

# Additional Information Sheet

## a) Location maps and legal description

NW1/4SW1/4, Section 35, T33N, R2W, Taylor County, Wisconsin, USA

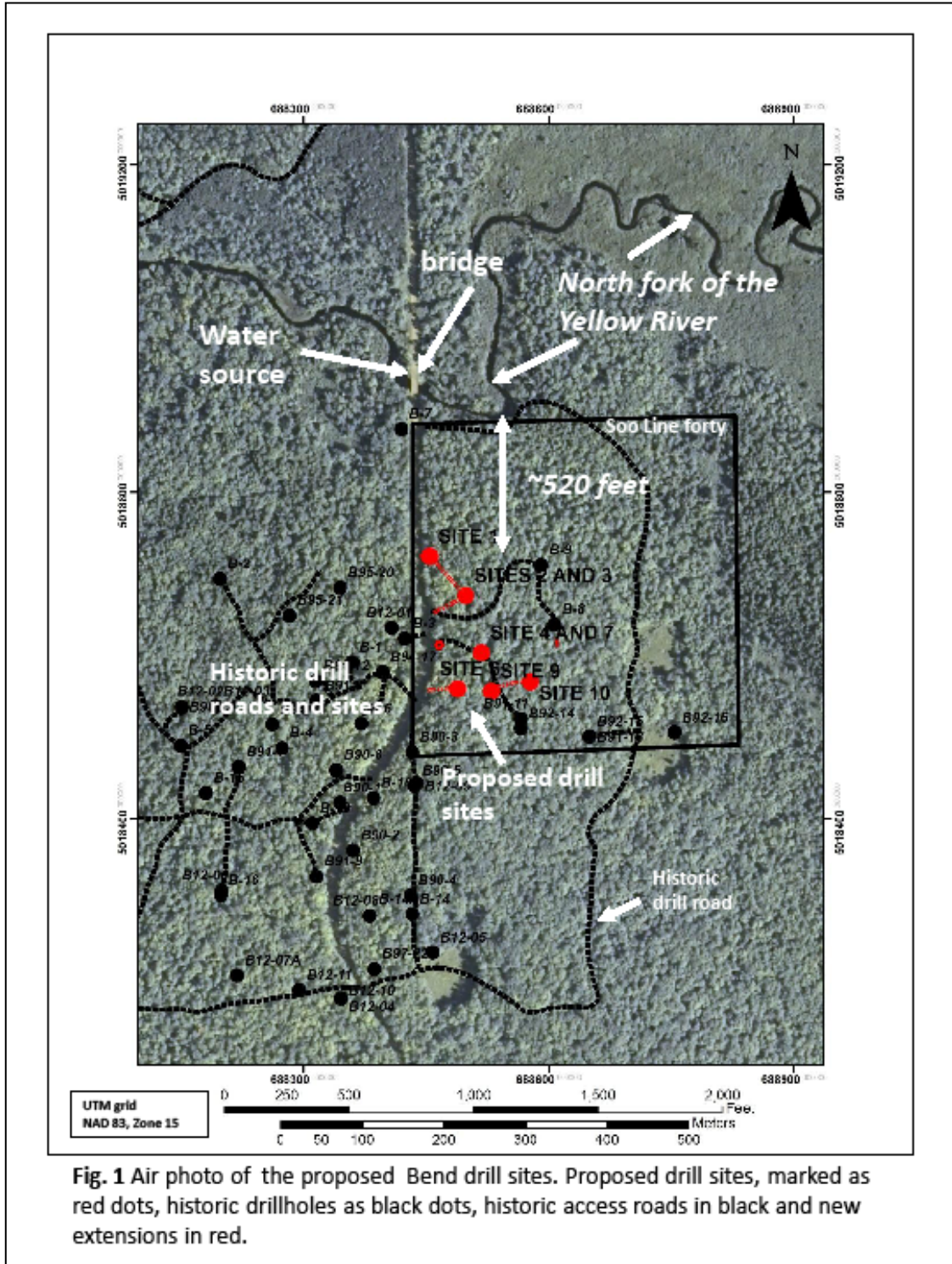


Fig. 1 Air photo of the proposed Bend drill sites. Proposed drill sites, marked as red dots, historic drillholes as black dots, historic access roads in black and new extensions in red.

