PC-26c(2)	No Releases		Describe methodology used to determine that releases from SWMUs are not present.	Sectoin 6	-
PC-27	Part B Certification	270.11		Part B renewal cover letter	-

Reviewer:_____

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-28	Information on the Potential for the Public to be Exposed to Releases. At a Minimum, this must include: -reasonably foreseeable potential releases -potential pathways of human exposure -potential magnitude and nature of exposure	270.10(j)	The federal requirement is for surface impoundments and land disposal units.	Section 3.4	-
PC-30b	Emergency Coordinators	270.14(b)(7); 264.52(d); 264.55	There must at least be one primary emergency coordinator available at all times.	Attachment 3-3, Section III.B.1	-
PC-30c	Implementation	270.14(b)(7); 264.52(a); 264.56(d)	Emergency coordinator to determine that facility has had a release, fire, or explosion that could threaten human health or the environment outside facility.	Attachment 3-3, Section III.B.2	-
PC-30d	Emergency Actions	270.14(b)(7); 264.56		Attachment 3-3, Section III.B.2	-
PC-30d(1)	Notification	270.14(b)(7); 264.56(a)	Describe the method for immediate notification of facility personnel and necessary state and local agencies.	Attachment 3-3, Section III.B.2 & IV	-
PC-30d(2)	Identification of Hazardous Materials	270.14(b)(7); 264.56(b)	Observations, records, manifests, or chemical analysis may be used by emergency coordinator.	Section 3.7 and Attachment 3-3	-
PC-30d(3)	Assessment	270.14(b)(7); 264.56(c),(d)	Direct and indirect effects must be considered.	Section 3.7 and Attachment 3-3	-
PC-30d(4)	Control Procedures	270.14(b)(7); 264.52(a)	Contingency plan must describe actions facility personnel must take in response to fires, explosions, or any unplanned release of hazardous waste to air, soil, or surface water.	Section 3.7 and Attachment 3-3	-
PC-30d(5)	Post-Emergency Equipment Management	270.14(b)(7); 264.56(h)(2)	Decontamination is required for emergency equipment.	Section 3.7 and Attachment 3-3	-
PC-30e	Evacuation Plan for Facility Personnel	270.14(b)(7); 264.52(f)	Evacuation plans must include evacuation signals and primary and alternate evacuation	Section 3.7 and Attachment 3-3	-
PC-30f	Notification of Federal, State and Local Authorities before Resuming Post-	270.14(b)(7); 264.56(i)	Federal or state authorities must be notified within 15 days of occurrence.	Section 3.7 and Attachment 3-3	-
PC-30g	Notification Reports	270.14(b)(7); 264.196(d)	Demonstrate that any release to the environment will be reported to regional administrator within 24 hours of detection.	Section 3.7 and Attachment 3-3	-
PC-31	Outline of Introductory and Continuing Training Programs	270.14(b)(12); 264.16(a)(1)	Facility personnel must successfully complete classroom or on-the-job training which will allow them to responsibly perform in their positions for post-closure care. The training program is limited to post-closure activities.	Section 3.13	-
PC-31a	Job Title/Job Description	270.14(b)(12); 264.16(d)1),	Owner or operator must maintain records of job titles, names of employees, job descriptions, and types and amounts of training given to employees.	Section 3.13.3	-

Reviewer:_____

Section	Requirment	Federal Regulation	Review Consideration[a]	Location in Application[b]	See Attached Comment Number[c]
PC-31b	Description of How Training will be Designed to Meet Actual Job Tasks	270.14(b)(12); 264.16(c),(d)(3)	Training must be conducted by a qualified person; there must also be an annual review of the training.	Sectoin 3.13.5	-
PC-31c	Training Director	270.14(b)(12); 264.16(a)(2)	Program must be directed by person trained in hazardous waste procedures.	Section 3.13.5	-
PC-31d	Relevance of Training to Job Position	270.14(b)(12); 264.16(a)(2)	Training must include instruction on hazardous waste proceures relevant to each employee's position.	Section 3.13	-
PC-31e	Training for Emergency Response	270.14(b)(12); 264.16(a)(3)	Personnel must minimally be familiar with emergency procedures, emergency equipment, and emergency systems.	Section 3.13	-
PC-31f	Maintenance of Training Records/Copy of Personnel Training Documents	270.14(b)(12); 264.16(b),(d)(4),(e)	Training records on current personnel must be kept until the post-closure care period is completed. Training must be completed within 6 months after date of employment or assignment to the facility, whichever is later.	Section 3.13	-
PC-32	Chemical and Physical Analyses	270.14(b)(2); 264.13(a)	Data generated by testing the waste, published data on the waste, or data gathered from similar processes may be used.	Section 3.2	-
PC-33	Waste Analysis Plan	270.14(b)(3); 264.13(b),(c) 266.102(a)(2)(ii); 266.104(a); (2), 268.7	Address how for closed units/facilities, a waste analysis plan is not applicable. Discuss previous waste stream and/or current management of the waste, if applicable. Discuss whether or not leachate or runoff collection and analysis are necessary.	Section 3.3	-

Notes:

a Considerations in addition to the requirements presented in the regulations.

b For each requirement, this column must indicate one of the following: NA for not applicable, IM for information missing, or the exact location of the information in the application.

c If application is deficient in an area, prepare a comment describing the deficiency, attach it to the checklist, and reference the comment in this column.

Reviewer:_____

Shepard Engineering, Inc.

65 Ash Lane • Bennington, KS 67422 • (785) 488-3336 • Fax: (785) 488-2955 • e-mail: shepard@twinvalley.net

December 17, 2012

Chief of the Hazardous Waste Permits Section
Kansas Department of Health and Environment
Bureau of Waste Management
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

RECEIVED
DEC 1 9
BUREAU OF W

Re: Groundwater Recovery Well (E-3) Shutdown
Exline, Inc., Salina, Kansas
EPA ID No. KSD 007127327
SEI File No. 12-010G

Dear Chief:

As noted in my December 12, 2012 e-mail to Ryan Pfeiffer, Exline recovery well E-3 was recently shut down due to a pump failure caused by low water levels. As stated in the e-mail, it appears that the pump failed late on December 11 or early on December 12. The pump was replaced and E-3 was re-started at 3:00 PM on December 14.

As was also mentioned in my December 12, 2012 e-mail, Exline is continuing efforts to set the recovery well pumping rates at levels, which yield the maximum volume, but maintain sustainable water levels (i.e., in order to protect the submersible pumps).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please contact me if you have any questions or need additional information.

SHEPARD ENGINEERING, INC.

Max Shepard, P.E.
President

cc: Steve Puttbrese – Exline, Inc.
Rob Exline – Exline, Inc.
Vince DePhillips – Exline, Inc.
Lisa Gotto – EPA Region VII

Ryan Pfeiffer

From: Max Shepard [shepard@twinvalley.net]
Sent: Wednesday, December 12, 2012 11:11 AM
To: Ryan Pfeiffer
Cc: 'Steve Puttbrese'
Subject: Exline Recovery Well E-3 Shutdown

Ryan:

The Exline recovery well E-3 shut down sometime late on December 11 or early in the morning on December 12. It appears that the submersible pump motor burned up due to low groundwater levels caused by the recent drought. Exline is in process of investigating alternatives for automatic protection of the pump due to low water levels.

