REMEDIATION WORK PLAN
for the
NORTH DRAINAGE CHANNEL

Kuhlman Electric Corporation
Crystal Springs, Mississippi

Prepared for

BorgWarner Inc.

April 2003

GeoEnvironmental Associates, LLC | MARTIN&SLAGLE

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1.0 INTRODUCTION

Kuhlman Electric Corporation (KEC) currently owns and operates a transformer manufacturing plant in Crystal Springs, Mississippi (Figure 1). Previous environmental assessments conducted at this site indicated that soil contaminated with PCB (Aroclor 1260) and various chlorinated benzenes was present on the plant site. Martin & Slagle GeoEnvironmental Associates, L.L.C., under the direction of the Mississippi Department of Environmental Quality (MDEQ) and the United States Environmental Protection Agency (USEPA), expanded the assessment to delineate the horizontal and vertical extent of soil impacted by PCBs at offsite properties downgradient of the plant. This assessment of PCB impacted soil was conducted in response to Mississippi Commission on Environmental Quality Order No. 4449-02, issued to Kuhlman Electric Corporation on July 23, 2002, and was completed January 15, 2003. The following remediation work plan addresses those properties identified during the assessment, which have PCB concentrations in soil at levels above 1.0 part-per-million (ppm) or milligrams per kilogram (mg/kg). This remediation plan describes a process for removing PCBs and restoring each property.

The north drainage channel characterization was conducted during the periods of November 14, 2001 through February 14, 2002, and May 9, 2002 through November 15, 2002. The characterization involved the collection of a total of 2,678 soil samples and 7 groundwater samples along and adjacent to a drainage channel extending from the north property boundary of the KEC plant to the culvert under US Highway 51 that discharges into the headwater of Lake Chautauqua. The drainage channel carries stormwater runoff from the KEC plant to Lake Chautauqua located approximately 0.66 miles northwest of the KEC plant (Figure 2). Samples were collected from 24 individual properties located along and within the drainage channel.

1.1 Site Description

The drainage channel is located within the city limits of Crystal Springs, Copiah County, MS 39059, at approximate latitude N 31° 59' 24" and longitude W 90° 21' 20". The town center is located approximately 0.50 miles south of the drainage channel (Figure 1).

The drainage channel is an intermittent stream that extends from the northwest portion of the KEC property for approximately 2/3 miles toward Lake Chautauqua, bordering some residential properties and flowing through others. The upper reaches of the drainage basin include wooded, residential, and industrially developed areas. The drainage channel winds through a heavily wooded area before discharging beneath U.S. Highway 51 into Lake Chautauqua. The total drainage basin area, east of US Highway 51, is approximately 300 acres, more than two-thirds of which is drained by three unnamed channels.

Except for the relatively flat interfluve east of the railroad that is occupied by the KEC plant and some residences, the land slopes steeply toward the drainage channels and the large wetland with slopes ranging from five to thirty percent. Drainage channels are deep and have slopes ranging from three or four percent near the uplands to less than one percent in the lower reaches. The wetland contains thick sediment deposits eroded from the uplands and the stream channels, and stream channels in the wetland are braided and poorly defined.

Soils in the watershed are very erodable. The interfluves and uplands with slopes up to fifteen percent consist of silt loams, mainly the Providence and Loring series. The gravelly, sandy loams of the Saffel series occupy steeper slopes. All of these soils are underlain by the Citronelle Formation, a gravel formation that underlies much of the coastal plain in the Mississippi Valley and the Southeastern U.S. The stream channels

have eroded into the Citronelle Formation in some places, so the sediments in the wetland flood plain are a mixture of clay, silt, sand, and gravel.

The main drainage channel shape and size vary throughout its length. Near the KEC plant the channel is shallow, from 1 foot to 2 feet deep, and narrow, 3 feet to 4 feet wide, with a poorly defined floodplain. It collects stormwater from street drainage around the KEC plant as well as runoff from the plant. As the drainage passes west under the Canadian Northern railroad track and through the residential community along McPherson Street and Forest Street, the channel size increases to approximately 8 to 10 feet deep and about 8 feet wide before becoming shallower with a wider, better defined floodplain. A reach of about 1300 feet flows through a relatively flat area with a wide floodplain, in excess of 600 feet wide. Because the grade is very flat, the stream through this area is braided. The floodplain is heavily wooded and overgrown.

The drainage channel terminates at the headwater of Lake Chautauqua on the west side of U.S. Highway 51. Thick sediments are evident along the shoreline of the lake at the discharge point.

1.2 Background

The KEC facility was constructed and has been operated as a transformer manufacturing plant since the 1950s by KEC or its predecessors ("KEC"). KEC continued to own and operate the plant in March 1999 when BorgWarner Inc. purchased Kuhlman Corporation, the parent of KEC, and thereafter as well. Seven months later, on October 1, 1999, BorgWarner and Kuhlman Corporation sold KEC's stock to KEC Acquisition Corporation. BorgWarner and Kuhlman Corporation indemnified KEC, KEC Acquisition Corporation and their affiliates for historic contamination at the site and may, under the purchase agreement, control any remediation of such contamination. None of BorgWarner, Kuhlman Corporation or KEC Acquisition Corporation has ever owned or operated the plant.

On April 19, 2000, BorgWarner received notification from KEC, in accordance with the purchase agreement, that areas of contaminated soil had been found in Crystal Springs, Mississippi. BorgWarner responded by sending a representative to meet with KEC plant representatives and a representative from MDEQ, Eric Dear, on April 25, 2000. During this meeting all parties were briefed on the existing situation at the plant and MDEQ's expectations regarding assessment of the site.