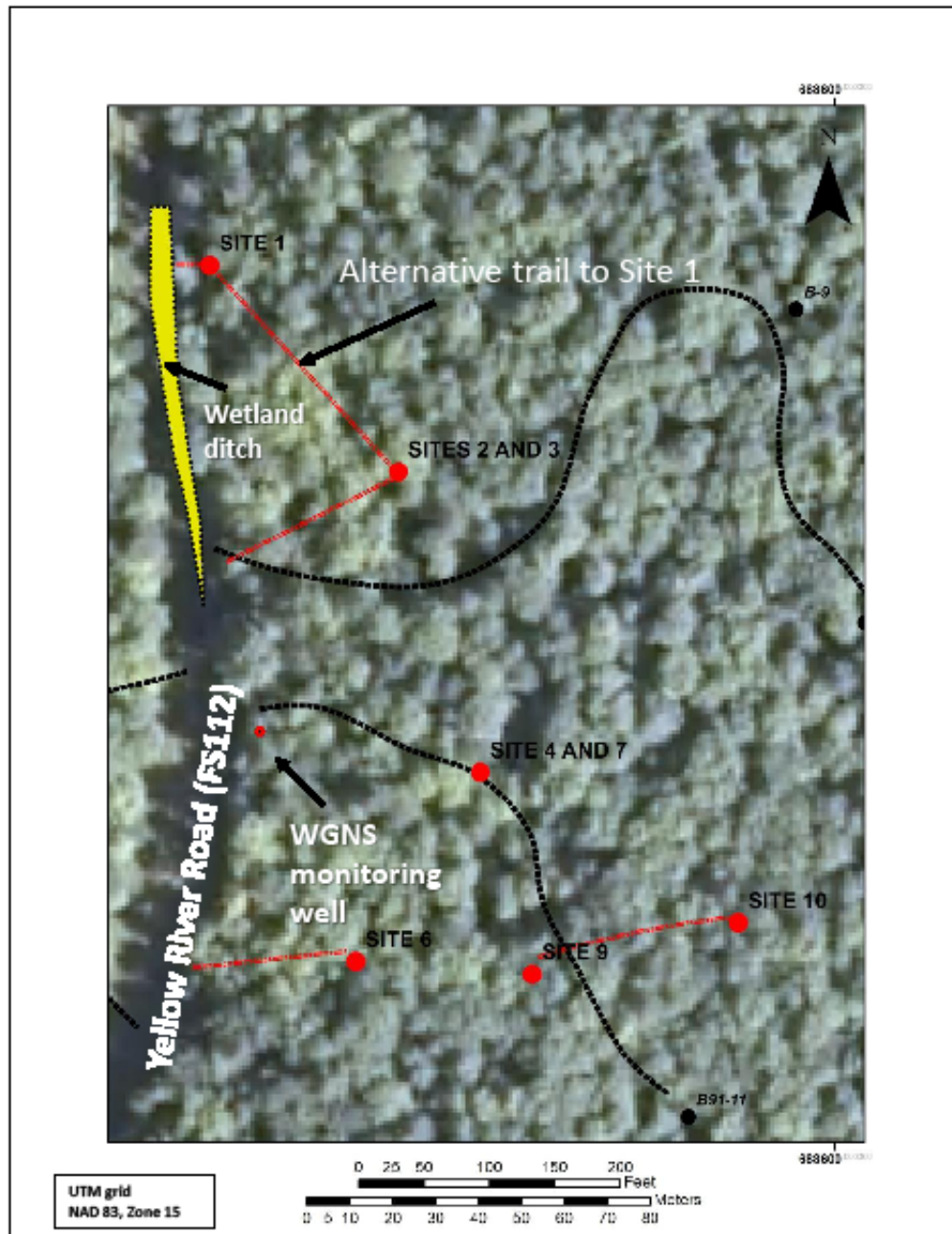


Fig.2 Wetland survey map of the proposed Bend drill sites. Results indicate a partially wetland ditch shown in yellow. Proposed drill sites, marked in red dots, historic drillholes (marked as black dots), historic access trails /roads in black and new extensions in red are located in areas of mature trees spaced well apart with a fairly open understory.

