BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Transmitted Via Federal Express

July 25, 2001

Mr. Tom Kendzierski
Wisconsin Department of Natural Resources
WDNR Service Center
810 W. Maple
Spooner, Wisconsin 53702

Re: RCRA Facility Investigation
Supplemental Investigation Activities
Koppers Industries, Inc., Superior, Wisconsin
WID 006 179 493
BBL Project #: 387.72 #2

Dear Mr. Kendzierski:

On behalf of Beazer East, Inc., Blasland, Bouck & Lee, Inc. (BBL) has prepared this work scope for additional RCRA Facility Investigation (RFI) activities at the Koppers Industries, Inc. (Koppers) facility in Superior, Wisconsin (Figure 1). The primary components of this work will consist of additional bedrock groundwater investigation, fire pond sediment investigation, additional Crawford Creek floodplain investigation, and additional sampling and analysis for dioxins/furans to support the risk assessment activities. Each of these items is addressed in the following sections.

I. BEDROCK GROUNDWATER INVESTIGATION

A. Background

In response to the Wisconsin Department of Environmental Resources' (WDNR's) comments regarding the facility's RFI Report, Beazer agreed (by way of a letter dated April 26, 1999) to install three monitoring wells in the bedrock aquifer. The purposes of these three wells were to determine if site-related constituents (SRCs) are present in the bedrock beneath the facility, determine the depth to bedrock beneath the facility, and determine groundwater flow direction in the bedrock beneath the facility. The wells were installed in October and November 1999 in the vicinity of the process area and the former water supply wells.

The wells were subsequently sampled in February 2000 and an RFI Bedrock Monitoring Wells Report was submitted to the WDNR on July 14, 2000 with the following conclusions:

- Groundwater in the sandstone beneath the process area flows to the north-northwest.

100 Pearl Street • 14th Floor • Hartford, CT 06103-4506
Tel (860) 249-7111 • Fax (860) 249-7112 • www.bbl-inc.com • offices nationwide

- Polynuclear aromatic hydrocarbons (PAHs) were not detected above laboratory quantitation limits in any bedrock monitoring well.

- Pentachlorophenol was detected at levels exceeding the WDNR Preventative Action Limit (PAL) of 0.1 ug/L in downgradient wells W-18D and W-33D. Pentachlorophenol was detected in the upgradient well, W-34D, at levels exceeding the PAL and the WNDR Enforcement Standard (ES) of 1.0 ug/L.

- Residential wells are located approximately 1,200 feet downgradient and to the north of the facility. Groundwater samples taken from these residential wells in 1997 did not indicate the presence of pentachlorophenol or PAHs.

As a follow-up to these findings, Beazer agreed to obtain a second round of bedrock well water levels and water quality samples to confirm water quality and groundwater flow conditions. Results of the second monitoring event were submitted to the WDNR on November 28, 2000, and indicated a flow direction to the northeast. This interpreted flow direction was approximately 90 degrees from the northwest flow pattern developed from the February 2000 water level data. This apparent shift in flow pattern is primarily due to a drop of over 7 feet in water levels in the upgradient well W-34D between February and June 2000. This drop has also resulted in a decrease in the groundwater gradient to a flatter 0.0032 ft/ft to the northeast compared to the 0.012 ft/ft to the northwest measured in February 2000.

Laboratory analytical data generated from the June 29, 2000 groundwater sampling event indicated the presence of benzo(b)fluoranthene in well W-33D (0.060 ug/L) and W-34D (0.025 ug/L), both above the WNDR PAL of 0.02 ug/L. No other PAHs were detected above the laboratory quantitation limit. Pentachlorophenol was detected in the two groundwater samples from W-18D (0.16 ug/L) and W-34D (0.36 ug/L) both above the WNDR PAL Groundwater Quality Standard of 0.1 ug/L. None of the detected constituents from the second monitoring event exceeded their respective ESs.

B. Additional Sampling of Existing Wells

Based on the results discussed above, Beazer plans to collect a third round of water-level measurements and groundwater samples from the three existing on-site bedrock monitoring wells. In addition, efforts will be made to collect a water-level measurement, well-depth measurement, and groundwater sample from a private well located northwest of the KII facility. We believe this private well is screened in the bedrock unit at the approximate location indicated on Figure 2. This well is not currently in use, and therefore is anticipated to represent static groundwater conditions.

