FOCUSED FORMER SMELTER ASSESSMENT REPORT
ALTOONA, KANSAS
KDHE ID: C310371601

Prepared For:

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1.0 EXECUTIVE SUMMARY

Maxim Technologies, Inc. is submitting this Focused Former Smelter Assessment (FFSA) Report for the former smelter located in Altoona, Wilson County, Kansas. The Altoona FFSA is part of the Kansas Department of Health and Environment (KDHE) State Water Plan's "Group A" designation for former smelter properties in the cities of Altoona, Chanute, Fredonia, and Neodesha, Kansas. The FFSA completed for each former smelter location will be described in separate reports.

The primary objective of the FFSA was to initially assess the potential negative effects to human health and the environment of metal contaminants (lead, zinc, arsenic, and cadmium) originating from former smelter operations. The FFSA detailed two investigative efforts. The first task was to locate and gather available information regarding location, historical ownership, and operations of the smelter operation. Using this information, a field investigation was performed to assess the effects of the former operations for surface and subsurface soil, sediment, surface water, and groundwater. The field investigation focused not only at the location of the former operations, but also on surrounding properties up to a one-half mile radius.

Sanborn Insurance Maps from 1906 indicate a smelter property located in the northwestern portion of Altoona, with the Missouri Pacific Railway bisecting the eastern half of the property. An initial records search conducted by Maxim at the Wilson County Register of Deeds indicated that a smelter was operated at this location from approximately 1904 through 1917. Available records indicate that the smelter was initially operated by the Cockerill Zinc Company and subsequently sold to United States Smelting Company after the Cockerill Zinc Company failed in 1910. The plant closed in 1917 and was reportedly dismantled in 1918.

A Certificate of Title Search indicated that the Cockerill Zinc Company owned the property from 1904 to 1910; Kansas Zinc Company from 1910 to 1915; George E. Nicholson for one day in 1915; the United States Smelting Company from 1915 to 1917; and the United States Smelting, Refining, and Mining Company from 1917 to 1918. From 1918 to the present, ownership has included individuals, husband/wives, and a bank. FFSA records research did not discover any information regarding the Cockerill Zinc Company, Kansas Zinc Company, George E. Nicholson, and the United States Smelting Company. It is therefore currently unknown whether these entities are presently in existence or financially solvent. Extensive litigation information exists regarding the United States Smelting, Refining, and Mining Company and the possibility exists that legally associated components of this company are currently operating. This information is discussed further in Section 2.2.2.

FFSA data indicate that on-site soils and sediment are impacted by arsenic, cadmium, lead, and zinc at levels exceeding residential and non-residential Risk-Based Standards for Kansas (RSK) for soils

and Threshold Effect Levels (TELs) for sediments. Generated data also indicate that the two on-site ponds are impacted with lead at concentrations greater than the Domestic Water Supply Surface Water Quality standards. An on-site drainageway that flows offsite and ultimately into the Verdigris River is impacted with cadmium, lead, and zinc at concentrations greater than the Domestic Water Supply Surface Water Quality standards and Maximum Contaminant Levels (MCLs). The primary contaminants in soils and surface water are lead and zinc and contaminants in waste piles are arsenic, cadmium, lead, and zinc. Lateral delineation appears to be complete on the smelter property as sample locations indicated primarily lead and/or zinc impact along the northern, western, and southern borders. Due to the presence of waste material and subsurface structural debris, penetrating the subsurface beyond 2 ft bgs was not entirely successful. At four of the five subsurface sample locations, concentrations of lead and/or zinc exceeded residential RSK standards at the furthest extent of vertical delineation. Therefore, vertical delineation is not complete.

Evidence of waste piles and former smelter structures were evident throughout the majority of the site. Smelter waste is mixed with soils in the entire section west of the railroad tracks, with structural debris evident at three ft bgs. Native soils appear to exist east of the railroad tracks. The sample collected from the northeast corner of the smelter property did not indicate elevated metal concentrations.

Important investigation findings indicate that a drainage creek extends south from the northernmost on-site pond and is joined by a drainageway that flows off of the waste piles to a pond located south of the site (approximately 0.25 miles south of the smelter southern border). The drainageway continues from this off-site pond to the south until it ultimately empties into the Verdigris River. The Verdigris River is a designated "Special Aquatic Life Use Waters" during its route through Wilson County. All reaches of the Verdigris River are considered critical habitat for five species of endangered or threatened freshwater mussels.

The sediment samples collected from four points along the southerly flowing drainageway that flows from the site to the Verdigris River, as well as into the capture pond located between the Verdigris River and the site, indicated sediment concentrations of arsenic, cadmium, lead, and zinc exceeding TELs. The surface water samples collected from the drainageway at the same four points between the site and Verdigris River did not indicate metal concentrations exceeding Surface Water Quality standards or MCLs. The surface water and sediment samples collected from the off-site pond located northwest of the site did not indicate metal concentrations exceeding TELs, Surface Water Quality standards, or MCLs. Metals were not detected above the Surface Water Quality standards or MCLs in the off-site surface water sample collected from the pond located south of the site; however, arsenic, cadmium, lead, and zinc were detected above the TELs in the off-site sediment sample collected from the same point.

Off-site residential properties to the north and south indicated soil lead and arsenic concentrations exceeding residential RSK standards. A soil sample collected in the right-of-way adjacent to a daycare, located east of the site at 209 E. 17th Street, did not indicated metal concentrations above residential RSK.

X-ray fluorescence (XRF) detection limits were elevated for arsenic, cadmium, chromium, mercury, and silver at the majority of sample locations. However, the elevated detection limits to not appear to have significantly reduced overall data quality or data usability.

In general, soil, sediment, and surface water are impacted by former smelting operations both on-site and off-site to the north and south, with off-site soil delineation incomplete in these directions (vertical delineation is also not complete based on laboratory results). Sample locations to the east, west, and northwest of the smelter property did not indicate metal concentrations exceeding residential RSK standards, TELs, Surface Water Quality standards, or MCLs. Due to the high heavy metals concentrations identified and the residential nature of impacted areas, exposure risk associated with impacted media is significant. Further, because lead does not dissipate, biodegrade, or decay, the lead deposited into dust and soil becomes a long-term source of lead exposure with children and adjacent ecosystems as likely contaminant receptors.

2.0 INTRODUCTION

2.1 Investigation Objectives

Complete details of the investigation objectives are discussed in Maxim's *Work Plan-Focused Former Smelter Assessments* (Workplan), dated February 2002. Further amendments to the Workplan are dated May 10 and June 3, 2002.

2.1.1 Data Needs and Work Plan Rationale

Workplan data needs and proposed actions to investigate PRPs, assess the potential negative effects to human health and the environment, and to assess the contaminants of concern in the surface/subsurface soils and groundwater included the following:

Potentially Responsible Party/Site History Search

- The former Altoona smelter was investigated at the Wilson County Courthouse. This research served two purposes, including 1) determining ownership immediately prior to the first recorded smelter-related activities/ownership, and 2) determining the property boundaries;

- Existing Sanborn Fire Insurance Maps were examined to substantiate the existence of the smelter in that the name and the approximate boundaries of the smelter were displayed, as well as listings of surrounding properties in relationship to the smelter locations;

- Aerial photographs were utilized to substantiate the existence of each respective smelter. Although the use of aerial photographs is limiting due to the beginning of the century timeframe in which the smelters were active, they still are useful in that stressed vegetation, wastepiles, and other demarcations provide evidence of operational boundaries;

- A Certificate of Title was completed by the Fink Abstract & Title Co., located in Fredonia, Kansas for the legal description assigned to the Altoona smelter;

- Wilson County governmental offices were utilized to collect plat maps and interview county employees concerning anecdotal evidence relative to the former smelter site;

- An Internet search was conducted regarding Altoona history, potential PRP information, and general information concerning abandoned smelters; and

- Conduct a historical records search at local libraries; interview knowledgeable residents.

Potential Receptor Identification

The first phase of the field investigation included obtaining information necessary prior to initiating site-sampling activities. The following potential receptors were investigated:

- Residential areas adjacent and within a one-half mile radius of the smelter boundaries, including homes and housing, schools and day cares, and public recreational areas including parks, churches, and other public common use areas;

- Each adjacent residence was investigated to determine the number of residents and children within each household;

- The presence of surface water (ponds, lakes, intermittent streams, rivers) and bodies of water utilized for recreational uses were noted within a one-half mile radius of the smelter boundaries;

- Use of private or public groundwater wells within a one-mile radius of the smelter boundaries;

- The presence of any sensitive aquatic, terrestrial, or wetland ecosystems within one-half mile;

- The presence and locations of surface water intakes; and

- County governmental offices were utilized to determine the location of parks, recreational sites (surface water and land uses), and trails.

The one-half mile receptor survey was conducted by foot and automobile. The above listed items are also applicable to any conditions pertaining to the smelter property. Each smelter property was transected and explored by foot (see Section 4.0: On-Site Findings).

Assessment of Contaminants: Sampling Approach

Based on a pre-investigation site visit by Maxim, the former smelter boundaries were approximated based on visual inspection of the property, Sanborn and aerial map review, anecdotal information, and deeds of ownership.

Although the sampling approach and procedures do not vary between the smelter properties included in the KDHE State Water Plan's "Group A" sites, general site-specific differences required preparation of an individualized sampling plan for each former smelter property. These factors included, but were not limited to size of the former site, adjoining property use, size of residential areas, and absence, presence, or number of surface water bodies or sensitive ecosystems. The general sampling strategies and field approach for the former smelter properties were discussed at a meeting between the KDHE and Maxim personnel on February 8, 2002.

It should be noted that variations to the individualized sampling plans had the potential to be modified based on both PRP research results and field conditions. Reasons for on-site and off-site sampling location changes could occur because of modification of smelter boundary locations, in-situ x-ray fluorescence (XRF) screening data results, and other unforeseen field conditions and/or information obtained during the PRP research. The XRF field screening data may have justified a relocation of the sampling locations, including the need to focus on a specific area of a property, decrease the off-site sampling locations, or, if warranted, expand the off-site sampling locations. Although modifications may have occurred regarding the XRF screening sample locations, the total number of XRF samples screened and submitted for laboratory analysis were to remain consistent (20%). If field conditions indicated that the number of XRF field screening samples changed from the general proposed amount for the smelter site in question, which would have subsequently modified the number of laboratory confirmatory samples submitted, Maxim was prepared to contact KDHE to discuss the circumstances. The following protocol occurred:

On-site Sampling

- Collection of on-site surface and subsurface soil samples for field screening using XRF technology and eventual laboratory confirmation of at least 20 percent (%) of the samples. Sample locations were determined by reviewing the layout of former smelter operations and visual inspection of the property. In general, the sampling strategy included both biased and non-biased sampling as needed to assess the extent of on-site soil impacts;

- Collection and subsequent laboratory analysis of waste material located on the smelter property;

- Collection of sediment samples from surface water bodies located on-site for XRF field analysis and 20% laboratory confirmation. Sediment sampling occurred as needed to assess on-site sediment impacts; and

- Collection of surface water and ground water samples from surface water bodies and water wells located on site as needed to assess the extent of on-site surface and ground water impacts. All collected water samples were submitted for laboratory analysis.

Off-site Sampling

- Collection of off-site surface and subsurface soil samples for XRF field analysis and laboratory confirmation analysis of at least 20 percent (%) of the samples. Sample locations were collected from adjacent residential areas, public-use lands, and sensitive ecosystems adjacent to the former smelter operations as needed to assess the extent of off-site soil impacts. The area of field sampling was limited to a 0.5-mile radius;

- Collection of sediment samples from surface water bodies located adjacent to, and within a one-half mile radius of, the smelter property for XRF field analysis and 20% laboratory confirmation. Both upstream (background) and downstream sediment samples were collected from creeks, streams, and rivers within the assessment area. Sediment samples were collected from ponds, streams, etc. within the assessment area as needed to assess the extent of off-site impacts; and

- Collection of surface water and ground water samples from surface water bodies and water wells located adjacent to, and within a one-half mile radius of, the smelter property for laboratory analysis. Both upstream (background) and downstream surface water samples were collected from creeks, streams and rivers within the assessment area. Surface water and ground water samples were collected from streams, ponds, wells, etc. as needed to assess the extent of off-site impacts.

Specific soil and water sample collection procedures are detailed in the Workplan. Additionally, Section 3.0 (Investigative Activities) will discuss procedures implemented for field screening and laboratory analytical sampling.

2.2 Smelter History and Background

2.2.1 General Site Location

The City of Altoona is located in the southeast quadrant of Wilson County, Kansas, in southeast Kansas at the intersection of U. S. Highway 75 and Kansas State Highway 47 (Figure 1). The geographic coordinates of Altoona are 37 ° 31′ 30″ N latitude and 95 ° 39′ 44″ W longitude (Reference 1). The general topographic slope in the vicinity of Altoona is to the south, with elevations from north to south ranging from approximately 850 feet above sea level to 820 feet above sea level.

Altoona is a rural community with approximately 485 residents. The town is divided approximately in half by the Missouri Pacific Railroad (Figure 1). The smelter is located northwest and adjacent to the northern city limit of Altoona, and west of the railroad line. The legal address for this property as

identified from the Wilson County Register of Deeds Office is "the NE ¼ of the SW ¼, Section 9, Township 29 South, Range 16 East, Altoona, Wilson County, Kansas. The land use adjacent to Altoona in all four directions is agricultural (Reference 2).

2.2.2 Smelter History/ Certificate of Title Search

Sanborn Insurance Maps from 1906 and 1913 indicate a smelter property encompassing 53 acres located in the northwestern portion of Altoona, with the Missouri Pacific Railway bisecting the eastern half of the property (Figures 2, 3, and 4). An initial records search conducted by Maxim at the Wilson County Register of Deeds indicated that a smelter was operated at this location from approximately 1904 through 1917 and was initially operated by Cockerill Zinc Company and subsequently sold to United States Smelting Company. Information obtained from KDHE (Reference 3) indicated that the Cockerill Zinc Co. failed in 1910, and also indicated that the smelter property was subsequently sold to the United States Smelting Company. The company known as the "Altoona Zinc Smelting Company" was dissolved in 1913 (Reference 3). It should be noted that although Reference 3 indicates the presence of the "Altoona Zinc Smelting Company", review of documents at the Wilson County Register of Deeds did not indicate ownership by this company. Therefore, information pertaining to the existence of this company is unknown. In 1907, the plant had five furnaces with 3,000 retorts (Reference 4). By the plants closing in 1917, the smelter had 4,640 retorts (Reference 5). The plant was reportedly dismantled in 1918 (Reference 5).

The Certificate of Title Search was completed by Fink Abstract & Title Company, located in Fredonia, Kansas (Appendix A: Certificate of Title Documents). Table 1 includes a summary of ownership. Records affecting the following described real estate were examined:

> Commencing at the center of Section Nine (9), Township Twenty-nine (29) South, Range Sixteen (16) East, running thence West 95 rods, thence South 54.21 rods, thence East 95 rods, thence North 54.21 rods to point of beginning.

In summary, the smelter property described above and currently owned by David and Toni Relph was originally deeded in two separate transactions from Mr. A.B. Cockerill to the Cockerill Zinc Company in 1904 and 1908 (Figure 5). The property dimensions encompassing a total of approximately 30.4 acres have remained the same. Although the Sanborn Fire Map indicates the smelter area is 53 acres, a review of the deeds indicates the 30.4 acres are carried through the deed transactions.

The Cockerill Zinc Company owned the property from 1904 to 1910; Kansas Zinc Company from 1910 to 1915; George E. Nicholson for one day in 1915; the United States Smelting Company from 1915 to 1917; and the United States Smelting, Refining, and Mining Company from 1917 to 1918. From 1918 to the present, ownership has included individuals, husband/wives, and a bank. Investigation of the list of grantor/grantees listed in Table 1 has indicated that George E. Nicholson is associated with known American zinc, lead, and smelting companies (Reference 6). Review of the Certificate of Title documents did not indicate the existence of the "Altoona Zinc Smelting Company".

2.2.3 Potential Responsible Party Summary

Based on available owner/operator records, identified PRPs include the Cockerill Zinc Company, Kansas Zinc Company, George E. Nicholson, the United States Smelting Company, and the United States Smelting, Refining and Mining Company. FFSA records research did not discover any information regarding the Cockerill Zinc Company, Kansas Zinc Company, George E. Nicholson, or the United States Smelting Company. It is unknown whether these entities are presently in existence or financially solvent. However, extensive information exists regarding the United States Smelting, Refining, and Mining Company (References 7 and 8). In 1979, UV Industries, Inc., previously known as U.S. Smelting, Refining, & Mining Co., conveyed most of its assets to Sharon Steel Corporation. UV Industries was subsequently dissolved, and all remaining assets were transferred to the Liquidating Trust. Reportedly, Sharon Steel went into bankruptcy in December 1990. The strongest component of the former UV Industries interests in 1990 was Mueller Industries, formerly Mueller Brass. Mueller Brass had been a major component (capacity and operational characteristics are unknown to Maxim) of the United States Smelting, Refining & Mining Company. Mueller Industries, Inc. is currently a public corporation.

The abovementioned References 7 and 8 are World Wide Web sites discussing Environmental Protection Agency (EPA) action taken in federal district court against UV Industries, the Liquidating Trust, and Sharon Steel. The referenced litigation alleges liability under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. and the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. for costs arising from the cleanup of the hazardous substances (slag) at a lead and zinc site in Utah (Midvale property). This discussion is relevant to the Altoona site only in the determination of a PRP. It is not known at this time whether the legal relationships described above have resulted in an existing PRP. Further PRP evaluation is necessary to make such a determination but is beyond the scope of this FFSA investigation.

2.3 Local Hydrology

The drainageways and capture ponds located on and to the south of the subject property flow to the south and ultimately discharge into the Verdigris River. The Verdigris River flows from north to south along the western edge of Altoona, with the eastern bank located approximately one-half mile west of the smelter property (Figure 1). The Little Cedar Creek, located approximately one-half mile east of the smelter property, flows south until it joins the Big Cedar Creek. Big Cedar Creek flows into the Verdigris River approximately 1.7 miles south of the smelter property. Big Cedar Creek and the Verdigris River are both perennial streams of the Upper Verdigris River Drainage Basin. Altoona is located in the southern tip of the Upper Verdigris River Drainage Basin. The Verdigris River continues south into Oklahoma.

The Verdigris River is the source of drinking water to residents of Altoona. The intake from the river is located on the Verdigris River at River Street and 7th Street, approximately 1.2 miles downstream of the smelter property. The water is piped directly from the river to the service pumps. No public water supply or private water wells within a one-half mile radius of the site were identified in the Kansas Geological Survey (KGS) Databases (Reference 9).

3.0 INVESTIGATIVE ACTIVITIES

3.1 Initial Site Visit

The purpose of the Initial Site Visit was to maximize information for preparation of the Workplan, in that the field information supported development of the field investigation approach. Maxim personnel completed the following tasks on February 5 and 6, 2002, prior to initiation of field activities:

- Completed a tax record review at the Wilson County Courthouse to identify overall smelter property dimensions and boundaries;
- Conducted interviews with available county personnel and Altoona residents regarding historical knowledge of the former smelter site;
- Performed a visual reconnaissance of the area surrounding the smelter site. Observations were made regarding adjoining properties, location of the nearest residential areas, surface water bodies, sensitive receptors, and potential sensitive ecosystems; and
- Performed a visual inspection of the smelter site.

3.2 Preparatory Work

Prior to beginning field activities, Maxim secured all permits for soil, sediment, and surface water sampling using KDHE's "Consent Agreement for Access to Property" document (Appendix B: Property Access Agreements). Access was requested and granted for the following properties:

1. David and Toni Relph: smelter location and property to the northwest of the smelter; and
2. City of Altoona: right-of-way sampling locations (primarily north, east, and southeast);
3. Rex and Tammy Good: Surrounding properties to the west and south.

Representatives of the City of Altoona stated that they did not require any kind of special permitting for city right-of-way work. Maxim used Kansas One Call to identify any subsurface utilities that may have interfered with field activities (Appendix C: Utility Clearance Checklist). Prior to commencement of field activities, Maxim received a written "notice to proceed" from the KDHE, dated June 6, 2002.

3.3 Field Activities

3.3.1 XRF Field Screening Procedures

The initial determinations for field verification of the RCRA 8 Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) and zinc were performed through the use of a Niton Model 722SRW field portable x-ray fluorescence (XRF) instrument utilizing both Cadmium 109 and Americium 241 radioactive sources. Field testing protocol was in accordance with the USEPA.

Draft Test Method 6200 "Field Portable XRF Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment". This method is now contained in SW486, the EPA grouping of standard methods. The in-situ testing included screening of the undisturbed ground surface. The ex-situ screening entailed excavation of soils, as described in Section 3.3.2 (Soil Screening and Sampling Procedures).

3.3.2 Soil/Sediment Screening and Sampling Procedures

The Risk-Based Standards for Kansas, RSK Manual – 2nd Version was used to determine the action levels used during field XRF soil testing. Residential Soil Pathway RSK values were used for on-site XRF assay locations and select off-site sampling locations that were indicative of a residential scenario. Residential and Non-Residential RSK values are as follows:

Residential RSK Values	**Non-Residential RSK Values**
Arsenic - 11 mg/kg	Arsenic – 38 mg/kg
Barium – 5,500 mg/kg	Barium – 140,000 mg/kg
Cadmium – 39 mg/kg	Cadmium – 1,000 mg/kg
Chromium – 390 mg/kg	Chromium – 4,000 mg/kg
Lead – 400 mg/kg	Lead – 1,000 mg/kg
Mercury – 2 mg/kg	Mercury – 20 mg/kg
Selenium – 390 mg/kg	Selenium – 10,000 mg/kg
Silver – 390 mg/kg	Silver – 10,000 mg/kg
Zinc – 23,000 mg/kg	Zinc – 610,000 mg/kg

If visual or XRF screening results suggested that metals detected above the instrument detection limits in the in-situ samples exceeded the RSK target concentrations, an attempt was made to assess the approximate vertical extent of the contaminants. It should be noted that the XRF detection limits for arsenic, cadmium, chromium, mercury, and silver were above the RSK values at several sample locations. The detection limits varied at each sample location and are representative of each specific sample location. Factors affecting the detection limits may include interference associated with the elevated metals concentrations present in the majority of collected samples, the homogeneity of the soil, and moisture content. Factors affecting XRF detection limits are discussed further in Section 6.1.1.

Samples were collected following excavation of surface and subsurface soil using either a shovel or trowel, or by use of a stainless steel hand auger. In-situ testing of soil involves placing the XRF directly onto the ground surface in order to test the soil in its existing state. Ex-situ testing of soil involves removing the soil from its existing state Ex-situ testing of soil involves removing the soil from its existing state and drying and sieving the sample as necessary to obtain an accurate reading.

In-situ samples were numbered sequentially (i.e. AS-1, AS-2, etc.). Ex-situ 0 to 1 ft bgs interval samples were denoted with an "a" following the sample location; the 1 to 2 ft bgs interval samples with a "b"; and the 2 to 3 ft bgs interval samples with a "c" (i.e. AS-1a, etc.). Subsurface samples were collected at one-foot intervals from ground surface to three ft bgs if field screening conditions

warranted vertical delineation and if the subsurface soils were accessible using a shovel, trowel, or hand auger. The sampling media from each one-foot soil core was placed on aluminum foil to dry and then placed in labeled zip-lock bags. Enough volume was collected to conduct field XRF screening (described in Section 7.3 of the Workplan) and fill appropriate sample containers. The soils were thoroughly mixed with a stainless steel spoon. Large pebbles and cobbles were removed from the soil. Approximately one half of the representative sample was transferred to 4-ounce jars for laboratory analysis, if warranted. At least 20% of samples from each site that were screened using the XRF were submitted for confirmatory laboratory analysis. Soil samples were submitted to M.D. Chemical and Testing, Inc. (M.D. Chemical) of Topeka, Kansas for analysis of arsenic, barium, cadmium, and silver by SW846 Method 6010B; zinc by EPA Method 6010B; chromium by SW846 Method 7190; mercury by SW846 Method 7471; and selenium by SW846 Method 7740.

The screening procedures implemented by Maxim stated that subsurface profiling and sampling were to occur at a minimum of three locations for each property. If three or fewer samples exhibited metals concentrations above RSK at a specific site, subsurface sampling and XRF screening occurred at these locations as needed to determine the vertical extent of impact, to a maximum depth of three feet below ground surface. If more than three locations exhibited impact above RSK, subsurface profiling/sampling occurred at three to five locations as needed to determine the vertical extent of impact, to a maximum depth of three feet below ground surface.

All reusable sampling equipment was decontaminated between sampling locations as specified in Section 7.5 of the Workplan (Decontamination of Reusable Equipment). Copies of the Maxim Field Notebook are included as Appendix D.

3.3.3 Waste Sampling

Workplan protocol specified collection and laboratory analysis of waste material located on the smelter property with no field screening performed. The vertical and horizontal dimensions, volume, physical description, and composition of identifiable waste piles were recorded.

3.3.4 Surface Water and Groundwater Sampling

Surface water samples were obtained using a sample collection container and were field filtered into a laboratory container. The sample collection container was decontaminated between sampling points. Prior to sampling a new location, the collection container was rinsed at least three times with water from the new location.

Once a water sample for metals was obtained from a surface water body, field filtering was completed using a disposable filter system equipped with a 45-micron filter. The collection container attached to the bottom of the filter unit was the actual sample container submitted for metals analysis. Water samples were submitted to M.D. Chemical for analysis of zinc, barium, cadmium, chromium, and silver by EPA Method 200.7; arsenic by EPA Method 206.2; lead by EPA Method 200.9; mercury by EPA Method 245.2; and selenium by EPA Method 270.2.

No monitoring wells, public water supply wells, or domestic water wells were identified during this investigation on the smelter property (Appendix H).

4.0 ON-SITE FINDINGS

4.1 Current Site Description

The site is currently located on a vacant, rural parcel of land (Appendix E: Photographs). The legal bounds of the site property, according to the records obtained from the Wilson County Courthouse, are as follows:

> Starting at the northeast corner of the west half of the southwest quarter of section 9 running west 95 rods, then running south 54.21 rods, then running east 95 rods, and then running north 54.21 rods.

Railroad tracks divide the site into eastern and western portions. The eastern portion is currently a pasture. Ground cover consists primarily of tall grasses. Two sheds that appear to be used for livestock purposes are located in the southeast corner as well as several lamas.

It should be noted that aerial photographs taken in 1986 and 1991 depict a pond located on the northeast portion of the site. Based on this aerial photography, a sample collection point was proposed on the northeast corner of the site property, approximately 240 feet east-northeast of the pond. During the site visit, sample number AS-15 was collected from this location in relation to the pond. However, after obtaining and reviewing aerial photographs taken in 1998 and 1999, it was discovered that the pond depicted in the older aerial photographs is no longer in existence, and a pond similar in size is currently located approximately 50 feet north of the previous pond, just north of the site property line. Ms. Toni Relph, the site property owner, has also confirmed that the pond is currently located outside of the former smelter site boundaries. Therefore, the soil sample (AS-15), thought to have been collected on the northeast corner of the site in relation to the pond, was actually collected from an off-site location approximately 150 feet north of the plotted sample location.

The western portion of the site contains remnants of former lead smelting activities. Ground cover consists primarily of waste "chat" (chat is residual smelting waste from lead and zinc smelting operations that, under a mining industry definition, is described as "small stones with ore") and demolition debris (primarily broken up pieces of bricks and clay). Sparse vegetation exists on the majority of the western portion of the site. Tree cover is primarily located on the northeast corner and southeast corner of the western portion of the site as well as near the center of the site. Brush and tree limbs are piled along the fence line on parts of the southern and western property borders and appear to have been washed from other parts of the site during heavy rain or flooding events. A small part of the north central portion of the site has been used as a junkyard for automobiles and household appliances.

Remaining structures located on the smelter property include three linear concrete AST support structures and four pairs of concrete furnace supports. Piles of foundry bricks and three linear

machine kilns were located in the west central portion of the site. Small remnants of brick building foundations were evident in other various locations on the site property. The Sanborn Insurance Maps from 1906 and 1913 substantiate the locations of these structures (Figures 3 and 4). Site features are illustrated in the Smelter Site Map (Figure 5).

Two ponds are located on the western portion of the site (Table 2). A drainage creek extends south from the northern-most pond and is joined by a drainageway (approximately three feet wide and 2.5 to 3.0 feet deep) that flows off of the waste piles to a pond located south of the site. The drainageway continues from this off-site pond to the south until it ultimately empties into the Verdigis River. The approximate distances of these drainageways and ponds in relationship to the smelter and the Verdigris River are as follows:

- Footage from southern border of smelter property via drainageway to southern pond – 1,230 feet;
- Footage from southern pond via drainageway to Verdigris River – 3,966 feet;
- Footage from drainageway point of entry into Verdigris River to drinking water surface water intake – 680 feet; and
- Total surface water pathway from the smelter property to the Verdigris River – approximately 1.1 miles.

Agricultural land immediately borders the site to the north, west, and south. Commercial Street borders the site to the east with a cemetery located on the east side of Commercial Street. A welding shop and two residences (one also serving as a daycare facility) border the site to tne southeast. The two residences are located on the east side of Commercial Street. A farmstead is located approximately 1,400 feet north-northeast of the site. Residential areas of Altoona are located approximately 1,200 feet south of the site and 100 feet southeast of the site.

Waste has migrated onto the south adjacent property up to approximately 40 feet south of the smelter property boundary and extends approximately 500 feet east and west along the property boundary on the south adjacent property. A drainage creek is also located on the south adjacent property running south and southwest from the site property (Appendix E: Photographs).

4.2 Waste Determination

Waste "chat" appears to be distributed across the entire western portion of the smelter property. Defined waste piles are located primarily on the west, south, and southeast portions of the site (on the west side of the railroad tracks). The waste piles range in height from approximately 6 inches to approximately 20 to 25 feet. A large waste pile extends east across the southern portion of the site approximately 800 feet and extends approximately 300 feet north to the former furnace supports. Flat, evenly distributed waste mixed in with soil is present across the majority of the remaining western portion of the site. The north portion of the site appears to have been recently graded as depicted in an aerial photograph from 1998. During the field investigation, it was observed that this portion of the site had a higher soil to waste ratio and more grass ground cover than the remainder of the western portion of the site.

Waste extends off-site approximately 5 to 40 feet south and approximately 500 feet east and west along the southern property border. The waste appears to have been possibly washed off-site during heavy rains or flooding events.

4.3 Field Screening and Analytical Results

4.3.1 Soil

A total of fifteen on-site soil locations (ten proposed and five contingency locations: AS-1 through AS-14 and AS-16) were determined to be representative of conditions at the former smelter site (Figures 6 and 7). Table 3 includes GIS coordinates for each location, depths sampled, laboratory analysis confirmation, residential/nonresidential status, and sample media.

This section is applied to "soil"; however, fourteen of the fifteen surface locations should be defined as a mixture of waste and soil. The only surface location where soil was encountered at the surface was AS-16.

The Workplan specified that a maximum of five locations be utilized to determine vertical contamination. Five of the fifteen sample locations chosen for ex-situ testing for vertical contaminant assessment included AS-2, AS-3, AS-6, AS-7, AS-8 (Figure 8). Those sampling location choices were based on the five highest XRF screening results. These areas were all located in the central portion of the site extending from the western perimeter east to the railroad track. Vertical delineation could not be completed beyond one foot below ground surface (ft bgs) at AS-7 and two ft bgs at AS-3 due to subsurface structural debris. Soil samples AS-2 and AS-6 were not field screened at three ft bgs as the XRF results at 2 ft bgs were below detection limits for all metals.

It was observed during subsurface metals delineation that material including structural debris (clay and brick materials), waste, and soil (dry, crumbly, and loose) were encountered at depths up to two ft bgs. Native soils (brown tight clay) were encountered at the two to three ft bgs depth at sample locations AS-2, AS-6, and AS-8.

The soils typically found at the site are the Dennis silt loam soils, found on the east side of the railroad tracks, and the Kenoma silt loam, found on the remainder of the site to the west (Reference 10). The Dennis silt loam is characterized by a very dark grayish brown silt loam from surface to approximately 10 inches bgs. The subsoil extends to a depth of more than 60 inches. The upper part is dark brown, firm silty clay loam, and the lower part is dark brown and yellowish brown, mottled, very firm silty clay. Permeability is slow in the Dennis soil, and surface runoff is medium.

The Kenoma silt loam is characterized by a very dark grayish brown silt loam from surface to approximately 9 inches bgs. The subsoil is very firm and extremely firm silty clay about 35 inches thick. The upper part is dark brown and mottled, and the lower part is brown. The substratum to a depth of about 60 inches is mixed yellowish born and gray, very firm silty clay. Permeability is very slow in the Kenoma soil, and surface runoff is medium.

4.3.1.1 XRF

Soil XRF screening was completed for arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc. Soil XRF findings are included in Table 4 and are summarized as follows:

- Arsenic > RSK (11 parts per million [ppm]): AS-3 – located in the west central portion of the property in the area of concrete foundations and close to the former kilns. Arsenic concentrations ranged from 962 ppm to 1,500 ppm. The sample AS-3b may not be indicative of actual contamination at 2 ft bgs (loose soil and waste caved in during sample collection);
- Lead > RSK (400 ppm): All soil sample locations screened with the exception of AS-16 exceeded residential RSK. Concentrations ranged from 537 ppm to 19,699 ppm.
- Zinc > RSK (23,000 ppm): Sample locations AS-1, AS-2, AS-3, AS-4, AS-7, AS-8, AS-12, and AS-13 indicated concentrations ranging from 27,699 ppm to 115,917 ppm

The metal concentrations detected at the remaining sampling locations were either detected at levels below residential RSK concentrations or below the XRF detection limit for that particular metal. The XRF detection limits for arsenic, cadmium, chromium, mercury, and silver are greater then residential RSK concentrations. Appendix F includes Niton XRF printout field data.

4.3.1.2 Laboratory Analytical Results

Laboratory confirmation occurred with three of the soil XRF samples (Table 4), including AS-2b, AS-8, AS-8a, with a QC sample submitted for AS-8a (duplicate: addressed in Section 4.3.6). Sample AS-2b had indicated only the lead XRF value exceeding residential RSK concentrations (722 ppm). The laboratory result for lead was 375 ppm (RSK = 400 ppm). In this case, XRF concentrations were greater than laboratory results.

The laboratory sample submitted for AS-8 indicated an arsenic result of 140 ppm (XRF = <405 ppm); cadmium result of 104 ppm (XRF = <210 ppm); lead result of 6,230 ppm (XRF = 5,869 ppm); and a zinc result of 30,000 ppm (XRF = 36,378 ppm). The laboratory sample submitted for AS-8a indicated a lead result of 757 ppm (XRF = 537 ppm). The remaining metal concentrations for these three laboratory samples were either detected at levels below residential RSK concentrations, or below the laboratory detection limit for that particular metal. M.D. Chemical analytical laboratory results are included as Appendix G.

4.3.2 Sediment

A total of two sediment samples (ASE-1 and ASE-2) were collected from the two on-site ponds located on the smelter property (Figures 6 and 7).

4.3.2.1 XRF

The in-situ sample results for sediment samples ASE-1 and ASE-2 indicated lead concentrations of 211 ppm and 874 ppm (Threshold Effect Level [TEL] = 35), respectively, and zinc concentrations of 999 ppm and 4,029 ppm (TEL = 123), respectively. The remaining metals for sediment samples ASE-1 and ASE-2 were not detected above the XRF detection limits (Table 4). However, detection limits were elevated for arsenic, cadmium, chromium, mercury, and silver.

4.3.2.2 Laboratory Analytical Results

Sediment sample ASE-2 was collected from the pond located central and west of the railroad tracks and submitted for laboratory analysis (Figure 6). The following metals were detected in sediment sample ASE-2 above the TELs (Table 4): lead at a concentration of 848 ppm, which is consistent with the XRF result of 874 ppm; arsenic at a concentration of 20.6 ppm (TEL = 5.9 ppm); cadmium at a concentration of 27.5 ppm (TEL = 0.596 ppm); and zinc at a concentration of 3,750 ppm (TEL = 123 ppm). Chromium was detected at a concentration of 18.3 ppm, which is below the TEL of 37.3 ppm. Barium was detected at 139 ppm, and selenium was detected at 0.653 ppm. TELs are not available for barium and selenium; however, these metals are not key indicators of heavy metal contamination caused by smelting operations and, therefore, are not significant.

4.3.3 Waste Analytical Results

Three waste samples were submitted for laboratory analysis (AW-1, AW-2, AW-3: Table 5; Figures 6 and 7). Metals detected at levels greater than residential RSK concentrations included arsenic (ranging from 92.9 ppm to 1,980 ppm); cadmium (ranging from 44.5 ppm to 80.8 ppm); lead (ranging from 2,520 ppm to 17,200 ppm); and zinc (ranging from 24,700 ppm to 27,700 ppm).

4.3.4 Surface Water Analytical Results

Surface water samples were submitted from the two on-site ponds (ASW-1 and ASW-2). A third surface water sample (ASW-3) was submitted from a location below the junction of the drainage creek which extends south from the northern-most pond and the drainageway that flows off of the waste piles. This sample location was at a point approximately 25 feet north of the southern smelter boundary (Figures 6 and 7). Laboratory results are presented in Table 6.

Surface water sample ASW-1 (pond located near southern property boundary) indicated a lead concentration of 0.015 ppm equal to the Domestic Water Supply Surface Water Quality standard. Surface water sample ASW-2 (pond located west of the railroad tracks) indicated a lead a concentration of 0.036 ppm, which is greater than the Domestic Surface Water Quality standard. Surface water sample ASW-3 indicated cadmium, lead, and zinc concentrations of 0.25 ppm, 0.196 ppm, and 38.2 ppm, respectively, which are greater than the Domestic Surface Water Quality standards for cadmium (0.005 ppm) and lead and the MCL for zinc. The MCL has been applied to zinc because the Domestic Surface Water Quality criteria are not available. The remaining analyzed metals for the three surface water samples were either reported below laboratory method detection limits or detected at concentrations below the Domestic Surface Water Quality standards or MCLs.

5.0 OFF-SITE FINDINGS

5.1 Receptor Survey

5.1.1 Residential Areas

Residential areas are located primarily to the south and southeast of the smelter property (Figure 9). One daycare (Cindy's Daycare) is located east and adjacent to the smelter property on the east side of Commercial Street. Two churches are located approximately one-half mile and three-tenths of a mile southeast of the smelter. Table 7 is included as a "Sensitive Receptor Information" table.

5.1.2 Direct Exposure Receptors

Two residential properties exist adjacent to the smelter property (Table 8: Direct Exposure Pathways: Adjacent Residential Properties). One of the residential properties also serves as a daycare (Cindy's Daycare) with eight children cared for on a daily basis (Figure 9). The second residence is a single person dwelling with no children inhabiting the premises.

Interview information with local residents and an adjacent property owner (Tammy Fink) has indicated that children have historically played on the smelter property. Additionally, site observations indicate that bricks and other surface debris have been shifted around (forming outlined shapes) suggesting people access the property.

5.1.3 Surface Water Receptors

Three off-site ponds, a segment of the Verdigris River, and one perennial creek (Little Cedar Creek) are located within a one-half mile radius of the site (Table 2; Figures 9 and 10). As discussed previously in Section 4.1 (Current Site Description), a drainage creek extends south from the northern-most on-site pond and is joined by a drainageway (approximately three feet wide and 2.5 to 3.0 feet deep) that flows off of the on-site waste piles to a small pond located south of the site (Figures 9 and 10). The drainageway continues from this off-site pond to the south until it ultimately empties into the Verdigis River. A surface water intake for Altoona's drinking water source is located approximately 680 feet downstream from this point. The approximate distances of these drainageways and ponds in relationship to the smelter and the Verdigris River are as follows:

- Footage from southern border of smelter property via drainageway to southern pond – 1,230 feet
- Footage from southern pond via drainageway to Verdigris River – 3,966 feet
- Footage from drainageway point of entry into Verdigris River to drinking water surface water intake (downriver) – 680 feet

Therefore, the total distance from the smelter property to the surface water intake is approximately 1.2 miles.

5.1.4 Groundwater Receptors

No monitoring wells, public water supply wells, or domestic water wells were identified during this investigation within a one-mile radius of the smelter property (Appendix H).

5.1.5 Sensitive Environments

The Verdigris River has been designated a "Special Aquatic Life Use Waters" during its route through Wilson County. The term "Special Aquatic Life Use Waters" means surface waters that contain combinations of habitat types and indigenous biota not found commonly in the state, or surface waters that contain representative populations of threatened or endangered species (Reference 10). Mr. Chris Hase with the Environmental Services Section of the Kansas Department of Wildlife & Parks stated that all reaches of the Verdigris River in Wilson County is considered critical habitat for the following species:

- Butterfly Mussel – threatened in Kansas
- Neosho Mucket Mussel – endangered in Kansas
- Ouachita Kidneyshell Mussel – threatened in Kansas
- Rabbitsfoot Mussel – endangered in Kansas
- Western Fanshell Mussel – endangered in Kansas

The designation as a critical habitat signifies that the Verdigris River is under state protection and governed by Kansas Department of Wildlife & Parks. This designation is supported by the presence of Biology Collection Stations, of which two are located along the Verdigris River both upgradient and downgradient of Altoona in Virgil and Sycamore, Kansas, respectively.

The status of the American Burying Beetle is designated endangered in Kansas. The Designated Critical Habitat is all suitable habitat within Wilson County, including upland grasslands or near the edge of grassland/forest. These beetles prefer loose soil in which carrion may be buried.

The status of the Eastern Spotted Skunk is considered designated threatened in Kansas. The Designated Critical Habitat is all suitable habitat within Wilson County, including forest edges and upland prairie grasslands, especially where rock outcrops and shrub clumps are present. Wood fencerows, odd areas, and abandoned farm buildings are also important habitat.

No other sensitive aquatic, terrestrial, or wetland ecosystems or critical habitats were identified within a one-half mile radius of the smelter property

5.2 Field Screening and Analytical Results

5.2.1 Soil

A total of seven off-site soil locations (AOS-1 through AS-06 and AS-15) were determined to be representative of off-site conditions at the former smelter site (Figures 9 and 10). Of important note is soil sample AOS-2, which was collected east and adjacent to the smelter across Commercial Street

in the city right-of-way along the "Cindy's Daycare" property. The remaining locations were chosen to represent locations radiating from out from the smelter to the north, south, east, and west, with consideration of residential areas and direct exposure pathway scenarios. Table 3 includes GPS coordinates for each location, depths sampled, laboratory analysis confirmation, residential/nonresidential status, and sample media. Vertical contaminant assessment decisions were based on in-situ field XRF screening results.

5.2.1.1 XRF

Soil XRF screening was completed for arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc. Soil XRF findings are included in Table 9 and are summarized as follows:

- Lead > RSK (400 ppm): Soil sample AOS-3 – located approximately 1,100 feet to the north of the smelter in the right-of-way adjacent to a private residence - indicated a lead concentration of 1,310 ppm. Vertical delineation indicated that RSK values for lead were not exceeded at the one ft bgs sample (103 ppm).

The metal concentrations detected at the remaining sampling locations were either detected at levels below residential RSK concentrations, or below the XRF detection limit for that particular metal. The XRF detection limits for arsenic, cadmium, chromium, mercury, and silver are greater than residential RSK concentrations. Appendix F includes Niton XRF printout field data.

5.2.1.2 Laboratory Analytical Results

Laboratory confirmation occurred with two of the soil XRF samples (Table 9), including soil samples AOS-3 and AOS-4. Soil sample AOS-3 had indicated only the lead XRF value exceeding residential RSK concentrations (1,310 ppm). However, the laboratory results for arsenic and lead were greater than RSK values at 59.6 ppm and 1,620 ppm, respectively. In this case, XRF concentrations were less than laboratory results. M.D. Chemical analytical laboratory results are included as Appendix G.

The laboratory sample submitted for soil sample AOS-4 (Rex and Tammy Good property) indicated an arsenic result of 12.2 ppm (XRF = <94 ppm) and a lead result of 414 ppm (XRF = 270).

Regarding the elevated lead result in soil sample AOS-3: The sample submitted from the soil sample location AS-15 (1,100 feet south of soil sample location AOS-3 and approximately 140 feet north of the smelter northern boundary) demonstrated that XRF concentrations for the RCRA 8 metals and zinc were below the instrument detection limits. Soil sample AS-15 is located between the smelter boundary and soil sample location AOS-3. However, it should be noted that these detection limits are above RSK values, and particularly in the case of arsenic, three out of the five soil confirmatory laboratory results indicate that arsenic is present at levels greater than RSK concentrations where elevated XRF detection limits resulted in no field quantification of arsenic. Therefore, these results should be interpreted with caution.

