Evaluation of Suspect Soil at Fence Lines and Railroad Track

for

United States Department of Agriculture (USDA)

at

Badger Army Ammunition Plant (BAAP)
Baraboo, Wisconsin

map → Appendix A

Prepared by:
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February 1, 2002

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Appendices

Executive Summary

At the request of the United States Department of Agriculture (USDA), field personnel representing Federal Occupational Health (FOH) conducted soil sampling at certain fence lines and railroad track on the Badger Army Ammunition Plant (BAAP) where the presence of herbicide and heavy metal contamination could adversely impact USDA Dairy Forage Research Center (DFRC) operations. Specifically, DFRC wishes to acquire a parcel of land (Referred to herein as the USDA land), which is adjacent to its present site. This land is currently titled to BAAP. Soil at fence lines and railroad track on this parcel of land is suspect because it was common practice at ammunition manufacturing sites to spray herbicide at fence lines and railroad track to prevent weed growth. Many herbicides persist in the soil and, if present, could harm cattle grazing or crops growing in these areas.

On August 7, 2001, eleven composite soil samples were collected along three segments of fence line that separate BAAP from DRFC as well as along railroad track within the parcel of land. Samples were analyzed via US Environmental Protection Agency (EPA) methods for various herbicides and heavy metals. Sample results were compared to three sets of soil remediation goals to include those developed by the USDA Forest Service at the Midewin National Tallgrass Prairie, the Wisconsin Soil Remediation Objectives intended to protect human health in residential settings and the Illinois Tier I Soil Remediation Objectives for residential settings intended to protect human health via soil ingestion. (These sets of goals are referred to herein as Midewin, Wisconsin and Illinois.) Individual goals for 10 of the 26 herbicides identified in the samples are not available in any of these three sets of goals.

Only one herbicide in one sample exceeded the most stringent goal that has been established for it. Specifically, the dieldrin concentration in Sample A4C1 taken from the midpoint of the railroad track was 180 ug/kg as compared to the Illinois Tier I goal for residential property of 40 ug/kg. The Midewin goal for dieldrin is 2,000 ug/kg, and Wisconsin has not promulgated a goal for it.

All sample results exceeded the Wisconsin objectives for arsenic in residential settings of 39 ug/kg ranging from 1,600 to 3,800 ug/kg. These arsenic levels in general are well below those found at JOAAP where fence line arsenic levels as high as 52,000 ug/kg were recorded. Further, the background level for arsenic in the BAAP area averages 16,000 ug/kg. None of them exceeded the Midewin Soil Remediation Goal for arsenic of 21,000 ug/kg or the Illinois Soil Remediation Goal of 11,300 ug/kg.

Three of the sample results exceeded the Midewin objective for lead of 185,000 ug/kg ranging from 251,000 to 274,000 ug/kg, four of the them exceeded the Wisconsin objective for lead 50,000 ug/kg ranging from 63,500 to 274,000 ug/kg and five of them exceeded the background level for lead at BAAP of 30,000 ug/kg ranging from 36,000 to 274,000 ug/kg. None of the eleven sample results exceeded the Illinois objective for lead of 400,000 ug/kg. Four of the five samples having the highest lead levels were collected

along the fence line on the southwestern portion of BAAP. The elevated levels of lead could have resulted from operations formerly conducted in and around the Propellant Burning Grounds Thermal Treatment/Racetrack area, and/or from emissions of vehicles traveling along U.S. Highway12, which runs parallel to and nearby the fence line in this area. The remaining sample, which was collected in the central portion of the railroad track run, had a slightly elevated lead level above background of 36,000 ug/kg. Lead in this sample could have resulted from operations formerly conducted in and around the Propellant Burning Grounds Thermal Treatment/Racetrack area. These results for lead suggest that further investigation into lead levels throughout the southwestern portion of BAAP is advisable.

Recommendations

1. Provide this report to State of Wisconsin Department of Natural Resources (WDNR) personnel and BAAP management.

2. Collect additional soil samples for lead analysis on the USDA land from an area bordered by the Gate Road 7/16 to the north, the perimeter fence lines to the west and south and the railroad track to the east.

I. Site Description and Background

Site Description

BAAP is a government-owned, contractor-operated (GOCO) military industrial installation that is located in south-central Wisconsin, nine miles south of Baraboo and 30 miles northwest of Madison. It covers approximately 7,354 acres in Sauk County and is bordered to the north by Devil's Lake State Park, to the east and south by farmland, to the west by U.S. Highway 12 and to the southeast by Lake Wisconsin.

The topography in the eastern two-thirds is knob and kettle while the outwash plain west of the terminal moraine is level to gently sloping (ANL, 1988). Surface runoff is limited (ABB, 1993) being contained in depressed areas where it tends to evaporate. The main direction of drainage is to the south being partially controlled by man-made ditches.

The geology of the site consists of a thick sequence of unconsolidated sediments underlain by bedrock. At the surface, a five to ten foot thick clayey silt layer exists over most of the site. Two major aquifers exist beneath the facility to include an overburden aquifer approximately 100 feet below ground surface and an underlying sandstone bedrock aquifer. These aquifers are interconnected so that water can flow between them. Direction of flow appears to be from the bedrock aquifer into the overburden aquifer. The general direction of groundwater flow is south-southeast (ABB, 1993).

Background

BAAP operated during three multi-year periods totaling 18 years since being constructed in 1942 to provide nitrocellulose-based single base artillery propellant, double base solventless rocket propellant and double base ball propellant for World War II and the Korean and Vietnam conflicts. All major production activities were located north of Gate Road 6/16 that serves as, for the most part, the northern boundary of the USDA land. Most of the USDA land was either open ground or used for storage of BAAP product in magazine areas.

The DFRC is located just southeast of BAAP. Responsibility for operation of the site is shared by USDA and the University of Wisconsin. DFRC has leased almost 1250 acres of land over the last 20 years from BAAP for purposes of growing crops and grazing cattle. Use of this land has become a very important part of the DFRC operation. Now that this land is going to be returned to the public domain, USDA wishes to acquire title to the land it has leased in the past as well as approximately an additional 500 acres comprised of individual parcels interspersed throughout the leased land areas.

Little or no soil sampling has been performed on the USDA land at BAAP. The reason for this is that previous environmental site assessments including the Environmental Baseline Study (EBS) have concluded that it is improbable that BAAP operations would have resulted in any significant contamination of the USDA land. Department of the

Army (DOA) has a policy that precludes sampling of areas unless it is likely that they may be contaminated. This same policy was implemented at JOAAP where environmental site assessments failed to determine that fence lines had been sprayed with Brulin, an arsenic-containing herbicide, and, as a result, cattle grazing along fence line areas became ill and died of arsenic poisoning. The use of Brulin was discontinued, but arsenic contamination in the soil was not remediated to acceptable levels. A soil study conducted by USDA confirmed the presence of arsenic and other heavy metals in concentrations significantly higher than USDA deems acceptable to protect human health. As a result of that experience, USDA has commissioned this soil sampling work in an attempt to preclude a reoccurrence of such a situation at BAAP.

II. Scope of Work

The purpose of this work was to determine if soil present at fence lines or along the railroad track that would be incorporated into the USDA land is contaminated with herbicides or heavy metals such that these contaminants would adversely affect cattle grazing or crops growing in these areas. Specific tasks included:

- Conduct soil sampling along fence lines that separate BAAP and DFRC and the railroad track that runs northeast through the southeast portion of BAAP.
- Compare soil sample results to appropriate soil remediation goals.
- Provide a report of findings.

III. Methodology

Montgomery Watson Harza performed soil sampling at various areas along perimeter fence line and the railroad track that runs northeast through the southwest portion of BAAP in conjunction with FOH representatives. Eight composite samples were obtained of soil at the fence line, which was divided into three sections as a function of its proximity to land that DFRC wishes to acquire. Two samples were collected from Area 1, which extends from Gate 16 south to Gate 15. The second area, where two samples were collected, extends from the southwest corner of the BAAP property east to Gate 13. Four samples were collected from Area 3, which is located in the southeast portion of the BAAP property running between Gate 7 and Gate 8. Three composite soil samples were obtained of soil along the railroad track, which runs from the south fence line to Gate Road 7/16 and was designated as Area 4. See Appendix A.

Each Area was subdivided into a number of segments equal to the number of composite samples to be collected from that area. Five individual samples were then collected from zero to six inches within 12 inches of the fence or within the rail footprint at the centerline of the segment and at intervals of approximately100 and 200 yards on either side of the centerline location using stainless steel implements and containers. Equal volumes of the individual samples were then deposited into a stainless steel container and thoroughly mixed using a stainless steel implement. The composite sample was then

placed into glass containers, labeled and refrigerated. Implements and field containers were decontaminated between samples. Sample containers and one blank soil sample were transported to CT Laboratories in Baraboo, Wisconsin on August 7, 2001 for analysis.

Each soil sample was analyzed for organophosphate-organonitrate (OP-ON) pesticides via EPA Method 8141A, organochloride (OC) pesticides via EPA Method 8081, acid extractable pesticides via EPA Method 8151A, tebuthiuron (Brulan) via EPA Method 8321-HPLC UV, mercury via EPA Method 7471 and eight RCRA metals via EPA Method 6010B. Further, samples collected along the railroad track were analyzed for PCBs using EPA Method 8082.

IV. Discussion

Cleanup Goals

As was the case at JOAAP, DOA and USDA have not set a mutually acceptable set of cleanup goals for the USDA land at BAAP. In view of this, an attempt has been made to consider three sets of goals that seem most relevant to the situation under consideration. The Midewin goals were selected because of the similarities between BAAP and JOAAP and they were developed under the USDA aegis. It should be noted, however, that these goals have an interim status while deliberations continue to finalize them. The Wisconsin NR 720 goals were considered because BAAP is located in the State of Wisconsin, they are based on human health effects and Wisconsin officials will review all data generated at BAAP. Finally, Illinois Tier I goals were used because Illinois has promulgated goals for many more of the herbicides in question than Wisconsin, and these goals are also based on human health effects. USDA must decide which of these goals are the most appropriate to determine the need for additional sampling or soil remediation. See Appendices D, E and F.

Sample Results

In total 25 individual herbicides were identified in the eleven composite soil samples. Goals have been promulgated for 16 of these herbicides. Only one of the herbicides identified, dieldrin, exceeded its most stringent goal, and only in one of the 11 samples. This was Sample A4C1, which was collected at the midpoint of the railroad track. The dieldrin concentration in this sample was 180 ug/kg as compared to the Illinois Tier I level of 40 ug/kg for residential property. Dieldrin concentration in the sample did not exceed the Midewin goal of 2,000 ug/kg or the Illinois goal for industrial property of 400 ug/kg. See Appendix B for the MWH report of findings and Appendix C, Tables 1 and 2 for a summary of the MWH findings and a comparison of the highest MWH findings to the Midewin, Wisconsin and Illinois remediation goals, respectively.

Goals have not been established that can be used to judge cumulative toxicity when several herbicides are present at a given location. One approach to making such a judgment, assuming the toxicity of these herbicides to be additive, is to sum the quantities

of herbicide present in each composite sample for which remediation goals have been established, and then to compare the total quantity of herbicides present in the most concentrated sample to the sum of the most stringent individual goals that have been established for the herbicides present in that sample. The total concentration of individual herbicides found in any given sample ranged from 59 in Sample A2C1, which was taken at the southwestern fence line, to 3960 ug/kg found in Sample A4C1, which was collected at the midpoint of the railroad track. Goals have been established for 11 of the 19 herbicides found in Sample A4C1. The sum of individual concentrations of the 11 herbicides in Sample A4C1 was 2,335 ug/kg as compared to the sum of the most stringent goals established for the same 11 herbicides of 4,765,040 ug/kg. Thus, the 11 herbicides having goals were present at a level of only 0.049 percent of their respective most stringent goals. Based on this approach, it appears that the cumulative effect of the herbicides identified in any of the 11 composite soil samples does not appear to pose a serious risk to cattle that might graze nearby the fence line and railroad track, or crops that might be grown in these areas. This conclusion should be reviewed by professionals specializing in the disciplines of toxicology and risk assessment.

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"Media Cleanup Standard" In field Con. Approval As= 16mg/kg

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Site Description

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The topography in the eastern two-thirds is knob and kettle while the outwash plain west of the terminal moraine is level to gently sloping (ANL, 1988). Surface runoff is limited (ABB, 1993) being contained in depressed areas where it tends to evaporate. The main direction of drainage is to the south being partially controlled by man-made ditches.

The geology of the site consists of a thick sequence of unconsolidated sediments underlain by bedrock. At the surface, a five to ten foot thick clayey silt layer exists over most of the site. Two major aquifers exist beneath the facility to include an overburden aquifer approximately 100 feet below ground surface and an underlying sandstone bedrock aquifer. These aquifers are interconnected so that water can flow between them. Direction of flow appears to be from the bedrock aquifer into the overburden aquifer. The general direction of groundwater flow is south-southeast (ABB, 1993).

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BAAP operated during three multi-year periods totaling 18 years since being constructed in 1942 to provide nitrocellulose-based single base artillery propellant, double base solventless rocket propellant and double base ball propellant for World War II and the Korean and Vietnam conflicts. All major production activities were located north of Gate Road 6/16 that serves as, for the most part, the northern boundary of the USDA land. Most of the USDA land was either open ground or used for storage of BAAP product in magazine areas.

The DFRC is located just southeast of BAAP. Responsibility for operation of the site is shared by USDA and the University of Wisconsin. DFRC has leased almost 1250 acres of land over the last 20 years from BAAP for purposes of growing crops and grazing cattle. Use of this land has become a very important part of the DFRC operation. Now that this land is going to be returned to the public domain, USDA wishes to acquire title to the land it has leased in the past as well as approximately an additional 500 acres comprised of individual parcels interspersed throughout the leased land areas.

Little or no soil sampling has been performed on the USDA land at BAAP. The reason for this is that previous environmental site assessments including the Environmental Baseline Study (EBS) have concluded that it is improbable that BAAP operations would have resulted in any significant contamination of the USDA land. Department of the

Army (DOA) has a policy that precludes sampling of areas unless it is likely that they may be contaminated. This same policy was implemented at JOAAP where environmental site assessments failed to determine that fence lines had been sprayed with Brulin, an arsenic-containing herbicide, and, as a result, cattle grazing along fence line areas became ill and died of arsenic poisoning. The use of Brulin was discontinued, but arsenic contamination in the soil was not remediated to acceptable levels. A soil study conducted by USDA confirmed the presence of arsenic and other heavy metals in concentrations significantly higher than USDA deems acceptable to protect human health. As a result of that experience, USDA has commissioned this soil sampling work in an attempt to preclude a reoccurrence of such a situation at BAAP.

II. Scope of Work

The purpose of this work was to determine if soil present at fence lines or along the railroad track that would be incorporated into the USDA land is contaminated with herbicides or heavy metals such that these contaminants would adversely affect cattle grazing or crops growing in these areas. Specific tasks included:

- Conduct soil sampling along fence lines that separate BAAP and DFRC and the railroad track that runs northeast through the southeast portion of BAAP.
- Compare soil sample results to appropriate soil remediation goals.
- Provide a report of findings.

III. Methodology

Montgomery Watson Harza performed soil sampling at various areas along perimeter fence line and the railroad track that runs northeast through the southwest portion of BAAP in conjunction with FOH representatives. Eight composite samples were obtained of soil at the fence line, which was divided into three sections as a function of its proximity to land that DFRC wishes to acquire. Two samples were collected from Area 1, which extends from Gate 16 south to Gate 15. The second area, where two samples were collected, extends from the southwest corner of the BAAP property east to Gate 13. Four samples were collected from Area 3, which is located in the southeast portion of the BAAP property running between Gate 7 and Gate 8. Three composite soil samples were obtained of soil along the railroad track, which runs from the south fence line to Gate Road 7/16 and was designated as Area 4. See Appendix A.

Each Area was subdivided into a number of segments equal to the number of composite samples to be collected from that area. Five individual samples were then collected from zero to six inches within 12 inches of the fence or within the rail footprint at the centerline of the segment and at intervals of approximately100 and 200 yards on either side of the centerline location using stainless steel implements and containers. Equal volumes of the individual samples were then deposited into a stainless steel container and thoroughly mixed using a stainless steel implement. The composite sample was then

placed into glass containers, labeled and refrigerated. Implements and field containers were decontaminated between samples. Sample containers and one blank soil sample were transported to CT Laboratories in Baraboo, Wisconsin on August 7, 2001 for analysis.

Each soil sample was analyzed for organophosphate-organonitrate (OP-ON) pesticides via EPA Method 8141A, organochloride (OC) pesticides via EPA Method 8081, acid extractable pesticides via EPA Method 8151A, tebuthiuron (Brulan) via EPA Method 8321-HPLC UV, mercury via EPA Method 7471 and eight RCRA metals via EPA Method 6010B. Further, samples collected along the railroad track were analyzed for PCBs using EPA Method 8082.

IV. Discussion

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As was the case at JOAAP, DOA and USDA have not set a mutually acceptable set of cleanup goals for the USDA land at BAAP. In view of this, an attempt has been made to consider three sets of goals that seem most relevant to the situation under consideration. The Midewin goals were selected because of the similarities between BAAP and JOAAP and they were developed under the USDA aegis. It should be noted, however, that these goals have an interim status while deliberations continue to finalize them. The Wisconsin NR 720 goals were considered because BAAP is located in the State of Wisconsin, they are based on human health effects and Wisconsin officials will review all data generated at BAAP. Finally, Illinois Tier I goals were used because Illinois has promulgated goals for many more of the herbicides in question than Wisconsin, and these goals are also based on human health effects. USDA must decide which of these goals are the most appropriate to determine the need for additional sampling or soil remediation. See Appendices D, E and F.

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In total 25 individual herbicides were identified in the eleven composite soil samples. Goals have been promulgated for 16 of these herbicides. Only one of the herbicides identified, dieldrin, exceeded its most stringent goal, and only in one of the 11 samples. This was Sample A4C1, which was collected at the midpoint of the railroad track. The dieldrin concentration in this sample was 180 ug/kg as compared to the Illinois Tier I level of 40 ug/kg for residential property. Dieldrin concentration in the sample did not exceed the Midewin goal of 2,000 ug/kg or the Illinois goal for industrial property of 400 ug/kg. See Appendix B for the MWH report of findings and Appendix C, Tables 1 and 2 for a summary of the MWH findings and a comparison of the highest MWH findings to the Midewin, Wisconsin and Illinois remediation goals, respectively.

Goals have not been established that can be used to judge cumulative toxicity when several herbicides are present at a given location. One approach to making such a judgment, assuming the toxicity of these herbicides to be additive, is to sum the quantities

of herbicide present in each composite sample for which remediation goals have been established, and then to compare the total quantity of herbicides present in the most concentrated sample to the sum of the most stringent individual goals that have been established for the herbicides present in that sample. The total concentration of individual herbicides found in any given sample ranged from 59 in Sample A2C1, which was taken at the southwestern fence line, to 3960 ug/kg found in Sample A4C1, which was collected at the midpoint of the railroad track. Goals have been established for 11 of the 19 herbicides found in Sample A4C1. The sum of individual concentrations of the 11 herbicides in Sample A4C1 was 2,335 ug/kg as compared to the sum of the most stringent goals established for the same 11 herbicides of 4,765,040 ug/kg. Thus, the 11 herbicides having goals were present at a level of only 0.049 percent of their respective most stringent goals. Based on this approach, it appears that the cumulative effect of the herbicides identified in any of the 11 composite soil samples does not appear to pose a serious risk to cattle that might graze nearby the fence line and railroad track, or crops that might be grown in these areas. This conclusion should be reviewed by professionals specializing in the disciplines of toxicology and risk assessment.

Two of the eight heavy metals analytes exceeded goals that have been established for them. These were arsenic and lead. All sample results exceeded the Wisconsin objectives for arsenic in residential settings of 39 ug/kg ranging from 1,600 to 3,800 ug/kg. However, the background level for arsenic in the area averages 16,000 ug/kg. WDNR NR 720 explicitly states that when background levels exceed values stated in NR 720, the background level will prevail as the goal. None of sample results exceeded the Midewin Soil Remediation Goal for arsenic of 21,000 ug/kg or the Illinois Soil Remediation Goal of 11,300 ug/kg. These results suggest that arsenic-containing herbicides such as Brulin were not used at BAAP to control fence line and railroad track weed growth.

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Evaluation of Suspect Soil at Fence Lines and Railroad Track

for

United States Department of Agriculture (USDA)

at

Badger Army Ammunition Plant (BAAP)
Baraboo, Wisconsin

Prepared by:
Federal Occupational Health (FOH)
536 S. Clark Street
Chicago, IL 60605

February 1, 2002

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On August 7, 2001, eleven composite soil samples were collected along three segments of fence line that separate BAAP from DRFC as well as along railroad track within the parcel of land. Samples were analyzed via US Environmental Protection Agency (EPA) methods for various herbicides and heavy metals. Sample results were compared to three sets of soil remediation goals to include those developed by the USDA Forest Service at the Midewin National Tallgrass Prairie, the Wisconsin Soil Remediation Objectives intended to protect human health in residential settings and the Illinois Tier I Soil Remediation Objectives for residential settings intended to protect human health via soil ingestion. (These sets of goals are referred to herein as Midewin, Wisconsin and Illinois.) Individual goals for 10 of the 26 herbicides identified in the samples are not available in any of these three sets of goals.

Only one herbicide in one sample exceeded the most stringent goal that has been established for it. Specifically, the dieldrin concentration in Sample A4C1 taken from the midpoint of the railroad track was 180 ug/kg as compared to the Illinois Tier I goal for residential property of 40 ug/kg. The Midewin goal for dieldrin is 2,000 ug/kg, and Wisconsin has not promulgated a goal for it.

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Background

BAAP operated during three multi-year periods totaling 18 years since being constructed in 1942 to provide nitrocellulose-based single base artillery propellant, double base solventless rocket propellant and double base ball propellant for World War II and the Korean and Vietnam conflicts. All major production activities were located north of Gate Road 6/16 that serves as, for the most part, the northern boundary of the USDA land. Most of the USDA land was either open ground or used for storage of BAAP product in magazine areas.

The DFRC is located just southeast of BAAP. Responsibility for operation of the site is shared by USDA and the University of Wisconsin. DFRC has leased almost 1250 acres of land over the last 20 years from BAAP for purposes of growing crops and grazing cattle. Use of this land has become a very important part of the DFRC operation. Now that this land is going to be returned to the public domain, USDA wishes to acquire title to the land it has leased in the past as well as approximately an additional 500 acres comprised of individual parcels interspersed throughout the leased land areas.

Little or no soil sampling has been performed on the USDA land at BAAP. The reason for this is that previous environmental site assessments including the Environmental Baseline Study (EBS) have concluded that it is improbable that BAAP operations would have resulted in any significant contamination of the USDA land. Department of the

Army (DOA) has a policy that precludes sampling of areas unless it is likely that they may be contaminated. This same policy was implemented at JOAAP where environmental site assessments failed to determine that fence lines had been sprayed with Brulin, an arsenic-containing herbicide, and, as a result, cattle grazing along fence line areas became ill and died of arsenic poisoning. The use of Brulin was discontinued, but arsenic contamination in the soil was not remediated to acceptable levels. A soil study conducted by USDA confirmed the presence of arsenic and other heavy metals in concentrations significantly higher than USDA deems acceptable to protect human health. As a result of that experience, USDA has commissioned this soil sampling work in an attempt to preclude a reoccurrence of such a situation at BAAP.