Environmental investigations conducted on the KEC property and surrounding residential properties since May 2000, confirmed that the PCB Aroclor 1260 and chlorinated benzenes were present in site soils and that offsite areas had been impacted by PCBs through the transport of contaminated soils by stormwater runoff from the KEC property.

1.3 Summary of Previous Work Performed

The KEC plant site and various other adjacent and downstream properties have been assessed for the presence of PCBs since May 2000. Results of the plant site and drainage channel assessments are included in the *Preliminary Site Characterization Report* (July 2000), the *Addendum to the Site Characterization Report* (February 2001), and the *North Drainage Channel Site Characterization Report* (January 2003) submitted to MDEQ and USEPA.

Results from previous site assessments indicate that the KEC plant is the primary source of PCB contamination on properties along the north drainage channel. Immediate corrective actions were taken to control future stormwater runoff and wind erosion of site soils from the KEC property. Ultraviolet-resistant plastic sheeting was placed in July 2000 over the 4.6 acres of the KEC site that were disturbed during plant expansion construction activities, and silt fences were placed around the periphery of the plastic cover. The plastic sheeting is being removed as remediation proceeds.

1.3.1 2000 Drainage Channel Assessment Summary

A total of nine residential properties located along the drainage channel were sampled for PCBs in soils during August and September 2000. Results of those analyses were submitted to MDEQ in January 2001. Results indicated that six of the nine properties had concentrations of PCBs in excess of the maximum allowable concentration of 1.0 mg/kg established by MDEQ for residential property soils.

1.3.2 2003 Drainage Channel Assessment Summary

The investigation conducted in 2001 through 2002 and submitted to MDEQ in January 2003, consisted of field reconnaissance, collection and laboratory analysis of 2,287 soil samples from 1,067 locations from the drainage channel and adjacent properties, installation of five temporary groundwater-monitoring wells and laboratory analysis of groundwater samples collected from these wells. Prior to conducting this comprehensive assessment, a hydrology study was conducted to determine the 100-year flood level within the floodplain of the drainage channel. Since one of the primary transport mechanisms for PCB migration is stormwater flow, this flood level was used to estimate the probable horizontal extent of impacted soil in the study area, and to guide the layout of soil sample locations for this assessment.

Samples were collected from 24 individual properties that included 21 residential properties, two government-owned properties, and one tract of land owned by the Canadian Northern Railroad located along and within the drainage channel. Analytical results indicate that PCBs have impacted multiple locations within the north drainage channel study area in excess of the MDEQ maximum allowable concentration of 1.0 mg/kg. Additionally, several areas within the drainage channel were determined to have PCB concentrations greater than 50 mg/kg. It is estimated that, of the 20.1 acres included

in the study area, approximately 10.5 acres have been impacted by PCBs with concentrations exceeding 1.0 mg/kg. Of these 10.5 acres, it is estimated that approximately 0.60 acre has PCB concentrations exceeding 50.0 mg/kg. Of the 24 properties investigated, a total of 19 had soil impacted by PCBs.

Ground water has not been impacted by PCBs within the north drainage channel investigation area.

1.4 Remediation Objectives and Rationale

The remediation goal established by MDEQ for all properties along and within the drainage channel is 1.0 mg/kg. This remediation goal is deemed protective of human health and the environment for unrestricted site use according to *Subpart II, Mississippi Department of Environmental Quality, Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites* (1999).

The general objective for remediation of this site is to conduct active remediation by removal and proper disposal of contaminated materials with concentrations of PCBs in excess of 1.0 mg/kg and to restore the properties, after soil removal and replacement, to their original conditions.

2.0 CONCEPTUAL PLAN

The properties to be remediated, adjacent to and within the drainage channel total approximately 10.5 acres in size. The area to be remediated was identified in the *North Drainage Channel Site Characterization Report* (January 2003) prepared by Martin & Slagle GeoEnvironmental Associates, L.L.C.

The remediation concept for the drainage channel is based on the maximum allowable concentration of 1.0 mg/kg of total PCBs that may remain in soils on unrestricted use sites. This remedial goal is established by the MDEQ in *Subpart II, Mississippi Department of Environmental Quality, Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites* (1999), as amended February 28, 2002.

Remediation will be accomplished by excavation and proper disposal at permitted disposal facilities of PCB-containing soil with concentrations greater that 1.0 mg/kg

The remediation plan is based on completion of the following tasks:

1. All soil exceeding the maximum allowable limit of 1.0 mg/kg PCB will be excavated and transported to disposal permitted disposal facilities based on the PCB levels already identified or based on confirmation sampling during site remedial activities.

2. Remedial target levels are based on the maximum allowable limit for residential properties as established by the MDEQ.

3. Culverts, soils surrounding culverts within the drainage channel, and soils beneath certain structures, as identified by letter from MDEQ dated February 5, 2003, will

be further assessed for PCBs prior to initiating remedial activities in those locations.

4. Excavated and stockpiled soil will be protected from stormwater and wind erosion.

5. Excavated areas will be backfilled with clean soil, graded to control runoff, and seeded to reduce sedimentation and erosion during stormwater runoff events.

6. Certain trees within the project area will be protected during site remediation. Remediation of soils around and beneath trees will be performed on a case by case basis. A reasonable effort will be made to salvage healthy hardwood trees meeting specific criteria outlined in Section 3.

7. For residential properties where remediation is required beneath structures, a registered professional engineer will determine the foundation shoring and stabilization plan.