5.2.2 Sediment

A total of six off-site sediment samples (AOSE-1 through AOSE-6) were collected (Figures 9 and 10). Sediment samples AOSE-1 and AOSE-2 were collected from ponds located to the south (northwest of 15th Street) and northwest, respectively, of the smelter property. The remaining four sediment samples (AOSE-3 through AOSE-6) were collected at points along the drainageway system originating from the northern on-site pond as discussed in Section 5.1.3. These drainageway sample locations are as follows:

- AOSE-3: collected along the base of the drainageway at a point approximately 265 feet south of the southern smelter boundary;
- AOSE-4: collected from the point of entry of the drainageway into the small pond located directly west of 15th Street;
- AOSE-5: collected at the base of the same drainageway (downgradient of the small pond) at a point approximately one-half mile from the smelter boundary; and
- AOSE-6: collected from the point of entry of the drainageway into the Verdigris River.

Fieldnotes indicate that a colored sheen was observed on water present in the drainageway both on-site and off-site.

5.2.2.1 XRF

XRF field screening results are available for sediment samples AOSE-1 through AOSE-3. Sediment XRF findings are included in Table 9 and are summarized as follows:

- Lead > TEL (35 ppm): AOSE-1 indicated a lead concentration of 329 ppm; and AOSE-3 indicated a lead concentration of 1,970 ppm.

- Zinc > TEL (123 ppm): AOSE-1 indicated a zinc concentration of 1,160 ppm; and AOSE-3 indicated a zinc concentration of 19,290 ppm.

The remaining XRF metal analytes were either detected at levels below respective TELs or below the XRF detection limits. The XRF detection limits for arsenic, cadmium, chromium, and mercury are greater then the TELs (Table 9). TELs are not available for barium, selenium, or silver; however, these metals are not key indicators of heavy metal contamination caused by smelting operations and, therefore, are not significant. XRF screening was not completed for locations AOSE-4 through AOSE-6 as laboratory samples were collected for these locations during an additional field trip.

5.2.2.2 Laboratory Analytical Results

Sediment samples AOSE-1, AOSE-4, AOSE-5, and AOSE-6 were submitted for laboratory confirmation (Table 9). Additionally, only arsenic, cadmium, lead, and zinc concentrations were analyzed in samples collected from AOSE-4, AOSE-5, and AOSE-6. The laboratory results for sediment sample AOSE-1 indicated arsenic, cadmium, lead, and zinc concentrations greater than the TELs at 14.1 ppm (TEL = 5.9), 13.4 ppm (TEL = 0.596), 543 ppm, and 1,610 ppm, respectively.

The laboratory results for sediment sample AOSE-4 indicated arsenic, cadmium, lead, and zinc concentrations greater than the TELs at 19.0 ppm, 33.2 ppm, 432 ppm, and 2,550 ppm, respectively. The laboratory results for sediment sample AOSE-5 indicated arsenic, cadmium, lead, and zinc concentrations greater than the TELs at 7.23 ppm, 7.79 ppm, 63 ppm, and 570 ppm, respectively. The laboratory results for sediment sample AOSE-6 indicated a concentration of cadmium greater than the TEL at 2.57 ppm. The remaining concentrations were not detected above laboratory analytical detection limits or at values exceeding TELs.

5.2.3 Surface Water Analytical Results

A total of six off-site surface water samples (AOSW-1 through AOSW-6) were collected (Figures 9 and 10). Surface water samples AOSW-1 and AOSW-2 were collected from ponds located to the south (northwest of 15th Street) and northwest, respectively, of the smelter property. The remaining four surface water samples (AOSW-3 through AOSW-6) were collected at points along the drainageway system originating from the northern on-site pond as discussed in Section 5.1.3. These sample locations are as follows:

- AOSW-3: collected from the drainageway at a location approximately 190 feet south of the southern smelter boundary (this point is north of AOSE-3 approximately 75 feet);
- AOSW-4: collected from the small pond located directly west of 15th Street;
- AOSW-5: collected from the same drainageway (downgradient of the small pond) at a point approximately one-half mile from the smelter boundary; and
- AOSW-6: collected from the point of entry of the Verdigris River at the point of entry of the drainageway.

The metal concentrations for the six surface water samples were either below laboratory method detection limits or at concentrations below the Domestic Water Supply Surface Water Quality standards or MCLs for the respective constituents. The MCL has been applied to zinc because the Domestic Surface Water Quality criteria are not available. The surface water sample collected from AOSW-1 indicated a lead concentration of 0.013 ppm, which is approaching the Domestic Water Supply Surface Water Quality standard of 0.015 ppm. The surface water sample collected from AOSW-3 indicated a zinc concentration of 4.60 ppm, which is approaching the Domestic Water Supply Surface Water Quality standard of 5.0 ppm. Samples AOSW-4, AOSW-5, and AOSW-6 were exclusively analyzed for arsenic, lead, cadmium, and zinc. Laboratory surface water sample results are presented in Table 6.

6.0 DATA VALIDATION

6.1 XRF

Niton Instrument # U1447 was utilized during the smelter assessment. Instrument calibration was completed the day before the instrument was shipped. Niton Corporation's technical department completed instrument calibration and low/high standard sample analysis the day before the instrument was shipped to Maxim. After the completion of field activities, Maxim shipped the instrument back to the Niton Corporation, and their technical department completed calibration and

low/high standard sample analysis upon receipt of the instrument. Quality control documentation is included in Appendix G, including calibration data and low and high standard values attained during the two calibration procedures. The calibration check, plus concentrations attained for the low and high standards indicate the instrument was in calibration during field sampling. Instrument calibration was completed prior to beginning fieldwork each day and every two hours during while the instrument was in operation.

X-ray fluorescence (XRF) detection limits were elevated for arsenic, cadmium, chromium, mercury, and silver at several in-situ screening locations. However, the elevated detection limits do not appear to have significantly reduced overall data quality or data usability. Laboratory data have been generated to supplement XRF data and, based on previous zinc/lead smelter investigations, it appears that evaluation lead impacts is the most critical issue for determining the extent of impact from smelter operations. Thus, addressing lead-impacted areas will also address impacts from other heavy metals, specifically arsenic, and cadmium. No chromium, mercury, or silver impacts were identified, or were anticipated to be present based on the nature of zinc/lead smelter impacts, during FFSA investigation. Consequently, the elevated chromium, mercury, and, silver XRF detection limits have had no impact on FFSA data usability or FFSA determinations.

6.1.1 External Factors Affecting XRF Detection Limits

The elevated XRF detection limits appear to be attributable to external factors. According to Niton Corporation and Method 6200 Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment (Method 6200), detection limits and sample results may be affected externally by the condition of the sample media. Variations in the physical characteristics of the soil such as homogeneity, surface condition, uniformity, organic content, and particle size as well as moisture content greater than 20% in the soil may interfere with the accuracy of detection. High concentrations of certain elements may cause interferences with other elements in the soil and cause detection limits to increase as a result of either spectral interferences (i.e. lead and arsenic) or as x-ray absorption and enhancement phenomena. This trend is common in soils contaminated with heavy metals. A more detail discussion of these factors is provided in Method 6200.

6.2 Laboratory Analytical Results

Quality Assurance/Quality Control (QA/QC) requirements were implemented and followed during the FSSA at the Chanute site and by M.D. Chemical. External QA focused on decontamination procedures, and sample handling, sample packing, and sample transportation to M.D. Chemical. The equipment blank ultimately represented these external QA issues and sample duplicates.

Laboratory analysis of the RCRA 8 metals and zinc for the equipment blank indicated all constituents at concentrations below the applicable method detection limits. A sample duplicate was collected from COS-6 and analyzed for the RCRA 8 metals and zinc. The relative percent differences (RPD) for the duplicate was 18.8 % for zinc; 13.5 % for arsenic; 0.8 % for barium; 7.4 % for cadmium; 0 % for chromium; 3.8 % for lead; 0 % for mercury; 0 % for selenium; and 0 % for silver. These values are all below M.D. Chemical's RPD range of 20%. It must be noted that

difficulties associated with creating a homogenous soil mixture are commonly reflected with the RPD parameter. Subsequently, these RPD's are believed to reflect the variables inherent with soil collection and not a laboratory problem.

The QA/QC requirements for Definitive data generated by M.D. Chemical were met for all soil and water analyses. The appropriate range criterions and/or values were met for the reagent blank, the laboratory fortified blank, and the recovery percent for the metals. All laboratory detection limits were below applicable RKS levels. The M.D. Chemical Quality Control Report and the specific laboratory reports for the equipment blank, sample duplicates and field blank are included as Appendix G.

6.3 Statistical Evaluation

For this investigation, five confirmatory soil samples were collected for analysis of metals. Regression analysis of the XRF values versus the analytical results for lead and zinc in soil samples was performed using Microsoft Excel. This analysis calculated a coefficient of determination for XRF measurements and lead results of 0.99 and XRF measurements and zinc results of 0.12. This analysis was performed to determine the level of confidence that can be placed in the XRF measurements for a specific matrix and a specific metal. Based on this very limited data set, the regression analysis indicates that the XRF measurements for lead were a reliable predictor of actual soil concentrations and the XRF measurements for zinc were not a reliable predictor of the soil analytical results. The printout of this analysis is presented in Appendix I.

7.0 POTENTIAL HUMAN HEALTH ISSUES AND ENVIRONMENTAL RISK

7.1 Contaminants of Concern

7.1.1 Arsenic

The environmental fate of arsenic in air, water, and soil is as follows:

Air: Arsenic found in air is generally due to natural phenomena, including volcanic eruptions and forest fires. Arsenic is also released into the environment through lead smelters;

Water: Arsenic in groundwater is largely the result of the minerals dissolving from weathered rocks and soils (Reference 12). Under oxidizing conditions, arsenic is present as arsenic acid and its anions (arsenate). The water chemistry, most notably the pH, will determine the speciation of arsenic. It is soluble in water and appears in many water supplies; and

Soil: Arsenic exists in the soil environment as arsenate, As(V), or as arsenite, As(III). Both are toxic; however, arsenite is the more toxic form and arsenate is the most common form (Reference 12). The behavior of arsenate in soil seems analogous to that of phosphate because of their chemical similarity. Like phosphate, arsenate is fixed to soil, and thus is relatively immobile. Additionally, it can also be transferred from the soil to plants because

plants can "mistake" arsenic for phosphate, a needed nutrient, causing it to accumulate in plant tissues. Iron, aluminum, and calcium influence this fixation by forming insoluble complexes with arsenate. The presence of iron in soil is most effective in controlling arsenate's mobility. The clay fraction and iron oxides have frequently been associated with arsenic-sorption in soils. Arsenite compounds are 4 to 10 times more soluble than arsenate compounds. Under anaerobic conditions, arsenate may be reduced to arsenite. Arsenite is more subject to leaching because of its higher solubility. Soil organic matter may not alter adsorption of arsenic.

7.1.2 Cadmium

The environmental fate of cadmium in air, water, and soil is as follows:

Air: Cadmium is emitted into the atmosphere mainly from natural sources, mainly volcanic activities, and from anthropogenic atmospheric sources including lead smelting operations;

Water: Some inorganic cadmium compounds are soluble in water, while cadmium oxide and cadmium sulfide are almost insoluble. Under oxidizing conditions, it is soluble under acid conditions and its solubility at higher pH is limited by the solubility of a carbonate or oxide/hydroxide. The largest contributor of water contamination from smelter operations would occur via process water and leakages form waste. Complexing of cadmium by organic solutes is, generally speaking, important only where concentrations of dissolved organic carbon is relatively high; and

Soil: Cadmium is loosely held by soil constituents and is readily available to plants. Thus, increased concentrations in soil result in increased concentrations in crops. Cadmium accumulation in plant materials varies with crop type and plant part. Cadmium is complexed by natural organic matter.

7.1.3 Lead

The environmental fate of lead in air, water, and soil is as follows:

Air: Lead particles are emitted from mines and smelters primarily in the form of $PbSO_4$, $PbO.PbSO_4$, and PbS (Reference 13). Lead halides are emitted from automobiles as lead halides and as the double salts with ammonium halides. In the atmosphere, lead exists primarily in the form of $PbSO_4$ and $PbCO_3$;

Water: Lead has a tendency to form compounds of low solubility with the major anions found in natural waters, including the divalent form Pb^{2+}, which is the most stable ionic species of lead. Hydroxide, carbonate, and sulfide may act as solubility controls in precipitating lead from water. A significant fraction of lead carried by river water is expected to be in an undissolved form. This can consist of colloidal particles or larger undissolved particles of lead carbonate, lead oxide, or lead hydroxide; and

Soil: The accumulation of lead in soil is primarily a function of the rate of deposition from the atmosphere. The fate of lead in soil is affected by the specific or exchange adsorption at mineral interfaces, the precipitation of sparingly soluble solid phases, and the formation of relatively stable organo-metal complexes or chelates with the organic matter in soil (Reference 12).

Lead may mobilize from soil when lead-bearing soil particles runoff to surface waters during heavy rains. Lead may also mobilize from soil to atmosphere by downwind transport of smaller lead-containing soil particles entrained in the prevailing wind. The downward movement of lead from soil by leaching is very slow under most natural conditions. The conditions that induce leaching are the presence of lead in soil at concentrations that either approach or exceed the sorption capacity of the soil, the presence in the soil of materials that are capable of forming soluble chelates with lead, and the a decrease in the pH of the leaching solution (e.g., acid rain). Partial favorable conditions for leaching may be resent in some soils near lead-smelting sites that contain elevated levels of lead in soil.

7.1.4 Zinc

Zinc can combine with other elements, such as chlorine, oxygen, and sulfur, to form zinc compounds. Zinc compounds that may be found at hazardous waste sites are zinc chloride, zinc oxide, zinc sulfate, and zinc sulfide. High levels of zinc in the soil, water, and air are often found along with high levels of other metals like lead and cadmium. The environmental fate of zinc in air, water, and soil is as follows:

Air: Zinc is emitted into the atmosphere from anthropogenic atmospheric sources including lead smelting operations;

Water: Most of the zinc in lakes, rivers, and streams does not dissolve, but settles to the bottom. Zinc behavior in water shares features with lead and cadmium. Under oxidizing conditions at low pH, it is soluble and mobile. As the pH rises, concentrations tend to decrease, first because of adsorption, and then because of the limited solubility of carbonates and oxides/hydroxides. Under reducing conditions, it will be immobilized as a sulfide; and

Soil: High levels of zinc in soil may result from the improper disposal of zinc-containing wastes from metal manufacturing industries and electric utilities. In soil, most of the zinc stays bound to the solid particles. Clay carbonates, or hydrous oxides, readily adsorb zinc. The greatest percentage of total zinc in polluted soil and sediment is associated with iron and manganese oxides. Rainfall removes zinc from soil because the zinc compounds are highly soluble. As with all cationic metals, zinc adsorption increases with pH (Reference 12). Zinc hydrolyzes at a pH >7.7. These hydrolyzed species strongly adsorb to soil surfaces. Zinc forms complexes with inorganic and organic ligands, which will affect its adsorption reactions with the soil surface.

7.2 Potential Contaminant Migration and Exposure Pathways

Potential contaminant migration and exposure pathways for the identified metals of concern with respect to former smelter operations in Altoona are as follows:

Ingestion

- Direct ingestion of surface soil containing metal concentrations originating from former smelter operations. The metal concentrations occurring in on-site or off-site surface soil would have primarily been transported through airborne diffusion from former smelter emissions. In addition, on-site smelter waste materials remaining at the surface could be accidentally ingested by children or adults. This receptor pathway is likely complete as fourteen of the fifteen Altoona smelter sample locations and two of the six off-site sample locations (both residential properties) indicated arsenic, lead, and/or zinc levels exceeding residential RSK standards. Further, impacted areas are easily accessed by the public and it was identified through FFSA investigation that the smelter property has been utilized (and likely still is) by local children as a recreational area (e.g. bike and motor vehicle trails). If construction activities were to occur in impacted areas, contaminant ingestion by on-site workers is also possible.

- Ingestion of water originating from surface water bodies affected by metal concentrations deposited by historical airborne processes or historical and continued surface water runoff/distribution. This receptor pathway is likely complete for the Altoona smelter as on-site and off-site surface water bodies impacted by arsenic, cadmium, lead, and zinc levels above Surface Water Quality standards are also accessible. Recreational use of the smelter and adjacent properties by area children further increase exposure risk associated with ingestion of impacted surface water. Additionally, a public water supply surface intake along the Verdigris River was identified approximately 1.2 miles downstream of the smelter property. A sediment sample collected at the point where the drainageway empties into the Verdigris River indicated a cadmium concentration above the TEL.

- Ingestion of metal concentrations in groundwater consumed from private or public wells. Because of the contaminant physical properties and necessary transport through the subsurface, this is the least likely receptor pathway to be completed. Ground water was not assessed during this FFSA as there were no domestic or public water supply wells identified in Altoona. Consequently, this receptor pathway is not accessible. Future completion of shallow water wells in impacted areas may result in ground water pathway exposure risk, but, due to regional hydrogeology, construction of shallow and productive water wells in impacted areas is not likely. In addition, Altoona residents are connected to a public water system that obtains water from the Verdigris River.

Inhalation

- Inhalation of airborne metal concentrations in soil originating from former smelters is unlikely, as operators have been terminated for over 80 years. However, extensive disturbance of metal contaminated areas by human activity may create short-term airborne

transportation of the metals. Because soil impacts above RSK have been identified, exposure risk associated with airborne migration of metals is significant. In rural areas where unpaved roads are present, a cycle is created with metal-enriched dust becoming airborne from automobile movement and subsequent dust settling back onto and along the roadways. This receptor pathway could be completed at the Altoona smelter if construction activities were to occur in impacted areas, or if children playing on the property come into contact with impacted soil/dust. As previously stated, it appears that the smelter property has been utilized (and likely still is) by local children as a recreational area; therefore, completion of the inhalation pathway is possible.

- Inhalation of airborne concentrations from metals present in surface water or groundwater is unlikely. Metals are not volatile and do not migrate in a manner that poses inhalation risks associated with metals-impacted water.

Dermal Contact

- Dermal contact with surface soil or surface water originating from former smelter site is likely. The detrimental health affect of dermal exposure to metals is minimal, with the exception of contact with the eyes, if the exposure is not in conjunction with ingestion. This receptor pathway is likely "complete" for the Altoona smelter. As indicated, the smelter property is accessible and exposure risk associated with ingestion of impacted soil and surface water, specifically by children, is present. As a result, dermal contact risk is also present and may increase if soil disturbance (e.g. construction, excavations, etc.) occurs in impacted areas.

Ecological Exposure

- The potential for heavy metals to "bioaccumulate" in flora and fauna at the site is likely;

- The status of the American Burying Beetle and the Eastern Spotted Skunk is considered designated threatened in Kansas, and all of Wilson County is considered suitable habitat for these creatures. As indicated, the smelter property is accessible and exposure risk associated with ingestion of impacted soil and surface water by animals is present. However, it is beyond the scope of this investigation to discuss the behavior patterns and toxicological characteristics of these animals;

- The Kansas Department of Wildlife & Parks stated that all reaches of the Verdigris River in Wilson County is considered critical habitat for five species of freshwater mussels. The sediment sample collected at the point where the drainageway empties into the Verdigris River indicated a cadmium concentration above the TEL. There is a potential that the habitat for the freshwater mussels may be impacted by the migration of cadmium into the Verdigris River, and further investigation may be warranted.

8.0 CONCLUSIONS

The FFSA completed for the former smelter property located in Altoona, Kansas may be summarized as follows:

On-site

- Evidence of wastepiles and former smelter structures are evident throughout the majority of the site. Smelter waste is mixed with soils in the entire section west of the railroad tracks, with structural debris evident at three ft bgs. Native soils appear to exist east of the railroad tracks;

- XRF field screening indicated lead above the residential RSK standards in all of the on-site soil samples with the exception of soil sample AS-16, ranging from 537 ppm to 19,699 ppm; Zinc was detected above the RSK standards at soil sample locations AS-1, AS-2, AS-3, AS-4, AS-7, AS-8, AS-12, and AS-13, ranging from 27,699 ppm to 115,917 ppm; Arsenic was detected above the RSK standards at soil sample location AS-3 (a and b), ranging from 962 ppm to 1,500 ppm;

- Due to the presence of waste material and subsurface structural debris, penetrating the subsurface beyond 2 ft bgs was not entirely successful. However, four of the five sample locations exceeded residential RSK standards at the furthest extent of delineation. Therefore, vertical delineation is not complete;

- XRF field screening results indicated both on-site sediment samples (ASE-1 and ASE-2) contained concentrations of lead and arsenic above the TELs; the laboratory results for sediment sample ASE-2 indicated arsenic, lead, and zinc concentrations above TELs;

- The three wastepile samples (AW-1 through AW-3) indicated arsenic, cadmium, lead, and zinc at concentrations exceeding residential RSK standards;

- The three smelter surface water samples (ASW-1 through ASW-3) indicated lead concentrations at or above the Domestic Water Supply Surface Water Quality standards; surface water sample ASW-3 also indicated arsenic and zinc concentrations above the MCLs;

- Figure 6 indicates geochemical trends in metal concentrations exceeding RSK residential standards. Arsenic is associated with the central section of the smelter. Arsenic exists in the soil environment most commonly as arsenate; arsenate is fixed to soil, and thus is relatively immobile. Cadmium is also seen primarily in the central portion of the site and wastepiles. Cadmium is loosely held by soil constituents and is readily available to plants. Both arsenic and cadmium can accumulate in plant tissues;

  Soil locations with elevated lead results were observed not only in the central section of the smelter, but most notably around the entire perimeter of the smelter property. Lead may

mobilize from soil when lead-bearing soil particles runoff to surface waters during heavy rains. Lead may also mobilize from soil to atmosphere by downwind transport of smaller lead-containing soil particles entrained in the prevailing wind.

Soil locations with elevated zinc concentrations were also observed in the central section. Figure 6 indicates that zinc is also found with lead along the southern border of the smelter, which is the direction of surface water flow during rainfall events. Rainfall removes zinc from soil because the zinc compounds are highly soluble.

Off-site

- Smelter waste extends off-site approximately 5 to 50 feet south and approximately 500 feet east and west along the southern property border. The waste may have been washed off-site during precipitation events;

- A drainage creek extends south from the northernmost on-site pond and is joined by a drainageway that flows off of the wastepiles to a pond located south of the site. The drainageway continues from this off-site pond to the south until it ultimately empties into the Verdigris River. The Verdigris River is a designated "Special Aquatic Life Use Waters" during its route through Wilson County. All reaches of the Verdigris River is considered critical habitat for five species of endangered or threatened freshwater mussels;

- Sediment samples AOSE-1, AOSE-4, and AOSE-5 contained concentrations of arsenic, cadmium, lead, and zinc exceeding the TELs. A concentration of lead exceeded the TEL in sediment sample AOSE-3. A concentration of cadmium exceeded the TEL in sediment sample AOSE-6. It is expected to see zinc in off-site water bodies due to the high solubility of zinc compounds. The metal concentrations for the six surface water samples were either below laboratory method detection limits or at concentrations below the Domestic Water Supply Surface Water Quality standards or MCLs, if applicable, for the respective constituents.

- Off-site residential properties to the north and south indicated soil lead and arsenic concentrations exceeding residential RSK standards;

- Soils collected in the right-of-way adjacent to a daycare located at 209 E. 17th Street do not appear to be impacted by former smelting operations;

General

- A Certificate of Title Search indicated that the Cockerill Zinc Company owned the property from 1904 to 1910; Kansas Zinc Company from 1910 to 1915; George E. Nicholson for one day in 1915; the United States Smelting Company from 1915 to 1917; and the United States Smelting, Refining, and Mining Company from 1917 to 1918. From 1918 to the present, ownership has included individuals, husband/wives, and a bank. FFSA records research did not discover any information regarding the Cockerill Zinc Company, Kansas Zinc Company,

George E. Nicholson, and the United States Smelting Company. It is therefore currently unknown whether these entities are presently in existence or financially solvent. Extensive litigation information exists regarding the United States Smelting, Refining, and Mining Company and the possibility exists that legally associated components of this company are currently operating;

- XRF detection limits were elevated for arsenic, cadmium, chromium, mercury, and silver at the majority of sample locations. However, the elevated detection limits to not appear to have significantly reduced overall data quality or data usability. Laboratory data have been generated to supplement XRF data and, based on the metals levels identified, it appears that evaluation lead impacts is the most critical issue for determining the extent of impact from smelter operations. In addition, the elevated detection limits appear to be attributable to the technology utilized rather than instrument or user error;

- In general, former smelting operations have impacted areas both on and off site. FFSA data indicate on and off site soil, sediment, and surface water concentrations above respective standards. Based on the data generated, cadmium, lead, arsenic, and zinc impacts above RSK are present on-site, and lead, arsenic, and zinc impacts are present off-site. FFSA data also indicate that both surface and subsurface impacts are present on-site, while off-site impacts appear to be limited to the surface. Horizontal delineation of on-site impacts appears to be complete; however, vertical delineation of on-site impacts was not completed due to media that could not be penetrated utilizing standard (i.e. hand auger) sampling equipment. Additional off-site investigation is warranted to fully delineate the horizontal extent of off-site impacts, specifically to the north and south of the smelter property;

- Exposure risk associated with identified impacts is significant and warrants response. Lead and arsenic (both highly toxic substances) are present at levels above RSK standards in residential areas, and lead and arsenic concentrations severely above RSK standards—up to 19,699 ppm (RSK = 400 ppm) and 1,980 ppm (RSK = 11 ppm), respectively—were identified on the smelter property. Ingestion, inhalation, and dermal contact exposure pathways appear to be complete, or have the potential to be completed. The smelter property is also accessible to the general public and, based on information obtained from local residents, has been historically utilized by children as a recreation area. Further, receptor survey information suggests that the subject property poses ecological risks, in addition to human health risks;

- Heavy metals do not dissipate, biodegrade, or decay readily in the environment; therefore, the impacts identified will remain long-term contaminant sources absent of response action. In addition, heavy metals can "bioaccumulate" in flora and fauna and may provide significant ecological implications. Due to the metals concentration identified, it appears that removal action is warranted to mitigate exposure risk and further contaminant migration. Exposure risks may also be mitigated through the use of institutional controls such as restricted access to impacted areas, land use restrictions, and "capping" impacted soil.

9.0 REFERENCES

1) U.S. Geological Survey, Map of Altoona Quadrangle, Kansas, 7.5 Minute Series (Topographic), 1959, 1984.

2) Wilson County Land Cover **(http://gisdasc.kgs.ukans.edu/kanview/landcov/html/Wilson.html)**

3) Clark, John G., Towns and Minerals in Southeastern Kansas, *A Study in Regional Industrialization*, 890-1930, Special Publication 52, State Geological Survey of Kansas, Lawrence, Kansas, 1970.

4) W. R. Ingalls, *Zinc Smelting in the United States in 1907*, Eng. & Min. Journal, Jan. 4, 1908, pp. 20-23.

5) *The Zinc Market in 1918*, E & MJ, Vol. 107, No. 2, Jan. 11, 1919, p. 58.

6) R010 – American Zinc, Lead & Smelting Company Records, 1901-1965—Index Cards (http//web.umr.edu/~whmcinfo/shelf1/r010/cards.html)

7) http://www.scripophily.net/uvinincprevk.html

8) http://utahrails.net/utah-ry/utah-ry-after-1960.htm

9) Kansas Geological Survey Hydrology/Water Resources Web Site http://www.kgs.ukans.edu/

10) *Soil Survey of Wilson County, Kansas*. United States of Agriculture, Soil Conservation Service, February 1989.

11) http://www.kdhe.state.ks.us/stormwater/resources/saluonrwlist-Rev301.pdf

12) *The Geochemistry of Natural Waters, Surface and Groundwater Environments.* Drever, J.I., Third Edition, 1997.

13) Agency for Toxic Substances and Disease Registry – Paper: Impact of Lead-Contaminated Soil on Public Health (http://www.atsdr.cdc.gov/cxlead.html).

TABLES

Table 1

CERTIFICATE OF TITLE INFORMATION
Focused Former Smelter Assessments

Altoona, Kansas

Records affecting the title to the following described real estate in Wilson County, Kansas:
Commencing the center of Section Nine (9), Township Twenty-nine (29) South, Range Sixteen (16) East, running thence West 95 rods, thence South 54.21 rods, thence East 95 rods, thence North 54.21 rods to point of beginning.

Deeds Filed of Record	Deed Transaction from Grantor/Grantee * (Dates associated with smelter operations)
A.B. Cockerill and Mary M. Cockerill	January 9, 1904 and February 22, 1908 *
Cockerill Zinc Company	June 25, 1910 *
Kansas Zinc Company	June 12, 1915
George L. Edwards and Mary Jette Edwards	June 12, 1915
George E. Nicholson and Ida H. Nicholson	June 12, 1915
Nicholson Construction Company	June 14, 1915 *
United States Smelting Company	December 31, 1917 *
U.S. Smelting, Refining and Mining Co.	February 27, 1918
Central Machinery & Supply Company	July 9, 1920
M.F. Highfill	August 1, 1921
W.A. Wilmoth and O.M. Lloyd	December 31, 1921
Oscar M. Lloyd	?
Mrs. M.F. Highfill	?
McClave State Bank of McClave, Colorado	August 11, 1928
Mrs. M.F. Highfill Saunders	May 17, 1929
Della Gamble	August 27, 1936
N.K. Bickford	October 13, 1337
J.W. Vandervoort	June 12, 1939
Charles Starbuck	October 2, 1943
C.J. Dutton	December 23, 1943
Chester R. Smith	September 20, 1945
John A. Kepler	October 2, 1945
Frank M. Green and Beryl L. Green	October 15, 1956
Arthur W. Pugh	December 9, 1963
Thomas E. Relph	August 25, 1977
Lloyde E. King and Virda L. King	September 17, 1982
Katherine M. Relph	December 30, 1985
David Relph and Toni Relph	

TABLE 2

ON AND OFFSITE RECEPTOR IDENTIFICATION: WATER PATHWAYS AND SENSITIVE ENVIRONMENTS
Focused Former Smelter Assessments

Altoona, Kansas

Surface Water Pathway	Groundwater Pathway	Sensitive Environment	Onsite	Offsite within 1/2 mile	Distance/Direction from Site	Description*	Use
Pond			X		north central portion of site	Width = ~ 85 feet and Length = ~130 feet; very turbid; excessive algal growth; appears to have an outlet that drains to the south and offsite; the drainageway is dry; water level appeared to be lower than average	Unused
Pond			X		south central portion of site	Width = ~ 100 feet and Legth = ~ 130 feet; somewhat clear; no visible algal growth or surface plant growth; no inlets/outlets	Unused
Pond			X		northeast portion of site, east of railroad tracks	Width = ~ 85 feet and Length = ~ 60 feet; no inlets/outlets; surrounded by tall grass	Livestock
Pond				X	~ 575 feet south of site	Width = ~160 feet and Length = ~ 340 feet; somewhat turbid; some algal growth along banks; no inlets/outlets were observed	Livestock
Pond				X	~1,000 feet south-southwest of the site	Width = ~ 60 feet and Length = ~ 50 feet; has an inlet that drains from drainageways on the site and has an outlet that appears to drain into the Vertigirs River	Unknown
Pond				X	~1,100 feet northwest of the site	Width = ~45 feet and Length = ~ 45 feet; very turbid; no apparent inlets/outlets	Livestock
River Basin		Verdigris River: Critical Habitat for Threatened & Endangered Mussel Species		X	~1/2 mile west and southwest of the site	The Verdigris River flows south-southeast within the 1/2 radius of the site; there are no apparent recreational uses of the river within the vicinity; the drinking water intake is located approximately 700 feet downstream of the location where the drainageway that originates on the site property flows into the river basin. The Verdigris River is designated a "Special Aquatic Life Use Waters" throughout Wilson County because the river basin is critical habitat for two threatened and three endangered species of mussels. The Verdigris River is therefore under state protection and governed by the Kansas Department of Wildlife & Parks.	Supplies drinking water to the City of Altoona
Perennial Creek				X	~1/2 east-southeast of the site	The Little Cedar Creek flows south-southwest	Unknown
Drainageway			X		central portion of the site	The drainageway flows from waste piles located on the south portion of the site and possibly from the pond located on the north central portion of the property onto the south adjacent property and into the pond located ~1,100 feet south-southwest of the site. The drainageway continues to flow outside of the 1/2 mile radius into the Verdigris River basin. An oily sheen was present on the surface water in the drainageway on- and offsite.	N/A

* Width is measured from east to west and length is measured from north to south.
~ = Approximately
Note: Groundwater pathways were not discovered witin a 1/2 mile radius of the site.

TABLE 3

SAMPLE COLLECTION POINT DESCRIPTION
Focused Former Smelter Assessment

Altoona, Kansas

	Sample No.	GPS Coordinates	In-situ	Ex-situ				Lab Analysis	Residential	Non-residential	Sample Media				
				Surface	1 foot bgs	2 feet bgs	3 feet bgs				Soil	Sediment	Surface Water	Ground-water	Waste
Onsite	ASE-1	N 37°32'07.5" W 95°39'47.6"		X					X			X			
	ASW-1	N 37°32'07.6" W 95°39'47.6"						X	X				X		
	ASE-2	N 37°32'10.6" W 95°39'49.9"		X				X	X			X			
	ASW-2	N 37°32'10.6" W 95°39'49.8"						X	X				X		
	ASW-3	N 37°32'06.6" W 95°39'49.9"						X	X				X		
	AS-1	N 37°32'06.4" W 95°39'59.1"	X						X		X				
	AS-2	N 37°32'09.4" W 95°39'59.4"	X						X		X				
	AS-2a	N 37°32'09.4" W 95°39'59.4"			X				X		X				
	AS-2b	N 37°32'09.4" W 95°39'59.4"				X		X	X		X				
	AS-3	N 37°32'10.9" W 95°39'56.7"	X						X		X				
	AS-3a	N 37°32'10.9" W 95°39'56.7"			X				X		X				
	AS-3b	N 37°32'10.9" W 95°39'56.7"				X			X		X				
	AS-4	N 37°32'10.4" W 95°39'56.0"	X						X		X				
	AS-5	N 37°32'13.6" W 95°39'58.4"	X						X		X				
	AS-6	N 37°32'10.4" W 95°39'46.7"	X						X		X				
	AS-6a	N 37°32'10.4" W 95°39'46.7"			X				X		X				
	AS-7	N 37°32'09.1" W 95°39'48.7"	X						X		X				
	AS-7a	N 37°32'09.1" W 95°39'48.7"			X				X		X				
	AS-8	N 37°32'09.3" W 95°39'51.2"	X					X	X		X				
	AS-8a	N 37°32'09.3" W 95°39'51.2"			X			X	X		X				
	AS-8a(dup)	N 37°32'09.3" W 95°39'51.2"			X			X	X		X				
	AS-9	N 37°32'14.0" W 95°39'49.4"	X						X		X				
	AS-10	N 37°32'12.4" W 95°39'53.2"	X						X		X				
	AS-11	N 37°32'13.1" W 95°39'56.2"	X						X		X				
	AS-12	N 37°32'07.1" W 95°39'55.0"	X						X		X				
	AS-13	N 37°32'05.6" W 95°39'55.9"	X						X		X				
	AS-14	N 37°32'05.8" W 95°39'51.7"	X						X		X				
	AS-16	N 37°32'06.6" W 95°39'40.5"	X						X		X				
	AW-1	N 37°32'09.0" W 95°39'46.4"						X	X						X
	AW-2	N 37°32'10.8" W 95°39'58.1"						X	X						X
	AW-3	N 37°32'07.2" W 95°39'57.6"						X	X						X

bgs = below ground surface
a = 1 foot bgs
b = 2 feet bgs

TABLE 3

SAMPLE COLLECTION POINT DESCRIPTION
Focused Former Smelter Assessment

Altoona, Kansas

	Sample No.	GIS Coordinates	In-situ	Ex-situ				Lab Analysis	Residential	Non-residential	Sample Media				
				Surface	1 foot bgs	2 feet bgs	3 feet bgs				Soil	Sediment	Surface Water	Ground-water	Waste
Offsite	AOSE-1	N 37°31'59.3" W 95°39'50.4"		X				X	X			X			
	AOSW-1	N 37°31'59.3" W 95°39'50.4"						X	X				X		
	AOSE-2	N 37°32'23.3" W 95°40'04.3"		X						X		X			
	AOSW-2	N 37°32'23.3" W 95°40'04.3"						X		X			X		
	AOSE-3	N 37°32'03.1" W 95°39'51.0"	X						X			X			
	AOSW-3	N 37°32'03.6" W 95°39'51.4"						X	X				X		
	AOS-1	N 37°32'10.4" W 95°39'39.3"	X						X		X				
	AOS-2	N 37°32'06.5" W 95°39'39.7"	X						X		X				
	AOS-3	N 37°32'27.0" W 95°39'40.1"	X					X	X		X				
	AOS-3a	N 37°32'27.0" W 95°39'40.1"			X				X		X				
	AOS-4	N 37°31'53.1" W 95°39'50.0"	X					X	X		X				
	AOS-5	N 37°32'04.0" W 95°39'12.9"	X							X	X				
	AOS-6	N 37°31'56.1" W 95°39'43.7"	X						X		X				
	AS-15	N 37°32'15.6" W 95°39'41.0"	X						X		X				
	AOSE-4	N 37°31'55.8" W 95°39'55.2"						X	X			X			
	AOSW-4	N 37°31'55.8" W 95°39'55.2"						X	X				X		
	AOSE-5	N 37°31'32.9" W 95°39'59.7"						X	X			X			
	AOSW-5	N 37°31'32.9" W 95°39'59.7"						X	X				X		
	AOSE-6	N 37°31'29.0" W 95°39'59.1"						X	X			X			
	AOSW-6	N 37°31'29.0" W 95°39'59.1"						X	X				X		

bgs = below ground surface
a = 1 foot bgs
b = 2 feet bgs

Table 4
XRF and Laboratory Analytical Results for Onsite Soil and Sediment Samples
Altoona, Kansas

Sample No.	Description	Analysis	As	As Error	Ba	Ba Error	Cd	Cd Error	Cr	Cr Error	Pb	Pb Error	Hg	Hg Error	Se	Se Error	Ag	Ag Error	Zn	Zn Error
AS-1	Residential	In-situ	<195	NA	<180	NA	<270	NA	<1,110	NA	1,859	180	<116	NA	<45	NA	<780	NA	115,917	4,499
AS-2	Residential	In-situ	<405	NA	<525	NA	<360	NA	<1,350	NA	7,629	470	<111	NA	<57	NA	<945	NA	39,578	1,899
AS-2a	Residential	Ex-situ	<615	NA	<360	NA	<300	NA	<1,800	NA	6,490	680	<165	NA	<86	NA	<825	NA	28,877	2,299
AS-2b	Residential	Ex-situ	<128	NA	<555	NA	<360	NA	<795	NA	722	120	<41	NA	<31	NA	<1,185	NA	3,459	340
		Lab	5.02	NA	187	NA	33.9	NA	19.8	NA	375	NA	ND(0.10)	NA	0.634	NA	ND(2.00)	NA	2,350	NA
AS-3	Residential	In-situ	<780	NA	<525	NA	<360	NA	<2,700	NA	10,195	980	<240	NA	<142	NA	<900	NA	60,774	4,598
AS-3a	Residential	Ex-situ	962	610	<870	NA	<345	NA	<3000	NA	14,195	1,300	<270	NA	<128	NA	<1,170	NA	88,371	6,499
AS-3b	Residential	Ex-situ	1,500	510	1,090	430	<210	NA	<2,100	NA	19,699	1,200	<195	NA	<118	NA	<540	NA	69,376	3,699
AS-4	Residential	In-situ	<450	NA	1,829	500	<165	NA	<1,650	NA	3,808	460	<132	NA	<77	NA	<510	NA	27,699	2,200
AS-5	Residential	In-situ	<180	NA	<465	NA	<135	NA	<885	NA	794	160	<63	NA	<41	NA	<765	NA	4,189	490
AS-6	Residential	In-situ	<390	NA	<600	NA	<195	NA	<1,380	NA	5,658	430	<100	NA	<67	NA	<840	NA	20,288	1,200
AS-6a	Residential	Ex-situ	<70	NA	<405	NA	<270	NA	<1,080	NA	<44	NA	<60	NA	<38	NA	<1,650	NA	1,160	290
AS-7	Residential	In-situ	<720	NA	<630	NA	<140	NA	<2,250	NA	16,192	1,100	<195	NA	<103	NA	<1,274	NA	73,267	4,099
AS-7a	Residential	Ex-situ	<1,140	NA	<855	NA	<390	NA	<3,749	NA	13,798	1,600	<270	NA	<165	NA	<945	NA	52,685	5,200
Residential RSK Values			11		5,500		39		390		400		2		390		390		23,000	
Nonresidential RSK Values			38		140,000		4,000		4,000		1,000		20		10,000		10,000		610,000	

Key:

Am = Americium	Pb = Lead	a = 1 foot below ground surface (bgs)
As = Arsenic	Hg = Mercury	b = 2 feet bgs
Ba = Barium	Se = Selenium	NA = Not Available
Cd = Cadmium	Ag = Siliver	
Cr = Chromium	Zn = Zinc	

Note: Concentrations are in parts per million (ppm)

The concentration plus the addition of error value, if applicable, was detected under the RSK value.
The concentration is approaching the RSK value (within 20%).
The concentration was detected above the RSK value.

Table 4
XRF and Laboratory Analytical Results for Onsite Soil and Sediment Samples
Altoona, Kansas

Sample No.	Description	Analysis	As	As Error	Ba	Ba Error	Cd	Cd Error	Cr	Cr Error	Pb	Pb Error	Hg	Hg Error	Se	Se Error	Ag	Ag Error	Zn	Zn Error
Soil																				
AS-8	Residential	In-situ	<405	NA	<285	NA	<210	NA	<1,320	NA	5,869	440	<117	NA	<58	NA	<765	NA	36,378	1,899
		Lab	140	NA	156	NA	104	NA	17.5	NA	6,230	NA	0.297	NA	0.857	NA	ND(2.00)	NA	30,000	NA
AS-8a	Residential	Ex-situ	<99	NA	<495	NA	<210	NA	<600	NA	537	95	<36	NA	<23	NA	<930	NA	3,069	290
		Lab	9.26	NA	101	NA	19.4	NA	11.8	NA	757	NA	ND(0.10)	NA	0.524	NA	ND(2.00)	NA	3,530	NA
AS-8a(dup)	Residential	Lab	9.96	NA	106	NA	18.8	NA	10.7	NA	1,300	NA	0.126	NA	ND(0.50)	NA	ND(2.00)	NA	3,590	NA
AS-9	Residential	In-situ	<165	NA	<450	NA	<240	NA	<975	NA	670	140	<49	NA	<43	NA	<945	NA	4,467	480
AS-10	Residential	In-situ	<210	NA	<315	NA	<195	NA	<825	NA	1,920	200	<59	NA	<32	NA	<615	NA	6,880	510
AS-11	Residential	In-situ	<270	NA	<165	NA	<345	NA	<1,500	NA	1,420	250	<96	NA	<50	NA	<750	NA	13,798	1,200
AS-12	Residential	In-situ	<930	NA	<19.8	NA	<165	NA	<2,549	NA	13,299	1,200	<240	NA	<149	NA	<645	NA	51,200	4,000
AS-13	Residential	In-situ	<330	NA	<285	NA	<119	NA	<1,500	NA	2,760	330	<119	NA	<62	NA	<1,095	NA	30,797	2,099
AS-14	Residential	In-situ	<345	NA	<270	NA	<330	NA	<1,200	NA	3,389	360	<106	NA	<66	NA	<690	NA	18,496	1,300
AS-16	Residential	In-situ	<63	NA	<345	NA	<150	NA	<525	NA	115	52	<28	NA	<26	NA	<720	NA	529	130
Residential RSK Values			11		5,500		39		390		400		2		390		390		23,000	
Nonresidential RSK Values			38		140,000		4,000		4,000		1,000		20		10,000		10,000		610,000	
Sediment																				
ASE-1	Residential	In-situ	<110	NA	<255	NA	<165	NA	<1,170	NA	211	110	<36	NA	<27	NA	<615	NA	999	290
ASE-2	Residential	In-situ	<210	NA	<315	NA	<89	NA	<1,110	NA	874	190	<63	NA	<43	NA	<570	NA	4,029	530
		Lab	20.6	NA	139	NA	27.5	NA	18.3	NA	848	NA	ND(0.10)	NA	0.653	NA	ND(2.00)	NA	3,750	NA
Threshold Effect Level (TEL)			5.9		NA		0.596		37.3		35		0.174		NA		NA		123	

Key:

Am = Americium	Pb = Lead	a = 1 foot bgs
As = Arsenic	Hg = Mercury	b = 2 feet bgs
Ba = Barium	Se = Selenium	NA = Not Available
Cd = Cadmium	Ag = Siliver	
Cr = Chromium	Zn = Zinc	

Note: Concentrations are in parts per million (ppm)

The concentration plus the addition of the error value, if applicable, was detected under the RSK/TEL value.
The concentration was detected; however, a TEL is not available for this metal.
The concentration is approaching the RSK/TEL value (within 20%).
The concentration was detected above the RSK/TEL value.