Groundwater samples from the three on-site bedrock wells and the off-site private well will be analyzed for polynuclear aromatic hydrocarbons (PAHs) and pentachlorophenol by EPA method 8270C. If the analytical results indicate decreases in PAH and pentachlorophenol concentrations relative to the previous sampling events (e.g., no constituents are detected above PALs), and if no SRCs are detected in the sample from the off-site private well, Beazer does not anticipate that additional bedrock monitoring wells would be installed. However, if these wells continue to exhibit concentrations of SRCs above the PALs or ESs, Beazer will proceed with the installation and sampling of additional bedrock monitoring wells, as described below. In either case, Beazer will summarize the results of this sampling event and discuss with the WDNR the basis for a decision to proceed or not proceed with the installation of additional bedrock monitoring wells.

C. Installation and Sampling of Additional Bedrock Monitoring Wells

Based on the results of the additional sampling and water-level measurements at the existing wells, Beazer may elect to proceed with the installation of up to four additional bedrock monitoring wells near the downgradient (north) side of the facility. The purposes of these wells would be to resolve the variation in flow direction and assess the potential for downgradient water quality impacts in proximity to the residential water supply wells.

The additional wells, if necessary, would likely be installed in the area indicated on Figure 2; the final locations would be determined based on the follow-up round of water-level measurements at existing bedrock wells (to determine the apparent flow direction) and following discussions with off-site property owners. The wells would be constructed using rotary drilling methods by first completing a 10-inch borehole to approximately 55 feet below ground surface (bgs) and installing a 6-inch-diameter steel casing that will be grouted in place. After allowing the grout to set for a minimum of 12 hours, a 6-inch borehole would continue to be advanced to bedrock at approximately 170 feet bgs. Split spoon soil sampling would not be performed from 0 to 30 feet bgs because this zone has been well characterized by previous investigations. Soil samples would be obtained at 5-foot intervals from 30 to 55 feet bgs and at 10-foot intervals from 55 feet bgs to the top of bedrock.

After encountering the bedrock, a temporary casing would be placed in the borehole and an NX corehole would be advanced approximately 20 feet into bedrock. Following retrieval of the rock core, the bedrock would be reamed to a 6-inch-diameter hole. The wells would be constructed of 20 feet of 2-inch-diameter schedule 80 PVC with a 0.010-inch slotted well screen and 2-inch schedule 80 PVC riser. A sand filter pack would extend to approximately two feet above the top of the well screen followed by a two-foot-thick bentonite seal. The remainder of the annular space would be filled to the surface with bentonite grout. All wells would be completed with a locking cap and, depending on location, would have a stickup or flush mount steel protective cover. All wells would be developed using surge and pump techniques to remove sediment and improve hydraulic connection between the bedrock and the well screen.

The new wells would be sampled a minimum of two weeks after they are developed. Prior to sampling, groundwater level measurements would be obtained in all bedrock wells to provide a more thorough understanding of the bedrock groundwater flow direction. As with the samples collected from the existing wells, groundwater samples collected from the new wells would be analyzed for PAHs and pentachlorophenol by EPA method 8270C.

II. FIRE POND SEDIMENT SAMPLING

The fire pond at the Koppers Superior facility is approximately 120 feet long by 60 feet wide. The depth is unknown, but is reported to be up to 12 feet. The fire pond is located in the northern portion of the facility, as shown on Figure 2. To evaluate the characteristics of the fire pond sediments, the pond bottom will be probed from all four sides and in the center to obtain an estimate of the thickness of depositional material and to determine the depth of water in the pond. Four samples will then be collected from two locations by manually pushing rigid tubing (e.g., Lexan™) into the bottom sediments. One of the sample locations will be established in the approximate center of the pond and the other will be established at the southern end near the outflow weir. At each location, samples will be collected to represent the 0- to 6-inch and 6-inch to end-of-core depth intervals. The samples will be submitted for laboratory analysis of PAHs and pentachlorophenol by EPA Method 8270C and dioxins by EPA method 8290. The water

elevation in the pond will be measured for relative comparison with groundwater levels in local shallow wells.

III. CRAWFORD CREEK FLOODPLAIN INVESTIGATION

As an additional component of the ongoing RFI, Beazer proposes to excavate a number of test pits to visually assess the nature and extent of SRCs in the Crawford Creek floodplain downstream of the confluence with the unnamed ditch and upstream of the railroad crossing. The purposes of the floodplain investigation are to:

- assess the vertical and horizontal extent of potential site-related impacts within the floodplain soils;
- assess the distribution of visual impacts in both a downstream direction and laterally distant from the creek channel;
- assess the continuity of the impacted area; and
- provide information to facilitate development of remedial alternatives.

