Wisconsin Department of Natural Resources

REPORT

Work Plan for Interim Action

Kewaunee Marsh Arsenic Site
Kewaunee, Wisconsin

STS Consultants Ltd.
Consulting Engineers

July 26, 1995

Mr. James R. Reyburn
Wisconsin Department of Natural Resources
1125 N. Military Avenue
Green Bay, Wisconsin 54307-0448

Re: Work Plan for Interim Action at the Kewaunee Marsh Arsenic Site, Kewaunee, Wisconsin -- STS Project No. 20716XA

Dear Mr. Reyburn:

STS Consultants, Ltd., (STS) is please to submit this letter work plan for Interim Action at the Kewaunee Marsh Arsenic Site. This work plan is being submitted in anticipation of a cooperative agreement with the Wisconsin Department of Natural Resources (WDNR) so that wood chip acquisition and storage can proceed and, the interim action can be completed during February 1996, at as low a cost as possible.

1.0 Proposed Interim Action

The Interim Action will include placement of a geotextile/woodchip cover over the visibly impacted areas of the marsh and installation of an additional 3,500 feet of cyclone fence. The enclosed drawing illustrates the proposed location of the geotextile/woodchip cover and security fence. The Interim Action has been design to restrict site access and to prevent direct contact exposure to wildlife.

The Interim Action also addresses surface water migration concerns. Construction of the proposed permeable cover would prevent direct runoff through the area of highest arsenic impacts and reduce the potential for elevated arsenic concentrations from reaching the river. Once the cover is in place, a portion of the precipitation that falls on the cover will runoff of the cover without contacting the arsenic impacted area. The remainder of the precipitation will evaporate or percolate through the cover and not contribute to runoff. The proposed interim action is described below.

Woodchips will be obtained from the City of Green Bay and stockpiled at the Fox Valley and Western Ltd. North Railyard. In the Fall, the City of Green Bay will provide a drum chipper and raw yard waste for on-site chipping. Approximately 30,000 cubic yards of woodchips will be stockpiled until the marsh surface is frozen and solid enough for placement of the geotextile/woodchip cover.

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The abandoned "Y" at the spill site will be excavated to supply fill material for construction of the geotextile anchor berm. Excavated material will be hauled and then dumped adjacent to the railroad grade for construction of the berm. Sections of the existing security fence will be removed to provide access for berm construction.

Geotextile will be anchored by the berm and will be placed over the impacted marsh surface (approximately 159,000 ft^2). Geotextile seams will be sealed to create a continuous cover prior to woodchip placement.

A four foot thick woodchip cover will be placed over the geotextile cover. Woodchips will be transported from the Fox Valley and Western Ltd. Railyard via rail cars. Woodchips will be dumped onto the geotextile cover adjacent to the railroad right-of-way. The woodchips will then be pushed out over the geotextile cover.

Upon completion of the geotextile/woodchip cover, the dismantled sections of the security fence and an additional 3500 feet of fence will be installed.

Monitoring will be conducted to determine long term effects of the interim action on the Kewaunee river. Monitoring will include installation and monitoring of a minimum of two monitoring points in the marsh within 100 feet of the west bank of the river. Pore water samples will be collected from these sampling points. In addition, monitoring of arsenic concentrations within the river will be conducted by sampling river water at the railroad bridge where sampling has previously been conducted. Samples will be collected in April and October of each year and be submitted to a certified analytical laboratory for arsenic analysis.

2.0 Opinion of Costs

We anticipate that the Interim Action described above can be implemented for an estimated cost of $422,000. The following Table summarizes the estimated costs included in this total.

Opinion of Costs

Geotextile Cover:	$ 130,000
Woodchip Cover:	$ 122,000
Fence Installation:	$ 50,000
Project Management/Design/ Report Preparation:	$ 25,000
Field Documentation:	$ 25,000
Subtotal:	$ 352,000
20% Contingency:	$ 70,000
Total:	**$ 422,000**

3.0 Proposed Interim Action Schedule

The following Table presents the anticipated schedule for implementation of the proposed Interim Action.

Tentative Date	Action
July 1995	Woodchip stockpile site preparation and start of acquisition of woodchips from the City of Green Bay.
October 1995	Excavation of the abandoned "Y" to supply fill material for construction of the geotextile anchor berm. Sections of the existing security fence will be removed to provide access for berm construction.
January 1996	Construction of cover.
February 1996	Installation of fence after the completion of the cover.

