DEPARTMENT OF THE ARMY
BADGER ARMY AMMUNITION PLANT
S7273 BLUFF ROAD
MERRIMAC, WISCONSIN 53561

June 6, 2018

SUBJECT: Gruber's Grove Bay Sediment Sampling Work Plan Addendum
Badger Army Ammunition Plant

Mr. Bill Fitzpatrick, P.E., P.G.
Wisconsin Department of Natural Resources
101 S. Webster Street
Box 7921
Madison, WI 53707-7921

Dear Mr. Fitzpatrick:

Per your letter dated January 23, 2018 regarding mercury contaminated sediment in Gruber's Grove Bay (GGB), the Army will be collecting additional sediment samples to delineate the horizontal and vertical mercury concentrations. This letter outlines the scope and schedule of the sediment sampling investigation.

The following outline of sediment sampling activities serves as an Addendum to the November 2015 Gruber's Grove Bay Remedial Investigation Work Plan. The sediment sampling conducted by the Army during February 2016 utilized the procedures outlined in the November 2015 work plan. The November 2015 work plan serves as a guide for the sediment sampling activities presented herein. The same sediment sampling methods, sampling equipment, sediment evaluation, documentation procedures, decontamination procedures, quality assurance and quality control procedures, and data analysis methods used during the 2016 sediment sampling investigation will be used. Any deviation from those procedures are outlined below.

The Army has requested SpecPro Professional Services, LLC (SPS) to conduct the sediment sampling within GGB during June 2018. SPS also conducted the February 2016 sediment sampling investigation. SPS will commence the sediment sampling on June 11, 2018. SPS expects to complete the field work by June 20, 2018. Upon review of the laboratory data, SPS will prepare a summary report that will be submitted to the Wisconsin Department of Natural Resources (WDNR).

The February 2016 sediment investigation characterized the mercury concentrations in the upper 6 inches of residual soft sediment. Sediment below 6 inches was not analyzed for mercury during the February 2016 investigation. The mercury concentrations were compared to the Most Probable Background Concentration (MPBC) of 0.36 milligrams per kilogram (mg/kg). The sediment sampling that will be conducted during June 2018 will evaluate the mercury concentrations below 6 inches and down to the native clay/silt sediment. This investigation will help define the vertical extent of mercury concentrations above the MPBC within GGB.

Figure 1 (enclosure) provides a layout of the estimated 41 sediment sample locations being proposed in GGB. Figure 2 (enclosure) shows the estimated 41 sediment sample locations and the bathymetric contours (water surface to top of sediment). Thirty-nine of the 41 proposed sediment

sample locations were previously evaluated during the 2016 investigation. At each proposed location, the piston-type coring sampler will be driven until firm sediment is encountered. Based on the 2016 investigation, the butterfly valve core tip on end of the sampler will provide the best sample recovery. Vertical sediment samples will be analyzed for mercury from the following recovered sediment core intervals (when available): 6 to 18 inches, 18 to 30 inches, and 30 inches to maximum depth. The proposed sample locations shown on Figure 1 were chosen based on the 2016 mercury concentrations and the measured soft sediment below 6 inches.

To help define the horizontal extent of mercury concentrations above the MPBC, an attempt to collect sediment at sample location GGB-48 will be made. During the 2016 sampling event, sediment could not be recovered from GGB-48 for mercury analysis even though 1.4 feet sediment was measured in the field. If sediment is recovered from GGB-48, the samples will be analyzed for mercury from the 0 to 6 inch and 6 to 18 inch intervals.

As shown on Figure 1, the mercury concentration in GGB-89 (0-6 inches) was above the MPBC of 0.36 mg/kg. The Army has chosen to further define both the horizontal and vertical mercury concentrations south of GGB-89. The top of sediment at GGB-89 was measured in 2016 to be 20.9 feet below the water surface. Sediment samples will be collected from further into the Wisconsin River at GGB-96 and GGB-97. Additional sample locations may be collected south and/or southeast of GGB-96 and GGB-97. These additional locations will only be collected if the sampling equipment and methods allow due to an increase in sediment depth. If sediment is recovered from GGB-96, GGB-97, or these additional locations, the samples will be analyzed for mercury from the following available intervals: 0 to 6 inches, 6 to 18 inches, 18 to 30 inches, and 30 inches to maximum depth.

Sediment thickness measurements (probing) will not be conducted where previous sediment samples were collected in 2016. Any new sampling location will have sediment thickness measurements collected.

Per the WDNR's request, six locations from the 2016 sediment investigation will be resampled and the sediment from the 0 to 6 inch depth will be analyzed for mercury. This will total 10% of the 2016 sediment investigation samples. Sampling locations will be distributed throughout GGB where higher mercury concentrations were detected.

For quality assurance, duplicate samples will be randomly selected at a rate of one per 10 sediment sample locations and analyzed for mercury. The original retrieved sediment core will be split vertically into two equal portions during sample dissection. Both the original and duplicate portions will be separately homogenized and placed into separate laboratory-supplied containers.

One random sampling location will have a replicate sediment core collected. The replicate sediment core will be collected within two feet of the original sample location. Sediment from the replicate location will also be analyzed for mercury.

An equipment blank or rinse blank water sample will be collected each sampling day and analyzed for mercury. These rinse blanks will evaluate the decontamination procedures of the sampling equipment.

SPS will utilize a pontoon boat to navigate to each sample location and use the boat as a work platform for sediment sampling. SPS will utilize a Trimble Geo 7X GPS with a Trimble Zephyr GNSS antenna to determine the sample locations. The GPS unit has a published centimetric accuracy while using real-time differential correction.