The remediation process will begin with the removal of contaminated soil in and around the culvert on Fulgham Avenue at the northern property boundary of the KEC plant. Remediation activities will continue to the northwest and downgradient along the drainage channel and terminate at the culvert that runs under US Highway 51. Workers that have received the OSHA hazardous waste operations training (HAZWOPER) will conduct all site remediation activities including removal of contaminated soil. The remediation contractor will install stormwater collection, detention, and diversion structures to control runoff during remedial activities and will be responsible for dust control during the site excavation activities. The remediation will be conducted in accordance with federal, state and local regulations and will be subject to approval by the Mississippi Department of Environmental Quality (MDEQ).

3.0 REMEDIATION PLAN

The contaminant of concern is polychlorinated biphenyl, Aroclor1260 (PCB). Approximately 10.5 acres of the 20.1 acres that were in and adjacent to the drainage channel assessment study area are to be remediated based on the maximum allowable concentration of 1.0 mg/kg PCBs as established by the MDEQ as the regulatory remedial goal (RG). These areas to be remediated were delineated in the *North Drainage Channel Site Characterization Report* (January 2003) submitted to the MDEQ in January 2003. Of the 10.5 acres to be remediated, approximately 0.60 acre has PCB levels exceeding 50 mg/kg.

3.1 Remediation Activities

The PCB-impacted areas to be remediated are presented in Figure 2. The properties to be remediated include:

Davis Farmer Property (referred to in report as Lewis Praytheon, Trustee)
Orister Harris Property
Harold Graham Property
R. A. McPherson Property
City of Crystal Springs Property
State of Mississippi Property
Beulah Mae Sojourner
Ralph Williams Rental Property
Willie Douglas, et.al. Property
Amelia Williams and Flossie Williams McMurray Property
Hackett Property
Kate Tillman Property
Lilluette Lewis/Leon Gayton Property

Canadian National/Illinois Central Railroad Property (referred to in report as Canadian Northern Railroad

Roberta Fitzgerald Estate Property

A. J. Hood Property

Paulette Welch Property

Harper Property

Floyd Patterson Property

Betty Sue Barnes

J. and J. Jennings Property

McPherson Subdivision Property

Prior to beginning any removal activities each property owner will be contacted to coordinate access and discuss the remediation process. Inventories will be conducted to document the existing condition of each property. Photographs, sketches and written descriptions will be prepared of landscaping, including trees, gardens, flower beds, shrubbery; garden decorations; outdoor furniture; shape and configuration of driveways, sidewalks, outdoor storage areas and any other objects that may require remediation. Trees designated to be saved will be marked. Underground utilities will be located on the ground and mapped by a qualified utility locating service.

Remediation of the properties will involve excavation of soil, soil disposal, backfilling with clean material, and site restoration. The work will include:

- Installation of silt fencing and/or other sedimentation and erosion control measures around areas of active remediation.

- Excavation and disposal of all soils identified as having PCB concentrations greater than 1.0 mg/kg to a depth at which confirmation sampling and analysis

indicates that PCB levels do not exceed the maximum allowable concentration of 1.0 mg/kg.

- Disposal of soils with PCB concentrations greater than 1.0 mg/kg but less than 50 mg/kg at a permitted RCRA Subtitle "D" landfill for disposal. Soils with PCB levels exceeding 50 mg/kg will be excavated and transported to a permitted RCRA Subtitle "C" landfill for disposal. All soil excavated during the site remedial activities will be disposed of in accordance with applicable state and federal requirements. A five-point composite soil sample will be collected from each roll-off box destined for transport to the RCRA Subtitle "D" landfill. The sample will be analyzed for PCBs to confirm that no soils with PCB concentrations greater than 50 mg/kg are being disposed of at the Subtitle "D" facility.

- Backfilling of excavated areas using clean soil, following confirmation sampling and analysis that PCB levels are less than 1.0 mg/kg.

- Placement of topsoil and immediate grass reseeding of excavated areas that have been backfilled in order to prevent erosion.

- Inventorying, wipe sampling and decontamination, if possible, of outdoor objects including but not limited to yard furniture, garden ornaments, garden tools, and other objects that are found in contact with contaminated soil. Objects that cannot be decontaminated will be replaced with items of equal quality and price.

- Replacement of structures, such as fences, sidewalks, driveways, etc. that require removal with structures of equal quality and price.

- Replacement of existing landscaping with new of equal quality and price.

3.1.1 Work Progression and Staging

The remediation work will begin with the excavation and disposal of PCB contaminated soil in and around the culvert on Fulgham Avenue at the northern property boundary of the KEC plant. Excavation and disposal of impacted soils will continue in the drainage channel and on adjacent properties to the northwest downgradient from the KEC facility. Remedial activities will terminate at the culvert that proceeds under Highway 51 and into Lake Chautauqua.

Excavation equipment and roll off boxes will be staged at the KEC plant site and dispatched from that location. Work will progress from the KEC plant site onto the Davis Farmer former ice house property. As work progresses across West Railroad Avenue equipment will access the site along the west side of the drainage channel until reaching the wider portion of the remediation area at the end of Forest Street. A haul road will be constructed along the west side of the drainage channel, exiting at West Railroad Avenue. As work progresses into the wide, flat portion of the drainage channel, a haul road will be constructed along the north side of the floodplain. A corridor will be remediated of sufficient width to accommodate truck traffic. The haul road will exit the exclusion zone at the intersection of Camp Street and Moore Street north of the closed bridge.