A contractor will excavate the test pits under the direction and observation of BBL field personnel. The test pits will be excavated at spatially representative locations throughout the Crawford Creek floodplain with in the area shown on Figure 2. Test pits will be excavated at various intervals in the Crawford Creek floodplain downstream of the unnamed ditch and upstream of the railroad crossing to assess the downstream distribution of constituents. To the extent possible (based on accessibility), test pit locations will be excavated at various lateral distances from the creek to determine the distribution of impacts as a function of distance from the channel.

The test pit activities will be performed over a period of approximately 15 workdays. The number of test pits that may be completed during that timeframe will be dependent upon a number of factors, including accessibility, weather conditions, excavation depth, and soil conditions. However, we anticipate that 50 to 100 shallow excavations can be completed over this time period. Test pits will be excavated to a depth at which potential site-related impacts are no longer observed, or until additional excavation is no longer feasible (i.e., due to stability considerations or excessive groundwater infiltration). The anticipated excavation depth will be less than 5 feet. At each location, the clean surficial soils will be removed and staged separately. The subsurface soils will then be excavated and visual impacts will be assessed and recorded. Upon completion, the subsurface soils will be backfilled first, and the vegetated surface soils will be re-placed on top of the excavation area. Stakes will be placed to identify the test pits and demarcate the test pit limits. The stake locations will subsequently be surveyed to record their locations and elevations.

Recognizing that the test pit activities are proposed to be performed in a floodplain (wetland) area, BBL has reviewed Wisconsin's regulations at NR 103 – Water Quality Standards for Wetlands and contacted the United States Army Corps of Engineers (USACE). Attachment A to this letter provides a brief summary of how the proposed activities will be protective of the wetland areas by evaluating the six factors identified in NR 103.08(3). Although the final determination must be made by the WDNR, the information provided in Attachment A indicates that the proposed activities will be protective of the wetland functional values specified in NR 103.03. The USACE was contacted on June 25, 2001 to discuss their potential jurisdiction regarding work in wetland areas. The USACE indicated that potential permit issues could initially be addressed by submitting a copy of this work plan, along with a joint permit application form. The joint permit application, a copy of this work plan, and other required supporting documentation, will be provided to the USACE under a separate cover.

IV. SAMPLING AND ANALYSIS FOR DIOXINS/FURANS

As part of the field investigations, Beazer will collect additional soil and sediment samples from both on- and off-site locations for analysis of dioxins and furans. The purpose of these additional samples is to provide additional data for these constituents in support of the Corrective Measures Study (CMS). Additionally, during recent discussions with AMEC, the WDNR has expressed concern that dioxins/furans may be present in portions of Crawford Creek and its floodplain that are not visibly impacted by other SRCs (e.g., creosote). As a result, the additional data collection will also address this issue.

Previous investigations in the off-site area have included the collection and dioxin/furan analysis of soil and sediment samples from the unnamed ditch, Crawford Creek, and the associated floodplain areas. In total, Beazer has collected 25 soil and sediment samples from 21 locations throughout these areas. Of these, only one sample has exceeded a dioxin toxic equivalency quotient (TEQ) of 1 ug/kg. Additional samples are warranted to demonstrate that elevated dioxin concentrations are not present in areas beyond those visibly impacted by SRCs. Accordingly, Beazer will collect nine additional soil/sediment samples from Crawford Creek and the adjacent floodplain area. These samples include the following:

- Four composite sediment samples will be collected from Crawford Creek between the railroad crossing and the confluence with the Nemadji River. The first will be located immediately downstream of the railroad crossing, the second approximately one-third of the way from the railroad crossing to the Nemadji River, the third approximately two-thirds of the way from the railroad crossing to the Nemadji River, and the fourth immediately upstream of the confluence with the Nemadji River. At each location, a composite sample will be collected from six locations. The six locations will include three points spanning no more than 10 feet of creek channel. At each of the three points, samples will be taken from both the right and left sides of the channel at a depth interval of 0- to 6-inches. These six individual samples will then be composited into a single sample representative of that portion of the creek.