II. Scope of Work

The purpose of this work was to determine if soil present at fence lines or along the railroad track that would be incorporated into the USDA land is contaminated with herbicides or heavy metals such that these contaminants would adversely affect cattle grazing or crops growing in these areas. Specific tasks included:

- Conduct soil sampling along fence lines that separate BAAP and DFRC and the railroad track that runs northeast through the southeast portion of BAAP.
- Compare soil sample results to appropriate soil remediation goals.
- Provide a report of findings.

III. Methodology

Montgomery Watson Harza performed soil sampling at various areas along perimeter fence line and the railroad track that runs northeast through the southwest portion of BAAP in conjunction with FOH representatives. Eight composite samples were obtained of soil at the fence line, which was divided into three sections as a function of its proximity to land that DFRC wishes to acquire. Two samples were collected from Area 1, which extends from Gate 16 south to Gate 15. The second area, where two samples were collected, extends from the southwest corner of the BAAP property east to Gate 13. Four samples were collected from Area 3, which is located in the southeast portion of the BAAP property running between Gate 7 and Gate 8. Three composite soil samples were obtained of soil along the railroad track, which runs from the south fence line to Gate Road 7/16 and was designated as Area 4. See Appendix A.

Each Area was subdivided into a number of segments equal to the number of composite samples to be collected from that area. Five individual samples were then collected from zero to six inches within 12 inches of the fence or within the rail footprint at the centerline of the segment and at intervals of approximately100 and 200 yards on either side of the centerline location using stainless steel implements and containers. Equal volumes of the individual samples were then deposited into a stainless steel container and thoroughly mixed using a stainless steel implement. The composite sample was then

placed into glass containers, labeled and refrigerated. Implements and field containers were decontaminated between samples. Sample containers and one blank soil sample were transported to CT Laboratories in Baraboo, Wisconsin on August 7, 2001 for analysis.

Each soil sample was analyzed for organophosphate-organonitrate (OP-ON) pesticides via EPA Method 8141A, organochloride (OC) pesticides via EPA Method 8081, acid extractable pesticides via EPA Method 8151A, tebuthiuron (Brulan) via EPA Method 8321-HPLC UV, mercury via EPA Method 7471 and eight RCRA metals via EPA Method 6010B. Further, samples collected along the railroad track were analyzed for PCBs using EPA Method 8082.

IV. Discussion

Cleanup Goals

As was the case at JOAAP, DOA and USDA have not set a mutually acceptable set of cleanup goals for the USDA land at BAAP. In view of this, an attempt has been made to consider three sets of goals that seem most relevant to the situation under consideration. The Midewin goals were selected because of the similarities between BAAP and JOAAP and they were developed under the USDA aegis. It should be noted, however, that these goals have an interim status while deliberations continue to finalize them. The Wisconsin NR 720 goals were considered because BAAP is located in the State of Wisconsin, they are based on human health effects and Wisconsin officials will review all data generated at BAAP. Finally, Illinois Tier I goals were used because Illinois has promulgated goals for many more of the herbicides in question than Wisconsin, and these goals are also based on human health effects. USDA must decide which of these goals are the most appropriate to determine the need for additional sampling or soil remediation. See Appendices D, E and F.

Sample Results

In total 25 individual herbicides were identified in the eleven composite soil samples. Goals have been promulgated for 16 of these herbicides. Only one of the herbicides identified, dieldrin, exceeded its most stringent goal, and only in one of the 11 samples. This was Sample A4C1, which was collected at the midpoint of the railroad track. The dieldrin concentration in this sample was 180 ug/kg as compared to the Illinois Tier I level of 40 ug/kg for residential property. Dieldrin concentration in the sample did not exceed the Midewin goal of 2,000 ug/kg or the Illinois goal for industrial property of 400 ug/kg. See Appendix B for the MWH report of findings and Appendix C, Tables 1 and 2 for a summary of the MWH findings and a comparison of the highest MWH findings to the Midewin, Wisconsin and Illinois remediation goals, respectively.

Goals have not been established that can be used to judge cumulative toxicity when several herbicides are present at a given location. One approach to making such a judgment, assuming the toxicity of these herbicides to be additive, is to sum the quantities

of herbicide present in each composite sample for which remediation goals have been established, and then to compare the total quantity of herbicides present in the most concentrated sample to the sum of the most stringent individual goals that have been established for the herbicides present in that sample. The total concentration of individual herbicides found in any given sample ranged from 59 in Sample A2C1, which was taken at the southwestern fence line, to 3960 ug/kg found in Sample A4C1, which was collected at the midpoint of the railroad track. Goals have been established for 11 of the 19 herbicides found in Sample A4C1. The sum of individual concentrations of the 11 herbicides in Sample A4C1 was 2,335 ug/kg as compared to the sum of the most stringent goals established for the same 11 herbicides of 4,765,040 ug/kg. Thus, the 11 herbicides having goals were present at a level of only 0.049 percent of their respective most stringent goals. Based on this approach, it appears that the cumulative effect of the herbicides identified in any of the 11 composite soil samples does not appear to pose a serious risk to cattle that might graze nearby the fence line and railroad track, or crops that might be grown in these areas. This conclusion should be reviewed by professionals specializing in the disciplines of toxicology and risk assessment.

Two of the eight heavy metals analytes exceeded goals that have been established for them. These were arsenic and lead. All sample results exceeded the Wisconsin objectives for arsenic in residential settings of 39 ug/kg ranging from 1,600 to 3,800 ug/kg. However, the background level for arsenic in the area averages 16,000 ug/kg. WDNR NR 720 explicitly states that when background levels exceed values stated in NR 720, the background level will prevail as the goal. None of sample results exceeded the Midewin Soil Remediation Goal for arsenic of 21,000 ug/kg or the Illinois Soil Remediation Goal of 11,300 ug/kg. These results suggest that arsenic-containing herbicides such as Brulin were not used at BAAP to control fence line and railroad track weed growth.

Three of the sample results exceeded the Midewin objective for lead of 185,000 ug/kg ranging from 251,000 to 274,000 ug/kg, four of them exceeded the Wisconsin objective for lead 50,000 ug/kg ranging from 63,500 to 274,000 ug/kg and five of them exceeded the background level for lead at BAAP of 30,000 ug/kg ranging from 36,000 to 274,000 ug/kg. None of the eleven sample results exceeded the Illinois objective for lead of 400,000 ug/kg. Four of the five samples having the highest lead levels were collected along the fence line on the southwestern portion of BAAP. The elevated levels of lead could have resulted from operations formerly conducted in and around the Propellant Burning Grounds Thermal Treatment/Racetrack area, and/or from emissions of vehicles traveling along U.S. Highway12, which runs parallel to and nearby the fence line in this area. The remaining sample, which was collected in the central portion of the railroad track run, had a slightly elevated lead level above background of 36,000 ug/kg. Lead in this sample could have resulted from operations formerly conducted in and around the Propellant Burning Grounds Thermal Treatment/Racetrack area. Based on this, additional soil samples should be collected for lead analysis on the USDA land from an area bordered by the Gate Road 7/16 to the north, the perimeter fence lines to the west and south and the railroad track to the east. However, it is advisable to discuss these

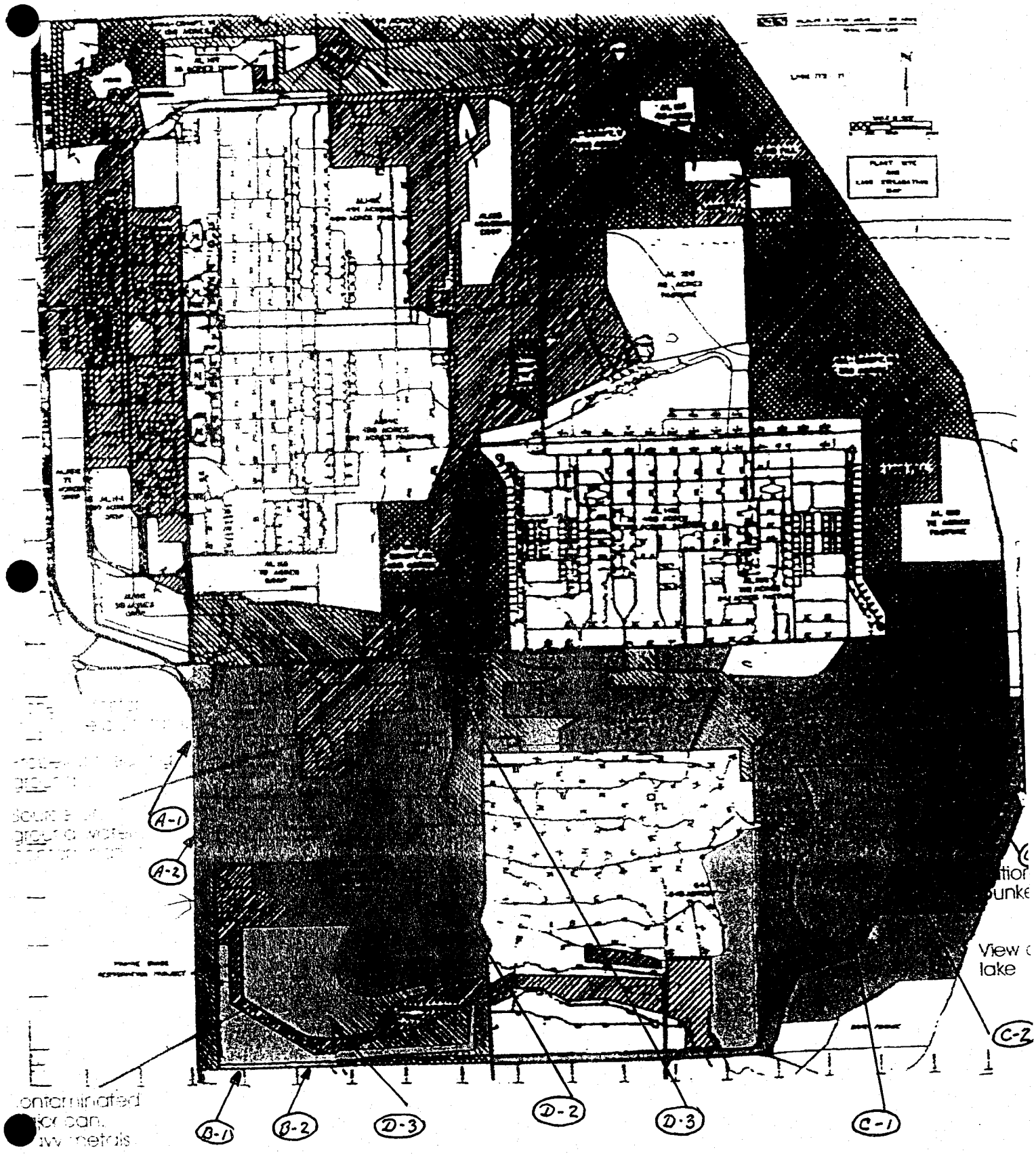
results with State of Wisconsin DNR personnel prior to conducting this type of sampling work.

Appendix A

BAAP Site Map

FIGURE 1
BADGER ARMY AMMUNITION PLANT
SHALLOW SOIL SAMPLE LOCATIONS.
AUGUST 7, 2001

MAP 1



NOTE: LOCATIONS ARE APPROXIMATE

Appendix B

Montgomery Watson Harza (MWH) Report of Soil Sampling Results at BAAP

MWH
MONTGOMERY WATSON HARZA

September 18, 2001

Mr. Dennis P. Bridge, CIH, CSP, PE
Bridge Environmental Management Group
P.O. Box 229
Lake Zurich, Illinois 60047

Re: Results of Soil Sampling and Analysis
USDA/Badger Army Ammunition Plant

Dear Mr. Bridge:

I have attached the laboratory results and a summary table for the sampling performed in August on behalf of the U.S. Department of Agriculture at the Badger Army Ammunition Plant near Baraboo, Wisconsin. Please call me at 608-231-4747 if you have questions.

Sincerely,

MONTGOMERY WATSON HARZA

Timothy E. Melka, P.G.
Project Manager

Enclosure: Table 1 – Summary of Soil Sample Results, Badger Army Ammunition Plant
Attachment A – Laboratory Analytical Results.

cc: Mark D. Pauli, P.G. - MWH
Michael G. Collentine, P.G. - MWH

TEM/tem/MDP
N:\Jobs\208\2398\01\wp\ltr\99_Bridge USDA.doc
2082398.01160101 MAD-1

multiple risks? additive synergistic cumulative

Table
Summary of Soil Sample Results
Badger Army Ammunition Plant

	A1C1	A1C2	A2C1	A2C2	A3C1	A3C2	A3C3	A3C4	A4C1	A4C2	A4C3	NR 720 Industrial (Residential) Standard	NR 605 Hazardous Constituent	USDA Goals (mg/Kg)
EPA 8081 (ug/Kg)														
4,4'-DDD	15	X	X	X	X	X	X	X	X	X	X	NA (NA)	yes	16
4,4'-DDE	X	X	X	X	X	X	24	X	160	X	X	NA (NA)	yes	0.4
4,4'-DDT	9.1	7.6	X	7.8	X	X	7.8	X	190	X	X	NA (NA)	yes	2
alpha Chlordane	X	X	X	X	X	X	X	X	77	X	X	NA (NA)	yes	4.4
beta-BHC	9.7	X	X	X	140	X	13	11	88	120	X	NA (NA)	no	NA
delta-BHC	X	X	X	X	X	21	X	X	X	X	X	NA (NA)	no	NA
Dieldrin	X	X	X	X	X	X	X	X	180	X	X	NA (NA)	yes	2
Endosulfan I	X	X	X	X	X	X	X	X	X	69	X	NA (NA)	yes	NA
Endosulfan II	X	X	X	X	75	X	X	X	130	240	X	NA (NA)	yes	NA
Endosulfan sulfate	12	X	X	X	X	9	X	X	520	X	130	NA (NA)	yes	NA
Endrin	X	X	X	X	X	X	X	X	110	X	X	NA (NA)	yes	2.3
Endrin aldehyde	10	X	X	X	X	X	7.7	X	160	X	X	NA (NA)	yes	NA
Endrin ketone	X	X	X	X	X	X	X	X	570	240	91	NA (NA)	yes	NA
gamma-Chlordane	11	X	X	X	X	X	X	X	X	X	X	NA (NA)	yes	4.4
Methoxychlor	X	X	X	X	X	X	X	X	800	X	110	NA (NA)	yes	NA
EPA 8151A (ug/Kg)														
Pentachlorophenol	X	350	X	X	X	32	X	X	X	3.4	X	NA (NA)	yes	NA
2,4-D	X	X	X	X	X	X	X	X	71	27	X	NA (NA)	yes	NA
EPA 8141A (ug/Kg)														
Trifluralin	X	X	X	X	X	X	X	X	100	41	X	NA (NA)	no	NA
Prometon	94	220	59	450	110	160	800	630	130	350	X	NA (NA)	no	NA
Propazine	X	X	X	X	X	X	X	X	8.4	X	X	NA (NA)	no	NA
Atrazine	X	X	X	X	X	X	X	X	10	8.6	X	NA (NA)	no	NA
Simazine	X	X	X	8.6	X	X	X	X	39	56	14	NA (NA)	no	NA
Alachlor	X	X	X	X	X	X	X	X	560	X	X	NA (NA)	no	NA
Pendamethalin	X	X	X	X	X	X	X	X	49	X	X	NA (NA)	no	NA
EPA 8321-HPLC UV (ug/Kg)														
Tebuthiuron	X	X	X	X	X	X	X	28	X	33	X	NA (NA)	no	NA
EPA 6010B (mg/Kg)														
Arsenic	2.7	3.8	2.5	2.7	2.5	2.2	2.5	2.1	1.6	2.6	2.2	1.6 (.039)	yes	21
Barium	125	182	93.5	125	154	135	169	147	31.7	21.9	31.5	NA (NA)	yes	705
Cadmium	0.59	0.87	0.62	0.74	0.7	0.68	0.81	0.88	0.42	0.92	0.84	510 (8)	yes	13
Chromium	12.4	15.1	9.2	11.4	13.6	14.1	13.8	14.1	4.8	8.6	8.3	NA trivalent, 200 hexavalent (16,000 trivalent,14 hexavalent)	yes	1300
Lead	63.5	251	274	266	16.9	14.9	17.3	15.9	13.4	36	20.2	500 (50)	yes	185
Selenium	1.2	1.6	0.91	1.1	1.2	0.88	0.97	0.96	0.42	0.37	0.25	NA (NA)	yes	70
Silver	X	X	X	X	X	X	X	X	X	X	0.045	NA (NA)	yes	34
EPA 7471 (mg/Kg)														
Mercury	0.055	0.034	0.022	0.029	0.03	0.025	0.038	0.034	0.034	0.037	0.02	NA (NA)	yes	0.1
EPA 8082 (ug/Kg)														
PCBs	---	---	---	---	---	---	---	---	X	X	X	NA (NA)	yes	1

Notes:
1. Only detected compounds are listed above. Complete Laboratory Reports are included in Attachment A.
2. A1C1 = Area 1 Composite Sample 1
3. X = Not Detected at the Limit of Detection
4. NR 720 Standards = State of Wisconsin RCLs for Soil. Bolded values indicate exceedance of the generic standard.
5. NR 605 Hazardous Consituent = Any solid waste that contains constituents as listed in Wisconsin Administrative Code Chapter NR 605
6. ug/Kg = microgram/kilogram
7. mg/Kg = milligram per kilogram
8. NA = Not Applicable

ATTACHMENT A

Laboratory Analytical Results

CTLaboratories
1230 Lange Court
Baraboo, WI 53913-3109
Phone: (800) 228-3012
Fax: (608) 356-2766
www.ctlaboratories.com

ANALYTICAL REPORT

MONTGOMERY WATSON
MARK PAULI
ONE SCIENCE COURT
MADISON, WI 53711

Project Name: BRIDGE/BADGER
Contract #: 1747
Project #: 2082398.01160101
Folder #: 18858
Purchase Order #:
Arrival Temperature: See COC
Report Date: 8/29/01
Date Received: 8/8/01
Reprint Date:

CTI LAB#: 81230 Sample Description: AREA 1 - COMPOSITE 1 Sampled: 8/7/01 0920

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	78.6	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	2.7	mg/kg	0.45	1.5	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	125	mg/kg	0.086	0.29	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.59	mg/kg	0.019	0.065	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	12.4	mg/kg	0.052	0.17	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	63.5	mg/kg	0.18	0.60	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	1.2	mg/kg	0.26	0.86	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.060	mg/kg	0.060	0.20	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.055	mg/kg	0.0076	0.025	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
4,4'-DDD	0.015	mg/kg	0.0051	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	<0.0064	mg/kg	0.0064	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	0.0091	mg/kg	0.0051	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.0076	mg/kg	0.0076	0.023	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.0076	mg/kg	0.0076	0.025	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.0064	mg/kg	0.0064	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	0.0097	mg/kg	0.0051	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.0038	mg/kg	0.0038	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.0051	mg/kg	0.0051	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.0064	mg/kg	0.0064	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.0064	mg/kg	0.0064	0.017	1		8/10/01	8/29/01	JRC	EPA 8081

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81230 Sample Description: AREA 1 - COMPOSITE 1 Sampled: 8/7/01 0920

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Endosulfan II	<0.0051	mg/kg	0.0051	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	0.012	mg/kg	0.0051	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.0064	mg/kg	0.0064	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	0.010	mg/kg	0.0051	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	<0.0064	mg/kg	0.0064	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	0.011	mg/kg	0.0064	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.0064	mg/kg	0.0064	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.0064	mg/kg	0.0064	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.0076	mg/kg	0.0076	0.023	1		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	<0.0038	mg/kg	0.0038	0.010	1		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.025	mg/kg	0.025	0.051	1		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

CTI LAB#: 81231 Sample Description: AREA 1 - COMPOSITE 2 Sampled: 8/7/01 100

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	78.70	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	3.8	mg/kg	0.60	2.0	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	182	mg/kg	0.11	0.38	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.87	mg/kg	0.026	0.087	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	15.1	mg/kg	0.069	0.23	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	251	mg/kg	0.24	0.81	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	1.6	mg/kg	0.35	1.2	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.081	mg/kg	0.081	0.27	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.034	mg/kg	0.0076	0.025	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
4,4'-DDD	<0.0051	mg/kg	0.0051	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	<0.0063	mg/kg	0.0063	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	0.0076	mg/kg	0.0051	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.0076	mg/kg	0.0076	0.023	1		8/10/01	8/29/01	JRC	EPA 8081

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81231 Sample Description: AREA 1 - COMPOSITE 2 Sampled: 8/7/01 100

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
alpha-BHC	<0.0076	mg/kg	0.0076	0.025	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.0063	mg/kg	0.0063	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	<0.0051	mg/kg	0.0051	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.0038	mg/kg	0.0038	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.0051	mg/kg	0.0051	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.0063	mg/kg	0.0063	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.0063	mg/kg	0.0063	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	<0.0051	mg/kg	0.0051	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	<0.0051	mg/kg	0.0051	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.0063	mg/kg	0.0063	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.0051	mg/kg	0.0051	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	<0.0063	mg/kg	0.0063	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.0063	mg/kg	0.0063	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.0063	mg/kg	0.0063	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.0063	mg/kg	0.0063	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.0076	mg/kg	0.0076	0.023	1		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	<0.0038	mg/kg	0.0038	0.010	1		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.025	mg/kg	0.025	0.051	1		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

CTI LAB# 81232 Sample Description: AREA 2 -COMPOSITE 1 Sampled: 8/7/01 1055

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	86.40	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	2.5	mg/kg	0.50	1.7	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	93.5	mg/kg	0.096	0.32	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.62	mg/kg	0.022	0.073	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	9.2	mg/kg	0.056	0.19	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	274	mg/kg	0.20	0.68	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	0.91	mg/kg	0.29	0.97	1		8/9/01	8/9/01	NAH	EPA 6010B

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81232 Sample Description: AREA 2 -COMPOSITE 1 Sampled: 8/7/01 1055

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Silver	<0.067	mg/kg	0.067	0.22	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.022	mg/kg	0.0069	0.023	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
4,4'-DDD	<0.0046	mg/kg	0.0046	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	<0.0058	mg/kg	0.0058	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	<0.0046	mg/kg	0.0046	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.0069	mg/kg	0.0069	0.021	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.0069	mg/kg	0.0069	0.023	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.0058	mg/kg	0.0058	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	<0.0046	mg/kg	0.0046	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.0035	mg/kg	0.0035	0.012	1		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.0046	mg/kg	0.0046	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.0058	mg/kg	0.0058	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.0058	mg/kg	0.0058	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	<0.0046	mg/kg	0.0046	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	<0.0046	mg/kg	0.0046	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.0058	mg/kg	0.0058	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.0046	mg/kg	0.0046	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	<0.0058	mg/kg	0.0058	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.0058	mg/kg	0.0058	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.0058	mg/kg	0.0058	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.0058	mg/kg	0.0058	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.0069	mg/kg	0.0069	0.021	1		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	<0.0035	mg/kg	0.0035	0.0092	1		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.023	mg/kg	0.023	0.046	1		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