Concurrently with the excavation and disposal of soils already identified as having PCB concentrations greater than 1.0 mg/kg, subsurface soils around and under structures designated by the MDEQ in their comments to the *North Drainage Channel Site Characterization Report*, as being in or near PCB contaminated areas will be sampled and analyzed for PCBs. Also, the soils and sediment around and inside the culverts in the areas where these culverts either prevented or interfered with sampling during the north drainage channel assessment will be sampled and analyzed for PCBs.

3.1.2 Additional Sampling Activities

In accordance with the MDEQ comments on the *North Drainage Channel Site Characterization Report* and based on the BorgWarner responses to those comments in correspondence dated February 18, 2003, additional sampling and analysis activities will be conducted as part of the remediation activities described in this plan.

The soil beneath the following structures is to be sampled to determine if remediation is required:

- The barn on McPherson Street listed as J. Harold Graham.
- The house on McPherson Street listed as Beulah Mae Sojourner.
- The house off of Forest Street listed as Ralph Williams Rental.
- The house off of Forest Street listed as Willie Douglas, et al.

Due to safety concerns regarding structural integrity of these buildings and other potential health and safety factors that are discussed in Section 7.0-Health and Safety Plan, soil sample collection in the low crawl spaces beneath these structures will be performed from the perimeter of the buildings using a hand auger equipped with extensions. All samples collected will be properly preserved and transported, under Chain-of-Custody, to the onsite laboratory for PCB analysis in accordance with the sample collection procedures and Quality Control and Quality Assurance (QA/QC) Plan included in Section 6.0. If analytical results indicate that remediation is required beneath these structures, a registered professional engineer will design the foundation shoring and stabilization plan to be implemented prior to any soil removal.

Areas where culverts prevented and/or interfered with sampling of the drainage way will be sampled and analyzed for PCBs. Sampling and analysis will be conducted of culverts,

sediment in culverts, and soils surrounding culvert headwalls and footwalls to determine if remediation is required. This additional sampling will be conducted as part of the remediation activities as described in this plan.

The following culvert areas will be sampled:

- The culvert extending under Fulgham Avenue at the KEC plant.
- The culvert extending under the Illinois Central RR right-of-way.
- The culvert extending under West Railroad Avenue.
- The culvert extending under the McPherson Street (right-of-way) to the City of Crystal Springs property on Old McPherson Road.
- The two culverts at the end of the paved portion of Forest Street.
- The culvert/bridge under Camp Street.

The culvert that proceeds under Highway 51 and into Lake Chautauqua will be assessed at a later date.

Grab samples of soil and sediment will be collected from the floor of the culverts. Soil samples will be collected from around the headwall and outfall of each culvert, and concrete and wood samples will be collected from the culvert structures. Samples collected will be properly preserved and transported, under chain-of-custody, to the onsite laboratory for PCB analysis.

All samples collected during these additional sampling activities will be analyzed for PCBs in accordance with the sampling protocols and QA/QC procedures described in Section 6.0.

3.1.3 Culvert Replacement, Channel Reconstruction and Bridge Replacement

The City of Crystal Springs is currently evaluating the culverts previously identified in Section 3.1.2. This evaluation is being conducted to properly size culverts for replacement, if necessary.

A total of eight culverts exist in the drainage channel remediation area of which six are reinforced concrete pipe, one reinforced concrete box culvert, and a timber bridge. The first option for remediation, if required, is to remove and replace. If replacement is not practicable, as in the case of the culvert under the Canadian National Railroad mainline, contaminated soil will be removed to the extent technically feasible around the headwall and footwall of the culvert and those areas backfilled with clean soil. The culvert will be lined with a durable material that will seal any remaining PCBs in place eliminating the possibility of stormwater transport of PCBs from this structure. If remediation is required at the timber bridge at Camp Street, the bridge and affected soil will be removed. The existing timber bridge at Camp Street was closed to traffic by the City of Crystal Springs in 2002 and is currently undergoing structural evaluation. Sampling and remediation of culverts will be accomplished as work progresses down the drainage channel.

The City of Crystal Springs is currently designing the open channel cross-section and any required slope protection measures. This design will include specifications for slope stabilization methods and any construction materials and geotechnical testing that might be required.

The remediation contractor will incorporate the channel engineering design and specifications provided by the City of Crystal Springs into the overall drainage channel remediation plan. However, the limits of construction will be the specific areas of the drainage channel and adjacent properties identified in the MDEQ approved *North Drainage Channel Site Characterization Report* and those areas identified as the result of

additional sampling activities and confirmation sampling activities as being impacted by PCBs.

3.1.4 Remediation of Delineated Areas

The areas to be remediated as identified in *the North Drainage Channel Site Characterization Report* and presented in Figure 2 will be located and staked by OSHA trained land surveyors. Soil from these areas will be excavated and transported to an approved landfill for disposal. Soils with PCB concentrations greater than 1.0 mg/kg but less than 50 mg/kg will be excavated and transported to a Subtitle "D" landfill for disposal. Soils with PCB levels exceeding 50 mg/kg will be excavated and transported to a Subtitle "C" landfill for disposal. Excavation will proceed horizontally and vertically until confirmation sampling and laboratory analysis of excavation sidewalls and base indicates that PCB levels in soils are less than 1.0 mg/kg.

After the field geologist has inspected the excavation and the analytical testing confirms that all soil above 1.0 mg/kg has been removed, the remedial contractor will backfill the entire excavation area with clean soil, and will grade the area to prevent ponding and promote positive drainage of stormwater. Approximately 6 inches of topsoil will be placed over the clean backfill. Immediately upon completion of backfilling operations the remediated area will be seeded with grass. Silt fencing and/or other sedimentation or erosion control measures will remain in place in the seeded areas until ~~a~~ about ~~of~~ 90% of the seeded area has a substantial growth of grass cover.