- One composite sample will be collected within approximately 50 feet upstream of the railroad crossing. This sample will be located downstream of the downstream-most sample that has previously been analyzed for dioxins/furans (T-34C from the 1999 investigation), and will represent the portion of the creek channel between T/FP 34 and the railroad crossing. This sample will be collected from six discrete locations using the same approach and depth interval as the samples collected downstream of the railroad crossing.

- Four floodplain soil samples will be collected in conjunction with the test pit excavations described above. The purpose of these samples is to address the WDNR's concern that dioxins may be present in areas not visibly impacted by other SRCs. Two of the samples will be collected from the downstream-most set of test pits in the floodplain. One of these will be collected from the western portion and one from the eastern portion of the creek channel. In both cases, the sample will be collected from the first test pit laterally distant from the centerline of the channel at which no visible impacts are observed in the surface or subsurface soils. The sample will be composited from 6 discrete locations within (i.e., along the sidewall) or immediately adjacent to the test pit. Using a similar approach, the other two samples will be collected from test pits located approximately mid-way between the unnamed ditch and the railroad crossing. All four floodplain soil samples will be collected from soils representing the 0- to 6-inch depth interval.

For the on-site areas, seven soil samples have previously been collected and analyzed for dioxins/furans. While each of these indicated a dioxin TEQ less than 1 ug/kg, Beazer proposes to collect one additional soil sample to supplement the available data set for the risk assessment. This sample will be collected adjacent to the former pentachlorophenol storage tank in the process portion of the facility. A previous soil sample collected from this area (BB-25) indicated a dioxin TEQ of 0.7 ug/kg, which is below the 1 ug/kg residential standard. The additional sample will be collected closer to the former pentachlorophenol storage tank to better represent the conditions surrounding the former tank location. Consistent with other on-site soil samples analyzed for dioxins/furans, this sample will be collected from the 0- to 2-foot depth interval.

Each of the proposed samples will be analyzed for dioxins/furans using USEPA Method 8290. Also, each sample location will also be subject to field survey so that they can be accurately recorded and re-established, if necessary.

V. IMPLEMENTATION SUPPORT ACTIVITIES

A. Decontamination and Investigation Derived Waste

To the extent possible, soil and sediment samples will be collected using dedicated disposable sampling equipment. Such equipment will be drummed for appropriate characterization and disposal by Beazer at the completion of the investigations. To the extent that any non-dedicated or non-disposable equipment is used, those items will be cleaned between sample locations. Decontamination fluids generated by equipment cleaning will also be containerized for appropriate characterization and disposal.

During drilling activities (if the additional wells are determined to be necessary), all downhole equipment will be decontaminated between each borehole using a high-pressure washer. All decontamination fluids and soils will be contained within a decontamination pad. It is anticipated that decontamination fluids (water) will evaporate from the decontamination pad. At the end of drilling activities, the decontamination pad, soils, and any residual fluids will be containerized. All soils and fluids generated during drilling will be separately containerized, and staged on site. Water from well development and purge water from groundwater sampling events will be placed in the on-site 1,550-gallon polyethylene tank for characterization and disposal.

B. Survey

Following the completion of the well installation (if performed), fire pond sampling, test pit excavations, and collection of samples for dioxin/furan analysis, a field survey will be completed to incorporate these new data points into the site RFI program. The survey activities will consist of the following:

- The location and measuring-point elevation of up to four new monitoring wells on the north side of the KII facility will be surveyed to the State Plane Coordinate System, consistent with previous survey activities at the site.

- A surface elevation measurement will be obtained for the on-site fire pond located in the northern portion of the facility.

- The location and elevation of 50 to 100 test pits along the floodplain of Crawford Creek in the area northwest of the facility will be surveyed to the State Plane Coordinate System and elevations will be established at a reference point at each test pit. Test pits are anticipated to be located in the low-lying area downstream from the confluence of the unnamed ditch from the facility and upstream of the railroad crossing prior to the confluence with the Nemadji River.

- The location of the nine soil and sediment samples from will be surveyed relative to the State Plane Coordinate System.

VI. REPORTING

As indicated above, the results from the supplemental round of water-level measurements and groundwater sampling at the existing bedrock monitoring wells, plus the off-site private well, will be summarized and presented to the WDNR. At that time, Beazer will also provide a recommendation regarding the need for and locations of proposed additional bedrock monitoring wells.