Table 5
Laboratory Analytical Results for Waste Samples
Altoona, Kansas

Sample No.	Description	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	Zn
AW-1	Residential	92.9	162	80.8	6.83	2,520	ND(0.10)	0.709	ND(2.00)	24,700
AW-2	Residential	1,180	351	56.7	14.6	17,200	ND(0.10)	0.94	ND(2.00)	17,700
AW-3	Residential	1,980	82.2	44.5	13.7	11,300	ND(0.10)	1.55	ND(2.00)	27,700
Residential RSK Values		11	5,500	39	390	400	2	390	390	23,000
Non-residential RSK Values		38	140,000	4,000	4,000	1,000	20	10,000	10,000	610,000

Key:
As = Arsenic
Ba = Barium
Cd = Cadmium
Pb = Lead
Hg = Mercury
Se = Selinium
Cr = Chromium
Ag = Silver
Zn = Zinc

Note: Concentrations are in parts per million (ppm)

The concentration was detected under the RSK value.
The concentration was detected above the RSK value.

Table 6
Laboratory Analytical Results for Onsite and Offsite Surface Water Samples
Altoona, Kansas

Sample No.	As	Ba	Cd	Cr	Pb	Hg	Se	Ag	Zn
Onsite									
ASW-1	0.003	ND(0.2)	ND(0.005)	ND(0.05)	0.015	ND(0.001)	ND(0.005)	ND(0.002)	0.07
ASW-2	0.016	ND(0.2)	ND(0.005)	ND(0.05)	0.036	ND(0.001)	ND(0.005)	ND(0.002)	0.41
ASW-3	0.002	ND(0.2)	0.25	ND(0.05)	0.196	ND(0.001)	ND(0.005)	ND(0.002)	38.2
Offsite									
AOSW-1	0.006	ND(0.2)	ND(0.05)	ND(0.05)	0.013	ND(0.001)	ND(0.005)	ND(0.002)	0.06
AOSW-2	0.002	ND(0.2)	ND(0.05)	ND(0.05)	0.001	ND(0.001)	ND(0.005)	ND(0.002)	0.04
AOSW-3	0.001	ND(0.2)	ND(0.005)	ND(0.05)	0.001	ND(0.001)	ND(0.005)	ND(0.002)	4.60
AOSW-4	0.004	NA	ND(0.005)	NA	ND(0.001)	NA	NA	NA	0.11
AOSW-5	0.003	NA	ND(0.005)	NA	ND(0.001)	NA	NA	NA	0.04
AOSW-6	0.003	NA	ND(0.005)	NA	ND(0.001)	NA	NA	NA	0.04
Domestic Water Supply Surface Water Quality Standards	0.05*	2	0.005	0.1	0.015	0.002*	0.05	0.05	5.0*

Key:

As = Arsenic
Ba = Barium
Cd = Cadmium
Pb = Lead
Hg = Mercury
Cr = Chromium
Ag = Silver
Zn = Zinc
Se = Selinium
NA = Not Analyzed

Note: Concentrations are in parts per million (ppm)

* Domestic Water Supply Surface Water Quality criteria were not available, therefore, Maximum Contaminant Levels (MCLs) were used.

The concentration was detected under the Surface Water Quality Standards/MCLs.
The concentration is approaching the Surface Water Quality Standards/MCLs (within 20%).
The concentration was detected at or above the Surface Water Quality Standards/MCLs.

TABLE 7

SENSITIVE RECEPTOR INFORMATION
Focused Former Smelter Assessments

Altoona, Kansas

Sensitive Receptor*	Name/Title	Address	Distane/Direction from Site Boundary	Comments
Daycare	Cindy's Daycare	209 E. 17th Street	east adjacent to the site property on the east side of Commercial Street	provides daycare for 8 children ranging in age from 3 months to 7 years
Church	Altoona Christian Church	P.O. Box 37, southeast corner of 11th and Main	1/2 mile southeast of the site	
Church	Greater New life Church	215 E. 13th Street	1,800 feet southeast of the site	

* Sensitive receptors include: nursing homes, daycares, schools, parks or public reacreation areas, and churches within a 1/2 mile radius of the site.

TABLE 8

DIRECT EXPOSURE PATHWAYS: ADJACENT RESIDENTIAL PROPERTIES
Focused Former Smelter Assessments

Altoona, Kansas

Owners' Name(s)	Direction from Site	Address	# of Residents per Household	# of Children per Household
Michael and Cindy Wickham	East	209 E. 17th Street	2	8 (daycare)
Colton Johnson	East	210 E. 17th Street	0	0

Table 9
XRF and Laboratory Analytical Results for Offsite Soil and Sediment Samples
Altoona, Kansas

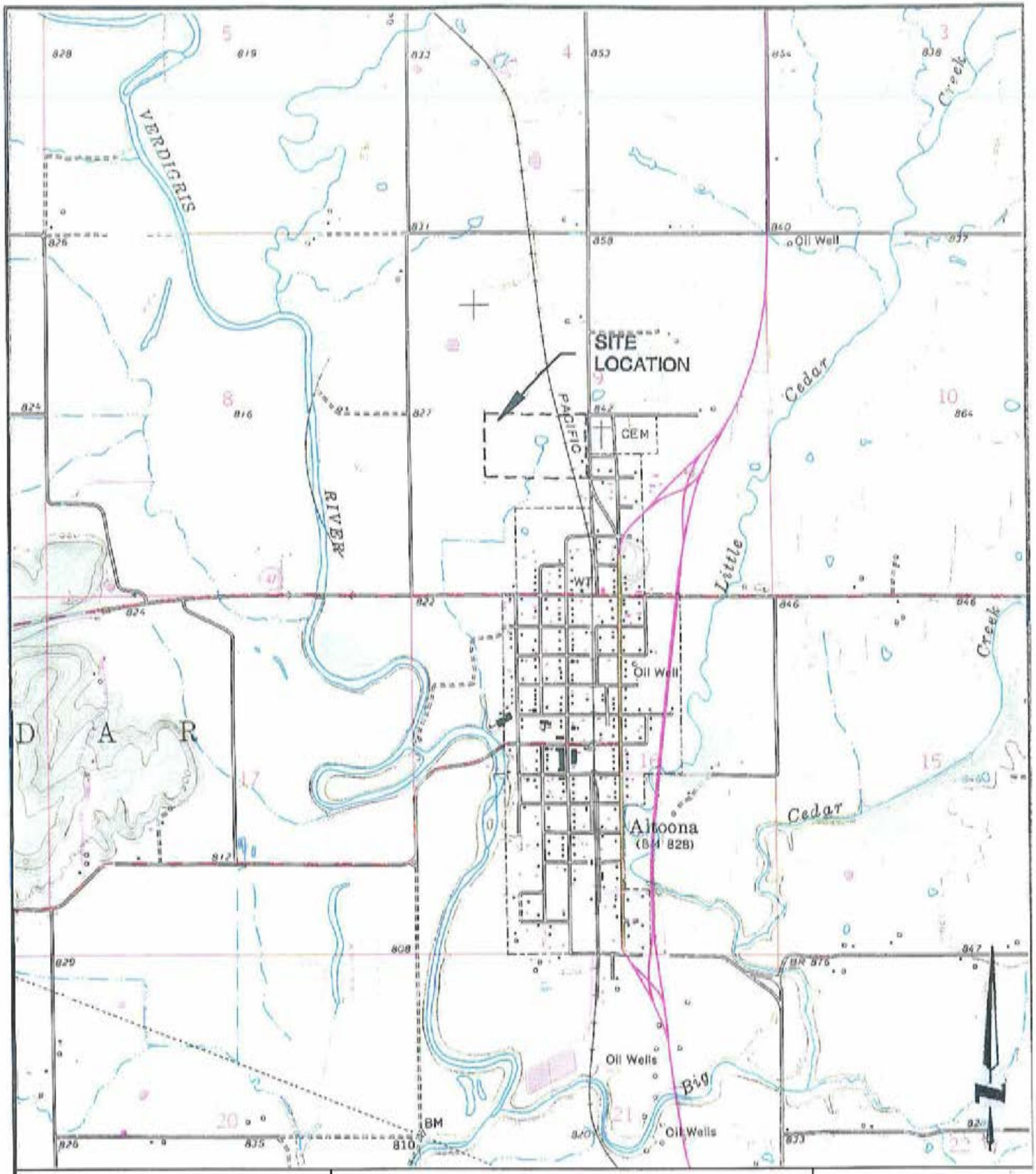
Sample No	Description	Analysis	As	As Error	Ba	Ba Error	Cd	Cd Error	Cr	Cr Error	Pb	Pb Error	Hg	Hg Error	Se	Se Error	Ag	Ag Error	Zn	Zn Error
Soil																				
AOS-1	Residential	In-situ	<44	NA	<300	NA	<195	NA	<630	NA	<59	NA	<25	NA	<25	NA	<1,274	NA	494	150
AOS-2	Residential	In-situ	<46	NA	<300	NA	<165	NA	<435	NA	93	39	<25	NA	<23	NA	<780	NA	652	120
AOS-3	Residential	In-situ	<150	NA	<180	NA	<165	NA	<960	NA	1,310	150	<42	NA	<40	NA	<585	NA	4,970	390
		Lab	59.6	NA	96.9	NA	10.5	NA	ND(5.00)	NA	1,620	NA	ND(0.10)	NA	ND(0.50)	NA	ND(2.00)	NA	1,090	NA
AOS-3a	Residential	Ex-situ	<84	NA	<285	NA	<255	NA	<900	NA	103	66	<45	NA	<34	NA	<660	NA	853	220
AOS-4	Residential	In-situ	<94	NA	<270	NA	<180	NA	<750	NA	270	87	<43	NA	<32	NA	<690	NA	877	200
		Lab	12.2	NA	156	NA	9.95	NA	11.8	NA	414	NA	ND(0.10)	NA	ND(0.50)	NA	ND(2.00)	NA	1,090	NA
AOS-5	Non-residential	In-situ	<68	NA	<240	NA	<100	NA	<825	NA	<90	NA	<43	NA	<28	NA	<660	NA	<210	NA
AOS-6	Residential	In-situ	<81	NA	<180	NA	<94	NA	<945	NA	134	76	<36	NA	<27	NA	<435	NA	708	220
AS-15	Residential	In-situ	<44	NA	<330	NA	<118	NA	<690	NA	<52	NA	<23	NA	<28	NA	<675	NA	<113	NA
Residential RSK Values			11		5,500		39		390		400		2		390		390		23,000	
Nonresidential RSK Values			38		140,000		4,000		4,000		1,000		20		10,000		10,000		610,000	
Sediment																				
AOSE-1	Residential	Ex-situ	<76	NA	<285	NA	<165	NA	<525	NA	329	71	<26	NA	<27	NA	<870	NA	1,160	170
		Lab	14.1	NA	125	NA	13.4	NA	11.1	NA	543	NA	ND(0.10)	NA	ND(0.50)	NA	ND(2.00)	NA	1,610	NA
AOSE-2	Non-residential	Ex-situ	<36	NA	<525	NA	<165	NA	<540	NA	<41	NA	<26	NA	<18	NA	<915	NA	<108	NA
AOSE-3	Residential	In-situ	<345	NA	<480	NA	<165	NA	<2,100	NA	1,970	330	<105	NA	<81.3	NA	<825	NA	19,290	1,699
AOSE-4	Residential	Lab	19.0	NA	NA	NA	33.2	NA	NA	NA	432	NA	NA	NA	NA	NA	NA	NA	2,550	NA
AOSE-5	Residential	Lab	7.23	NA	NA	NA	7.79	NA	NA	NA	63	NA	NA	NA	NA	NA	NA	NA	570	NA
AOSE-6	Residential	Lab	4.26	NA	NA	NA	2.57	NA	NA	NA	18	NA	NA	NA	NA	NA	NA	NA	116	NA
Threshold Effect Level (TEL)			5.9		NA		0.596		37.3		35		0.174		NA		NA		123	

Key:
Am = Americium
As = Arsenic
Ba = Barium
Cd = Cadmium
Cr = Chromium
OS = Offsite Soil
Pb = Lead
Hg = Mercury
Se = Selenium
Ag = Siliver
Zn = Zinc
a = 1 foot below ground surface (bgs)
NA = Not Available

Note: Concentrations are in parts per million (ppm)

The concentration plus the addition of error, if applicable, was detected under the RSK/TEL value.
The concentration was detected; however, a TEL is not available for this metal.
The concentration is approaching the RSK/TEL value (within 20%).
The concentration was detected above the RSK/TEL value.

FIGURES



SITE AND VICINITY MAP

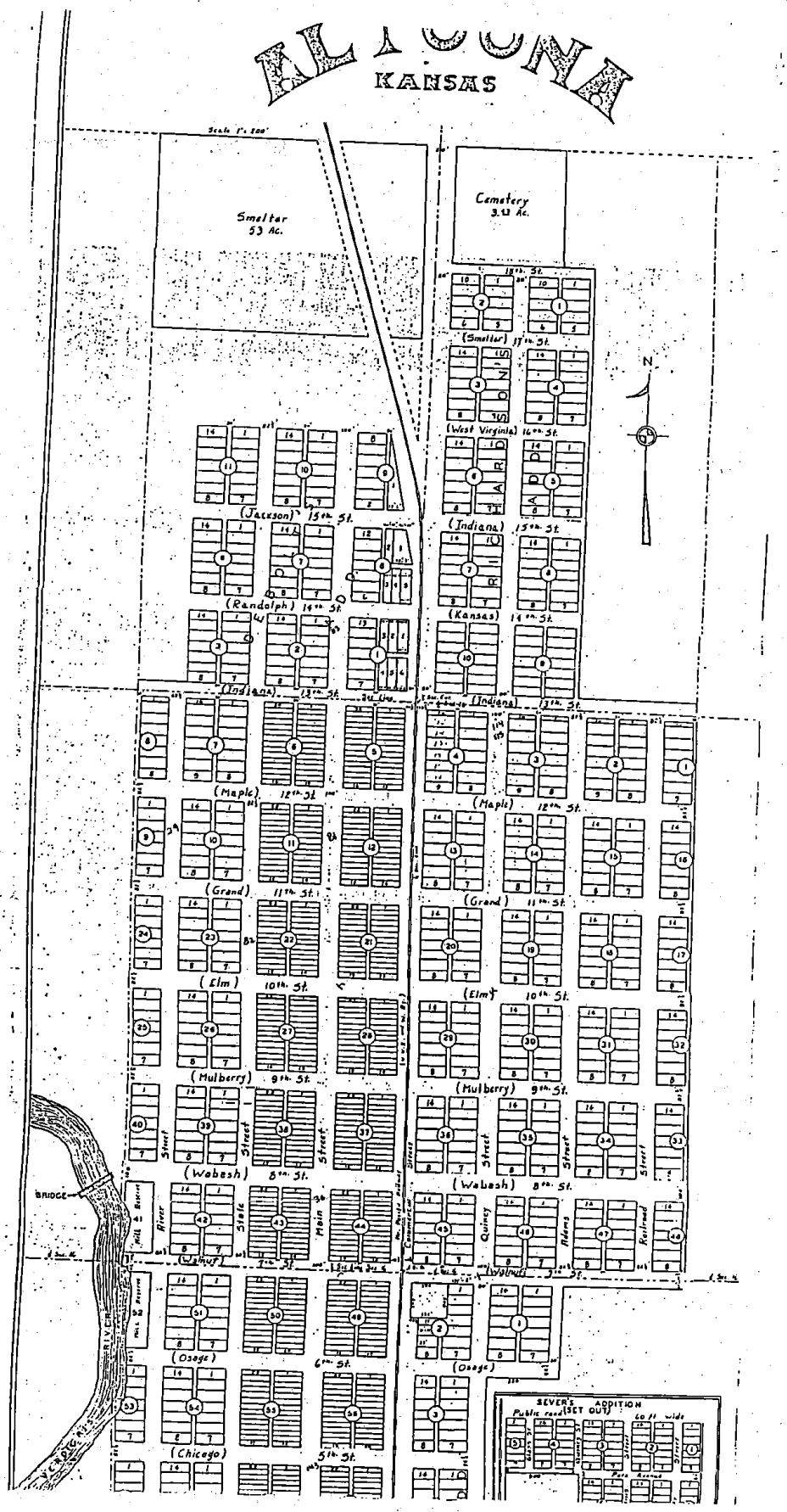
Maxim Technologies, Inc.
721 S. Packard
Kansas City, Kansas 66105

KDHE State Water Plan
Smelter Site
Figure 1

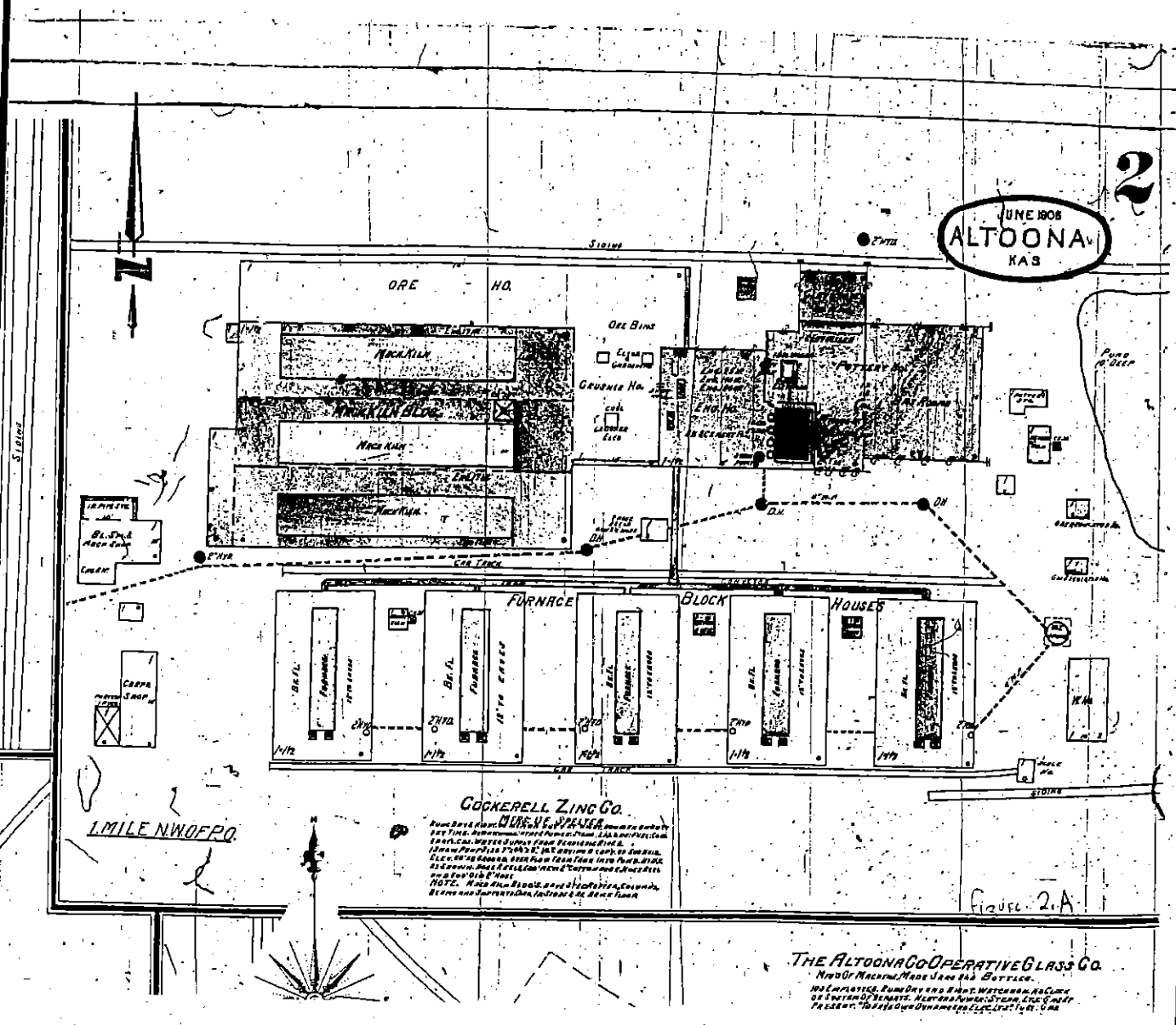
PROJECT NUMBER
2390202

DATE: **1959, 1984**

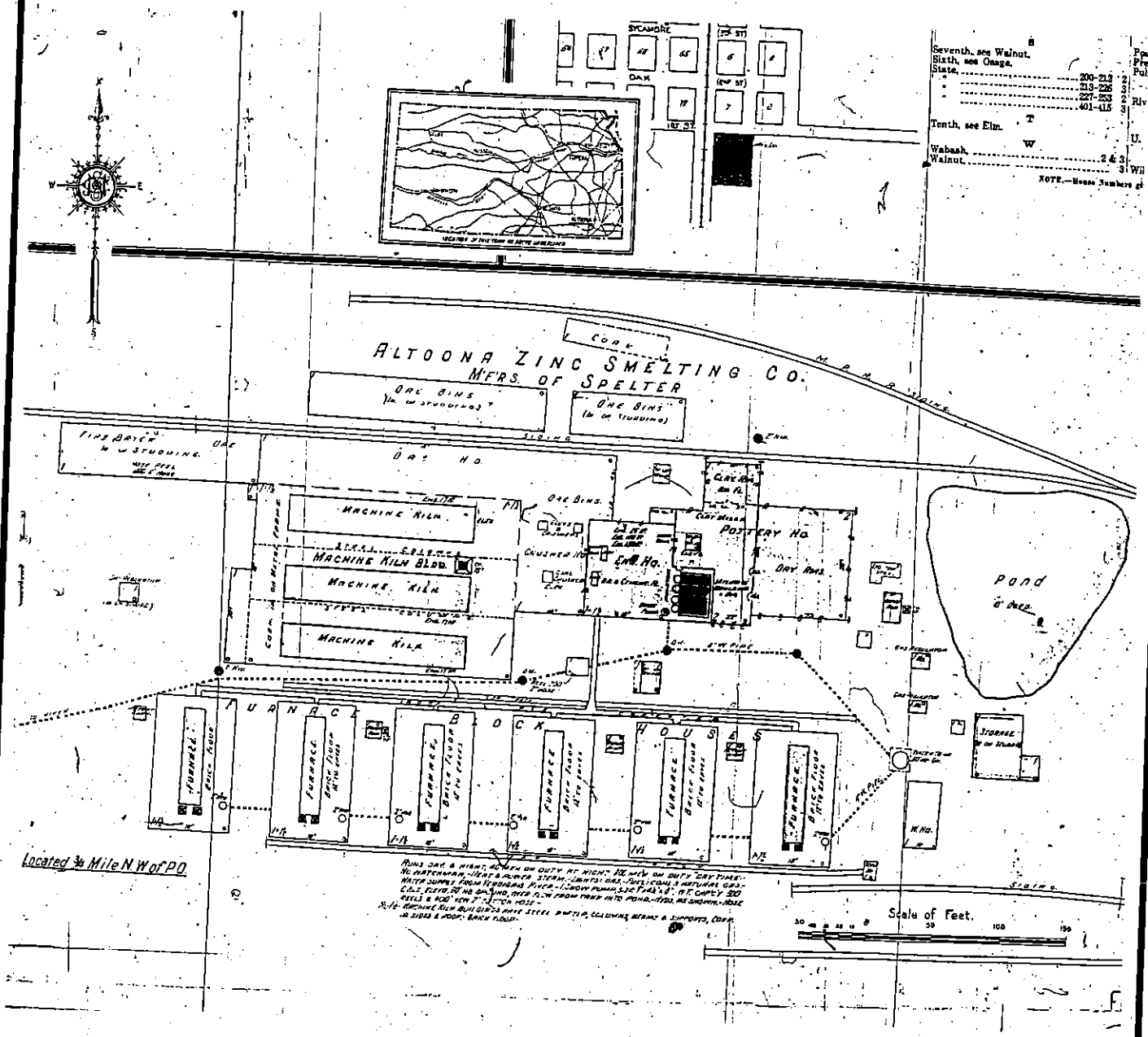
SOURCE: **U.S.G.S. 7.5'**
Altoona Quadrangle



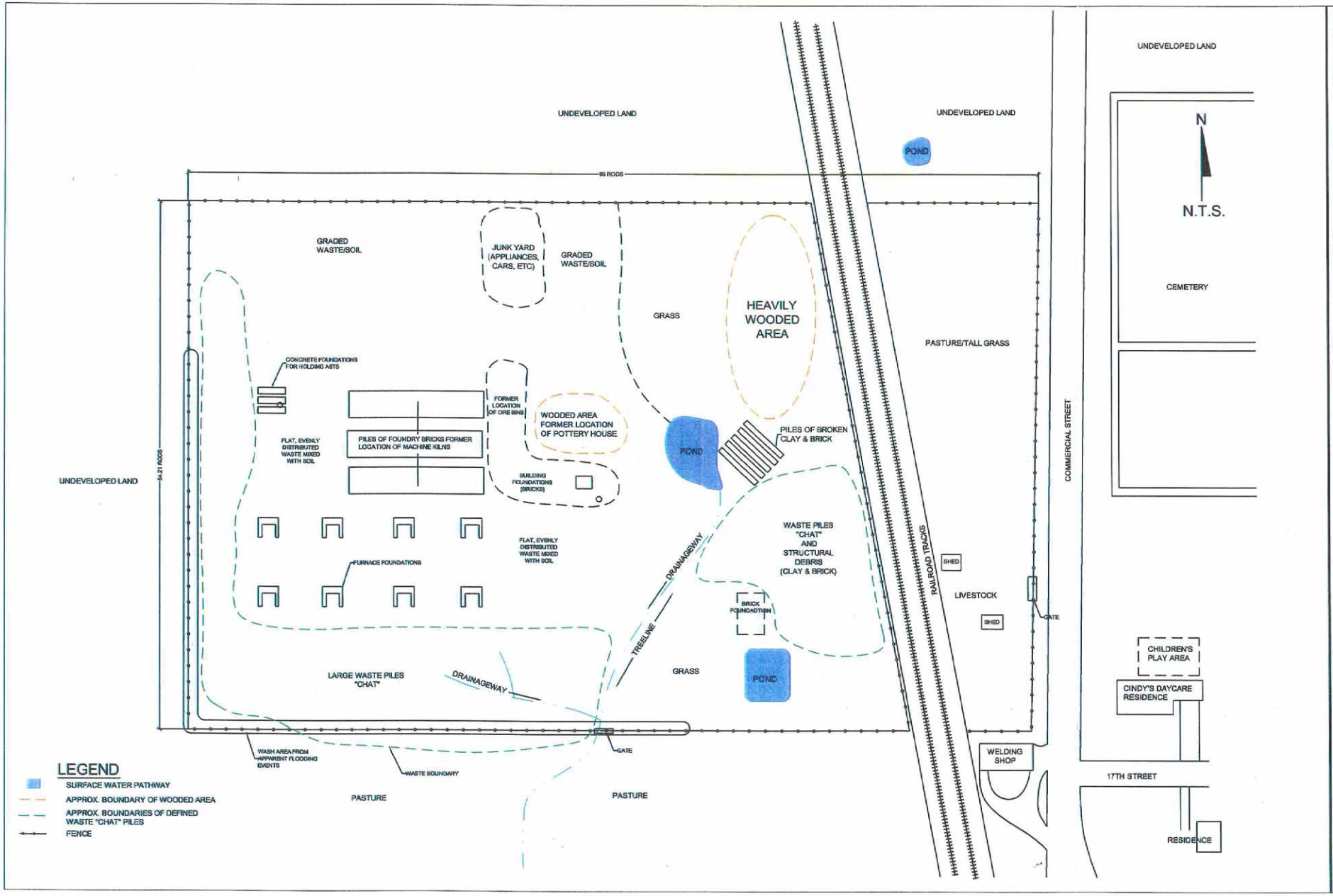
Maxim Technologies, Inc. **721 S. Packard** **Kansas City, Kansas 66105**	**SANBORN FIRE INSURANCE MAP** KDHE State Water Plan Smelter Location Figure 2	**Date:** 1906 **Project No.:** 2390202 **Source:** Center for Historical Research N



Maxim Technologies, Inc. **721 S. Packard** **Kansas City, Kansas 66105**	**SANBORN FIRE INSURANCE MAP** KDHE State Water Plan Smelter Detail Figure 3	**Date:** 1906 **Project No.:** 2390202 **Source:** Center for Historical Research **N**



Maxim Technologies, Inc. 721 S. Packard Kansas City, Kansas 66105	**SANBORN FIRE INSURANCE MAP** KDHE State Water Plan Smelter Site Figure 4	**Date:** 1913 **Project No.:** 2390202 **Source:** Center for Historical Research N

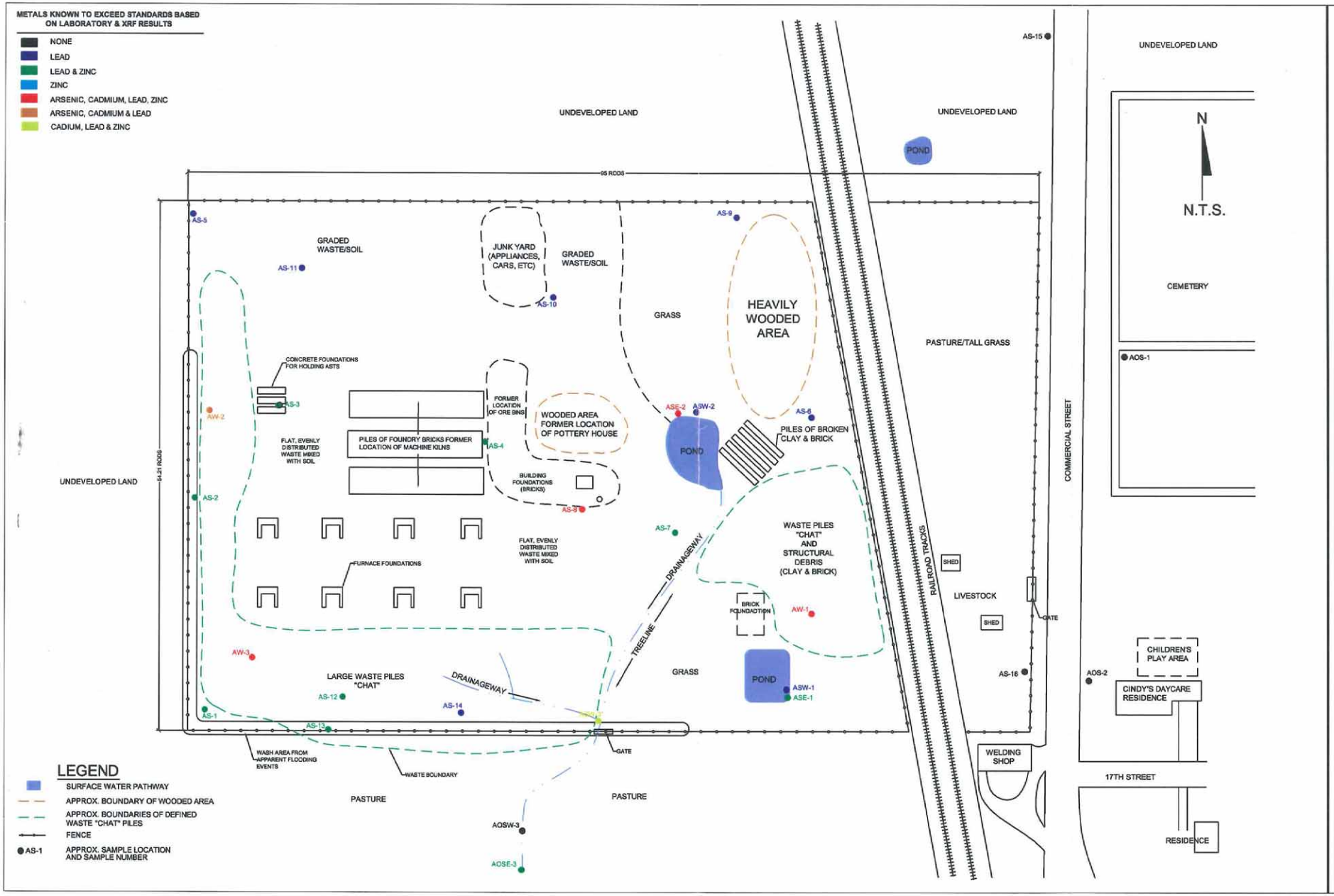


MAXIM TECHNOLOGIES INC

SMELTER SITE MAP
ALTOONA, KANSAS

PROJECT NO. 2360202
DRAWN BY ALLEN
CHECKED BY HOWARD
DATE 08/04/02
VERSION 0
DRAWING BY Smelter

F-5

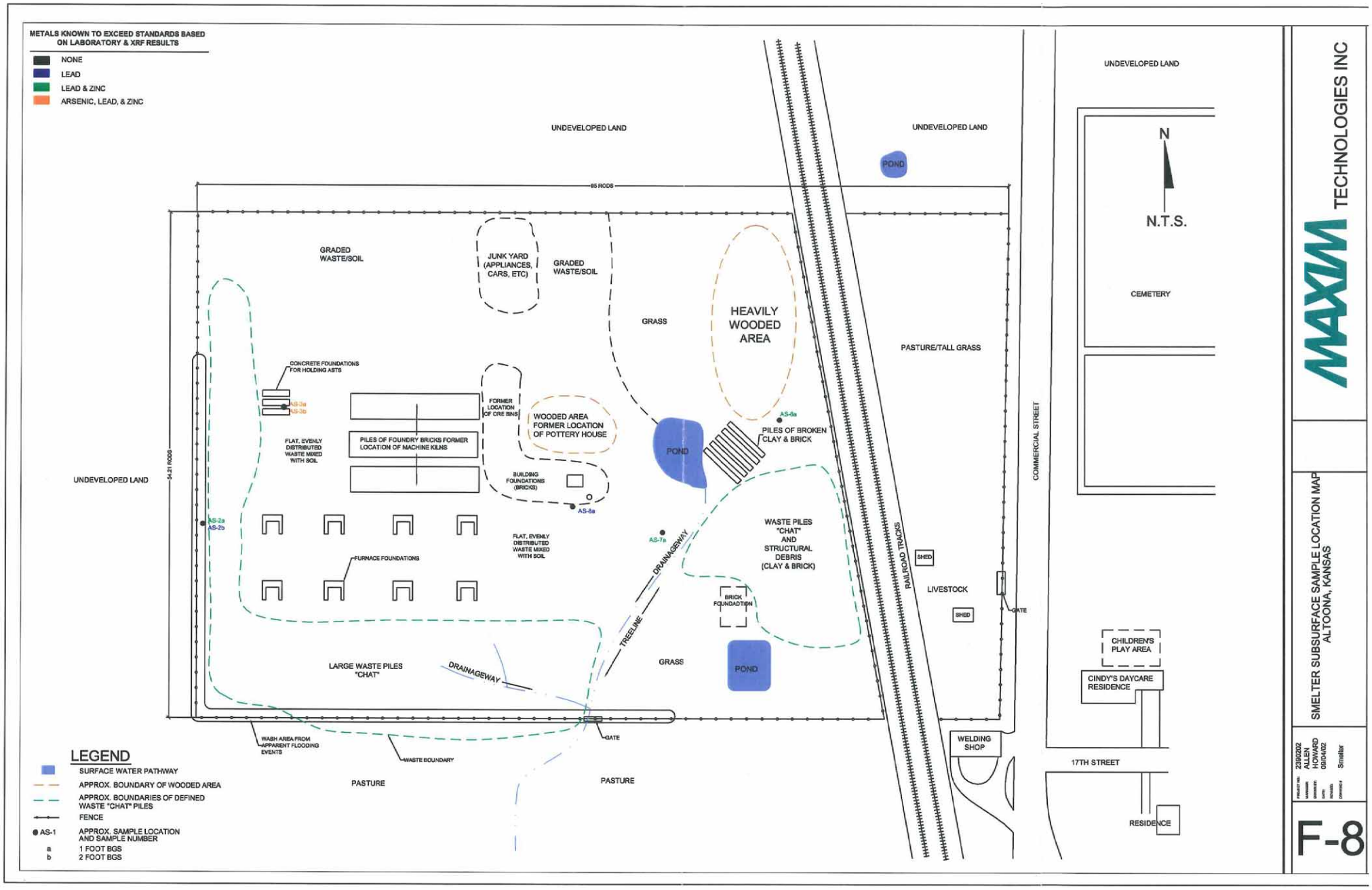


MAXIM TECHNOLOGIES INC

SMELTER SAMPLE LOCATION MAP
ALTOONA, KANSAS

PROJECT NO.: 23902/02
DRAWN BY: ALLEN
REVIEWED: HORVAT
DATE: 09/04/02
REVISED:
DRAWING #: Smelter

F-6



MAXIM TECHNOLOGIES INC

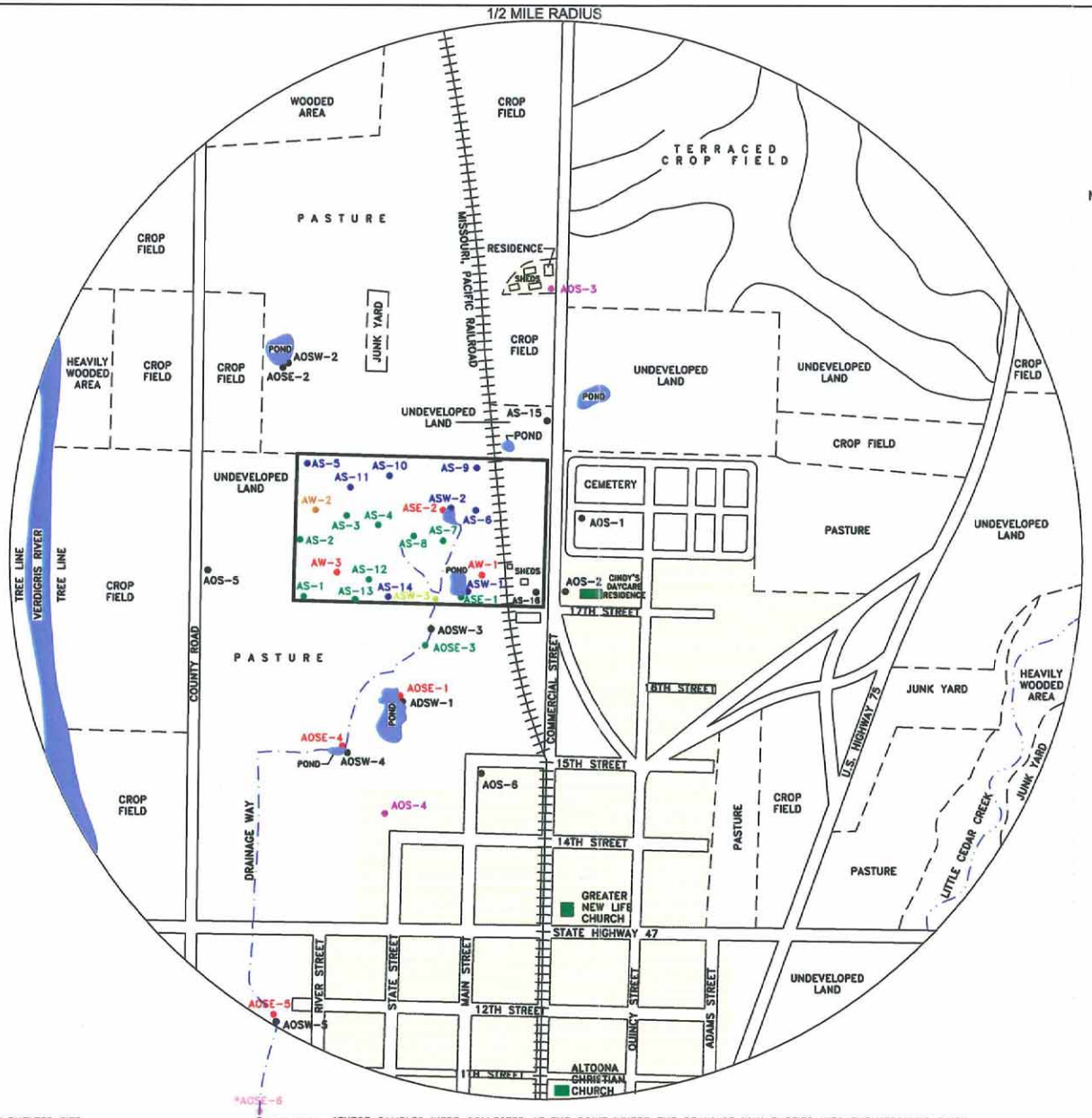
SMELTER SUBSURFACE SAMPLE LOCATION MAP
ALTOONA, KANSAS

PROJECT NO. 23902002
DRAWN BY: ALLEN
REVIEWED BY: HOWARD
DATE: 09/04/02
REVISED:
DRAWING #: Smelter

F-8

METALS KNOWN TO EXCEED STANDARDS BASED ON LABORATORY & XRF RESULTS

- NONE
- LEAD
- LEAD & ZINC
- CADMIUM
- ZINC
- ARSENIC, CADMIUM, LEAD, ZINC
- ARSENIC, CADMIUM & LEAD
- ARSENIC & LEAD
- CADMIUM, LEAD & ZINC



LEGEND:

- AOSE-5 — APPROXIMATE SAMPLE LOCATION AND SAMPLE NUMBER
- SITE PROPERTY BOUNDARY
- SENSITIVE RECEPTORS
- SURFACE WATER PATHWAYS
- RESIDENTIAL/COMMERCIAL AREAS

*1/2 MILE RADIUS EXTENDS FROM BOUNDARIES OF SMELTER SITE

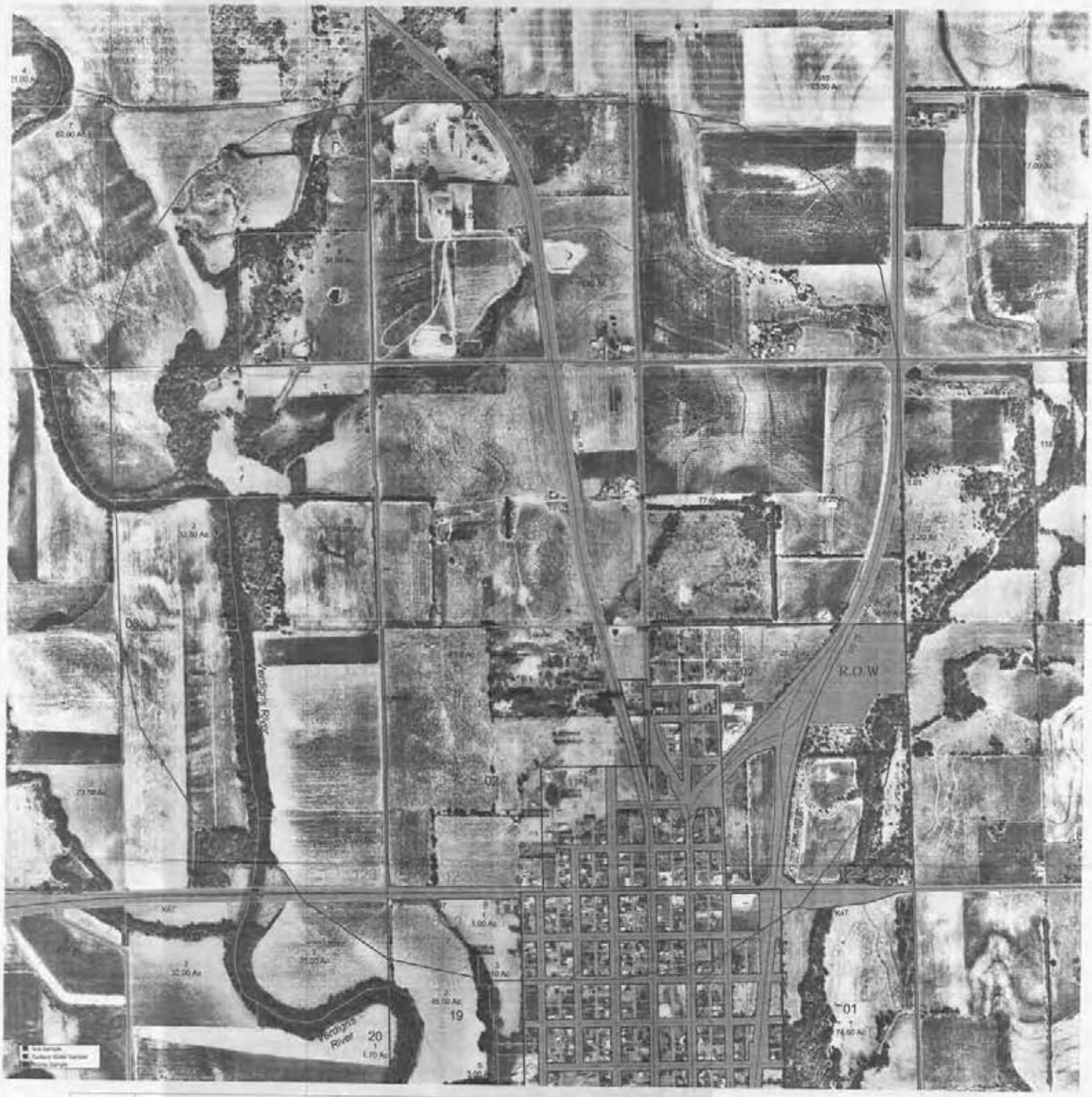
*AOSW-6 *THESE SAMPLES WERE COLLECTED AT THE POINT WHERE THE DRAINAGE WAY EMPTIES INTO THE VERDIGRIS RIVER

MAXIM TECHNOLOGIES INC

1/2 MILE RADIUS OF SMELTER SITE
WITH ONSITE AND OFFSITE SAMPLE LOCATION MAP
ALTOONA, KANSAS

PROJECT NO.	2390202
MANAGER:	ALLEN
DRAWN BY:	JJD
DATE:	02/11/02
FILE NAME:	ALTOONA ARIAL.DWG

F-9



F-10	½ MILE RADIUS OF SMELTER SITE WITH ONSITE AND OFFSITE SAMPLE LOCATIONS ALTOONA, KANSAS	MAXIM TECHNOLOGIES INC

Legend

- Townships
- Sections
- Railroads
- Corporate Limits
- Blocks
- Subdivisions
- Parcels
- Index
- Water
- Map Index
- 911 roads
- Federal highways
  - US 400
  - US 75
- Statehighways
  - K39
  - K47
- Row

Date Printed: 09-21-02 tll.
Wilson County Kansas
Scale: n.t.s.
P:/edit.apr (maps-plat w/orthophotography)

Map features are representations of original data sources and do not intend to modify or replace deeds, land surveys, or other legal instruments used to describe land ownership or use.