CTI LAB# 81233 Sample Description: AREA 2 COMPOSITE 2 Sampled: 8/7/01 1140

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	84.00	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81233 Sample Description: AREA 2 COMPOSITE 2 Sampled: 8/7/01 1140

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Metals Results										
Arsenic	2.7	mg/kg	0.44	1.5	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	125	mg/kg	0.085	0.28	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.74	mg/kg	0.019	0.065	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	11.4	mg/kg	0.051	0.17	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	266	mg/kg	0.18	0.60	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	1.1	mg/kg	0.26	0.86	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.060	mg/kg	0.060	0.20	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.029	mg/kg	0.0071	0.024	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
4,4'-DDD	<0.0048	mg/kg	0.0048	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	<0.0060	mg/kg	0.0060	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	0.0078	mg/kg	0.0048	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.0072	mg/kg	0.0072	0.022	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.0072	mg/kg	0.0072	0.024	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.0060	mg/kg	0.0060	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	<0.0048	mg/kg	0.0048	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.0036	mg/kg	0.0036	0.012	1		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.0048	mg/kg	0.0048	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.0060	mg/kg	0.0060	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.0060	mg/kg	0.0060	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	<0.0048	mg/kg	0.0048	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	<0.0048	mg/kg	0.0048	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.0060	mg/kg	0.0060	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.0048	mg/kg	0.0048	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	<0.0060	mg/kg	0.0060	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.0060	mg/kg	0.0060	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.0060	mg/kg	0.0060	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.0060	mg/kg	0.0060	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.0072	mg/kg	0.0072	0.022	1		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	<0.0036	mg/kg	0.0036	0.0096	1		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.024	mg/kg	0.024	0.048	1		8/10/01	8/29/01	JRC	EPA 8081

WI DNR Lab Certification Number: 15-706030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81233 Sample Description: AREA 2 COMPOSITE 2 Sampled: 8/7/01 1140

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

CTI LAB#: 81234 Sample Description: AREA 4- COMPOSITE1 Sampled: 8/7/01 1235

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	89.00	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	1.6	mg/kg	0.40	1.3	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	31.7	mg/kg	0.077	0.26	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.42	mg/kg	0.017	0.058	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	4.8	mg/kg	0.046	0.15	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	13.4	mg/kg	0.16	0.54	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	0.42	mg/kg	0.23	0.77	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.054	mg/kg	0.054	0.18	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.034	mg/kg	0.0067	0.022	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
Aroclor-1016	<0.045	mg/kg	0.045	0.12	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1221	<0.045	mg/kg	0.045	0.13	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1232	<0.034	mg/kg	0.034	0.10	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1242	<0.056	mg/kg	0.056	0.16	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1248	<0.034	mg/kg	0.034	0.10	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1254	<0.022	mg/kg	0.022	0.056	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1260	<0.045	mg/kg	0.045	0.12	1		8/10/01	8/22/01	JRC	EPA 8082
4,4'-DDD	<0.045	mg/kg	0.045	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	0.16	mg/kg	0.056	0.18	10		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	0.19	mg/kg	0.045	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.067	mg/kg	0.067	0.20	10		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.067	mg/kg	0.067	0.22	10		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	0.077	mg/kg	0.056	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	0.088	mg/kg	0.045	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.034	mg/kg	0.034	0.11	10		8/10/01	8/29/01	JRC	EPA 8081

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81234 Sample Description: AREA 4- COMPOSITE1 Sampled: 8/7/01 1235

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
delta-BHC	<0.045	mg/kg	0.045	0.12	10		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	0.18	mg/kg	0.056	0.18	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.056	mg/kg	0.056	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	0.13	mg/kg	0.045	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	0.52	mg/kg	0.045	0.12	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin	0.11	mg/kg	0.056	0.18	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	0.16	mg/kg	0.045	0.13	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	0.57	mg/kg	0.056	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.056	mg/kg	0.056	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.056	mg/kg	0.056	0.18	10		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.056	mg/kg	0.056	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.067	mg/kg	0.067	0.20	10		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	0.80	mg/kg	0.034	0.090	10		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.22	mg/kg	0.22	0.45	10		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

CTI LAB#: 81235 Sample Description: AREA 3 - COMPOSITE 1 Sampled: 8/7/01 1315

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	85.3	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	2.5	mg/kg	0.62	2.1	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	154	mg/kg	0.12	0.40	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.70	mg/kg	0.027	0.090	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	13.6	mg/kg	0.072	0.24	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	16.9	mg/kg	0.25	0.84	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	1.2	mg/kg	0.36	1.2	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.083	mg/kg	0.083	0.28	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.030	mg/kg	0.0070	0.023	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
4,4'-DDD	<0.047	mg/kg	0.047	0.15	10		8/10/01	8/29/01	JRC	EPA 8081

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81235 Sample Description: AREA 3 - COMPOSITE 1 Sampled: 8/7/01 1315

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
4,4'-DDE	<0.058	mg/kg	0.058	0.19	10		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	<0.047	mg/kg	0.047	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.070	mg/kg	0.070	0.21	10		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.070	mg/kg	0.070	0.23	10		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.058	mg/kg	0.058	0.18	10		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	0.14	mg/kg	0.047	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.035	mg/kg	0.035	0.12	10		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.047	mg/kg	0.047	0.13	10		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.058	mg/kg	0.058	0.19	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.058	mg/kg	0.058	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	0.075	mg/kg	0.047	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	<0.047	mg/kg	0.047	0.13	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.058	mg/kg	0.058	0.19	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.047	mg/kg	0.047	0.14	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	<0.058	mg/kg	0.058	0.18	10		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.058	mg/kg	0.058	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.058	mg/kg	0.058	0.19	10		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.058	mg/kg	0.058	0.18	10		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.070	mg/kg	0.070	0.21	10		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	<0.035	mg/kg	0.035	0.094	10		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.23	mg/kg	0.23	0.47	10		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

CTI LAB#: 81236 Sample Description AREA 3 - COMPOSITE 2 Sampled: 8/7/01 1420

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	84.3	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	2.2	mg/kg	0.43	1.4	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	135	mg/kg	0.082	0.27	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.68	mg/kg	0.019	0.063	1		8/9/01	8/9/01	NAH	EPA 6010B

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81236 Sample Description: AREA 3 - COMPOSITE 2 Sampled: 8/7/01 1420

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Chromium	14.1	mg/kg	0.050	0.17	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	14.9	mg/kg	0.17	0.58	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	0.88	mg/kg	0.25	0.83	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.058	mg/kg	0.058	0.19	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.025	mg/kg	0.0070	0.023	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
4,4'-DDD	<0.0047	mg/kg	0.0047	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	<0.0059	mg/kg	0.0059	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	<0.0047	mg/kg	0.0047	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.0071	mg/kg	0.0071	0.021	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.0071	mg/kg	0.0071	0.024	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.0059	mg/kg	0.0059	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	<0.0047	mg/kg	0.0047	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.0036	mg/kg	0.0036	0.012	1		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	0.021	mg/kg	0.0047	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.0059	mg/kg	0.0059	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.0059	mg/kg	0.0059	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	<0.0047	mg/kg	0.0047	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	0.0090	mg/kg	0.0047	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.0059	mg/kg	0.0059	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.0047	mg/kg	0.0047	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	<0.0059	mg/kg	0.0059	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.0059	mg/kg	0.0059	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.0059	mg/kg	0.0059	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.0059	mg/kg	0.0059	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.0071	mg/kg	0.0071	0.021	1		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	<0.0036	mg/kg	0.0036	0.0095	1		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.024	mg/kg	0.024	0.047	1		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81237 Sample Description: AREA 3- COMPOSITE 3 Sampled: 8/7/01 1500

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	80.2	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	2.5	mg/kg	0.49	1.6	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	169	mg/kg	0.094	0.31	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.81	mg/kg	0.021	0.072	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	13.8	mg/kg	0.057	0.19	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	17.3	mg/kg	0.20	0.66	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	0.97	mg/kg	0.28	0.95	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.066	mg/kg	0.066	0.22	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.038	mg/kg	0.0075	0.025	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
4,4'-DDD	<0.0050	mg/kg	0.0050	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	0.024	mg/kg	0.0062	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	0.0078	mg/kg	0.0050	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.0075	mg/kg	0.0075	0.022	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.0075	mg/kg	0.0075	0.025	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.0062	mg/kg	0.0062	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	0.013	mg/kg	0.0050	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.0037	mg/kg	0.0037	0.012	1		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.0050	mg/kg	0.0050	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.0062	mg/kg	0.0062	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.0062	mg/kg	0.0062	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	<0.0050	mg/kg	0.0050	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	<0.0050	mg/kg	0.0050	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.0062	mg/kg	0.0062	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.0050	mg/kg	0.0050	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	0.0077	mg/kg	0.0062	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.0062	mg/kg	0.0062	0.017	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.0062	mg/kg	0.0062	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.0062	mg/kg	0.0062	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.0075	mg/kg	0.0075	0.022	1		8/10/01	8/29/01	JRC	EPA 8081

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81237 Sample Description: AREA 3- COMPOSITE 3 Sampled: 8/7/01 1500

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Methoxychlor	<0.0037	mg/kg	0.0037	0.010	1		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.025	mg/kg	0.025	0.050	1		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

CTI LAB#: 81238 Sample Description: AREA 3- COMPOSITE 4 Sampled: 8/7/01 1550

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	78.7	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	2.1	mg/kg	0.52	1.7	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	147	mg/kg	0.099	0.33	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.68	mg/kg	0.022	0.075	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	14.1	mg/kg	0.060	0.20	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	15.9	mg/kg	0.21	0.70	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	0.96	mg/kg	0.30	1.0	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.069	mg/kg	0.069	0.23	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.034	mg/kg	0.0076	0.025	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
4,4'-DDD	<0.0051	mg/kg	0.0051	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	<0.0063	mg/kg	0.0063	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	<0.0051	mg/kg	0.0051	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.0076	mg/kg	0.0076	0.023	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.0076	mg/kg	0.0076	0.025	1		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.0063	mg/kg	0.0063	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	0.011	mg/kg	0.0051	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.0038	mg/kg	0.0038	0.013	1		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.0051	mg/kg	0.0051	0.014	1		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.0063	mg/kg	0.0063	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.0063	mg/kg	0.0063	0.016	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	<0.0051	mg/kg	0.0051	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	<0.0051	mg/kg	0.0051	0.014	1		8/10/01	8/29/01	JRC	EPA 8081

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81238 Sample Description: AREA 3- COMPOSITE 4 Sampled: 8/7/01 1550

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Endrin	<0.0063	mg/kg	0.0063	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.0051	mg/kg	0.0051	0.015	1		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	<0.0063	mg/kg	0.0063	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.0063	mg/kg	0.0063	0.018	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.0063	mg/kg	0.0063	0.020	1		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.0063	mg/kg	0.0063	0.019	1		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.0076	mg/kg	0.0076	0.023	1		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	<0.0038	mg/kg	0.0038	0.010	1		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.025	mg/kg	0.025	0.051	1		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

CTI LAB#: 81239 Sample Description: AREA 4- COMPOSITE 2 Sampled: 8/7/01 1630

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	95.0	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A
Metals Results										
Arsenic	2.6	mg/kg	0.47	1.6	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	21.9	mg/kg	0.090	0.30	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.92	mg/kg	0.021	0.069	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	6.6	mg/kg	0.054	0.18	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	36.0	mg/kg	0.19	0.64	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	0.37	mg/kg	0.27	0.91	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	<0.063	mg/kg	0.063	0.21	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.037	mg/kg	0.0061	0.020	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
Aroclor-1016	<0.042	mg/kg	0.042	0.12	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1221	<0.042	mg/kg	0.042	0.13	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1232	<0.032	mg/kg	0.032	0.095	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1242	<0.053	mg/kg	0.053	0.15	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1248	<0.032	mg/kg	0.032	0.095	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1254	<0.021	mg/kg	0.021	0.053	1		8/10/01	8/22/01	JRC	EPA 8082

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81239 Sample Description: AREA 4- COMPOSITE 2 Sampled: 8/7/01 1630

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Aroclor-1260	<0.042	mg/kg	0.042	0.12	1		8/10/01	8/22/01	JRC	EPA 8082
4,4'-DDD	<0.042	mg/kg	0.042	0.14	10		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	<0.052	mg/kg	0.052	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT		mg/kg	N/A	N/A	10		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.063	mg/kg	0.063	0.19	10		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.063	mg/kg	0.063	0.21	10		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.052	mg/kg	0.052	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	0.12	mg/kg	0.042	0.14	10		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.031	mg/kg	0.031	0.10	10		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.042	mg/kg	0.042	0.12	10		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.052	mg/kg	0.052	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	0.069	mg/kg	0.052	0.14	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	0.24	mg/kg	0.042	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	<0.042	mg/kg	0.042	0.12	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.052	mg/kg	0.052	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.042	mg/kg	0.042	0.13	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin ketone	0.24	mg/kg	0.052	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.052	mg/kg	0.052	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.052	mg/kg	0.052	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.052	mg/kg	0.052	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.063	mg/kg	0.063	0.19	10		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	<0.031	mg/kg	0.031	0.084	10		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.21	mg/kg	0.21	0.42	10		8/10/01	8/29/01	JRC	EPA 8081

Sub Lab Results

Herbicides	SUB		N/A	N/A	1			8/27/01	PML

CTI LAB#: 81240 Sample Description: AREA 4- COMPOSITE 3 Sampled: 8/7/01 1745

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Solids, Percent	92.2	%	N/A	N/A	1			8/9/01	TAR	EPA 5030A

Metals Results

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 81240 Sample Description: AREA 4- COMPOSITE 3 Sampled: 8/7/01 1745

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Arsenic	2.2	mg/kg	0.33	1.1	1		8/9/01	8/9/01	NAH	EPA 6010B
Barium	31.5	mg/kg	0.064	0.21	1		8/9/01	8/9/01	NAH	EPA 6010B
Cadmium	0.84	mg/kg	0.015	0.049	1		8/9/01	8/9/01	NAH	EPA 6010B
Chromium	8.3	mg/kg	0.038	0.13	1		8/9/01	8/9/01	NAH	EPA 6010B
Lead	20.2	mg/kg	0.13	0.45	1		8/9/01	8/9/01	NAH	EPA 6010B
Selenium	0.25	mg/kg	0.19	0.64	1		8/9/01	8/9/01	NAH	EPA 6010B
Silver	0.045	mg/kg	0.045	0.15	1		8/9/01	8/9/01	NAH	EPA 6010B
Mercury	0.020	mg/kg	0.0063	0.021	1		8/11/01	8/13/01	NAH	EPA 7471
Organic Results										
Aroclor-1016	<0.044	mg/kg	0.044	0.12	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1221	<0.044	mg/kg	0.044	0.13	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1232	<0.033	mg/kg	0.033	0.098	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1242	<0.054	mg/kg	0.054	0.15	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1248	<0.033	mg/kg	0.033	0.098	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1254	<0.022	mg/kg	0.022	0.054	1		8/10/01	8/22/01	JRC	EPA 8082
Aroclor-1260	<0.044	mg/kg	0.044	0.12	1		8/10/01	8/22/01	JRC	EPA 8082
4,4'-DDD	<0.043	mg/kg	0.043	0.14	10		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDE	<0.054	mg/kg	0.054	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
4,4'-DDT	<0.043	mg/kg	0.043	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Aldrin	<0.065	mg/kg	0.065	0.19	10		8/10/01	8/29/01	JRC	EPA 8081
alpha-BHC	<0.065	mg/kg	0.065	0.22	10		8/10/01	8/29/01	JRC	EPA 8081
alpha-Chlordane	<0.054	mg/kg	0.054	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
beta-BHC	<0.043	mg/kg	0.043	0.14	10		8/10/01	8/29/01	JRC	EPA 8081
Chlordane (Technical)	<0.032	mg/kg	0.032	0.11	10		8/10/01	8/29/01	JRC	EPA 8081
delta-BHC	<0.043	mg/kg	0.043	0.12	10		8/10/01	8/29/01	JRC	EPA 8081
Dieldrin	<0.054	mg/kg	0.054	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan I	<0.054	mg/kg	0.054	0.14	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan II	<0.043	mg/kg	0.043	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Endosulfan sulfate	0.13	mg/kg	0.043	0.12	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin	<0.054	mg/kg	0.054	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
Endrin aldehyde	<0.043	mg/kg	0.043	0.13	10		8/10/01	8/29/01	JRC	EPA 8081

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTLaboratories

MONTGOMERY WATSON

Project Name: BRIDGE/BADGER
Project #: 2082398.01160101

Contract #: 1747
Folder #: 18858

CTI LAB#: 81240 Sample Description: AREA 4- COMPOSITE 3 Sampled: 8/7/01 1745

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Endrin ketone	0.091	mg/kg	0.054	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
gamma-Chlordane	<0.054	mg/kg	0.054	0.15	10		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor	<0.054	mg/kg	0.054	0.17	10		8/10/01	8/29/01	JRC	EPA 8081
Heptachlor epoxide	<0.054	mg/kg	0.054	0.16	10		8/10/01	8/29/01	JRC	EPA 8081
Lindane	<0.065	mg/kg	0.065	0.19	10		8/10/01	8/29/01	JRC	EPA 8081
Methoxychlor	0.11	mg/kg	0.032	0.086	10		8/10/01	8/29/01	JRC	EPA 8081
Toxaphene	<0.22	mg/kg	0.22	0.43	10		8/10/01	8/29/01	JRC	EPA 8081
Sub Lab Results										
Herbicides	SUB		N/A	N/A	1			8/27/01	PML	

Notes: * Indicates Value in between LOD and LOQ.

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without written approval of this laboratory. The Chain of Custody is attached.

Submitted by: PML

Record Reviewer

Solic sample results reported on a Dry Weight Basis

8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81230 Area 1-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11058
Date Analyzed: 08/22/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.15
Dilution Factor: 1
Solids, Total: 79.2%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		83.3%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Lenihan
Date: 8/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81231 Area 1-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11059
Date Analyzed: 08/22/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.14
Dilution Factor: 1
Solids, Total: 79.1%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	350
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		84.7%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Fenchel
Date: 9/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81232 Area 2-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11060
Date Analyzed: 08/22/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.31
Dilution Factor: 1
Solids, Total: 82.0%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		82.6%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M Jenkins
Date: 9/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81231 Area 1-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11059
Date Analyzed: 08/22/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.14
Dilution Factor: 1
Solids, Total: 79.1%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	350
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		84.7%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Fenske
Date: 9/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81232 Area 2-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11060
Date Analyzed: 08/22/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.31
Dilution Factor: 1
Solids, Total: 82.0%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		82.6%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M Jenkins
Date: 9/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81233 Area 2-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11061
Date Analyzed: 08/22/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.17
Dilution Factor: 1
Solids, Total: 80.3%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		84.6%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Jenkins
Date: 8/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81234 Area 4-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11062
Date Analyzed: 08/22/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.21
Dilution Factor: 1
Solids, Total: 89.4%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	71
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		74.9%

Method Reference: 8151A

WI Lab Certification #113289110

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Date: 8/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81235 Area 3-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11063
Date Analyzed: 08/22/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.26
Dilution Factor: 1
Solids, Total: 80.7%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		85.2%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Jenkins
Date: 8/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81236 Area 3-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11064
Date Analyzed: 08/23/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 84.5%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	32
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		82.6%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Jenkins
Date: 8/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81237 Area 3-Composite 3
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11065
Date Analyzed: 08/23/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 80.1%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		78.8%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Jenkins
Date: 8/28/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81238 Area 3-Composite 4
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11066
Date Analyzed: 08/23/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 77.5%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		75.7%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Jenstrup
Date: 9/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81239 Area 4-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11067
Date Analyzed: 08/23/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 94.7%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	3.4
2,4-D	14	27
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		78.3%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Tenaka

Date: 8/24/01

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8151 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81240 Area 4-Composite 3
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/17/01 Lab Sample Number: AA11068
Date Analyzed: 08/23/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 91.9%

Compound	Reporting Limit	Sample Result
Dalapon	38	< 38
Dicamba	8.5	< 8.5
Dichlorprop	38	< 38
Pentachlorophenol	2.0	< 2.0
2,4-D	14	< 14
2,4,5-TP	3.0	< 3.0
2,4,5-T	3.0	< 3.0
Dinoseb	5.0	< 5.0
2,4-DB	28	< 28
Picloram	3.4	< 3.4
Bentazon	25	< 25
Dacthal	2.1	< 2.1
Trichlopyr	3.2	< 3.2
Bromoxynil	1.8	< 1.8
Chloramben	14	< 14
Acifluorfen	8.0	< 8.0
DCAA (Surrogate)		80.2%

Method Reference: 8151A

WI Lab Certification #113289110

Approved: M. Terefenko
Date: 8/24/01

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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81230 Area 1-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11058
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.2
Dilution Factor: 1
Solids, Total: 79.2%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	94
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	< 1.0
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		61.8%

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Lindsay
Date: 8/23/01

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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81231 Area 1-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11059
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.3
Dilution Factor: 1
Solids, Total: 79.1%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	220
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	< 1.0
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		58.7% *

* = Low surrogate recovery may indicate low bias to sample results.

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Linsbauer
Date: 8/23/01

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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81232 Area 2-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11060
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.2
Dilution Factor: 1
Solids, Total: 82.0%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	59
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	< 1.0
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		62.0%

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Tuschen

Date: 8/23/01

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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81233 Area 2-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11061
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.1
Dilution Factor: 1
Solids, Total: 80.3%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	450
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	8.6
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		47.9% *

* = Low surrogate recovery may indicate low bias to sample results.

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Linthurst
Date: 8/23/01

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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81234 Area 4-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11062
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.1
Dilution Factor: 1
Solids, Total: 89.4%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	100
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	130
Propazine	3.5	8.4
Atrazine	2.1	18
Simazine	1.0	39
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	560
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	49
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		106.3%

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Jenkins
Date: 8/23/01

E.C.C.S
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81235 Area 3-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11063
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 80.7%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	110
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	< 1.0
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		67.0%

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: R. Jensen

Date: 8/23/01

E.C.C.S.
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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81236 Area 3-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11064
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.2
Dilution Factor: 1
Solids, Total: 84.5%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	160
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	< 1.0
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		45.9% *

* = Low surrogate recovery may indicate low bias to sample results.