I will document when the pump has been re-started following its repair or replacement.

Please contact me if you have any questions or need additional information.

Thanks,
Max Shepard, P.E.
Shepard Engineering, Inc.
Office: 785-488-3336
Fax: 785-488-2955
shepard@twinvalley.net

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

DEC 11 2012

RECEIVED
DEC 14 2012
BUREAU OF WASTE MANAGEMENT

Mr. Ryan Pfeiffer
Bureau of Waste Management
Kansas Department of Health and Environment
1000 SW Jackson Street, Suite 320
Topeka, Kansas 66612

RE: Exline Hazardous Waste Part B Permit Application
Section 6 – Solid Waste Management Units
Exline, Incorporated (Exline)
Salina, Kansas
EPA RCRA ID No. KSD007127327

Dear Mr. Pfeiffer:

The U.S. Environmental Protection Agency Region 7 has reviewed the above referenced Section of the Exline Part B permit application. The review of the subject document has been completed to evaluate the facility's compliance with federal hazardous waste regulations pertaining to Solid Waste Management Units, specifically 40 Code of Federal Regulations Part 270.14 (d). Enclosed are comments which must be addressed by the facility prior to the EPA approval. Please include these comments in your comment letter to the facility on the remaining sections of the Part B permit application. If you have any questions regarding the contents of this letter, please contact me at (913) 551-7210.

Sincerely,

Lisa A. Gotto
Environmental Scientist
Waste Remediation and Permits Branch
Air and Waste Management Division

Enclosure

Printed on Recycled Paper

Enclosure: EPA Comments on Section 6 of the Exline Part B Permit Application

1. Item I of this Section is an excerpt from the approved RCRA Facility Investigation Report, containing a list of the Solid Waste Management Units (SWMUs). In November, 2009, the facility Hazardous Waste Management Permit list of Solid Waste Management Units requiring further action (Section C.2) was amended to include the Deionizer Column Discharge Area (SWMU 19). Although the text later discusses the Deionizer Column Discharge Area, leaving it off the list of SWMUs may be confusing to the public. Please amend the list in the Part B permit application to include SWMU 19 – Deionizer Column Discharge Area.

2. In August 2009, the EPA made a final decision to select corrective measures for the Chrome Plating Ventilation Discharge Area (SWMU 16), the Deionizer Column Regeneration Area (SWMU 19), the Concrete Culvert Excavation Area (AOC 1), and the Brown Soil Stain Area (AOC 2). Please provide a section in the permit application which outlines the corrective measures required at these SWMUs and AOCs, along with the media cleanup standards the facility is required to meet for residential and industrial uses.

Shepard Engineering, Inc.

65 Ash Lane • Bennington, KS 67422 • (785) 488-3336 • Fax: (785) 488-2955 • e-mail: shepard@twinvalley.net

November 6, 2012

Ryan Pfeiffer
Kansas Department of Health and Environment
Bureau of Waste Management
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

RECEIVED
NOV 07 2012
BUREAU OF WASTE MANAGEMENT

Re: Up-Dated Post Closure Plan
Exline, Inc., Salina, Kansas
EPA ID No. KSD 007127327
SEI File No. 12-010G

Dear Mr. Pfeiffer:

In accordance with your October 23, 2012 e-mail request, I have attached one (1) copy of the up-dated Post Closure Plan for the Exline, Inc. facility.

Please contact me if you have any questions or need additional information.

SHEPARD ENGINEERING, INC.

Max Shepard

Max Shepard, P.E.
President

cc: Rob Exline – Exline, Inc. (letter and attachment)
Steve Puttbrese – Exline, Inc. (letter and attachment)
Lisa Gotto – EPA Region 7 (letter and attachment)

Enc.

Bureau of Waste Management
Curtis State Office Building
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Kansas
Department of Health & Environment

phone: 785-296-1600
fax: 785-296-1592
email: bwmweb@kdheks.gov
www.kdheks.gov/waste

Robert Moser, MD, Secretary.

Sam Brownback, Governor

October 29, 2012

Mr. Rob Exline, President
Exline, Inc.
P.O. Box 1487
Salina, KS 67402

RE: Revised Sampling and Analysis Plan
Exline, Inc. - Salina, Kansas
EPA RCRA ID No. KSD007127327

Dear Mr. Exline:

The Kansas Department of Health and Environment (KDHE) has received replacements pages for the revised Sampling and Analysis Plan (SAP). The replacement pages, dated October 16, 2012, were submitted in response to comments provided in the KDHE letter dated October 5, 2012. Exline initially submitted a revised SAP to reflect a change in sampling methods to the use of no-purge sampling using HydraSleeves. After review, KDHE finds all comments have been adequately addressed and the revised SAP is hereby approved. Exline must adhere to the procedures described in the revised SAP during all future sampling events. If you have questions regarding this letter, please do not hesitate to call me at (785) 291-3132.

Sincerely,

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permitting Section

cc: Max Shepard - Shepard Engineering
Lisa Gotto - EPA Region 7 AWMD/RCAP
Jennifer Nichols – KDHE/NCDO
Bill Bider – BWM

Ryan Pfeiffer

From: MAX SHEPARD [shepard@twinvalley.net]
Sent: Tuesday, October 23, 2012 4:59 PM
To: Ryan Pfeiffer
Subject: Re: Exline Post-Closure Plan

Ryan:

I'm out of the office the rest of the week at a conference. However, I'll work on this when I get back and should not have a problem getting you the up-dated Post-Closure Plan by November 9.

Thanks,
Max Shepard

On Tue, 23 Oct 2012 14:48:11 -0500
Ryan Pfeiffer <RPfeiffer@kdheks.gov> wrote:
> Max,
>
> I've been reviewing the Post-Closure Permit Application for Exline and
>I noticed the Post-Closure Plan has not been updated for some time.
>For example, it still refers to the groundwater treatment system and
>Jerry Exline is listed as the Post-Closure Care contact person (I
>believe Rob Exline would the current contact). Please make any
>necessary changes to the Post-Closure Plan (and associated appendices)
>and submit a replacement copy for KDHE's copy of the Permit
>Application. Please try to submit the revised Post-Closure Plan by
>November 9th. In the meantime, I will continue to review the Permit
>Application and I will notify you of any other major changes that will
>be necessary.
>
> Let me know if you have any questions.
>
> Thanks,
>
> Ryan Pfeiffer
> Environmental Scientist
> Geology Unit - Hazardous Waste Section Bureau of Waste Management
> 1000 SW Jackson, Suite 320
> Topeka, KS 66612-1366
> (785)291-3132 Fax: (785)296-1592
> rpfeiffer@kdheks.gov<mailto:rpfeiffer@kdheks.gov>
>
>Find out what's new with the Bureau of Waste Managment at
>http://www.kdheks.gov/waste/p_whatsnew.html
>

Shepard Engineering, Inc.

65 Ash Lane • Bennington, KS 67422 • (785) 488-3336 • Fax: (785) 488-2955 • e-mail: shepard@twinvalley.net

RECEIVED
OCT 29 2012
AWMD/WRAP-KNRP

October 16, 2012

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permitting Section
Kansas Department of Health and Environment
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Re: Revised Sampling and Analysis Plan – Exline Groundwater Monitoring
EPA ID No. KSD 007127327
SEI File No. 12-010C

Dear Mr. Pfeiffer:

I have attached one (1) copy of replacement pages to be inserted in the September, 2012 Sampling and Analysis Plan for the Exline, Inc. groundwater monitoring program. These pages were modified to address comments set forth in your October 5, 2012 letter to Rob Exline.