N
W E
S

400 0 400 800 1200 1600 Feet

F-7	SMELTER SITE BLUE LINE MAP – ONSITE SAMPLING LOCATIONS ALTOONA, KANSAS	MAXIM TECHNOLOGIES INC

APPENDIX A

CERTIFICATE OF TITLE

FINK ABSTRACT & TITLE CO., Fredonia, Ks.

(ADOPTED BY KANSAS TITLE ASSOCIATION)
(APPROVED BY KANSAS ABSTRACTERS' BOARD OF EXAMINERS)

STATE OF KANSAS, COUNTY OF WILSON, SS:

We the undersigned, being duly licensed and bonded abstracters in said County and State do hereby certify that we have examined the records in the office of the Register of Deeds, County Treasurer, District Court, Probate Court affecting the title to the following described real estate in said County and State, to wit:

Commencing at the center of Section Nine (9), Township Twenty-nine (29) South, Range Sixteen (16) East, running thence West 95 rods, thence South 54.21 rods, thence East 95 rods, thence North 54.21 rods to point of beginning.

That the deeds filed of record covering the above described real estate since January, 1904, are:

See attached Exhibit "A"- No. 1 to No. 29

The names of the previous owners of record are:

A.B. Cockerill and Mary M. Cockerill;
Cockerill Zinc Company;
Kansas Zinc Company;
George L. Edwards and Mary Jette Edwards;
George E. Nicholson and Ida H. Nicholson;
Nicholson Construction Co.;
United States Smelting Co.;
U.S. Smelting, Refining and Mining Co.;
Central Machinery & Supply Co.;
M.F. Highfill;
W.A. Wilmoth and O.M. Lloyd;
Oscar M. Lloyd;
Mrs. M.F. Highfill;
McClave State Bank of McClave, Colorado;
Mrs. M.F. Highfill Saunders;
Della Gamble;
N.K. Bickford;
J.W. Vandervoort;
Charles Starbuck;
C.J. Dutton;
Chester R. Smith;
John A. Kepler;
Frank M. Green and Beryl L. Green;
Arthur W. Pugh;
Thomas E. Relph;
Lloyde E. King and Virda L. King;
Katherine M. Relph;

That the current owners are:

David Relph and Toni Relph;

That there are no agreements concerning the smelting plant filed of record, except:

See attached Exhibit "B" – No. 30

That there are no judgments, transcripts of judgments from State or United States Courts, foreign judgments filed under the Uniform Enforcement of Foreign Judgments Act, executions from other Kansas counties, mechanic liens or other liens, attachments, suits pending, lis pendens, or court proceedings or other proceedings, on file or of record in any court of record, affecting the title to said real property, against, by or pertaining to any of the above current owners except:

None.

That there are no proceedings of record in the Probate Court of said County, pertaining to any of the above-named parties, except:

See attached Exhibit "C" – No. 31.

That there are no unreleased mortgages of record, except:

Mortgage dated July 13, 2001, from Susan Rae Relph and Edward Lee Wheeler, Jr., both single persons, and David L. Relph and Toni S. Relph, husband and wife, to Community National Bank; Filed July 18, 2001, at 10:10 A.M.; Recorded in Book 244 of Mortgages at Page 51; covering the real estate in question and other property in Neosho County.

That the records in the office of the County Treasurer show the taxes for 2001 and prior years have been paid and no federal, state, county, local, or special taxes or tax liens are unpaid.

This certificate is made upon the mutual understanding that the maker thereof has not examined all instruments and proceedings in the chain of title to above described real estate nor any of the following: (1) instruments filed in the Register of Deeds records under the Uniform Commercial Code, unless containing a legal real estate description and indexed in the numerical index; (2) proceedings which by statute are privileged and not open to public inspection; (3) taxes on oil, gas, and other leasehold estates listed separately from the taxes on the surface rights; (4) appointments of resident process service agents under K.S.A. 60-306; (5) records not to be shown under K.S.A. Chapter 58, Article 28; and that such certificate is not a guarantee of title and that the maker thereof shall not be liable for defects in the title to the above described real estate.

That the undersigned is a duly licensed and qualified abstracter in and for the County and State aforesaid, whose bond as required by law, is in force at the date of this certificate.

Dated at Fredonia, Kansas, this 8th day, of July, A.D., 2002 at 8:00 O'clock A.M.

Fink Abstract & Title Co.

By Lisette J. Chambers

Licensed & Bonded Abstracter

EXHIBIT A-1

John. Phillips (seal)
Elizabeth Phillips (seal)

State of Kansas County Wilson ss:

Be it Remembered, That on this 13 day of Jany A.D. 1904 Before me R. C. Taylor a Notary Public in and for said County and State came John W. Phillips and Elizabeth Phillips his wife to me personally known to be the same persons who executed the foregoing instrument and duly acknowledged the execution of the same.

In witness whereof, I have hereunto subscribed my name and affixed my official seal on the day and year last above written.

R. C. Taylor
Notary Public

(seal)

My Commission Expires March 24-1906

Filed for Record January 14th 1904 at 11 o'clock a m.
R. A. McGregor Register of Deeds

A. B. Lockwill & wife
to
Lockwill Gince Company

This Indenture made this 9th day of January 1904 by and between A. B. Lockwill and Mary M. Lockwill his wife as first parties, and Lockwill Gince Company, a corporation chartered and organized under the laws of the state of Wyoming, as second party. Witnesseth:

That said first parties for and in consideration of the sum of One Dollar ($1.00) and other good and valuable consideration, the receipt of which is hereby acknowledged, have sold and by these presents do sell, remise, release, quit claim, transfer and set over unto said second party, its successors and assigns forever, all their right, title, interest and estate in and to the following described tracts or parcels of land with the appurtenances, situated in the County of Wilson and State of Kansas, to wit:

(1) Lots number nine (9), ten (10), eleven (11), twelve (12), thirteen (13), fourteen (14), fifteen (15) and sixteen (16) in Block number four (4); also Lot Thirteen (13) in Block Thirty-eight (38) in the City of Altoona;

(2) That part of section nine (9) in Township Twenty-nine (29) of Range sixteen (16), more particularly described as follows, to wit:

Commencing at the center of said section nine (9), running thence south Fifty-four and 21/100 rods, thence west Eighty (80) rods, thence north Fifty four and 21/100 rods, thence east Eighty (80) rods to the place ~~and place~~ of commencement, and containing twenty-five and One-third (25 1/3) acres

exclusive of railroad right-of-way, it also being the intention, hereby sell, assign, transfer and set over to said second party, the smelter now in course of construction on the tract of land last hereinbefore described, together with all real, personal or mixed property used or for use in connection with said Smelter;

To have and to hold all of the aforesaid property unto the said party of the second part, its successors and assigns forever.

In witness whereof the said parties of the first part have hereunto set their hands and seals this 9th day of January, 1904.

A. B. Lockerill seal
Mary H. Lockerill seal

State of Kansas County of Allen ss:

I hereby certify that on the 9th day of January, 1904, before me the undersigned Notary Public in and for ~~the~~ said County and State came A. B. Lockerill and Mary H. Lockerill his wife, who are to me personally known to be the same persons who executed the above and foregoing instrument and they and each of them duly acknowledged the execution of the same.

Witness my hand and notarial seal at the City of Iola, Kan. this 9th day of January, 1904.

(seal)

W. B. Hankins
Notary Public

Commission expires Aug 12 1904

Filed for Record January 14th 1904 at 11 O'clock a.m.

W. A. McGregor Register of Deeds

Jas. Eastman et al to Geo. Weisbrod

This Indenture made this 6 day of January in the year of our Lord, One Thousand Nine Hundred and 4 between Jas. East and his wife Minnie East, and R. P. Bu[illegible] and his wife Alice Bentry, of the County of Wilson and State of Kansas of the first part, and Geo. Weisbrod of the second part.

Witnesseth, That the said parties of the first part, in consideration of the sum of Two Hundred Dollars to them duly paid, have sold and by these presents do Remise, Release and Quit-Claim to the said party of the second part, his heirs and assigns, all their right, title and interest in the tract or parcel of land situated in Wilson County, and State of Kansas, and described as follows, to-wit:

Lot Number (22) Twenty Two of Block number (49) Forty Nine of the City of Altoona, County of Wilson, State of Kansas. To Have and To Hold the above described premises, together with the appurtenances, unto the said party of the second part, his heirs and [illegible]

3-2-305

EXHIBIT A-2

A. B. Cockerill : THIS INDENTURE, Made this 22nd day of February in the year of our
to : Lord one thousand nine hundred and eight between A. B. Cockerill, a
Cockerill Zinc Co. : widower, of Nevada in the County of Vernon and State of Missouri
of the first part, and Cockerill Zinc Company, a corporation of Wy-
oming of the second part:

WITNESSETH, That the said party of the first part, in consideration of the sum of One Dollar and other valuable considerations Dollars, to him duly paid, has sold and by these presents does REMISE, RELEASE AND QUIT CLAIM, to the said party of the second part its successors and assigns, all his right, title and interest in that tract or parcel of land situated in the County of Wilson and State of Kansas, and described as follows, to-wit:

Beginning at the North East corner of the West half (½) of the South-West Quarter (¼) of Section Nine (9) Township Twenty-nine (29), Range Sixteen (16), running thence west fifteen (15) Rods, thence south fifty-four & 21/100 (54.21) Rods, thence East fifteen (15) Rods, thence North fifty-four & 21/100 (54.21) Rods to place of beginning, containing five and 1/16 acres, more or less.

TO HAVE AND TO HOLD the above described property, together with the appurtenances unto the said party of the second parties successors and assigns forever.

IN WITNESS WHEREOF, The said party of the first part has hereunto set his hand and seal the day and year above written. A. B. Cockerill (seal)

Signed, Sealed and Delivered in the presence of (seal)

STATE OF MISSOURI, VERNON COUNTY, S.S.

BE IT REMEMBERED, That on this 25th day of February A.D. 1908 before me, a Notary Public in and for said County came A. B. Cockerill, a widower, to me personally known to be the same person who executed the foregoing instrument and duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my official seal on the day and year last above written. (seal) Z. Edmond Davidson,
My commission expires Aug. 20, 1908. Notary Public in and for Vernon County, Missouri.

Filed for record March 11, 1908, at 8 A.M.

m. P. Spong Register of Deeds.

D. E. Keefe & wife : THIS INDENTURE WITNESSETH, That the grantors D.E. Keefe and Mrs.
to : Jennie C. Keefe, his wife of the city of East St. Louis in the County
D. G. Sullivan : of ST. Clair and State of Illinois for ~~and in~~ consideration of Six
Hundred ($600.00) Dollars CONVEY AND QUIT-CLAIM to D. G. Sullivan of the County of ST. Clair and State of Illinois all interest in the following described Real Estate, to-wit:

An undivived one-eighth (1/8) interest in the following described premises, to-wit: The South-west quarter of the North West Quarter and the North West Quarter of the South-West Quarter of Section Twenty-one (21), Township Twenty-seven (27), South, Range Sixteen (16) East of the 6th Principal Meridian in the County of Wilson and State of Kansas. Also an undived one-eighth (1/8) interest in the West half of Section Fourteen (14) and in forty acres off of the North part of the East half of said Section Fourteen (14), in Township Twenty-four (24) South, Range Twelve (12) East of the 6th Principal Meridian. situated in the County of Greenwood in the State of Kansas, hereby releasing and waiving

for and in the name of Neosho Presbytery the property herein before described and that I, Harvey G. Mathis stated Clerk of Neosho Presbytery by the same Resolution of Presbytery was instructed to certify to the above named Trustees being duly elected by the members of Presbytery and to join with the aforenamed trustees in the proper transfer of the aforesaid property.

Signed.

Harvy G. Mathis,
Stated Clerk of Neosho Presbytery.

STATE OF KANSAS, County of NEOSHO ~~COUNTY~~, S.S.

Be it remembered that on this 27th day of April A.D. 1908 before me, the undersigned a Notary Public in and for the County and State aforesaid, came Harvy G. Mathis, who is personally known tome to be the same person who executed the foregoing instrument of writing and such person duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written. (seal) J. L. Taylor,

Com. Exp. Feb. 26-- 1911. Notary Public.

Filed for record May 8th. 1908, at 10 o'clock A. M.

M. P. Spong Register of Deeds.

Cockerill Zinc Co : THIS INDENTURE, Made by and between Cockerill Zinc Company, a
T O : corporation chartered and organized under the laws of the State of
Cockerill Zinc Co.: Wyoming, as first party, and Cockerill Zinc Company, a corporation chartered and organized under the laws of the State of Maine, as second party, WITNESSETH:

That said first party for and in consideration of the sum of One ($1.00) Dollar and other good and valuable considerations, receipt of all which is hereby acknowledged, has sold and by these presents does hereby grant and convey unto said second party, its successors and assigns, a certain tract of land situated in Wilson County, in the State of Kansas, and more particularly described and bounded as follows, to-wit:

Commencing at the center of Section Nine (9), in Township Twenty-nine (29), Range Sixteen (16) East running thence west 95 rods, thence South 54.21 rods, thence East 95 rods, thence North 54.21 rods to point of commencement (subject however, to all conditions contained in an oil and gas lease executed July 15, 1904 by George W. DeBolt and wife to A. B. Cockerill and to the railroad right-of-way now used by the Missouri Pacific Railway Company), including the zinc smelter with the apparatus and appurtenances thereof located on said real estate, together with the trade-names, patents, patent rights and licenses used by, and the good will of the smelting business of, said first party (but excluding and reserving to said first party, its supplies, moneys, funds, book accounts, bills, debts and demands receivable);

And the said first party hereby covenants and agrees that at the delivery hereof it is the lawful owner of the premises above granted and seized of a good and indefeasible estate of inheritance therein free and clear of all incumbrance, and that it will warrant and defend the same in the quiet and peaceable possession of the said second party its successors and assigns forever, against all persons lawfully claiming the same, except as against the incumbrances, exceptions and reservations hereinbefore contained.

IN WITNESS WHEREOF, said first party has caused this instrument to be executed by its President, attested by its Secretary and sealed with its corporate seal at the City

of this 27th day of February, 1908.

Attest: Cockerill Zinc Company, of Wyoming,

W.H. Robertson, Its Secretary. By A.B. Cockerill, Its President.

STATE OF KANSAS, COUNTY OF ALLEN, S.S.

I hereby certify that on this 16 day of March, 1908, before me, the undersigned Notary Public in and for said last mentioned county and state, came A.B. Cockerill, to me personally known to be the same person who executed the foregoing written instrument as President of Cockerill Zinc Company, a corporation under the laws of the State of Wyoming, and thereupon duly acknowledged the execution of the same to be the act of said corporation.

Witness my hand and notarial seal the day and year last above written.

My commission expires Aug. 23rd. 1910. (seal) Ottis C. Westwood, Notary Public.

Filed for record May 14th. 1908, at 2 o'clock P. M.

M. F. Spong Register of Deeds.

Eastern Realty Company : KNOW ALL MEN BY THESE PRESENTS, That Eastern Realty Company

T O : a corporation organized under the laws of the State of Nebraska

George W. Stroup : in consideration of Thirty-two Hundred ($3200.) Dollars, in hand paid, does hereby Grant, Bargain, Sell, Convey and Confirm unto George W. Stroup the following described real property, situate in the County of Wilson and State of Kansas, to-wit:

The North one half of the North-east Quarter of Section number Thirty-four (34) in Township number Twenty-eight (28), Range number Seventeen (17) East of the 6th P.M.

This deed is made subject to the taxes for the year 1908 and thereafter.

together with all the tenements, hereditaments and appurtenances to the same belonging, and all the estate, Title, Claim or Demand whatsoever of the said Eastern Realty Company of in or to the same or any part thereof. TO HAVE AND TO HOLD the above described premises, with the appurtenances, unto the said above named grantee and to his heirs and assigns forever. And the said Eastern Realty Company for itself and its successors, does covenant with the said above named grantee and with his heirs and assigns, that it is lawfully seized of said premises, that they are free from incumbrance, except as above stated, that it has good right and lawful authority to sell the same, and that it will and its successors shall warrant and defend the same unto the said above named grantee and his heirs and assigns forever against the lawful claims and demands of all persons whomsoever.

IN WITNESS WHEREOF, said Eastern Realty Company has caused those presents to be signed by its President and Secretary, and its corporate seal to be hereunto affixed, this 9 day of May A.D. 1908.

Eastern Realty Company,

In presence of By W.H. Becker, President.

A L. Garrett for both Attest: Winter Byles, Secretary.

STATE OF NEBRASKA, COUNTY OF DOUGLAS, S.S.

On this 9th day of May A.D. 1908 before me, a Notary Public duly commissioned and qualified in and for said County, personally came the above named W.H. Becker President, and Winter Byles Secretary of Eastern Realty Company, who are personally known to me to be the identical persons whose names are affixed to the above Deed as President and Secretary of said corporation, and they acknowledged the instrument to be their voluntary act and deed,

EXHIBIT A-4

tion of the pre ies,and by virtue of authority in m ested by law,do hereby Give, Grant, Sell and Convey,unto the said Garrett Ellison his Heirs and assigns forever,the said lands and tenements so sold as aforesaid,situate in said State and County and described as follows,to-wit:

The South Half ($\frac{1}{2}$) of Section Two (2) Township Thirty (30) Range Thirteen (I3)East

To have and to Hold the same to the said Garrett Ellison,his heirs and assigns forever.

WITNESS MY HAND as Sheriff this 25th day of January I913

J.E.Whiteside.

Sheriff of Wilson County,State of Kansas.

The State of Kansas,

ss.

Wilson County

Be It Remembered,That on this 25th day of January I913 before me ,the undersigned,a Notary Public in and for said Cou nty and State same J.E.Whiteside Sheriff of said County,who is personally known to me to be the same person who execut the foregoing instrument, and duly acknowledged that he executed the same for the uses therein named.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Notarial Seal the day and year last above written.

My commission will expire Apr.7-I914

W.H.Edmundson Notary Public (SEAL)

Filed for record Feb.5th I913 at 2 P.M.

Register of Deeds.

J.E.Whiteside Sheriff

To

Kansas-Zinc Co.

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS,on the 25th day of March,I9Io in an action then pending in the District Court of Allen County,in the Thirty-seventh Judicial District of the State of Kansas, wherein Commonwealth Trust Company,Trustee,was plaintiff,and Cockerill-Zinc Company,a corporation,was defendant,being civil action No.8787,said plaintiff recovered a Judgment and decree in said court against said defendant Cockerill-Zinc Company for the sum of $I,389,472.00 debt and $9,I0, costs of said action, said Judgment to bear interest at the rate of six per cent (6%) per annum from the date of the rendition thereof until paid; and,

WHEREAS,it was further considered,ordered and adjudged by said court that the following described property situated in Wilson County in the State of Kansas,be sold by the Sheriff of said Wilson Countyas real estate in one parcel and as an entirety, to-wit:

A tract of land bounded as follows: Commencing at the North-east corner of the West half ($\frac{1}{2}$) of the South-west quarter ($\frac{1}{4}$) of Section Nine (9), Township Twenty-nine (29),Range Sixteen (I6),running thence west I5 rods, thence south 54.2I rods, thence east I5 rods, thence north 54.2I rods to place of beginning,containing 5 I/I6 acres,more or less,subject to all conditions contained in an oil and gas lease executed July I5,I904, by

George W.DaBolt andwife to A.B.Cockerill; also a tract of land bounded as follows: Commencing at the center of Section Nine (9),Township Twenty-nine (29),Range Sixteen(I6) East,running thence south 54.2I rods, thence west 80 rods,thence north 54.2I rods,thence east 80 rods to place of beginning,containing 25 I/3 acres exclusive of railroad right-of-way, together with the complete zinc smelting works located on the above-described lands,including among other property,all gas pipe-lines,water pipe-lines and other pipe-lines,and all regulators,meters,pumps, appliances,apparatus,buildings,boilers,engines, blowers,furnaces,kilns,retorts,condensers,crushers,tools,apparatus,machinery and appliances,implements,fixtures,furniture,supplies,stock,horses,carts,leases,contracts,rights, franchises,trade-names,patents patent rights and licenses and all other property used or for use in or about the operation or maintenance of said zinc smelting works; also the following oil and gas mining leases,to-wit:

(I) Lease dated February 7,I906 made by Martha E.Blakley as guardian of Erma Martin,a minor,to A.B.Cockerill,upon an undivided one-fourth of the East half (½) of the North-west quarter (¼) of Section Twenty-three (23),Township Twenty-eight (28), Range Sixteen (I6) East.

(2) Lease dated May 3 I905 made by E.Delp and wife to A.B.Cockerill upon the West half (½) of the South-west quarter (¼) of Section Three (3), Township Twenty-eight (28) Range Sixteen (I6).

(3) Lease dated May 8, I905 made by William M.Green and wife to A.B.Cockerill upon the North West quarter (¼) of the South West quarter (¼) of Section Fifteen (I5),Township Twenty-eight (28), Range Sixteen (I6).

(4) Lease dated October 6,I903 made by Eva L.Gillett et al to Sigmund L Wing upon the South-half (½) of the North-West quarter (¼) and the West half (½) of the South west quarter (¼) of Section (I2), Township Twenty-nine (29), Range Sixteen (I6).

(5)Lease dated May II, I906 made by Alfred Hughes and wife to the Cockerill Zinc Company upon the North 78 acres of the North-east quarter (¼) of Section Thirteen (I3), Township Twenty-eight (28), Range Fifteen (I5).

(6) Lease dated September I9,I905 made by William H. Herrington and wife to A.B.Cockeril upon the North-west quarter (¼) of Section (7), Township Twenty-nine (29),Range Seventeen (I7),containing I46.94 acres.

(7) Lease dated May 3,I905 made by A.F.Keiser and wife to A.B. Cockerill upon the North-west quarter (¼) of the North -west quarter (¼) and 5.70 acres in the South-west quarter (¼) of the North-west quarter (¼) of Section Fifteen (I5), Township Twenty -eight,Range Sixteen (I6),containing about 46 acres.

(8) Lease dated May 3, I905 made by Hance Moore and wife to A.B.Cockerill upon the North half (½) of the South-east quarter (¼) and the South half (½) of the North-west quarter (¼),the West half (½) of the North-east Quarter (¼), of the South-east Quarter (¼) of the North-east quarter(¼) and the West half (½) of the North-east quarter (¼) of the North east quarter (¼) of Section(I0) Ten ,TownshipTwenty-eight (28), Range Sixteen (I6), containing 300 acres.

(9) Lease dated September I9,I905 made by Martin McFarland and wife to A.B.Cockerill upon the North-east quarter (¼) of Section Twelve (I2),Township Twenty-nine (29),Range

41-150-152 EXHIBIT 1

Geo.L.Edwards et ux

to

Kansas% inc Company.

This Indenture,made this I2th day of June,I9I5,by and between George L. Edwards,and Mary Jette Edwards,his wife,as first parties,and Kansas% inc Company, a corporation under the laws of the State of West Virginia,as second party:-

WITNESSETH:

That said first parties,for and in consideration of the sum of One Dollar ($I.) to them in hand paid,receipt whereof is hereby acknowledged,hereby remise, release and quit-claim,unto said second party,all of their right,title,interest and estate,of,in and to certain real estate situated in Wilson County,in the State of Kansas,and more particularly bounded and described as follows,to-wit:

Beginning at the Northeast corner of the West half (½) of the Southwest quarter (¼) of Section Nine (9),Township Twenty Nine (29),Range Sixteen (I6),running thence West I5 rods,thence South 54.2I rods,thence East I5 rods,thence North 54.2I rods,to place of beginning,containing 5-I/I6 acres,more or less,subject to all conditions contained in an oil and gas lease executed July I5,I904, by George W.Debolt,and wife,to A.B.Cockerill;also a tract of land bounded as follows: Commencing at the center of Section Nine (9),Township Twenty-nine (29),Range Sixteen (I6) East,running thence South 54.2I rods,thence West 80 rods,thence North 54.2I rods,thence East 80 rods to place of beginning,containing 25-I/3 acres,exclusive of Railroad right-of-way,together with the complete zinc smelting works located on the above described lands,including among other property all gas pipe-lines,water pipe-lines and other pipe-lines,and all regulators, meters,pumps, appliances,apparatus,buildings,boilers,engines,pumps,blowers,furnaces,kilns, retorts,condensers,crushers,tools,apparatus,machinery and appliances,implements, fixtures,furniture,supplies,stock,horses,carts,leases,contracts,rights, and licenses,and all other property used or for use in or about the operation or maintenance of said % inc smelting works.

This deed is given for the purpose of correcting a certain assignment of certificate of purchase from the grantors hereof,to said Kansas% inc Company, which said assignment of certificate of purchase was dated March IIth,I9II,and is recorded in Book 42 at page I53,in the office of the Register of Deeds of said County, and which said assignment of certificate of purchase fails to describe the property further than by reference to said certificate of purchase,and this deed is given to supply an accurate description of the property intended to be conveyed by said assignment of certificate of purchase.

IN WITNESS WHEREOF,the said first parties have hereunto set their hands the day and year first above written.

Geo.L.Edwards (SEAL)

Mary Jette Edwards (SEAL)

State of Missouri)
County of St.Louis)

I hereby certify that on the I2th day of June,I9I5,before me,the undersigned, Notary Public in and for said last mentioned county and State,came George L.Edwards and Mary Jette Edwards,his wife,to me personally known to be the same persons who executed the foregoing written instrument,and thereupon duly acknowledged the execution of the same.

Witness my hand and Notarial Seal at the County of St .Louis,State of Missouri, on the day and year last above written.

(SEAL) V.O.Gregory-Notary Public

My commission expires October 5th I9I5

Filed for record June 2I-I9I5 at 4 P.M.

[illegible] Register of Deeds.

George E.Nicholson et ux

to

Kansas Zinc Company. QUIT CLAIM DEED.

THIS INDENTURE,made this I2th day of June,I9I5,by and between George E.Nicholson and Ida H.Nicholson his wife,as first parties,and Kansas Zinc Company,a corporation under the laws of the State of West Virginia,as second parties:

WITNESSETH:

That said first parties,for and in consideration of the sum of One Dollar ($I.) to them in hand paid,receipt whereof is hereby acknowledged,hereby remise,release,and quit-claim,unto said second party,all of their right,title,interest and estate,of,in and to certain real estate,situated in Wilson County,in the State of Kansas and more particularly bounded and described as follows,to-wit:

Beginning at the Northeast corner of the West half (½) of the Southwest quarter (¼) of Section Nine (9),Township Twenty-nine (29),Range Sixteen (I6),running thence West I5 rods,thence South 54.2I rods,thence East I5 rods,thence North 54.2I rods to place of beginning,containing 5-I/I6 acres,more or less,subject to all conditions contained in an oil and gas lease executed July I5,I904,by George W.Dobolt and wife to A.B.Cockerill: also a tract of land bounded as follows: Commencing at the center of section Nine (9) , Township Twenty-nine (29) Range Sixteen (I6) East,running thence South 54.2I rods,thence West 80 rods,thence North 54.2I rods,thence East 80 rods,to place of beginning,containing 25-I/3 acres,exclusive of railroad right-of-way,together with the complete zinc smelting works,located on the above described lands,including among other property all gas pipe-lines,water pipe-lines and other pipe-lines,and all regulators,meters,pumps, appliances,apparatus,buildings,boilers,engines,pumps,blowers,furnaces,kilns,retorts,condensers,crushers,tools,apparatus,machinery and appliances,implements,fixtures,furniture, supplies,stock,horses,carts,leases,contracts,rights,franchises,trade-names,patents,patent rights and licenses and all other property used or for use in or about the operation or maintenance of said Zinc Smelting Works.

This deed is given for the purpose of correcting a certain assignment of certif-

EXHIBIT A-6

State of Missouri)
County of St.Louis)

I hereby certify that on the I2th day of June,I9I5,before me,the undersigned, Notary Public in and for said last mentioned county and State,came George L.Edwards and Mary Jetta Edwards,his wife,to me personally known to be the same persons who executed the foregoing written instrument,and thereupon duly acknowledged the execution of the same.

Witness my hand and Notarial Seal at the County of St .Louis,State of Missouri, on the day and year last above written.

(SEAL) V.C.Gregory-Notary Public

My commission expires October 5th I9I5

Filed for record June 2I-I9I5 at 4 P.M.

Register of Deeds.

George E.Nicholson et ux

to

Kansas Zinc Company.

41-151

QUIT CLAIM DEED.

THIS INDENTURE,made this I2th day of June,I9I5,by and between George E.Nicholson and Ida H.Nicholson his wife,as first parties,and Kansas Zinc Company,a corporation under the laws of the State of West Virginia,as second parties:

WITNESSETH:

That said first parties,for and in consideration of the sum of One Dollar ($I.) to them in hand paid,receipt whereof is hereby acknowledged,hereby remise,release,and quit-claim,unto said second party,all of their right,title,interest and estate,of,in and to certain real estate,situated in Wilson County,in the State of Kansas and more particularly bounded and described as follows,to-wit:

Beginning at the Northeast corner of the West half (½) of the Southwest quarter (¼) of Section Nine (9),Township Twenty-nine (29),Range Sixteen (I6),running thence West I5 rods,thence South 54.2I rods,thence East I5 rods,thence North 54.2I rods to place of beginning,containing 5-I/I6 acres,more or less,subject to all conditions contained in an oil and gas lease executed July I5,I904,by George W.Dobolt and wife to A.B.Cockerill: also a tract of land bounded asfollows: Commencing at the center of section Nine (9) , Township Twenty-nine (29) Range Sixteen (I6) East,running thence South 54.2I rods,thence West 80 rods,thence North 54.2I rods,thence East 80 rods,to place of beginning,containing 25-I/3 acres,exclusive of railroad right-of-way,together with the complete zinc smelting works,located on the above described lands,including among other property all gas pipe-lines,water pipe-lines and other pipe-lines,and all regulators,meters,pumps, appliances,apparatus,buildings,boilers,engines,pumps,blowers,furnaces,kilns,retorts,condensers,crushers,tools,apparatus,machinery and appliances,implements,fixtures,furniture, supplies,stock,horses,carts,leases,contracts,rights,franchises,trade-names,patents,patent rights and licenses and all other property used or for use in or about the operation or maintenance of said Zinc Smelting Works.

This deed is given for the purpose of correcting a certain assignment of certif-

assignment of certificate of purchase was dated March IIth-I9II, and is recorded in Book 42, at page I53, in the office of the Register of Deeds of said County, and which said assignment of certificate of purchase fails to describe the property further than by reference to said certificate of purchase, and this deed is given to supply an accurate description of the property intended to be conveyed by said assignment of certificate of purchase.

IN WITNESS WHEREOF, the said first parties have hereunto set their hands the day and year first above written.

George E. Nicholson (SEAL)
Ida H. Nicholson (SEAL)

STATE OF MISSOURI)
COUNTY OF JACKSON) SS

I hereby certify that on the I4th day of June, I9I5, before me, the undersigned, Notary Public in and for said last mentioned County and State, came George E. Nicholson and Ida H. Nicholson, his wife, to me personally known to be the same persons who executed the foregoing written instrument, and thereupon duly acknowledged the execution of the same.

Witness my hand and Notarial Seal at the City of Kansas City, County of Jackson, State of Missouri, on the day and year last above written.

(SEAL)

W.W. Pollock-Notary Public

My commission expires on the 29th day of January I9I7

Filed for record June 2I I9I5 at 4/05 P.M.

W. G. Fink Register of Deeds.

Kansas Zinc Company

to

Nicholson Construction Co.

THIS INDENTURE, Made on this I2 day of June, I9I5, between the Kansas Zinc Company, a corporation organized and existing under the laws of the State of West Virginia, of the first part, and the Nicholson Construction Company, a corporation duly organized, of the second part;

WITNESSETH:

THe the first party, for and in consideration of the sum of Seventeen Thousand ($I7,000) Dollars, to it duly paid by the second party, the receipt of which is hereby acknowledged, hath sold, and by these presents doth grant, sell, convey and deliver, unto said second party its successors and assigns, all of its right, title and interest, of, in and to the following described property, located in the County of Wilson, and State of Kansas, to-wit:

A tract of land bounded as follows: Beginning at the Northeast corner of the West half (½) of the Southwest quarter (¼) of Section Nine (9), Township Twenty-nine (29), Range Sixteen (I6), running thence West I5 rods, thence South 54.2I rods, thence East I5 rods, thence North 54.2I rods to place of beginning,

assignment of certificate of purchase was dated March IIth.I9II, and is recorded in Book 42, at page I53, in the office of the Register of Deeds of said County, and which said assignment of certificate of purchase fails to describe the property further than by reference to said certificate of purchase, and this deed is given to supply an accurate description of the property intended to be conveyed by said assignment of certificate of purchase.

IN WITNESS WHEREOF, the said first parties have hereunto set their hands the day and year first above written.

George E.Nicholson (SEAL)
Ida H.Nicholson (SEAL)

STATE OF MISSOURI)
COUNTY OF JACKSON)SS

I hereby certify that on the I4th day of June, I9I5, before me, the undersigned, Notary Public in and for said last mentioned County and State, came George E. Nicholson and Ida H.Nicholson, his wife, to me personally known to be the same persons who executed the foregoing written instrument, and thereupon duly acknowledged the execution of the same.

Witness my hand and Notarial Seal at the City of Kansas City, County of Jackson, State of Missouri, on the day and year last above written.

(SEAL)

W.W.Pollock-Notary Public

My commission expires on the 29th day of January I9I7

Filed for record June 2I I9I5 at 4/05 P.M.

W.G. Finch Register of Deeds.

Kansas Zinc Company

to

Nicholson Construction Co.

41-152

THIS INDENTURE, Made on this I2 day of June, I9I5, between the Kansas Zinc Company, a corporation organized and existing under the laws of the State of West Virginia, of the first part, and the Nicholson Construction Company, a corporation duly organized, of the second part;

WITNESSETH:

THe the first party, for and in consideration of the sum of Seventeen Thousand ($I7,000) Dollars, to it duly paid by the second party, the receipt of which is hereby acknowledged, hath sold, and by these presents doth grant, sell, convey and deliver, unto said second party its successors and assigns, all of its right, title and interest, of, in and to the following described property, located in the County of Wilson, and State of Kansas, to-wit:

A tract of land bounded as follows: Beginning at the Northeast corner of the West half ($\frac{1}{2}$) of the Southwest quarter ($\frac{1}{4}$) of Section Nine (9), Township Twenty-nine (29), Range Sixteen (I6), running thence West I5 rods, thence South 54.2I rods, thence East I5 rods, thence North 54.2I rods to place of beginning,

oil and gas lease executed July I5,I904, by George W.Debolt and wife, to A.B.Cockerill; also a tract of land bounded as follows: Commencing at the center of Section Nine (9), Township Twenty-nine (29) Range Sixteen (I6) East, running thence South 54.2I rods, thence West 80 rods, thence North 54.2I rods, thence East 80 rods to place of beginning, containing 25-I/3 acres, exclusive of rail road right-of-way, together with the complete zinc smelting works located on the above described lands, including among other property, all gas pipe-lines, water pipe-lines, and other pipelines, and all regulators, meters, pumps, appliances, apparatus, buildings, boilers, engines, pumps, blowers, furnaces, kilns, retorts, condensers, crushers, tools, apparatus, machinery, and appliances, implements, fixtures, furniture, supplies, stock, horses, carts, leases, contracts, rights, franchises, trade-names, patents, patent rights and licenses, and all other property used or for use in or about the operation or maintenance of said zinc smelting works. ($I7-00 U.S.Rev. attached.)

It is the intention of first party to convey only such right, title and interest as it has in the property above described, and to convey all of that interest only to second party.

IN WITNESS WHEREOF, the said first party has hereunto caused its corporate name to be subscribed, by its Vice-President, attested by its Secretary, with its corporate seal hereto affixed, all by authority of its Board of Directors, on the day and year first above written.

(corporate seal)

Kansas Zinc Company

By Geo.L.Edwards
Vice-President.

Attest:

E.J.Mudd-Secretary

STATE OF MISSOURI)
: SS.
City of St.Louis)

I hereby certify that on the I2th day of June, A.D.I9I5, before me, the undersigned, Notary Public in and for said last mentioned City and State, came Geo.L.Edwards, to me personally known to be the same person who executed the foregoing written instrument as Vice-President of the Kansas Zinc Company, a corporation, and thereupon duly acknowledged the execution of the same to be the act and deed of said corporation.

WITNESS my hand and Notarial Seal at the City of St.Louis, Missouri, on the day and year last above written.

J.E.Cantwell-Notary Public
for the City of St.Louis

(SEAL)

(seal shows John E.Cantwell)

My commission expires on the I5th day of Dec.I9I7.

Filed for record June 2I-I9I5 at 4/I0 P.M.

W. G. Fink Register of Deeds.

EXHIBIT A-8

50 of 137

Term expires Aug.6-1917

(10 ¢ U.S.Revenue attached.)

FILED FOR RECORD June 15-1915 at 8 A.M.

W.A. Finks Register of Deeds.

Nicholson ConstructionCO.

to

United States Smelting Co.

DEED

THIS INDENTURE,made and entered into by and between the Nicholson Construction Company,a corporation under the laws of the State of West Virginia,and United StatesSmelting Company,a corporation under the laws of the State of Maine,as second party:

WITNESSETH:

THAT said first party for and in consideration of the sum of Two hundred and twenty five thousand ($25000.00) Dollars,receipt whereof is hereby acknowledged,hath sold,and by these presents doth grant and convey unto said second party,certain real estate situated in Wilson County in the State of Kansas,and more particularly described and bounded as follows,to-wit:

Beginning at the Center of Section Nine (9),Township Twenty-nine (29) South,Range Sixteen (16) East,running thence West 95 rods,thence South 54.21 rods,thence East 95 rods,thence North to place of beginning,containing 30-19/48 acres,more or less,together with the zinc Smelting works located thereon,and all the appurtenances thereof,including gas pipelines,water pipelines,and other pipelines,and all regulators,meters,pumps,appliances,apparatus,buildings boilers,engines,pumps ,blowers,furnaces,kilns,retorts,condensers,crushers,tools,machinery and appliances,implements,fixtures,furniture,supplies,stock horses,carts,leases,contracts,rights, franchises,trade-names,patents,patent rights and licences,and all other property used or for use in or about the operation or maintenance of said zinc Smelting works.

And the said first party covenants and agrees that at the delivery hereof,it is possessed in fee simple of the real estate hereinbefore described,together with the appurtenances thereof,and that the same is free and clear of encumbrance,and that it will forever warrant and defend the same in the quiet and peaceable possession of the said second party its successors and assigns, against all persons lawfully claiming the same.

IN WITNESS WHEREOF,said first party has duly caused this instrument to be dated and signed by its President attested by its Secretary or Assistant Secretary,and sealed with its corporate seal,at Kansas City ,Missouri,on this 14th day of June,1915.

Corporate Seal)

Nicholson Construction Company

Attest:

By Geo.E.Nicholson-President

Ralph E.Nicholson-Secretary.

($225.00)U.S.Revenue attached.

State of Missouri)
County of Jackson)SS

I hereby certify that on the 14th day of June,1915 before me,the undersigned,a Notary Public,in and for said last mentioned County and State,came George E.Nicholson,to me personally known to be the same person who executed the foregoing written instrument,as President of

Term expires Aug.6-1917

(10 ¢ U.S.Revenue attached.)

Filed For Record June 15-1915 at 8 A.M.

W.O. Fink Register of Deeds.

Nicholson ConstructionCo.

to

United States Smelting Co.

DEED

THIS INDENTURE,made and entered into by and between the Nicholson Construction Company,a corporation under the laws of the State of West Virginia,and United StatesCSmelting Company,a corporation under the laws of the State of Maine,as second party:

WITNESSETH:

THAT said first party for and in consideration of the sum of Two hundred and twenty five thousand ($225000.00) Dollars,receipt whereof is hereby acknowledged,hath sold,and by these presents doth grant and convey unto said second party,certain real estate situated in Wilson County in the State of Kansas,and more particularly described and bounded as follows,to-wit:

BEginning at the Center of Section Nine (9),Township Twenty-nine (29) South,Range Sixteen (16) East,running thence West 95 rods,thence South 54.21 rods,thence East 95 rods,thence North to place of beginning,containing 30-19/48 acres,more or less,together with the zinc Smelting works located thereon,and all the appurtenances thereof,including gas pipelines,water pipelines,and other pipelines,and all regulators,meters,pumps,appliances,apparatus,buildings boilers,engines,pumps ,blowers,furnaces,kilns,retorts,condensers,crushers,tools,machinery and appliances,implements,fixtures,furniture,supplies,stock horses,carts,leases,contracts,rights, franchises,trade-names,patents,patent rights and licences,and all other property used or for use in or about the operation or maintenance of said zinc Smelting works.

And the said first party covenants and agrees that at the delivery hereof,it is possessed in fee simple of the real estate hereinbefore described,together with the appurtenances thereof,and that the same is free and clear of encumbrance,and that it will forever warrant and defend the same in the quiet and peaceable possession of the said second party its successors and assigns, against all persons lawfully claiming the same.

IN WITNESS WHEREOF,said first party has duly caused this instrument to be dated and signed by its President attested by its Secretary or Assistant Secretary,and sealed with its corporate seal,at Kansas City ,Missouri,on this 14th day of June,1915.

Corporate Seal) Nicholson Construction Company

Attest: By Geo.E.Nicholson-President

Ralph E.Nicholson-Secretary. ($225.00)U.S.Revenue attached.

State of Missouri)
County of Jackson)SS

I hereby certify that on the 14th day of June,1915 before me,the undersigned,a Notary Public,in and for said last mentioned County and State,came George E.Nicholson,to me personally known to be the same person who executed the foregoing written instrument,as President of the Nicholson Construction Company,a corporation,and thereunpon duly acknowledged the execution

EXHIBIT A-9

In Witness Whereof, I, Simon Coats, Sheriff as aforesaid have hereunto set my hand this 7 day of february A.D 1918.

Simon Coats, Sheriff
of Wilson County, Kansas..