The well defined channel extending from the KEC plant site to the end of Forest Street will be reconstructed according to plans and specifications provided by the City of Crystal Springs. Any drainage structures removed as a result of remediation will be replaced with materials of a size and configuration as specified by the City of Crystal Springs.

3.2 Excavation Near Structures

Soil sampling results indicate that excavation of impacted soil from beneath buildings and around building foundations may be required. Extreme care will be taken in excavating any soil or disturbing any structural foundation materials that are contaminated with PCBs. A registered professional engineer will design foundation shoring and stabilization plans prior to initiating any remedial activity at the properties owned by Beulah Mae Sojourner and Ralph Williams.

Two dilapidated and abandoned structures, one on the Willie Douglas property and one on the Harold Graham property are located in the active remediation zone. These structures may not be salvageable if remediation is required beneath them and may have to be demolished. Property owners will be contacted to discuss options.

3.3 Remediation within the Closed Landfill

An area of the drainage channel designated for remediation is identified as being a portion of a closed landfill site owned and operated by the City of Crystal Springs. Only surface soils impacted by PCBs as determined during the site characterization will be remediated. No waste or contamination resulting from operation of the landfill or post-closure activities will be removed or remediated.

For health and safety purposes, this area will be sampled for the presence of methane gas, and a geophysical investigation will be conducted prior to beginning remediation. The geophysical survey will aid in determining the location of any buried solid waste to help excavation crews avoid exposing waste material. This issue is further discussed in the Health and Safety Plan included in Section 7.0.

3.4 Excavation in the Vicinity of Trees

Reasonable care will be taken to protect live oak trees in the project area during site remediation. The roots of live oak trees will be washed prior to backfilling with clean soil. The root washing process has been used successfully during previous site remediations related to this project. The process involves the use of a pressure washer and vacuum truck. Soil is removed from around the roots of the tree using a low pressure spray which prevents damage to the outer protective layer of the root. Soil is suspended in water and the soil/water slurry is vacuumed into a holding tank. The slurry is allowed to separate; the water is decanted into a fractionation (frac) tank and the soil is loaded into a roll-off box. The soil will be disposed as previously described and water will be sampled. Water with less than 3 ug/l of PCBs will be discharged into the storm sewer under a State of Mississippi temporary NPDES permit. Water with PCB concentrations greater than 3 ug/l will be treated on-site to achieve a PCB concentration less than 3 ug/l or disposed at a permitted disposal facility.

If soil excavation beneath any trees exceeds 2 feet in depth, the trees may lack adequate support and may have to be removed.

A reasonable effort will be made to salvage visually healthy hardwood trees with trunks exceeding 24" in diameter by root washing prior to backfill. However, it may be necessary to remove some of these trees if they are located in areas that will require extensive excavation of soils below ground surface. Attempts will be made to salvage hardwood trees believed by any residential property owner to be essential to the intrinsic aesthetic value of the property.

Removal of trees will involve the use of a trackhoe with a skidder attachment and hydraulic cutter, which will cut and lift trees without allowing them to touch unprotected ground. Trees will be cut and placed on plastic sheeting for trimming and loading onto

trucks. Every effort will be made to prevent trees from coming in direct contact with the contaminated soil. If trees come in contact with contaminated soil, they will be properly disposed of at the appropriate permitted facility depending on the concentrations of PCBs in soil at the tree's location.

3.5 Prevention of Off-Site Migration

The possible transport mechanisms for PCBs are via stormwater runoff and wind-blown dust. Sediment transport as well as airborne PCBs will be controlled during remediation.

3.5.1 Sediment and Runoff Control During Remediation

Soil erosion and deposition of sediments into State of Mississippi waters will be controlled during remediation activities. The erosion and sediment control measures utilized during remediation of this site will be implemented in accordance with the State of Mississippi *Planning and Design Manual for Control of Erosion, Sediment and Stormwater.*

Runoff will be controlled through staging and progression of the remedial activities as well as active stormwater control. The remediation will begin at the upgradient end of the drainage channel at the KEC property which will eliminate sources of PCBs as work progress downstream. Stormwater diversion channels and other engineering controls such as silt fences, rock dams, and hay bail dams will be used to limit stormwater contact with contaminated soil and trap sediment. Prior to initiating excavation activities in any portion of the drainage channel, silt fences will be placed around the perimeter of the active construction zone. Bales of hay or straw will be placed inside the silt fencing as an additional measure of controlling erosion and sedimentation during remediation of that section of the channel. Rock dams will be constructed in open channels to detain flow and retain sediments. Soils that cannot be immediately deposited in the roll-off box

containers and must remain overnight will be stockpiled on 60-mil polyethylene sheeting, covered with polyethylene sheeting secured with sand bags to prevent stormwater and/or wind erosion.

Dust generation will be controlled by minimizing the area of exposed ground during remediation activities, and by using a fine water mist to spray the work area. A dust monitoring program, to monitor breathing air for remediation workers and to monitor migration of fugitive dust at the perimeter of the active working area, is included in the Health and Safety Plan section. Air monitoring for airborne dust will be conducted using a Personal Data RAM, Model PDR-1000AN "Airborne Particulates Monitor" or equivalent instrumentation. Monitors will be set upwind and downwind of remedial activities and in the active breathing zone inside the exclusion zone.

3.5.2 Post-Remediation Sedimentation and Erosion Control

Excavated areas will be immediately reseeded with grass after backfilling with clean soil and topping the clean backfill with 6 inches of clean topsoil. The grassed areas will be covered with hay or straw to prevent erosion, sediment transport, and airborne dust generation. The silt fencing and/or other erosion control measures will remain around the grassed excavation areas until approximately 90% of the area has a substantial vegetative cover.