## b) Overburden drilling

- 1) Before diamond coring operations begin, hollow 10-foot long steel casing (4"-6" diameter) is either rotary-drilled or cored through the unconsolidated glacial overburden and down to solid bedrock. The casing is driven 5-10 feet into fresh

bedrock. This assures groundwater aquifers are sealed off from the bore hole to prevent cross contamination between aquifers and introduction of contaminants to groundwater. Further ground water protection is provided by using bentonite as a drilling mud during overburden drilling. The bentonite mud adds stability to the hole and prevents lose of water during the drilling operation by forming a sleeve that holds in the fluid.

- 2) Drilling fluids – Surface water (treated with chlorine) will be used as the primary drilling fluid and may be mixed with bentonite +/- WDNR approved drilling additives. (See attached list of approved drilling fluids – *“WDNR\_Aproved\_DrillAbandonProducts\_May2022.pdf”*)
- 3) Water source is the North Fork of the Yellow River (see Fig. 1).
- 4) Water from the river will be pumped by a portable pump unit into a 500-gallon tank mounted on a two-or three-axle flatbed truck. The pump site is the bridge deck on the Yellow River Road that crosses the North Fork of the Yellow River (see Figure 1). Snow plowing of the Yellow River Road by the Township during winter allows this site will be accessible during this time.
- 5) The drillers record the amount of water taken from the river in their daily reports.
- 6) Chlorine bleach is added to the surface water prior to usage as a drilling fluid to prevent organic contamination to groundwater. The Michigan Department of Environment, Great Lakes, and Energy (Formerly DEQ) provides specifications for disinfecting surface water for the use in drilling mineral wells in Michigan. These specifications will be utilized for this drilling program and chlorine additions will be recorded by the drilling contractor in their daily shift reports. (See attached document for specifications *“EQC\_7200-1\_Requirements\_for\_sources\_of\_water\_and\_water\_wells\_372147\_7”*)
- 7) In the event that traffic due to water hauling causes excessive disturbance (i.e. during a thawing event), the water source is close enough to the drill sites that direct pumping may be an option. A portable pump unit would be set up along the North Fork of the Yellow River or adjacent to the bridge that crosses the river A water line would be set up from the pump to the drill site and water pumped from the river, on an as needed basis, to the drill site and stored either in the sump or water tank. Line heaters may be necessary to keep the water from freezing.
- 8) A reporting District Ranger is to be designated by USFS; likely Mat St Pierre; GLM will include DNR personnel on all notices.

**c) Access and Site Preparation**

- 1) Site and road preparation will begin upon issuance of all necessary permits for conducting the drill program and will initially consist of cutting brush and small trees (<3') with chain saws at each drill site, and along established drill roads and new road extensions. After clearing is completed, and during a stretch of weather where temperatures will remain below freezing, a small dozer will be utilized to partially remove and/or pack down snow along the access routes and at the drill sites to reduce the insulating effect of the snow. A visual inspection of the access routes and drill sites will be completed to determine if ground conditions are suitable to initiate drilling activities or to determine if additional time/work is required.
- 2) See above.
- 3) Road construction, as it pertains to the NOI, involves creating a temporary path (approximately 10' wide) through the forest to access drill sites as outlined in 1) above. Existing trails will be utilized as much as possible and access routes will be selected to avoid the removal of mature trees and to avoid terrain that would require significant disturbance to soils. No road building (i.e. grading, filling, or installation of culverts) will be required.
- 4) Erosion control measures are not anticipated to be necessary due to conducting the drilling activities during frozen ground conditions. In the event that unanticipated ground disturbances such as excessive rutting (or anticipated disturbances such as in the case of sump construction at the drill site) are located in areas in proximity to water features or along terrain where erosion may occur and sediments could be transported, GLW will utilize mulch (likely straw) and/or silt socks to prevent the transport of sediment away from the disturbed area. Mulch will be placed directly over the affected areas upon discontinuing use of the access route or drill site and silt socks, if necessary, will be placed directly on the ground surface down slope of the disturbance. Such instances will be dealt with on a case-by-case basis and will be discussed with DNR field staff during operations. During spring break-up any erosion control measures implemented during the program will be monitored to ensure their effectiveness and modifications of such implements will be made, as necessary, to ensure that the erosion control measures remain effective until final reclamation can be completed.
- 5) Excessive rutting is defined as ruts greater than one foot deep and determined by visible inspection.
- 6) GLW confirms that total disturbances will remain under 1 acre. The area included within new access routes and drill sites is estimated to be ~0.5 acre which is far below the 1 acre threshold which would require a construction storm water permit (see Exploration plan).