State of Kansas,
~~Wilson~~ County, of Wilson SS:

Be it remembered that on this 7th day of february A.D 1918 before me, the undersigned Clerk of the District Court, for the county and state aforesaid came Simon Coats, Sheriff of the said County of Wilson and state of Kansas, who is personally known to me to be the same person who executed the foregoing instrument of writing and duly acknowledged the execution of the same as Sheriff aforesaid.

In Witness Whereof, I have hereunto set my hand and affixed my official seal the day and year last above written.

John E.Mc Cray, Clerk Dist_ Cou
of Wilson County, Kansas

(District Clerk seal)
($ 8.50 U.S Rev. attached)

Filed for record Feb. 7, 1918 at 4 P.M

G. W. Trottler
Register of Deeds.

UNITED STATES SMELTING CO
TO
U.S SMELTING & REF. & Min. CO

Know all men by these presents; That the United States Smelting Company, a corporation organized and existing under the laws of the state of Maine, in consideration of One Dollar to it in hand paid by the United States Smelting Refining and Mining Company, a corporation organized and existing under the laws of the state of Maine the receipt of which is hereby acknowledged, has conveyed and quitclaimed, and does hereby convey and quitclaim, to the United States Smelting Refining and Mining Company , its successors and assigns, all the real estate and property now owned by said United States Smelting Company in Wilson County, Kansas, together with all property and rights pertaining thereto, including without limitation of the foregoing general grant, the following described property located at or near Altoona, in Wilson County, Kansas:

Beginning at the center of Section Nine (9), Township Twenty nine (29) South, Range Sixteen (16) East, running thence West 95 rods; thence South 54.21 rods running thence East 95 rods; thence North to place of beginning containing 30- 19/48 acres more or less;

together with the Zinc Smelting works located thereon, and all the appurtenances thereof, including gas pipelines, water pipelines and other pipe lines, and all regulators, meters pumps, appliances, apparatus, buildings, boilers, engines, pumps, blowers, furnaces, kilns, retorts, condensors, crushers, tools, machinery and appliances, implements, fixtures, furniture, supplies, stock, horses, carts, leases, contracts, rights, franchises, tradenames patents, patent rights and licenses, and all other property used or for use in or about the operation or maintenance of said zinc smelting works.

To Have and to Hold to the United States Smelting Refining and Mining Company, its successors and assigns forever.

In Witness Whereof the said United States Smelting Company, by its president and Secretary duly authorized, has hereunto set its corporate name and seal this Thirty first day of December 1917.

United States Smelting Company.
By W.G Sharp President.
F.W Batchelder, Secretary.

Witnessed (Cor seal)
W.S Tice

Commonwealth of Massachusetts.
Suffolk, SS: Boston, December 31, 1917.

Personally appeared William G. Sharp, president and F.W Batchelder Secretary of the United States Smelting Company, and acknowledged the foregoing deed by them executed in behalf of said United States Smelting Company to be the free act and deed of said corporation. Before me. -

(seal) Philip E. Coyle, Notary Public.
My commission xpires Aug 28, 1919
Filed for record Feb. 4, 1918 at 8 A._M

G. W. Trottler
Register of Deeds

41-221

EXHIBIT A-10

U.S SMELTING REF.& MINING CO.

TO

CENTRAL MACHINERY & SUPPLY CO QUIT CLAIM DEED.

This indenture made onithe 27th day of February A.D One Thousand Nine Hundred and Eighteen by and between United States Smelting, Refining & Mining Company a corporation duly organized under the laws of the state of Maine, of the county of Cumberland, state of Maine, party of the first part and, The Central Machinery & Supply Company, a corporation organized under the laws of the state of Kansas, of Iola of the county of Allen, state of Kansas party of the second part,

Witnesseth, That the said party of the first part, in consideration of the sum of One Dollar to it in hand paid by the party of the second part, the receipt for which is hereby acknowledged, does, by these presents, remise, release, and forever quit claim unto the said party of the second part, the following described lots, tracts or parcels of land lying and being and situate in the county of Wilson and state of Kansas, to-wit:

beginning at the center of Section Nine (9), Township Twenty-nine (29), South range Sixteen (16) East, running thence West Ninety Five (95) rods; thence South Fifty four and Twenty one hundredths (54.21) rods; thence East ninety five (95) rods; thence North to place of beginning, containing Thirty and nineteen forty-eighths (30-19/48) acres more or less.

($1.50) U.S Rev. Attached)

~~This deed of quit claim being made to release~~

To have and to hold the same, with all the rights, immunities, privileges and appurtenances thereto belonging, unto the said party of the second part and unto its and assigns forever, so that neither the said party of the first part nor, nor any other person or persons, for it or in its name or behalf, shall or will hereafter claim or demand any right or title to the aforesaid premises or any part thereof, but they and each of them shall, by these presents, be excluded and forever barred.

In Witness Whereof, the said party of the first part has caused these presents to be signed by its vice president and attested by its assistant secretary and the corporate seal to be hereto attached, the day and year first above written.

The United States Smelting, Refining & Mining Company.

Carl W. Rice (Corporate seal) By C.G Rice, vice president.

Assistant Secretary

State of Massachusetts, County of Suffolk, SS:

On this 27 day of February, 1918 before me appeared C.G Rice, to me personally known, who being by me duly sworn, did say that he is the vice- president of United States Smelting, refining & Mining Company a corporation, and that the seal affixed to the foregoing instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of the Executive Committee of its Board of Directors, and said C.G Rice acknowledged said instrument to be the free act and deed of said corporation.

In Witness Whereof, I have hereunto set my hand and affixed my notarial seal at my office in Boston, Massachusetts the day and year first above written.

My commission expires Aug. 28, 1919.

(Seal) Philip E Coyle, Notary Public.

Filed for record March 19, 1918 at 4 P.M

Register of Deeds

DEED RECORD No 54. 622

EXHIBIT A-11

Hutchinson Office Supply & Printing Co. 4319

FROM
Central Mch & Supply Co

TO
Marion Highfill

Filed for Record on the 7 day of Aug
1920, at 9 o'clock A M.
J. W. Tuttle
Register of Deeds.

(Bracketed in Book 62, Page 130.)

This Indenture, Made this 4th day of July, A. D. 1920, between The Central Machinery & Supply Company a corporation of Kansas of Allen County, in the State of Kansas of the first part, and M. F. Highfill of Wilson County, in the State of Kansas, of the second part.

WITNESSETH, That said party of the first part, in consideration of the sum of Fifteen Hundred & 00/100 ~~and~~ DOLLARS, the receipt whereof is hereby acknowledged, does by these presents grant, bargain, sell and convey unto said party of the second part, his heirs and assigns, all the following described real estate, situated in the County of Wilson, and State of Kansas, to-wits

Beginning at the center of Section 7, Township 29 South Range 16 east, running thence west to the right of way of the Missouri Pacific Railroad Company, thence in a Southerly direction along the east line of said right of way to a point fifty four and twenty one hundredths (54.21) rods South of the half Section line, thence east to the half Section line at a point of fifty four and twenty one hundredths (54.21) rods south of the place of beginning, thence North to beginning, containing approximately five acres.

($1.50 R. S. Rev. Attached)

TO HAVE AND TO HOLD THE SAME, Together with all and singular the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining, forever.

And the said party of the first part used for its, ~~heirs~~, executors or administrators, does hereby covenant, ~~promise~~ and agree, to and with said party of the second part, that at the delivery of these presents it is lawfully seized in its own right, of an absolute and indefeasible estate of inheritance, in fee simple, of and in all and singular the above granted and described premises, with the appurtenances; that the same are free, clear, discharged and unincumbered of and from all former and other grants, titles, charges, estates, judgments, taxes, assessments and incumbrances, of what nature or kind soever;

and that it will warrant and forever defend the same unto said party of the second part, his heirs and assigns, against said party of the first part, its ~~heirs~~, and all and every person or persons whomsoever lawfully claiming or to claim the same.

IN WITNESS WHEREOF, The said party of the first part has hereunto set its hand, the day and year first above written.

Attest, J. H. Campbell
Secretary

(Corporate Seal)

The Central Machinery & Supply Company
By D. C. Morrow, President

STATE OF ~~KANSAS~~, Missouri Jackson COUNTY, ss.

BE IT REMEMBERED, That on this 20th day of July, A. D. 1920, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came D. C. Morrow President and J. H. Campbell Secretary of the Central Machinery & Supply Co for and on behalf of the Central Machinery & Supply Company who are personally known to me to be the same persons who executed the within instrument of writing, and such persons duly acknowledged the execution of the same, as the act and deed of said corporation.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official seal, the day and year last above written.

Seal

Frances Brazeale
Notary Public.

My Commission (~~Term~~ Expires Feb 8, 1923)

EXHIBIT A-12

FREDONIA CEMETERY ASSN
TO
JUNIOUS CLIFF.

CEMETERY DEED.

THIS INDENTURE WITNESSETH:

The City of Fredonia, to All to Whom this Concerns:

KNOW YE, That this is to certify that Junious Cliff has complied with the requirements of the Resolution of the Mayor and Council of the City of Fredonia, with reference to the sale of lots in the Cemetery of said City, adopted September 20th, 1872, and paid to the City Clerk the sum of $5.00, and is in consideration thereof, the owner of Lot No. 197 in the said Cemetery of the City of Fredonia. Said lot to be used exclusively for the interment of the dead, and the erection of stones, monuments and sepulchral structures, and the cultivation of shrubs and plants.

WITNESS MY HAND AND THE COUNTERSIGNING BY THE City Clerk, under the seal of said City, this 22nd day of May, A. D. 1875.

(Clerk's Seal) R. M. Foster,
Mayor.

Countersigned;
P. W. Bahl,
City Clerk.

Filed for record August 23, 1921 at 10 A. M. G. W. Trues
Register of Deeds.

MACHINERY & SUPPLY CO
TO
W. A WILMOTH ET AL

WARRANTY DEED.

This Indenture made and entered into this 1st day of August 1921, by and between The Machinery and Supply Corporation, a corporation organized under the laws of the state of Kansas, (the name of which corporation was formerly The Central Machinery and Supply Company, but which was changed agreeable to statute, to The Machinery and Supply Corporation), of Iola county of Allen, state of Kansas party of the first part, and W. A Wilmoth and O. M Lloyd, of Altoona, county of Wilson, state of Kansas parties of the second part.

Witnesseth, that the said party of the first part, in consideration of the sum of Three hundred Fifty Dollars to the party of the first part paid by the parties of the second part, the receipt of which is hereby acknowledged, does by these presents grant, bargain, sell, convey and confirm unto the said parties of the second part, their heirs and assigns, all the following described real estate situated in the county of Wilson and state of Kansas to wit;

Beginning at the center of Section Nine (9), Township Twenty nine (29) south, Range Sixteen (16) east, running thence west Ninety five (95) rods, thence south fifty-four and twenty one hundredths (54.21) rods, thence east ninety five (95) rods, thence North to place of beginning, containing thirty and nineteen forty eighths (30-19/48) acres, more or less, excepting approximately five (5) acres heretofore conveyed to Marion Highfill, described as follows; Beginning at the center of Section Nine (9) Township Twenty nine (29) south, Range Sixteen (16) east, running thence west to the right of way of the Missouri Pacific Railroad Company, thence in a southerly direction along the east line of said right of way to a point fifty four and twenty one hundredths (54.21) rods south of the half section line, thence east to the half section line at a point of fifty four and twenty one hundredths (54.21) rods south of the place of beginning, thence north to beginning, this instrument covering twenty five and nineteen forty eighths (25-19/48) acres more or less.

To have and to hold the premises aforesaid, with all and singular the rights, privileges, appurtenances and immunities thereto belonging, or in anywise appertaining unto the said parties of the second part, and unto their heirs and assigns forever, the said party of the first part hereby covenanting that it is lawfully seized of an indefeasible estate in fee in the premises herein conveyed; that it has good right to convey the same, and that the said premises are free and clear of any incumbrances done or suffered by it or those under whom it claims, and that it will warrant and defend the title to the said premises unto the said parties of the second part and unto their heirs and assigns forever, against the lawful claims and demands of all persons whomsoever, excepting taxes for year 1921, all personal property now on said premises

to remain the property of party of the first part.

In Witness Whereof the said party of the first part has caused these presents to be signed in its corporate name, by its vice president, and its corporate seal to be hereto affixed attested by its secretary, on the day and year first above written.

(50 cts U. S Rev. attached)

(Corporate Seal)

The Machinery & Supply Corporation
By Loy T LeBow, vice president

Attest;
Jos v. Henry, secretary

State of Missouri, County of Jasper SS:

On this 1 day of August 1921, before me a notary public in and for the county and state aforesaid came Loy T LeBow vice president of The Machinery and Supply Corporation (a corporation organized under the laws of the state of Kansas), personally known to me as being the identical person whose name is affixed to the foregoing deed as vice president of The Machinery and Supply Corporation, and in behalf of said corporation acknowledged the same to be his own voluntary act and deed, and that he voluntarily affixed thereto the corporate seal of said company and caused the same to be attested by the secretary of said company, and that said deed was so executed by order of the Board of Directors of said Company.

In Testimony Whereof I have hereunto set my hand and notarial seal at my office in the city of Joplin, Jasper County, Missouri this 1 day of August 1921.

My commission expires April 27, 1924.

(seal)

W. E Maddox, NOtary Public
Jasper County, Missouri

Filed for record August 24, 1921 at 8 AM

G. W. Tuttle
Register of Deeds.

ALTOONA CEMETERY ASS'N.
TO
CHAS. H. SMITH.

CEMETERY DEED.

KNOW ALL MEN BY THESE PRESENTS:

That the ALTOONA CEMETERY ASSOCIATION, of Altoona, in the CoUnty of Wilson, and State of Kansas, for and in consideration of Twenty Dollars, paid by Chas H. Smith to said Association, the receipt whereof is hereby acknowledged, do hereby bargain, sell, and convey to Chas. H. Smith and to his heirs forever, Lot No. 52 Section N. E. on the plat of said cemetery grounds containing 260 square feet.

TO have and to hold said lot in fee simple to grantee and his heirs forever for the purposes of sepulture alone, subject to the provisions of the Articles of Incorporation ~~of said Corporation~~ of said Association now in force, or which may hereafter be adopted, for the government of said Association; and subject to all By-Laws, Rules and Regulations now in force or which may hereafter be adopted by said Association, prescribing the rights and duties of the officers, lot owners, and all others connected with said Association, and regulating interments, improvements and embellishments within said cemetery grounds.

IN TESTIMONY WHEREOF, The said Altoona Cemetery Association has caused these presents to be signed by their President and countersigned by their Secretary, and the seal of the Association to be hereunto affixed this 5th day of July, A. D. 1921.

(no corporate seal)

Attest: Mabel Stanley.
Secretary

W. H. Gillett,
President.

EXHIBIT A-13

62-309

Intercontinental Office Supply & Printing Co.—Topeka

FROM	STATE OF KANSAS, WILSON COUNTY, ss.
W. A. Wilmoth et ux	This instrument was filed for record on the 5 day of January, A. D. 1922, at 1 o'clock 1' M.
TO	G. W. Tuttle, Register of Deeds.
O. M. Lloyd	By ....., Deputy.

THIS INDENTURE, Made this 31st day of December, in the year of our Lord One Thousand Nine Hundred and Twenty One between W. A. Wilmoth and Olive R. Wilmoth husband and wife of Altoona, in the County of Wilson and State of Kansas, of the first part, and Oscar M. Lloyd, of the second part

WITNESSETH, That the said parties of the first part, in consideration of the sum of One dollar and dissolution of partnership DOLLARS, to them duly paid, have sold, and by these presents do grant and convey to the said party of the second part, his heirs and assigns, all that tract or parcel of land situate in Wilson County, and State of Kansas, and described as follows, to-wit: Lots Thirteen (13) Fourteen (14) and Twelve (12) in Block Four (4) of Hardy Addition to Altoona Kansas and a tract of land in the North east Quarter of the South west Quarter of Section Nine (9) Township (29) Twenty Nine Range Sixteen (16) described as follows: Beginning at the center of said section Nine (9) and running thence west Ninety five rods, thence South fifty four and Twenty one hundredths (54.21) thence East Ninety five (95) rods, thence North Fifty four and Twenty one hundredths (54.21) rods to place of beginning, except approximately five acres sold to Marion High for which said five acre tract lies east of the right of way of the Missouri Pacific Railroad

with the appurtenances, and all the estate, title and interest of the said parties of the first part therein. And the said parties of the first part do hereby covenant and agree that at the delivery hereof they are the lawful owners of the premises above granted, and seized of a good and indefeasible estate of inheritance therein, free and clear of all incumbrances

(See A. I. Rev. attached)

and that they will WARRANT AND DEFEND the same in the quiet and peaceable possession of said party of the second part, his heirs and assigns, forever, against all persons lawfully claiming the same.

IN WITNESS WHEREOF, The said parties of the first part have hereunto set their hand, the day and year first above written.

Signed and delivered in presence of

W. A. Wilmoth
Olive R. Wilmoth

STATE OF KANSAS, Wilson COUNTY, ss.

BE IT REMEMBERED, That on this 31st day of December, A. D. 1921, before me, a Notary Public in and for said County, came W. A. Wilmoth and Olive R. Wilmoth husband and wife to me personally known to be the same persons who executed the foregoing instrument, and duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal, on the day and year last above written.

(My Notary Commission expires the 26th day of April, A. D. 1922.)

SEAL

Thos. H. Converse, Notary Public.

Address Altoona Kansas

EXHIBIT A-14

FROM

George M. Highfill et ux

TO

Mrs. M. J. Highfill Saunders

STATE OF KANSAS, WILSON COUNTY, ss.

This instrument was filed for record on the 26 day of Nov. A. D. 1928, at 8 o'clock A. M.

Cora M. Drake
Register of Deeds

By ..... Deputy.

THIS INDENTURE, Made this 11th day of August, in the year of our Lord One Thousand Nine Hundred and twenty eight, between George M. Highfill and Hilma K. Highfill, his wife of Fort Scott, in the County of Bourbon and State of Kansas of the first part and Mrs. M. J. Highfill Saunders of — in the County of — and State of Kansas, of the second part.

WITNESSETH, That the said parties of the first part, in consideration of the sum of One dollar and other valuable consideration — DOLLARS, to them duly paid, have sold, and by these presents do — grant and convey to the said party of the second part her heirs and assigns, all that tract or parcel of land situated in ~~Wilson~~ Wilson County, and State of Kansas, and described as follows, towit:

Beginning at the center of Section Nine (9), Twp. Twenty-nine (29) South, Range Sixteen (16) East, running thence West to the right of way of the Missouri Pacific Railroad Company, thence in a southerly direction along the east line of said right of way to a point fifty four and twenty one hundredths (54.21) rods south of the half section line thence east to the half section line at a point fifty four and twenty one hundredths (54.21) rods south of the place of beginning thence north to beginning, containing approximately five acres.

with the appurtenances, and all the estate, title and interest of the said parties of the first part therein. And the said parties of the first part do hereby covenant and agree that at the delivery hereof they are the lawful owners of the premises above granted, and seized of a good and indefeasible estate of inheritance therein, free and clear of all incumbrances

and that they will WARRANT AND DEFEND the same in the quiet and peaceable possession of said party of the second part, her heirs and assigns, forever, against all persons lawfully claiming the same.

IN WITNESS WHEREOF, the said parties of the first part have hereunto set their hands, the day and year above written.

Signed ~~and delivered~~ in presence of

George M. Highfill
Hilma K. Highfill

STATE OF KANSAS, County of Bourbon ~~COUNTY~~, ss.

BE IT REMEMBERED, That on this 11th day of August, A. D. 1928, before me, a Notary Public in and for said County, came George M. Highfill and Hilma K. Highfill, his wife, to me personally known to be the same persons who executed the foregoing instrument, and duly acknowledged the execution of the same to be their free act.

Witness IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal, on the day and year last above written.

Seal.

(My ~~Notary~~ Commission expires on the 21st day of March A. D. 1932.)

Florence Fortner ~~Notary Public~~

~~Address~~

'10 4 00'

EXHIBIT A-15

FROM	STATE OF KANSAS, WILSON COUNTY, ss.
O. M. Lloyd	This instrument was filed for record on the 13 day of Aug., A. D. 1931, at 1 o'clock P. M.
TO	Bertie J. Minton, Register of Deeds
Mc Clave State Bank	By ....., Deputy.

THIS INDENTURE, Made this 5th day of December, in the year of our Lord One Thousand Nine Hundred and Thirty between O. M. Lloyd a single man of Altoona, in the County of Wilson and State of Kansas of the first part, and Mc Clave State Bank of Mc Clave, Colorado, of the second part.

WITNESSETH, That the said part y of the first part, in consideration of the sum of one Dollar and exchange of property DOLLARS, to them duly paid, has sold, and by these presents do grant and convey to the said part of the second part heirs and assigns, all that tract or parcel of land situated in Wilson County, and State of Kansas, and described as follows, towit:

All that part of the following described tract lying West of the Missouri Pacific Railroad right of way. Commencing at the Northeast corner of the Southwest Quarter (SW¼) of section Nine (9) township Twenty Nine (29) South of Range Sixteen (16) East, running thence south Fifty four and twenty one hundredths (54.21) rods thence West Ninety Five (95) rods thence North Fifty four and twenty one hundredths (54.21) rods; thence East Ninety Five (95) rods to the place of beginning.

with the appurtenances, and all the estate, title and interest of the said part y of the first part therein. And the said part y of the first part do hereby covenant and agree that at the delivery hereof he is the lawful owner of the premises above granted, and seized of a good and indefeasible estate of inheritance therein, free and clear of all incumbrances

and that he will WARRANT AND DEFEND the same in the quiet and peaceable possession of said part y of the second part, his heirs and assigns, forever, against all persons lawfully claiming the same.

IN WITNESS WHEREOF, the said part y of the first part has hereunto set his hand the day and year first above written.

O. M. Lloyd

Signed and delivered in presence of

STATE OF KANSAS, Wilson COUNTY, ss.

BE IT REMEMBERED, That on this 13 th day of December 1930, A. D. 192, before me, a Notary Public in and for said County, came O. M. Lloyd a single man, to me personally known to be the same person who executed the foregoing instrument, and duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal, on the day and year last above written.

Seal.

(My Notary Commission expires the 24th day of Feb. A. D. 1931)

Arthur Puckett, Notary Public.

Address Altoona Kansas

EXHIBIT A-16

FROM

Mrs. M. J. Highfill Saunders

TO

Della Lamb

STATE OF KANSAS, WILSON COUNTY, ss.

This instrument was filed for record on the 17 day of Dec., A. D. 1933, at 2 o'clock P. M.

Flossie M. Smith
Register of Deeds

By ..... Deputy.

This INDENTURE, Made this 17th day of May, in the year of our Lord One Thousand Nine Hundred and Twenty nine between Mrs. M. J. Highfill Saunders a widow and formerly Marion Highfill of Fonrock Grove, in the County of Morris and State of Kansas of the first part, and Della Lamb, of the second part.

WITNESSETH, That the said party of the first part, in consideration of the sum of Thirteen hundred DOLLARS, to her duly paid, has sold, and by these presents do grant and convey to the said party of the second part her heirs and assigns, all that tract or parcel of land situated in Wilson County, and State of Kansas, and described as follows, towit:

Beginning at the center of Section Nine (9) Township Twenty nine (29) South, Range Sixteen (16) East, running thence west to the right of way of the Missouri Pacific Railroad Company, thence in southerly direction along the east line of said right of way to a point fifty four and twenty one hundredths rods (54.21) south of the half section line thence east to the half section line at a point fifty four and twenty one hundredths rods (54.21) south of the place of beginning, thence north to beginning, containing approximately five acres.

with the appurtenances, and all the estate, title and interest of the said party of the first part therein. And the said party of the first part do hereby covenant and agree that at the delivery hereof she is the lawful owner of the premises above granted, and seized of a good and indefeasible estate of inheritance therein, free and clear of all incumbrances

and that she will WARRANT AND DEFEND the same in the quiet and peaceable possession of said party of the second part, her heirs and assigns, forever, against all persons lawfully claiming the same.

IN WITNESS WHEREOF, the said party of the first part has hereunto set her hand the day and year first above written.

Mrs. M. J. Highfill Saunders

Signed and delivered in the presence of

STATE OF KANSAS, Wilson COUNTY, ss.

BE IT REMEMBERED, That on this 17th day of May A. D. 1929, before me, a Notary Public in and for said County, came Mrs. M. J. Highfill Saunders, a widow, formerly Marion Highfill to me personally known to be the same person who executed the foregoing instrument, and duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal, on the day and year last above written.

Seal

My Notary Commission expires the 26th day of April, A. D. 1931

Chas. N. Converse, Notary Public.

Address Altoona, Kansas

EXHIBIT A-17

76 260

And said The Aetna Building & Loan Association, for itself, its successors and assigns, does hereby covenant, promise and agree, to and with said party of the second part, that at the delivery of these presents, it is lawfully seized in its own right, of an absolute and indefeasible estate of inheritance, in fee simple, of and in all and singular the above-granted and described premises, with the appurtenances; that the same are free, clear, discharged and unincumbered of and from all former and other grants, titles, charges, estates, judgments taxes, assessments and incumbrances, of what nature and kind soever and that it will warrant and forever defend the same, unto said party of the second part, his heirs and assigns, against said party of the first part, its successors and assigns and all and every person or persons whomsoever, lawfully claiming or to claim the same.

IN WITNESS WHEREOF, The said party of the first part has hereunto caused this Deed to be signed on its behalf by its Vice President, thereunto duly authorized so to do, and to be attested by its Ass't. Secretary, and has caused its common seal to be hereunto affixed, the day and year last above written.

(Corp. Seal)

THE AETNA BUILDING & LOAN ASSOCIATION
By J. M. Thompson its Vice President.
and J. E. Morgan its Ass't. Secretary

STATE OF KANSAS, SHAWNEE COUNTY, SS.

BE IT REMEMBERED, That on this 28th day of July, A. D. 1936 before me, the undersigned, a Notary Public in and for the County and State aforesaid, came J. M. Thompson, Vice President of the Aetna Building & Loan Association, a corporation duly organized, incorporated and existing under and by virtue of the laws of State of Kansas and J. E. Morgan, Ass't Secretary of said corporation, who are personally known to me to be such officers, and who are personally known to me to be the same persons who executed, as such officers, the within instrument of writing on behalf of said corporation, and such persons duly acknowledged the execution of the same to be the act and deed of said corporation The Aetna Building & Loan Association,

IN TESTIMONY WHEREOF, I have hereunto set my hand, and affixed my Notarial Seal the day and year last above mentioned.

(Seal)

Frank J. Cronin
Notary Public.

Term expires Sept. 4th, 1936.

Filed for record August 27, 1936, at 2 P. M. ✓

Flossie M. Smith,
Register of Deeds.

WARRANTY DEED.

McCLAVE STATE BANK, McCLAVE, COLORADO
TO
N. K. BICKFORD.

THIS DEED, Made this Twenty-seventh day of August in the year of our Lord one thousand nine hundred and Thirty-six, between McClave State Bank of McClave, Colorado a corporation duly organized and existing under and by virtue of the laws of the State of Colorado of the first part, and N. K. Bickford of the County of Prowers and State of Colorado, of the second part;

WITNESSETH, That the said party of the first part, for and in consideration of the sum of One Dollar and other good and valuable considerations, to the said party of the first part in hand paid by the said party of the second part, the receipt whereof is hereby confessed and acknowledged, hath granted, bargained, sold and conveyed, and by these presents doth grant, bargain, sell, convey and confirm unto the said party of the second part, his heirs and assigns forever, all

the following described lots or parcels of land, situate, lying and being in the County of Wilson and State of Kansas, to-wit:

All that part of the following described tract lying West of the Missouri Pacific Railroad right of way:

Commencing at the Northeast corner of the Southwest Quarter (SW¼) of Section Nine (9) Township Twenty-nine (29) South of Range Sixteen (16) East, running thence south Fifty four and twenty-one hundredths (54.21) rods thence West Ninety five (95) rods thence North Fifty four and Twenty-one hundredths (54.21) rods; thence East Ninety five (95) rods to place of beginning.

(50 cents U. S. Revenue Stamp Attached)

Together with all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof; and all the estate, right, title, interest, claim and demand whatsoever of the said party of the first part, either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances.

To Have and to Hold the said premises above bargained and described, with the appurtenances, unto the said party of the second part, his heirs and assigns forever. And the said McClave State Bank of McClave, Colorado party of the first part, for itself, its successors and assigns, doth covenant, grant, bargain and agree to and with the said party of the second part, his heirs and assigns, that at the time of the ensealing and delivery of these presents it is well seized of the premises above conveyed, as of a good, sure, perfect, absolute and indefeasible estate of inheritance, in law, in fee simple, and hath good right, full power and lawful authority to grant, bargain, sell and convey the same in manner and form aforesaid, and that the same are free and clear from all former and other grants, bargains, sales, liens, taxes, assessments and incumbrances of whatever kind or nature soever; and the above bargained premises in the quiet and peaceable possession of the said party of the second part, his heirs and assigns, against all and every person or persons lawfully claiming or to claim the whole or any part thereof, the said party of the first part shall and will Warrant and Forever Defend.

IN WITNESS WHEREOF, The said party of the first part hath caused its corporate name to be hereunto subscribed by its President, and its corporate seal to be hereunto affixed, attested by its Secretary, the day and year first above written.

Attest:

W. C. Bourne
Secretary.

McClave State Bank of McClave, Colo.
By Daniel Carl
President.

(Corp. Seal)

STATE OF COLORADO,)
) SS.
COUNTY OF BENT.)

I, Della C. Hartsell, Notary Public in and for said Bent County, in the State aforesaid, do hereby certify that Daniel Carl, President and W. C. Bourne, Secretary who are personally known to me to be the same persons whose names are subscribed to the foregoing Deed as having executed the same respectively as President and Secretary of The McClave State Bank of McClave, Colorado, a corporation, and who are known to me to be such officers respectively, appeared before me this day in person, and severally acknowledged: That the seal affixed to the foregoing instrument is the corporate seal of said corporation; that the same was thereunto affixed by the authority of said corporation; that said instrument was by like authority subscribed with its corporate name;

EXHIBIT A-18

GENERAL WARRANTY

7884

FROM	State of Kansas, Wilson County, ss.
N. K. Bickford	This instrument was filed for record on the 18 day
TO	of October, A. D. 1937, at 10 o'clock A. M.
J. W. Vandervoort.	Louise M. Smith
	Register of Deeds.

THIS INDENTURE, Made this Thirteenth day of October A. D. 1937, between N. K. Bockford, a single man

of Prowers County, in the State of Colorado of the first part, and J. W. Vandervoort

of Finney County, in the State of Kansas of the second part.

WITNESSETH, That said party of the first part, in consideration of the sum of One Dollar and other good and valuable considerations ~~and~~ ~~DOLLARS~~ the receipt whereof is hereby acknowledged, does by these presents, GRANT, BARGAIN, SELL AND CONVEY unto said party of the second part, his heirs and assigns, all the following described real estate, situated in the County of Wilson and State of Kansas, to-wit:

All that part of the following described tract lying West of the Missouri Pacific Railroad right of way: Commencing at the Northeast corner of the South-west Quarter (SW¼) of Section Nine (9) in Township Twenty-nine (29), South of Range Sixteen (16) East, running thence south Fifty-four and twenty-one hundredths (54.21) rods thence west Ninety-five (95) rods thence North fifty-four and twenty-one hundredths (54.21) rods; thence East Ninety-five (95) rods to the place of beginning

TO HAVE AND TO HOLD THE SAME, Together with all and singular the tenements, hereditaments and appurtenances thereunto belonging, or in anywise appertaining, forever.

And said N. K. Bickford, a single man for himself and his heirs, executors or administrators does hereby covenant, promise and agree to and with said party of the second part that at the delivery of these presents he is lawfully seized in his own right of an absolute and indefeasible estate of inheritance; in fee simple, of and in all and singular the above-granted and described premises, with the appurtenances; that the same are free, clear, discharged and unincumbered of and from all former and other grants, titles, charges, estates, judgments, taxes, assessments and incumbrances of what nature or kind, soever.

and that he WILL WARRANT AND FOREVER DEFEND the same unto said party of the second part his heirs, and assigns, against said party of the first part his heirs, and all and every person or persons whomsoever lawfully claiming or to claim the same.

IN WITNESS WHEREOF, The said party of the first part has hereunto set his hand, the day and year first above written.

SEAL

N. K. Bickford.

State of ~~Kansas~~ Colorado, Prowers County, ss.

BE IT REMEMBERED, That on this Thirteenth day of October A. D. 1937, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came N. K. Bickford, a single man

who is personally known to me to be the same person who executed the within instrument of writing, and such person duly acknowledged the execution of the same.

IN ~~TESTIMONY~~ WITNESS WHEREOF, I have hereunto set my hand and affixed my seal, the day and year last above written.

(Seal)

Alva H. Filkins
Notary Public

Term expires Dec. 2, 1939.

EXHIBIT A-19

GENERAL WARRANTY 78-243

A-82792 CRANE & CO., TOPEKA

FROM

J. W. Vandervoort

TO

Charles Starbuck

State of Kansas, Wilson County, ss.

This instrument was filed for record on the 17 day of July, A. D. 1939, at 8 o'clock A.M.

Mabel Elliott
Register of Deeds.

THIS INDENTURE, Made this 12th day of June 1939 zzz A. D. 19~~3~~1 - between J. W. Vandervoort & Wife, Lois N. Vandervoort

of El Paso County, in the State of Colorado of the first part, and Charles Starbuck

of El Paso County, in the State of Colorado of the second part.

WITNESSETH, That said part y of the first part, in consideration of the sum of One Dollar & Exchange of Property of which and - DOLLARS, the receipt ~~WHEREOF~~ is hereby acknowledged, does by these presents, GRANT, BARGAIN, SELL AND CONVEY unto said party of the second part, his heirs and assigns, all the following described real estate, situated in the County of Wilson and State of Kansas, to-wit:

All of that part of the following described tract lying west of the Missouri Pacific Railroad right of way:
Commencing at the Northeast Corner of the South-west Quarter (¼) of Section Nine (9) in Township Twenty-nine (29) South of Range Sixteen (16) East, running thence south Fifty-four and twenty-one hundredths (54.21) rods thence west Ninety-five (95) rods thence North fifty-four and twenty-one hundredths (54.21) rods; thence East Ninety-five (95) rods to the place of Beginning.

TO HAVE AND TO HOLD THE SAME, Together with all and singular the tenements, hereditaments and appurtenances thereunto belonging, or in anywise appertaining, forever.

And said J. W. Vandervoort & Wife, for their heirs, executors or administrators do es hereby covenant, promise and agree to and with said party of the second part that at the delivery of these presents they are lawfully seized in their own right of an absolute and indefeasible estate of inheritance; in fee simple, of and in all and singular the above-granted and described premises, with the appurtenances; that the same are free, clear, discharged and unincumbered of and from all former and other grants, titles, charges, estates, judgments, taxes, assessments and incumbrances of what nature or kind, soever.

and that they WILL WARRANT AND FOREVER DEFEND the same unto said party of the second part - heirs, and assigns, against said part - of the first part - heirs, and all and every person or persons whomsoever lawfully claiming or to claim the same.

IN WITNESS WHEREOF, ~~the~~ That said part ies of the first part have hereunto set their hand - the day and year first above written.

J. W. Vandervoort
Lois N. Vandervoort

State of ~~KANSAS~~ Colorado El Paso County, ss.

BE IT REMEMBERED, That on this 12th day of June A. D. 1939, before me, the undersigned, a Notory Public in and for the County and State aforesaid, came J. W. Vandervoort and Lois N. Vandervoort his wife

who are personally known to me to be the same persons who executed the within instrument of writing, and such persons ~~he~~ they duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my - seal, the day and year last above written.

(Seal) (Seal shows Jas. H. Bruce)

James H. Bruce
Notary Public.

Term expires Sept. 19th 1940, ~~XXXXXXX~~

EXHIBIT A-20

97-222

Wilson County Citizen 43134-5

FROM	STATE OF KANSAS, WILSON COUNTY, ss.
CHARLES STARBUCK, single person	This instrument was filed for record on the 19th day of June, A. D. 1944, at 5 o'clock A. M.
TO	Register of Deeds.
C. J. DUTTON	By ..... Deputy.

THIS INDENTURE, Made this 2nd day of October, A. D. 1943, between Charles Starbuck, a single person

of El Paso County, in the State of Colorado, of the first part: and C. J. Dutton

of El Paso County, in the State of Colorado, of the second part:

WITNESSETH, That said party of the first part, in consideration of the sum of One Dollar and other valuable consideration ~~xxx~~ 100 DOLLARS, the receipt whereof is hereby acknowledged, does by these presents, grant, bargain, sell and convey unto said party of the second part, his heirs and assigns, all the following-described real estate, situated in the County of Wilson, and State of Kansas, to wit:

All of that part of the following described tract lying west of the Missouri Pacific Railroad right of way: Commencing at the Northeast corner of the Southwest quarter (¼) of Section Nine (9) in Township Twenty-nine (29) South of Range Sixteen (16) East, running thence South Fifty-four and twenty-one hundredths (54.21) rods thence west Ninety-five (95) rods thence North fifty-four and twenty-one hundredths (54.21) rods thence East Ninety-five (95) rods to the place of beginning.

Reserving to Grantor, his heirs, executors and assigns, all gas, oil, coal and mineral rights underlying said real property together with the right to prospect for and to drill and mine for same and the right of ingress and egress thereon and thereto for the purpose of drilling and mining and of removing gas, oil, coal and minerals.

TO HAVE AND TO HOLD THE SAME. Together with all and singular the tenements, hereditaments and appurtenances thereunto belonging, or in anywise appertaining, forever.

And said Charles Starbuck for himself, his heirs, executors or administrators, does hereby covenant, promise and agree, to and with said party of the second part, that at the delivery of these presents he is lawfully seized in his own right, of an absolute and indefeasible estate of inheritance, in fee simple, of and in all and singular the above-granted and described premises, with the appurtenances; that the same are free, clear, discharged and unincumbered of and from all former and other grants, titles, charges, estates, judgments, taxes, assessments and incumbrances, of what nature or kind, soever; except the taxes for the year 1943 and subsequent taxes

and that he will WARRANT AND FOREVER DEFEND the same unto said party of the second part, his heirs and assigns, against said party of the first part, his heirs, and all and every person or persons whomsoever, lawfully claiming or to claim the same.

IN WITNESS WHEREOF, The said party of the first part has hereunto set his hand, the day and year first above written.

Charles Starbuck

STATE OF ~~KANSAS~~ Colorado, El Paso COUNTY, ss.

BE IT REMEMBERED, That on this 2nd day of October, A. D. 1943, before me, the undersigned, a Lucille Hasbrouck, a Notary Public, in and for the County and State aforesaid, came Charles Starbuck

who is personally known to me to be the same person who executed the within instrument of writing, and such person duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my notarial Seal, the day and year last above written.

(SEAL)

Lucille Hasbrouck
Notary Public.

Term expires October 9, 1944.

EXHIBIT A-21

94-232

person duly acknowledged the execution of the same. IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Notarial Seal the day and year last above written.

(SEAL) Marjorie L. Boehren, Notary Public

Term expires May 8, 1945.

STATE OF KANSAS, WILSON COUNTY, SS:

BE IT REMEMBERED, That on this 17th day of April, A.D., 1944 before me, a Notary Public in and for said County and State, came Juanita C. Dove, Margaret F. Dove, who are to me personally known to be the same persons who executed the foregoing instrument, and duly acknowledged the execution of the same. IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my official seal on the year and day last above written.

(SEAL) Marguerite Ong, Notary Public

My term as Notary Public expires June 9, 1945. Residence Fredonia, Kansas.

STATE OF TEXAS, COUNTY UVALDE, SS:

BE IT REMEMBERED, That on this 3rd day of June, A.D., 1944, before me, a Notary Public in and for said County and State, came Howard E. Cummings and Rose Audrey Cummings, who --- to me personally known to be the same persons who executed the foregoing instrument, and duly acknowledged the execution of the same. IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my official seal on the year and day last above written.

(Notary SEAL) J. A. Millikin, Notary Public

My term as Notary Public expires -- 19-- Residence Sabinal, Texas

J. A. MILLIKIN, Justice of the Peace and Exofficio Notary Public, Uvalde County, Texas.

STATE OF NEW YORK, QUEENS COUNTY, SS:

BE IT REMEMBERED, That on this 14th day of May, A.D., 1944, before me, a Notary Public in and for said County and State, came Lery Virginia Rhodes and Mac. Lee Rhodes, who are to me personally known to be the same persons who executed the foregoing instrument, and duly acknowledged the execution of the same. IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my official seal on the year and day last above written.

(SEAL) Anthony P. Mashin, Notary Public
Residence 189-19 Jamaica Ave.,
Hollis, N. Y.

My term as Notary Public expires -- 19 --.

ANTHONY P. MASHIN, NOTARY PUBLIC, QUEENS CO. CLK'S No. 2581 REG. No. 171-M-6
COMMISSION EXPIRES MARCH 30, 1946.

Filed for record June 14, 1944, at 3 P. M. Charles Grant
Register of Deeds

DEED

C. J. DUTTON,

TO

CHESTER R. SMITH.

THIS DEED, Made this 23rd day of December in the year of our Lord one thousand nine hundred and Fortythree between -----, Matilda M. Dutton of the County of ElPaso and State of Colorado, of the first part, and Chester R. Smith of the County of El Paso and State of Colorado, of the second part:

Witnesseth, That the said party of the first part, for and in consideration of the sum of One Dollar and other valuable Consideration DOLLARS, to the said party of the first part in hand paid by the said party of the second part, the receipt thereof is hereby confessed and acknowledged, has granted, bargained, sold and conveyed, and by these presents does grant, bargain, sell, convey and confirm unto the said party of the second part, his heirs and assigns forever,

all the following described lot or parcel of land, situate, lying and being in the County of Wilson and State of Kansas.

All that part of the following described tract lying west of the Missouri Pacific Railway right of way: commencing at the Northeast corner of the Southwest Quarter of Section 9 in Township Twentynine South of Range Sixteen East, running thence south fiftyfour and twenty hundreds rods thence west west Ninety-five rods thence North fiftyfour and twenty one hundreths rods, thence East Ninety rods.

Reserving to First party, his heirs, executors, his assigns, all gas, oil, coal and mineral rights underlying said real property together with the right to prospect for and to drill and mine for same and the right of ingress and egress and agress thereto for the purpose of drilling and mining and removing Gas, Oil, coal and minerals.

Together With all and singular the hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof; and all the estate, right, title, interest, claim and demand whatsoever of the said party of the first part, either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances.

To Have and to Hold the said premises above bargained and described, with the appurtenances unto the said party of the second part, his heirs and assigns forever. And the said party of the first part for herself, heirs, executors and administrators, does covenant, grant, bargain and agree to and with the said party of the second part, his heirs and assigns, that at the time of the ensealing and delivery of these presents she is well seized of the premises above conveyed, as of good, sure, perfect, absolute and indefeasible estate of inheritance, in law, in fee simple, and has good right, full power and lawful authority to grant, bargain, sell and convey the same, in the manner and form aforesaid, and that the same are free and clear from all former and other grants, bargains, sales, liens, taxes, assessments and incumbrances of whatsoever kind nature soever; and the above bargained premises, in the quiet and peaceable possession of the said party of the second part, his heirs and assigns, against all and every person or persons lawfully claiming or to claim the whole or any part thereof, the said party of the first part shall and will Warrant and Forever Defend.

In Witness Whereof, The said party of the first hereunto set her hands and seals the day and year first above written.

Signed, Sealed and Delivered in Presence of ---

C. J. Dutton (SEAL)
(SEAL)
Matilda R. Dutton (SEAL)
(SEAL)

STATE OF COLORADO, County of El Paso, ss.

I, Guy L. Pryor, a Notary Public in and for said County, in the State aforesaid, do hereby certify that C. J. Dutton and Matilda R. Dutton, who are personally known to me to be the persons whose names are subscribed to the annexed Deed, appeared before me this day in person, and acknowledged that they signed, sealed and delivered the said instrument of writing as their free and voluntary act, for the uses and purposes therein set forth. Given under my hand and Notarial seal, this 23rd day of December, A.D., 1943.

(SEAL)

Guy L. Pryor, Notary Public

My Commission expires Dec. 11, 1946, 13-

Filed for record June 19, 1944, at 9 A.M.

Mabel Short
Register of Deeds

EXHIBIT A-22

DEED RECORD No. 89 - 16

LOCKWOOD-MAZEL PRINTING & STATIONERY CO., ATCHISON, KAN. 4B2481-87

FROM

Della Gamble et vir

TO

John A. Kepler

STATE OF KANSAS, Wilson County, ss.