Thank you for your assistance with this project. Please contact me if you have any questions or need additional information.

SHEPARD ENGINEERING, INC.

Max Shepard, P.E.
President

cc: Steve Puttbrese – Exline, Inc. (letter, only)
Rob Exline – Exline, Inc. (letter, only)
Lisa Gotto – EPA Region 7 (letter and attachments)

RCRA
521744

SOP Application:

This Standard Operating Procedure (SOP) is to be used to sample groundwater monitoring wells using a Hydrasleeve® sampler. The manufacturer description of the Hydrasleeve® sampler follows (GeoInsight, 2006).

> *The Hydrasleeve® groundwater sampler can be used to collect a representative sample for most physical and chemical parameters without purging the well. It collects a whole water sample from a user defined interval (typically within the well screen), without mixing fluid from other intervals. One or more Hydrasleeves® are placed in the screened interval of the monitoring well and a period of time is allocated for the well to re-equilibrate. Hours to months later, the sealed Hydrasleeve® can be activated for sample collection. When activated, the Hydrasleeve® collects a sample with no drawdown and minimal agitation or displacement of the water column. Once the sampler is full, the one-way reed valve collapses, preventing mixing of extraneous, non-representative fluid during recovery.*

References:

The following documents may be applicable to this procedure:

Project Work Plan
Project Quality Assurance / Quality Control Plan
Project Health and Safety Plan

Safety Notes:

Groundwater may have chemicals present that are detrimental to health. Read and follow the Project Health and Safety Plan. Prevent dermal contact with water. Air monitoring may be required if an inhalation risk is present.

Equipment and Material Requirements:

The following list gives the equipment and materials that may be required to purge and sample groundwater monitoring wells. Where the need for an item may vary based on project specific requirements the item is identified with a dagger (†). All other items should be considered mandatory.

- Padlock keys with which to access the wells
- Well Level Indicator
- Total Depth Tape†
- Disposable Sampling Gloves
- Decontamination Supplies (for water level and total depth gauge, if used)
- Sample Containers with appropriate preservatives
- Sample Labels
- Sample Coolers
- Ice
- Pens, with water-proof ink
- Chain-of-Custody Records
- Chain-of-Custody Seals
- Hydrasleeve® Specific Materials
  - Standard 2-inch Hydrasleeve® (625 milliliter)
  - One-liter Hydrasleeve® (optional, use if more than 625 milliliter is required)
  - Bullet weight – 5 ounce
  - Weight Clip
  - Spring Clip (for tether attachment)
  - ¼-inch Calibrated Tether or other appropriate cordage
  - Hydra Clamps

Procedure:

1. Inspect the visible portions of the well and well completion for damage.

2. Open the well. If required, collect a headspace reading with the photoionization detector.

3. Collect a static water level measurement. In some circumstances, the groundwater elevation may continue to increase after the well is initially opened. Verify the reading to ensure that the static water level measurement has stabilized.

4. If required, use the total depth tape to determine the total depth of the well.

5. Assemble the Hydrasleeve®.

    a. Remove the Hydrasleeve® for the package and inspect for obvious damage.
    b. Squeeze the side of the top reinforcement together so that an opening is formed in the top of the Hydrasleeve®
    c. Attach the spring clip to the top of the sampler
    d. Fastener the tether cord to the top of the spring clip, a bowline knot is recommended
    e. Fold the bottom of the sampler together so that the right and left holes are aligned
    f. Insert the weight clip with the attached weight through the holes.

6. Lower the Hydrasleeve® to the proper depth. If the Work Plan does not state the installation depth, install the Hydrasleeve® so that the bottom of the sampler is about one foot above the bottom of the well.

7. Secure the tether cord to the well cap.

8. Allow the sampler to remain in the well for the specified time period. The minimum time period shall be 24 hours. There is no maximum time period.

9. For monitoring wells with screen intervals 6.5 ft. or greater, retrieve the sampler by pulling the tether cord at a rate of 1 to 2 feet per second, which is the approximate rate that a bailer would normally be retrieved.

10. For monitoring wells with screen intervals less than 6.5 ft., cycle the Hydrasleeve® up and down using short rapid strokes – 6 inch cycle at a minimum of 1 cycle per second – 5 to 8 times, before retrieving the sampler.

11. If sediment is visible in the Hydrasleeve® and it is desirable to collect a sample with minimal turbidity, install a Hydra clamp toward to the bottom of the sample at a location above the sediment. This will prevent the sediment from being introduced into the collected sample.

12. Push the discharge tube through the Hydrasleeve® approximately 3 to 4 inches below the white reinforcing strips at the top of the sampler.

13. Fill the sample bottle(s) from the discharge of the discharge tube.

14. If groundwater samples are being collected for analysis of volatile organic compounds (VOCs) then the VOC vials should be collected in a matter that will minimize the potential for volatilization of the VOCs. Water should flow into the sample vial in a laminar fashion to minimize the potential for release of the VOCs from the water. The vial should be completely filled with water such that all air in the vial is displaced by the water sample. The vial should be slightly overfilled such that a meniscus is present above the top of the vial. The vial cap should then be tightly secured on the vial. The vial should be inverted and checked for air. If an air bubble large than approximately 1/8-inch in diameter is present, the vial and sample must be discarded and a new vial filled.

15. Place filled sample containers in cooler with ice in order to lower and maintain the sample temperature at approximately four degrees Celsius.

16. Complete chain-of-custody record.

17. Maintain samples under chain-of-custody control at all times.

18. Record any pertinent observations in the field notebook.

19. Install a new Hydrasleeve® sampler for the next sampling event in accordance with steps 5 through 7 above.

2. Sample Container Preparation.

Table 2.1 summarizes the well sampling schedule, the analyses to be conducted, and the measurements to be taken. All samples for chromium analysis shall be collected in new, 125 or 250 ml. polyethylene containers, which are supplied by the analytical laboratory. The laboratory shall adhere to the following procedures to assure contaminant-free, preserved containers:

1. Rinse bottles and caps with hot tap water.
2. Rinse bottles and caps with (1:1) nitric acid.
3. Rinse bottles and caps with deionized or distilled water.
4. Invert bottles and allow to air dry.
5. Add 1 ml. of (1:1) nitric acid to the bottles to be used for total chromium analysis. Nitric acid is a required preservative for total chromium analysis.
6. Attach caps and deliver to Exline, Inc.

TABLE 2.1: WELL SAMPLING SCHEDULE
Exline, Inc., Salina, Kansas

WELL TYPE	WELL NUMBER	CHEMICAL ANALYSIS * AND SAMPLING FREQUENCY	WATER LEVEL MEASUREMENT
Groundwater Recovery	B-7, C-9R, E-3	total chromium, semi-annual	none
Corrective Action Performance	C-1, D-1, D-2, E-2, G-1, G-2, H-1, H-2, H-3, H-4, H-5, H-6	total chromium, semi-annual	yes
Supplemental Information	B-4, B-8, B-11 C-3, C-4, C-5 C-6, C-8, D-3	no analyses semi-annual	yes
Residential	Bernhardt, Weber, O'Neil	total chromium, annual	none

* Analyses shall be completed by a laboratory which is certified by the KDHE, for the subject parameter.