- 7) If there is an unexpected cessation of work, all equipment will either be removed from the drill site or secured onsite and removed as soon as possible. Partially completed drillholes will be temporarily abandoned with their casings capped (treaded or welded cap) and sump pits filled or fenced off. Erosion control measures will be implemented as discussed in 4) above until final reclamation can be completed
- 8) All activities will be completed during frozen ground conditions except for final reclamation of the drill sites and access roads.

**d) Water Management, Sump Construction/Reclamation**

- 1) Ground water depth will be measured by inspection during digging of the sump at each drill site. Additional groundwater depth in the immediate area of the drilling operation can be derived from WGNS monitoring well (WA233).
- 2) Disturbance at each drill sites will include one 20' x 20' by 10' - deep pit (maximum size; generally smaller) to contain returned water and drill cuttings. The sump pit would be constructed by a tract-mounted backhoe and located along one side of the drill rig. Excavated soils (top soil and sub soil) would be segregated and stockpiled near the pit. When sump use is completed, the cuttings and bentonite will be allowed to settle to the bottom of the pit and then the water can be pumped out on the surrounding ground surface. Before the pit is backfilled and leveled, cement will be mixed with the drill cuttings.
- 3) During drilling operations, water is collected in a small circular trench dug by hand around the drill collar and directed to the sump pit by a shallow trench (several feet long) also dug by hand.
- 4) During construction of the sump pit the walls and base of the sump are lined with 1" of bentonite by hand. The walls will be sufficiently cut at an angle to accommodate the layer of bentonite. An alternative option is to line the sump pit with a 20-mil or greater polyvinyl chloride or polyethylene geomembrane as prescribed in NR130.110 (1) (b).
- 5) If flowing well conditions are encountered during drillhole abandonment, GLM will contact DNR for approval on how to procedure before continuing work. One option is to permanently abandon the drillhole immediately.
- 6) During reclamation a sufficient number of bags of cement will be added to the sump in order to solidify the cuttings in the dewatered pit. It is common practice in the masonry industry to combine aggregate, such as sand, to Portland cement at a ratio of 4 parts sand to 1 part cement. A ratio of 3 parts cuttings to 1 part cement will serve as a starting point for solidifying the mud/cuttings mixture. The solidification of the mixture will be monitored over a 24 to 48-hour period to

ensure solidification and additional bags of cement will be added as required. The cement is mixed with the bentonite mud, cuttings and free water in the sump with the bucket of a backhoe. Under normal winter conditions, the sump will be covered with a tarp to ensure that the mixture is kept relatively warm for at least 48 hours. If severe conditions persist, sump reclamation will be delayed to the spring. Native soils will be stockpiled and stored at the drill site near the sump pit and later used during back filling and leveling.