Upon completion of all field activities (including the installation and sampling of additional bedrock wells, if performed), a letter report will be prepared to summarize the work. The letter report will document the scope and findings of the supplemental round of water-level measurements and groundwater sampling, fire pond sampling, findings of the Crawford Creek floodplain investigations, results of the additional dioxin/furan analyses, and, if performed, the well drilling/installation, and sampling activities. The type of information to be presented will include sampling procedures, tabulated analytical results, tabulated water-level measurement data, a potentiometric surface map from the supplemental round of water-level measurements, assessment of the presence and extent of SRCs in the various investigation areas, test pit logs, and other pertinent data. Relative to the additional bedrock monitoring wells, if installed, the letter report will discuss the geologic findings of the well installations and how the subsurface conditions correlate to the conditions at the previously installed monitoring wells. The groundwater quality sampling procedures and the analytical results will also be presented. The groundwater-level data will be tabulated along with the previous water level measurements. The analytical results will be summarized in a table that includes the relevant historic data. In addition, attachments to the letter report will include well construction logs, groundwater sampling field sheets, and laboratory analytical results. A groundwater contour map will also be prepared based on water level measurements from the new and existing bedrock monitoring wells.

Finally, the summary report will assess the need for and proposed scope of any follow-up investigations.

V. SCHEDULE

We currently anticipate that the supplemental round of sampling and water-level measurements at existing wells will be performed during the week of July 30, 2001. Analytical data, and Beazer's assessment of the need for additional well installations, are expected to be presented to the WDNR within approximately three to four weeks of sampling. In the interim, the remaining investigation components (i.e., fire pond sampling, floodplain investigations, and soil/sediment sampling) will be initiated as soon as possible pending WDNR approval of this work plan, USACE approval of the proposed floodplain work, and procurement of the necessary property access approvals. Beazer currently anticipates that these activities will be initiated in August 2001.

If additional bedrock monitoring wells are warranted, the construction of up to four additional bedrock monitoring wells will require approximately two months to complete. The wells would subsequently be subject to water level measurements and sampling as soon as possible following development.

Please note that this schedule is subject to change based on a variety of factors, including the timing of WDNR approval, property owner access approvals, driller availability, weather conditions, and subsurface utility clearances. Regardless of the start time or duration of the field work, the letter report summarizing the field investigation results will be provided to the WDNR within approximately 90 days of the completion of the field work and receipt of all associated laboratory analytical data.

Please feel free to contact me at (860) 249-7111, or Ms. Jane Patarcity at (412) 208-8813, with any questions or comments.