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Jenkins
Date: 8/23/01

E.C.C.S.
2525 Advance Road
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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81237 Area 3-Composite 3
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11065
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.2
Dilution Factor: 1
Solids, Total: 80.1%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	800
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	< 1.0
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		72.9%

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Lineberry
Date: 8/23/01

E.C.C.S.
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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81238 Area 3-Composite 4
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11066
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.3
Dilution Factor: 1
Solids, Total: 77.5%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	630
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	< 1.0
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		69.5%

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Tenofonte
Date: 8/23/01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
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8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81239 Area 4-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11067
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.2
Dilution Factor: 1
Solids, Total: 94.7%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	41
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	350
Propazine	3.5	< 3.5
Atrazine	2.1	8.6
Simazine	1.0	56
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		62.7%

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: M. Linskens
Date: 8/23/01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8141A Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81240 Area 4-Composite 3
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/13/01 Lab Sample Number: AA11068
Date Analyzed: 08/16/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.1
Dilution Factor: 1
Solids, Total: 91.9%

Compound	Reporting Limit	Sample Result
EPTC	7.0	< 7.0
Butylate	15	< 15
Trifluralin	18	< 18
Desethylatrazine	6.0	< 6.0
Desisopropylatrazine	9.5	< 9.5
Prometon	3.7	< 3.7
Propazine	3.5	< 3.5
Atrazine	2.1	< 2.1
Simazine	1.0	14
Acetochlor	12	< 12
Dimethenamid	16	< 16
Alachlor	10	< 10
Metribuzin	16	< 16
Metolachlor	22	< 22
Chloropyrifos	4.3	< 4.3
Pendamethalin	7.0	< 7.0
Cyanazine	4.0	< 4.0
Triphenyl Phosphate (Surr)		66.1%

Method Reference: Modified 8141A

WI Lab Certification #113289110

Approved: R. Linsbauer
Date: 8/23/01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81230 Area 1-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11058
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 79.2%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		111.5%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Johnson

Date: 22AUG1

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81231 Area 1-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11059
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 79.1%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		96.1%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Rebecca W Johnson

Date: 22AUG01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax. 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81232 Area 2-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11060
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 82.0%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		93.7%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Johnson

Date: 2-14-02

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81233 Area 2-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11061
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 80.3%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		96.5%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Johnson

Date: 2 AUG 01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81234 Area 4-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11062
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 89.4%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		84.3%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Johnson

Date: 22 AUG 01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81235 Area 3-Composite 1
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11063
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 80.7%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		86.9%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Johnson

Date: 7/14/02

E.C.C.S.
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Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81236 Area 3-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11064
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 84.5%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		99.9%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Johnson

Date: 22AUG01

E.C.C.S.
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8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81237 Area 3-Composite 3
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11065
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 80.1%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		95.7%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Johnson

Date: 2/28/01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
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Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81238 Area 3-Composite 4
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11066
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 77.5%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	28
Chlorotoluron (Surr)		95.3%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Olson

Date: 7-2-01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81239 Area 4-Composite 2
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11067
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 94.7%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	33
Chlorotoluron (Surr)		74.0%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Barbara Johnson

Date: 7-24-01

E.C.C.S.
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Madison, WI 53718
Phone: 608-221-8700
Fax: 608-221-4889

8321 Pesticides
Summary of Test Results

Project Name: Montgomery Watson – Bridge/Badger
Project Number: 2082398.01160101
Purchase Order Number: 18858ECCS
Sample Description: 81240 Area 4-Composite 3
Date Collected: 08/07/01
Sample Type: Soil

Date Extracted: 08/14/01 Lab Sample Number: AA11068
Date Analyzed: 08/15/01
Concentration: ug/kg dry weight
Sample Weight (g): 10.0
Dilution Factor: 1
Solids, Total: 91.9%

Compound	Reporting Limit	Sample Result
Tebuthiuron	20	< 20
Chlorotoluron (Surr)		79.0%

Method Reference: Modified 8321-HPLC UV

WI Lab Certification #113289110

Approved: Richard Johnson

Date: 22 Aug 01

E.C.C.S.
2525 Advance Road
Madison, WI 53718
Phone: 608-221-8700
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MONTGOMERY
WATSON
HARZA

Folder #: 18858
Company: MONTGOMERY WATS
Project: BRIDGE/BADGER
Logged By: NJR PM: PMI

CHAIN ..... D

SPECIAL INSTRUCTIONS:
- ☐ PECFA
- ☐ WI LUST
- ☐ ACT 307
- ☐ REPORT DRY WT
- ☒ OTHER:

TURNAROUND
- ☒ 2 WEEKS (standard)
- ☐ 1 WEEK
- ☐ 3 DAYS
- ☐ 1 DAY

PROJECT NAME: BRIDGE ENH./USDA
PROJECT #: 20823398.0116.01
CITY: SUMPTER
STATE: WISCONSIN
SAMPLER(S): MARK PAULI

COLLECTION DATE	COLLECTION TIME	GRAB / COMP	SAMPLE ID	NO. OF CONTAINERS	ORGANOPHOSPHATE-ORGANO NITRATE (8141)	ORGANOCHLORINE (8081)	ACID/BNEUTRAL (8150)	BRUTAN	PCBS (8082)	RCRA METALS	DIOXIN/FURANS	TCLP METALS	REMARKS	LAB USE ONLY MATRIX	LAB USE ONLY LAB NO.
8/7/01	9:20	COMP	AREA 1 - COMPOSITE 1	5	X	X	X	X		X	X	X	HOLD DIOXIN/FURAN		81230
	10:00		AREA 1 - COMPOSITE 2	5	X	X	X	X		X	X	X			81231
	10:55		AREA 2 - COMPOSITE 1	5	X	X	X	X		X	X	X			81232
	11:40		AREA 2 - COMPOSITE 2	5	X	X	X	X		X	X	X			81233
	12:35		AREA 4 - COMPOSITE 1	6	X	X	X	X	X	X	X	X			81234
	13:15		AREA 3 - COMPOSITE 1	5	X	X	X	X		X	X	X			81235
	14:20		AREA 3 - COMPOSITE 2	5	X	X	X	X		X	X	X			81236
	15:00		AREA 3 - COMPOSITE 3	5	X	X	X	X		X	X	X			81237
	15:50		AREA 3 - COMPOSITE 4	5	X	X	X	X		X	X	X			81238
	16:30		AREA 4 - COMPOSITE 2	6	X	X	X	X	X	X	X	X			81239
	17:45		AREA 4 - COMPOSITE 3	6	X	X	X	X	X	X	X	X			81240

ICE PRESENT YES NO

SPECIAL INSTRUCTIONS:
HOLD DIOXIN/FURAN ANALYSIS UNTIL REQUESTED

TAMPER EVIDENT SEAL INTACT? ___YES ___NO ___NOT PRESENT
SEAL NO.: ___
TEMPERATURE 0.4 °C
SAMPLES RECEIVED ON ICE? ___YES ___NO TEMP: ___°C
INITIALS ___

PROJ. MGR.: TIM MELKA

	SIGNATURE	DATE	TIME		SIGNATURE	DATE	TIME
RELINQUISHED BY:		8/7/01	17:50	RECEIVED BY:			
RELINQUISHED BY				RECEIVED BY:			
RELINQUISHED BY:				RECEIVED BY:			
RELINQUISHED BY				RECEIVED FOR LABORATORY BY:		8/8/01	1315

DATE 8/7/01 TIME PM

C-O-C No. 22401

NAME OF COURIER: ___
AIRBILL NUMBER: ___

Appendix C

Soil Sample Summary Tables

Tab

Summary of Soil Sample Results
Badger Army Ammunition Plant

	A1C1	A1C2	A2C1	A2C2	A3C1	A3C2	A3C3	A3C4	A4C1	A4C2	A4C3	NR 720 Industrial (Residential) Standard	NR 605 Hazardous Constituent	USDA Goals (mg/Kg)
EPA 8081 (ug/Kg)														
4,4'-DDD	15	X	X	X	X	X	X	X	X	X	X	NA (NA)	yes	16
4,4'-DDE	X	X	X	X	X	X	24	X	160	X	X	NA (NA)	yes	0.4
4,4'-DDT	9.1	7.6	X	7.8	X	X	7.8	X	190	X	X	NA (NA)	yes	2
alpha-Chlorodane	X	X	X	X	X	X	X	X	77	X	X	NA (NA)	yes	4.4
beta-BHC	9.7	X	X	X	140	X	13	11	88	120	X	NA (NA)	no	NA
delta-BHC	X	X	X	X	X	21	X	X	X	X	X	NA (NA)	no	NA
Dieldrin	X	X	X	X	X	X	X	X	180	X	X	NA (NA)	yes	2
Endosulfan I	X	X	X	X	X	X	X	X	X	69	X	NA (NA)	yes	NA
Endosulfan II	X	X	X	X	75	X	X	X	130	240	X	NA (NA)	yes	NA
Endosulfan sulfate	12	X	X	X	X	9	X	X	520	X	130	NA (NA)	yes	NA
Endrin	X	X	X	X	X	X	X	X	110	X	X	NA (NA)	yes	2.3
Endrin aldehyde	10	X	X	X	X	X	X	X	160	X	X	NA (NA)	yes	NA
Endrin ketone	X	X	X	X	X	X	7.7	X	570	240	91	NA (NA)	yes	NA
gamma-Chlorodane	11	X	X	X	X	X	X	X	X	X	X	NA (NA)	yes	4.4
Methoxychlor	X	X	X	X	X	X	X	X	800	X	110	NA (NA)	yes	NA
EPA 8151A (ug/Kg)														
Pentachlorophenol	X	350	X	X	X	32	X	X	X	3.4	X	NA (NA)	yes	NA
2,4-D	X	X	X	X	X	X	X	X	71	27	X	NA (NA)	yes	NA
EPA 8141A (ug/Kg)														
Trifluralin	X	X	X	X	X	X	X	X	100	41	X	NA (NA)	no	NA
Prometon	94	220	59	450	110	160	800	630	130	350	X	NA (NA)	no	NA
Propazine	X	X	X	X	X	X	X	X	8.4	X	X	NA (NA)	no	NA
Atrazine	X	X	X	X	X	X	X	X	18	8.6	X	NA (NA)	no	NA
Simazine	X	X	X	8.6	X	X	X	X	39	56	14	NA (NA)	no	NA
Alachlor	X	X	X	X	X	X	X	X	560	X	X	NA (NA)	no	NA
Pendamethalin	X	X	X	X	X	X	X	X	49	X	X	NA (NA)	no	NA
EPA 8321-HPLC UV (ug/Kg)														
Tebuthiuron	X	X	X	X	X	X	X	28	X	33	X	NA (NA)	no	NA
EPA 6010B (mg/Kg)														
Arsenic	2.7	3.8	2.5	2.7	2.5	2.2	2.5	2.1	1.6	2.6	2.2	1.6 (.039)	yes	21
Barium	125	182	93.5	125	154	135	169	147	31.7	21.9	31.5	NA (NA)	yes	705
Cadmium	0.59	0.87	0.62	0.74	0.7	0.68	0.81	0.68	0.42	0.92	0.84	510 (8)	yes	13
Chromium	12.4	15.1	9.2	11.4	13.6	14.1	13.8	14.1	4.8	6.6	8.3	NA trivalent, 200 hexavalent (16,000 trivalent,14 hexavalent)	yes	1300
Lead	63.5	251	274	266	16.9	14.9	17.3	15.9	13.4	36	20.2	500 (50)	yes	185
Selenium	1.2	1.6	0.91	1.1	1.2	0.88	0.97	0.96	0.42	0.37	0.25	NA (NA)	yes	70
Silver	X	X	X	X	X	X	X	X	X	X	0.045	NA (NA)	yes	34
EPA 7471 (mg/Kg)														
Mercury	0.055	0.034	0.022	0.029	0.03	0.025	0.038	0.034	0.034	0.037	0.02	NA (NA)	yes	0.1
EPA 8082 (ug/Kg)														
PCBs	----	----	----	----	----	----	----	----	X	X	X	NA (NA)	yes	1

Notes:

1. Only detected compounds are listed above. Complete Laboratory Reports are included in Attachment A.
2. A1C1 = Area 1 Composite Sample 1
3. X = Not Detected at the Limit of Detection
4. NR 720 Standards = State of Wisconsin RCLs for Soil. Bolded values indicate exceedance of the generic standard.
5. NR 605 Hazardous Constituent = Any solid waste that contains constituents as listed in Wisconsin Administrative Code Chapter NR 605
6. ug/Kg = microgram/kilogram
7. mg/Kg = milligram per kilogram
8. NA = Not Applicable

Table 2

Comparison of the Highest Contaminant Levels Found at BAAP

Versus USDA Midewin Interim Soil Remediation Goals and States of Wisconsin and Illinois Soil Remediation Goals for the Protection of Human Health

Contaminant	Highest Badger Level Sampled (ug/kg)	USDA Midewin Interim Soil Remediation Goals (ug/kg)	Wisconsin NR 720 Industrial (Residential) ug/kg Soil Remediation Reg.9 Objectives PRG (ug/kg)	Illinois Section 742 Tier I Industrial (Residential) Soil Remediation Objectives (ug/kg)
EPA 8081				
4,4'-DDD	15	16,000	N (N)	24,000 (3,000)
4,4'-DDE	160	400	N (N)	17,000 (2,000)
4,4'-DDT	190	2000	1,700 N (N)	17,000 (2,000)
Alpha-Chlorodane	77	4,400	N (N)	1,600 (1,800)
Beta-BHC	140	N	320 N (N)	N (N)
Delta-BHC	21	N	N (N)	N (N)
Dieldrin	180	2,000	300 N (N)	400 (40)
Endosulfan I	69	N	N (N)	12,000,000 (470,000)
Endosulfan II	240	N	N (N)	12,000,000 (470,000)
Endosulfan sulfate	520	N	N (N)	N (N)
Endrin	110	23,000	18,000 N (N)	610,000 (23,000)
Endrin aldehyde	160	N	N (N)	N (N)
Endrin ketone	570	N	N (N)	N (N)
Gamma-Chlorodane	11	4,400	N (N)	N (N)
Methoxychlor	800	N	N (N)	10,000,000 (390,000)
EPA 8151A				
Pentachlorophenol	350	N	3,000 N (N)	24,000 (3,000)
2,4-D	71	N	690,000 N (N)	20,000,000 (780,000)
EPA 8141A				
Trifluralin	100	N	63,000 N (N)	N (N)
Prometon (Triazine)	800	N	N (N)	N (N)
Propazine	8.4	N	N (N)	N (N)
Atrazine	18	N	2,200 N (N)	72,000,000 (2,700,00)
Simazine	56	N	N (N)	10,000,000 (390,000)
Alachlor	560	N	6,000 N (N)	72,000 (8,000)
Pendamethalin	49	N	N (N)	N (N)
EPA 8321-HPLC UV				
Tebuthiuron (Brulan)	33	N	4,300,000 N (N)	N (N)
	Propellant R.C. → PBG	**EPA 6010B**		
Arsenic	3800	16,000 21,000	62/390 1,600 (39)	11,300 (11,300)
Barium	182,000	705,000	5,400,000 N (N)	140,000,000 (5,500,000)
Cadmium	920	13,000	1,400,000 510,000 (8,000)	2,000,000 (78,000)
Chromium (Total)	15,100	38,000	210,000 N(N)	6,100,000 (230,000)
Lead	274,000	185,000 30,000	250,000 500,000 (50,000)	400,000 (400,000)
Selenium	1,600	390,000	390,000 N (N)	10,000,000 (390,000)
Silver	45	390,000	390,000 N (N)	10,000,000 (390,000)
EPA 7471				
Mercury	55	380 100	N (N)	610,000 (23,000)
EPA 8082				
PCBs	BDL	1,000	N (N)	1,000 (1,000)

Notes:

1. "BAAP" means Badger Army Ammunition Plant.

2. USDA Midewin Soil Remediation Goals were obtained from Volume I of the report entitled Sampling and Analytical Report Midewin National Tallgrass Prairie, July 1999 prepared for the USDA Forest Service by Barr Engineering Company.

3. Wisconsin NR720 Industrial (Residential) Soil Remediation Objectives are based on protection of human health from direct contact through ingestion of soil or inhalation of particulate matter.

4. Illinois Section 742 Tier 1 Industrial (Residential) Soil Remediation Objectives are generally based on the protection of human health from direct contact through ingestion of soil. An exception to this is the objective for arsenic, which is based on background levels of arsenic in counties outside metropolitan statistical areas.

5. "N" or "(N)" means goals have not been promulgated.

6. "ug/kg" means microgram of contaminant per kilogram of soil.

7. "BDL" means below detectable levels.

Appendix D

USDA Forest Service Interim Soil Remediation Goals at the Midewin National Tallgrass Prairie

Soil Analytical Results
Midewin National Tallgrass Prairie
[concentrations in mg/kg]

Parameter	USDA Proposed Remediation Goals For Midewin		Miscellaneous Source Areas									
		L29-C-01 11/18/98 TriMatrix	L29-C-01 11/18/98 TriMatrix	L29-C-02 11/18/98 TriMatrix	L29-C-03 11/18/98 TriMatrix	L29-C-04 11/18/98 TriMatrix	L103-G-01 10/16/98 TriMatrix	L103-G-02 10/16/98 TriMatrix	L104-G-04 11/17/98 TriMatrix	L106-G-01 10/26/98 TriMatrix	L117-G-01 11/13/98 TriMatrix	L117-G-02 11/413/98 TriMatrix
Semivolatile Organic Compounds												
Acenaphthene	5	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Acenaphthylene	5	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Anthracene	7	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Benzo(a)anthracene	8	0.065 j	0.086 j	<0.33	0.19 j	0.061 j	--	--	<0.33	<0.33	<0.33	<0.33
Benzo(a)pyrene	0.78	<0.33	<0.33	<0.33	0.12 j	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Benzo(b)fluoranthene	3	0.16 j	0.13 j	<0.33	0.2 j	0.1 j	--	--	<0.33	<0.33	<0.33	<0.33
Benzo(g,h,i)perylene	5	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Benzo(k)fluoranthene	3	0.086 j	0.082 j	<0.33	0.11 j	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Bis(2-ethylhexyl)phthalate	410	0.11 jb	0.12 jb	<0.33	<0.33	0.088 jb	--	--	<0.33	<0.33	<0.33	<0.33
Chrysene	6	0.099 j	0.12 j	<0.33	0.22 j	0.11 j	--	--	<0.33	<0.33	<0.33	<0.33
Dibenz(a,h)anthracene	5	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Dibenzofuran	8,200	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
1,2-Dichlorobenzene	7,000	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
1,3-Dichlorobenzene	27	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Diethyl phthalate	240	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Di-n-butyl phthalate	200	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Di-n-octyl phthalate	10,000	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Fluoranthene	6	0.13 j	0.14 j	<0.33	0.28 j	0.14 j	--	--	<0.33	<0.33	<0.33	<0.33
Fluorene	30	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Hexachlorobenzene	2	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Indeno(1,2,3-cd)pyrene	4	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
2-Methylnaphthalene	10,000	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Naphthalene	5	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Phenanthrene	7	<0.33	<0.33	<0.33	0.16 j	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Phenol	10,000	<0.33	<0.33	<0.33	<0.33	<0.33	--	--	<0.33	<0.33	<0.33	<0.33
Pyrene	4	0.15 j	0.13 j	<0.33	0.36	0.15 j	--	--	<0.33	<0.33	<0.33	<0.33
1,2,4-Trichlorobenzene	3,200	--	--	--	--	--	--	--	--	--	--	--
Pesticides/PCBs												
a-Chlordane	4.4	<0.08	<0.08	0.0024 j	<0.08	<0.08	--	--	0.0014 j	<0.08	<0.08	<0.08
g-Chlordane	4.4	0.014 j	0.017 j	0.0012 j	<0.08	<0.08	--	--	0.0015 j	<0.08	<0.08	<0.08
4,4'-DDD	16	<0.016	<0.016	<0.016	<0.016	<0.016	--	--	<0.016	<0.016	<0.016	0.0005 j
4,4'-DDE	0.4	<0.016	<0.016	<0.016	0.0034 j	<0.016	--	--	<0.016	<0.016	<0.016	0.0013 j
4,4'-DDT	2	<0.016	<0.016	0.0005 j	<0.016	<0.016	--	--	<0.016	<0.016	<0.016	<0.016
Dieldrin	2	0.013 j	0.013 j	<0.016	<0.016	<0.016	--	--	0.013 j	<0.016	<0.016	<0.016
Endrin	23	<0.016	<0.016	<0.016	<0.016	<0.016	--	--	<0.016	<0.016	<0.016	<0.016
Heptachlor	112	<0.008	<0.008	<0.008	<0.008	<0.008	--	--	<0.008	<0.008	<0.008	<0.008
Heptachlor Epoxide	0.63	<0.008	<0.008	<0.008	0.0011 j	<0.008	--	--	0.0034 j	<0.008	<0.008	<0.008
Isodrin	1000	--	--	--	--	--	--	--	--	--	--	--
PCB-1016	1	<0.16	<0.16	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
PCB-1221	1	<0.16	<0.16	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
PCB-1232	1	<0.16	<0.16	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
PCB-1242	1	<0.16	<0.16	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
PCB-1248	1	<0.16	<0.16	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
PCB-1254	1	<0.32	<0.32	<0.16	0.19	0.14 j	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
PCB-1260	1	2.8	3.2	<0.16	<0.16	<0.16	0.14 j	0.10 j	<0.16	<0.16	<0.16	<0.16

Soil Analytical Results
Midewin National Tallgrass Prairie
[concentrations in mg/kg]

Parameter	USDA Proposed Remediation Goals For Midewin		Miscellaneous Source Areas										
		L121-G-01 10/26/98 TriMatrix	L121-G-02 10/26/98 TriMatrix	L121-G-03 10/26/98 TriMatrix	L121-G-04 10/29/98 TriMatrix	L121-G-05 10/29/98 TriMatrix	L121-G-06 10/29/98 TriMatrix	M101-G-02 11/19/98 TriMatrix	M105-G-02 11/3/98 TriMatrix	M111-G-01 10/30/98 TriMatrix	M111-G-05 11/3/98 TriMatrix	M111-G-07 11/3/98 TriMatrix	M111-G-08 11/4/98 TriMatrix
Explosives													
4,6-Dinitroaminophenol (Picramic Acid)	4,100	--	--	<50	<50	<50	<50	--	<50	74	--	--	<50
1,3-Dinitrobenzene	20	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
2,4-Dinitrotoluene	9.3	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
2,6-Dinitrotoluene	8.4	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
Cyclonite (1,3,5,7Tetranitro-tetrazocine)	4.19	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
Nitrobenzene	92	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5 UC	<2.5	--	--	<2.5
2-Nitrotoluene	10,000	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
Hexahydro-1,3,5-Trinitro-s-triazine(RDX)	3.6	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
n-methyl-2,4,6-Tetranitro-aniline	4,100	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
2,4,6-Trinitrophenol (Picric Acid)	4,100	--	--	<50	<50	<50	<50	--	<50	<50	--	--	<50
1,3,5-Trinitrobenzene	7	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
2,4,6-Trinitrotoluene	31	--	--	<2.5	<2.5	<2.5	<2.5	--	<2.5	<2.5	--	--	<2.5
Metals/Inorganics													
Aluminum	15,860	--	--	3980	6260	11000	10200	5780	2270	11400	12800	9010	12000
Antimony	31	--	--	0.36 J	0.42 J	0.81 J	0.68 J	0.81 J	0.15 J	0.6 J	143	13	0.41 J
Arsenic	21	--	--	4.3	10	9	7.9	5.3	0.91 J	5.9	3	10	8.6
Barium	705	--	--	21	53	73	90	343	9.4	118	429	138	122
Beryllium	1.3	--	--	<0.2	0.011 J	<0.2	0.037 J	<0.2	<0.2	0.018 J	0.6	<0.2	0.065 J
Cadmium	13	--	--	1.6	0.99	0.94	0.91	1.2	0.3	0.76	0.77	0.53	0.33 *
Chromium, total	38	--	--	4.9	7.4	11	10	7.1	3.4	13	27	24	12
Cobalt	20	--	--	3.3	3.9	5.8	7.7	6.4	1.9	5.3	4	6	2.2
Copper	646	--	--	6.2	11	21	19	20	3.7	16	15	19	12
Iron	610,000	--	--	9900	13900	21600	19100	20400	4310	17400	20200	15800	18300
Lead	185	371	24	11	14	16	19	16	6.5	15	661	173	19
Manganese	500	--	--	301	332	482	763	514	93	489	248	683	235
Mercury	0.1	--	--	0.013 J	0.023 J	0.047 J	0.045 J	0.24	0.015 J	0.065 J	<0.1	0.035 J	0.054 J
Nickel	1,622	--	--	8.6	11	23	20	15	4.3	17	13	16	11
Selenium	390	--	--	0.34 J	0.25 J	0.4 J	0.38 J	0.13 J	0.21 J	0.63	0.27 J	0.6	0.53
Silver	390	--	--	1.1	<0.2	<0.2	<0.2	0.23 *	<0.2	0.068 J	0.051 J	<0.2	<0.2
Thallium	1	--	--	0.18 J	0.18 J	0.36 J	0.38 J	0.11 J	<1 J	0.27 J	<1 J	0.2 J	<1
Vanadium	344	--	--	13	21	30	29	22	8.4	31	34	28	33
Zinc	105	--	--	22	40	58	54	149	16	57	84	87	58

Appendix E

State of Wisconsin, DNR Chapter NR 720, Soil Cleanup Goals

Chapter NR 720

SOIL CLEANUP STANDARDS

NR 720.01 Purpose. The purpose of this chapter is to establish soil cleanup standards, for the remediation of soil contamination, which result in restoration of the environment to the extent practicable, minimize harmful effects to the air, lands and waters of the state and are protective of public health, safety and welfare, and the environment as required by ss. 144.442, 144.76 and 144.765, Stats., and which are consistent with ch. 160, Stats., and ch. NR 140. This chapter is adopted pursuant to ss. 144.431 (1) (a) and (b), 144.442, 144.76, 144.765 and 227.11 (2), Stats.

