UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 8

Docket No. SDWA-08-2007-0082

| | | |
|---|---|---|
| In the Matter of: | ) | |
| | ) | |
| Assiniboine & Sioux Tribes | ) | UNOPPOSED MOTION TO |
| of the Fort Peck Reservation | ) | REVISE CONSENT AGREEMENT |
| | ) | |
| | ) | |
| Respondents | ) | |

Respondents, Assiniboine & Sioux Tribes of the Fort Peck Reservation (Respondents), by their undersigned representative, move as follows:

INTRODUCTION

1. Because the Respondents, despite good faith efforts, have not been able to appropriately spend all the funds identified in the Consent Agreement for Supplemental Environmental Projects (SEP), they now request that the Regional Judicial Officer allow for the modification of the Consent Agreement to add an additional SEP. Respondents believe that approval of this motion would be in the interest of justice and would benefit the environment. Complainant United States Environmental Protection Agency, Region 8 (EPA) does not oppose this request.

CONSENT AGREEMENT REQUIREMENTS

2. On April 28 2008 the Regional Judicial Officer signed a Final Order approving the Consent Agreement between Respondents and EPA.

3. The Consent Agreement requires that Respondents pay a civil penalty, implement a compliance protocol and undertake a SEP.

4. The SEP is described in paragraph 6 of the Consent Agreement as follows:

a. Respondents agree to perform work at the following injection well:

Phillip Red Eagle #2-25 Salt Water Disposal Well, bearing EPA Permit No. MT20080-00182, located 1320 feet from the south section line and 1050 feet from the east section line, in the Southeast quarter of the Southeast quarter of Section 25, Township 30 North, Range 47 East, in

Roosevelt County, Montana.

b. Respondents, within sixty (60) calendar days from the date written on the Final Order, issued by the Regional Judicial Officer, which adopts this Consent Agreement, shall expend no less than $25,923 to investigate the mechanical integrity status of and attempt to restore mechanical integrity to the Phillip Red Eagle #2-25 well, long-abandoned by Roosevelt Disposal, Inc. Respondents shall determine the cause of the loss of mechanical integrity, which loss was confirmed during a mechanical integrity test that took place on January 11, 2008.

c. If Respondents can restore the well's mechanical integrity, then the Respondents shall promote the Phillip Red Eagle #2-25 well as a viable salt water disposal or other well to a company capable of managing it.

d. If Respondents cannot restore the well's mechanical integrity, then the Respondents, within ninety (90) calendar days from the date written on the Final Order, issued by the Regional Judicial Officer, which adopts this Consent Agreement, shall apply for funding from available sources, such as the Montana Reclamation and Development Grant Program, in order to properly plug and abandon the Phillip Red Eagle #2-25 well. If successful in obtaining funding, Respondents shall take the lead for plugging and abandoning the well. If unsuccessful in obtaining adequate funding for such purpose, Respondents agree to provide EPA with documentation showing the level of effort expended to obtain funding.

e. If Respondents fail to expend the amount in paragraph 6.b, the Respondents shall choose to spend the shortfall amount on either:

   i. within one hundred and twenty (120) calendar days from the date written on the Final Order, issued by the Regional Judicial Officer, which adopts this Consent Agreement, remediating the following site by properly removing and disposing of the oily sludge and visibly impacted soils under and near the oily sludge: South Poplar Sludge Pit, located on Industrial Drive, Poplar, Montana 59255, with coordinates 48° N, 6', 25.54", 105°W, 12', 15.06", or

   ii. within ninety (90) calendar days from the date written on the Final Order, issued by the Regional Judicial Officer, which adopts this Consent Agreement, paying an additional cash penalty using the procedures set forth in paragraph 5, above.

f. Respondents agree to furnish EPA with a Final SEP Report(s) no later

than December 31, 2008. This report shall contain a brief summary of the work performed under this paragraph, including at a minimum, a tally of expenditures, a well rework summary, all mechanical integrity test results, and a final as-built wellbore diagram showing the configuration of the Phillip Red Eagle #2-25 well with all tubulars displayed and described, and as needed, documenting with a summary, photographs, and a tally of expenditures the work done at the South Poplar Sludge Pit.

g. For federal income tax purposes, Respondents agree that they will neither capitalize into inventory or basis nor deduct any costs or expenditures incurred in performing the SEP(s).

COMPLIANCE BY RESPONDENTS WITH CONSENT AGREEMENT

5. Respondents have substantially complied with these requirements. However, Respondents have not yet spent all the funds required by paragraph 6.e of the Consent Agreement.