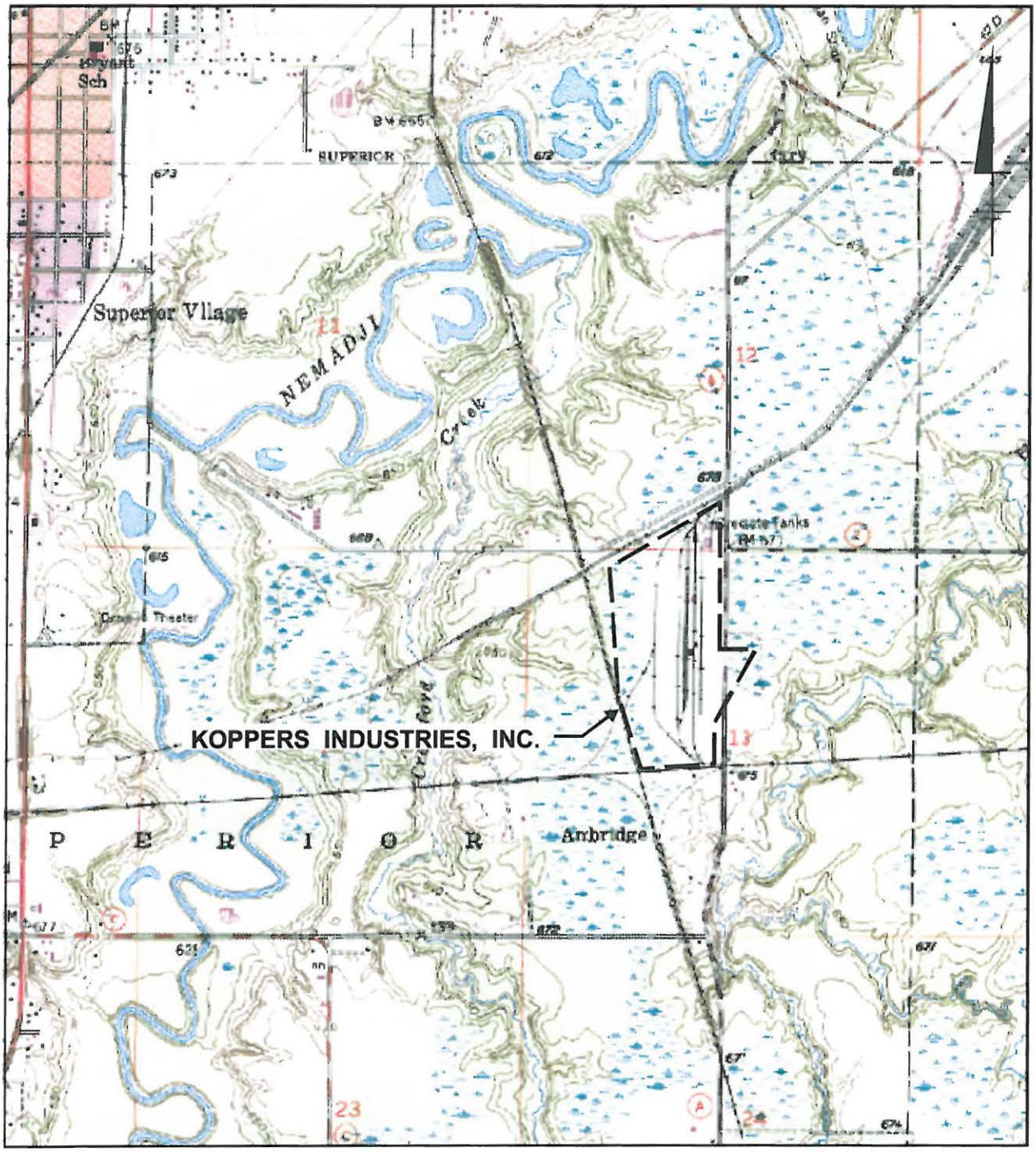
Sincerely,

BLASLAND, BOUCK & LEE, INC.

Jeffrey S. Holden, P.E.
Manager

JSH/lmd
Enclosures

cc: Ms. Jane Patarcity, Beazer
Mr. Brian Magee, AMEC
Mr. Paul Anderson, AMEC
Ms. Linda Paul, KII
Mr. Tim Ries, KII
Mr. Robert J. Anderson, P.G., BBL
Mr. Mark F. Weider, BBL



REFERENCE: BASEMAPSOURCEUSGS 7.5 MINUTE QUAD. SERIESSUPERIOR,WISCONSIN - MINNESOTA, 1954,PHOTOREVISED 1993.

2000' 0 2000'

Approximate Scale: 1 " = 2 0 00'