History: Cr. Register, March, 1995, No. 471, eff. 4–1–95; am., Register, February, 1996, No. 482, eff. 3–1–96.

NR 720.02 Applicability. (1) This chapter applies to all remedial actions taken by responsible parties to address soil contamination after an investigation has been conducted at a site, facility or portion of a site or facility that is subject to regulation under s. 144.442 or 144.76, Stats., regardless of whether there is direct involvement or oversight by the department. This chapter also applies to soil contamination at all of the following:

(a) Solid waste facilities, where remedial action is required by the department pursuant to s. NR 508.20 (11);

Note: Chapter NR 720 does not apply to landspreading regulated under ch. NR 518 or solid waste facilities where ongoing operations are occurring, unless remedial action is required pursuant to s. NR 508.20 (11).

(b) Hazardous waste facilities, where the owner or operator is required to close the facility pursuant to s. 144.64 (2m), Stats., or ch. NR 685, to institute corrective action pursuant to s. 144.735, Stats., or s. NR 635.17, or to meet requirements imposed by the department under s. NR 600.07 where a discharge has occurred. However, if U.S. EPA requires that states employ soil cleanup standards for hazardous waste facilities that are more stringent than the standards in this chapter, the department is obligated under the state's hazardous waste management act, ss. 144.60 to 144.74, Stats., and its hazardous waste program RCRA authorization to apply the more stringent soil cleanup standards.

(c) Wastewater lagoons, storage structures and treatment structures that are abandoned pursuant to s. NR 110.09, 213.07 or 214.08.

Note: Chapter NR 720 applies to abandonment of lagoons, storage structures and treatment structures for sewage treatment facilities projects; abandonment of lagoons, storage structures and treatment structures that receive wastewaters, associated sludges, by–product solids and any resulting leachates from industrial, commercial or agricultural sources, except as provided in s. NR 213.02 (2); and abandonment of land treatment systems for industrial liquid wastes, by–product solids and sludges, except as provided in s. NR 214.02 (3). Chapter NR 720 does not apply to activities regulated under s. 146.20, Stats., or permitted activities regulated under 40 CFR 503 or ch. NR 204, 206 or 214, including permitted land spreading of sludge or land disposal of wastewaters from municipal and domestic wastewater treatment works and permitted land treatment of industrial liquid wastes, by–product solids and sludges.

(d) Sites where remedial action is being taken by a person who is seeking the liability exemption under s. 144.765, Stats.

(2) This chapter applies to interim actions taken by responsible parties or other persons under s. 144.765, Stats., when at the completion of both the site investigation and interim action taken to address contaminated soil, the responsible parties or persons taking action under s. 144.765, Stats., request that the site or facility be closed out in accordance with ch. NR 726, without taking a subsequent remedial action to address the contaminated soil.

(3) This chapter applies to remedial actions taken by the department where a department–funded response action is being taken under the authority of s. 144.442 or 144.76, Stats.

(4) Concentrations of legally applied pesticides are exempt from the requirements of this chapter when all of the following conditions are met:

(a) The application of the pesticide was done in compliance with:

1. The pesticide label currently registered with the U.S. EPA;
2. Sections 94.67 to 94.71, Stats.; and
3. Rules adopted under ss. 94.67 to 94.71, Stats.

(b) For pesticides that are intended to be applied to the soil, pesticide concentrations exceeding soil cleanup standards are only found in the surface soil layer, where the pesticide is expected to perform its intended purpose, and only at concentrations that would be expected from pesticide application, in compliance with the pesticide label requirements.

Note: The depth of the surface layer of soil will vary depending on the type of pesticide applied and the appropriate intended use of that pesticide.

(5) The department may exercise enforcement discretion on a case–by–case basis and choose to regulate a site, facility or a portion of a site or facility under only one of a number of potentially applicable statutory authorities. However, where overlapping restrictions or requirements apply, the more restrictive control. The department shall, after receipt of a request from a responsible party, provide a letter that indicates which regulatory program or programs the department considers to be applicable.

Note: Sites, facilities or portions of a site or facility that are subject to regulation under s. 144.442 or 144.76, Stats., may also be subject to regulation under other statutes, including solid waste statutes, ss. 144.43 to 144.47, Stats., or the hazardous waste management act, ss. 144.60 to 144.74, Stats., and the administrative rules adopted pursuant to those statutes. One portion of a site or facility may be regulated under a different statutory authority than other portions of that site or facility. When necessary, the department will, to the best of its ability, facilitate coordination between the regulatory programs involved.

(6) The department may take any action within the context of regulatory programs established in statutes or rules outside this chapter, if those actions are necessary to protect public health, welfare or safety or prevent a damaging effect on the environment for present and future uses, whether or not a soil cleanup standard has been adopted under this chapter.

(7) Nothing in this chapter authorizes an impact on soil quality that would cause a violation of a groundwater quality standard contained in ch. NR 140, an impact on soil quality or groundwater quality that would cause a violation of a surface water quality standard contained in chs. NR 102 to 106 or an impact on soil quality that would cause a violation of an air quality standard contained in chs. NR 400 to 499.

History: Cr. Register, March, 1995, No. 471, eff. 4–1–95; cr. (1) (d), am. (2); Register, February, 1996, No. 482, eff. 3–1–96.

NR 720.03 Definitions. In this chapter:

(1) "Aquifer" means a saturated subsurface geological formation of rock or soil.

(2) "Contaminant of concern" means a hazardous substance that is present at a site or facility in such concentrations that the

Note: Numeric residual contaminant levels are determined separately for each exposure or migration pathway of concern at a site. These residual contaminant levels are not the soil cleanup standard for the site. The soil cleanup standard for the site is determined by selecting the lowest concentration from among the individual residual contaminant levels determined for each pathway.

2. A performance standard determined in accordance with s. NR 720.19 (2).

(c) In addition to meeting the requirements of par. (b), a soil cleanup standard developed under this chapter shall comply with the following requirements:

1. Residual soil contamination at the site or facility shall not adversely affect surface water;

2. Residual soil contamination at the site or facility shall not adversely affect a sensitive environment; and

3. Residual soil contamination at the site or facility shall not concentrate through plant uptake and adversely affect the food chain.

Note: It is the department's intention to adopt in the future soil cleanup standards based on protection of human food chain exposures, protection of surface water quality and protection of terrestrial ecosystems after exposure assumptions and methods have been developed to allow the department to calculate soil cleanup standards for these pathways of exposure. Responsible parties are required by ss. NR 720.07 (2) and 720.19 (6) to consider human food chain exposures, the protection of surface water quality and the protection of terrestrial ecosystems, if these pathways are of concern, when determining a residual contaminant level at a site or facility.

(2) COMPLIANCE WITH SOIL CLEANUP STANDARDS. (a) Contaminant concentrations in soil samples shall be determined using a department–approved and appropriate analytical method and reported on a dry weight basis. An appropriate analytical method shall have limits of detection or limits of quantitation, or both, at or below soil cleanup standards where possible. Responsible parties shall report the limit of detection and the limit of quantitation with sample results. The department may require that supporting documentation for the reported limit of detection and limit of quantitation be submitted.

(b) If a soil contaminant concentration in a sample exceeds the soil cleanup standard at or above the limit of quantitation for that soil contaminant, the soil cleanup standard shall be considered to have been exceeded.

(c) If a soil cleanup standard for a soil contaminant is between the limit of detection and the limit of quantitation, the soil cleanup standard shall be considered to be exceeded if the soil contaminant concentration is reported at or above the limit of quantitation.

(d) The following applies when a soil cleanup standard for a soil contaminant is below the limit of detection:

1. If a soil contaminant is not detected in a sample, the soil cleanup standard shall not be considered to have been exceeded.

2. If a soil contaminant is reported above the limit of detection but below the limit of quantitation, the soil cleanup standard shall be considered to have been exceeded if the presence of that soil contaminant has been confirmed by the use of an appropriate analytical method.

History: Cr. Register, March, 1995, No. 471, eff. 4–1–95.

NR 720.09 Determination of residual contaminant levels based on protection of groundwater. (1) CRITERIA AND PROCESS USING GENERIC RESIDUAL CONTAMINANT LEVELS. If all of the following criteria are met, responsible parties may use one of the methods in sub. (3) and, where applicable, the standards in sub. (4) to determine residual contaminant levels based on groundwater protection for a site or facility:

(a) An investigation has been conducted and completed in accordance with applicable administrative rules, as specified in s. NR 720.05 (1);

(b) The contaminants of concern are listed in Table 1, except that at sites or facilities with petroleum contamination where gasoline range organics (GRO) or diesel range organics (DRO), or both, are the only contaminants of concern present other than contaminants listed in Table 1, the standards in sub. (4) (a) may be used for non–specific GRO or DRO contamination in addition to the methods in sub. (3) which are applicable to contaminants listed in Table 1;

(c) The horizontal and vertical degree and extent of contamination is defined;

(d) The vertical distance from the base of the contaminated soil to carbonate bedrock (limestone or dolostone) or fractured bedrock is one meter (3.28 feet) or greater;

(e) The vertical thickness of the residual soil contamination is 6 meters (19.69 feet) or less; and

(f) None of the residual contaminants or combinations of residual contaminants at the site or facility are known to contribute to facilitated transport or cosolvent effects.

Note: In some cases, a contaminant or combination of contaminants may contribute to an increased potential for migration of contaminants to groundwater by facilitated transport or by acting as a solvent for other contaminants, which would make the use of the values in Table 1 inappropriate. An example of facilitated transport might be polychlorinated biphenyls (PCBs) in the presence of an oily phase. An example of cosolvency might be polycyclic aromatic hydrocarbons (PAHs) in the presence of alcohols, where the alcohol acts to increase the solubility of the PAHs.

Note: If a site or facility meets the criteria in sub. (1), responsible parties are not required to use the methods for generic residual contaminant levels in sub. (3). The procedure in s. NR 720.19 may be used to determine site–specific soil cleanup standards even when the site or facility meets the criteria in sub. (1).

(2) SITE-SPECIFIC PROCESS. If any of the criteria in sub. (1) are not met, responsible parties shall use the procedure in s. NR 720.19 to determine soil cleanup standards specific to a site or facility based on groundwater protection.

(3) METHODS FOR DETERMINING GENERIC RESIDUAL CONTAMINANT LEVELS. Responsible parties may select one of the following methods to determine residual contaminant levels based on groundwater protection for sites or facilities that meet all of the criteria in sub. (1) in addition to meeting the requirements of sub. (4), if applicable:

(a) *Method 1.* Responsible parties may use the residual contaminant levels based on protection of groundwater listed for each substance in Table 1.

(b) *Method 2. 1.* Responsible parties may determine the residual contaminant levels based on protection of groundwater using the baseline concentration for each substance listed in Table 1 multiplied by a groundwater dilution factor specific to the site or facility determined using parameter values from the site or facility determined in accordance with subd. 2. and a groundwater mixing zone depth of 5 feet (152.4 cm) in the following equation:

$$DF = 1 + \frac{K \times I \times d}{R \times I}$$

Where:

DF = groundwater dilution factor,

K = hydraulic conductivity (cm/day),

I = hydraulic gradient (cm/cm)

d = depth of groundwater mixing zone (cm)

R = average groundwater recharge rate (cm/day), and

I = horizontal extent of contaminated soil parallel to the hydraulic gradient (cm).

2. Parameter values specific to the site or facility shall be determined as follows:

a. Hydraulic conductivity shall be determined as the geometric mean of values determined from appropriate aquifer tests. Appropriate aquifer tests may include slug tests and pumping tests, and shall be properly performed using accepted practices.

b. Hydraulic gradient shall be determined using water level measurements from a minimum of 3 groundwater monitoring wells whose screens intersect the same hydrogeologic unit using the procedures specified in s. NR 716.13 (8). In cases where the

720.19 to determine soil cleanup standards specific to a site or facility based on protection from direct contact.

(5) EXCEPTIONS. If the background concentration for a substance in soil at a site or facility is higher than the residual contaminant level for that substance listed in Table 2 or determined using the procedure in s. NR 720.19 (3), the background concentration in soil may be used as the residual contaminant level for that substance. The background concentration for a substance in soil shall be determined using a department–approved and appropriate method.

Note: Naturally occurring background concentrations of arsenic in soil, for example, may be higher than the residual contaminant level for arsenic listed in Table 2. In such instances, the naturally occurring background concentration should be used as the soil cleanup level.

Table 2

Residual Contaminant Levels Based On

Human Health Risk From Direct Contact Related To Land Use

(milligrams per kilogram)

Substance	Non–Industrial	Industrial	Basis
Arsenic	0.039	1.6	cancer
Cadmium	8	510	noncancer
Chromium, hexavalent	14	200	cancer
Chromium, trivalent	16,000	NA	noncancer
Lead	50	500	noncancer

NA= Not applicable

Note: Milligrams per kilogram (mg/kg) is equivalent to parts per million (ppm) in soil. Soil concentrations are on a dry weight basis.

Note: The residual contaminant levels in Table 2 are based on protection of human health from direct contact through ingestion of soil or inhalation of particulate matter. These concentrations of hazardous substances in soil may not be protective of other pathways of concern. The definition of direct contact will be expanded in future revisions to include human exposures by inhalation of vapors and dermal absorption. In addition, these levels may be higher than those which would be characteristic of hazardous waste when tested using the toxicity characteristic leaching procedure (TCLP), U.S. EPA Method 1311.

History: Cr. Register, March, 1995, No. 471, eff. 4–1–95.

NR 720.19 Procedure for determining soil cleanup standards specific to a site or facility. (1) GENERAL. (a) Responsible parties shall propose a soil cleanup standard specific to a site or facility in accordance with the requirements of this section when required in ss. NR 720.09 to 720.11 or if it is determined that it is not practicable to achieve the residual contaminant level for a soil contaminant specified in ss. NR 720.09 to 720.11 using on–site remedial action or, if the responsible party chooses to utilize off–site remedial actions, using off–site remedial action or a combination of on–site and off–site remedial actions at a site or facility.

(b) Responsible parties shall establish a soil cleanup standard for a specific soil contaminant or physical location at a site or facility using one of the methods in sub. (2) or (3).

(2) PERFORMANCE STANDARD. If selected, a performance standard shall be established for a remedial action so that the remedial action is operated and maintained, in compliance with chs. NR 722 and 724 when those chapters are applicable to the site or facility, until the lowest concentration that is practicable is achieved or a permanent engineering control is maintained, or both, so that the residual contaminants left in the soil do not pose a threat to public health, safety and welfare or the environment.

Note: Examples of performance standards include the allowable rate of infiltration by soil contaminants into the groundwater after a membrane liner has been installed, or the rate or percentage of removal efficiency offered by an in–situ treatment system at a specific site or facility. At a site or facility where an engineering control is being considered for selection, in accordance with the requirements of ch. NR 722, an engineering control may be selected even though the soil contaminants exceed a residual contaminant level.

(3) RESIDUAL CONTAMINANT LEVELS SPECIFIC TO A SITE OR FACILITY. If selected, residual contaminant levels specific to a site or facility shall be established that are protective of public health, safety and welfare and the environment and restore the environment to the lowest concentration practicable, in accordance with the requirements of sub. (4) to (6). Even in cases where the procedure in sub. (3) is selected by the responsible party, the procedure in sub. (2) may be used when the residual contaminant levels established under sub. (3) are not practicable to achieve.

(4) PROTECTION OF GROUNDWATER. (a) Residual contaminant levels for soil based on protection of groundwater shall be developed using the preventive action limits (PALs) established in ch. NR 140 or using procedures consistent with the methodology in ss. 160.13 and 160.15, Stats., and the criteria in s. NR 722.09 (2) (b) 2. when there is no preventive action limit as the target concentrations in groundwater.

Note: In developing a residual contaminant level, any relevant information shall be considered, including public welfare concerns for groundwater, such as taste and odor.

(b) Responsible parties shall use one or more of the methods listed in this paragraph based on scientifically valid procedures that are subject to department review and approval and site–specific geological, physical and chemical conditions to establish residual contaminant levels.

1. A contaminant transport and fate model.

2. Leaching tests appropriate for the site or facility in both application and extent.

3. Any other appropriate method approved by the department for that specific site or facility, or other appropriate method suggested in department guidance.

(5) PROTECTION OF HUMAN HEALTH FROM DIRECT CONTACT. (a) *General.* Residual contaminant levels for soil based on protection of human health from direct contact shall be developed:

1. For individual compounds using the excess cancer risk of $1x10^{-6}$ and the hazard quotient for non–carcinogens of one; and

2. So that the cumulative excess cancer risk will not exceed $1x10^{-5}$ and the hazard index for non–carcinogens will not exceed one for the site or facility.

3. Risks for carcinogens and for non–carcinogens are presumed to be additive within each category, unless there is specific information that demonstrates that an alternative approach is more appropriate.

4. If toxicological indices for both carcinogenic and non–carcinogenic end points exist for a substance, both shall be evaluated and the value that generates the lowest residual contaminant level shall be used for the site or facility.

(b) *Methods and procedures.* Responsible parties shall determine a residual contaminant level to protect public health from direct contact with soil contamination using scientifically valid procedures and toxicological values approved by the department and the default exposure assumptions identified in par. (c) or alternative assumptions specifically approved by the department in writing.

Note: The department will generally consider toxicological values in the following order: recommendations of the department of health and social services; indices contained in U.S. EPA's Integrated Risk Information System (IRIS); indices contained in U.S. EPA's Health Effects Assessment Summary Tables (HEAST); recommendations of U. S. EPA's Environmental Criteria and Assessment Office; indices withdrawn from IRIS; indices withdrawn from HEAST; and other pertinent toxicological information.