6. Pursuant to paragraph 6.b, the Respondents investigated the Phillip Red Eagle #2-25 well and attempted to restore its mechanical integrity. Via its May 19-20, 2008 workover procedure, the Respondents were able to determine the cause of the loss of mechanical integrity: the tubing had become weakened over time and had collapsed at around 370 feet below ground surface.

7. Because the Respondents were not able to restore the mechanical integrity of the well, pursuant to paragraph 6.d the Respondents applied for funding from the Montana Reclamation and Development Grant Program. On July 17, 2009, Tribal staff received a letter from the Program approving a grant of $11,410 for development of a reclamation plan for the Phillip Red Eagle #2-25 well. The letter is attached as Exhibit A. The Respondents are in the process of developing this reclamation plan and will seek funds from the Program and/or other funding source to implement the plan.

8. Pursuant to paragraph 6.b, the Respondents spent approximately $13,357.00 on the workover procedure for the Phillip Red Eagle #2-25 well.1 Receipts are attached as Exhibit B. Because the Respondents committed to total supplemental environmental project (SEP) spending of $25,923.00, pursuant to paragraph 6.e.i, the Respondents (via its letter to EPA of August 6, 2008) chose to spend the shortfall amount of approximately $12,566.00 to remediate the South Poplar Sludge Pit site (Poplar Site) in Poplar Montana.

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1 The Respondents also used their own tubing (valued at $40,000) for the attempted workover of the Red Eagle 2-15 well. It will cost the Respondents approximately $2,000 to remove this tubing from the well.

15. The nexus between the original violations and this additional SEP is they are both oil production related concerning groundwater protection and are in the general vicinity of each other.

16. Respondents commit to spending the shortfall amount of $12,566.00 no later than within 4 months of the date of the Final Order of the Revised Consent Agreement. Otherwise, Respondents shall pay the difference between what Respondents actually spent and $12,566.00 in compliance with paragraph 5 of the original Consent Agreement.

CONCLUSION

17. The additional SEP would meet the intent of the original Consent Agreement. Moreover, it would further the goal of the Safe Drinking Water Act: to protect sources of drinking water supply.

18. Counsel for EPA have reviewed this motion and indicate that EPA does not oppose it.

**ASSINIBOINE & SIOUX TRIBES OF THE FORT PECK RESERVATION,**

Respondents

Date: 9-20-2010

By: _____
A.T. Stafne
Chairman

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 8

Docket No. SDWA-08-2007-0082

| | | |
|---|---|---|
| In the Matter of: | ) | |
| | ) | |
| Assiniboine & Sioux Tribes | ) | **CERTIFICATE OF SERVICE** |
| of the Fort Peck Reservation | ) | |
| | ) | |
| | ) | |
| Respondents | ) | |

I certify that the foregoing Unopposed Motion to Revise Consent Agreement, dated September, 21 2010, was sent this day in the following manner to the addressees listed below:

Original by Regular Mail (plus one copy) and Electronic Transmission to:

Ms. Tina Artemis
Regional Hearing Clerk
U.S. Environmental Protection Agency
1595 Wynkoop Street (8RC)
Denver, Colorado 80202-1129

Copy by Regular Mail and Electronic Transmission to:

Attorney for Complainant:

Mr. Jim Eppers, Esquire
Senior Enforcement Attorney
Legal Enforcement Program
U.S. Environmental Protection Agency
1595 Wynkoop Street (8ENF-L)
Denver, Colorado 80202-1129

Copy by hand delivery (by Ms. Artemis):

Regional Judicial Officer:

Ms. Elyana R. Sutin, Esquire
U.S. Environmental Protection Agency
1595 Wynkoop Street (8RC)

# EXHIBIT A

# DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

BRIAN SCHWEITZER, GOVERNOR
1625 ELEVENTH AVENUE
STATE OF MONTANA
DIRECTOR'S OFFICE (406) 444-2074
FAX: (406) 444-2684
PO BOX201601
HELENA, MONTANA 59620-1601



July 17, 2009

Deb Madison
Fort Peck Tribes
PO Box 1027
Poplar, MT 59255

**Re: Development of Reclamation Plan for Philip Red Eagle 2-25 SWD on Fort Peck Indian Reservation RDG Planning Grant Application**

Dear Deb:

The Department of Natural Resources and Conservation (DNRC) has completed its evaluation and ranking of Reclamation and Development Grants Program (RDGP) planning grants for the June 30, 2009 funding cycle. We received 12 applications requesting $532,850. All the applications received were of exceptional quality and decisions on which projects to fund were very difficult.