5. Monitor Well Sample Collection.

5.1. Frequency and Parameters. Sampling frequency and analysis parameters were presented earlier in Table 2.1.

5.2. Sample Containers. Sample containers shall be prepared as follows. A clean, 250 ml polyethylene sample bottle, preserved for total chromium, shall be obtained from the laboratory for each well to be sampled. An additional bottle shall be filled at one well for the duplicate sample.

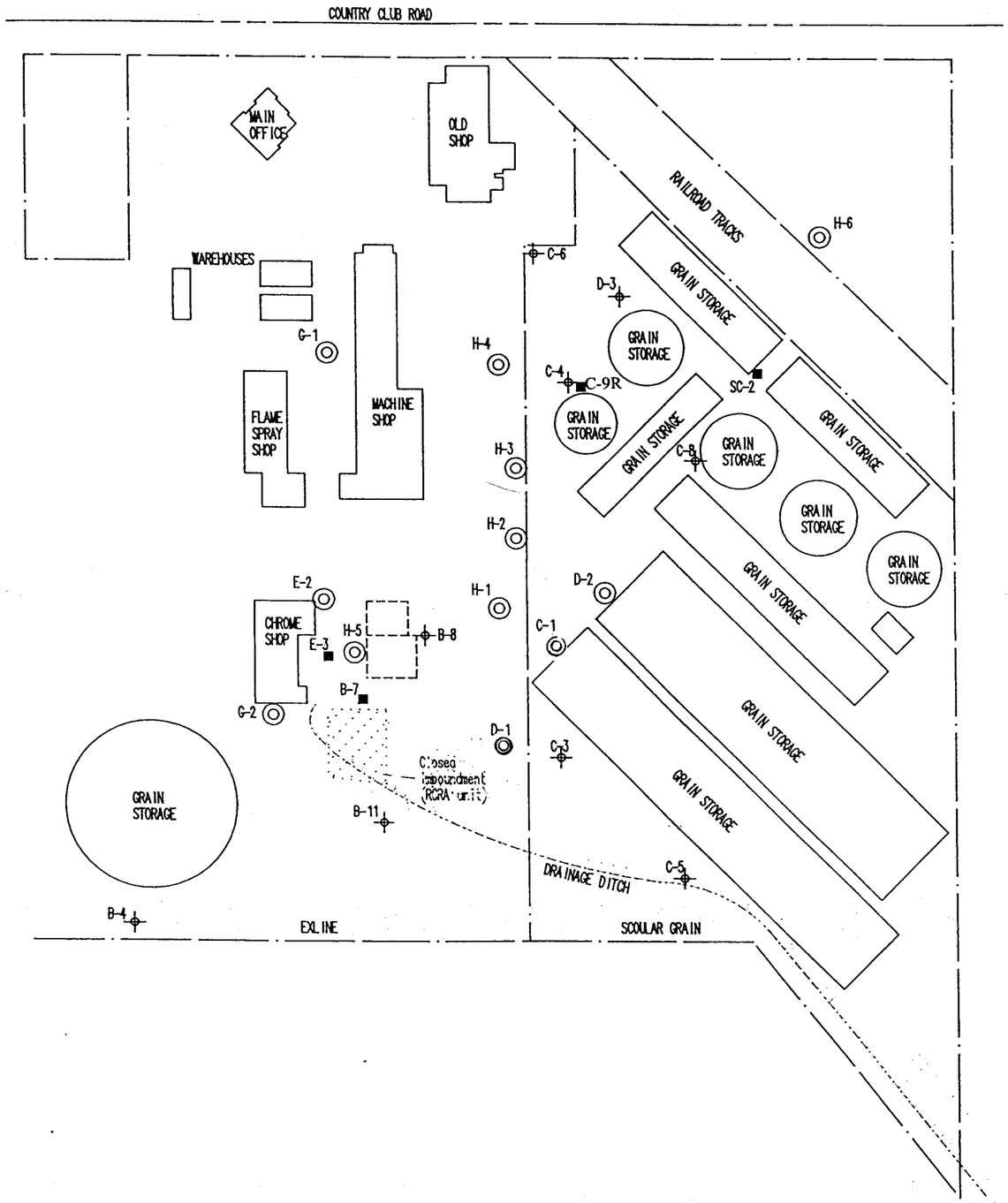
5.3. Sample Collection for Monitoring Wells. As specified in Section 3.1 above, the wells shall be sampled in the same order as the static water level measurements. The procedures for monitoring well sample collection are set forth in the following document, which is included as Attachment B:

"Standard Operating Procedure – Monitor Well Sampling Procedures Using a Hydrasleeve® Sampler", Enviro Tech Services, Inc. SOP No.: SOP-GWS-04, October 15, 2012.

As noted in that document, the sample volume from the Hydrasleeve® sampler is 600 ml. The sample volume required for the total chromium analysis, including all laboratory quality assurance/quality control analyses, is 250 ml. Therefore, the Hydrasleeve® sampler will generate sufficient volume for the sample analysis and laboratory QA/QC analyses, as well as, sample duplicates.

The "pull" distance to fill the Hydrasleeve® is three (3) feet, as measured from the top of the sampler. Since each sampler will be set one foot from the bottom of the well, a minimum well screen interval of 6.5 ft. (1 ft. from bottom of well + 2.5 ft. sampler length + 3 ft. pull) is required using the standard sampler retrieval method. With the exception of monitoring well C-1, all Exline monitoring well screen intervals are 7 ft. or greater.

The screen interval for monitoring well C-1 is 5 ft. Therefore, monitoring well C-1 will be sampled using the procedure set forth in the Attachment B SOP for monitoring wells with screen intervals less than 6.5 ft.