This instrument was filed for record on the 3rd day of October, A. D. 1945, at 9 o'clock A. M.

[illegible]
Register of Deeds.

This Indenture, Made this 20th day of September in the year of our Lord, One Thousand, Nine Hundred and forty-five between Della Gamble and C. F. Gamble, her husband of Chanute in the County of Neosho and State of Kansas of the first part, and John A. Kepler of the second part.

WITNESSETH, That the said parties of the first part, in consideration of the sum of One Dollar and other valuable consideration ~~DOLLARS~~, to them duly paid, have sold and by these presents do grant and convey to the said party of the second part his heirs and assigns, all that tract or parcel of land situate in Wilson County and State of Kansas, and described as follows, to-wit:

Beginning at the center of Section Nine (9) Township Twenty-nine (29) South, Range Sixteen (16) East, running thence west to the right of way of the Missouri Pacific Railroad Company, thence in a southerly direction along the east line of said right of way to a point fifty four and twenty-one hundredths rods (54.21) south of the half section line thence east to the half section line at a point fifty four and twenty one hundredths rods (54.21) south of the place of beginning, thence north to beginning, containing approximately five acres.

($2.20 U. S. REVENUE STAMPS ATTACHED)

with the appurtenances, and all the estate, title and interest of the said parties of the first part therein. And said parties of the first part, do hereby covenant and agree that at the delivery hereof they are the lawful owners of the premises above granted, and seized of a good and indefeasible estate of inheritance therein, free and clear of all incumbrances.

and that they will Warrant and Defend the same in the quiet, peaceable possession of said party of the second part his heirs and assigns, forever, against all persons lawfully claiming the same.

IN WITNESS WHEREOF, The said parties of the first part have hereunto set their hands the day and year first above written.

Signed: and Delivered in the Presence of

Della Gamble

C. F. Gamble

STATE OF KANSAS, WILSON County, ss.

BE IT REMEMBERED, That on this 20th day of September, A. D. 1945, before me, a Notary Public in and for said County, came Della Gamble and C. F. Gamble, her husband

to me personally known to be the same persons who executed the foregoing instrument, and duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal on the day and year last above written.

(SEAL) My Notary Commission expires the 16th day of October, A. D. 1946.

Audra Wakeland
Notary Public.

Address: Fredonia, Kansas

18415

EXHIBIT A-23

DEED RECORD No. 98

Lockwood Co., Atchison, Kansas

FROM	STATE OF KANSAS, Wilson County, ss.
John A. Kepler et ux	This instrument was filed for record on the 14 day of February, A. D. 1953, at 3 o'clock P. M.
TO	
Frank M. Green et ux	Register of Deeds.

This Indenture, Made this 2nd day of October, in the year of our Lord, One Thousand, Nine Hundred and Forty-Five, between

John A. Kepler and Inez Kepler, his wife

of Altoona, in the County of Wilson, and State of Kansas, of the first part, and

Frank M. Green and Beryl L. Green, his wife, as joint tenants, to hold as joint tenants and not as tenants in common, and to the survivor of them, and to the heirs and assigns of such sruvivor forever, parties

, of the second part.

WITNESSETH, That the said parties of the first part, in consideration of the sum of One dollar and other valuable consideration DOLLARS, to them duly paid, have sold and by these presents do grant and convey to the said parties of the second part, ~~the~~ ~~heirs and assigns, all that tract or parcel of land situate in Wilson County and State of Kansas and described as follows, to wit:~~

as joint tenants, to hold as joint tenants and not as tenants in common, and to the survivor of them, and to the heirs and assigns of such survivor forever, all that tract or parcel of land situate in Wilson County, and State of Kansas, and described as follows: towit:

Beginning at the center of Section Nine (9) Township Twenty-nine (29) South, Range Sixteen (16) East, running thence west to the right of way of the Missouri Pacific Railroad Company, thence in a southerly direction along the east line of said right of way to a point fifty four and twenty one hundredths rods (54.21) south of the half section line thence east to the half section line at a point fifty four and twenty-one hundredths rods (54.21) south of the place of beginning, thence north to beginning, containing approximately five acres.

($2.20 U. S. Revenue Stamps Attached.)

with the appurtenances, and all the estate, title and interest of the said parties of the first part therein. And said parties of the first part, do hereby covenant and agree that at the delivery hereof they are the lawful owners of the premises above granted, and seized of a good and indefeasible estate of inheritance therein, free and clear of all incumbrances

---

and that they will Warrant and Defend the same in the quiet, peaceable possession of said parties of the second part their heirs and assigns, forever, against all persons lawfully claiming the same

IN WITNESS WHEREOF, The said parties of the first part have hereunto set their hands the day and year first above written.

John A. Kepler

Signed, ~~and Delivered in the Presence of:~~

Inez Kepler

STATE OF KANSAS, WILSON County, ss.

BE IT REMEMBERED, That on this 2nd day of October, A. D. 19 45, before me, a Notary Public in and for said County, came

John A. Kepler and Inez Kepler, his wife

to me personally known to be the same persons who executed the foregoing instrument, and duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal on the day and year last above written.

My Notary Commission expires the 2 day of September, A. D. 1948.

(Seal)

Alice Vandaveer,
Notary Public.

EXHIBIT A-24

Sheriff's Deed, Judicial Tax Sale

KNOW ALL MEN BY THESE PRESENTS, That Whereas, on the 4th day of September, 19 56, in the District Court in and for Wilson County, Kansas, at the September Term, 19 56, of said Court, then being held in and for said County, in a certain action then pending in said Court, numbered 17493, wherein the Board of County Commissioners of the County of Wilson and State of Kansas was plaintiff, and Vyrle Adams, et al and the unknown heirs, executors, administrators, devisees, trustees and assigns of any of the defendants who may be dead and the unknown officers, successors, trustees and assigns of such corporations as may have been dissolved, were defendants, a judgment was rendered by said Court foreclosing the lien of the plaintiff for delinquent taxes in and upon the property hereinafter described, and it was further ordered that said property be sold by the Sheriff of Wilson County, Kansas, for the payment of said judgment and costs, and that after said sale that the defendants and each of them, and all persons claiming by, through, or under them, or either of them, be forever barred, foreclosed, excluded and cut off from any and all right, title, claim, interest, estate, or equity of redemption in or to the hereinafter described real estate or any part thereof.

AND WHEREAS, afterward, there was issued by the Clerk of said Court, an execution and order of sale, in pursuance of said judgment and in accordance with law, directed to the Sheriff of said County of Wilson commanding him to cause said property to be advertised and sold according to law, and from the proceeds thereof to pay, first, the costs and expenses of such suit and sale; second, the judgments of the plaintiff against each particular piece, parcel and tract; third, the balance, if any there be, be paid into court to abide its further orders, and that he make return of said execution and order of sale in sixty days from the date thereof, with his proceedings indorsed thereon, which said execution and order of sale were delivered to and received by the said Sheriff on the 7th day of September, 19 56, and the said Sheriff, by virtue thereof, then advertised said property for sale by causing a notice that he would on the 15th day of October, 19 56, at 2:00 o'clock P. M., of said day at the court house door in the City of Fredonia, Kansas, in said County of Wilson, offer said lands and tenements at public sale, and sell the same to the highest bidder for cash in hand at the time of sale, the said notice being published in the official paper of said Wilson County, the Wilson County Citizen, a newspaper of general circulation therein, which said newspaper has been continuously and uninterruptedly published in said county during the period of fifty-two consecutive weeks immediately prior to the first publication of the notice of this sale, said notice being published for more than thirty days immediately prior to the date of said sale.

AND WHEREAS, on the date so named in said notice and at the time and place designated therein, the Sheriff did publicly offer for sale and sell the hereinafter described tracts and parcels of land to Arthur W. Pugh at and for the price and sums as follows, to-wit:

	PRICE, $.
All that part of the follcwing described tract lying west of the Missouri Pacific Railway Right of Way, Commencing at the Northeast Corner of the SW¼ of Sec. 9, Twp. 29, Range 16, running thence South 54.20 rods, thence West 95 rods, thence North 54.21 rods, thence East 90 Rods containing 27.40 acres, Cedar Twp.	20.00
Tract described as Com. 4' 8" W NW Cor. L. 6 th W 25' X S 60' th E 25' th. N. to beginning being parts of Lots 4 & 5, B 1, Lafontaine City, Talleyrand Twp.	4.00
Beg. at SE corner, SW¼, Sec. 17, Twp. 27, Range 14, to center of Ross Branch, along Branch to S. line, East to beginning less 1.46 acres to the Railroad, containing 3.45 acres, Descriptions adjoining Coyville, Coyville City	3.00
	$27.00

AND WHEREAS, the said Sheriff duly returned said execution and order of sale to said Court, with his proceedings thereunder indorsed thereon, and thereafter and on the 13th day of November, 19 56, the said Court duly confirmed said sale as having been made in all respects in conformity with law, and directed the Clerk of said Court to make an entry on the journal thereof that the said court is satisfied with the legality of said sale, and ordered and directed said Sheriff to make to said purchaser a deed for said lands and tenements so purchased as aforesaid, and such entry and order were thereupon then and there duly made and entered accordingly.

AND WHEREAS, the said Arthur W. Pugh has paid the said purchase money in full and the same has been applied as directed by said judgment and order of sale, and there is presented to me the order of said Court confirming said sale, and directing the issuance of a good and sufficient deed to said premises to said purchaser:

NOW, THEREFORE, I, Chas. A. Spohn, Sheriff of the said County of Wilson, in consideration of the premises, and by virtue of the powers in me vested by law, do hereby give, grant, sell and convey unto the said Arthur W. Pugh successors and asigns forever, the lands and tenements above described so sold as aforesaid, situate in the County of Wilson, and State of Kansas.

TO HAVE AND TO HOLD the same unto the said Arthur W. Pugh heirs, successors and assigns, forever.

IN TESTIMONY WHEREOF, I, the said Chas. A. Spohn Sheriff as aforesaid, have hereunto set my hand this 16th day of November, 19 56.

Chas. A. Spohn
Sheriff of Wilson County, Kansas.

199.

10 Rec 511 - 11/19/56

STATE OF KANSAS,
Wilson County, } ss.

BE IT REMEMBERED, that on this day of , A. D., 19 , personally appeared before me, to me personally known to be the Sheriff of said Wilson County, Kansas, and the person who executed the above and foregoing deed and duly acknowledged the execution of the same for the purpose therein stated, as such Sheriff.

WITNESS my Hand and Seal the day and year last above written.

Clerk District Court of Wilson County, Kansas.

STATE OF KANSAS,
Wilson County, } ss.

BE IT REMEMBERED, That on this 16th day of November, A. D. 19 56, before me, the undersigned, Clerk of the District Court in and for the County and State aforesaid, came Chas. A. Spohn as Sheriff of said County, who is personally known to me to be the same person who executed the within instrument of writing, and such person duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal, the day and year last above written.

(SEAL) SEAL OF DISTRICT COURT WILSON CO. KANSAS

Clerk of the District Court.

2599

SHERIFF'S DEED

FROM

Chas. A. Spohn - Shf.

TO

Arthur M. Pugh

Entered in Transfer Record this 19
day of , 19
County Clerk.

STATE OF KANSAS,
Wilson County, } ss.

This Deed was filed for record this 19
day of December, A. D., 1956, at
10:15 o'clock A.M. of that day and duly recorded in Book 102 of Deeds, at
page 511.

Register of Deeds.

Fees, $

EXHIBIT A-25

Sheri 's Deed, Judicial Tax S 2

1264

KNOW ALL MEN BY THESE PRESENTS, That Whereas, on the 3rd day of September, 19 63, in the District Court in and for Wilson County, Kansas, at the September Term, 19 63, of said Court, then being held in and for said County, in a certain action then pending in said Court, numbered 18487, wherein the Board of County Commissioners of the County of Wilson and State of Kansas was plaintiff, and Ruth D. Ash, et al and the unknown heirs, executors, administrators, devisees, trustees and assigns of any of the defendants who may be dead and the unknown officers, successors, trustees and assigns of such corporations as may have been dissolved, were defendants, a judgment was rendered by said Court foreclosing the lien of the plaintiff for delinquent taxes in and upon the property hereinafter described, and it was further ordered that said property be sold by the Sheriff of Wilson County, Kansas, for the payment of said judgment and costs, and that after said sale that the defendants and each of them, and all persons claiming by, through, or under them, or either of them, be forever barred, foreclosed, excluded and cut off from any and all right, title, claim, interest, estate, or equity of redemption in or to the hereinafter described real estate or any part thereof.

AND WHEREAS, afterward, there was issued by the Clerk of said Court, an execution and order of sale, in pursuance of said judgment and in accordance with law, directed to the Sheriff of said County of Wilson commanding him to cause said property to be advertised and sold according to law, and from the proceeds thereof to pay, first, the costs and expenses of such suit and sale; second, the judgments of the plaintiff against each particular piece, parcel and tract; third, the balance, if any there be, be paid into court to abide its further orders, and that he make return of said execution and order of sale in sixty days from the date thereof, with his proceedings indorsed thereon, which said execution and order of sale were delivered to and received by the said Sheriff on the 3rd day of September, 19 63, and the said Sheriff, by virtue thereof, then advertised said property for sale by causing a notice that he would on the 22nd day of October, 19 63, at 10:00 o'clock A. M., of said day at the court house door in the City of Fredonia, Kansas, in said County of Wilson, offer said lands and tenements at public sale, and sell the same to the highest bidder for cash in hand at the time of sale, the said notice being published in the official paper of said Wilson County, the Wilson County Citizen, a newspaper of general circulation therein, which said newspaper has been continuously and uninterruptedly published in said county during the period of fifty-two consecutive weeks immediately prior to the first publication of the notice of this sale, said notice being published for more than thirty days immediately prior to the date of said sale.

AND WHEREAS, on the date so named in said notice and at the time and place designated therein, the Sheriff did publicly offer for sale and sell the hereinafter described tracts and parcels of land to Thomas E. Relph at and for the price and sums as follows, to-wit;

PRICE, $ 7.00

✓ Mineral Reservation Part NE¼ SW¼ Section 9, Township 29, Range 16.
Cedar Township.

11487

12/9/63

AND WHEREAS, the said Sheriff duly returned said execution and order of sale to said Court, with his proceedings thereunder indorsed thereon, and thereafter and on the 7th day of November, 19 63, the said Court duly confirmed said sale as having been made in all respects in conformity with law, and directed the Clerk of said Court to make an entry on the journal thereof that the said court is satisfied with the legality of said sale, and ordered and directed said Sheriff to make to said purchaser a deed for said lands and tenements so purchased as aforesaid, and such entry and order were thereupon then and there duly made and entered accordingly.

AND WHEREAS, the said Thomas E. Relph has paid the said purchase money in full and the same has been applied as directed by said judgment and order of sale, and there is presented to me the order of said Court confirming said sale, and directing the issuance of a good and sufficient deed to said premises to said purchaser:

NOW, THEREFORE, I, Hubert W. Harris, Sheriff of the said County of Wilson, in consideration of the premises, and by virtue of the powers in me vested by law, do hereby give, grant, sell and convey unto the said Thomas E. Relph, successors and asigns forever, the lands and tenements above described so sold as aforesaid, situate in the County of Wilson, and State of Kansas.

TO HAVE AND TO HOLD the same unto the said Thomas E. Relph heirs, successors and assigns, forever.

IN TESTIMONY WHEREOF, I, the said Hubert W. Harris Sheriff as aforesaid, have hereunto set my hand this 21 day of Dec, 19 63.

Hubert W. Harris
Sheriff of Wilson County, Kansas.

STATE OF KANSAS,
Wilson County, } ss.

BE IT REMEMBERED, that on this ..... day of ..... A. D., 19....., personally appeared before me, ...to me personally known to be the Sheriff of said Wilson County, Kansas, and the person who executed the above and foregoing deed and duly acknowledged the execution of the same for the purpose therein stated, as such Sheriff.

WITNESS my Hand and Seal the day and year last above written.

.....
Clerk District Court of Wilson County, Kansas.

STATE OF KANSAS,
Wilson County, } ss.

BE IT REMEMBERED, That on this 6th day of December A. D. 19 63, before me, the undersigned, Clerk of the District Court in and for the County and State aforesaid, came Hubert W. Harris as Sheriff of said County, who is personally known to me to be the same person who executed the within instrument of writing, and such person duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

(SEAL)

Viviane A. Poos
Clerk of the District Court.

SHERIFF'S DEED

FROM

Hubert W. Harris, Sheriff

TO

Thomas E. Ralph

Entered in Transfer Record this 9 day of Dec, 19 63
B. ..... County Clerk.

STATE OF KANSAS,
Wilson County, } ss.

This Deed was filed for record this 9 day of December A. D. 1963 at 10:30 o'clock A. M. of that day and duly recorded in Book 114 of Deeds, at page 97

Gertrude Cox
Register of Deeds.

Fees, $ .....

1864

EXHIBIT A-26

Sheriff's Deed, Judicial Tax Sale

KNOW ALL MEN BY THESE PRESENTS, That Whereas, on the 3rd day of September, 19 63, in the District Court in and for Wilson County, Kansas, at the September Term, 19 63, of said Court, then being held in and for said County, in a certain action then pending in said Court, numbered 18487, wherein the Board of County Commissioners of the County of Wilson and State of Kansas was plaintiff, and Ruth D. Ash, et al and the unknown heirs, executors, administrators, devisees, trustees and assigns of any of the defendants who may be dead and the unknown officers, successors, trustees and assigns of such corporations as may have been dissolved, were defendants, a judgment was rendered by said Court foreclosing the lien of the plaintiff for delinquent taxes in and upon the property hereinafter described, and it was further ordered that said property be sold by the Sheriff of Wilson County, Kansas, for the payment of said judgment and costs, and that after said sale that the defendants and each of them, and all persons claiming by, through, or under them, or either of them, be forever barred, foreclosed, excluded and cut off from any and all right, title, claim, interest, estate, or equity of redemption in or to the hereinafter described real estate or any part thereof.

AND WHEREAS, afterward, there was issued by the Clerk of said Court, an execution and order of sale, in pursuance of said judgment and in accordance with law, directed to the Sheriff of said County of Wilson commanding him to cause said property to be advertised and sold according to law, and from the proceeds thereof to pay, first, the costs and expenses of such suit and sale; second, the judgments of the plaintiff against each particular piece, parcel and tract; third, the balance, if any there be, be paid into court to abide its further orders, and that he make return of said execution and order of sale in sixty days from the date thereof, with his proceedings indorsed thereon, which said execution and order of sale were delivered to and received by the said Sheriff on the 3rd day of September, 19 63, and the said Sheriff, by virtue thereof, then advertised said property for sale by causing a notice that he would on the 22nd day of October, 19 63, at 10:00 o'clock A. M., of said day at the court house door in the City of Fredonia, Kansas, in said County of Wilson, offer said lands and tenements at public sale, and sell the same to the highest bidder for cash in hand at the time of sale, the said notice being published in the official paper of said Wilson County, the Wilson County Citizen, a newspaper of general circulation therein, which said newspaper has been continuously and uninterruptedly published in said county during the period of fifty-two consecutive weeks immediately prior to the first publication of the notice of this sale, said notice being published for more than thirty days immediately prior to the date of said sale.

AND WHEREAS, on the date so named in said notice and at the time and place designated therein, the Sheriff did publicly offer for sale and sell the hereinafter described tracts and parcels of land to Thomas E. Relph at and for the price and sums as follows, to-wit:

PRICE, $10.00

✓ Part NE¼ of SW¼ Section 9, Township 29, Range 16.
Cedar Township.

AND WHEREAS, the said Sheriff duly returned said execution and order of sale to said Court, with his proceedings thereunder indorsed thereon, and thereafter and on the 7th day of November, 19 63, the said Court duly confirmed said sale as having been made in all respects in conformity with law, and directed the Clerk of said Court to make an entry on the journal thereof that the said court is satisfied with the legality of said sale, and ordered and directed said Sheriff to make to said purchaser a deed for said lands and tenements so purchased as aforesaid, and such entry and order were thereupon then and there duly made and entered accordingly.

AND WHEREAS, the said Thomas E. Relph has paid the said purchase money in full and the same has been applied as directed by said judgment and order of sale, and there is presented to me the order of said Court confirming said sale, and directing the issuance of a good and sufficient deed to said premises to said purchaser;

NOW, THEREFORE, I, Hubert W. Harris, Sheriff of the said County of Wilson, in consideration of the premises, and by virtue of the powers in me vested by law, do hereby give, grant, sell and convey unto the said Thomas E. Relph, successors and asigns forever, the lands and tenements above described so sold as aforesaid, situate in the County of Wilson, and State of Kansas.

TO HAVE AND TO HOLD the same unto the said Thomas E. Relph heirs, successors and assigns, forever.

IN TESTIMONY WHEREOF, I, the said Hubert W. Harris Sheriff as aforesaid, have hereunto set my hand this 4th day of Dec, 19 63.

Hubert W. Harris
Sheriff of Wilson County, Kansas.

1285

114 d 99

12/9/63

STATE OF KANSAS,
Wilson County, } ss.

BE IT REMEMBERED, that on this.....day of....., A. D., 19....., personally appeared before me, ...to me personally known to be the Sheriff of said Wilson County, Kansas, and the person who executed the above and foregoing deed and duly acknowledged the execution of the same for the purpose therein stated, as such Sheriff.

WITNESS my Hand and Seal the day and year last above written.

.....
Clerk District Court of Wilson County, Kansas.

STATE OF KANSAS,
Wilson County, } ss.

BE IT REMEMBERED, That on this 6th day of December, A. D. 19 63, before me, the undersigned, Clerk of the District Court in and for the County and State aforesaid, came Hubert W. Harris as Sheriff of said County, who is personally known to me to be the same person who executed the within instrument of writing, and such person duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

(SEAL)

Raine Poor
Clerk of the District Court.

SHERIFFS DEED

FROM

Hubert W. Harris, Sheriff

TO

Thomas E. Ralph

Entered in Transfer Record this 9
day of Dec., 19 63
Bernice Shue
Deputy County Clerk.

STATE OF KANSAS,
Wilson County, } ss.

This Deed was filed for record this 9
day of December A. D. 19 63, at 10:30 o'clock A.M. of that day and duly recorded in Book 114 of Deeds, at page 99

Register of Deeds.

Fees, $ 2.60

R.R. Attorne

EXHIBIT A-27

3538.
139 p.

JOINT TENANCY WARRANTY DEED (Following Kansas Statutory Warranty Form)

Transfer Record in my office this 25 day of August, A. D., 1977.
Arlene Cranor
County Clerk.

Frank M. Green and Beryl L. Green, husband and wife,

CONVEY_____ AND WARRANT_____TO

Lloyde E.King and Virda L. King, husband and wife,

as JOINT TENANTS and not as tenants in common, with full rights of survivorship, the whole estate to vest in the survivor in the event of the death of either, all the following described REAL ESTATE in the County of Wilson

and the State of Kansas, to-wit:

Beginning at the center of Section 9, Townsh:p 29 S., Range 16 E., running thence west to the right of way of the Missouri Pacific RR Co., thence in a southerly direction along the east line of South right of way to a point 54 and 21 hundredths rods (54.21) south of the half section line, thence east to the half Section line at a point 54.21 rods south of the place of beginning, thence north to beginning, containing approximately 5 acres

pr. sw

for the sum of -----One dollar and other valuable and good considerations-----

EXCEPT AND SUBJECT TO:

138 p 21
138 p 22
8/25/77

Dated August 25, 19 77

STATE OF KANSAS, WILSON COUNTY, ss

BE IT REMEMBERED, That on this 25th day of August, A. D. 19 77, before me, the undersigned, a notary public in and for the County and State aforesaid, came

Frank M. Green and Beryl L. Green, husband and wife

who are personally known to me to be the same persons who executed the within instrument of writing and such persons duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal, the day and year last above written.

Lula Fink
Notary Public.

Term expires 7/21, 19 79

Frank M. Green
Frank M. Green

Beryl L. Green
Beryl L. Green

3538
STATE OF Kansas
Wilson County, } ss.

This instrument was filed for record on the 25 day of August, A. D., 1977, at 2:10 o'clock P. M., and duly recorded in book 138 of Deeds at page 21.

Arlene Cranor
Register of Deeds.

Deputy.

Fees, $ 5.00

333669

(This form is printed by the Kansas Bar Association solely for the use of its Members)

EXHIBIT A-20

DEED—GENERAL WARRANTY, JOINT TENANCY—PHOTOSTATIC P-1JT-2TV

Hall Litho. Co., Inc., Topeka

519

FROM
Virda L. King
TO
Thomas E. Relph, et ux

Entered in Transfer Record in my office, this 15 day of March 1983
Marjorie Hoine
TAC County Clerk.

STATE OF KANSAS
Wilson County, } ss.
This instrument was filed for record on the 15 day of March 1983, at 1:30 o'clock P. M., and duly recorded in Book 146 of Deeds, at page 404.
Ruth M. Boice
Ruth M. Boice Register of Deeds.
By _____ Deputy.

FEES.
Register of Deeds, for recording, $ _____
County Clerk, for transfer, $ _____
Total, $ 5.00

THIS DEED, Made this 17th day of September, 1982, between

Virda L. King, a single person

of Jefferson County, in the State of Kansas as first party, and

Thomas E. Relph and Katherine M. Relph, Husband and Wife

of Oklahoma County, in the State of Oklahoma as joint tenants with the right of survivorship and not as tenants in common, as second parties,

WITNESSETH: In consideration of the sum of One Dollar and Other Valuable Considerations and 100 Dollars the receipt of which is hereby acknowledged, first party hereby conveys and warrants unto second parties, as joint tenants with the right of survivorship and not as tenants in common, all the following described real estate situated in the County of Wilson State of Kansas, to wit:

Beginning at the center of Section Nine (9), Township Twenty-nine South (29S), Range Sixteen East (16E), running thence west to the right of way of the Missouri Pacific Railroad Company, thence in a southerly direction along the east line of South right of wayto a point Fifty-four and twenty-one hundredths (54.21) Rods south of the half section line, thence east to the half section line at a point Fifty-four and twenty-one hundredths (54.21) Rods South of the place of beginning, thence North to beginning, containing approximately Five (5) Acres.

146 d 404 3/15/83

TO HAVE AND TO HOLD THE SAME, Together with all and singular the tenements, hereditaments and appurtenances thereunto belonging or in anywise appertaining, forever, as joint tenants, the survivor to take the whole estate.

First party, for herself, her heirs, executors and administrators does hereby covenant, promise and agree to and with second parties that at the delivery of these presents she is lawfully seized in her own right of an absolute and indefeasible estate of inheritance, in fee simple, of and in all and singular the above described premises together with the appurtenances; that the same are free, clear, discharged and unincumbered of and from all former and other grants, estates, taxes, assessments and incumbrances of what nature or kind soever, except;

and that she will WARRANT AND FOREVER DEFEND the same unto second parties, as joint tenants with the right of survivorship and not as tenants in common, and the heirs and assigns of the survivor of them, against first party, her heirs, and all and every person or persons whomsoever lawfully claiming or to claim the same.

IN WITNESS WHEREOF, first party, has hereunto set her hand, the day and year first above written.

Virda L. King
Virda L. King

STATE OF Kansas, Jefferson COUNTY, ss.

BE IT REMEMBERED, That on this 17th day of September, 1982, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came

Virda L. King, a single person

who is personally known to me to be the same person who executed the foregoing deed, and duly acknowledged the execution of the same.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my official seal on the day and year last above written.

THOMAS D. HOTCHKISS NOTARY PUBLIC STATE JEFFERSON COUNTY, KANSAS

My appointment expires June 30, 1983

Thomas D. Hotchkiss
Notary Public
Thomas D Hotchkiss

(Seal)

Atl. Rev. 3-80

EXHIBIT A-29

JOINT TENANCY WARRANTY DEED (Following Kansas Statutory Warranty Form)

Entered in Transfer Record in my office this 30 day of December, A. D., 1985
Jacqueline Hinson
Deputy County Clerk.

This 30th day of December, 19 85

THOMAS E. RELPH and M. KATHERINE RELPH, a/k/a KATHERINE M. RELPH, husband and wife,

CONVEY _____ AND WARRANT _____ TO

DAVID RELPH and TONI RELPH, husband and wife,

as JOINT TENANTS and not as tenants in common, with full rights of survivorship, the whole estate to vest in the survivor in the event of the death of either, all the following described REAL ESTATE in the County of WILSON

and the State of Kansas, to-wit:

Beginning at the center of Section Nine (9), Township Twenty-nine South (29S), Range Sixteen East (16E), running thence West to the right-of-way of the Missouri Pacific Railroad Company, thence in a Southerly direction along the East line of South right-of-way to a point 54.21 rods South of the Half Section line, thence East to the Half Section line at a point 54.21 rods South of the place of beginning, thence North to beginning, containing approximately five (5) acres; Part Northeast Quarter of the Southwest Quarter (NE/4 SW/4) (as conveyed to grantors by Sheriff's Deed recorded in the Wilson County Register of Deeds Office in Book 114, at Page 99); and Northwest Quarter (NW/4), less railroad right-of-way; all in Section Nine (9), Township Twenty-nine South, Range Sixteen (16), Wilson County, Kansas;

Book 150 pg 487

12-30-85

for the sum of ONE DOLLAR ($1.00) and other good and valuable consideration.

EXCEPT AND SUBJECT TO:
Easements and rights-of-way of record.

Dated December 30, 19 85

STATE OF KANSAS, WILSON COUNTY, ss

BE IT REMEMBERED, That on this 30th day of December A. D. 19 85, before me, the undersigned, a Notaroy Public in and for the County and State aforesaid, came THOMAS E. RELPH and M. KATHERINE RELPH, a/k/a KATHERINE M. RELPH, husband and wife,

who are personally known to me to be the same persons who executed the within instrument of writing and such persons duly acknowledged the execution of the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

Katherine D. Nagel
Katherine D. Nagel Notary Public.

Term expires October 4, 19 89

KATHERINE D. NAGEL NOTARY PUBLIC STATE OF KANSAS

Thomas E. Relph
THOMAS E. RELPH

M. Katherine Relph
M. KATHERINE RELPH, a/k/a KATHERINE M. RELPH

2397

STATE OF Kansas
Wilson County, } ss.

This instrument was filed for record on the 30 day of December, A. D., 1985, at 3:30 o'clock P. M., and duly recorded in book 150 of Deeds at page 487.

Ruth M. Boice
Ruth M. Boice Register of Deeds.

Deputy.

Fees, $5.00

(This form is printed by the Kansas Bar Association solely for the use of its Members)

shall have the right to discharge any incumbrance on said premises and shall have a lien thereon for the amount so paid together with all costs and expenses incurred. And the said part of the first part does covenant and agree that at the delivery hereof she is the lawful owner of the premises above granted, and seized of a good and indefeasible state of inheritance therein, free and clear of all incumbrances.

It is further agreed by the said second party to commence drilling for gas and oil within six months from date of this lease on this territory.

This Contract shall extend to and be binding upon the heirs, assigns, successors and personal representatives of the parties hereto.

Executed in duplicate the day and year first above written.

Witness: Irene Smyth (Seal)

(Seal)

(Seal)

(Seal)

State of Kansas, Wilson County, ss:

Be it remembered, That on this 18 day of February, A.D. 1903, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came Irene Smyth a single lady who is personally known to me to be the same person who executed the within instrument of writing, and such person duly acknowledged the execution of the same.

In Testimony Whereof, I have hereunto set my hand and affixed my notorial seal the day and year last above written.

(Seal) J. S. Claiborne

My Commission Expires Sept. 15 1904 Notary Public

Filed for record Dec. 23rd 1903 at 8 o'clock A. M.

R. A. McGregor, Register of Deeds.

The Richardson Gas & Oil Co. To A. B. Cockerill

This Agreement made, and entered into in duplicate by and between R. N. Richardson, party of the first part and A. B. Cockerill, party of the second part.

Witnesseth: That for and in consideration of the sum of Fifty Dollars ($50.00) per annum and the agreements and conditions herein after mentioned.

The aforesaid R. N. Richardson, party of the first part, by and with the consent of the lessee, The Richardson Gas & Oil Co. hereby releasing the said lessee from all responsibility of well royalty under the lease held by them, do hereby grant to A. B. Cockerill, successors heirs or assigns the right to one gas well, also the right of ingress and egress to and from same; to lay and maintain a pipe line for the transportation of the natural gas from said well over and across the North half of the South East quarter of Section Nine (9) Township

Twenty nine (29) Range Sixteen (16) East, the pipe to be buried sufficient depth so as not to interfere with cultivation or surface of land, and to be responsible for any damage from the said pipe line privilege; said damage if not mutually agreed upon, to be ascertained and determined by three disinterested persons, one thereof to be appointed by the Grantor heirs or assigns, one by A. B. Cockerill, successors heirs or assigns and the third by the two so appointed as aforesaid, and the award thereof of such three persons shall be final and conclusive.

The aforesaid A. B. Cockerill party of the Second part, for and in consideration of the privilege above granted, hereby agree to locate and operate a smelter, to be located on the South West quarter of Section Nine (9) Township Twentynine (29) Range Sixteen (16) East, Wilson County Kansas, and further agree that all Gas used from well above mentioned, shall be for fuel for the operation only, of said smelter; should any gas from said well be made use of for any other purpose other than as mentioned, all rights under and by virtue of the privilege herein granted shall be forfeited, to The Richardson Gas & Oil Co.

In Witness whereof, the parties hereto have hereunto set their hands this 9th day of December A. D. 1903.

R. N. Richardson
A. B. Cockerill

Executed and delivered in presence of
M. E. Richardson
A. M. Richardson

On this 9th day of December A. D. 1903, The Richardson Gas & Oil Co. by its Secretary Treasurer and President hereby consent and agree to the above contract.

The Richardson Gas & Oil Company
By R. N. Richardson Pt
M. E. Richardson Secy
A. M. Richardson Treas

Corporate Seal

State of Kansas County of Wilson ss

Personally appeared before me a Notary Public, in and for said County and State, R. N. Richardson, and the Richardson Gas and Oil Co. by R. N. Richardson President, M. E. Richardson Secretary and A. M. Richardson, Treasurer, who are personally known to me to be the same persons who executed the foregoing instruments and duly acknowledged the execution of the same.

In witness whereof, I have hereunto subscribed my name and affixed my official seal 24th day of December A. D. 1903.

(Seal)

Robt O Graham
Notary Public

My commission expires Oct 22/ 1907

Filed for record Dec. 24, 1903 at 5 30 O'clock P. M.

R. A. McGregor
Register of Deeds

EXHIBIT C - No. 31

LARRY D. HENDRICKS
420 West 33rd Street
Topeka, Kansas 66611
913-266-4220

IN THE DISTRICT COURT OF JEFFERSON COUNTY, KANSAS
PROBATE DIVISION

In the Matter of the Estate of)
LLOYDE E. KING, Deceased.) No. 83-P-25
)

DECREE OF DESCENT

NOW on this 15th day of April, 1983, comes on for hearing the Petition for Determination of Descent filed by Virda Louise King, the sole heir of Lloyde E. King, deceased.

The petitioner appears in person and by her attorney, Larry D. Hendricks. There are no other appearances.

After examining the file, hearing the evidence, statements and arguments of counsel, and being duly advised in the premises, the Court finds:

1. That due diligence has been exercised in the search for names, ages, relationships, residences and addresses of heirs.

2. That notice of this hearing has been given as required by law and the order of this Court and that proof thereof has been duly filed and is hereby approved.

3. That the allegations of the petition are true.

4. That the terms and provisions of the Soldiers and Sailors Civil Relief Act of 1940, as amended, have been complied with as to any interested person or persons who are in the service of the United States or its allies.

5. That Lloyde E. King, died at Topeka, Kansas, on the 15th day of June, 1982; that more than nine (9) months have expired since the date of the decedent's death; that at the time of his death, he was a resident of Jefferson County, Kansas, and a citizen of the United States.

6. That no petition has been filed for the probate of a will of Lloyde E. King, nor administration commenced in this state.

RY D. HENDRICKS
TORNEY AT LAW
0 WEST 33RD ST.
EKA, KANSAS 66611
(913) 266-4220

7. That Virda Louise King, an adult, and wife of the deceased, is the sole heir to this estate and entitled to all of the property of whatever nature left by Lloyde E. King.

8. That the decedent had no spouse or children or adopted children or issue of deceased children, natural or adopted, or other heirs who survived him other than his wife, Virda Louise King.

9. That at the time of his death, the decedent owned the following described real estate situtated in the State of Kansas:

Lot Two (2) in Block Two (2), in Welter Estates Subdivision to the City of Perry, according to the recorded Plat thereof, in Jefferson County, Kansas.

5 Acres Pt. S.W. ¼, Section 9, Twp. 19, Range 16 Wilson County, Kansas.

10. That at the time of his death, the decedent owned the following described personal property:

One (1) 1977 Oldsmobile
One (1) 1976 Chevrolet 3/4 ton pickup truck
One (1) 1981 Coachman 5th wheel camper
Two (2) Certificates of Deposit at Capitol Federal Savings & Loan
One (1) Savings Account at Capitol Federal Savings & Loan
One (1) Checking Account at Bank of Perry.

11. That all taxes imposed by the State of Kansas and by the United States have been paid.

IT IS THEREFORE BY THE COURT CONSIDERED, ORDERED, ADJUDGED AND DECREED:

1. That the findings hereinabove made be and the same hereby are made a part of the order and decree of this Court.

2. That the title to all of the interests of Lloyde E. King, deceased, in and to the real property hereinabove described and all other Kansas real estate owned by the decedent at his death on the 15th day of June, 1982, descend from him to his wife, Virda Louise King.

3. That the title to all real property hereinabove described is assigned to Virda Louise King as of the date of

IIY D. HENDRICKS
TTORNEY AT LAW
0 WEST 33RD ST.
EKA, KANSAS 66611
(913) 266-4220

death, subject to any lawful disposition heretofore made.

4. That all other property owned by the decedent, descended on the date of death, June 15, 1982, to Virda Louise King, and title is assigned to her as of that date, subject to any lawful dispositions previously made.

Edwin Z. Riley
Judge

PREPARED BY:

Larry D. Hendricks

LARRY D. HENDRICKS
420 West 33rd Street
Topeka, Kansas 66611
913-266-4220
Attorney for Petitioner

STATE OF KANSAS, JEFFERSON COUNTY
FILED
APR 15 1983
10:05 AM-PM
Evelyn R. Bowers
DISTRICT COURT
CLERK OF DISTRICT COURT

RY D. HENDRICKS
ITORNEY AT LAW
0 WEST 33RD ST.
EKA, KANSAS 66611
(913) 266-4220

APPENDIX B

MAXIM
TECHNOLOGIES INC

June 17, 2002

City of Altoona
715 Main Street
Altoona, KS 66710

RE: Notification to Complete Soil Sampling in City Right-of-Way
Vicinity of Former Smelter Property
NE ¼ of SW ¼ of Section 9, T29S, R16E
Altoona, Kansas

To City Personnel:

Maxim Technologies, Inc. (Maxim) has been hired by the Kansas Department of Health and Environment (KDHE) to perform Focused Former Smelter Assessments (FFSAs) of former smelter properties located in southeastern Kansas. The primary objective of completing the FFSA is to evaluate human health and environmental risk associated with the operation of a smelter reportedly located in the NE ¼ of SW ¼ of Section 9, T29S, R16E. This smelter was known as the Cockerill Zinc Company/United States Smelting Company, and operated during the approximate timeframe of 1904 – 1917.

Maxim personnel will be completing the actual fieldwork, including collection of surface and subsurface soil samples in areas bordering the above-described area. Approximately 4 to 5 soil samples will be collected from 1 to 3 feet below ground surface in city right-of-ways. Before field activities begin, Kansas One-Call will be notified for utility markings. If this work described is acceptable to Altoona, Maxim hopes to complete the fieldwork during the week of July 22, 2002.

Please call Mr. Brian Conrad with the KDHE at (785) 296-5519 or me at (913) 321-8100 if you have any questions or comments regarding this letter.

Sincerely,
MAXIM TECHNOLOGIES, INC.

Liz McVay
Project Manager

721 S. Packard, Kansas City, KS 66105 • Ph: (913) 321-8100 • Fax: (913) 321-8181

"Providing Cost-Effective Solutions to Clients Nationwide"

CONSENT AGREEMENT FOR ACCESS TO PROPERTY

OWNER(S) OF PROPERTY MR. DAVID RELPH

ADDRESS OF PROPERTY NE 1/4 of SW 1/4, Section 9, T29S, R16E
Altoona, WILSON COUNTY, KS

The owner(s) of the above described property grant to the Kansas Department of Health and Environment (KDHE), its employees, agents, or other authorized representatives, the right and privilege to enter on the above described property for the purpose of conducting an environmental investigation which may include the following:

1. the boring of holes for subsurface investigation including the use of hydraulic boring equipment;
2. the collection of water and soil samples as are determined to be necessary; and
3. other actions related to the investigation of subsurface contamination.

This consent agreement shall terminate upon the accomplishment of the above stated purpose.

KDHE assures the owner that prior to termination of this consent agreement, all materials and equipment shall be removed from the property and the property will be restored, as nearly as reasonably possible, to its condition at the time this consent agreement was executed.

3-15-02
Date

David Relph
Owner Signature

WITNESSES:

_____

_____
Date

_____

_____
Date

MAXIM
TECHNOLOGIES INC

March 11, 2002

Mr. David Relph
Box 7, RR #1
Altoona, KS 66710-9802

RE: Consent Agreement for Access to Property
Former Smelter Property
NE ¼ of SW ¼, Section 9, T29S, R16E
Altoona, KS 66710-9802

Dear Mr. Relph:

Maxim Technologies, Inc. (Maxim) has been hired by the Kansas Department of Health and Environment (KDHE) Bureau of Environmental Remediation (BER) to perform Focused Former Smelter Assessments (FFSAs) of former smelter properties located in southeastern Kansas. After completing a records search at the Wilson County Register of Deeds Office, it is Maxim's understanding that you are the present property owner of the site known as the SE 1/4 of the SW ¼, Section 9, T29S, R16E in Altoona, Kansas. The primary objective of completing the FFSA is to evaluate human health and environmental risk associated with the operation of a smelter at this site by Cockerill Zinc Company and the United States Smelting Company during the timeframe from approximately 1904 through 1917.

A "Consent Agreement for Access to Property" is enclosed as an attachment. This agreement allows KDHE and Maxim personnel permission to gain access to your property for completion of the FFSA. If permission is granted, KDHE personnel will perform a visual survey of your property as soon as possible, and, at a later date, Maxim personnel will be completing the actual fieldwork, including collection of surface and subsurface soil samples, surface water samples, and groundwater samples if domestic water wells exist on the property.

If this agreement meets with your approval, please sign and return to Maxim. Please call us at (913) 321-8100 if you have any questions or comments regarding the information described above.

Sincerely,
MAXIM TECHNOLOGIES, INC.

Liz McVay
Project Manager

cc: Mr. Brian Conrad, Kansas Department of Health and Environment

attachment: Consent Agreement For Access to Property

721 S. Packard, Kansas City, KS 66105 • Ph: (913) 321-8100 • Fax: (913) 321-8181

CONSENT AGREEMENT FOR ACCESS TO PROPERTY

OWNER(S) OF PROPERTY Rick and Tammy Good

ADDRESS OF PROPERTY ① Block 11 ② NW 1/4 of the SW 1/4 of Sec 9, T29S, R16E

The owner(s) of the above described property grant to the Kansas Department of Health and Environment (KDHE), its employees, agents, or other authorized representatives, the right and privilege to enter on the above described property for the purpose of conducting an environmental investigation which may include the following:

1. the boring of holes for subsurface investigation including the use of hydraulic boring equipment;
2. the collection of water and soil samples as are determined to be necessary; and
3. other actions related to the investigation of subsurface contamination.

This consent agreement shall terminate upon the accomplishment of the above stated purpose.

KDHE assures the owner that prior to termination of this consent agreement, all materials and equipment shall be removed from the property and the property will be restored, as nearly as reasonably possible, to its condition at the time this consent agreement was executed.