3.5.3 Vegetative Stabilization

Establishing a perennial vegetative cover will be the principal method used for stabilizing areas that are disturbed during site remediation activities. These areas will be prepared and seeded with vegetation in accordance with the practices, site considerations and methods specified in the State of Mississippi *Planning and Design Manual for Control of*

Erosion, Sediment and Stormwater, Chapter 5 – Vegetative Practice Standards First Edition, April 1994.

After excavation of PCB-impacted soils, the excavated area will be backfilled to grade with clean soil. Every effort will be made to minimize the steepness of slopes during final grading. For any area that would have a final slope exceeding 3:1, the bare soil will be roughed with horizontal grooves running across the slope using construction equipment prior to seeding and mulching.

Plant species chosen for site stabilization will be based on plant adaptability/suitability for the Central Region as stated in the State of Mississippi vegetative practices standards. Areas that are disturbed will be stabilized with permanent vegetation and will be seeded within 30 days after final grading activities are completed. Prior to final grading and seeding, soils will be tested for pH and nutrient requirements. Application rates for fertilizer and/or lime will be based on the results of these tests.

To reduce the potential for erosion during the establishment stage of vegetation, the silt fencing, hay bales and other erosion and sedimentation control measures used during excavation activities will remain around seeded areas. Areas that fail to establish vegetation will be reseeded. Straw mulch will be placed over seeded areas on areas with slopes greater than 3:1. Fabric netting will be placed over mulched areas that have a high potential for erosion. In all cases, erosion and sedimentation control measures will remain in place until ground cover is established.

3.6 Confirmation Sampling Plan

Following excavation, all excavated areas will be sampled to confirm that impacted soil with concentrations of PCBs above the remedial goal has been removed. The sampling program is based on criteria established in the *State of Michigan Department of*

Environmental Quality, Waste Management Division, Guidance Document, Verification of Soil Remediation, April 1994, Revision 1, as adopted by Mississippi DEQ for use on projects of this nature.

The guidance document provides statistically based procedures for establishing a soil-sampling grid for confirmation that cleanup goals have been met or exceeded. Three different procedures are described. One procedure applies to "large sites" with a surface area greater than 3 acres (130,680 square feet). The second procedure applies to "medium sites" with a surface area of 0.25 to 3.0 acres (10,890 to 130,680 square feet). The third method applies to site of less than 0.25 acres or 10,890 square feet.

For large properties the grid spacing is determined by the following equation:

$$((A * \pi)/SF)^{1/2} = GI$$

where: A = area to be gridded (ft^2)
GI = grid interval
SF= Site Factor (length of area to be gridded, unitless)
π = 3.14159

For medium size properties the grid spacing is determined by the following equation:

$$(A * \pi)^{1/2} /4 = GI$$

where: A = area to be gridded (ft^2)
GI = grid interval
π = 3.14159

For small sites, the following tables will be used.

TABLE 1

EXCAVATION FLOOR SAMPLES	
Area of Floor (ft^2)	**Number of Samples**
<500	2
500 < 1,000	3
1,000 < 1,500	4
1,500 < 2,500	5
2,500 < 4,000	6
4,000 < 6,000	7
6,000 < 8,500	8
8,500 < 10,980	9

TABLE 2

EXCAVATION SIDEWALL SAMPLES	
Area of Sidewalls (ft^2)	**Number of Samples**
<500	4
500 < 1,000	5
1,000 < 1,500	6
1,500 < 2,000	7
2,000 < 3,000	8
3,000 < 4,000	9
> 4,000	1 Sample per 45 Lineal Feet of Sidewall

Grab samples will be collected at all nodes of the grid that will be laid out within the remediated area of the site. Sidewall samples will be collected on the same spacing as determined by the equations for establishing sample grid nodes for large and medium size sites, or in accordance with Table 2, as appropriate. If a grab sample concentration exceeds the cleanup criteria, excavation will continue to a depth of at least 1 foot below the node and laterally to a distance of ½ the grid spacing in all directions from the node. Two samples will then be collected from the base of the excavation and sidewall samples will be collected in accordance with the guidance for analysis by the on-site laboratory. Only the re-excavated area will be re-sampled if the initial result exceeds the clean-up criteria.

All samples will be collected in accordance with EPA Region IV EISOPQAM and the project Quality Assurance Plan presented in Section 6.0. Sample locations and limits of excavation will be referenced to the Mississippi State Plane Coordinate System (horizontally) and the North American Vertical Datum - 1988. Sample locations will be depicted on a scaled site map. Surveying and mapping will be performed under the direction of a licensed Mississippi Professional Land Surveyor.

3.7 Management of Investigative Derived Waste

Management of investigative derived waste (IDW) will be the responsibility of the Field Manager. IDW includes, but is not limited to soil removed from vehicles and equipment, decontamination solutions and water, personal protective clothing, gloves, and any other material to be discarded that has come in contact with constituents of concern.

All IDW will be placed in roll off boxes and stored in a secured location on the KEC plant site until removal to an appropriate disposal facility. The IDW will be profiled for disposal by either direct sampling and analysis of the material, or by using current, existing analytical data. Roll off boxes will be removed to a disposal facility within 90

4.0 ARMY CORPS OF ENGINEERS PERMITTING REQUIREMENTS

4.1 USACE Nationwide Permit 38

If a jurisdictional determination confirms that the drainage channel falls within the purview of the United States Army Corps of Engineers (USACE), remediation activities must be performed in accordance with the conditions of Nationwide Permit 38. Preparation of written notification to the Corps is underway with the first requirements of a wetlands delineation and jurisdictional determination scheduled for early April 2003.