N

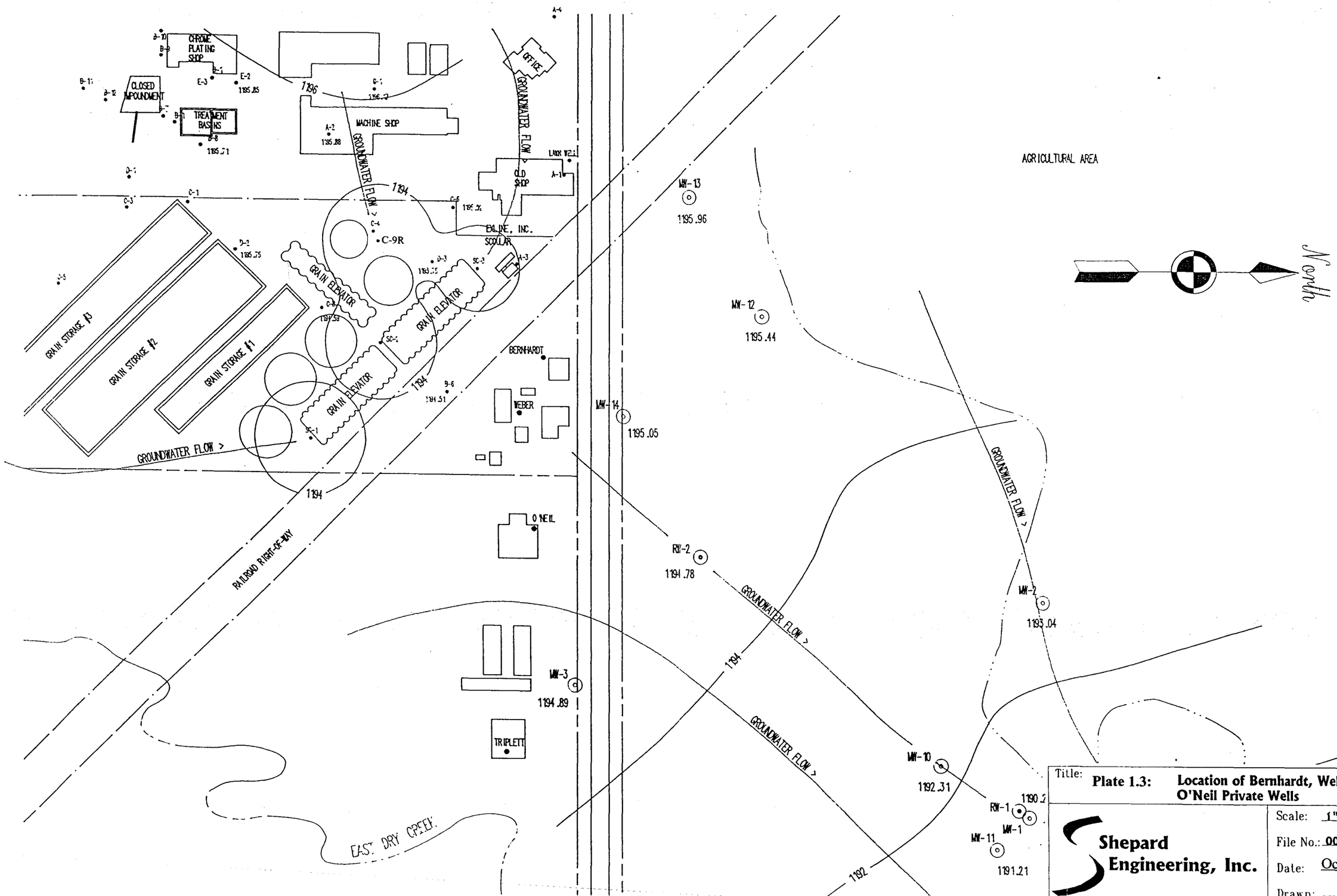
LEGEND:

■ : PUMPING WELL

⊕ : PIEZOMETRIC NETWORK WELL

◎ : MONITOR WELL

TITLE: Plate 1.2: Well Location Map Exline, Inc., Salina, KS	SCALE: 1"=200'
Shepard Engineering, Inc.	
DRN RTH / FILE NO.: 02-010C	DATE: Oct., 2012



Title: **Plate 1.3: Location of Bernhardt, Weber, O'Neil Private Wells**

Shepard Engineering, Inc.

Scale: 1" = 200'

File No.: 00-010G

Date: Oct., 2012

Drawn:

Bureau of Waste Management
Curtis State Office Building
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Robert Moser, MD, Secretary.

Kansas
Department of Health & Environment

phone: 785-296-1600
fax: 785-296-1592
email: bwmweb@kdheks.gov
www.kdheks.gov/waste

Sam Brownback, Governor

October 5, 2012

Mr. Rob Exline, President
Exline, Inc.
P.O. Box 1487
Salina, KS 67402

RE: Revised Sampling and Analysis Plan
Exline, Inc. - Salina, Kansas
EPA RCRA ID No. KSD007127327

Dear Mr. Exline:

The Kansas Department of Health and Environment (KDHE) has received the subject document which was revised to reflect a change in sampling methods. Exline has proposed no-purge sampling using HydraSleeves at the site. After review, KDHE has the following comments:

General

1. Please update all figures and text to reflect the replacement of well C-9 with C-9R.

Attachment B

2. Please include a statement indicating the minimum volume of groundwater required for analyses and explain what size HydraSleeves will be used to ensure an adequate amount of groundwater is collected. Also indicate the volume of groundwater that will be required when sampling wells from which QA/QC samples are also collected and indicate what size HydraSleeve will be utilized for those wells.
3. Under the "Procedure" heading, please include a statement that groundwater samples will be collected from within the screened interval of each well. The sampling team must ensure that, once deployed, there is sufficient distance from the top of the HydraSleeve(s) to the top of well screen (or top of groundwater if water levels are below the top of screen) so that when the HydraSleeve is retrieved, only groundwater from within the screened interval is collected. Care must be taken to avoid collecting the stagnant water above the screened interval.

Please submit replacement pages for the *Groundwater Monitoring Plan* that address the above comments no later than November 9, 2012. If you have questions regarding this letter, please do not hesitate to call me at (785) 291-3132.

Sincerely,

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permitting Section

cc: Max Shepard - Shepard Engineering
Lisa Gotto - EPA Region 7 AWMD/RCAP
Jennifer Nichols – KDHE/NCDO
Bill Bider – BWM

Exline SWMU-16 Confirmation Soil Sample Results
Max Shepard
to:
Lisa Gotto
10/05/2012 03:39 PM
Cc:
"'Rob Exline'", "'Steve Puttbrese'"
Hide Details
From: "Max Shepard" <shepard@twinvalley.net>

To: Lisa Gotto/R7/USEPA/US@EPA

Cc: "'Rob Exline'" <r.exline@exline-inc.com>, "'Steve Puttbrese'" <s.puttbrese@exline-inc.com>

1 Attachment

SWMU-16 Area B Confirmation Soil Sample Results - Oct. 3,2012.pdf

Lisa:

I have attached a copy of the CAS Laboratory Report, which includes the chemical analysis data, for the confirmation soil samples that were collected on October 3, 2012. These data are summarized below. Sample ID numbers correspond to the locations shown on Plate 4.4 in the January, 2011 CMI Work Plan.

Sample ID	Hex Cr Conc. – mg/kg
SWMU-16-B-SW-7-1.5	< 20
SWMU-16-B-SW-6-1.5	< 20
SWMU-16-B-B-4-3	< 20
SWMU-16-B-SW-5-1.5	< 20
SWMU-16-B-SW-4-1.5	< 20
SWMU-16-B-B-D-3	< 20

SWMU-16-B-B-D-3 is a duplicate sample of SWMU-16-B-B-4-3.

RCRA
521422

As discussed in previous communication, confirmation soil sample ID SWMU-16-B-SW-8-1.5 was not collected due to the fact that the building foundation extended 3 ft. below ground surface, therefore, no soil was present at that location.

These data indicate that all confirmation soil sample concentrations were well below the Industrial Use Remedial Goal of 38 mg/kg for hexavalent chromium. Exline will be back-filling the excavated area on October 5.

The chemical analysis results for the excavated soil (12 roll-off containers) will likely be completed the week of October 15. The disposition of that material will be determined following the generation of those results.

Finally, this action represents the completion of the excavation remediation activities with respect to SWMU-16, SWMU-19, AOC-1, and AOC-2. In-situ treatment is still required with respect to SWMU-16 – Area "A".

Please contact me if you have any questions or need additional information.