I am happy to inform you that your project was approved for funding in the amount of $11,410. To authorize the expenditure of funds, it is now necessary to prepare and execute a contract agreement. We will begin the contracting process immediately. Please contact me as soon as possible so that we can begin the contract process.

Thank you for your time and effort in preparing an application. If you have any questions regarding the contracting process, please call me at (406) 444-0547.

Sincerely,

Alicia Stickney
RDG Planning Grants

Cc: File
A.T. "Rusty" Stafne, Chairman
PO Box 1027
Poplar, MT 59255

# EXHIBIT B

MEMORANDUM

TO: Doug Wolf

FROM: Earlene Ackerman

SUBJECT: Red Eagle SWD

DATE: November 30, 2009

Enclosed is a copy of the expenditures spend on Red Eagle SWD. One invoice was left off Les White Hawk, Pumper, notes. I have included Well Pro's invoice for $2,635.00, the total expenditures for Red Eagle is ***$13,357.00.***

I wanted to know what we were going to do about the Tribes tubing that was used. This would be another expense to remove it from this site and take it to the Lustre Well 1A. Estimate cost would be around $2,000.00.

Please let me know what other information you would need. Sorry I took so long in getting this info to you.

WELLPRO INCORPORATED

FISHING & RENTAL TOOLS

4973 Hwy 85
PO Box 2436
Williston ND 58802-2436

Phone (701) 774-8989
Fax (701) 774-0125

**INVOICE: W40803**
Invoice Date: Wednesday, May 28, 20

FORT PECK TRIBES

605 INDIAN AVE
POPLAR, MT 59255

ORDERED BY: DUANE HAGADONE
PO NUMBER:
ORDER TAKEN BY: GH
RIG#:
VENDOR #:

LEASE/WELL: RED EAGLE
STATE: MT
COUNTY:
AFE#:
CONTRACT #:

(DELIVERY TICKET # 121802)

| QTY | DESCRIPTION | MINIMUM | BILL FROM | THRU | ADD'L | ADD'L AMOUNT | DISCOUNT | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 2 | FISHING TOOL SUPERVISOR JAMIE OCAIN<br>Serial#: S-OCAIN | 1,050.00 | | | | | | 2,100.00 |
| 220 | FISHING TOOL SUPERVISOR'S TRANSPORTATION (ONE ROUND TRIP)<br>Serial#: S-TRANS | 1.75 | | | | | | 385.00 |
| 1 | FISHING TOOL SUPERVISOR VEHICLE USE<br>Serial#: S-PICKUP | 150.00 | | | | | | 150.00 |

SubTotal: 2,635.00

THANK YOU FOR YOUR BUSINESS... AMOUNT DUE... $2,635.00

Please SIGN & RETURN Yellow copy.

Thank you, Wellpro Inc.

TERMS: Net 30 Days U.S. Funds

Approved By:

Workover of Red Eagle 2-25

May 19th, 2008
7:00 a.m.

H&H Well service rigged up onsite.

Removed well head
Hooked on to tubing and attempted to free packer
Packer would not release.
H&H thought that the tubing would twist off.
H&H ordered wire line service for 5/20/08.
Work stopped at 1:00 p.m.

May 205h 2008
7:00 a.m.

Superior well service ran wire down tubing, but ran into blockage, suspected paraffin.
Superior attemped to break through blockage, ran a sinker bar.
Sinker bar unable to go below 370'.
Notified OEP and Dan Reinke, contract petroleum engineer.
Dan Reinke said to stop workover, well was not viable
Workover ended at 10:00 a.m.

H&H rigged down at 10:30 a.m.
While rigging down, tuning parted at the slips.

H&H off location at noon.