(c) *Default exposure assumptions.* 1. Non–carcinogens. When the contaminant is not a carcinogen, the following default exposure assumptions shall be used:

a. When the land use of a site or facility is classified as non–industrial, in accordance with s. NR 720.11 (1), incidental ingestion of soil shall be assumed to occur at the rate of 200 mg of soil per day for a 15 kg child for 350 days each year and inhalation of particulate matter shall be assumed to occur at the inhalation rate of 20 m^3 of air per day with a concentration of 1.4 g/m^3 of contami-

Appendix F

State of Illinois Tier One Soil Cleanup Objectives for Residential And Industrial Property

Section 742.APPENDIX B: Tier 1 Tables and Illustrations

Section 742.TABLE A: Tier 1 Soil Remediation Objectives[a] for Residential Properties

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
83-32-9	Acenaphthene	4,700[b]	---[c]	570[b]	2,900	*
67-64-1	Acetone	7,800[b]	100,000[d]	16[b]	16	*
15972-60-8	Alachlor[o]	8[e]	---[c]	0.04	0.2	NA
116-06-3	Aldicarb[o]	78[b]	---[c]	0.013	0.07	NA
309-00-2	Aldrin	0.04[e]	3[e]	0.5[e]	2.5	0.94
120-12-7	Anthracene	23,000[b]	---[c]	12,000[b]	59,000	*
1912-24-9	Atrazine[o]	2700[b]	---[c]	0.066	0.33	NA
71-43-2	Benzene	12[e]	0.8[e]	0.03	0.17	*
56-55-3	Benzo(*a*)anthracene	0.9[e]	---[c]	2	8	*
205-99-2	Benzo(*b*)fluoranthene	0.9[e]	---[c]	5	25	*

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
207-08-9	Benzo(*k*)fluroanthene	9[e]	---[c]	49	250	*
50-32-8	Benzo(*a*)pyrene	0.09[e,f]	---[c]	8	82	*
111-44-4	Bis(2-chloroethyl)ether	0.6[e]	0.2[e,f]	0.0004[e,f]	0.0004	0.66
117-81-7	Bis(2-ethylhexyl)phthalate	46[e]	31,000[d]	3,600	31,000[d]	*
75-27-4	Bromodichloromethane (Dichlorobromomethane)	10[e]	3,000[d]	0.6	0.6	*
75-25-2	Bromoform	81[e]	53[e]	0.8	0.8	*
71-36-3	Butanol	7,800[b]	10,000[d]	17[b]	17	NA
85-68-7	Butyl benzyl phthalate	16,000[b]	930[d]	930[d]	930[d]	*
86-74-8	Carbazole	32[e]	---[c]	0.6[e]	2.8	NA
1563-66-2	Carbofuran°	390[b]	---[c]	0.22	1.1	NA
75-15-0	Carbon disulfide	7,800[b]	720[d]	32[b]	160	*

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
56-23-5	Carbon tetrachloride	5[e]	0.3[e]	0.07	0.33	*
57-74-9	Chlordane	1.8[e]	72[e]	10	48	*
106-47-8	4-Chloroaniline (*p*-Chloroaniline)	310[b]	---[c]	0.7[b]	0.7	*
108-90-7	Chlorobenzene (Monochlorobenzene)	1,600[b]	130[b]	1	6.5	*
124-48-1	Chlorodibromomethane (Dibromochloromethane)	1,600[b]	1,300[d]	0.4	0.4	*
67-66-3	Chloroform	100[e]	0.3[e]	0.6	2.9	*
218-01-9	Chrysene	88[e]	---[c]	160	800	*
94-75-7	2,4-D[g]	780[b]	---[c]	1.5	7.7	*
75-99-0	Dalapon[o]	2,300[b]	---[c]	0.85	8.5	*
72-54-8	DDD	3[e]	---[c]	16[e]	80	*
72-55-9	DDE	2[e]	---[c]	54[e]	270	*

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
50-29-3	DDT	2[e]	---[g]	32[e]	160	*
53-70-3	Dibenzo(*a,h*)anthracene	0.09[e,f]	---[c]	2	7.6	*
96-12-8	1,2-Dibromo-3-chloropropane	0.46[e]	11[b]	0.002	0.002	*
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.0075[e]	0.17[e]	0.0004	0.004	0.005
84-74-2	Di-*n*-butyl phthalate	7,800[b]	2,300[d]	2,300[d]	2,300[d]	*
95-50-1	1,2-Dichlorobenzene (*o* - Dichlorobenzene)	7,000[b]	560[d]	17	43	*
106-46-7	1,4-Dichlorobenzene (*p* - Dichlorobenzene)	---[c]	11,000[b]	2	11	*
91-94-1	3,3'-Dichlorobenzidine	1[e]	---[c]	0.007[e,f]	0.033	1.3
75-34-3	1,1-Dichloroethane	7,800[b]	1,300[b]	23[b]	110	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	7[e]	0.4[e]	0.02	0.1	*
75-35-4	1,1-Dichloroethylene	700[b]	1,500[d]	0.06	0.3	*
156-59-2	*cis*-1,2-Dichloroethylene	780[b]	1,200[d]	0.4	1.1	*
156-60-5	*trans*-1,2-Dichloroethylene	1,600[b]	3,100[d]	0.7	3.4	*
78-87-5	1,2-Dichloropropane	9[e]	15[b]	0.03	0.15	*
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	6.4[e]	1.1[e]	0.004[e]	0.02	0.005
60-57-1	Dieldrin[n]	0.04[e]	1[e]	0.004[e]	0.02	0.603
84-66-2	Diethyl phthalate	63,000[b]	2,000[d]	470[b]	470	*
105-67-9	2,4-Dimethylphenol	1,600[b]	---[c]	9[b]	9	*
121-14-2	2,4-Dinitrotoluene	0.9[e]	---[c]	0.0008[e,f]	0.0008	0.250

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
606-20-2	2,6-Dinitrotoluene	0.9[e]	---[c]	0.0007[e,f]	0.0007	0.260
117-84-0	Di-*n*-octyl phthalate	1,600[b]	10,000[d]	10,000[d]	10,000[d]	*
115-29-7	Endosulfan[o]	470[b]	---[c]	18[b]	90	*
145-73-3	Endothall[o]	1,600[b]	---[c]	0.4	0.4	NA
72-20-8	Endrin	23[b]	---[c]	1	5	*
100-41-4	Ethylbenzene	7,800[b]	400[d]	13	19	*
206-44-0	Fluoranthene	3,100[b]	---[c]	4,300[b]	21,000	*
86-73-7	Fluorene	3,100[b]	---[c]	560[b]	2,800	*
76-44-8	Heptachlor	0.1[e]	0.1[e]	23	110	0.871
1024-57-3	Heptachlor epoxide	0.07[e]	5[e]	0.7	3.3	1.005
118-74-1	Hexachlorobenzene	0.4[e]	1[e]	2	11	*
319-84-6	*alpha*-HCH (*alpha*-BHC)	0.1[e]	0.8[e]	0.0005[e,f]	0.003	0.0074

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
58-89-9	*gamma*-HCH (Lindane)[n]	0.5[c]	---[c]	0.009	0.047	*
77-47-4	Hexachlorocyclopentadiene	550[b]	10[b]	400	2,200[d]	*
67-72-1	Hexachloroethane	78[b]	---[c]	0.5[b]	2.6	*
193-39-5	Indeno(1,2,3-*c,d*)pyrene	0.9[e]	---[c]	14	69	*
78-59-1	Isophorone	15,600[b]	4,600[d]	8[b]	8	*
72-43-5	Methoxychlor[o]	390[b]	---[c]	160	780	*
74-83-9	Methyl bromide (Bromomethane)	110[b]	10[b]	0.2[b]	1.2	*
75-09-2	Methylene chloride (Dichloromethane)	85[e]	13[e]	0.02[e]	0.2	*
95-48-7	2-Methylphenol (*o* - Cresol)	3,900[b]	---[c]	15[b]	15	*
91-20-3	Naphthalene	1,600[b]	170[b]	12[b]	18	*
98-95-3	Nitrobenzene	39[b]	92[b]	0.1[b,f]	0.1	0.26

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
86-30-6	*N*-Nitrosodiphenylamine	130[c]	---[c]	1[e]	5.6	*
621-64-7	*N*-Nitrosodi-*n*-propylamine	0.09[e,f]	---[c]	0.00005[e,f]	0.00005	0.0018
108-95-2	Phenol	47,000[b]	---[c]	100[b]	100	*
1918-02-1	Picloram[o]	5,500[b]	---[c]	2	20	NA
1336-36-3	Polychlorinated biphenyls (PCBs)[n]	1[h]	---[c,h]	---[h]	---[h]	*
129-00-0	Pyrene	2,300[b]	---[c]	4,200[b]	21,000	*
122-34-9	Simazine[o]	390[b]	---[c]	0.04	0.37	NA
100-42-5	Styrene	16,000[b]	1,500[d]	4	18	*
127-18-4	Tetrachloroethylene (Perchloroethylene)	12[e]	11[e]	0.06	0.3	*
108-88-3	Toluene	16,000[b]	650[d]	12	29	*

		Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
8001-35-2	Toxaphene[n]	0.6[e]	89[e]	31	150	*
120-82-1	1,2,4-Trichlorobenzene	780[b]	3,200[b]	5	53	*
71-55-6	1,1,1-Trichloroethane	---[c]	1,200[d]	2	9.6	*
79-00-5	1,1,2-Trichloroethane	310[b]	1,800[d]	0.02	0.3	*
79-01-6	Trichloroethylene	58[e]	5[e]	0.06	0.3	*
108-05-4	Vinyl acetate	78,000[b]	1,000[b]	170[b]	170	*
75-01-4	Vinyl chloride	0.46[e]	0.28[e]	0.01[f]	0.07	*
108-38-3	m-Xylene	160,000[b]	420[d]	210	210	*
95-47-6	o-Xylene	160,000[b]	410[d]	190	190	*
106-42-3	p-Xylene	160,000[b]	460[d]	200	200	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
1330-20-7	Xylenes (total)	160,000[b]	320[d]	150	150	*
	Ionizable Organics					
65-85-0	Benzoic Acid	310,000[b]	---[c]	400[b,i]	400[i]	*
95-57-8	2-Chlorophenol	390[b]	53,000[d]	4[b,i]	4[i]	*
120-83-2	2,4-Dichlorophenol	230[b]	---[c]	1[b,i]	1[i]	*
51-28-5	2,4-Dinitrophenol	160[b]	---[c]	0.2[b,f]	0.2	3.3
88-85-7	Dinoseb[o]	78[b]	---[c]	0.34[b,i]	3.4[i]	*
87-86-5	Pentachlorophenol	3[e,j]	---[c]	0.03[f,i]	0.14[i]	*
93-72-1	2,4,5-TP (Silvex)	630[b]	---[c]	11[i]	55[i]	*
95-95-4	2,4,5-Trichlorophenol	7,800[b]	---[c]	270[b,i]	1,400[i]	*
88-06-2	2,4,6 Trichlorophenol	58[e]	200[e]	0.2[e,f,i]	0.77[i]	0.66

CAS No.	Chemical Name	Exposure Route-specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
		Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
	Inorganics					
7440-36-0	Antimony	31[b]	---[c]	0.006[m]	0.024[m]	*
7440-38-2	Arsenic[l,n]	[t]	750[e]	0.05[m]	0.2[m]	*
7440-39-3	Barium	5,500[b]	690,000[b]	2.0[m]	2.0[m]	*
7440-41-7	Beryllium	160[b]	1,300[e]	0.004[m]	0.5[m]	*
7440-42-8	Boron	7,000[b]	---[g]	2.0[m]	2.0[m]	*
7440-43-9	Cadmium[l,n]	78[b,r]	1,800[e]	0.005[m]	0.05[m]	*
16887-00-6	Chloride	---[c]	---[c]	200[m]	200[m]	*
7440-47-3	Chromium, total	230[b]	270[e]	0.1[m]	1.0[m]	*
16065-83-1	Chromium, ion, trivalent	120,000[b]	---[c]	---[g]	---[g]	*
18540-29-9	Chromium, ion, hexavalent	230[b]	270[e]	---	---	*
7440-48-4	Cobalt	4,700[b]	---[c]	1.0[m]	1.0[m]	*

		Exposure Route-specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
7440-50-8	Copper[n]	2,900[b]	---[c]	0.65[m]	0.65[m]	*
57-12-5	Cyanide (amenable)	1,600[b]	---[c]	0.2[q,m]	0.6[q,m]	*
7782-41-4	Fluoride	4,700[b]	---[c]	4.0[m]	4.0[m]	*
15438-31-0	Iron	---[c]	---[c]	5.0[m]	5.0[m]	*
7439-92-1	Lead	400[k]	---[c]	0.0075[m]	0.1[m]	*
7439-96-5	Manganese	3,700[b]	69,000[b]	0.15[m]	10.0[m]	*
7439-97-6	Mercury[l,n,s]	23[b]	10[b]	0.002[m]	0.01[m]	*
7440-02-0	Nickel[l]	1,600[b]	13,000[e]	0.1[m]	2.0[m]	*
14797-55-8	Nitrate as N[p]	130,000[b]	---[c]	10.0[q]	100[q]	*
7782-49-2	Selenium[l,n]	390[b]	---[c]	0.05[m]	0.05[m]	*

		Exposure Route-specific Values for Soils		Soil Component of the Groundwater Ingestion Exposure Route Values		
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
7440-22-4	Silver	390[b]	---[c]	0.05[m]	---	*
14808-79-8	Sulfate	---[c]	---[c]	400[m]	400[m]	*
7440-28-0	Thallium	6.3[b,u]	---[c]	0.002[m]	0.02[m]	*
7440-62-2	Vanadium	550[b]	---[c]	0.049[m]	0.1[m]	*
7440-66-6	Zinc[l]	23,000[b]	---[c]	5.0[m]	10[m]	*

"*" indicates that the ADL is less than or equal to the specified remediation objective.
NA means not available; no PQL or EQL available in USEPA analytical methods.

Chemical Name and Soil Remediation Objective Notations

[a] Soil remediation objectives based on human health criteria only.
[b] Calculated values correspond to a target hazard quotient of 1.
[c] No toxicity criteria available for the route of exposure.
[d] Soil saturation concentration ($C_{[sat]}$) = the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.
[e] Calculated values correspond to a cancer risk level of 1 in 1,000,000.
[f] Level is at or below Contract Laboratory Program required quantitation limit for Regular Analytical Services (RAS).
[g] Chemical-specific properties are such that this route is not of concern at any soil contaminant concentration.
[h] 40 CFR 761 contains applicability requirements and methodologies for the development of PCB remediation objectives. Requests for approval of a Tier 3 evaluation must address the applicability of 40 CFR 761.
[i] Soil remediation objective for pH of 6.8. If soil pH is other than 6.8, refer to Appendix B, Tables C and D of this Part.
[j] Ingestion soil remediation objective adjusted by a factor of 0.5 to account for dermal route.
[k] A preliminary remediation goal of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive #9355.4-12.
[l] Potential for soil-plant-human exposure.
[m] The person conducting the remediation has the option to use: 1) TCLP or SPLP test results to compare with the remediation objectives listed in this Table; or 2) the total amount of contaminant in the soil sample results to compare with pH specific remediation objectives listed in Appendix B, Table C or D of this Part. (See Section 742.510.) If the person conducting the remediation wishes to calculate soil remediation objectives based on background concentrations, this should be done in accordance with Subpart D of this Part.
[n] The Agency reserves the right to evaluate the potential for remaining contaminant concentrations to pose significant threats to crops, livestock, or wildlife.
[o] For agrichemical facilities, remediation objectives for surficial soils which are based on field application rates may be more appropriate for currently registered pesticides. Consult the Agency for further information.
[p] For agrichemical facilities, soil remediation objectives based on site-specific background concentrations of Nitrate as N may be more appropriate. Such determinations shall be conducted in accordance with the procedures set forth in Subparts D and I of this Part.
[q] The TCLP extraction must be done using water at a pH of 7.0.
[r] Value based on dietary Reference Dose.
[s] Value for Ingestion based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7); value for Inhalation based on Reference Concentration for elemental Mercury (CAS No. 7439-97-6).
[t] For the ingestion route for arsenic, see 742.Appendix A, Table G.
[u] Value based on Reference Dose for Thallium sulfate (CAS No. 7446-18-6).

(Source: Amended at 25 Ill. Reg. 10374, effective August 15, 2001)

Section 742.APPENDIX B: Tier 1 Tables and Illustrations

Section 742.Table B: Tier 1 Soil Remediation Objectives[a] for Industrial/Commercial Properties

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
83-32-9	Acenaphthene	120,000[b]	-----[c]	120,000[b]	-----[c]	570[b]	2,900	*
67-64-1	Acetone	200,000[b]	100,000[d]	200,000[b]	100,000[d]	16[b]	16	*
15972-60-8	Alachlor[o]	72[e]	-----[c]	1,600[e]	-----[c]	0.04	0.2	NA
116-06-3	Aldicarb[o]	2,000[b]	-----[c]	200[b]	-----[c]	0.013	0.07	NA
309-00-2	Aldrin	0.3[e]	6.6[e]	6.1[b]	9.3[e]	0.5[e]	2.5	0.94
120-12-7	Anthracene	610,000[b]	-----[c]	610,000[b]	-----[c]	12,000[b]	59,000	*
1912-24-9	Atrazine[o]	72,000[b]	-----[c]	7,100[b]	-----[c]	0.066	0.33	NA
71-43-2	Benzene	100[e]	1.6[e]	2,300[e]	2.2[e]	0.03	0.17	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
56-55-3	Benzo(*a*)anthracene	8[e]	-----[c]	170[e]	-----[c]	2	8	*
205-99-2	Benzo(*b*)fluoranthene	8[e]	-----[c]	170[e]	-----[c]	5	25	*
207-08-9	Benzo(*k*)fluroanthene	78[e]	-----[c]	1,700[e]	-----[c]	49	250	*
50-32-8	Benzo(*a*)pyrene	0.8[e]	-----[c]	17[e]	-----[c]	8	82	*
111-44-4	Bis(2-chloroethyl)ether	5[e]	0.47[e]	75[e]	0.66[e]	0.0004[e,f]	0.0004	0.66
117-81-7	Bis(2-ethylhexyl)phthalate	410[e]	31,000[d]	4,100[b]	31,000[d]	3,600	31,000[d]	*
75-27-4	Bromodichloromethane (Dichlorobromomethane)	92[e]	3,000[d]	2,000[e]	3,000[d]	0.6	0.6	*
75-25-2	Bromoform	720[e]	100[e]	16,000[e]	140[e]	0.8	0.8	*
71-36-3	Butanol	200,000[b]	10,000[d]	200,000[b]	10,000[d]	17[b]	17	NA
85-68-7	Butyl benzyl phthalate	410,000[b]	930[d]	410,000[b]	930[d]	930[d]	930[d]	*
86-74-8	Carbazole	290[e]	-----[c]	6,200[e]	-----[c]	0.6[e]	2.8	NA

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
1563-66-2	Carbofuran[a]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.22	1.1	NA
75-15-0	Carbon disulfide	200,000[b]	720[d]	20,000[b]	9.0[b]	32[b]	160	*
56-23-5	Carbon tetrachloride	44[e]	0.64[e]	410[b]	0.90[e]	0.07	0.33	*
57-74-9	Chlordane	1.6[e]	140[e]	100[b]	22[b]	10	48	*
106-47-8	4 - Chloroaniline (*p*-Chloroaniline)	8,200[b]	-----[c]	820[b]	-----[c]	0.7[b]	0.7	*
108-90-7	Chlorobenzene (Monochlorobenzene)	41,000[b]	210[b]	4,100[b]	1.3[b]	1	6.5	*
124-48-1	Chlorodibromomethane (Dibromochloromethane)	41,000[b]	1,300[d]	41,000[b]	1,300[d]	0.4	0.4	*
67-66-3	Chloroform	940[e]	0.54[e]	2,000[b]	0.76[e]	0.6	2.9	*
218-01-9	Chrysene	780[e]	-----[c]	17,000[e]	-----[e]	160	800	*
94-75-7	2,4-D[a]	20,000[b]	-----[c]	2,000[b]	-----[c]	1.5	7.7	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
75-99-0	Dalapon[o]	61,000[b]	-----[c]	6,100[b]	-----[c]	0.85	8.5	*
72-54-8	DDD	24[e]	-----[c]	520[e]	-----[c]	16[e]	80	*
72-55-9	DDE	17[e]	-----[c]	370[e]	-----[c]	54[e]	270	*
50-29-3	DDT	17[e]	1,500[e]	100[b]	2,100[e]	32[e]	160	*
53-70-3	Dibenzo(*a,h*)anthracene	0.8[e]	-----[c]	17[e]	-----[c]	2	7.6	*
96-12-8	1,2-Dibromo-3-chloropropane	4[e]	17[b]	89[e]	0.11[b]	0.002	0.002	*
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.07[e]	0.32[e]	1.5[e]	0.45[e]	0.0004	0.004	0.005
84-74-2	Di-*n*-butyl phthalate	200,000[b]	2,300[d]	200,000[b]	2,300[d]	2,300[d]	2,300[d]	*
95-50-1	1,2-Dichlorobenzene (*o* - Dichlorobenzene)	180,000[b]	560[d]	18,000[b]	310[b]	17	43	*
106-46-7	1,4-Dichlorobenzene (*p* - Dichlorobenzene)	-----[c]	17,000[b]	-----[c]	340[b]	2	11	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
91-94-1	3,3'-Dichlorobenzidine	13[e]	-----[c]	280[e]	-----[c]	0.007[e,r]	0.033	1.3
75-34-3	1,1-Dichloroethane	200,000[b]	1,700[d]	200,000[b]	130[b]	23[b]	110	*
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	63[e]	0.70[e]	1,400[e]	0.99[e]	0.02	0.1	*
75-35-4	1,1-Dichloroethylene	18,000[b]	1,500[d]	1,800[b]	300[v]	0.06	0.3	*
156-59-2	*cis*-1,2-Dichloroethylene	20,000[b]	1,200[d]	20,000[b]	1,200[d]	0.4	1.1	*
156-60-5	*trans*-1,2-Dichloroethylene	41,000[b]	3,100[d]	41,000[b]	3,100[d]	0.7	3.4	*
78-87-5	1,2-Dichloropropane	84[e]	23[b]	1,800[e]	0.50[b]	0.03	0.15	*
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	57[e]	2.1[e]	1,200[e]	0.39[b]	0.004[e]	0.02	0.005
60-57-1	Dieldrin[n]	0.4[e]	2.2[e]	7.8[e]	3.1[e]	0.004[e]	0.02	0.603
84-66-2	Diethyl phthalate	1,000,000[b]	2,000[d]	1,000,000[b]	2,000[d]	470[b]	470	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
105-67-9	2,4-Dimethylphenol	41,000[b]	-----[c]	41,000[b]	-----[c]	9[b]	9	*
121-14-2	2,4-Dinitrotoluene	8.4[e]	-----[c]	180[e]	-----[c]	0.0008[e,f]	0.0008	0.250
606-20-2	2,6-Dinitrotoluene	8.4[e]	-----[c]	180[e]	-----[c]	0.0007[e,f]	0.0007	0.260
117-84-0	Di-*n*-octyl phthalate	41,000[e]	10,000[d]	4,100[b]	10,000[d]	10,000[d]	10,000[d]	*
115-29-7	Endosulfan[g]	12,000[b]	-----[c]	1,200[b]	-----[c]	18[b]	90	*
145-73-3	Endothall[o]	41,000[c]	-----[c]	4,100[b]	-----[c]	0.4	0.4	NA
72-20-8	Endrin	610[b]	-----[c]	61[b]	-----[c]	1	5	*
100-41-4	Ethylbenzene	200,000[b]	400[d]	20,000[b]	58[b]	13	19	*
206-44-0	Fluoranthene	82,000[b]	-----[c]	82,000[b]	-----[c]	4,300[b]	21,000	*
86-73-7	Fluorene	82,000[b]	-----[c]	82,000[b]	-----[c]	560[b]	2,800	*
76-44-8	Heptachlor	1[e]	11[e]	28[e]	16[e]	23	110	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
1024-57-3	Heptachlor epoxide	0.6[e]	9.2[e]	2.7[b]	13[e]	0.7	3.3	1.005
118-74-1	Hexachlorobenzene	4[e]	1.8[e]	78[e]	2.6[e]	2	11	*
319-84-6	*alpha*-HCH (*alpha*-BHC)	0.9[e]	1.5[e]	20[e]	2.1[e]	0.0005[e,f]	0.003	0.0074
58-89-9	*gamma*-HCH (Lindane)[n]	4[e]	-----[c]	96[e]	-----[c]	0.009	0.047	*
77-47-4	Hexachlorocyclopentadiene	14,000[b]	16[b]	14,000[b]	1.1[b]	400	2,200[d]	*
67-72-1	Hexachloroethane	2,000[b]	-----[c]	2,000[b]	-----[c]	0.5[b]	2.6	*
193-39-5	Indeno(1,2,3-*c,d*)pyrene	8[e]	-----[c]	170[e]	-----[c]	14	69	*
78-59-1	Isophorone	410,000[b]	4,600[d]	410,000[b]	4,600[d]	8[b]	8	*
72-43-5	Methoxychlor[o]	10,000[b]	-----[c]	1,000[b]	-----[c]	160	780	*
74-83-9	Methyl bromide (Bromomethane)	2,900[b]	15[b]	1,000[b]	3.9[b]	0.2[b]	1.2	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
75-09-2	Methylene chloride (Dichloromethane)	760[e]	24[e]	12,000[b]	34[e]	0.02[e]	0.2	*
95-48-7	2-Methylphenol (*o* - Cresol)	100,000[b]	-----[c]	100,000[b]	-----[c]	15[b]	15	*
86-30-6	*N*-Nitrosodiphenylamine	1,200[e]	-----[c]	25,000[e]	-----[c]	1[e]	5.6	*
621-64-7	*N*-Nitrosodi-*n*-propylamine	0.8[e]	-----[c]	18[e]	-----[c]	0.00005[e,f]	0.00005	0.0018
91-20-3	Naphthalene	41,000[b]	270[b]	4,100[b]	1.8[b]	12[b]	18	*
98-95-3	Nitrobenzene	1,000[b]	140[b]	1,000[b]	9.4[b]	0.1[b,f]	0.1	0.26
108-95-2	Phenol	1,000,000[b]	-----[c]	120,000[b]	-----[c]	100[b]	100	*
1918-02-1	Picloram[o]	140,000[b]	-----[c]	14,000[b]	-----[c]	2	20	NA
1336-36-3	Polychlorinated biphenyls (PCBs)[n]	1[h]	-----[c,h]	1[h]	-----[c,h]	-----[h]	-----[h]	*
129-00-0	Pyrene	61,000[b]	-----[c]	61,000[b]	-----[c]	4,200[b]	21,000	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
122-34-9	Simazine[o]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.04	0.37	NA
100-42-5	Styrene	410,000[b]	1,500[d]	41,000[b]	430[b]	4	18	*
127-18-4	Tetrachloroethylene (Perchloroethylene)	110[e]	20[e]	2,400[e]	28[e]	0.06	0.3	*
108-88-3	Toluene	410,000[b]	650[d]	410,000[b]	42[b]	12	29	*
8001-35-2	Toxaphene[n]	5.2[e]	170[e]	110[e]	240[e]	31	150	*
120-82-1	1,2,4-Trichlorobenzene	20,000[b]	3,200[d]	2,000[b]	920[b]	5	53	*
71-55-6	1,1,1-Trichloroethane	-----[c]	1,200[d]	-----[c]	1,200[d]	2	9.6	*
79-00-5	1,1,2-Trichloroethane	8,200[b]	1,800[d]	8,200[b]	1,800[d]	0.02	0.3	*
79-01-6	Trichloroethylene	520[e]	8.9[e]	1,200[b]	12[e]	0.06	0.3	*
108-05-4	Vinyl acetate	1,000,000[b]	1,600[b]	200,000[b]	10[b]	170[b]	170	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
75-01-4	Vinyl chloride	7.9[e]	1.1[e]	170[e]	1.1[b]	0.01[f]	0.07	*
108-38-3	m-Xylene	1,000,000	420[d]	410,000[b]	420[d]	210	210	*
95-47-6	o-Xylene	1,000,000	410[d]	410,000[b]	410[d]	190	190	*
106-42-3	p-Xylene	1,000,000	460[d]	410,000[b]	460[d]	200	200	*
1330-20-7	Xylenes (total)	1,000,000[b]	320[d]	410,000[b]	320[d]	150	150	*
	Ionizable Organics							
65-85-0	Benzoic Acid	1,000,000[b]	-----[c]	820,000[b]	-----[c]	400[b,i]	400[i]	*
95-57-8	2-Chlorophenol	10,000[b]	53,000[d]	10,000[b]	53,000[d]	4[b,i]	20[i]	*
120-83-2	2,4-Dichlorophenol	6,100[b]	-----[c]	610[b]	-----[c]	1[b,i]	1[i]	*
51-28-5	2,4-Dinitrophenol	4,100[b]	-----[c]	410[b]	-----[c]	0.2[b,f,i]	0.2[i]	3.3
88-85-7	Dinoseb[o]	2,000[b]	-----[c]	200[b]	-----[c]	0.34[b,i]	3.4[i]	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	Class II (mg/kg)	ADL (mg/kg)
87-86-5	Pentachlorophenol	24[e,j]	-----[c]	520[e,j]	-----[c]	0.03[f,i]	0.14[i]	*
93-72-1	2,4,5-TP (Silvex)	16,000[b]	-----[c]	1,600[b]	-----[c]	11[i]	55[i]	*
95-95-4	2,4,5-Trichlorophenol	200,000[b]	-----[c]	200,000[b]	-----[c]	270[b,i]	1,400[i]	*
88-06-2	2,4,6- Trichlorophenol	520[e]	390[e]	11,000[e]	540[e]	0.2[e,f,i]	0.77[i]	0.66