Thanks,
Max Shepard, P.E.
Shepard Engineering, Inc.
Office: 785-488-3336
Fax: 785-488-2955
shepard@twinvalley.net

Continental Analytical Services, Inc.

10/05/2012

Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date and Time Received: 10/03/2012 1155
Continental File No.: 5030
Continental Order No.: 106510
Project ID: 12-010

Dear Mr. Puttbrese:

This laboratory report containing the samples indicated below, includes 10 pages for the analytical report, 1 page(s) for the chain of custody and/or analysis request, and 1 page(s) for the sample receipt form.

CAS LAB ID #	SAMPLE DESCRIPTION	SAMPLE TYPE	DATE SAMPLED
12100227	SWMU-16-B-SW-7-1.5	Solid	10/3/2012
12100228	SWMU-16-B-SW-6-1.5	Solid	10/3/2012
12100229	SWMU-16-B-B-4-3	Solid	10/3/2012
12100230	SWMU-16-B-SW-5-1.5	Solid	10/3/2012
12100231	SWMU-16-B-SW-4-1.5	Solid	10/3/2012
12100232	SWMU-16-B-B-D-3	Solid	10/3/2012

The Appendix and Quality Control sections are integral parts of this laboratory report and may contain important data qualifiers.

All results are reported on a wet weight basis unless otherwise stated.

Samples will be retained for thirty days unless Continental is otherwise notified.

Continental is accredited by the State of Kansas through the National Environmental Laboratory Accreditation Program (NELAP). The results contained in this report were obtained using Continental's Standard Operating Procedures. These procedures are in substantial compliance with the approved methods referenced and the standards published by NELAP unless otherwise noted in the Appendix and Quality Control sections of this report.

This report may not be reproduced, except in full, without written approval from Continental Analytical Services, Inc.

Thank you for choosing Continental for this project.

525 N. Eighth St. - P.O. Box 3737 - Salina, KS 67402-3737
785-827-1273 800-535-3076 Fax 785-823-7830
KDHE Environmental Laboratory Accreditation No. E-10146

CONTINENTAL ANALYTICAL SERVICES, INC.

Clifford J. Baker
Technical Manager

Petra M. Craddock
Project Manager

525 N. Eighth St. - P.O. Box 3737 - Salina, KS 67402-3737
785-827-1273 800-535-3076 Fax 785-823-7830

KDHE Environmental Laboratory Accreditation No. E-10146

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 10/05/2012
Date Received: 10/03/2012
Continental File No: 5030
Continental Order No: 106510

Lab Number: 12100227
Sample Description: SWMU-16-B-SW-7-1.5

Date Sampled: 10/03/2012
Time Sampled: 1030

Analysis	Concentration	Units	Book/Page
Chromium, Hexavalent, Soil	ND(20)	mg/kg	7178/22
Oxidation/Reduction Potential	420	mV	7181/6
pH, (1:1 Water Extraction)	7.92@24C	Std. units	7183/390

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	10/03/12 1306	121003-1	121003-1	JND	7196A
Oxidation/Reduction Potent	N/A	10/04/12 1446	121004-1	121004-1	JND	SM 2580B Mod(1:1)
pH, (1:1 Water Extraction)	N/A	10/04/12 1533	121004-1	121004-1	JND	9045D
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 12100227

Lab Number: 12100228
Sample Description: SWMU-16-B-SW-6-1.5

Date Sampled: 10/03/2012
Time Sampled: 1035

Analysis	Concentration	Units	Book/Page
Chromium, Hexavalent, Soil	ND(20)	mg/kg	7178/22
Oxidation/Reduction Potential	420	mV	7181/6
pH, (1:1 Water Extraction)	8.00@24C	Std. units	7183/390

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	10/03/12 1325	121003-1	121003-2	JND	7196A
Oxidation/Reduction Potent	N/A	10/04/12 1455	121004-1	121004-1	JND	SM 2580B Mod(1:1)
pH, (1:1 Water Extraction)	N/A	10/04/12 1535	121004-1	121004-1	JND	9045D
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 12100228

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 10/05/2012
Date Received: 10/03/2012
Continental File No: 5030
Continental Order No: 106510

Lab Number: 12100229
Sample Description: SWMU-16-B-B-4-3

Date Sampled: 10/03/2012
Time Sampled: 1040

Analysis	Concentration	Units	Book/Page
Chromium, Hexavalent, Soil	ND(20)	mg/kg	7178/22
Oxidation/Reduction Potential	420	mV	7181/6
pH, (1:1 Water Extraction)	7.41@24C	Std. units	7183/390

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	10/03/12 1327	121003-1	121003-2	JND	7196A
Oxidation/Reduction Potent	N/A	10/04/12 1456	121004-1	121004-1	JND	SM 2580B Mod(1:1)
pH, (1:1 Water Extraction)	N/A	10/04/12 1539	121004-1	121004-1	JND	9045D
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 12100229

Lab Number: 12100230
Sample Description: SWMU-16-B-SW-5-1.5

Date Sampled: 10/03/2012
Time Sampled: 1045

Analysis	Concentration	Units	Book/Page
Chromium, Hexavalent, Soil	ND(20)	mg/kg	7178/22
Oxidation/Reduction Potential	410	mV	7181/6
pH, (1:1 Water Extraction)	8.00@24C	Std. units	7183/390

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	10/03/12 1329	121003-1	121003-2	JND	7196A
Oxidation/Reduction Potent	N/A	10/04/12 1501	121004-1	121004-1	JND	SM 2580B Mod(1:1)
pH, (1:1 Water Extraction)	N/A	10/04/12 1544	121004-1	121004-1	JND	9045D
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 12100230

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 10/05/2012
Date Received: 10/03/2012
Continental File No: 5030
Continental Order No: 106510

Lab Number: 12100231
Sample Description: SWMU-16-B-SW-4-1.5

Date Sampled: 10/03/2012
Time Sampled: 1050

Analysis	Concentration	Units	Book/Page
Chromium, Hexavalent, Soil	ND(20)	mg/kg	7178/22
Oxidation/Reduction Potential	410	mV	7181/6
pH, (1:1 Water Extraction)	7.96@24C	Std. units	7183/390

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	10/03/12 1330	121003-1	121003-2	JND	7196A
Oxidation/Reduction Potent	N/A	10/04/12 1503	121004-1	121004-1	JND	SM 2580B Mod(1:1)
pH, (1:1 Water Extraction)	N/A	10/04/12 1547	121004-1	121004-1	JND	9045D
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 12100231

Lab Number: 12100232
Sample Description: SWMU-16-B-B-D-3

Date Sampled: 10/03/2012
Time Sampled: 1055

Analysis	Concentration	Units	Book/Page
Chromium, Hexavalent, Soil	ND(20)	mg/kg	7178/22
Oxidation/Reduction Potential	410	mV	7181/6
pH, (1:1 Water Extraction)	7.43@24C	Std. units	7183/390

Analysis	Date/Time Prepared	Date/Time Analyzed	QC Batch	Inst. Batch	Analyst	Method(s)
Chromium, Hexavalent, Soil	N/A	10/03/12 1332	121003-1	121003-2	JND	7196A
Oxidation/Reduction Potent	N/A	10/04/12 1505	121004-1	121004-1	JND	SM 2580B Mod(1:1)
pH, (1:1 Water Extraction)	N/A	10/04/12 1549	121004-1	121004-1	JND	9045D
Alkaline Digestion-Cr+6 Preparation Method						3060A

Conclusion of Lab Number: 12100232

Appendix

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 10/05/2012
Date Received: 10/03/2012
Continental File No: 5030
Continental Order No: 106510

ND(), where reported, indicates the analyte was not detected above the Limit of Quantitation (LOQ). The concentration of the LOQ is inside the parentheses.