Expenses:

H&H Well Service - $5950
Azure Oilfield Service - $2512
Superior Well Service - $2,260

Total Invoiced: $10,722

Dwayne Hagadone
P.O. Box 1244
Poplar, MT 59255
(406) 768-5290 or 768-7061

# H & H

## WELL SERVICE, INC.

POPLAR, MONTANA

No. 7546

Company _____ Date _____ Rig No. _____

Lease and Well No. _____

| Unit | Date | Work Performed | Rig Time |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Rod Count

Tubing Count

Information and Materials Used

Misc. Charges

| | | | |
|---|---|---|---|
| | 2 7/8" | | |
| 7/8" | 2 3/8" | | |
| 3/4" | Subs | | |
| 5/8" | Subs | | |
| Subs | Anchor | | |
| Subs | Pump | | |

Unit _____ Hrs. at _____ Per Hr. _____

Operator _____ Extra Man _____

Man _____ Extra Man _____

Man _____ Pickup _____

Travel Time _____ Hrs. at _____ Per Hr. Per Man _____

MAILING ADDRESS

Total Work Ticket

Signed _____

Dwayne Haggadone
P.O. Box 1244
Poplar, MT 59255
(406) 768-5290 or 768-7061

# H & H
## WELL SERVICE, INC.
POPLAR, MONTANA

No. 7945

Rig No. _____

Company _____ Date _____

Lease and Well No. _____

| From | To | Work Performed | Rig Time |
|---|---|---|---|
| | | | |

Rod Count | Tubing Count | Information and Materials Used | Misc. Charges

1" _____ 2 7/8" _____
7/8" _____ 2 3/8" _____
3/4" _____ Subs _____
5/8" _____ Subs _____
Subs _____ Anchor _____
Subs _____ Pump _____

Unit _____ Hrs. at _____ Per Hr. _____
Operator _____ Extra Man _____
Man _____ Extra Man _____
Man _____ Pickup _____
Travel Time _____ Hrs. at _____ Per Hr. Per Man _____

MAILING ADDRESS

Total Work Ticket _____
Signed _____

Duayne Hagstrom
P.O. Box 1244
Poplar, MT 59255
(406) 768-5290 or 768-7061

# H & H
## WELL SERVICE, INC.
POPLAR, MONTANA

No. 7947

Company [illegible] Date [illegible]

Rig No.

Lease and Well No. [illegible]

| From | To | Work Performed | Rig Time |
|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] |

| Rod Count | Tubing Count | Information and Materials Used | Misc. Charges |
|---|---|---|---|
| [illegible] | 2 7/8" | [illegible] | |
| [illegible] | 2 3/8" | | |
| [illegible] | Subs | | |
| [illegible] | Subs | | |
| [illegible] lbs | Anchor | | |
| [illegible] lbs | Pump | | |

Unit [illegible] Hrs. at [illegible] Per Hr. [illegible]

Operator [illegible] Extra Man [illegible]

Man [illegible] Extra Man

Man [illegible] Pickup [illegible]

Travel Time [illegible] Hrs. at [illegible] Per Hr. Per Man

MAILING ADDRESS

Total Work Ticket [illegible]

Signed [illegible]

INVOICE
03361

# AZURE'S OILFIELD SERVICE

Box 704 • Poplar, Montana 59255

HOWARD AZURE
(406) 768-5361

Date 5-14+16-08

| | |
|---|---|
| CUSTOMER | Fort Peck Tribes |
| ADDRESS | |
| CITY Poplar | STATE MT ZIP 59255 |
| ORDER NO. | AUTHORIZED BY |
| SIGNED RECEIVED BY X | Lee White Hawk |

LOCATION

| WORK DONE BY | RATE PER HOUR | HRS. | | TOTAL |
|---|---|---|---|---|
| PUSHER | 34.00 | 17 | Wochopi & Tribal 1-A | 578.00 |
| HAND | 34.00 | 17 | | 578.00 |
| HAND | 34.00 | 17 | | 578.00 |
| TRUCK | 34.00 | 17 | | 578.00 |
| BACKHOE | | | | |
| TRAILER | 20.00 | 10 | | 200.00 |
| | | | | |
| | | | | $2512.00 |
| | | | | |
| | | | | |

Job Description: Hauled tubing from Wachopi well to Red Eagle disposal. And From Tribal 1-A to Red Eagle Picked up & hauled junk off to garbage at Lustre garbage.