4.0 Remedial Action Alternatives

A list of remedial alternatives was compiled from a preliminary assessment of technologies which may be suitable for site remediation. The preliminary technologies were evaluated to identify low cost, innovative alternatives for site remediation. A preliminary opinion of feasible remedial alternatives and an opinion of costs for each alternative was completed. The opinions of costs were compiled for comparison purposes only.

Opinions of costs are based upon treatment or containment of impacted material within the 3,000 milligram per kilogram (mg/kg) isoconcentration line adjacent to the railroad right of way. This area has an approximate surface area of 39,200 square feet. The approximate volume of material in this area from the ground surface to a depth of 8 feet is 14,500 cubic yards. Remedial alternatives reviewed and opinions of costs are as follows:

1. Containment: $2,500,000 to $3,000,000

   Costs include construction of work platforms, installation of 800 linear feet of double wall sheeting containing concrete-bentonite slurry to a depth of 30 feet, and a fabric and soil cover.

2. In-Situ Fixation: $2,500,000 to $12,500,000

   Cost range reflects unknowns regarding material treatment. In-Situ fixation would require treatability studies before system design or implementation.

3. Thermal Desorption: $9,000,000

   Costs include treatment of material only. Estimated cost does not include material handling or dewatering. Thermal desorption would require material to pass TCLP test before implementation.

4. Disposal in Subtitle D Landfill: $3,500,000 to $4,000,000

   Costs include shipping, stabilization and disposal in a Subtitle D Landfill. Estimated cost does not include material handling or dewatering. Estimated cost assumes material can be chemically stabilized to pass TCLP test.

5. Excavation: $5,000,000 to $5,500,000

   Costs include construction of work platforms, installation of a containment system, excavation and dewatering of impacted material. Estimated cost does not include treatment of excavated solids, or treatment of generated water.

The list of remedial alternatives and estimated costs was compiled from a preliminary assessment of technologies which may be suitable for site remediation. This list is for comparison purposes only and cannot be used to determine actual site remediation costs.

During the July 25, 1995 meeting with the WDNR, the inclusion of "hotspot" excavation or installation of an impermeable cap over the "hotspot" were discussed. Based upon cost estimates supplied for remedial action alternatives, STS estimates that costs for hotspot (>3,000 mg/kg adjacent to railroad right-of-way) excavation would be approximately $9,000,000 (see Nos. 4 and 5 above). This estimate includes costs for construction of working platforms, installation of a containment system, excavation and dewatering of impacted material and disposal in a Subtitle D Landfill. Even after "hotspot" removal, it may be necessary to implement measures such as installation of a cover and security fencing to prevent direction contact exposure. Given these circumstances, we do not believe "hotspot" removal is practical.

The WDNR indicated that installation of an impermeable cap over the "hotspot" could be an alternative to excavation. Initial review of impermeable cap installation identified some problems. First, with no underlying support for the impermeable cap, the weight of the cap may cause it to sink. Second, with the groundwater table at the ground surface, the horizontal component of groundwater flow may have a greater impact on arsenic mobility than precipitation infiltration. Therefore, an impermeable cap may provide little benefit if any in controlling arsenic migration.

As was stated at our meeting of July 25, 1995, we believe that the Interim Action proposed above represents the most reasonable and practical alternative for this site. It would address the Department's immediate concern -- minimizing the potential for direct contact exposure to humans and wildlife. It would also provide for continued monitoring of the Kewaunee River. Based on the fact that the monitoring conducted in the river to date has not detected any arsenic and the fact that the original release likely occurred at least 40 years ago, we do not believe there will be any significant, adverse impact on the river.

We look forward to working with the Department during this project. If you have any questions regarding this work plan or our answers to your questions regarding "hotspot" remediation, please contact Mark Bergeon at (414)468-1978.

Sincerely,

STS CONSULTANTS LTD.