Not all samples were received at the recommended temperature of less than 6 degrees Celsius. Because the samples were hand-delivered to the Laboratory immediately after collection and showed evidence of cooling by the presence of ice and/or cool blue ice, they are considered acceptable by NELAC. Refer to the enclosed Cooler/Sample Receipt Form(s) for the affected coolers and samples.

No analysis with a holding time of seventy-two hours or less was performed in this Continental order.

Accreditation Summary

Client: Exline, Inc.
Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 10/05/2012
Date Received: 10/03/2012
Continental File No: 5030
Continental Order No: 106510

NELAP accreditation is issued under each EPA regulatory program for a given matrix/analyte/method combination. Continental is NELAP accredited for each matrix/analyte/method and EPA program cited in this Laboratory Report, except for those listed in the table below and for analyses performed in the field. For most of the analyses listed in the table, NELAP accreditation is not offered under the listed EPA program and Continental is NELAP accredited for the analysis, using the same analytical technology, but under a different EPA program. Continental's full NELAP accreditation status may be viewed at www.kdheks.gov/envlab. Note that unless qualified otherwise in the Laboratory Report, Continental performs all analyses, including each analysis listed in the table below, utilizing NELAP protocol.

Test	Analysis	Matrix-Regulatory Program	Method	CAS NELAP Accredited in Other Reg. Program
GL134	Oxidation/Reduction Potential	S-RCRA	SM 2580B Mod(1:1)	N

Continental Analytical Services, Inc.

Quality Control Report
Batch Summary

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 10/05/2012
Date Received: 10/03/2012
Continental File No: 5030
Continental Order No: 106510

Test	Testname	QC Batch	Method Blank Date Analyzed	LCS Date Analyzed	MS Lab No. Date Analyzed	
GL341	Chromium, Hexavalent, Soil	121003-1	121003BLK1 10/03/12 13:05	121003LCS1 10/03/12 13:05	12100227MS 10/03/12 13:08	12100227RS

Lab numbers associated with this batch:
12100227 12100228 12100229 12100230 12100231 12100232

GL134	Oxidation/Reduction Potential	121004-1	121004BLK1	121004LCS1	12100229MS
GL212	pH, (1:1 Water Extraction)	121004-1	121004BLK1 10/04/12	121004LCS1 10/04/12 15:28	12100229MS 10/04/12 15:39

Lab numbers associated with this batch:
12100227 12100228 12100229 12100230 12100231 12100232

Quality Control Report
Method Blank, LCS, MS/MSD Data

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 10/05/2012
Date Received: 10/03/2012
Continental File No: 5030
Continental Order No: 106510

Analysis	Blank Data	% Rec LCS	Limits	Spike Level	Units	Spiked Sample (% Recovery) MS	MSD	Limits	Spike Level	Units	Spiked Sample Precision Data RPD	Limit
QC Batch: 121003-1	**For sample analyzed on: 10/03/2012**					**Spiked sample: 12100227**						
Chromium, Hexavalent, Soil	ND(20)	98.9	80.5-110	60.0	mg/kg	103	96.4	75.0-125	60.0	mg/kg	6.6	20.0
QC Batch: 121003-1	**For sample analyzed on: 10/03/2012**					**Spiked sample: 12100227R**						
Chromium, Hexavalent, Soil	ND(20)	98.9	80.5-110	60.0	mg/kg	101 RI	101 RI	75.0-125	1290	mg/kg	0.0	20.0
QC Batch: 121004-1	**For sample analyzed on: 10/04/2012**					**Spiked sample: 12100229**						
Oxidation/Reduction Potential	N/A	99.9	#	221	mV	420 T	420 T	#		mV	0.0	#
pH, (1:1 Water Extraction)	N/A	99.7	99.0-101	7.0	Std. u	7.41@24C T	7.43@24C T	#		Std. un	0.3	2.2

Data Qualifiers:
RI - This lab number with the "R" suffix is used to provide the insoluble hexavalent chromium matrix spike recoveries. The spike level is normally 1290 mg/kg.

T - MS/MSD cannot be performed for this analysis. The MS result is the same as the sample result. The MSD result is a duplicate of the sample.

- Limits not available.

Quality Control Report
Continuing Calibration Data Summary

Client: Exline, Inc.
Attn: Steve Puttbrese
P.O. Box 1487
Salina, KS 67402-1487

Date Reported: 10/05/2012
Date Received: 10/03/2012
Continental File No: 5030
Continental Order No: 106510

Analysis	Date of Analysis	Instrument Batch ID	Amount in Standard	Amount Detected	Units	Percent Recovery
Oxidation/Reduction Potential	10/04/2012	121004-1	CCV recovery acceptable for this Instrument Batch.			
Oxidation/Reduction Potential	10/04/2012	121004-2	CCV recovery acceptable for this Instrument Batch.			
pH, (1:1 Water Extraction)	10/04/2012	121004-1	CCV recovery acceptable for this Instrument Batch.			
pH, (1:1 Water Extraction)	10/04/2012	121004-2	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	10/03/2012	121003-1	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	10/03/2012	121003-2	CCV recovery acceptable for this Instrument Batch.			
Chromium, Hexavalent, Soil	10/03/2012	121003-3	CCV recovery acceptable for this Instrument Batch.			

- Laboratory Report Conclusion -

CAS ORDER NO 10650

CHAIN OF CUSTODY RECORD

Project #: 12-010

Project Name: Exline - Salina

Sampler's Name: Jack Eslick

Sampler's Signature:

ENVIRO TECH SERVICES, INC.
2323 North 20th Road Glasco, Kansas 67445
(785) 593-1616 email: jackeslick@gmail.com

Sample Information / Analytical Parameters

Date 2012	Time	Sample ID	Sample Point Identification	Matrix	Number of Containers	Hexavalent Chromic								Comments
10/3	1030		SWMU-16-B-SW-7-1.5	Soil	1	✓								
10/3	1035		SWMU-16-B-SW-6-1.5	Soil	1	✓								
10/3	1040		SWMU-16-B-B-4-3	Soil	1	✓								
10/3	1045		SWMU-16-B-SW-5-1.5	Soil	1	✓								
10/3	1050		SWMU-16-B-SW-4-1.5	Soil	1	✓								
10/3	1055		SWMU-16-B-B-D-3	Soil	1	✓								

Emergency T-A-T

		Time	Date			Time	Date
#1 Relinquished by:	Printed Name: Jack Eslick Signature:	1155	10/3/12	#1 Received By:	Printed Name: Signature:	1155	10-3-12
#2 Relinquished by:	Printed Name: Signature:			#2 Received By:	Printed Name: Signature:		

Send Report To:

Invoice to:

Special Instructions/Comments:

Continental Analytical Services, Inc.
Cooler/Sample Receipt Form (C/S RF)