BOSS Printing, Glendive, MT / M218-Azurssinv (Rev. 8-

# SUPERIOR WELL SERVICES

SALES AND SERVICE INVOICE

| | |
|---|---|
| INVOICE | 46- 000454 |
| INVOICE DATE | 5-20-08 |
| INVOICE PAGE | 1 of 1 |

CHARGE TO: Fort Peck tribes

CUST PO / REF NO:

LEASE NAME / PROJECT: Red Eagle SWD

COUNTY:

STATE: MT

BILLING ADDRESS:

FIELD / LOCATION:

API WELL NUMBER:

SERVICE SUPERVISOR: Eric Falcon

JOB TYPE: Pipe Recovery

| CALLED OUT | ON LOCATION | COMPLETED |
|---|---|---|
| 6:00am | 8:00am | 12:30pm |

SIGNATURE: X [signature] NAME (PLEASE PRINT)

CUSTOMER OR CUSTOMER'S AGENT

I have read, understood and agreed to the terms and conditions printed on the reverse side hereof which include, but are not limited to, LIMITED WARRANTY, INDEMNITY, RELEASE and PAYMENT and represent that I have full power and authority to execute this agreement.

| LOC | DEPT | CAT | SUB | AMOUNT | DESCRIPTION | UNIT COST | TOTAL COST |
|---|---|---|---|---|---|---|---|
| | | | | 1 | Service Charge | 1200.00 | 1200.00 |
| | | | | 0-10000psi | Packoff, test Swivel | 400.00 | 400.00 |
| | | | | 370' | 1 3/4 Sinker Bar | .22/Ft | |
| | | | | 3000' minimum | Stacked out + 370' | X 3000' | 660.00 |

Customer or Customer's Agent Signature: X [signature]

Did these services meet your expectations? If No, please explain

I acknowledge that equipment, materials and services as listed on this field invoice were received.

Terms: Net 30 days. Finance charge 1.5% per month on past due accounts. Applicable taxes will be added on invoice

| | |
|---|---|
| SUB TOTAL | 2260.00 |
| BALANCE DUE | 2,260.00 |

WHITE COPY - MAIN OFFICE CANARY COPY - CUSTOMER PINK COPY - FIELD OFFICER

# EXHIBIT C

# *Draft*

# *Cleanup Options Report*

## *Sludge Pit Site*
## *Poplar, Montana*

***Prepared for:***

***Office of Environmental Protection***
***603 Court Avenue***
***Poplar, Montana***

***October 30, 2009***

McCain and Associates, Inc.
2718 Gateway Avenue
Suite 101
Bismarck, ND 58503

# Cleanup Options Report
# Sludge Pit Site
# Poplar, Montana

## TABLE OF CONTENTS

# 3.0 ESTIMATED COSTS

The following sections summarize estimated costs for three alternatives for sludge removal and disposal (local land treatment, commercial disposal at a facility located in the Williston, North Dakota area, and on-site thermal desorption using a commercial desorption unit), and also for a monitored natural attenuation approach for residual low-level soil contamination at the site. These estimates are based on assumed rates for contracted heavy equipment such as excavators and dump trucks that are typical of such industry usage, generic verbal quotes for local procurement of aggregate material, and professional judgment regarding these types of environmental projects.

These estimates have been prepared without inclusion of any subcontracting fees that may be applicable if services are subcontracted through a consultant. Actual cleanup costs may differ from these estimates based on project-specific factors such as labor rates and subcontracted services costs. Estimated costs for sludge removal and associated cleanup tasks are summarized in Table 3-1 below:

| SLUDGE CLEANUP OPTION | DESCRIPTION | ESTIMATED COST |
|---|---|---|
| Option 1 | Removal of Sludge with Off-Site Commercial Disposal | $156,000 |
| Option 2 | Removal of Sludge with Local Land Treatment | $110,131 |
| Option 3 | Removal of Sludge with Onsite Thermal Desorption | $138,572 |
| | | |
| **RESIDUAL SUBSURFACE SOIL CLEANUP OPTION** | **DESCRIPTION** | **ESTIMATED COST** |
| Monitored Natural Attenuation | Annual Soil and Groundwater Sample Collection & Analysis | $69,842 |

## 3.1 Sludge Waste Material Cleanup Options

### 3.1.1 Removal of Sludge with Off-Site Commercial Land Treatment Costs

This alternative assumes excavation and removal of 740 cubic yards of sludge and peripheral soil with trucking of the material and added bulking material to a disposal facility located near Williston, North Dakota. A total of 1,000 cubic yards of waste mixed with sawdust is assumed for this cost estimate. The total estimated cost for this approach is **$156,000**. This total estimated cost includes acquisition and placement of clean road-base backfill material in the excavated sludge pit.

The majority of the estimated costs associated with such an approach are in hauling of the waste material ($50,000) and disposal fees ($30,000) at the facility. This approach assumes that clean backfill material can be picked up by the waste hauler trucks on the return trip from the disposal facility. It is assumed that the use of sawdust mixed in each load will prevent excessive sticking of the waste material to the truck beds. It is

assumed that this measure will enable the dump trucks to be cleaned after each load through the use of a steam-cleaner, and that cleaning will not take longer than 15 minutes per round trip. It is assumed that truck washout can be performed at the disposal facility.