7-9-02
Date

Owner Signature

Tammy Good

WITNESSES:

Date

Date

MAXIM
TECHNOLOGIES INC

June 17, 2002

Rick and Tammy Good
P.O. Box 274
Altoona, KS 66710

RE: Consent Agreement for Access to Property
Vicinity of Former Smelter Property
Block 11 and the NW ¼ of the SW ¼ of Section 9, T29S, R16E
Altoona, Kansas

Dear Mr. and Mrs. Good:

Maxim Technologies, Inc. (Maxim) has been hired by the Kansas Department of Health and Environment (KDHE) to perform Focused Former Smelter Assessments (FFSAs) of former smelter properties located in southeastern Kansas. After completing a records search at the Wilson County Register of Deeds Office, it is Maxim's understanding that you are the present property owner of the two properties known as Block 11, consisting of 2.9 acres, and the NW ¼ of the SW ¼ of Section 9, T29S, R16E, consisting of 81.2 acres. The primary objective of completing the FFSA is to evaluate human health and environmental risk associated with the operation of a smelter reportedly located to the north and east of your properties. This smelter was known as the Cockerill Zinc Company/United States Smelting Company, and operated during the approximate timeframe of 1904 – 1917.

A "Consent Agreement for Access to Property" is enclosed as an attachment. This agreement allows KDHE and Maxim personnel permission to gain access to your property for completion of the FFSA. If permission is granted, Maxim personnel will be completing the actual fieldwork, including collection of surface and subsurface soil samples (1-2 samples) in the area described as the SW ¼ of Section 9, T29S, R16E, and sediment/surface water samples from the pond located in the area known as Block 11. If domestic water wells exist on the property, a sample would be collected from this source if possible. Maxim hopes to complete the fieldwork during the week of July 22, 2002.

If this agreement meets with your approval, please sign and return to Maxim. Please call Mr. Brian Conrad with the KDHE at (785) 296-5519 or me at (913) 321-8100 if you have any questions or comments regarding this request.

Sincerely,
MAXIM TECHNOLOGIES, INC.

Liz McVay
Project Manager

cc: Mr. Brian Conrad, KDHE, Bureau of Environmental Remediation

721 S. Packard, Kansas City, KS 66105 • Ph: (913) 321-8100 • Fax: (913) 321-8181

APPENDIX C

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT

BUREAU OF ENVIRONMENTAL REMEDIATION

ALTOONA (SEE REVERSE SIDE)

UTILITY CLEARANCE CHECKLIST

This document must be completed in its entirety and submitted to the appropriate Project Manager before any intrusive event such drilling, excavation or probing may be performed by any entity executing work orders generated by the Kansas Department of Healt & Environment, Bureau of Environmental Remediation. Completion of this form is mandatory for each separate event if substantial distances separate subsurface activities.

Failure to complete and submit this document before work is performed will preclude agency approval of the work and will transfer liability associated with damages to the contractor or and/or subcontractors. If it is determined a specific utility is not in the area of the project, please indicate this in the company/contact person column. If there are additional utilities which require clearance in th area, please indicate all necessary information and/or comments on the back of this page.

This document will also be completed by any KDHE/BER personnel who undertake such activities using agency or contracted equipment.

I, Liz McVay, hereby attest that I have contacted the following companies/municipaliti

Purpose / description of work: Soil Sampling

Name of facility: City of Altoona

Address / location of facility:

Site ID# (if applicable):

Dig Safe* LM (initial if called) Date Called 7/29 Ticket Number(s) 269419

Utilities Covered:

	Company/ Contact	Were Utilities Cleared?		Did you observe utility clearance?			Initial
Natural Gas	KGE	✓ yes	___ no	___ yes	✓ no	Date 7/31	SA
	United Cities Gas	✓ yes	___ no	___ yes	✓ no	Date 7/31	SA
Telephone	Sprint	✓ yes	___ no	___ yes	✓ no	Date	SA
	Southwestern Bell	✓ yes	___ no	___ yes	✓ no	Date	SA
Cable TV	Media Com	✓ yes	___ no	___ yes	✓ no	Date	SA
Electric	Radian Electric Coop	✓ yes	___ no	___ yes	✓ no	Date	SA
		___ yes	___ no	___ yes	___ no	Date	SA

Municipalities:

	Contact Person						
Sanitary Sewer	John Troutman	✓ yes	___ no	___ yes	✓ no	Date 7/31	SA
Public Water	" "	✓ yes	___ no	___ yes	✓ no	Date	SA
Storm Sewer	" "	✓ yes	___ no	___ yes	✓ no	Date	SA

Other:

	Company						
Fiber Optic Cable	SPRINT	✓ yes	___ no	___ yes	✓ no	Date 7/31	SA
Pipeline (specify)	Pinderosa Gas Pipeline	✓ yes	___ no	___ yes	✓ no	Date 7/31	SA

The information on this document is correct to the best of my knowledge:

signed Mary Allen date: July 31, 2002

Dig safe does not cover all utility companies. It is the responsibility of the on-site Project Manager to insure all companies with utilities in the area are contacted.

REV. 12/4/96

ALTOONA - KANSAS ONE CALL

Site: ① Entire NE 1/4 of SW 1/4, Section 9, T29S, R16E + Row

② SE 1/4 of SW 1/4, Sec 9 T29S, R16E + Row

③ SW & SE 1/4 of NW 1/4, Sec 9, T29S, R16E

④ ~~East~~ ~~Row~~ NW 1/4 of SE 1/4, Sec 9, T29S, R16E + Row

APPENDIX D

APPENDIX E

7/31/02 Altoona, KS Page 1

800 Shannon Allen and Teresa Ferguson with Maxim Technologies arrive at the site to begin site investigations.

Weather: low 80s, clear, sunny, slight breeze.

Maxim finds a large waste pile and the possible foundation of the smelter, located on the southeast portion of the site, just east of both onsite ponds and just west of the RR tracks.

825 Collect waste sample AW-1 N37°32'09.0" W95°39'46.4"

Waste pile appears to also be former smelter location because a large amount of what appears to be busted up clay pipes and kiln bricks mixed in with chat.

855 Teresa collects sediment sample ASE-1. N37°32'07.5" W95°39'47.6"

858 Teresa collects surface water sample ASW-1. N37°32'07.6" W95°39'47.6"

Appears to be smelter kiln material at border of pond where prev. samples were collected

SA

Photo Log

Date	Time	Photo	Description
905 7/31/02	905	9	point of collection of ASW-1 and ASE-1 onsite
7/31/02	910	10	waste pile close to pond onsite (#1)
7/31	911	11	waste piles
7/31	912	12	part of possible former loc. of smelter
7/31	913	13	waste piles by pond #2 onsite
7/31		↓	Waste piles & smelter locations
		27	
7/31	1405	1	possible kiln structure foundation w/ waste
↓	1411	2	waste
	1412	3	brick structure
	1416	4	collection loc. of ASW-3
	1416	5	drainage route from waste pile leading to water where ASW-3 was collected.

7/31/02 Altoona, AS Page 2

1002 Collecting onsite surface water sample ASW-2. N37°32'10.6" W95°39'49.6"

1005 Collecting onsite sediment sample ASE-2 N37°32'10.6" W95°39'49.9"

A majority of the site west of the RR tracks is covered with waste (chat, burnt metal, burnt clay) and building structure material.

1049 Collected data onsite insitu soil sample AS-1 N 37°32'06.4" W095°39'59.1"

1120 Onsite insitu soil sample AS-2 N37°32'09.4" W95°39'59.4"

1124 onsite insitu soil sample AS-3 N37°32'10.9" W95°39'56.7"

1131 onsite insitu soil sample AS-4 N 37°32'10.4" W 95°39'56.0"

1139 onsite insitu soil sample AS-5 N 37°32'13.6" W 95°39'58.4"

1200 Left site for lunch + to get supplies.

1315 Arrive back at site.

1352 Onsite insitu soil AS-6 N 37°32'10.4" W 95°39'46.7"

1357 XRF overheated, waiting for it to cool.

SA

MATRIX	ONSITE XRF INSITU	ONSITE LAB	OFFSITE XRF INSITU	OFFSITE LAB
Soil	AS-1		AOS-1	
	AS-2		AOS-2	
	AS-3		AOS-3	AOS-3
	AS-4		AOS-3a	
	AS-5		AOS-4	AOS-4
	AS-6			
	AS-7			
	AS-8	AS-8		
	AS-9			
	AS-10			
	AS-11			
	AS-12			
	AS-13			
	AS-14			
	AS-15			
	AS-16			
Surface Water		ASW-1		AOSW-1
		ASW-2		AOSW-2
				AOSW-3
Sediment	ASE-1		AOSE-1	AOSE-1
	ASE-2	ASE-2	AOSE-2	~~AOSE-2~~
			AOSE-3	~~AOSE-3~~
Waste		W-1 W-2 W-3		

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1400 Onsite insitu soil AS-7
N 37° 32' 09.1" W 95° 39' 48.7"

1415 Collect, ASW-3, onsite surface water sample from drainage route off of waste pile.
N 37° 32' 06.0" W 95° 39' 49.9"

1455 onsite insitu soil AS-8
N 37° 32' ~~32~~ 09.3" W 95° 39' 51.2"

1504 onsite insitu soil AS-9
N 37° 32' 14.0" W 95° 39' 49.4"

1512 onsite insitu soil AS-10
N 37° 32' 12.4" W 95° 39' 53.2"

1519 onsite insitu soil AS-11
N 37° 32' 13.1" W 95° 39' 56.2"

1524 onsite waste sample AW-2
N 37° 32' 10.8" W 95° 39' 58.1"

1530 onsite waste sample AW-3
N 37° 32' 7.2" W 95° 39' 57.6"

1538 onsite insitu soil AS-12
N 37° 32' 7.1" W 95° 39' 55.0"

1544 onsite insitu soil AS-13
N 37° 32' 5.6" W 95° 39' 55.9"

1550 onsite insitu soil AS-14
N 37° 32' 5.8" W 95° 39' 51.7"

5A

Photo Log

Date	Time	Photo	Description
7/31	1418	6	drainage route leading to pooled surface H_2O
7/31	1424	7-8	waste structures
8/1	9:00	9	south adjacent prop. boundary
8/1	9:00	10	and drainage
8/1	9:00	11	area running offsite.

Bar <280
Lead <250
Si <600

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1625 Offsite insitu soil AOS-1
N 37° 32' 10.4" W 95° 39' 39.3"

1633 ~~Offsite~~ on insitu soil ~~AOS-2~~ AS-15
N 37° 32' 15.6" W 95° 39' 41.0"

Pond on northeast portion of site on last of RR tracks appears to be onsite visually but appears to be offsite on aerial photo (2000)

1643 ~~Offsite~~ on insitu soil ~~AOS-3~~ AS-16
N 37° 32' 6.6" W 95° 39' 40.5"

1649 Offsite insitu soil AOS-2
N 37° 32' 6.5" W 95° 39' 39.7"
Collected in West ROW adjacent to a daycare

Offsite insitu soil AOS-3

1603 Offsite insitu soil AOS-3
N 37° 32' 27" W 95° 39' 40.1"
Collect soil sample AOS-3 for laboratory analysis ≈ 0"-3"

1707 offsite exsitu sample AOS-3a
1 foot - below BSK Cabers

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1755 Offsite insitu soil AOS-4
N37° 32' 53.1" W 95° 39' 50.0"
Collect sample for laboratory analysis
1805 collecting ~~AOSW-4~~ AOSW-1 and AOSE-1 from offsite pond surface water and sediment respectively. Pond located just south of site.
N37°31'59.3" W95° 39'50.4"

1826 offsite insitu soil AOS-5
N 37° 32' 4.0" W95° 40' 12.9"
1840 collecting offsite surface water & sediment samples AOSW-2 and AOSE-2, respectively.
N37°32'23.3" W95°40'84.3"
1858 left site for hotel

AA

8/1/02 Altoona, KS Page 6
830 Maxim representatives Theresa Ferguson & Shannon Allen arrive onsite.

Weather: mid 80's, high of 99° with heat index of 105°, slight breeze, clear.

Note: parked vehicle on south adjacent property and notice that a large amount of waste has washed onto south adjacent property. A drainage creek that runs from the waste piles onsite, runs through the south adjacent property. Drainage channel is 3'-5' wide and approx. 2' deep in the deepest areas and 6"-1' deep throughout the majority of channel. Channel drains into a pond on the southwest adjacent property to the south adjacent property. May take an additional ~~obs~~ site visit and surface water sample as a result of those findings. Drainage route is apparent on

8/1/02 Altoona, KS

2000 aerial photo from Wilson County.

922 Collecting AS-6a (1' depth) onsite soil sample

932 Collecting AS-6b (2' depth) onsite soil sample

941 collecting AS-6c (5' depth) onsite soil sample.

947 attempting to collect AS-7a building structure is mixed in with the soil, possibly waste as well. Cannot go deeper than 1' due to brick & clay building structures. A pure soil sample could not be obtained at 1' and ~~not~~ SA the soil was not moist and compacted like native soil. AS-7a was collected.

1000 collecting onsite soil sample AS-8a (1' depth)

1004 collecting onsite soil sample AS-8 (surface soil) for laboratory analysis

1009 collecting AS-8b (2' depth) and duplicate.

8/1/02 Altoona, KS Page 8

At soil sample location AS-8 the top 9" is a dark, loose, organic soil. At 10'-12" there is a red layer that may be deteriorated brick, and then 12" and deeper it is a clayey substrate.

1014 Soil sampl AS-8a (3' depth) was collected

1104 collecting exsitu soil sample AS-3a (1' depth) - 1' foot depth appears to be waste/soil combination.

1117 collecting exsitu soil sample AS-3b and appears to be same waste/soil combo., very loose and may not be representative of 2' because loose soil/waste kept falling in from the walls of hole.

1123 digging to 1' at AS-2 to get AS-2a (1' depth), building material was encountered at approx 3'-6" very dark topsoil, may have some waste mixed in it (debris). Approx 85% soil mixture.

SA

8/1/02 Altoona, KS Page 9

1131 Collecting exsitu soil sample AS-2b (2' depth) clayey sub.

1135 40 Collecting AS-2c (3' depth) clayey substrate.

1155 collecting offsite ~~sed~~ surface water sample ADSW-3 N 37°32'03.6" W95°39'51.4"

1200 collecting insitu offsite sediment from drainage route on south adjacent property. ADSE-3 N 37°32'03.1" W95°39'51.0"

1230 collecting offsite insitu soil sample ADS 6

N 37°31'56.1" W95°39'42.7"

1236 leave site for lunch.

1340 Start 1/2 mile radius.

Daycare located on east adjacent property called Cindy's Daycare. In a residence where 2 adults live. 8 children ranging in age from 3mo. to 7yrs. are in daycare here. 3 churches are located south of the site, and 1 ballfield located southeast of site ~~or~~ within 1/2 mile radius. Only one residence located

adjacent to site property, which is located east adjacent. (One residence is also located E-SE of site adjacent. Little Cedar Creek is located approx. 1/2 mile east of site. The Neosho River is located approx. 1/2 mile southwest of site. A drainage route starting on site appears to drain into Neosho River. Ms. Cindy Wickham, operator of the daycare stated that they were on city water and was unaware of any private wells in the vicinity. 1508 Maxim team leaves Altoona for Neodesha to do 1/2 mile radius of site.

SK

APPENDIX F

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP

Project No: 2390202

1. View of small waste piles and structural debris located in the southeast corner of the western portion of the site looking southeast.

2. View of small waste piles and structural debris located in the east portion of the site, west of the railroad tracks, looking north.

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP

Project No: 2390202

3. View of linear piles of structural debris located just east of the northern-most pond on the site property, looking northwest.

4. View of structural debris and a brick foundation located just north of the southern-most pond on the site property, looking north.

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP

Project No: 2390202

5. View of the large waste piles located on the southern portion of the site, looking east. The tree cover in the background is located near the drainage creek that extends offsite.

6. View from the top of a waste pile located on the southern portion of the site looking south toward the City of Altoona and an offsite pond where samples were collected.

7. View of large pieces of structural debris and waste located on the southern portion of the site looking south.

8. View of large waste pile located on the southern portion of the site looking west.

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP

Project No: 2390202

9. View of waste piles and structural debris located on the southern portion of the site looking west. A water runoff route is located in the lower right portion of the photo.

10. View of waste piles and structural debris located on the western portion of the site looking northwest.

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP

Project No: 2390202

11. View of remnant structural foundation located near the center of the site looking north.

12. View of the northwest portion of the site and part of the junkyard area looking northwest. Waste and structural debris is mixed in with the soil.

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP

Project No: 2390202

13. View of inferred refuse smelter exhaust system components located along the western border of the site property.

14. View of flat, evenly distributed waste observed throughout the central portion of the site.

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP

Project No: 2390202

15. View of a furnace support located on the west central portion of the site looking north.

16. View of flat, evenly distributed waste mixed in with soil as well as several small piles of waste. Three remnant piles of foundry bricks where the machine kilns were located are shown in the background.

17. View of the inferred concrete AST support structures located on the west central portion of the site looking west.

18. View of building debris, waste, and the remnant portion of a structure located in the vicinity of the former pottery house looking west. This structure is located just south the wooded area in the center of the site.

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP

Project No: 2390202

19. View of the southern-most pond located on the site property looking south.

20. View of a portion of the drainageway just before it flows offsite at the southern border of the site property. A film is present of the surface of the water.

21. View of the drainageway that flows from the waste piles on the southern portion of the site into the drainageway that flows offsite looking northwest.

22. View of the drainageway flowing offsite and brush that appears to have been washed into the fence from other parts of the site during heavy rain or flood events.

FORMER LEAD SMELTER SITE
Altoona, Kansas

Client: KDHESWP.

Project No: 2390202

23. View of the waste extending offsite along the southern border of the site property and a drainageway into the drainage creek extending offsite onto the southern adjacent property.

XRF QUALITY CONTROL DATA

Serial #32.700-1 (1437095), Vitor Date: 7/10/2002

No	Note	Size	Date/Time	B2266 ± Prec	Mo ± Prec	Zr ± Prec	Sr ± Prec	Rb ± Prec	Pb ± Prec	Se ± Prec	As ± Prec	Hg ± Prec	Zn ± Prec	Cu ± Prec	Ni ± Prec	Co ± Prec	Fe ± Prec	Mn ± Prec	Cr ± Prec	Eu ± Prec	La ± Prec	Ba ± Prec	Ce ± Prec	Te ± Prec	Sb ± Prec	Sn ± Prec	Cd ± Prec	Ag ± Prec	Pd ± Prec	#27 ± Prec
1		19.6	7/10/2002 06:08:48	113.20 ± 0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	NIOOIII-1	104.8	7/10/2002 06:09:39	NA	31.30 ± 8.40	97.00 ± 9.90	118.20 ± 15.90	214.20 ± 21.50	5548.80 ± 130.00	LOD 21.00	593.20 ± 82.10	LOD 30.30	6988.60 ± 180.00	2720.00 ± 160.00	150.30 ± 93.60	21.80 ± 435.00	43894.40 ± 700.00	8928.00 ± 610.00	LOD 613.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	NIOOIII-1	101.6	7/10/2002 06:12:33	NA	30.50 ± 5.30	103.30 ± 8.40	105.80 ± 9.90	220.00 ± 13.40	5478.40 ± 88.60	14.00 ± 8.70	593.20 ± 31.20	31.40 ± 12.80	6937.60 ± 116.00	2748.30 ± 100.00	-LOD 86.70	21.0 ± 285.00	43894.40 ± 590.00	9804.80 ± 400.00	LOD 405.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	7708	309.7	7/10/2002 06:19:55	NA	273.20 ± 6.80	303.60 ± 7.40	499.20 ± 7.70	LOD 6.45	511.20 ± 14.40	6.90 ± 3.80	453.60 ± 14.40	<LOD 6.60	568.00 ± 21.80	-437.20 ± 30.90	456.40 ± 33.20	628.80 ± 110.00	20992.00 ± 240.00	3817.60 ± 190.00	722.40 ± 130.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	7708	549.4	7/10/2002 06:33:40	NA	269.40 ± 6.50	502.80 ± 7.10	489.60 ± 7.90	<LOD 6.15	492.80 ± 13.50	8.70 ± 3.70	453.60 ± 13.70	6.50 ± 4.90	556.00 ± 20.60	444.40 ± 28.80	243.40 ± 29.50	591.60 ± 99.60	20697.60 ± 230.00	3769.60 ± 180.00	738.00 ± 130.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	7708	204.9	7/10/2002 06:48:54	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD 126.00	113.50 ± 41.10	940.80 ± 86.70	<LOD 48.45	<LOD 51.15	<LOD 52.80	181.30 ± 110.00	475.60 ± 55.40	546.40 ± 110.00	<LOD ± 27.45	NA
7	7708	257.9	7/10/2002 06:53:29	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD ± 108.60	124.50 ± 28.50	1060.00 ± 81.10	57.90 ± 39.50	<LOD 42.45	<LOD 49.35	<LOD 136.35	460.80 ± 47.50	523.20 ± 92.70	<LOD ± 22.65	NA
8	7708	166.6	7/10/2002 06:59:27	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD ± 134.65	557.20 ± 78.40	5107.20 ± 410.00	235.00 ± 74.30	<LOD 71.70	98.80 ± 45.10	292.40 ± 130.00	<LOD ± 33.45	<LOD ± 180.00	<LOD ± 30.30	NA
9		19.6	7/10/2002 07:13:14	114.40 ± 0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	RCVE-R11nM	164.6	7/10/2002 07:14:45	NA	16.90 ± 10.20	1120.00 ± 19.50	184.10 ± 8.40	211.20 ± 13.90	498.80 ± 28.90	534.40 ± 19.00	476.80 ± 27.70	<LOD ± 11.55	65.80 ± 21.70	<LOD ± 50.23	<LOD 68.25	LOD 285.00	25190.40 ± 460.00	LOD 405.00	562.80 ± 150.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Serial #XL700-U14477095LV Site: Date: 8/28/2002

No	XLNo	Note	Seen	Date/Time	Mo ± Prec	Zr ± Prec	Sr ± Prec	Rb ± Prec	Pb ± Prec	Se ± Prec	As ± Prec	Hg ± Prec	Zn ± Prec	Cu ± Prec	Ni ± Prec	Co ± Prec	Fe ± Prec	Mn ± Prec	Cr ± Prec
					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	1		69.5	8/28/2002 09:41:52															
2	2	Blank	154.6	8/28/2002 10:17:10	<LOD = 5.40	<LOD = 4.20	101.80 ± 5.60	<LOD = 6.75	<LOD = 8.55	<LOD = 5.10	<LOD = 7.05	<LOD = 5.10	<LOD = 18.00	<LOD = 31.65	<LOD = 36.30	<LOD = 49.05	<LOD = 75.00	<LOD = 32.05	<LOD = 81.90
3	3	Low	139.3	8/28/2002 10:21:52	<LOD = 7.80	109.00 ± 6.50	168.20 ± 8.00	128.00 ± 11.00	20.40 ± 8.60	<LOD = 6.60	<LOD = 10.95	<LOD = 7.05	77.00 ± 20.10	<LOD = 46.50	<LOD = 64.35	<LOD = 270.00	23488.00 ± 450.00	<LOD = 390.00	<LOD = 195.00
4	4	Medium	201.3	8/28/2002 10:25:27	<LOD = 8.10	231.40 ± 7.70	217.00 ± 8.00	176.30 ± 11.50	1120.00 ± 32.20	11.60 ± 5.50	46.10 ± 23.20	<LOD = 9.60	320.80 ± 25.70	<LOD = 47.85	<LOD = 58.35	<LOD = 225.00	21196.80 ± 370.00	<LOD = 330.00	223.60 ± 110.00
5	5	High	129.1	8/28/2002 10:31:09	29.30 ± 7.50	115.50 ± 9.10	300.40 ± 13.80	222.90 ± 16.70	5548.80 ± 110.00	<LOD = 18.00	601.60 ± 73.10	<LOD = 26.85	6937.60 ± 160.00	2708.80 ± 140.00	<LOD = 117.45	<LOD = 390.00	33280.00 ± 690.00	9305.60 ± 550.00	<LOD = 465.00
6	6	7708	162.2	8/28/2002 10:34:56	285.80 ± 12.00	504.00 ± 12.90	492.00 ± 13.20	<LOD = 11.55	515.20 ± 25.10	<LOD = 10.05	435.60 ± 24.80	<LOD = 11.70	530.00 ± 36.60	412.40 ± 51.00	230.60 ± 52.30	489.60 ± 180.00	19891.20 ± 410.00	3897.60 ± 320.00	474.00 ± 190.00
7	7	RCRA	247.6	8/28/2002 10:39:36	25.00 ± 8.70	1149.60 ± 16.60	202.20 ± 7.30	195.50 ± 11.30	510.40 ± 24.40	520.40 ± 16.10	485.60 ± 23.40	<LOD = 9.75	73.60 ± 18.50	<LOD = 42.45	<LOD = 58.20	<LOD = 240.00	25689.60 ± 390.00	377.20 ± 230.00	523.20 ± 130.00

Appendix J

Chemical composition of NIST samples

Non-certified value standards

[illegible] are provided for *information* only. All non-certified values are listed in parentheses. Standards for many elements do not have certified values. This occurs because:

- some bias is suspected in one or more of the methods used for certification, or
- two independent methods of certification are not available.

As more data becomes available, certified-value standards will likely become available for some of these elements.

Table D-1. High standard certified values

Element	wt. %	Element	µg/g
Aluminum	0.440 ± 0.08	Antimony	38.4 ± 3.0
Calcium	1.250 ± 0.03	Arsenic	626.0 ± 38.0
Iron	2.580 ± 0.10	Barium	707.0 ± 51.0
Magnesium	0.853 ± 0.042	Cadmium	21.8 ± 0.2
Manganese	1.010 ± 0.04	Copper	2,950.0 ±130.0
Phosphorus	0.106 ± 0.015	Lead	5,532.0 ± 80.0
Potassium	2.110 ± 0.11	Mercury	32.6 ± 1.8
Silicon	28.970 ± 0.18	Nickel	14.3 ± 1.0
Sodium	1.140 ± 0.06	Silver	35.3 ± 1.5
Sulfur	0.240 ± 0.006	Vanadium	76.6 ± 2.3
Titanium	0.283 ± 0.010	Zinc	6952.0 ± 91.0

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Table D-2. High standard non-certified values

Element	wt. %
Carbon	(3)

Element	µg/g
Bromine	(6)
Cerium	(57)
Cesium	(107)
Chromium	(39)
Cobalt	(10)
Dysprosium	(5.4)
Europium	(1)
Gallium	(34)
Gold	(0.6)
Hafnium	(3.2)
Holmium	(0.6)
Indium	(5.1)
Lanthanum	(34
Molybdenum	(19)
Neodymium	(23)
Rubidium	(120)
Samarium	(7.8)
Scandium	(8.7)
Strontium	(240)
Thallium	(1.3)
Thorium	(13)
Tungsten	(93)
Uranium	(25)
Ytterbium	(1.3)
Yttrium	(23)

Table D-3. Low standard certified values

Element	wt. %
Aluminum	7.50 ± 0.06
Calcium	1.89 ± 0.03
Iron	3.50 ± 0.11
Magnesium	1.51 ± 0.03
Phosphorus	0.062 ± 0.003
Potassium	2.03 ± 0.06
Silicon	29.66 ± 0.23
Sodium	1.16 ± 0.03
Sulfur	0.089 ± 0.002
Titanium	0.342 ± 0.021

Element	µg/g
Antimony	7.9 ± 0.5
Arsenic	17.7 ± 0.8
Barium	968 ± 40
Cadmium	0.38 ± 0.01
Chromium	130 ± 4
Cobalt	13.4 ± 0.7
Copper	34.6 ± 0.7
Lead	18.9 ± 0.5
Manganese	538 ± 17
Mercury	1.40 ± 0.08
Nickel	88 ± 5
Selenium	1.57 ± 0.08
Silver	0.41 ± 0.03
Strontium	231 ± 2
Thallium	0.74 ± 0.05
Vanadium	112 ± 5
Zinc	106 ± 3

XRF FIELD RESULTS

XRF RESULTS
ALTOONA

		Sample	Ars	Bar	Cad	Chrom	Lead	Mer	Sel	Sil	Zinc	XRF Reading
On-site	Soil	1	<190	<180	<270	<1,100	1,860	<120	<45	<780	116K	69 & 71
		2	<400	<520	<360	<1,300	7,630	<110	<57	<940	39.6K	72, 73
		3	<780	<520	<360	<2,700	10.2K	<240	<140	<900	60.8K	75, 76
		4	<450	1,830	<160	<1,600	3,810	<130	<76	<510	27.7K	77, 78
		5	<180	<460	<130	<880	794	<63	<41	<760	4,190	79, 80
		6	<390	<600	<190	<1,400	5,060	<100	<67	<840	20.3K	82, 83
		7	<720	<630	<140	<2,200	16.2K	<190	<100	<1,500	73.3K	84, 85
		8	<400	<280	<210	<1,300	5,870	420	<58	<760	36.4K	87, 88
		9	<460	<450	<240	<970	670	249	<43	<940	4,470	89, 90
		10	<210	<310	<190	<820	1920	<58	<32	<1010	6,880	91, 92
	Contingency (Soil)	11	<270	<160	<340	<1,500	1,420	<96	<50	<750	13.8K	93, 94
		12	<930	<20	<160	<2,500	13.3K	<240	<150	<640	51.2K	95, 96
		13	<330	<280	<120	<1,500	2,760	<120	<62	<1,100	30.8K	97, 98
		14	<340	<270	<330	<1,200	3,390	<110	<66	<690	18.5K	99, 100
		15	<44	<330	<120	<690	<52	<32	<28	<670	<110	103, 104
		16	<63	<346	<50	<520	115	<28	<26	<720	529	105, 106
	Sediment	1	<110	<250	<160	<1,200	211	<36	<27	<610	999	130, 131
		2	<210	<310	<89	<1,100	874	<63	<43	<570	4,030	128, 129
Off-site	Soil	1	<44	<300	<190	<630	<59	<25	<25	<1,300	494	101, 102
		2	<46	<300	<160	<430	93.3	<25	<23	<780	652	107, 108
		3	<150	<180	<160	<960	1,310	<42	<40	<580	4,970	109, 110
		4	<94	<270	<180	<750	270	<43	<32	<690	877	115-117
		5	<67	<240	<100	<820	<90	<43	<28	4060	<210	118-119
		6	<81	<180	<94	<940	133	<36	<27	<430	708	124-125
		7										
	Sediment	1	<76	<280	<160	<520	329	<26	<27	<870	1,160	132, 133
		2	<36	<520	<160	<540	<41	<26	<18	<910	<110	134, 135
		3	<340	<480	<160	<2,100	1,970	<110	<81	<820	19.3K	122, 123
Residential RSK Values			11	5,500	39	390	400	2	390	390	23,000	
Nonresidential RSK Values			38	140,000	1,000	4,000	1,000	20	10,000	10,000	610,000	

Results in milligrams per kilogram (mg/kg: parts per million)

Subsurface (> surface sample)

Location	Type	Sample	Ars	Bar	Cad	Chrom	Lead	Mer	Sel	Sil	Zinc	XRF Reading
ADS-3	Soil	a	<84	<280	<250	<900	103	<45	<34	<660	850	113-114
AS-2	↓	a	<610	<360	<300	<1800	6,490	<160	<86	<820	28.9K	136-137
AS-2		b	<130	<550	<360	<790	722	<41	<31	<1200	3460	140-141
AS-7		a	<1100	<850	<390	<3700	13.8K	<270	<160	<940	52.7K	148-149
AS-6		a	<70	<400	<270	<1100	<44	<60	<38	<1600	1160	138, 139
AS-3		a	962	<870	<340	<3000	14.2K	<270	<130	<1200	88.4K	142, 143
AS-3		b	1500	1090	<210	<2100	19.7K	<190	420	<540	69.4K	146, 147
AS-8	↓	a	<99	<490	<210	<600	537	<36	<23	<930	3070	144, 145

a = 1 foot interval
b = 2 foot interval
c = 3 foot interval

* = sample submitted to laboratory

XRF PRINTOUT DATA

Serial #XL700-U14477095LY
BULK
Header:
Site: <none>

No	XLNo	Ssec	Date/Time	Cycle	RES0	RES0 Err	Pb	Pb Error	Se	Se Error	As	As Error	Hg	Hg Error	Zn	Zn Error	Cr	Cr Error	RES6	RES6 Err	Ba	Ba Error	Cd	Cd Error	Ag	Ag Error	RES5	RES5 Err
1	1	20	7/28/02 14:42	1 of 1	318.8	0	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
2	2	2.3	7/28/02 14:43	1 of 1	NA		<LOD	32.7	<LOD	28.25	<LOD	40.6	<LOD	30.9	578	210	<LOD	585	NA		NA		NA		NA		NA	
3	3	19.8	7/29/02 14:50	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA	317.8	0	NA		NA		NA		
4	4	31.7	7/29/02 16:51	1 of 1	NA		<LOD	34.2	<LOD	19.05	<LOD	30.45	<LOD	16.8	<LOD	76.75	<LOD	450	NA		NA		NA		NA		NA	
5	5	24	7/29/02 16:58	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		208.4	120	<LOD	84.9	<LOD	405	NA	
6	6	52.3	7/29/02 17:16	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		483.6	120	<LOD	52.95	<LOD	255	NA	
7	7	46.3	7/29/02 17:20	1 of 1	NA		939.2	64.9	<LOD	16.6	<LOD	68.7	<LOD	20.55	3106.8	150	<LOD	375	NA		NA		NA		NA		NA	
8	8	23.6	7/29/02 17:33	1 of 1	NA		1449.6	120	<LOD	24.8	<LOD	118.2	<LOD	32.85	2708.8	200	<LOD	570	NA		NA		NA		NA		NA	
9	9	22.8	7/29/02 17:35	1 of 1	NA		1368.8	110	<LOD	25.8	<LOD	118.05	<LOD	33	2440	190	<LOD	540	NA		NA		NA		NA		NA	
10	10	36.3	7/29/02 17:50	1 of 1	NA		293.8	37.6	<LOD	13.95	<LOD	40.6	<LOD	16.05	1500	100	<LOD	315	NA		NA		NA		NA		NA	
11	11	31.1	7/29/02 17:52	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		333.2	130	<LOD	39.15	<LOD	330	NA	
12	12	15.9	7/29/02 17:54	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		320.6	170	<LOD	46.35	<LOD	420	NA	
13	13	13.9	7/29/02 17:54	1 of 1	NA		252.4	60.3	<LOD	24.3	<LOD	70.2	<LOD	28.1	1349.6	170	<LOD	600	NA		NA		NA		NA		NA	
14	14	19.5	7/30/02 8:06	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		318.4	0
15	15	10.5	7/30/02 8:26	1 of 1	NA		<LOD	49.95	<LOD	25.35	<LOD	38.4	<LOD	25.2	215.2	89.1	<LOD	585	NA		NA		NA		NA		NA	
16	16	1.4	7/30/02 8:26	1 of 1	NA		<LOD	10.95	<LOD	13.8	<LOD	59.4	<LOD	61.15	<LOD	525	<LOD	1950	NA		NA		NA		NA		NA	
17	17	7.4	7/30/02 8:26	1 of 1	NA		<LOD	66.7	<LOD	32.65	<LOD	52.8	<LOD	32.4	179.1	110	<LOD	630	NA		NA		NA		NA		NA	
18	18	8.8	7/30/02 8:27	1 of 1	NA		<LOD	55.95	<LOD	24.75	<LOD	41.7	<LOD	19.9	244	93.8	<LOD	510	NA		NA		NA		NA		NA	
19	19	32.8	7/30/02 8:28	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		299.2	110	<LOD	55.8	<LOD	300	NA	
20	20	22.4	7/30/02 8:31	1 of 1	NA		80.3	24.1	<LOD	14.7	<LOD	28.35	<LOD	16.5	205	55.9	<LOD	345	NA		NA		NA		NA		NA	
21	21	31.9	7/30/02 8:44	1 of 1	NA		<LOD	25.5	<LOD	14.85	<LOD	20.4	<LOD	15.15	119.8	46.8	<LOD	285	NA		NA		NA		NA		NA	
22	22	84.2	7/30/02 8:86	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	89.4	<LOD	89.6	<LOD	255	NA	
23	23	13.4	7/30/02 9:01	1 of 1	NA		<LOD	60.3	<LOD	25.2	<LOD	52.5	<LOD	31.95	290.4	110	<LOD	630	NA		NA		NA		NA		NA	
24	24	35.9	7/30/02 9:04	1 of 1	NA		46.9	23.6	<LOD	17.25	<LOD	27.75	<LOD	15.6	265.8	64.4	<LOD	330	NA		NA		NA		NA		NA	
25	25	9.7	7/30/02 9:16	1 of 1	NA		133.6	51.2	<LOD	26.7	<LOD	56.25	<LOD	27	676.8	150	<LOD	600	NA		NA		NA		NA		NA	
26	26	18.4	7/30/02 9:17	1 of 1	NA		87.6	33	<LOD	18.9	<LOD	34.65	<LOD	22.35	884.8	120	<LOD	525	NA		NA		NA		NA		NA	
27	27	21.7	7/30/02 9:37	1 of 1	NA		42.7	22.8	<LOD	16.35	<LOD	28.35	<LOD	13.95	529.2	81.9	<LOD	330	NA		NA		NA		NA		NA	
28	28	7.3	7/30/02 9:42	1 of 1	NA		91.1	49.4	<LOD	19.5	<LOD	54.9	<LOD	22.35	475.2	140	<LOD	660	NA		NA		NA		NA		NA	
29	29	14.1	7/30/02 9:43	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	225	<LOD	86.85	<LOD	480	NA	
30	30	18.4	7/30/02 10:02	1 of 1	NA		<LOD	43.5	<LOD	27.6	<LOD	36	<LOD	23.1	<LOD	87.6	<LOD	465	NA		NA		NA		NA		NA	
31	31	8	7/30/02 10:04	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	20.55	<LOD	86.5	<LOD	645	NA	
32	32	8.8	7/30/02 10:09	1 of 1	NA		<LOD	86.1	<LOD	39.45	<LOD	57.9	<LOD	40.35	<LOD	186	<LOD	615	NA		NA		NA		NA		NA	
33	33	29.4	7/30/02 10:10	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	103.5	<LOD	72.75	<LOD	390	NA	
34	34	21.2	7/30/02 10:28	1 of 1	NA		51.4	25.3	<LOD	17.85	<LOD	29.7	<LOD	17.1	446.4	60	<LOD	345	NA		NA		NA		NA		NA	
35	35	46.9	7/30/02 10:30	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		235.6	81.2	<LOD	36.85	<LOD	270	NA	
36	36	17.4	7/30/02 11:27	1 of 1	NA		<LOD	48.15	<LOD	22.8	<LOD	37.65	<LOD	28.4	<LOD	102.6	<LOD	630	NA		NA		NA		NA		NA	
37	37	9.5	7/30/02 11:29	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	330	<LOD	128.7	<LOD	800	NA	
38	38	7.3	7/30/02 11:43	1 of 1	NA		<LOD	61.8	<LOD	28.05	<LOD	48	<LOD	27.15	385.4	130	<LOD	610	NA		NA		NA		NA		NA	
39	39	22.1	7/30/02 11:44	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	195	<LOD	80.85	<LOD	435	NA	
40	40	9.9	7/30/02 11:51	1 of 1	NA		840.8	190	<LOD	56.85	<LOD	210	<LOD	84.35	3288.6	470	<LOD	2250	NA		NA		NA		NA		NA	
41	41	42.2	7/30/02 11:54	1 of 1	NA		788	83.7	<LOD	25.05	<LOD	92.1	<LOD	30.3	3226.8	220	<LOD	990	NA		NA		NA		NA		NA	
42	42	11.4	7/30/02 11:58	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		630.8	370	<LOD	180	<LOD	720	NA	
43	43	21.3	7/30/02 12:04	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	119.85	<LOD	83.4	<LOD	435	NA	
44	44	16.9	7/30/02 12:07	1 of 1	NA		<LOD	53.4	<LOD	33.75	<LOD	46.95	<LOD	25.35	<LOD	135.15	<LOD	630	NA		NA		NA		NA		NA	
45	45	12.8	7/30/02 13:21	1 of 1	NA		70.1	41.8	<LOD	24	<LOD	46.45	<LOD	23.7	416	130	<LOD	600	NA		NA		NA		NA		NA	
46	46	34.6	7/30/02 13:23	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		151.9	89.4	<LOD	88.65	<LOD	330	NA	
47	47	7.3	7/30/02 13:39	1 of 1	NA		<LOD	80.25	<LOD	30.45	<LOD	58.65	<LOD	32.85	<LOD	148.65	<LOD	960	NA		NA		NA		NA		NA	
48	48	7.1	7/30/02 13:40	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	315	<LOD	15.9	<LOD	570	NA	
49	49	14.7	7/30/02 13:50	1 of 1	NA		50.9	33.3	<LOD	22.35	<LOD	39	<LOD	23.4	306.6	91.8	<LOD	570	NA		NA		NA		NA		NA	
50	50	6.2	7/30/02 13:51	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	465	<LOD	36.75	<LOD	690	NA	
51	51	7.4	7/30/02 14:02	1 of 1	NA		374.2	110	<LOD	33.15	<LOD	121.05	<LOD	45	2829.6	380	<LOD	900	NA		NA		NA		NA		NA	
52	52	6.2	7/30/02 14:03	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	315	<LOD	63.45	<LOD	660	NA	
53	53	19.5	7/30/02 14:22	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		316.6	0
54	54	10.3	7/30/02 14:23	1 of 1	NA		270	77.6	<LOD	29.25	<LOD	81.15	<LOD	37.8	2169.6	270	<LOD	765	NA		NA		NA		NA		NA	
55	55	6.2	7/30/02 14:24	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	465	<LOD	165	<LOD	660	NA	
56	56	7.2	7/30/02 14:26	1 of 1	NA		391.8	120	<LOD	43.95	<LOD	136.45	<LOD	53.25	3385.6	450	<LOD	1155	NA		NA		NA		NA		NA	
57	57	6.2	7/30/02 14:27	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	435	<LOD	21.9	<LOD	750	NA	
58	58	5.9	7/30/02 14:27	1 of 1	NA		158.9	82.1	<LOD	40.05	<LOD	96.9	<LOD	52.65	<LOD	240	<LOD	1125	NA		NA		NA		NA		NA	
59	59	9	7/30/02 14:30	1 of 1	NA		183.6	89.4	<LOD	31.95	<LOD	75.3	<LOD	38.25	1840	280	<LOD	870	NA		NA		NA		NA		NA	
60	60	11.6	7/30/02 14:30	1 of 1	NA		39.8	15.8	<LOD	10.35	<LOD	20.55	<LOD	8.1	<LOD	45.3	<LOD	180	NA		NA		NA		NA		NA	
61	61	11.3	7/30/02 14:31	1 of 1	NA		86.7	34.6	<LOD	17.1	72	33.6	<LOD	22.95	705.6	120	<LOD	390	NA		NA		NA		NA		NA	
62	62	6.2	7/30/02 14:32	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	480	<LOD	25.65	<LOD	640	NA	
63	63	20	7/30/02 18:27	1 of 1	313.6	0	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
64	64	13.4	7/30/02 18:31	1 of 1	NA		101.7	55.9	<LOD	25.8	<LOD	65.4	<LOD	38.25	875.2	190	<LOD	945	NA		NA		NA		NA		NA	
65	65	7.8	7/30/02 18:34	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	810	<LOD	37.65	<LOD	960	NA	
66	66	8.3	7/30/02 18:37	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	240	<LOD	25.8	<LOD	885	NA	
67	67	8.4	7/30/02 18:38	1 of 1	NA		<LOD	96.6	<LOD	43.05	<LOD	75.15	<LOD	47.85	1080	250	<LOD	1080	NA		NA		NA		NA		NA	
68	68	19.8	7/31/02 9:00	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA	312	0	NA		NA		NA		NA
69	69	26.3	7/31/02 10:57	1 of 1	NA		1859.2	180	<LOD	45.45	<LOD	195	<LOD	115.5	115916.8	4499.2	<LOD	1110	NA		NA		NA		NA		NA	
70	70	8.8	7/31/02 11:00	1 of 1	NA		2280	330	<LOD	67.35	<LOD	330	<LOD	180	105984	6798.6	<LOD	1800	NA		NA		NA		NA		NA	
71	71	10.5	7/31/02 11:01	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	180	<LOD	270	<LOD	780	NA	
72	72	8.9	7/31/02 11:28	1 of 1	NA		NA		NA		NA		NA		NA		NA		NA		<LOD	525	<LOD	360	<LOD	945	NA	
73	73	16.8	7/31/02 11:29	1 of 1	NA		7628.6	470	<LOD	67.15	<LOD	405	<LOD	111	39677.6	1699.2	<LOD	1350	NA		NA		NA		NA		NA	