- 7) When sump use is completed, the cuttings and bentonite mud will be allowed to settle to the bottom of the pit until the water is clean enough to be pumped out on the surrounding ground surface. If weather conditions permit the sump to be amended with cement and reclaimed immediately, the sump will be backfilled with stockpiled soil and covered with stockpiled topsoil after the cuttings are amended with cement. If the disturbed area is located in proximity to water features or along terrain where erosion and transport of sediment to water features is possible, straw will be used to cover the disturbed area to minimize transport of sediment and a silt sock will be laid directly on the ground surface in the down-slope direction of the disturbed area and left in place until final reclamation of the drill site can be completed. If weather conditions do not permit immediate reclamation, water will be pumped from the sump and re-used in the drilling process and a fence will be placed around the perimeter of the sump until final reclamation can be completed. To ensure that sediment from disturbed areas, including stockpiled soils, are not transported to water features, the use of straw and/or silt socks will be implemented as described above. GLM recognizes that the discharge of water from the sump may require a WPDES permit.
- 8) If flowing well conditions are encountered during drillhole abandonment, GLM will contact DNR for approval on how to procedure before continuing work.

**e) Management of drill cuttings, mud, and other pollutants**

- 1) Approximately 2% to >90%, fine to coarse-grained pyrite + chalcopyrite are expected in the drill cuttings.
- 2) The only sulfide-bearing waste generated during the operation would be contained in the drill cuttings which are disposed of in the sump pit as described above.
- 3) To contain materials that could be released due to equipment failure, spill containment materials and absorbent mats will be place under all equipment such as pumps, hoses, fuel barrows and the drill rig itself. These would be removed upon removal of the drill rig from the site.

#### **f) Drillhole abandonment**

- 1) Permanent abandonment of drillholes will be in accordance with NR130.111 (1) (b) and requires filling the entire hole from top to bottom with concrete or neat cement. GLW will likely use neat (Portland) cement that is mixed on the drill rig (typically within a 55 gallon drum in batches that allow for the cementing of approximately 100' of drillhole) and used immediately to avoid freezing. The abandonment procedure includes the neat cement being pumped down each hole through a conductor pipe (drill rods). Rods will be removed concurrently with the filling of the drillholes with the bottom of the rods kept below the surface of the fill material throughout the operation. When cement is pumped under water by a conductor pipe, the bottom end of the conductor pipe shall be submerged in the cement at all times. If removal of all or part of casing from an unconsolidated formation results in the caving of the borehole, the casing will be removed concurrently with the filling of the drillhole and the bottom end of the casing shall be kept below the surface of the fill material throughout the operation.
- 2) Cement is mixed at the rate of 1- 94 lb. bag of cement to 6 gallons of water. The drillers will record amounts of cement and water used in their daily reports.

#### **g) Topsoil Management**

- 1) Soils from the sump pit will be dug with a small backhoe, segregated, and stockpiled adjacent to the sump pit. Upon backfilling the sump, topsoil is spread across the reclaimed sump and will be reseeded during the following spring. If the reclaimed sump is located upon terrain where erosion of the topsoil may take place, straw will be placed over the topsoil to prevent transport until reseeded can be completed. If a sump is not immediately backfilled and such activities are planned to occur during the following spring, erosion and sedimentation controls will be implemented as discussed previously to prevent sediment from leaving the drill area and a tarp will be secured over the topsoil stockpile to ensure its availability for use in final reclamation.
- 2) The stockpiles will be stored adjacent to the sump pit and within the drill site footprint.

#### **h) Invasive species management and timing of final reclamation**

- 1) Other than general cleanup, drillhole abandonment and possible sump pit closure, complete restoration of the drill sites under frozen conditions cannot be achieved. Restoration work, including mulching and re-seeding would be completed in the following spring. As stated above, erosion and sedimentation controls will be implemented and topsoil stockpiles will be covered after drilling has been completed.

- 2) GLM confirms that any equipment and brought to the site will be delivered in a clean state and free of mud/weeds/debris from previous sites. All mulch and seed mixtures used for reclamation purposes will be certified seed and weed free.