A cost estimate spreadsheet for sludge cleanup using Off-site (Williston, ND) Commercial Land Treatment is presented in Table C-1.

### 3.1.2 Removal of Sludge with Local Land Treatment Costs

This alternative assumes excavation and removal of 740 cubic yards of sludge and peripheral soil with trucking of the material and added bulking material to a local disposal facility located near Poplar, Montana. A total of 1,000 cubic yards of waste mixed with sawdust (27,000 cubic feet) is assumed for this cost estimate. The total estimated cost for this approach is **$110,131.00**. This total estimated cost includes acquisition and placement of clean road-base backfill material in the excavated sludge pit.

For the local land treatment approach, it is assumed that a temporary land treatment cell will be constructed at a suitable location outside the town of Poplar. Optimally this will be a flat-lying area located more than one mile from any surface water (streams, lakes, or rivers), with a clayey soil present at the surface.

A one-acre area would be scraped using a bulldozer so that the upper one foot of soil material is removed, and used to form a soil berm around the area. Waste material would be placed and spread within the interior of the bermed area to a maximum depth of one foot. Ideally the removal and land treatment strategy would take place in the spring so that biodegradation of petroleum constituents could proceed throughout the summer months, when ambient temperatures and associated microbial activity would favor breakdown of contaminants.

The cost estimate includes performance of periodic sample collection and analysis throughout the summer months to assess contaminant degradation. Once contaminant concentrations are shown to be below applicable cleanup levels, the treatment cell will be re-graded and seeded with native grasses.

A cost estimate spreadsheet for sludge cleanup using temporary Local (Poplar, Montana area) Land Treatment is presented in Table C-2.

### 3.1.3 Removal of Sludge with Onsite Thermal Desorption Costs

The Thermal Desorption alternative uses a generic rate for onsite treatment of waste on a per-cubic yard basis. It is assumed that approximately 873 tons of waste would be treated at a rate of $65 per cubic yard, plus excavation, backfilling, and oversight costs. This rate is based on the cited range of rates for this treatment technology by the U.S EPA OSWER Underground Storage Tank Cleanup program (see more information at www.epa.gov/oust/cat/LTTD.htm). The cited range of estimated costs per cubic yard is between $30 and $70 per ton of waste, depending on whether the site cleanup requirements can be characterized as easy of difficult. Based on the presence of semi-volatile organics in the waste material, the presence of a significant moisture component in the waste, and the clayey nature of associated soils, a value representing a difficult

site, i.e., $65 per ton, has been used for this cost estimate. It is assumed that the use of such an approach would be implemented onsite, i.e., no transport of the waste material would be necessary. The total estimated cost for onsite thermal desorption of the sludge pit waste material using the assumption of $65/ton plus excavation and oversight costs is **$117,145.50.** A cost estimate spreadsheet for sludge cleanup using these assumptions for Thermal Desorption is presented in Table C-3.

The Federal Remediation Technologies Roundtable (FRTR) Remediation Technologies Screening Matrix (www.frtr.gov/matrix2/section4/4-26.html) cites a generic cost range for thermal desorption at small sites between $75 and $232 per cubic yard, depending on site difficulty. Using an assumed rate of $200/cubic yard for the site translates to a cost estimate of **$160,000.00** for cleanup of the sludge material.

Based on this range of estimated costs for this approach to sludge cleanup, an average value of **$138,572** is selected to represent the estimated cost for a Thermal Desorption sludge cleanup alternative.

## 3.2 Monitored Natural Attenuation for Residual Low-Level Soil Contamination Costs

Regardless of the cleanup approach selected to address the sludge material present in the pit, residual low-level soil contamination would be present in the subsurface areas around the pit, to depths of approximately sixteen feet below the ground surface. Monitored natural attenuation of the low-level contamination is a cost-effective approach for addressing this subsurface contamination at this site. This approach involves periodic (annual) collection and analysis of subsurface soil and groundwater samples.

Three annual soil sampling events and three annual groundwater sampling events are assumed for this strategy. An additional one to three groundwater monitoring wells would need to be installed north and west of the pit under this approach to address uncertainties regarding groundwater flow directions at the site. Costs for installation of these wells are included in the cost estimate.