CAS Order No.: 106510

Client Name: Exline **CAS File No.:** 5030

Sample ID's in cooler: See COC

Cooler 1 **of** 1 **for this CAS Order No.**

Cooler Identification: CAS Cooler #: _____ / Client's Cooler / Box / Letter / Hand-delivered
Other: _____

Date/Time Cooler Received: 10 / 3 / 12 11 : 55

Delivered By: UPS / FedX / AB Express / Field Svcs / Mail / Walk-In / Other: _____

Custody Seal: Present: Intact / Broken Absent: X Seal No: _____
Seal Name: _____ Seal Date: _____
Seal matches Chain of Custody: Yes / No / N/A

Type of Packing Material: Blue Ice / Ice / Melted Ice / Bubble / Foam / Paper / Peanuts / Vermiculite / None / Other: _____

Cooler Temperature (°C): Original Reading (°C) 5.6 Corrected Reading (°C) 6.1
Temp. By: Temp. Blank Cooler Surface: Glass / Plastic /Metal /Other: _____
Thermo. ID No.: 580 Thermo. Correction Factor (°C): 0.5

☒ Evidence of Cooling and date received = date sampled

Sample Receipt Discrepancies: ☒ No ☐ Yes **(See below for discrepancies.)**

Note: If discrepancies are present, CAS will proceed with analyses until/unless directed otherwise by the client.

- ☐ Chain of Custody not present - information taken from:
  - Cover Letter ☐ Container ☐
  - PO ☐ CAS Proj. Mgr. ☐
- ☐ Container label absent
- ☐ Chain of Custody incomplete [see detail below]
- ☐ Chain of Custody missing date/time sampled (excl. TB or Dup.)
- ☐ Date or Time sampled obtained from container label
- ☐ Chain of Custody missing sampler's name
- ☐ Chain of Custody missing matrix (sample type)
- ☐ Missing relinquished information: signature date time
- ☐ Sample excluded from Chain of Custody
- ☐ Sample listed on Chain of Custody, not received
- ☐ Sample description on container and Chain of Custody do not agree
- ☐ Air bubbles in Aqueous VOA vials larger than pea-size [approx. 6 mm]
- ☐ Cooler temperature exceeded 0.1 - 6.0 °C requirement [Do not mark if samples do not require cooling to 0.1 - 6.0 °C.]
- ☐ Broken or leaking containers (detail actions below)
- ☐ Sample container type or labeled chemical preservation inappropriate
- ☐ Other discrepancies: _____

Detail to discrepancies/comments:

Completed by: MMK **Date Completed:** 10-3-12

Shepard Engineering, Inc.

65 Ash Lane • Bennington, KS 67422 • (785) 488-3336 • Fax: (785) 488-2955 • e-mail: shepard@twinvalley.net

RECEIVED
OCT 04 2012
BUREAU OF WASTE MANAGEMENT

October 3, 2012

Ryan Pfeiffer
Environmental Scientist
Geology Unit
Hazardous Waste Permitting Section
Kansas Department of Health and Environment
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Re: Revised Sampling and Analysis Plan – Exline Groundwater Monitoring
EPA ID No. KSD 007127327
SEI File No. 12-010C

Dear Mr. Pfeiffer:

I have attached one (1) copy of a revised Sampling and Analysis Plan (SAP) for the Exline, Inc. facility. The Plan was revised in accordance with your August 17, 2012 letter to Rob Exline.

Thank you for your assistance with this project. Please contact me if you have any questions or need additional information.

SHEPARD ENGINEERING, INC.

Max Shepard

Max Shepard, P.E.
President

cc: Steve Puttbrese – Exline, Inc. (letter and attachment)
Rob Exline – Exline, Inc. (letter, only)
Lisa Gotto – EPA Region 7 (letter and attachment)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

OCT 01 2012

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Article Number: 7011 0470 0002 2746 4265

Mr. Rob Exline
Exline, Incorporated
P.O. Box 1487
Salina, Kansas 67402

RE: Interim Remedial Proposal
Exline, Inc - Salina
EPA ID No. KSD007127327

Dear Mr. Exline:

The Environmental Protection Agency Region 7 has reviewed your email dated September 10, 2012, requesting the EPA approval to implement an interim remedial action at Solid Waste Management Unit 5 (SWMU-5) (Sludge Drying Beds). The Exline proposal included the following actions:

1. Soil excavation within an area located at the southeast corner of SWMU-5;
2. Analysis of the excavated soil – followed by disposition based on the chemical analysis results; and
3. Confirmation sampling of the underlying soil for hexavalent chromium analysis.

The EPA understands the interim remedy proposal (excavation and confirmation sampling) is consistent with the corrective actions currently being implemented at SWMUs 16 and 19, as well as Areas of Concern 1 and 2; and that these corrective actions were determined to be the most appropriate remedial actions for these units. The EPA also understands that that the excavation at SWMU-5 will be completed immediately following the SWMU-16 excavation, and would result in a more cost-effective and efficient remedial approach (primarily due to excavation contractor mobilization and availability, interaction with City Landfill, etc.).

Consistent with the EPA guidance document entitled, RCRA Corrective Action Plan (OSWER Directive 9902.3-2A (May 1994)) and the Exline facility Hazardous Waste Management Part II Permit (Permit), the EPA is granting conditional approval of you request, with the following caveats:

1. Exline must adhere to the media cleanup standards included in Section C.12 of the facility Permit. The corrective action obligations for this unit will only be met if confirmatory soil samples demonstrate contaminants above the industrial media cleanup standards have been removed.

RECYCLED 100% FIBER

2. If concentrations of soil contaminants remain above the residential use media cleanup standards, Exline must submit an Institutional Control Plan which conforms to the requirements of Section C.12. of the facility Permit.

3. When the EPA fulfils the public participation requirements for the final remedy(s) at the remaining SWMUs, the EPA will concurrently notify the public of the interim actions completed at SWMU-5 and invite the public to consider these actions at the time. The EPA may, if warranted, require additional remedial measures to ensure the requirements of the Permit are met.

If you have any questions regarding this letter, please contact me at (913) 551-7210.

Sincerely,

Lisa A. Gotto
Waste Remediation and Permitting Branch
Air and Waste Management Division

cc: Ryan Pfiffer, KDHE/BWM
Max Shepard, SEI

2. If concentrations of soil contaminants remain above the residential use media cleanup standards, Exline must submit an Institutional Control Plan which conforms to the requirements of Section C.12. of the facility Permit.

3. When the EPA fulfils the public participation requirements for the final remedy(s) at the remaining SWMUs, the EPA will concurrently notify the public of the interim actions completed at SWMU-5 and invite the public to consider these actions at the time. The EPA may, if warranted, require additional remedial measures to ensure the requirements of the Permit are met.

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Sincerely,

Lisa A. Gotto
Waste Remediation and Permitting Branch
Air and Waste Management Division

cc: Ryan Pfiffer, KDHE/BWM
Max Shepard, SEI

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

OCT 01 2012

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
Article Number: 7011 0470 0002 2746 4265

Mr. Rob Exline
Exline, Incorporated
P.O. Box 1487
Salina, Kansas 67402

RE: Interim Remedial Proposal
Exline, Inc - Salina
EPA ID No. KSD007127327

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RECYCLED 100% FIBER