#### **i) Pollution Prevention**

- 1) Because of the remoteness of the project area, there are no known potential pollution sources that GLM is aware of within the project area. Since all of the drill sites are in uplands (high ground), fuel storage tanks will be kept within the drill site disturbance area at each site during the operation. They will be moved from site to site as the drilling proceeds or placed in an upland staging area used during past drilling programs. Spill kits will be available at all drill sites and at locations where fuel or other hydrocarbons are being stored.
- 2) The drilling sites are not located within floodplains. Floodplains within the vicinity of the project area are located primarily within wetland areas below the 1320-foot elevation. All drill sites are located on a broad topographical feature above this elevation.

#### **j) Reclamation**

- 1) All solid and liquid waste (drill rods, empty drums, wood, plastic, etc.) will be removed from the project area by the drilling contractor and disposed of in accordance with State waste management rules.
- 2) Reclamation of the sumps will be completed per procedures outlined in NR130.110 (2) (a) 2.
- 3) Reuse of top soil is a priority. Stockpiled topsoil will spread by hand or small backhoe over the reclaimed sump pit and disturbed areas where it has been removed.
- 4) Drill site reclamation and revegetation methods
  - a. Reclamation of access roads and drill sites are as follows:
    - a) spreading top soil over disturbed areas
    - b) filling all ruts along drill roads and drill sites
    - c) remove cement from drill collars of permanently abandoned drillholes
    - d) treaded water-tight caps placed on temporarily abandoned drillholes
    - e) brush and small timber scattered
    - f) pruning seal applied to scraps on effected trees
    - g) remove all equipment from staging area, drill sites, access roads etc.
    - h) seed/mulch disturbed areas
    - i) block main access roads with large rock boulders



- b. Seed mixes for reclamation will be determined by the DNR/USFS.
- c. Areas of soil disturbance will be stabilized by vegetation by seeding and mulching to prevent the transport of sediment by air/water and will include stabilization of access routes and drill sites via DNR/USFS— approved, non-invasive seed mixtures and placement of weed and seed free straw over the revegetated areas.

5) Wetland Impacts

- a. Access to Drill Site 1 crosses a 5-foot wide ditch designated as wetlands. Either the ditch can be filled in with snow and packed down or a wood mat can be laid across the ditch. If this is not acceptable to the DNR, GLM will construct a new road extension from Drill Site 2; approximately 180 feet for an incremental increase in potential surface disturbance of 0.04 acres. This alternative access route is shown in Figure 2 and the incremental increase to potential surface disturbance would then total 0.52 acres, well under the 1 acre threshold.
- b. See Above
- c. No gravel or culverts are necessary for this project.
- d. See above.
- e. No gravel will be necessary during this drilling program.
- f. The ditch along the Yellow River Road that accessed Site 1 can be filled in with snow and packed down or a temporary wood mat laid across the ditch avoiding any impacts. If this is unacceptable, an alternative access route has been proposed (see 5a above).

6) Cost Estimate

<b>Reclamation cost estimate</b>			
<b>Drillhole Abandonment</b>			
	<b>Unit cost \$</b>	<b>Units</b>	<b>Total \$</b>
Mob/DeMob drill / grouting unit	4,000	1	4,000
Grouting - diamond drillholes	20/bag	24 (1bag/300')	480
Labor (average 1-12hr shift per hole)	300/hr	12hrs per hole/ 8 holes	28,800
Cementing sump pits	20/bag	8 sumps (av. + 5 bags/sump)	800
Labor (average 4 hrs per sump)	150	8 sumps	4,800
Backhoe operator	250/hr	20hrs	5,000
<b>Manual site prep/ seeding/mulching</b>			
Labor - 4 hrs per site ( 6 sites + roads)	150/hr	6 sites + roads	5 000
Seed - 75lbs/acre (for 1 acre max)	42.00/lb	0.5 acres	1,575
Mulch - 5 bales of straw/site	12/bale	6 sites + roads	480
		<b>Total estimate</b>	<b>45,935</b>

Additional Information:

- GLW will provide copies of all relevant correspondences with federal agencies.
- An *Endanger Resources Review (ERR)* request has been submitted to the DNR for the project area.
- The DNR will also be notified of any unanticipated archaeological discoveries.