The total estimated cost for the monitored natural attenuation portion of cleanup at the Poplar sludge pit site is **$69,842.00**. This phase of cleanup applies to all three of the sludge removal and treatment options summarized above, i.e., regardless which of the sludge cleanup options as described above is chosen, monitored natural attenuation is recommended to address the residual low-level soil contamination that is present below depths of four feet.

A cost estimate spreadsheet for Monitored Natural Attenuation of residual soil contamination is presented in Table C-4.

# EXHIBIT D

**ALTERNATIVE SEP PROPOSAL DOCUMENT**

**Title: DELINEATION OF BRINE CONTAMINATION IN AND NEAR THE EAST POPLAR OIL FIELD: Strontium Isotope Sampling of City of Poplar Water Supply Wells and Potential Source Areas, Fort Peck Indian Reservation, Montana**

**Name of Tribe:** Fort Peck Assiniboine & Sioux Tribes

**Pollutant of Concern:** Chloride levels in exceedance of Secondary Maximum Contaminant Level's (SMCL) in one of 3 primary drinking water wells for the City, source unknown

**ALTERNATIVE SEP SUMMARY**

Last year as part of the ongoing brine delineation project, the Tribes were requested by the City of Poplar (COP) to investigate the water quality of the City public water supply (PWS) wells. During this time water quality information became available showing elevated chloride levels in COP Well #3 as early as 1985 and continuing today. After a thorough background and historical evaluation of the area it was determined that strontium isotope sampling was the most effective parameter to determine whether the well had been compromised by the production water being studied in the East Poplar Unit. Six samples were taken from city wells, area wells, and production water; however, the results were inconclusive.

We have received funding through the Bureau of Reclamation to analyze an additional 25 samples within the study area. At this time a technical steering committee was formed to critique and further develop the sampling and analysis plan including the U.S. Geological Survey (USGS), Environmental Protection Agency (EPA), State of Montana Department of Environmental Quality, the City of Poplar, and the area oil companies. During multiple discussions it became evident that an expert and unbiased third party, the USGS, would be required to collect the samples, provide the sampling equipment and supplies, and enter the data in to the distributed copy of the project database, as well as provide quality assurance, review and oversight by the USGS project Hydrologist for the entire event.

**1.0 INTRODUCTION**

In 1952, oil production began in the East Poplar oil field, a few miles northeast of the City of Poplar on the Fort Peck Indian Reservation in northeastern Montana. Since then, millions of barrels of brine have been produced primarily from the Charles Formation of the Madison Group. The brine, which contains 47,700 to 201,000 milligrams per liter dissolved solids, was placed in storage or evaporation pits or injected into subsurface geologic units by means of disposal wells. Improper handling and disposal of the brine has resulted in contamination of not only the unconsolidated Quaternary aquifers, but also the Poplar River. The Quaternary aquifers primarily consist of alluvium and glacial deposits and are as much as 100 feet thick. They are underlain by 700 to 1,000 feet of relatively impermeable Cretaceous Bearpaw Shale.

Previous investigations by Thamke and Craigg (1997) and Levings (1984) documented and delineated a portion of the extent of brine contamination in the East Poplar oil field. The extent of contamination was as large as 12.4 square miles. For comparison purposes, contaminated ground water in the East Poplar oil field contains dissolved-solids concentrations that are nearly 10 times greater than water that is produced during methane gas development in the Powder River Basin. Contaminated ground water in the East Poplar oil field contains chloride concentrations that are more than 400 times greater than chloride concentrations in produced water in the Powder River Basin. In the 10 years since the brine contamination was partially delineated, dissolved-solids and chloride concentrations in water from at least 17 domestic wells increased substantially (Thamke and Midtlyng, 2003), and the entire extent of contamination has likely grown larger.

**2.0 STATEMENT OF NEED**

The Quaternary deposits are the sole developed source of ground water in the area and provide source water for the City of Poplar water supply wells, which serve 2,900 local residents. Brine plumes in the East Poplar oil field are migrating toward the nearby City of Poplar. Contaminated domestic wells are less than 3 miles up-gradient of the City of Poplar and brine plumes in the shallow alluvium are adjacent to the Poplar River. Initial reports indicated the plumes could reach the City of Poplar's well field in as little as 2 years (MDEQ, 2002) or as many as 108 years (Land and Water Consulting, Inc., 2003), however new water quality data has come to light that suggests that the City of Poplar PWS well #3 may already be compromised. The well was originally drilled in 1985, and (according to recently found data) exhibited at that time a chloride concentration of 545 mg/l, above both natural background levels as well as the SMCL of 250mg/l that we have been using to identify the leading edge of the contaminant plume to the north. The raw water in well #3 was sampled by the OEP upon request in April 2009 and the chloride level was 439mg/l. The well was sampled a second time in May 2009 and found to have a level 782mg/l, a 78% increase above the March levels.