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
	Inorganics							
7440-36-0	Antimony	820[b]	-----[c]	82[b]	-----[c]	0.006[m]	0.024[m]	*
7440-38-2	Arsenic[l,n]	[1]	1,200[e]	61[b]	25,000[e]	0.05[m]	0.2[m]	*
7440-39-3	Barium	140,000[b]	910,000[b]	14,000[b]	870,000[b]	2.0[m]	2.0[m]	*
7440-41-7	Beryllium	4,100[b]	2,100[e]	410[b]	44,000[e]	0.004[m]	0.5[m]	*
7440-42-8	Boron	180,000[b]	1,000,000	18,000[b]	1,000,000	2.0[m]	2.0[m]	*
7440-43-9	Cadmium[l,n]	2,000[b,r]	2,800[e]	200[b,r]	59,000[e]	0.005[m]	0.05[m]	*
16887-00-6	Chloride	-------[c]	-----[c]	-----[c]	-----[c]	200[m]	200[m]	*
7440-47-3	Chromium, total	6,100[b]	420[e]	4,100[b]	690[b]	0.1[m]	1.0[m]	*
16065-83-1	Chromium, ion, trivalent	1,000,000[b]	-----[c]	310,000[b]	-----[c]	-----[g]	-----[g]	*
18540-29-9	Chromium, ion, hexavalent	6,100[b]	420[e]	4,100[b]	690[b]	-----	-----	*

CAS No.	Chemical Name	Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
		Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
7440-48-4	Cobalt	120,000[b]	-----[c]	12,000[b]	-----[c]	1.0[m]	1.0[m]	*
7440-50-8	Copper[n]	82,000[b]	-----[c]	8,200[b]	-----[c]	0.65[m]	0.65[m]	*
57-12-5	Cyanide (amenable)	41,000[b]	-----[c]	4,100[b]	-----[c]	0.2[q,m]	0.6[q,m]	*
7782-41-4	Fluoride	120,000[b]	-----[c]	12,000[b]	-----[c]	4.0[m]	4.0[m]	*
15438-31-0	Iron	-----[c]	-----[c]	-----[c]	-----[c]	5.0[m]	5.0[m]	*
7439-92-1	Lead	400[k]	-----[c]	400[k]	-----[c]	0.0075[m]	0.1[m]	*
7439-96-5	Manganese	96,000[b]	91,000[b]	9,600[b]	8,700[b]	0.15[m]	10.0[m]	*
7439-97-6	Mercury[l,n,s]	610[b]	540,000[b]	61[b]	52,000[b]	0.002[m]	0.01[m]	*
7440-02-0	Nickel[l]	41,000[b]	21,000[e]	4,100[b]	440,000[e]	0.1[m]	2.0[m]	*
14797-55-8	Nitrate as N[p]	1,000,000[b]	-----[c]	330,000[b]	-----[c]	10.0[q]	100[q]	*
7782-49-2	Selenium[l,n]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.05[m]	0.05[m]	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	ADL (mg/kg)
7440-22-4	Silver	10,000[b]	-----[c]	1,000[b]	-----[c]	0.05[m]	-----	*
14808-79-8	Sulfate	-----[c]	-----[c]	-----[c]	-----[c]	400[m]	400[m]	*
7440-28-0	Thallium	160[b,u]	-----[c]	160[b,u]	-----[c]	0.002[m]	0.02[m]	*
7440-62-2	Vanadium	14,000[b]	-----[c]	1,400[b]	-----[c]	0.049[m]	0.1[m]	*
7440-66-6	Zinc[l]	610,000[b]	-----[c]	61,000[b]	-----[c]	5.0[m]	10[m]	*

"*" indicates that the ADL is less than or equal to the specified remediation objective.

NA means Not Available; no PQL or EQL available in USEPA analytical methods.

Chemical Name and Soil Remediation Objective Notations (2nd, 5th thru 8th Columns)

[a] Soil remediation objectives based on human health criteria only.

[b] Calculated values correspond to a target hazard quotient of 1.

[c] No toxicity criteria available for this route of exposure.

[d] Soil saturation concentration ($C_{[sat]}$) = the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.

[e] Calculated values correspond to a cancer risk level of 1 in 1,000,000.

[f] Level is at or below Contract Laboratory Program required quantitation limit for Regular Analytical Services (RAS).

[g] Chemical-specific properties are such that this route is not of concern at any soil contaminant concentration.

[h] 40 CFR 761 contains applicability requirements and methodologies for the development of PCB remediation objectives. Requests for approval of a Tier 3 evaluation must address the applicability of 40 CFR 761.

[i] Soil remediation objective for pH of 6.8. If soil pH is other than 6.8, refer to Appendix B, Tables C and D in this Part.

[j] Ingestion soil remediation objective adjusted by a factor of 0.5 to account for dermal route.

[k] A preliminary remediation goal of 400 mg/kg has been set for lead based on *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive #9355.4-12.

[l] Potential for soil-plant-human exposure.

[m] The person conducting the remediation has the option to use: (1) TCLP or SPLP test results to compare with the remediation objectives listed in this Table; or (2) the total amount of contaminant in the soil sample results to compare with pH specific remediation objectives listed in Appendix B, Table C or D of this Part. (See Section 742.510.) If the person conducting the remediation wishes to calculate soil remediation objectives based on background concentrations, this should be done in accordance with Subpart D of this Part.

[n] The Agency reserves the right to evaluate the potential for remaining contaminant concentrations to pose significant threats to crops, livestock, or wildlife.

[o] For agrichemical facilities, remediation objectives for surficial soils which are based on field application rates may be more appropriate for currently registered pesticides. Consult the Agency for further information.

[p] For agrichemical facilities, soil remediation objectives based on site-specific background concentrations of Nitrate as N may be more appropriate. Such determinations shall be conducted in accordance with the procedures set forth in Subparts D and I of this Part.

[q] The TCLP extraction must be done using water at a pH of 7.0.

[r] Value based on dietary Reference Dose.

[s] Value for Ingestion based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7); value for Inhalation based on Reference Concentration for elemental Mercury (CAS No. 7439-97-6).

[t] For the ingestion route for arsenic for industrial/commercial, see 742.Appendix A, Table G.

[u] Value based on Reference Dose for Thallium sulfate (CAS No. 7446-18-6).

[v] Calculated values correspond to soil concentrations that should not result in air concentrations that exceed criteria for workplace air.

(Source: Amended at 25 Ill. Reg. 10374, effective August 15, 2001)

Section 742.APPENDIX B: Tier 1 Tables and Illustrations

Section 742.Table C: pH Specific Soil Remediation Objectives for Inorganics and Ionizing Organics for the Soil Component of the Groundwater Ingestion Route (Class I Groundwater)

Chemical (totals) (mg/kg)	pH 4.5 to 4.74	pH 4.75 to 5.24	pH 5.25 to 5.74	pH 5.75 to 6.24	pH 6.25 to 6.64	pH 6.65 to 6.89	pH 6.9 to 7.24	pH 7.25 to 7.74	pH 7.75 to 8.24	pH 8.25 to 8.74	pH 8.75 to 9.0
Inorganics											
Antimony	5	5	5	5	5	5	5	5	5	5	5
Arsenic	25	26	27	28	29	29	29	30	31	32	33
Barium	260	490	850	1,200	1,500	1,600	1,700	1,800	2,100	[a]	[a]
Beryllium	1.1	2.1	3.4	6.6	22	63	140	1,000	8,000	[a]	[a]
Cadmium	1.0	1.7	2.7	3.7	5.2	7.5	11	59	430	[a]	[a]
Chromium (+6)	70	62	54	46	40	38	36	32	28	24	21
Copper	330	580	2,100	11,000	59,000	130,000	200,000	330,000	330,000	[a]	[a]
Cyanide	40	40	40	40	40	40	40	40	40	40	40
Mercury	0.01	0.01	0.03	0.15	0.89	2.1	3.3	6.4	8.0	[a]	[a]
Nickel	20	36	56	76	100	130	180	700	3,800	[a]	[a]
Selenium	24	17	12	8.8	6.3	5.2	4.5	3.3	2.4	1.8	1.3
Silver	0.24	0.33	0.62	1.5	4.4	8.5	13	39	110	[a]	[a]

440

USDA

United States Department of Agriculture

Research, Education and Economics
Agricultural Research Service

January 8, 2003

Subject: Summary of Soil Sampling Activities – October 2002, USDA/Badger Army Ammunition Plant, Baraboo, Wisconsin

To: Adrianna D. Hewings
Midwest Area Director

From: Steven Pitts
Midwest Area Environmental Protection Specialist

1. The subject document details the results from the last round of testing conducted at the Badger Army Ammunition Plant. The sampling and testing was conducted in regards to concerns relating to contamination at the USDA/Badger site that could have the potential to delay property transfer of the Badger-USDA sites. The conclusion of the testing and analysis as provided in the cover letter of the report is:

> *"All soil analytical results were compared to the most stringent Wis. Administrative Code, CH. NR. 720 Residual Contaminant Level (RCL), scenarios available."*
>
> *"None of the composite soil samples analyzed were above these conservative RCL Scenarios."*

2. If there are any questions or concerns, please feel free to contact me at (309) 681-6644 or via email at spitts@mwa.ars.usda.gov.

Enclosure: Summary of Soil Sampling Activities – October 2002, Tank Farm, Trap Area, and Southwest Quadrant, USDA/Badger Army Ammunition Plant, Baraboo, Wisconsin

cc: P. Barry, FD
T. Fox, OGC
P. Jovanovich, FD SHEMB
N. Martin, RL, DFRC
E. Reilly, FD RPMB
C. Romine, MWA SHEM
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Midwest Area Office, 1815 North University St., Peoria IL 61604
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DEPARTMENT OF HEALTH & HUMAN SERVICES

Program Support Center

CHICAGO AREA OFFICE
536 S. CLARK STREET
ROOM 714
CHICAGO, IL 60605
PHONE # 312-886-0413
FAX # 312-886-0434

December 12, 2002

Caryl Romine
Area Safety & Occupational Health Manager
USDA Agricultural Research Service
1815 N. University
Peoria, IL 61604

Dear Ms. Romine:

Enclosed you will find the final report for the soil sampling work performed at Badger Army Ammunition Plant (BAAP) for the United States Department of Agriculture (USDA) on October 29 and 30, 2002. This work was conducted to determine if certain areas of BAAP that USDA wishes to acquire can be considered reasonably free of lead and hydrocarbon contamination.

Bridge Environmental developed the scope of the project in conjunction with USDA personnel, supervised fieldwork and reviewed analytical results contained in the MWH report of findings. The report was conducted by Mr. Dennis Bridge with report reviewed and approved by Ms. Michelle C. Stemmons, FOH Environmental Health Manager. We appreciate this opportunity to provide consulting services for the U.S. Department of Agriculture. Should questions arise concerning this report or if FOH may be of further services, please do not hesitate to contact me at 312-886-0413.

Sincerely,

Michelle C. Stemmons

Michelle C. Stemmons, MS
Environmental Health Manager
Federal Occupational Health

Enclosure
original
(1) copy

MWH
MONTGOMERY WATSON HARZA

December 6, 2002

Mr. Dennis Bridge, CIH, CSP, PE
Bridge Environmental Management Group
P.O. Box 229
Lake Zurich, Illinois 60047

Re: Summary of Soil Sampling Activities - October 2002
Tank Farm, Trap Area, and Southwest Quadrant
USDA/ Badger Army Ammunition Plant, Baraboo, Wisconsin

Dear Mr. Bridge:

This letter summarizes soil sampling activities and analytical results for soil samples collected by MWH Americas, Inc. (MWH) at the Badger Army Ammunition Plant located in Baraboo, Wisconsin on October 29 and 30, 2002. Enclosed Table 1 summarizes analytical results for soil samples collected from the Tank Farm, Trap Area, and Southwest Quadrant (previously referenced as Area 4 in MWH proposal dated September 11, 2002). Soil samples were hand delivered to and analyzed by CT Laboratories in Baraboo, Wisconsin by EPA Method SW846-8270C for SVOCs and by EPA Method 6010B for total lead. A copy of analytical results from CT Labs is also enclosed.

All soil analytical results were compared to the most stringent Wis. Administrative Code, Ch. NR 720 Residual Contaminant Level (RCL) scenarios available. For example, residential classification of land was selected instead of industrial, and a child's exposure rate was considered over an adult's exposure rate for the compounds of concern listed in Table 1. None of the composite soil samples analyzed were above these conservative RCL scenarios.

Table 2 summarizes the GIS coordinates for all sample locations. The coordinates are in the Wisconsin State Plane UTM coordinate system using NAD 27 as the horizontal datum. Some of the initial sample locations coordinates collected on October 29, 2002 were recorded in the NAD 83 version of the Wisconsin State Plane coordinate system. Due to difficulties with the Trimble® GPS receiver on October 30, 2002, resurveying of these sample locations in the field with the GPS unit in desired NAD 27 coordinates was not possible. NAD 83 coordinates were converted to NAD 27 coordinates by MWH using CORPSCON transformation software. Table 2 and Drawings B1 and B2 display coordinates and sample locations in NAD 27 coordinates of the Wisconsin State Plane system. Drawings B1 and B2 were generated from a base map of the BAAP prepared from a November 1994 aerial photograph by Aero-Metric Engineering.

If you have any questions or comments on the information provided in this letter, please call us at (608) 231-4747. Thank you again for the opportunity to provide environmental services to BEMG.

Sincerely,

MWH

John R. Marchewka
Engineer

Michael G. Collentine, P.G.
Principal Hydrogeologist

Enclosures: Table 1 - Summary of Soil Sample Analytical Results (October 2002)
Table 2 - Summary of Soil Sample Coordinates (October 2002)
Drawing B1 - Basewide Site Features Map
Drawing B2 - USDA Soil Sample Locations - October 2002
Soil Sampling Analytical Report - November 19, 2002

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TABLES

TABLE 1

Summary of Soil Sample Analytical Results - October 2002
Tank Farm, Trap Area, and Southwest Quadrant
Badger Army Ammunition Plant
Baraboo, WI.

		Compound (mg/kg)			
Sample Location	Date Sampled	Total lead	Bis(2-ethylexy)phthalate[1]	Di-n-butylphthalate	Ethyl acetate
TF-1-6-12	10/29/2002	NA		<0.17	<0.083
TF-1-24-36	10/29/2002	NA		<0.16	<0.079
TF-2-6-12	10/29/2002	NA		<0.16	<0.079
TF-2-24-36	10/29/2002	NA		0.19	<0.081
TF-3-6-12	10/29/2002	NA	0.70	1.2	<0.081
TF-3-24-36	10/29/2002	NA	3.6	0.24	<0.077
TF-4-6-12	10/29/2002	NA	1.3	4.9	<0.087
TF-4-24-36	10/29/2002	NA	1.6	0.23	<0.078
Trap 1[3]	10/29/2002	25.9	NA	NA	NA
Trap 2	10/30/2002	12.7	NA	NA	NA
Trap 3	10/30/2002	13	NA	NA	NA
Trap 4	10/30/2002	12.9	NA	NA	NA
Trap 5	10/30/2002	13.2	NA	NA	NA
Trap 6	10/30/2002	14.2	NA	NA	NA
Trap 7	10/30/2002	11.5	NA	NA	NA
SWQ1[3]	10/29/2002	12.5	NA	NA	NA
SWQ2	10/29/2002	11.9	NA	NA	NA
SWQ3	10/29/2002	13.4	NA	NA	NA
SWQ4	10/29/2002	12.8	NA	NA	NA
SWQ5	10/29/2002	16.1	NA	NA	NA
SWQ6	10/29/2002	16.2	NA	NA	NA
NR 720 RCL[2]		**50**	**4.6**	**16,000**	**ND**

Notes:

ND - No Generic RCL calculated for this coumpound

NA - Not Analyzed

The "6-12" and "24-36" nomenclature attached behind Tank Farm sample locations TF-1 through TF-4 represent the depth in inches below ground surface at which the soil sample was collected.

Footnotes:

(1) Di-n-butylphthalate, ethyl acetate and total lead were requested as target analytes. When detected, bis(2-ethylhexyl)phthalate concentrations were reported.

(2) The most stringent RCL attainable is reported on this table. The generic NR 720 RCL for lead is listed. Site specific direct contact RCLs for bis(2-ethylhexl)phthalate (residential child/adult cancer value) and di-n-butylphthalate and ethyl acetate (both residential child noncancer value) were calculated according to NR 720

(3) Trap and SWQ samples were composite samples from locations shown on Drawing B2, USDA soil sample locations - October 2002.

TABLE 2

Summary of Soil Sample Coordinates - October 2002
Tank Farm, Trap Area, and Southwest Quadrant
Badger Army Ammunition Plant
Baraboo, WI.