Requirements for compliance with the nationwide permit should be met by July 1, 2003. If delays occur, the Corps permitting requirements will certainly be met by the time remediation begins in affected areas since these areas are located well downstream of the KEC plant site where work will begin.

5.0 SCHEDULE

Remediation work is scheduled to begin July 1, 2003. Work is projected to continue for approximately 18 to 24 months.

6.0 QUALITY ASSURANCE PLAN

As established by the Mississippi Department of Environmental Quality (MDEQ) guidelines, all work related to the confirmation of remedial actions in and adjacent to the North Drainage Channel will be performed in accordance with the Environmental Protection Agency (EPA), Region IV *"Environmental Investigations, Standard Operating Procedures and Quality Assurance Manual", May 1996 (EISOPQAM).* Copies of relevant and applicable portions of the EISOPQAM will be maintained on site during all field activities and all field personnel will be trained in its implementation.

6.1 Sampling Objectives

The sampling objective for the remedial work is to confirm the effectiveness of the remediation of materials impacted with PCBs exceeding the MDEQ maximum allowable limit of 1.0 mg/Kg. Soil samples will be collected by the field geologist at the frequency prescribed in Section 3.0 of this work plan. Removal and disposal of impacted soil will continue in an active remediation zone until analytical laboratory data confirms PCB levels are below the MDEQ remediation goal.

6.2 Analytical Methods

Samples will be analyzed for PCBs by the field laboratory, Environmental Chemistry Consulting Services (ECCS) of Madison, Wisconsin. At least 10% of all samples will be split and sent to a fixed-base laboratory, Paradigm Analytical Laboratories, Inc. (PAL) in Wilmington, North Carolina for analysis of the same parameters as the on-site mobile laboratory. This measure is taken to corroborate the results of field laboratory analyses.

The field laboratory will analyze the soil samples using a mini-extraction procedure based on EPA Method 8082/8141 for PCBs. The procedure incorporates all the quality control rigors of the full 8082 method including quantification based on 6-point

calibration with continuing calibration verification, surrogate method performance monitoring, method blanks, laboratory control samples (LCS), and matrix spike/matrix spike duplicate samples.

The fixed-base laboratory will analyze all soil samples using EPA method 8082 for PCBs.

6.3 Key Personnel

The following is the list of key personnel dedicated to this project:

Project Manager: Robert Martin, Martin & Slagle GeoEnvironmental Associates, LLC

Duties: Responsible for overall management of project including all field coordination efforts.

Field Manager: Charles Peel, Peel Consulting, PLLC

Duties: Field oversight of remedial activities. Collection of samples. Maintenance of all field logs and records.

Field Laboratory Manager: Richard Johnson, ECCS

Duties: Responsible for accepting custody of samples from the field personnel. Maintenance of laboratory records. Sample analysis.

QA/QC Coordinator: Christine Slagle, Martin & Slagle GeoEnvironmental Associate, LLC

Duties:	Review daily sample logs. Confirm that QC samples are collected and sampling protocols are met. Assure that data quality objectives are met.
Data Validation:	Dr. Eric Butler, Gradient Corporation
Duties:	Review and validate laboratory data generated by the field and fixed-base laboratories.

6.4 Quality Assurance Objectives for Data

The data quality objectives are pre-defined for the ECCS data in that the State of Mississippi considers all field lab data screening level data. ECCS uses the same equipment and methodology as the fixed-base lab with the exception of the mini extraction modification. Ten percent of the samples collected will be split and submitted to Paradigm Analytical for confirmation analysis. Following this procedure, the data will qualify as screening data with definitive confirmation under EPA region IV EISOPQAM guidelines.

Samples designated for further analysis by Paradigm will be delivered to the field lab where ECCS will take its aliquot for analysis. Due to the limited sample volume required by the ECCS mini extraction and the low volatility of the contaminant of concern, the jar will be resealed, refrigerated, and the same container will then be sent to Paradigm, under Chain-of-Custody, for analysis. Paradigm will be thus analyzing the exact same sample as ECCS.

Equipment rinsates will be collected for evaluation of the potential of cross-of sampling equipment between sample locations. These samples will be prepared by pouring distilled water over the sampling equipment after decontamination of the equipment, and collecting, preserving and analyzing the rinsate generated.

Blind duplicate soil samples will be collected for analysis and sent to both labs. Blind duplicates will be collected by homogenizing an aliquot of the sample in a disposable plastic container and splitting the homogenized sample into 2 separate containers for subsequent analysis. After ECCS retains their aliquot of these samples, the remainder will be sent to Paradigm for analysis.

6.5 Sample Control and Field Records

6.5.1 Sample Identification

Each sample will be assigned a unique alphanumeric identifier that will be clearly recognizable by both laboratories. Sample labels will conform to the labeling requirements under section 3.2.1 of the EISOPQAM.

6.5.2 Chain of Custody Procedures

The field geologist will record the sample ID, date, and time sampled in the field logbook at the time of collection. Samples will be placed in a cooler and transferred by the field geologist to the field laboratory. Upon arrival at the lab, the samples will be transferred to the ECCS laboratory manager who will log each sample on ECCS chain of custody forms. Each sample will be assigned a unique ECCS internal ID for tracking purposes. After analysis, the samples will be transferred to a sample refrigerator in the field lab until they are either sent to Paradigm for confirmation analysis or disposed of on-site.