LEGEND

APPROXIMATEPROPERTYLINE

AREA LOCATION

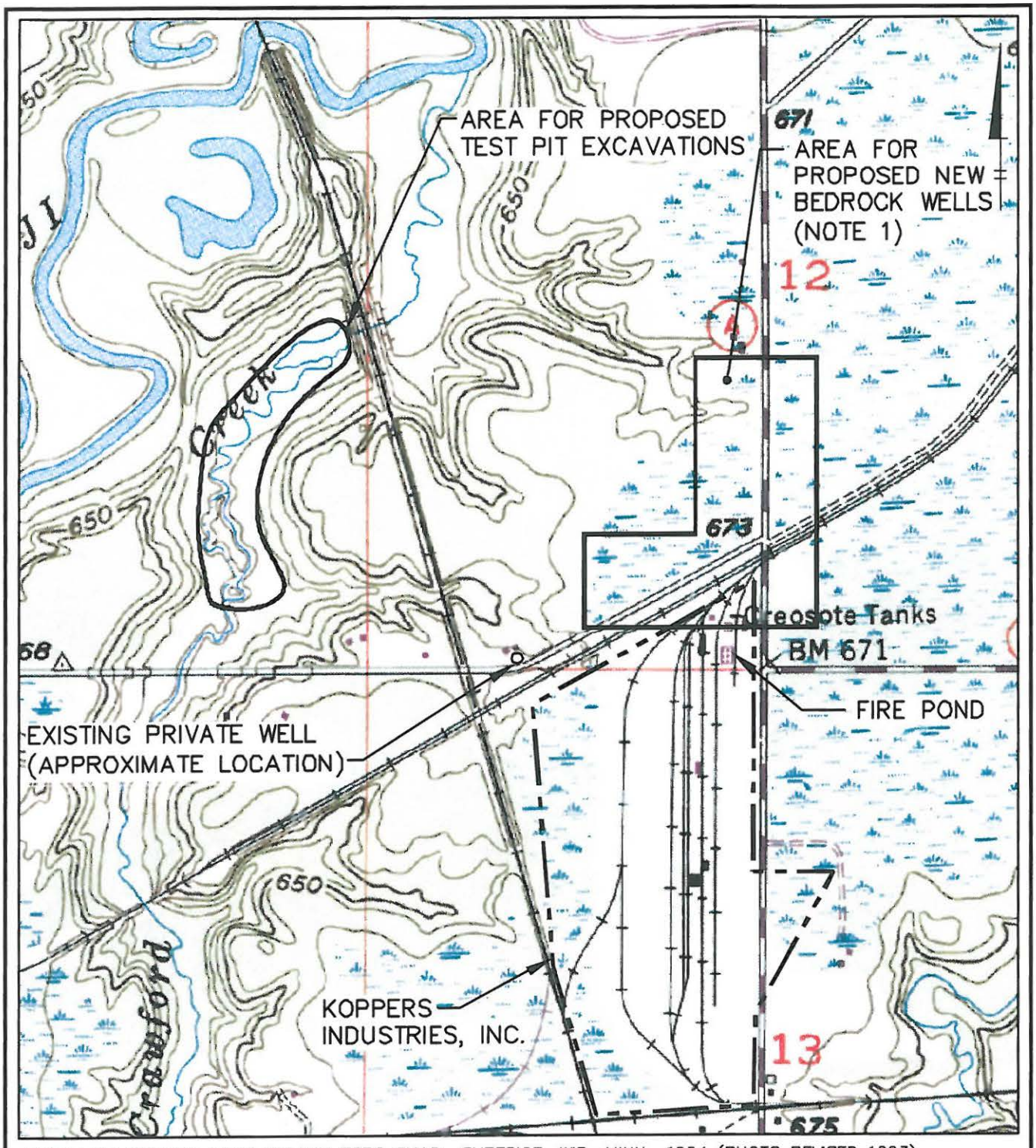
06/01 SYR-D54-MRC, DJH
38746001/38746n02.cdr

KOPPERS INDUSTRIES, INC.
SUPERIOR WISCONSIN FACILITY

SITE LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 1



BASE MAP SOURCE: USGS 7.5 MIN TOPO QUAD., SUPERIOR, WIS.–MINN., 1954 (PHOTO REVISED 1993)

0 1000' 2000'

APPROXIMATE GRAPHIC SCALE

LEGEND

APPROXIMATE PROPERTY LINE

NOTE:

THE ACTUAL LOCATIONS OF THE PROPOSED NEW BEDROCK WELLS WILL BE DETERMINED BASED ON CONFIRMATION OF THE GROUNDWATER FLOW DIRECTION AND ABILITY TO OBTAIN PROPERTY ACCESS AGREEMENTS TO OFF-SITE AREAS.

IMAGE: 38746X01.TIF
L: ON-*, OFF-REF
P: PAGESET/AP
7/25/01 ROC-54-SLM
SYR-NES GMS
38746001/38746B09.DWG

KOPPERS INDUSTRIES, INC.
SUPERIOR WISCONSIN FACILITY

SITE INVESTIGATION MAP

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 2

ATTACHMENT A

Koppers Industries, Inc. Wood-Treating Facility
Superior, Wisconsin

Evaluation of NR 103 Requirements

A component of the proposed investigations includes excavation of test pits in the Crawford Creek floodplain downstream of the confluence with the unnamed ditch and upstream of the railroad crossing. The purpose of this attachment is to demonstrate that the proposed test pit activities will satisfy the requirements of Wisconsin's NR 103 regulations related to work in wetland areas. The factors that must be addressed to "protect all present and prospective future uses of wetlands" are specified in NR 103.08(3). While Beazer recognizes that the ultimate determination of protectiveness is made by the WDNR, this attachment provides information to facilitate the WDNR's determination. Provided below is additional information regarding the proposed investigations relative to the six factors that are specified in NR 103.08(3).