	Wisconsin State Plane Coordinates (NAD 27)	
Sample Location	Northing[(1)]	Easting[(1)]
TF-1	493870	2066078
TF-2	493873	2066052
TF-3	493852	2066058
TF-4	493849	2066069
Trap 1a	492756	2065299
Trap 1b	492687	2065359
Trap 1c	492868	2065281
Trap 2a	493935	2064821
Trap 2b	493944	2064669
Trap 2c	493925	2064965
Trap 3a	493736	2065477
Trap 3b	493731	2065344
Trap 3c	493717	2065607
Trap 4a	493706	2065813
Trap 4b	493715	2065680
Trap 4c	493705	2065947
Trap 5a	493664	2066458
Trap 5b	493687	2066326
Trap 5c	493656	2066594
Trap 6a	492915	2066707
Trap 6b	492788	2066676
Trap 6c	493031	2066734
Trap 7a	493172	2066762
Trap 7b	493305	2066779
Trap 7c	493042	2066722
SWQ-1A	487109	2066394
SWQ-1B	487070	2066278
SWQ-1C	487142	2066520
SWQ-2A	489354	2066781
SWQ-2B	489204	2066780
SWQ-2C	489497	2066790
SWQ-3A	485995	2065557
SWQ-3B	485847	2065526
SWQ-3C	486137	2065585
SWQ-4A	490527	2065342
SWQ-4B	490595	2065445
SWQ-4C	490448	2065225
SWQ-5A	484915	2064330
SWQ-5B	484916	2064392
SWQ-5C	484929	2064273
SWQ-6A	489720	2064351
SWQ-6B	489775	2064407
SWQ-6C	489687	2064299

Footnotes:

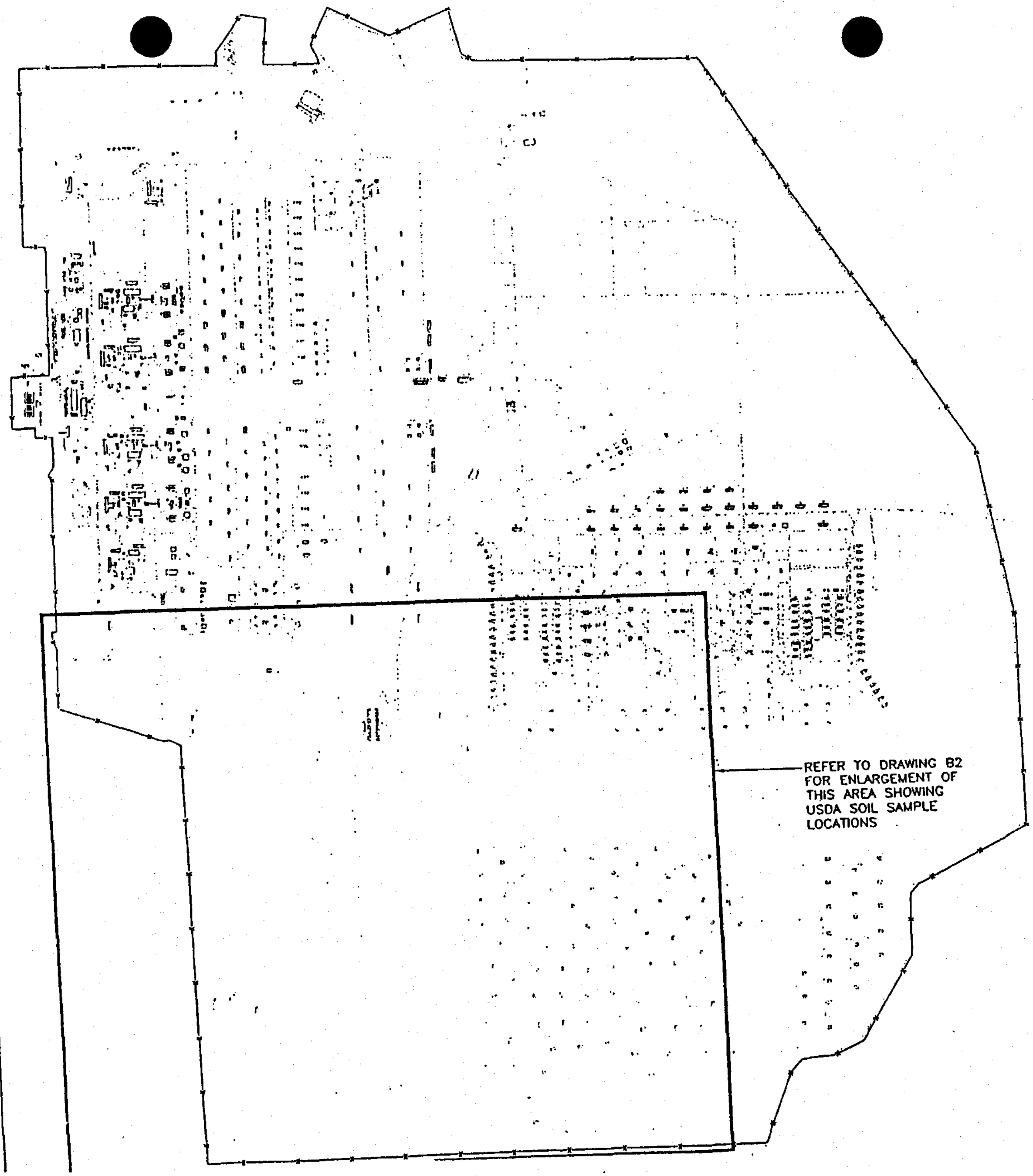
(1) SWQ coordinates and Tank Farm (TF) coordinates converted from NAD 83 to NAD 27 using CORPSCON software.

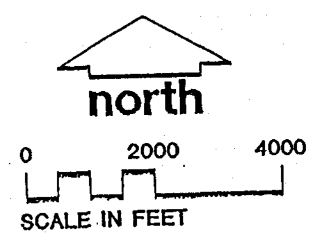
DRAWINGS

LEGEND

——x—— PERIMETER FENCE

NOTE
BASE MAP DEVELOPED FROM TOPOGRAPHIC MAPPING DATA FOR BADGER ARMY AMMUNITION PLANT PREPARED BY AERO-METRIC ENGINEERING, INC. DATE OF PHOTOGRAPHY: 11-10-94. WISCONSIN RIVER LOCATION DEVELOPED FROM NAPP AERIAL PHOTOGRAPH NUMBER 5437-34, DATED 5-7-92.





Developed By JRM	Drawn By DLF	
Approved By	Date	12-5-02
Reference 8002641.00500101-B1		
Revisions		

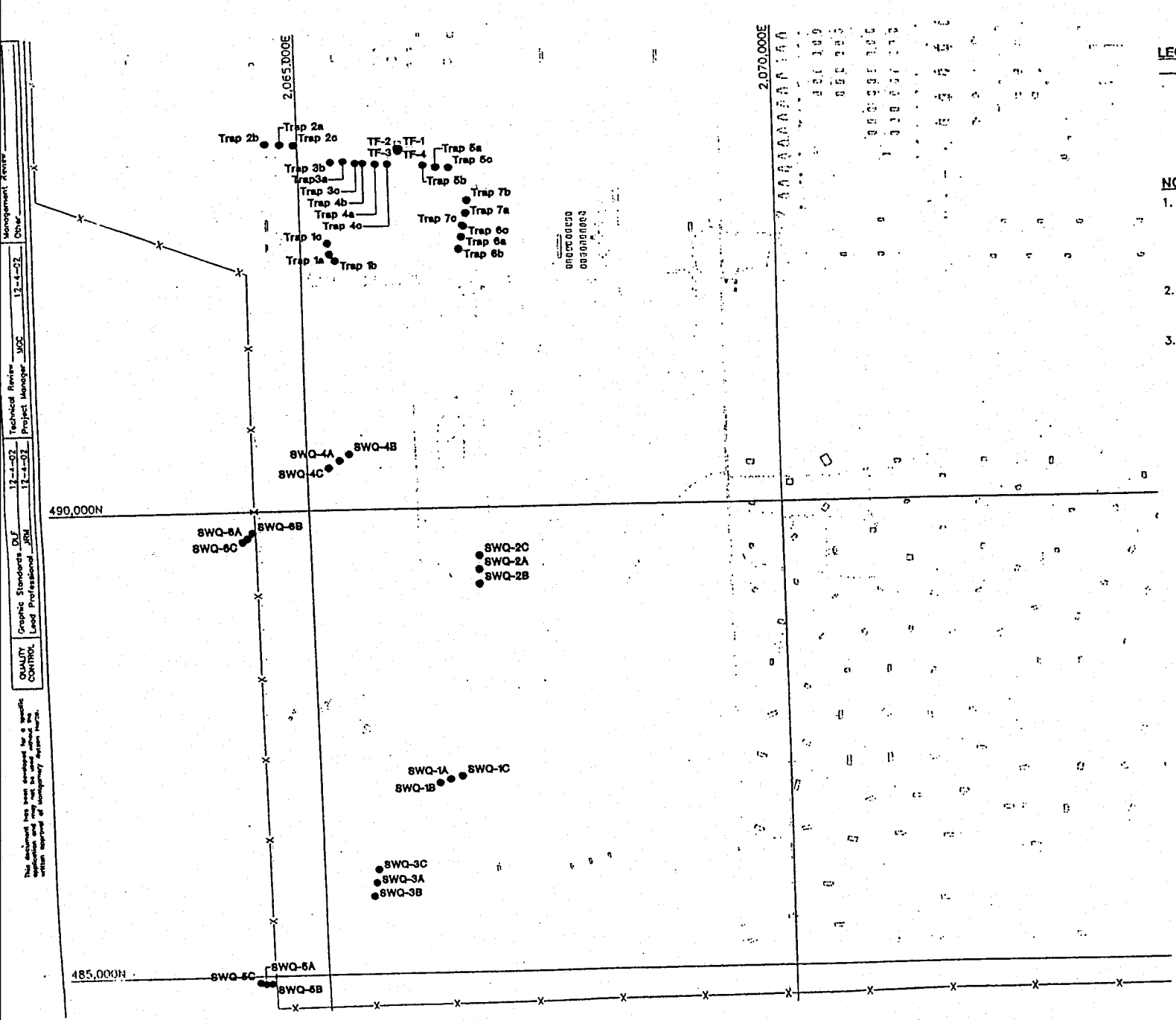
BASEWIDE SITE FEATURES MAP
BADGER ARMY AMMUNITION PLANT
BARABOO, WISCONSIN

Drawing Number
2082537
01160101 B1

MWH

QUALITY CONTROL	Graphic Standards DLF	12-4-02	Technical Review	
	Lead Professional JRM	12-4-02	Project Manager MGC	12-4-02	Other

This document has been developed for a specific application and may not be used without the written approval of Montgomery Watson Harza.



LEGEND

——X—— PERIMETER FENCE

● TF-1 SOIL SAMPLE LOCATION AND NUMBER

NOTE

1. BASE MAP DEVELOPED FROM TOPOGRAPHIC MAPPING DATA FOR BADGER ARMY AMMUNITION PLANT PREPARED BY AERO-METRIC ENGINEERING, INC. DATE OF PHOTOGRAPHY: 11-10-94.
2. COORDINATES ARE IN WISCONSIN STATE PLANE (NAD 27) COORDINATE SYSTEM.
3. PRECOMPOSITE SOIL SAMPLE LOCATION SHOWN. SAMPLES WITH SAME NUMBER DESIGNATION WERE COMPOSITED INTO ONE SAMPLE FOR LABORATORY ANALYSIS. FOR EXAMPLE, SAMPLES SWQ-2A, SWQ-2B AND SWQ-2C WERE COMPOSITED INTO SAMPLE SWQ-2 FOR LABORATORY ANALYSIS.

north

0 1000 2000

SCALE IN FEET

QUALITY CONTROL
Graphic Standards DLF 12-4-02
Lead Professional JRM 12-4-02
Technical Review
Project Manager JCC 12-4-02
Management Review
Other

This document has been developed for a specific application and may not be used on other projects without approval of competent design parties.

Developed By JRM
Drawn By DLF
Approved By
Date 12-5-02
Reference
Revisions

USDA SOIL SAMPLE LOCATIONS - OCTOBER 2002

BADGER ARMY AMMUNITION PLANT
BARABOO, WISCONSIN

Drawing Number
2082537
01160101 B

MWH

SOIL SAMPLING ANALYTICAL REPORT - NOVEMBER 19, 2002

CT Laboratories
1230 Lange Court
Baraboo, WI 53913-3109
Phone: (800) 228-3012
Fax: (608) 356-2766
www.ctlaboratories.com

ANALYTICAL REPORT

ONTGOMERY WATSON HARZA
ARK PAULI
NE SCIENCE COURT
ADISON. WI 53711

Project Name: BRIDGE/BADGER
Contract #: 1747
Project #: 2082537.01160101
Folder #: 30348
Purchase Order #:
Arrival Temperature: See COC
Report Date: 11/19/2002
Date Received: 10/30/2002
Reprint Date:

CTI LAB#: 160384 Sample Description: TF-3-24-36 Sampled: 10/29/2002 1445

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Organic Results										
Solids, Percent	88.2	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Organic Results										
Bis(2-ethylhexyl)phthalate	3.6	mg/kg	0.12	0.39	1	M,Y	11/12/200	11/14/2002	EAM	EPA 8270
Di-n-butylphthalate	0.24	mg/kg	0.16 *	0.52	1		11/12/200	11/14/2002	EAM	EPA 8270
Ethyl acetate	<0.077	mg/kg	0.077	0.26	1		11/5/2002	11/5/2002	RLD	EPA 8260

CTI LAB#: 160385 Sample Description: TF-4-6-12 Sampled: 10/29/2002 1505

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	78.2	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Organic Results										
Bis(2-ethylhexyl)phthalate	1.3	mg/kg	0.14	0.43	1	M,Y	11/12/200	11/14/2002	EAM	EPA 8270
Di-n-butylphthalate	4.9	mg/kg	0.18	0.59	1		11/12/200	11/14/2002	EAM	EPA 8270
Ethyl acetate	<0.087	mg/kg	0.087	0.29	1		11/5/2002	11/5/2002	RLD	EPA 8260

CTI LAB#: 160386 Sample Description: TF-4-24-36 Sampled: 10/29/2002 1525

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	86.7	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Organic Results										
Bis(2-ethylhexyl)phthalate	1.6	mg/kg	0.13	0.39	1	M,Y	11/12/200	11/14/2002	EAM	EPA 8270
Di-n-butylphthalate	0.23	mg/kg	0.16 *	0.53	1		11/12/200	11/14/2002	EAM	EPA 8270

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 160386 Sample Description: TF-4-24-36 Sampled: 10/29/2002 1525

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Ethyl acetate	<0.078	mg/kg	0.078	0.27	1		11/5/2002	11/5/2002	RLD	EPA 8260

CTI LAB#: 160387 Sample Description: TRAP 1 Sampled: 10/29/2002 1620

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	81.8	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	25.9	mg/kg	0.17	0.58	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160388 Sample Description: TRAP 2 Sampled: 10/30/2002 0815

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	79.3	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	12.7	mg/kg	0.17	0.56	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160389 Sample Description: TRAP 3 Sampled: 10/30/2002 0855

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	83.8	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	13.0	mg/kg	0.17	0.55	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160390 Sample Description: TRAP 4 Sampled: 10/30/2002 0915

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	81.6	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	12.9	mg/kg	0.17	0.58	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160391 Sample Description: TRAP 5 Sampled: 10/30/2002 0950

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	80.8	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	13.2	mg/kg	0.18	0.59	1		10/31/200	11/4/2002	NAH	EPA 6010B

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 160392 Sample Description: TRAP 6 Sampled: 10/30/2002 1020

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	77.7	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	14.2	mg/kg	0.18	0.61	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160393 Sample Description: TRAP 7 Sampled: 10/30/2002 1045

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	80.5	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	11.5	mg/kg	0.18	0.59	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160394 Sample Description: SWQ 1 Sampled: 10/29/2002 0900

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	81.1	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	12.5	mg/kg	0.18	0.60	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160395 Sample Description: SWQ 2 Sampled: 10/29/2002 0933

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	80.0	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	11.9	mg/kg	0.17	0.56	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160396 Sample Description: SWQ 3 Sampled: 10/29/2002 1020

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	79.8	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	13.4	mg/kg	0.18	0.59	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160397 Sample Description: SWQ 4 Sampled: 10/29/2002 1108

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	79.8	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 160397 Sample Description: SWQ 4 Sampled: 10/29/2002 1108

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Lead	12.8	mg/kg	0.17	0.56	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160398 Sample Description: SWQ 5 Sampled: 10/29/2002 1238

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	80.0	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
Lead	16.1	mg/kg	0.17	0.58	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160399 Sample Description: SWQ 6 Sampled: 10/29/2002 1255

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	77.9	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Metals Results										
	16.2	mg/kg	0.17	0.57	1		10/31/200	11/4/2002	NAH	EPA 6010B

CTI LAB#: 160400 Sample Description: TF-1- 6-12 Sampled: 10/29/2002 1320

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	82.3	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Organic Results										
Di-n-butylphthalate	<0.17	mg/kg	0.17	0.56	1		11/12/200	11/14/2002	EAM	EPA 8270
Ethyl acetate	<0.083	mg/kg	0.083	0.28	1		11/5/2002	11/5/2002	RLD	EPA 8260

CTI LAB#: 160401 Sample Description: TF-1-24-36 Sampled: 10/29/2002 1340

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	85.8	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Organic Results										
Di-n-butylphthalate	<0.16	mg/kg	0.16	0.53	1		11/12/200	11/14/2002	EAM	EPA 8270
Ethyl acetate	<0.079	mg/kg	0.079	0.27	1		11/5/2002	11/5/2002	RLD	EPA 8260

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

CTI LAB#: 160402 Sample Description: TF-2-6-12 Sampled: 10/29/2002 1355

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	86.1	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Organic Results										
Di-n-butylphthalate	<0.16	mg/kg	0.16	0.53	1		11/12/200	11/14/2002	EAM	EPA 8270
Ethyl acetate	<0.079	mg/kg	0.079	0.27	1		11/5/2002	11/5/2002	RLD	EPA 8260

CTI LAB#: 160403 Sample Description: TF-2-24-36 Sampled: 10/29/2002 1410

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	84.1	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Organic Results										
Di-n-butylphthalate	0.19	mg/kg	0.17 *	0.55	1		11/12/200	11/14/2002	EAM	EPA 8270
acetate	<0.081	mg/kg	0.081	0.27	1		11/5/2002	11/5/2002	RLD	EPA 8260

CTI LAB#: 160404 Sample Description: TF-3-6-12 Sampled: 10/29/2002 1425

Analyte	Result	Units	LOD	LOQ	Dilution	Qualifier	Prep Date	Analysis Date	Analyst	Method
Inorganic Results										
Solids, Percent	84.7	%	N/A	N/A	1			10/30/2002	GCE	EPA 5030A
Organic Results										
Bis(2-ethylhexyl)phthalate	0.70	mg/kg	0.13	0.40	1	M,Y	11/12/200	11/14/2002	EAM	EPA 8270
Di-n-butylphthalate	1.2	mg/kg	0.17	0.54	1		11/12/200	11/14/2002	EAM	EPA 8270
Ethyl acetate	<0.081	mg/kg	0.081	0.27	1		11/5/2002	11/5/2002	RLD	EPA 8260

Notes: * Indicates Value in between LOD and LOQ.

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without written approval of this laboratory. The Chain of Custody is attached.

Submitted by: PML

Record Reviewer

QC Qualifiers

Code	Description
A	Analyte averaged calibration criteria within acceptable limits.
B	Analyte detected in associated Method Blank.
C	Toxicity present in BOD sample.
D	Diluted Out.
E	Safe, No Total Coliform detected.
F	Unsafe, Total Coliform detected, no E. Coli detected.
G	Unsafe, Total Coliform detected and E. Coli detected.
H	Holding time exceeded.
J	Estimated value.
L	Significant peaks were detected outside the chromatographic window.
M	Matrix spike and/or Matrix Spike Duplicate recovery outside acceptance limits.
N	Insufficient BOD oxygen depletion.
O	Complete BOD oxygen depletion.
P	Concentration of analyte differs more than 40% between primary and confirmation analysis.
Q	Laboratory Control Sample outside acceptance limits.
R	See Narrative at end of report.
S	Surrogate standard recovery outside acceptance limits due to apparent matrix effects.
T	Sample received with improper preservation or temperature.
V	Raised Quantitation or Reporting Limit due to limited sample amount or dilution for matrix background interference.
W	Sample amount received was below program minimum.
X	Analyte exceeded calibration range.
Y	Replicate/Duplicate precision outside acceptance limits.
Z	Calibration criteria exceeded.

WI DNR Lab Certification Number: 15-7066030
DATCP Certification Number: 105-000289

Solid sample results reported on a Dry Weight Basis

MONTGOMERY WATSON HARZA

CHAIN OF CUSTODY RECORD

SPECIAL INSTRUCTIONS:
- [ ] PECFA
- [ ] WI LUST
- [ ] ACT 307
- [ ] REPORT DRY WT
- [x] OTHER:

TURNAROUND
- [x] ~~2~~ WEEKS (standard)
- [ ] 1 WEEK
- [ ] 3 DAYS
- [ ] 1 DAY

PROJECT NAME: Badger Army Am. Plant
PROJECT #: 20825370116001
CITY: Baraboo
STATE: WI
SAMPLER(S): John Manchester

COLLECTION DATE	COLLECTION TIME	GRAB / COMP	SAMPLE ID	NO. OF CONTAINERS	Total Lead	SVOC	VOC	REMARKS	LAB USE ONLY MATRIX	LAB USE ONLY LAB NO.
10/29/02	0900	Comp	SWQ1	2	✓				160394	~~160395~~
10/29/02	0933	Comp	SWQ2	2	✓				160395	~~160396~~
	1020	Cmp	SWQ3	2	✓				160396	~~160397~~
↓	1108	Cmp	SWQ4	1	✓				160397	~~160398~~
10/29/02	1238	Cmp	SWQ5	1	✓				160398	~~160399~~
	1255	Cmp	SWQ6	1	✓				160399	~~160400~~
	1320	GRB	TF-1-6-12	2		✓	✓	27.6 grams in VOC	160400	~~160401~~
	1340	GRB	TF-1-24-36	2		✓	✓	25.1 grams in VOC	160401	~~160402~~
	1355	GRB	TF-2-6-12	2		✓	✓	26.0 g in VOC	160402	~~160403~~
	1410	GRB	TF-2-24-36	2		✓	✓	26.3 g in VOC	160403	~~160404~~
↓	1425	GRB	TF-3-6-12	2		✓	✓	25.1 g in VOC	160403	

PROJ. MGR.: M. Collentine

SPECIAL INSTRUCTIONS:

TAMPER EVIDENT SEAL INTACT? ___YES ___NO ___NOT PRESENT
SEAL NO.: ___
SAMPLES RECEIVED ON ICE? ___YES X NO TEMP: 5.9 °C
cooler #180

	SIGNATURE	DATE	TIME
RELINQUISHED BY:	John Manchester	10/30/02	1210
RELINQUISHED BY:			
RELINQUISHED BY:			
RELINQUISHED BY			

	SIGNATURE	DATE	TIME
RECEIVED BY:			
RECEIVED BY:			
RECEIVED BY:			
RECEIVED FOR LABORATORY BY:	Kelly Brooks	10/30/02	1555

NAME OF COURIER: ___
AIRBILL NUMBER: ___

C-O-C No. 22973

MONTGOMERY WATSON HARZA

Folder #: 30348

Company: MONTGOMERY WATSON

Project: BRIDGE/BADGER

Logged By: GRB PM: PMI

SPECIAL INSTRUCTIONS:
- [ ] PECFA.
- [ ] WI LUST
- [ ] ACT 307
- [ ] REPORT DRY WT
- [x] OTHER:

TURNAROUND
- [x] 2 WEEKS (standard)
- [ ] 1 WEEK
- [ ] 3 DAYS
- [ ] 1 DAY

PROJECT NAME: Badger Army A. P. PROJECT #: 20822537. 0116

CITY: Baraboo STATE: WI.

SAMPLER(S): John Manchester

COLLECTION DATE	COLLECTION TIME	GRAB / COMP	SAMPLE ID	NO. OF CONTAINERS	VOC	SVOC	Pb, Lead	REMARKS	LAB USE ONLY MATRIX	LAB USE ONLY LAB NO.
10/29/02	1445	GRB	TF-3-24-36	4	2	2		odor in soil		160384
10/29/02	1505	GRB	TF-4-6-12	2	1	1		odor in soil		160385
	1525	GRB	TF-4-24-36	4	2	2				160386
	1620	GMP	TRAP 1	1			1			160387
10/30/02	0815	CMP	TRAP 2	1			1			160388
	0855	CMP	TRAP 3	1			1			160389
	0915	CMP	TRAP 4	1			1			160390
	0950	CMP	TRAP 5	1			1			160391
	1020	CMP	TRAP 6	1			1			160392
	1045	CMP	TRAP 7	1			1			160393
										~~160394~~

PROJ. MGR.: M. Collentine

SPECIAL INSTRUCTIONS:

TAMPER EVIDENT SEAL INTACT? ___YES ___NO ___NOT PRESENT

SEAL NO.: _____

SAMPLES RECEIVED ON ICE? ___YES ___NO TEMP: _____ °C

	SIGNATURE	DATE	TIME		SIGNATURE	DATE	TIME
RELINQUISHED BY:	John Manchester	10/30/02	1218	RECEIVED BY:			
RELINQUISHED BY				RECEIVED BY:			
RELINQUISHED BY:				RECEIVED BY:			
RELINQUISHED BY				RECEIVED FOR LABORATORY BY:	Hugh Masters	10/30/02	1557

NAME OF COURIER: _____

AIRBILL NUMBER: _____

C-O-C No. 22971

End