The field geologist will fill out a new chain of custody for samples that are sent to Paradigm.

6.5.3 Field Records

Field records will be kept in accordance with procedures specified in section 3.5 of EISOPQAM.

6.6 Laboratory QA/QC

QA/QC for both labs is identical. Summaries of each lab's procedures follow.

ECCS:

- Continuing calibration standards analyzed every ten samples or less and at the end of a run.
- Blank and LCS samples analyzed every twenty samples or less with a minimum of one per day.
- MS/MSD samples analyzed every twenty samples or less with a minimum of one per day.

Paradigm:

- Continuing calibration standards analyzed at least once every 12-hour shift plus a minimum of every 20 samples (GC/MS criteria follows method specific tuning requirements per EPA 8270).
- Blank and LCS samples analyzed every twenty sample or less with a minimum of one per day.

- MS/MSD samples analyzed every twenty samples or less with a minimum of one per day.

6.7 Data Review and Validation

All laboratory reports will be reviewed for reporting accuracy and consistency with laboratory QA/QC protocols. The primary validation of the field lab data will be accomplished through comparison with the data from Paradigm. The relative percent difference (RPD) between the laboratory's results for split samples will be calculated and compared to a 50 % RPD acceptability threshold.

7.0 REFERENCES

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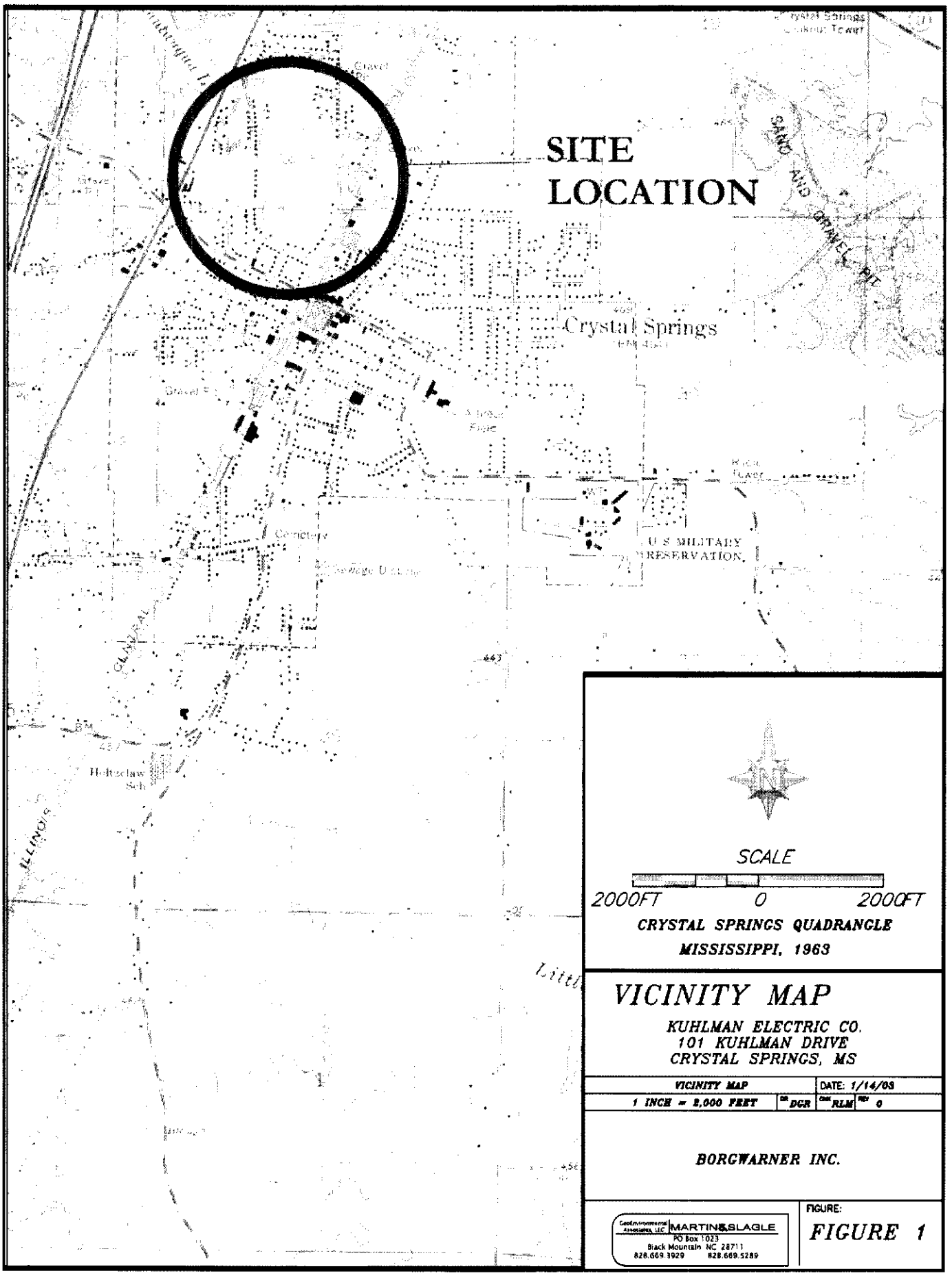

CRYSTAL SPRINGS QUADRANGLE
MISSISSIPPI, 1963

VICINITY MAP

KUHLMAN ELECTRIC CO.
101 KUHLMAN DRIVE
CRYSTAL SPRINGS, MS

VICINITY MAP		DATE: *1/14/08*
1 INCH = 2,000 FEET	DR *DGR*	CHK *RLM* REV *0*

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FIGURE:
FIGURE 1