Because this well has had elevated chloride levels since 1985 there is considerable debate as to the cause. Does this reflect a local contamination source (natural or human caused) or is the contamination related to the oil and gas field brine plume?

Although selected residents in the East Poplar oil field have received potable water supplies through USEPA emergency orders, alternative water supplies are not currently available for the City of Poplar or other residents located down-gradient of the contamination. Currently there is not enough data to determine whether the high chloride concentrations are a result of natural conditions or if the oil field brine contamination has already reached the City of Poplar through a previously unidentified pathway. In light of the high chloride levels in PWS well #3, the Tribes have been partially funded through the BOR to conduct a comprehensive delineation of the brine contamination as well as determination of migration and identification of all brine sources is needed to evaluate the true threat to the City of Poplar. This project proposal is supported by both the City of Poplar and by residents affected by the groundwater contamination

**3.0 PROJECT WORK PLAN**

The project area includes the East Poplar oil field and extends south to include the town of Poplar (approximately 9.5 miles E-W and 14 miles N-S). Delineation of the brine contamination was scheduled to span a six-year period, and was divided into two project phases ending in August of 2009 (detailed work plan available upon request), and has now reopened for further investigation with regard to elevated chloride levels in the City of Poplar public water supply.

It was determined that the most effective method of investigating possible chloride sources is further sampling including strontium isotope analysis of the City and area wells to rule out oil field brine as a potential contaminant source. Differences in delta strontium-87 ($\delta^{87}$ Sr) composition of ground water have been used to identify saline water sources and have had successful application in the identification of the effects of oil field brines on a national level and locally within the Williston Basin, only 65 miles northeast of the brine delineation project area (http://steppe.cr.usgs.gov/pres.html). If the $\delta^{87}$ values were similar in the City and area wells, it would confirm the possibility that the oil field brine has reached the city well field. If the values differed significantly, then the source remains unidentified. Six samples were taken in 2009 and the results proved inconclusive.

**SEP Requested Funding Activity and Output:**
Samples will collected during July 2010 will be analyzed at the USGS Yucca Lab, which is EPA certified and will provide interpretation along with the analysis for the samples. Initially the sampling was to be conducted by the Fort Peck Tribes OEP, however, due to the sensitive nature of the project in dealing with the safety/susceptibility of a public water supply and the potential for future litigation regarding the water quality within the Lower Poplar Watershed, the OEP now believes that it is necessary to have an unbiased third party conduct the sampling, in this case, an experienced technician from the USGS to take the samples with assistance in locating the wells and equipment set up and take down from the OEP, with data validation and entry also conducted by the USGS. Once collected, these samples will be submitted to the USGS Yucca Lab where expert personnel are prepared to analyze

the samples before the end of FY 2010 and have made a commitment to interpret the strontium isotope ratio findings immediately following for a total period of approximately 4 months of approval by the RJO.

The data derived from this effort will provide supplemental information in contaminant preferential pathways, concentrations, and further aquifer characterization of the communication and transition between the Poplar River Bench and Alluvium and the Missouri River Valley Alluvium; providing the short term outcome of increased agency understanding of the contaminant plumes as they move through the Lower Poplar Watershed, and the long term outcome of allowing informed and effective decision making in regard to public health, water quality, and the protection of tribal resources. . In other words, if the strontium data links the elevated chloride level in PWS well # 3 with the oil and gas field brine plume a new approach to addressing the plume may be required to protect human health and the environment. For example, if the elevated chloride in PWS well #3 comes from the plume then its shape may be larger than previously understood and private wells currently considered out of the plume will need to be tested for contamination.

that provides a crucial bridge in understanding the geology of the area and behavior of the contaminant plume and to definitively establish whether or not the high chloride levels in the public water supply are naturally occurring; if not the City of Poplar and the Tribes will need to carefully examine the consequences of historical oil production and look to identify the economic impact that the development has had on one of the most precious of the Tribes resources, it's drinking water.

Proposed expanded sampling activities are estimated to cost additional monies currently unaccounted for through other sources in FY10-11, therefore, the tribes propose to use the balance of the SEP funds, **$12,566**, with a tribal match of $5,934 for a total of $18,500.

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