Michael T. Berger
Microbiologist

Mark A. Bergeon, CPG
Associate

MAB/hlw.wp

Copy to:

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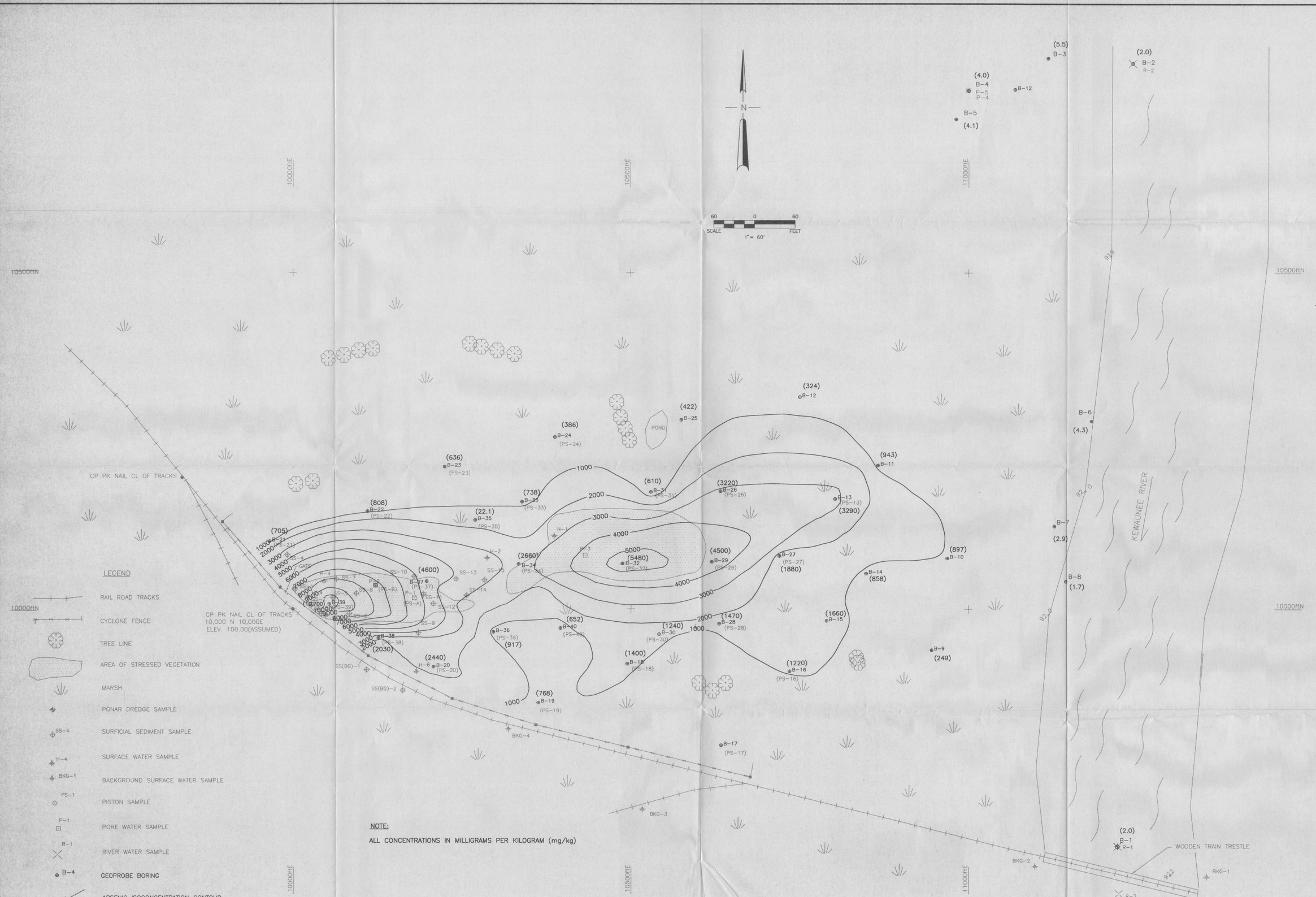

NOTE:

ALL CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM (mg/kg)

REVISION	BY	DATE

DRAWN BY D.T.B. DATE 3-17-95
CHECKED BY MTB DATE 5-23-95
APPROVED BY [illegible] DATE 5-23-95
CADFILE C:\DTB\20716XF\4DWG.DWG

SITE

FOX VALLEY & WESTERN LTD.
KEWAUNEE MARSH ARSENIC IMPACT SITE
KEWAUNEE, WISCONSIN

SEDIMENT QUALITY

STS Consultants Ltd.
Consulting Engineers

STS PROJECT NUMBER 20716XF
STS PROJECT FILE
SCALE 1" = 60'
SHEET NUMBER 20716XF-4

02-31-0005015 K 7/27/1995 RA&R