Please do not hesitate to contact me at 608-434-5374 if you have any questions.

Sincerely,

Robert M. Sitton
Commander's Representative

Enclosure
Copy furn: Jason Lowery, Wisconsin Department of Natural Resources
Bryan Lynch, Army Environmental Command
SpecPro Professional Services, LLC

Legend

GGB-01

- Proposed Sample - 2018
- Sample Collected - 2016
- No Sample Collected - 2016

2016 Mercury Concentrations

- 0.36 - 1.49 mg/kg
- 1.5 - 3.0 mg/kg
- 3.0 - 6.3 mg/kg

- 2006 Dredged Extent
- Road
- Building
- Wisconsin River

Wisconsin River

Figure 1

Proposed Sampling Locations - 2018
Gruber's Grove Bay Sediment Sampling
Badger Army Ammunition Plant

Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Vertical Datum: North American Vertical Datum 88 (NAVD 88)
Units: Foot US

0 130 260 520 780 1,040 Feet

SPS SPECPRO PROFESSIONAL SERVICES

1 inch = 195 feet

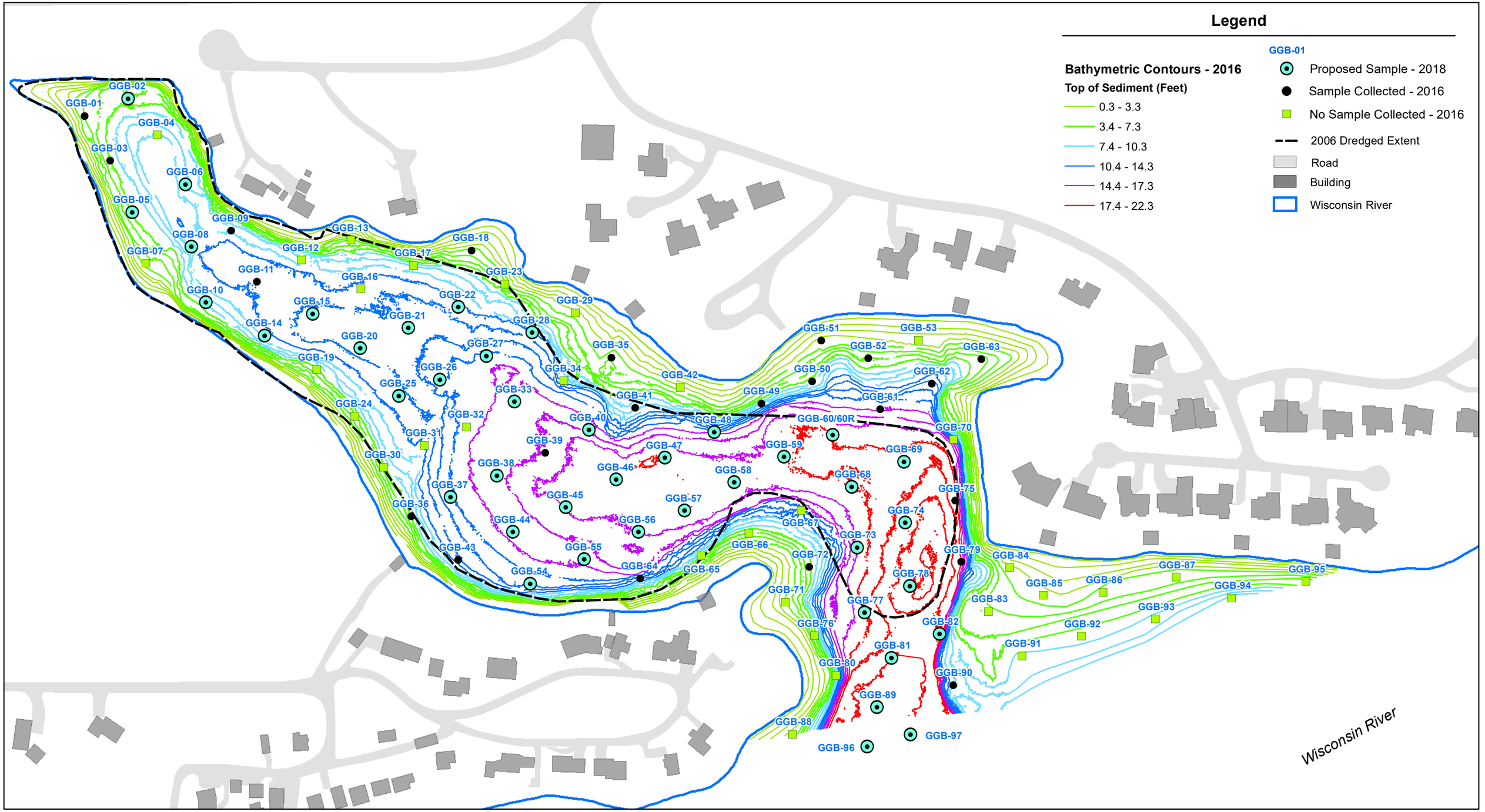

Figure 2

Bathymetric Contours
Gruber's Grove Bay Sediment Sampling
Badger Army Ammunition Plant

Bathymetric contour survey (sediment depth) conducted by Veolia ES Special Services, Inc. on 10/10/12.
Depths of GGB were obtained via multi-beam sonar survey.
Contours were updated with 2016 sediment depth measurements collected with manual probe.

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