NR 103.08(3)(a) – Wetland Dependency

As defined in NR 103.07(3), "wetland dependency" refers to activities that are of a nature that require location in or adjacent to surface waters or wetlands to fulfill their basic purpose. The purpose of the test pit excavations is to visually assess the nature and extent of potential site-related constituents in the Crawford Creek floodplain. Because the floodplain encompasses a wetland area, and because the investigation must be performed in the wetland area (i.e., as opposed to an alternate location), the proposed test pit excavations are wetland dependent.

NR 103.08(3)(b) – Practicable Alternative

While alternate investigation methods exist for assessing subsurface conditions (e.g., hand augering), such methods will not provide the level of subsurface detail that can be obtained via the proposed test pits. The test pits will facilitate a better understanding of the presence, extent, and continuity of subsurface impacts than could be obtained using alternate methods. In turn, the additional level of detail afforded by the test pits will be beneficial to the longer-term objectives of evaluating, designing, and implementing a suitable remedial approach, if necessary, for the affected area(s) of the floodplain. Accordingly, a practicable alternative to the test pits is not available.

NR 103.08(3)(c) – Wetland Impacts

Both the scope of the test pit investigations and their method of implementation have been developed to minimize the extent of wetland impacts and be protective of the wetland standards specified in NR 103.03(1). During excavation of each test pit, the clean surficial soils, including surficial vegetation, will be removed and staged separately. The subsurface soils will then be excavated and visual impacts will be assessed and recorded. Upon completion, the subsurface soils will be backfilled and compacted first, and the vegetated surface soils will be re-placed on top of the excavation area. In this manner, the amount of exposed soils at the completion of the work will be minimal and long-term impacts to surficial vegetation will be avoided.

It is anticipated that 50 to 100 shallow test pits (expected to be less than approximately 5 feet deep) will be excavated over an approximately 3-week period in the course of implementing the Crawford Creek floodplain investigations. Conservatively assuming that 100 test pits are

excavated – with dimensions of 3 feet in width and 10 feet in length – the resulting surface area affected by the test pits is approximately 0.07 acres. This is a minimal area of impact and is less than the 0.1-acre limit specified in NR 103.08(4)(a)(1). Furthermore, the test pits will be spaced throughout the floodplain area such that the 0.7-acre area will also be non-continuous.

Other factors regarding the proposed test pit activities that will serve to limit the wetland impacts include the following:

- The test pits will be remain open for only a very short period of time and no test pits or excavated soils will remain exposed over non-work periods (i.e., all test pits will be backfilled at the end of each day).
- No fill material will be brought into or removed from the wetland area.
- The excavation equipment will utilize timber mats when crossing the creek and when staged for excavating in order to minimize disturbance of the wetland.
- The excavation equipment may damage surficial vegetation in the course of traversing the wetland. However, the equipment will be operated in a manner to minimize the potential for damaging root structures such that the vegetation will not be permanently affected.
- The excavation equipment will be removed from the floodplain area for fuel and servicing.
- The minimal areal extent and non-contiguous nature of the test pits will minimize adverse impacts to wetland habitats and communities.
- Test pit excavation activities will be discontinued during heavy rainfall and/or elevated surface water conditions to minimize the potential for erosion of exposed soils.

NR 103.08(3)(d) – Cumulative Impacts

As stated above, the test pit excavations will be temporary, result in no net loss of wetland material, and impact small, isolated areas. Consequently, there are no reasonably anticipated future activities that, in combination with or resulting from the proposed Crawford Creek floodplain test pit excavations, would result in cumulative adverse impacts on the wetland functional values.

NR 103.08(3)(e) – Potential Secondary Impacts

Because the test pit excavations will be temporary, result in no net loss of wetland material, and impact small, isolated areas, there are no potential secondary impacts on wetland functional values associated with the proposed Crawford Creek floodplain investigations. In fact, the very nature of the investigations is to facilitate the identification and implementation of a suitable remedial alternative, if and as necessary, to address historical impacts within this area.

NR 103.08(3)(f) – Potential Adverse Impacts to Special Natural Resource Areas

The Crawford Creek floodplain is not located within an area of special natural resource interest, as listed in NR 103.04. Although Crawford Creek is a secondary tributary to Lake Superior (which is an area of special natural resource interest), the test pit excavations are not anticipated to result in any potential adverse impacts to the Lake. Regardless, as discussed above, there would be no alternate location for performing this work given that the investigations must target the affected area.