74	74	0.8	7/31/02 11:30	1 of 1	NA			7269.6	2089.2	<LOD	315	<LOD	1800	<LOD	510	37785.6	6198.4	<LOD	6145.6	NA		NA	NA	NA	NA										
75	75	6.7	7/31/02 11:37	1 of 1	NA			10195.2	980	<LOD	142.2	<LOD	780	<LOD	240	60774.4	4598.4	<LOD	2700	NA		NA	NA	NA	NA										
76	76	6.9	7/31/02 11:36	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	525	<LOD	360	<LOD	900	NA							
77	77	21.6	7/31/02 11:42	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		1828.8	500	<LOD	165	<LOD	610	NA							
78	78	9	7/31/02 11:43	1 of 1	NA			3808	460	<LOD	78.5	<LOD	450	<LOD	132.45	27899.2	2200	<LOD	1650	NA		NA	NA	NA	NA										
79	79	7.3	7/31/02 11:50	1 of 1	NA			793.6	160	<LOD	40.8	<LOD	180	<LOD	62.85	4188.8	490	<LOD	885	NA		NA	NA	NA	NA										
80	80	7.2	7/31/02 11:51	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	465	<LOD	134.7	<LOD	765	NA							
81	81	19.5	7/31/02 13:57	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA				314.4	0					
82	82	13.5	7/31/02 14:03	1 of 1	NA			5857.6	430	<LOD	67.05	<LOD	390	<LOD	100.05	20288	1200	<LOD	1350	NA		NA	NA	NA	NA										
83	83	7.8	7/31/02 14:05	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	600	<LOD	195	<LOD	840	NA							
84	84	6.8	7/31/02 14:11	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	630	<LOD	140.4	<LOD	1274.4	NA							
85	85	20.9	7/31/02 14:12	1 of 1	NA			16192	1100	<LOD	103.05	<LOD	720	<LOD	195	73267.2	4099.2	<LOD	2250	NA		NA	NA	NA	NA										
86	86	22	7/31/02 14:58	1 of 1		311.4	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA										
87	87	11.5	7/31/02 15:07	1 of 1	NA			5868.8	440	<LOD	58.35	<LOD	405	<LOD	117.3	36377.6	1899.2	<LOD	1320	NA		NA	NA	NA	NA										
88	88	6.2	7/31/02 15:08	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	285	<LOD	210	<LOD	765	NA							
89	89	6.2	7/31/02 15:15	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	450	<LOD	240	<LOD	945	NA							
90	90	7.1	7/31/02 15:18	1 of 1	NA			670.4	140	<LOD	42.8	<LOD	165	<LOD	48.75	4467.2	480	<LOD	975	NA		NA	NA	NA	NA										
91	91	7.7	7/31/02 15:23	1 of 1	NA			1920	200	<LOD	32.4	<LOD	210	<LOD	58.5	6660	510	<LOD	825	NA		NA	NA	NA	NA										
92	92	7	7/31/02 15:24	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	315	<LOD	195	<LOD	615	NA							
93	93	7.1	7/31/02 15:29	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	165	<LOD	345	<LOD	750	NA							
94	94	8.4	7/31/02 15:29	1 of 1	NA			1420	250	<LOD	50.1	<LOD	270	<LOD	95.7	13766.4	1200	<LOD	1500	NA		NA	NA	NA	NA										
95	95	6.8	7/31/02 15:48	1 of 1	NA			13299.2	1200	<LOD	149.1	<LOD	930	<LOD	240	51200	4000	<LOD	2546.8	NA		NA	NA	NA	NA										
96	96	9.7	7/31/02 15:50	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	19.8	<LOD	165	<LOD	645	NA							
97	97	6.7	7/31/02 15:54	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	285	<LOD	118.95	<LOD	1095	NA							
98	98	11.5	7/31/02 15:55	1 of 1	NA			2760	330	<LOD	62.1	<LOD	330	<LOD	118.8	30799.9	2099.2	<LOD	1500	NA		NA	NA	NA	NA										
99	99	7.7	7/31/02 16:01	1 of 1	NA			3388.8	360	<LOD	65.7	<LOD	345	<LOD	105.9	18486	1300	<LOD	1200	NA		NA	NA	NA	NA										
100	100	6.2	7/31/02 16:02	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	270	<LOD	330	<LOD	690	NA							
101	101	7.2	7/31/02 16:36	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	300	<LOD	195	<LOD	1274.4	NA							
102	102	8.9	7/31/02 16:37	1 of 1	NA			<LOD	68.85	<LOD	25.2	<LOD	44.25	<LOD	24.75	493.6	150	<LOD	630	NA		NA	NA	NA	NA										
103	103	8.4	7/31/02 16:44	1 of 1	NA			<LOD	61.9	<LOD	27.9	<LOD	44.25	<LOD	23.1	<LOD	112.85	<LOD	690	NA		NA	NA	NA	NA										
104	104	6	7/31/02 16:45	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	330	<LOD	118.2	<LOD	675	NA							
105	105	7	7/31/02 16:54	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	345	<LOD	150	<LOD	720	NA							
106	106	8.1	7/31/02 16:54	1 of 1	NA			115.2	51.6	<LOD	26.4	<LOD	62.85	<LOD	28.2	528.6	130	<LOD	525	NA		NA	NA	NA	NA										
107	107	19	7/31/02 17:00	1 of 1	NA			93.3	39	<LOD	23.25	<LOD	45.9	<LOD	24.9	652.4	120	<LOD	435	NA		NA	NA	NA	NA										
108	108	15	7/31/02 17:01	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	300	<LOD	165	<LOD	780	NA							
109	109	12.2	7/31/02 17:13	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	180	<LOD	165	<LOD	585	NA							
110	110	23.7	7/31/02 17:14	1 of 1	NA			1309.6	150	<LOD	39.6	<LOD	150	<LOD	42.15	4989.6	390	<LOD	980	NA		NA	NA	NA	NA										
111	111	22.9	7/31/02 17:32	1 of 1	NA			708	110	<LOD	30.75	<LOD	117.15	<LOD	34.8	2640	260	<LOD	660	NA		NA	NA	NA	NA										
112	112	8.2	7/31/02 17:35	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	660	<LOD	37.2	<LOD	960	NA							
113	113	8.9	7/31/02 17:43	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	285	<LOD	255	<LOD	660	NA							
114	114	6.7	7/31/02 17:44	1 of 1	NA			102.6	66.3	<LOD	34.35	<LOD	84	<LOD	45.45	862.8	220	<LOD	900	NA		NA	NA	NA	NA										
115	115	7.4	7/31/02 18:06	1 of 1	NA			270.4	87.1	<LOD	32.1	<LOD	94.35	<LOD	43.2	876.6	200	<LOD	750	NA		NA	NA	NA	NA										
116	116	6.5	7/31/02 18:07	1 of 1	NA			293.6	98.7	<LOD	38.45	<LOD	118.95	<LOD	40.2	970.4	230	<LOD	915	NA		NA	NA	NA	NA										
117	117	6.2	7/31/02 18:07	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	270	<LOD	180	<LOD	690	NA							
118	118	8.8	7/31/02 18:38	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	240	<LOD	100.05	<LOD	660	NA							
119	119	6.8	7/31/02 18:38	1 of 1	NA			<LOD	90.3	<LOD	27.6	<LOD	67.5	<LOD	42.6	<LOD	210	<LOD	825	NA		NA	NA	NA	NA										
120	120	19.8	8/1/02 12:08	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	314.2	0	NA	NA	NA	NA									
121	121	6.6	8/1/02 12:19	1 of 1	NA			<LOD	19497.6	<LOD	1244.4	<LOD	8400	<LOD	3000	<LOD	224870.4	<LOD	40473.6	NA		NA	NA	NA	NA										
122	122	6.6	8/1/02 12:20	1 of 1	NA			1969.6	330	<LOD	61.3	<LOD	345	<LOD	105.45	19289.6	1699.2	<LOD	2100	NA		NA	NA	NA	NA										
123	123	8.8	8/1/02 12:22	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	480	<LOD	165	<LOD	825	NA							
124	124	21.4	8/1/02 12:45	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	180	<LOD	84.05	<LOD	435	NA							
125	125	5.9	8/1/02 12:46	1 of 1	NA			133.5	78.1	<LOD	27.45	<LOD	61.45	<LOD	38	708.4	220	<LOD	945	NA		NA	NA	NA	NA										
126	126	19.5	8/1/02 18:59	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA				313.2	0					
127	127	40.1	8/1/02 19:05	1 of 1	NA			727.2	71	<LOD	16.6	<LOD	60.1	<LOD	27.3	4208	220	<LOD	450	NA		NA	NA	NA	NA										
128	128	6.7	8/1/02 19:08	1 of 1	NA			673.6	190	<LOD	43.2	<LOD	210	<LOD	63.3	4028.8	530	<LOD	1110	NA		NA	NA	NA	NA										
129	129	19	8/1/02 19:09	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	315	<LOD	89.1	<LOD	570	NA							
130	130	16.6	8/1/02 19:15	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	265	<LOD	165	<LOD	615	NA							
131	131	5.9	8/1/02 19:18	1 of 1	NA			211.4	110	<LOD	27.3	<LOD	110.25	<LOD	35.7	999.2	290	<LOD	1170	NA		NA	NA	NA	NA										
132	132	20.9	8/1/02 19:24	1 of 1	NA			329.4	70.9	<LOD	27.45	<LOD	78.2	<LOD	25.65	1160	170	<LOD	525	NA		NA	NA	NA	NA										
133	133	16.1	8/1/02 19:27	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	285	<LOD	165	<LOD	870	NA							
134	134	6.2	8/1/02 19:41	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	525	<LOD	165	<LOD	915	NA							
135	135	18.4	8/1/02 19:42	1 of 1	NA			<LOD	40.8	<LOD	18.15	<LOD	36.3	<LOD	25.95	<LOD	107.7	<LOD	540	NA		NA	NA	NA	NA										
136	136	8.1	8/1/02 19:56	1 of 1	NA			6488.6	680	<LOD	95.85	<LOD	615	<LOD	185	26978.8	2299.2	<LOD	1800	NA		NA	NA	NA	NA										
137	137	15.3	8/1/02 19:57	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	360	<LOD	300	<LOD	825	NA							
138	138	6.2	8/1/02 20:03	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	405	<LOD	270	<LOD	1650	NA							
139	139	5.8	8/1/02 20:04	1 of 1	NA			<LOD	44.1	<LOD	38.4	<LOD	69.9	<LOD	60.3	1160	290	<LOD	1080	NA		NA	NA	NA	NA										
140	140	18.8	8/1/02 20:12	1 of 1	NA			721.6	120	<LOD	30.6	<LOD	128.25	<LOD	41.4	3459.2	340	<LOD	795	NA		NA	NA	NA	NA										
141	141	6.3	8/1/02 20:14	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	555	<LOD	360	<LOD	1185	NA							
142	142	6.6	8/1/02 20:22	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	870	<LOD	345	<LOD	1170	NA							
143	143	10.7	8/1/02 20:23	1 of 1	NA			14198.2	1300	<LOD	128.4	862.4	610	<LOD	270	66371.2	6489.2	<LOD	3000	NA		NA	NA	NA	NA										
144	144	15.8	8/1/02 20:30	1 of 1	NA			536.8	95.1	<LOD	22.65	<LOD	99	<LOD	36	3088.8	290	<LOD	600	NA		NA	NA	NA	NA										
145	145	7.1	8/1/02 20:33	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	495	<LOD	210	<LOD	930	NA							
146	146	22.4	8/1/02 20:34	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		1089.8	430	<LOD	210	<LOD	840	NA							
147	147	21.4	8/1/02 20:35	1 of 1	NA			19699.2	1200	<LOD	118.05	1500	510	<LOD	195	69378	3699.2	<LOD	2100	NA		NA	NA	NA	NA										
148	148	6.3	8/1/02 20:36	1 of 1	NA			13798.4	1600	<LOD	165	<LOD	1140	<LOD	270	52884.8	5200	<LOD	3745.8	NA		NA	NA	NA	NA										
149	149	6.2	8/1/02 20:38	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		<LOD	855	<LOD	390	<LOD	945	NA							
150	150	19.5	8/2/02 7:50	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA				316.4	0					
151	151	19.5	8/2/02 13:13	1 of 1	NA			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA				313.6	0					
152	152	18.4	8/2/02 13:19	1 of 1	NA			<LOD	49.2	<LOD	24.45	<LOD	47.7	<LOD	27.45	296	100	<LOD	570	NA		NA	NA	NA	NA										

153	153	6.2	8/2/02 13:22	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	510	<LOD	210	<LOD	1200	NA
154	154	6.2	8/2/02 13:28	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	20.55	<LOD	23.25	<LOD	870	NA
155	155	6	8/2/02 13:26	1 of 1	NA	<LOD	59.85	<LOD	57.15	<LOD	72.6	<LOD	45.3	<LOD	270	<LOD	1364.4	NA	NA	NA	NA	NA	NA
156	156	6	8/2/02 13:34	1 of 1	NA	<LOD	89.1	<LOD	48.15	<LOD	67.05	<LOD	55.85	<LOD	270	<LOD	1215	NA	NA	NA	NA	NA	NA
157	157	6.3	8/2/02 13:34	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	420	<LOD	29.1	<LOD	665	NA
158	158	6.2	8/2/02 13:44	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	180	<LOD	142.8	<LOD	810	NA
159	159	5.9	8/2/02 13:45	1 of 1	NA	<LOD	67.35	<LOD	44.65	<LOD	68.1	<LOD	39.3	375.2	170	<LOD	885	NA	NA	NA	NA	NA	NA
160	160	14.5	8/2/02 14:03	1 of 1	NA	<LOD	53.7	<LOD	27	<LOD	43.35	<LOD	27.15	142.8	93.5	<LOD	615	NA	NA	NA	NA	NA	NA
161	161	20.6	8/2/02 14:04	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	180	<LOD	75.6	<LOD	435	NA
162	162	6.2	8/2/02 14:09	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	315	<LOD	95.25	<LOD	690	NA
163	163	6	8/2/02 14:09	1 of 1	NA	<LOD	87.6	<LOD	44.25	<LOD	88.7	<LOD	35.7	<LOD	210	<LOD	930	NA	NA	NA	NA	NA	NA
164	164	6.1	8/2/02 14:18	1 of 1	NA	<LOD	136.85	<LOD	60.9	<LOD	101.1	<LOD	51.15	388.6	250	<LOD	1260	NA	NA	NA	NA	NA	NA
165	165	6.3	8/2/02 14:19	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	255	<LOD	25.95	<LOD	870	NA
166	166	6.8	8/2/02 14:23	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	345	<LOD	21	<LOD	750	NA
167	167	6	8/2/02 14:24	1 of 1	NA	<LOD	113.7	<LOD	72	<LOD	79.5	<LOD	40.95	456	220	<LOD	1050	NA	NA	NA	NA	NA	NA
168	168	5.9	8/2/02 14:33	1 of 1	NA	<LOD	109.5	<LOD	65.4	<LOD	100.65	<LOD	56.7	454	270	<LOD	1650	NA	NA	NA	NA	NA	NA
169	169	7.2	8/2/02 14:34	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	270	<LOD	30.9	<LOD	975	NA
170	170	6.2	8/2/02 14:37	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	330	<LOD	150	<LOD	840	NA
171	171	5.9	8/2/02 14:38	1 of 1	NA	139.4	85.3	<LOD	44.7	<LOD	102.75	<LOD	46.95	279.4	170	<LOD	1005	NA	NA	NA	NA	NA	NA
172	172	8.4	8/2/02 14:45	1 of 1	NA	148.7	77.1	<LOD	42.15	<LOD	83.4	<LOD	37.05	647.2	190	<LOD	1085	NA	NA	NA	NA	NA	NA
173	173	23.2	8/2/02 14:46	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	165	<LOD	73.65	<LOD	420	NA
174	174	10.4	8/2/02 14:53	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	315	<LOD	134.4	<LOD	690	NA
175	175	21.3	8/2/02 14:63	1 of 1	NA	138	47.9	<LOD	26.55	<LOD	58.2	<LOD	25.2	752.8	130	<LOD	815	NA	NA	NA	NA	NA	NA
176	176	21.3	8/2/02 14:69	1 of 1	NA	85.7	40.2	<LOD	24.3	<LOD	48.45	<LOD	25.35	375.8	100	<LOD	485	NA	NA	NA	NA	NA	NA
177	177	6.2	8/2/02 15:00	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	420	<LOD	26.25	<LOD	655	NA
178	178	6.2	8/2/02 15:05	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	390	<LOD	240	<LOD	975	NA
179	179	6.4	8/2/02 15:08	1 of 1	NA	129.6	86.6	<LOD	52.05	<LOD	89.6	<LOD	46.3	964.8	270	<LOD	1334.4	NA	NA	NA	NA	NA	NA
180	180	6.6	8/2/02 15:12	1 of 1	NA	<LOD	128.45	<LOD	42.3	<LOD	107.4	<LOD	64.2	<LOD	285	<LOD	1140	NA	NA	NA	NA	NA	NA
181	181	6.2	8/2/02 15:12	1 of 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<LOD	255	<LOD	48.3	<LOD	825	NA

APPENDIX G

M.D. Chemical and Testing, Inc.
P.O. Box 19321, Forbes Field, Bldg 281, Topeka, KS 66619
Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-01 **Sample ID:** MW-22A						
Sampled: 7/29/02						
Zinc	EPA 200.7	Not Detected	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	Not Detected	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK
1022333-02 **Sample ID:** MW-11						
Sampled: 7/29/02						
Zinc	EPA 200.7	0.01	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	Not Detected	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK

M.D. Chemical and Testing, Inc.
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Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-03 **Sample ID:** NSW-1						
Sampled: 7/30/02						
Zinc	EPA 200.7	0.08	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	Not Detected	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK
1022333-04 **Sample ID:** NW-1						
Sampled: 7/29/02						
Zinc	EPA 6010B	1470	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	7.08	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	153	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	13.6	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	18.5	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	876	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	0.341	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-05 **Sample ID:** NW-2						
Sampled: 7/30/02						
Zinc	EPA 6010B	2380	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	10.2	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	74.1	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	23.1	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	9.77	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	265	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-06 **Sample ID:** NOS-3						
Sampled: 7/30/02						
Zinc	EPA 6010B	720	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	5.84	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	161	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	8.19	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	15.7	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	154	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-07 **Sample ID:** NOS-5						
Sampled: 7/30/02						
Zinc	EPA 6010B	8602	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	18.7	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	29.2	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	Not Detected	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	Not Detected	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	37.1	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-08 **Sample ID:** NS-12						
Sampled: 7/30/02						
Zinc	EPA 6010B	1270	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	7.99	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	192	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	15.9	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	20.7	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	334	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	0.119	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-09 **Sample ID:** NS-13						
Sampled: 7/30/02						
Zinc	EPA 6010B	2930	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	11.0	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	185	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	25.6	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	20.8	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	711	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	0.131	(0.10)	mg/kg(ppm)		HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-10 **Sample ID:** Duplicate						
Sampled: 7/30/02						
Zinc	EPA 6010B	3130	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	12.5	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	203	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	34.4	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	22.0	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	637	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	0.160	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-11 **Sample ID:** ASW-1						
Sampled: 7/31/02						
Zinc	EPA 200.7	0.07	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	0.003	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	0.015	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK
1022333-12 **Sample ID:** ASW-2						
Sampled: 7/31/02						
Zinc	EPA 200.7	0.41	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	0.016	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	0.036	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-13 **Sample ID:** ASW-3						
Sampled: 7/31/02						
Zinc	EPA 200.7	38.2	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	0.002	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	0.25	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	0.196	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK
1022333-14 **Sample ID:** AOSW-1						
Sampled: 7/31/02						
Zinc	EPA 200.7	0.06	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	0.006	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	0.013	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-15 **Sample ID:** AOSW-2						
Sampled: 7/31/02						
Zinc	EPA 200.7	0.04	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	0.002	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	0.001	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK
1022333-16 **Sample ID:** AOSW-3						
Sampled: 8/1/02						
Zinc	EPA 200.7	4.60	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	0.001	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	0.001	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-17 **Sample ID:** AS-2b						
Sampled: 8/1/02						
Zinc	EPA 6010B	2350	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	5.02	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	187	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	33.9	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	19.8	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	375	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	0.634	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-18 **Sample ID:** AS-8						
Sampled: 8/1/02						
Zinc	EPA 6010B	30000	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	140	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	156	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	104	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	17.5	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	6230	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	0.297	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	0.857	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-19 **Sample ID:** AS-8a						
Sampled: 8/1/02						
Zinc	EPA 6010B	3530	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	9.26	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	101	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	19.4	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	11.8	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	757	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	0.524	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-20 **Sample ID:** AS-8a(dup)						
Sampled: 8/1/02						
Zinc	EPA 6010B	3590	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	9.96	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	106	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	18.8	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	10.7	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	1300	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	0.126	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-21 **Sample ID:** AOS-3						
Sampled: 7/31/02						
Zinc	EPA 6010B	3460	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	59.6	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	96.9	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	10.5	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	Not Detected	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	1620	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-22 **Sample ID:** AOS-4						
Sampled: 7/31/02						
Zinc	EPA 6010B	1090	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	12.2	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	156	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	9.95	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	11.8	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	414	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

M.D. Chemical and Testing, Inc.
P.O. Box 19321, Forbes Field, Bldg 281, Topeka, KS 66619
Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-23 **Sample ID:** ASE-2						
Sampled: 7/31/02						
Zinc	EPA 6010B	3750	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	20.6	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	139	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	27.5	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	18.3	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	848	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	0.653	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-24 **Sample ID:** AOSE-1						
Sampled: 7/31/02						
Zinc	EPA 6010B	1610	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	14.1	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	125	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	13.4	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	11.1	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	543	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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P.O. Box 19321, Forbes Field, Bldg 281, Topeka, KS 66619
Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-25 **Sample ID:** AW-1						
Sampled: 7/31/02						
Zinc	EPA 6010B	24700	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	92.9	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	162	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	80.8	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	6.83	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	2520	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	0.709	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-26 **Sample ID:** AW-2						
Sampled: 7/31/02						
Zinc	EPA 6010B	17700	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	1180	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	351	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	56.7	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	14.6	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	17200	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	0.940	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-27 **Sample ID:** AW-3						
Sampled: 7/31/02						
Zinc	EPA 6010B	27700	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	1980	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	82.2	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	44.5	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	13.7	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	11300	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	1.55	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-28 **Sample ID:** COS-6						
Sampled: 8/2/02						
Zinc	EPA 6010B	82.3	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	12.8	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	61.8	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	1.08	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	Not Detected	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	61.4	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

M.D. Chemical and Testing, Inc.
P.O. Box 19321, Forbes Field, Bldg 281, Topeka, KS 66619
Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-29 **Sample ID:** COS-6(duplicate)						
Sampled: 8/2/02						
Zinc	EPA 6010B	66.8	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	14.8	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	62.3	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	Not Detected	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	Not Detected	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	63.8	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-30 **Sample ID:** COS-11						
Sampled: 8/2/02						
Zinc	EPA 6010B	374	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	16.9	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	143	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	3.51	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	14.9	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	161	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	0.103	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

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Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-31 **Sample ID:** COS-10						
Sampled: 8/2/02						
Zinc	EPA 6010B	285	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	14.9	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	112	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	3.21	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	13.8	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	141	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK
1022333-32 **Sample ID:** Field Blank(1')						
Sampled: 8/2/02						
Zinc	EPA 6010B	37.3	(1.00)	mg/kg(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	SW846 6010B	5.57	(0.25)	mg/kg(ppm)	8/8/02	HK
Barium	SW846 6010B	112	(10)	mg/kg(ppm)	8/8/02	HK
Cadmium	SW846 6010B	1.84	(1.00)	mg/kg(ppm)	8/8/02	HK
Chromium	SW846 7190	13.6	(5.00)	mg/kg(ppm)	8/8/02	HK
Lead	SW846 7420	19.5	(5.00)	mg/kg(ppm)	8/8/02	HK
Mercury	SW846 7471	Not Detected	(0.10)	mg/kg(ppm)	8/7/02	HK
Selenium	SW846 7740	Not Detected	(0.50)	mg/kg(ppm)	8/7/02	HK
Silver	SW846 6010B	Not Detected	(2.00)	mg/kg(ppm)	8/8/02	HK

M.D. Chemical and Testing, Inc.
P.O. Box 19321, Forbes Field, Bldg 281, Topeka, KS 66619
Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Shannon Allen
Received In lab: 8/6/02
Date Reported: 8/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022333
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022333-33 **Sample ID:** Equipment Blank						
Sampled: 8/2/02						
Zinc	EPA 200.7	Not Detected	(0.01)	mg/L(ppm)	8/8/02	HK
TOTAL METAL RESULTS						
Arsenic	EPA 206.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Barium	EPA 200.7	Not Detected	(0.2)	mg/L(ppm)	8/8/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	8/8/02	HK
Chromium	EPA 200.7	Not Detected	(0.05)	mg/L(ppm)	8/8/02	HK
Lead	EPA 200.9	Not Detected	(0.001)	mg/L(ppm)	8/8/02	HK
Mercury	EPA 245.2	Not Detected	(0.001)	mg/L(ppm)	8/7/02	HK
Selenium	EPA 270.2	Not Detected	(0.005)	mg/L(ppm)	8/7/02	HK
Silver	EPA 200.7	Not Detected	(0.02)	mg/L(ppm)	8/8/02	HK

Approved By: Lab Manager

MD CHEMICAL & TESTING, INC.

FORBES FIELD, BLDG. 281, TOPEKA, KS 66619
PHONE: 785/862-3500 FAX: 785/862-5132

TURNAROUND TIME REQUESTED	
STANDARD	RUSH ANALYSIS
☒ 5 working days	☐ 72 HR ☐ 48 HR ☐ 24 HR
	additional fees for RUSH analysis

*RUSH TAT requires lab contact for availability of services.

LAB USE ONLY	
LAB NUMBER	DUE DATE

PAGE 1 of 3

CLIENT NAME: Maxim Technologies
CONTACT: Shanna Allen
STREET ADDRESS: 221 S. Packard
CITY, STATE, ZIP: Paola City, KS 66055
PHONE #: (913) 321-2700
FAX #: (913) 321-2181
PROJECT NAME: Lead Smelters

PROJECT #: 2390202
P.O. #:

CONTAINER TEMP (°C):

LAB USE ONLY	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	Number of Containers	PRESERVATION: HNO3 (Nitric Acid)	H_2SO_4 (Sulfuric Acid)	NaOH (Sodium Hydroxide)	HCl (Hydrochloric Acid)	Non-Preserved	COMPOSITE	GRAB	MATRIX: WATER (Surface Water)	SOLID	AIR	OTHER (SPECIFY) Sediment	ANALYSIS REQUESTED: EPA Method 200.7/6010	7421	NOTES
	MW-22A	7/29/02	15:10	1					✓			✓				✓	✓	
	MW-11	7/29/02	16:09	1					✓			✓				✓	✓	
	NSW-1	7/30/02	14:50	1					✓			✓				✓	✓	
	NW-1	7/29/02	17:25	1					✓				✓		✓	✓	✓	
	NW-2	7/30/02	11:10	1					✓				✓		✓	✓	✓	
	NDS-3	7/30/02	9:00	1					✓				✓			✓	✓	
	NDS-5	7/30/02	10:07	1					✓				✓			✓	✓	
	NS-12	7/30/02	14:30	1					✓				✓			✓	✓	
	NS-13	7/30/02	14:35	1					✓				✓			✓	✓	
	Duplicate	7/30/02	14:35	1					✓				✓			✓	✓	
	ASW-1	7/30/02	[illegible]	1					✓			✓				✓	✓	
	ASW-2	7/30/02	10:02	1					✓			✓				✓	✓	

RELINQUISHED BY	DATE/TIME	ACCEPTED BY
[illegible]	8/5/02	[illegible] 8/5/02
[illegible]	8/5/02 1550	1547

SAMPLER (PRINT): Shanna Allen

SIGNATURE: [illegible]

COMMENTS: Field filtered w/ no preservatives

*FAILURE TO COMPLETE THIS FORM OR COMPLETELY FILL SAMPLE CONTAINERS MAY DELAY LABORATORY RESULTS.

MD CHEMICAL & TESTING, INC.

FORBES FIELD, BLDG. 281, TOPEKA, KS 66619
PHONE: 785/862-3500 FAX: 785/862-5132

CLIENT NAME: Maxim Technologies
CONTACT: Shawn Allen
STREET ADDRESS: 701 S. Packard
CITY, STATE, ZIP: Olathe, KS 66025
PHONE #: (913) 321-8100
FAX #: (913) 321-9181
PROJECT NAME: Lead Smelters

TURNAROUND TIME REQUESTED

STANDARD	RUSH ANALYSIS		
☒ 5 working days	☐ 72 HR	☐ 48 HR	☐ 24 HR
	additional fees for RUSH analysis		

*RUSH TAT requires lab contact for availability of services.

PROJECT #: 2590202

P.O. #:

LAB USE ONLY

LAB NUMBER	DUE DATE

PAGE 2 of 3

CONTAINER TEMP (°C)

LAB USE ONLY	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	Number of Containers	HNO3 (Nitric Acid)	H_2SO_4 (Sulfuric Acid)	NaOH (Sodium Hydroxide)	HCl (Hydrochloric Acid)	Non-Preserved	COMPOSITE	GRAB	WATER	SOLID	AIR	OTHER (SPECIFY)	200/4000	7951	NOTES
	ADSW-3	7/31/02	11:15	1					✓			✓				✓	✓	
	ADSW-1	7/31/02	15:05	1					✓			✓				✓	✓	
	ADSW-2	"	"	1					✓			✓				✓	✓	
	ADSW-3	8/01/02	11:00	1					✓			✓				✓	✓	
	AS-2b	8/01/02	11:31	1					✓				✓			✓	✓	
	AS-8	8/01/02	10:04	1					✓				✓			✓	✓	
	AS-8a	8/01/02	10:00	1					✓				✓			✓	✓	
(DUP)	AS-8a	8/01/02	10:00	1					✓				✓			✓	✓	
	ADS-3	7/31/02	1603	1					✓				✓			✓	✓	
	ADS-4	7/31/02	1755	1					✓				✓			✓	✓	
	A[illegible]-2	7/31/02	1005	1					✓				✓			✓	✓	
	ADSE-1	7/31/02	1806	1					✓				✓			✓	✓	

RELINQUISHED BY	DATE/TIME	ACCEPTED BY
Shawn Allen	8/5/02	Glenn Polan 8/5/02
Michael Ferguson	8/5/02 1550	1545

SAMPLER (PRINT): Shawn Allen

SIGNATURE: Shawn Allen

COMMENTS:

Field filtered w/no preservatives

*FAILURE TO COMPLETE THIS FORM OR COMPLETELY FILL SAMPLE CONTAINERS MAY DELAY LABORATORY RESULTS

MD CHEMICAL & TESTING, INC.

FORBES FIELD, BLDG. 281, TOPEKA, KS 66619
PHONE: 785/862-3500 FAX: 785/862-5132

TURNAROUND TIME REQUESTED	
STANDARD	RUSH ANALYSIS
☒ 5 working days	☐ 72 HR ☐ 48 HR ☐ 24 HR
	additional fees for RUSH analysis

*RUSH TAT requires lab contact for availability of services.

LAB USE ONLY	
LAB NUMBER	DUE DATE

CLIENT NAME: Maxim Technologies
CONTACT: Shannon Allen
STREET ADDRESS: 701 S. Packard
CITY, STATE, ZIP: Kansas City, KS 66105
PHONE #: (913) 321 8100
FAX #: (913) 321 8181
PROJECT NAME: Lead Smelters

PROJECT #: 2390202
P.O. #:

CONTAINER TEMP (°C):

LAB USE ONLY	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	Number of Containers	PRESERVATION: HNO3 (Nitric Acid)	H_2SO_4 (Sulfuric Acid)	NaOH (Sodium Hydroxide)	HCl (Hydrochloric Acid)	Non-Preserved	COMPOSITE	GRAB	MATRIX: WATER	SOLID	AIR	OTHER (SPECIFY)	ANALYSIS REQUESTED: 200.7/200.8	9251	NOTES
	AW-1	7/31/02	[illegible]	1					✓		✓		✓			✓	✓	
	AW-2	7/31/02	1524	1					✓		✓		✓			✓	✓	
	AW-3	7/31/02	1530	1					✓		✓		✓			✓	✓	
	COS-6	8/2/02	1355	1					✓		✓		✓			✓	✓	
	COS-6 (Duplicate)	8/2/02	1355	1					✓		✓		✓			✓	✓	
	COS-11	8/2/02	1435	1					✓		✓		✓			✓	✓	
	COS-10	8/2/02	1425	1					✓		✓		✓			✓	✓	
	Field Blank (1)	8/2/02	1338	1					✓		✓		✓			✓	✓	
	Equipment Blank	8/2/02	1346	1					✓			✓				✓	✓	

Complete

RELINQUISHED BY	DATE/TIME	ACCEPTED BY
[signature]	8/5/02	[signature] 8/5/02
[signature]	8/5/02 1550	1550

SAMPLER (PRINT): Shannon Allen

SIGNATURE: [signature]

COMMENTS: Field Filtered w/no preservatives

*FAILURE TO COMPLETE THIS FORM OR COMPLETELY FILL SAMPLE CONTAINERS MAY DELAY LABORATORY RESULTS

M.D. Chemical and Testing, Inc.
P.O. Box 19321, Forbes Field, Bldg 281, Topeka, KS 66619
Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Matt McDonald
Received In lab: 9/6/02
Date Reported: 9/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022682
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022682-01 **Sample ID:** AOSW-4 **Sampled:** 9/3/02						
Arsenic	EPA 206.2	0.004	(0.001)	mg/L(ppm)	9/10/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	9/10/02	HK
Lead	EPA 200.9	Not Detected	(0.001)	mg/L(ppm)	9/9/02	HK
Zinc	EPA 200.7	0.11	(0.01)	mg/L(ppm)	9/10/02	HK
1022682-02 **Sample ID:** AOSW-5 **Sampled:** 9/3/02						
Arsenic	EPA 206.2	0.003	(0.001)	mg/L(ppm)	9/10/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	9/10/02	HK
Lead	EPA 200.9	Not Detected	(0.001)	mg/L(ppm)	9/9/02	HK
Zinc	EPA 200.7	0.04	(0.01)	mg/L(ppm)	9/10/02	HK
1022682-03 **Sample ID:** AOSW-6 **Sampled:** 9/3/02						
Arsenic	EPA 206.2	0.003	(0.001)	mg/L(ppm)	9/10/02	HK
Cadmium	EPA 200.7	Not Detected	(0.005)	mg/L(ppm)	9/10/02	HK
Lead	EPA 200.9	Not Detected	(0.001)	mg/L(ppm)	9/9/02	HK
Zinc	EPA 200.7	0.04	(0.01)	mg/L(ppm)	9/10/02	HK
1022682-04 **Sample ID:** AOSE-4 **Sampled:** 9/3/02						
Arsenic	EPA 7060	19.0	(0.25)	mg/kg(ppm)	9/10/02	HK
Cadmium	EPA 6010B	33.2	(1.00)	mg/kg(ppm)	9/10/02	HK
Lead	EPA 6010B	432	(5.00)	mg/kg(ppm)	9/10/02	HK
Zinc	EPA 6010B	2550	(1.00)	mg/kg(ppm)	9/10/02	HK

M.D. Chemical and Testing, Inc.
P.O. Box 19321, Forbes Field, Bldg 281, Topeka, KS 66619
Kansas Certification No. E-10135 (785)862-3500 fax(785)862-5132

Sample Collected By: Matt McDonald
Received In lab: 9/6/02
Date Reported: 9/12/02
Project Name: Lead Smelters
Project Number: 2390202

Lab Number: 1022682
Client: Maxim Technologies(KC)
721 S. Packard
Kansas City, KS 66105

ATTN: Shannon Allen

Analysis	Method	Result	Detection Limit	Units	Date Analyzed	Analyst
1022682-05 **Sample ID:** AOSE-5 **Sampled:** 9/3/02						
Arsenic	EPA 7060	7.23	(0.25)	mg/kg(ppm)	9/10/02	HK
Cadmium	EPA 6010B	7.79	(1.00)	mg/kg(ppm)	9/10/02	HK
Lead	EPA 6010B	63.2	(5.00)	mg/kg(ppm)	9/10/02	HK
Zinc	EPA 6010B	570	(1.00)	mg/kg(ppm)	9/10/02	HK
1022682-06 **Sample ID:** AOSE-6 **Sampled:** 9/3/02						
Arsenic	EPA 7060	4.26	(0.25)	mg/kg(ppm)	9/10/02	HK
Cadmium	EPA 6010B	2.57	(1.00)	mg/kg(ppm)	9/10/02	HK
Lead	EPA 6010B	17.6	(5.00)	mg/kg(ppm)	9/10/02	HK
Zinc	EPA 6010B	116	(1.00)	mg/kg(ppm)	9/10/02	HK

Approved By: Lab Manager

MD CHEMICAL & TESTING, INC.

FORBES FIELD, BLDG. 281, TOPEKA, KS 66619
PHONE: 785/862-3500 FAX: 785/862-5132

TURNAROUND TIME REQUESTED

STANDARD	RUSH ANALYSIS		
☒ 5 working days	☐ 72 HR	☐ 48 HR	☐ 24 HR

additional fees for RUSH analysis

*RUSH TAT requires lab contact for availability of services.

LAB USE ONLY

LAB NUMBER	DUE DATE
2682	9/13

PAGE 1 of 1

CLIENT NAME: Maxim Technologies
CONTACT: Shannon Allen
STREET ADDRESS: 721 S. Parkwood
CITY, STATE, ZIP: Kansas City, KS 66105
PHONE #: 913 321-8100
FAX #: 913 321-8181
PROJECT NAME: Lead Smelters

PROJECT #: 2340202
P.O. #:

CONTAINER TEMP (°C): 6°

ANALYSIS REQUESTED: 200.7 (Cd, Pb, Zn); 7471 (Hg)

LAB USE ONLY	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	Number of Containers	HNO3 (Nitric Acid)	H_2SO_4 (Sulfuric Acid)	NaOH (Sodium Hydroxide)	HCl (Hydrochloric Acid)	Non-Preserved	COMPOSITE	GRAB	WATER	SOLID	AIR	OTHER (SPECIFY)	200.7 (Cd, Pb, Zn)	7471 (Hg)	NOTES
1	AOSW-4	9/13/02	14:30	1					X			X				X	X	
2	AOSW-5		15:45	1					X			X				X	X	
3	AOSW-6		15:00	1					X			X				X	X	
4	AOSE-4	9/13/02	14:30	1					X				X			X	X	
5	AOSE-5		15:45	1					X				X			X	X	
6	AOSE-6		15:00	1					X				X			X	X	

RELINQUISHED BY	DATE/TIME	RECEIVED BY
[signature]	9/13/02	Leland Dunaway
	9/16/02 8AM	[signature]

SAMPLER (PRINT): Matt McDonald

SIGNATURE: [signature]

COMMENTS: Field Filtered w/m no Preservation

*FAILURE TO COMPLETE THIS FORM OR COMPLETELY FILL SAMPLE CONTAINERS

M.D. CHEMICAL & TESTING
QA/QC DATA

MD Chemical
QC data for 1022333

Sample_ID	EL	Mean_SA	Samp_Units	Recovery	% Difference	Sam_Date	Sam_Time
TMI*2500	As	39.673	µg/L	99.2%		8/7/02	13:06:11
RB 8-6-02	As	-1.159	µg/L			8/7/02	13:09:21
LFB 8-6-02*25	As	2203.971	µg/L	88.2%		8/7/02	13:12:33
TMI*2500	As	41.798	µg/L	104.5%		8/7/02	13:44:29
22333-11	As	5.507	mg/kg			8/7/02	14:34:54
22333-11	As	16.550	mg/kg			8/7/02	14:38:58
TMI*2500	As	41.190	µg/L	103.0%		8/7/02	14:42:09
22333-11 SPK*25	As	127.595	mg/kg	111%	1.525%	8/7/02	14:51:42
22333-11 DSPK*25	As	125.664	mg/kg	109%		8/7/02	14:54:52
TMI*2500	As	39.660	µg/L	99.1%		8/7/02	15:01:16
TMI*2500	As	40.216	µg/L	100.5%		8/7/02	15:34:03
RB 8-7-02	As	-0.268	µg/L			8/7/02	15:37:13
LFB 8-7-02*25	As	2385.095	µg/L	95.4%		8/7/02	15:40:24
TMI*2500	As	40.061	µg/L	100.2%		8/7/02	16:36:43
22333-31	As	3.562	mg/kg			8/7/02	17:26:45
22333-31 SPK*25	As	99.665	mg/kg	96%	6.890%	8/7/02	17:29:55
22333-31 DSPK*25	As	93.026	mg/kg	89%		8/7/02	17:33:05
TMI*2500	As	79.922	µg/L	199.8%		8/7/02	17:39:28
TMI*2500	As	36.921	µg/L	92.3%		8/7/02	17:58:42
TMI*2500	As	32.136	µg/L	80.3%		8/7/02	19:33:26
TMI*2500	Se	11.344	µg/L	113.4%		8/7/02	20:10:16
RB 8-6-02	Se	4.704	µg/L			8/7/02	20:13:28
LFB 8-6-02*25	Se	2255.649	µg/L	90.2%		8/7/02	20:16:40
TMI*2500	Se	10.854	µg/L	108.5%		8/7/02	20:48:47
22333-11	Se	0.318	mg/kg			8/7/02	21:24:00
22333-11 SPK*25	Se	83.264	mg/kg	83%	-8.698%	8/7/02	21:27:11
TMI*2500	Se	9.090	µg/L	90.9%		8/7/02	21:30:24
22333-11 DSPK*25	Se	90.835	mg/kg	91%		8/7/02	21:36:48
RB 8-7-02	Se	-0.129	µg/L			8/7/02	21:43:13
LFB 8-7-02*25	Se	1890.238	µg/L	75.6%		8/7/02	21:46:25
22333-31	Se	-0.192	mg/kg			8/7/02	22:47:29
22333-31 SPK*25	Se	79.778	mg/kg	80%	-8.022%	8/7/02	22:50:40
TMI*2500	Se	9.605	µg/L	96.1%		8/7/02	22:53:52
22333-31 DSPK*25	Se	86.445	mg/kg	87%		8/7/02	23:00:17
TMI*2500	Se	11.329	µg/L	113.3%		8/7/02	23:29:12
QCHG	Hg	4.487	µg/L	89.7%		8/7/02	10:39:19
22309-01*2	Hg	0.224	µg/L			8/7/02	10:41:50
22309-01 SPK	Hg	3.322	µg/L	62%	-19.387%	8/7/02	10:43:07
22309-01 DSPK	Hg	4.035	µg/L	76%		8/7/02	10:44:25
QCHG	Hg	4.845	µg/L	96.9%		8/7/02	10:55:40
22333-10	Hg	0.160	mg/kg			8/7/02	11:09:33
22333-10 SPK	Hg	0.418	mg/kg	103%	-3.316%	8/7/02	11:10:50
QCHG	Hg	4.532	µg/L	90.6%		8/7/02	11:12:08
22333-10 DSPK	Hg	0.432	mg/kg	109%		8/7/02	11:14:40
RB 8-6-02	Hg	-0.007	µg/L			8/7/02	11:25:40
LFB 8-6-02	Hg	4.645	µg/L	92.9%		8/7/02	11:26:54
QCHG	Hg	4.867	µg/L	97.3%		8/7/02	11:28:17
QCHG	Hg	4.446	µg/L	88.9%		8/7/02	14:01:48
22333-32	Hg	0.014	mg/kg			8/7/02	14:14:20
22333-32 SPK	Hg	0.258	mg/kg	98%	-18.766%	8/7/02	14:15:32

MD Chemical
QC data for 1022333

QCHG	Hg	4.896	µg/L	97.9%	8/7/02	14:16:46
22333-32 DSPK	Hg	0.312	mg/kg	119%	8/7/02	14:19:14
RB 8-7-02	Hg	-0.018	µg/L		8/7/02	14:20:29
LFB 8-7-02	Hg	4.492	µg/L	89.8%	8/7/02	14:21:42
QCHG	Hg	4.913	µg/L	98.3%	8/7/02	14:22:57

TMI = Lab. Performance Check
RB = Reagent Blank
LFB = Lab. Fortified Blank

MD Chemical
QC for 1022333 ICP Analysis

Sample ID	Analyte Name	Reported Conc (Calib)	Calib Units	Recovery	% Difference	Elem	Date	Time
RB 8-6-02	Ag 328.068	0.000	mg/L			Ag	8/8/02	9:54:13 AM
LFB 8-6-02	Ag 328.068	0.220	mg/L	88.0%		Ag	8/8/02	9:56:18 AM
22333-10	Ag 328.068	-0.011	mg/L			Ag	8/8/02	10:48:10 AM
22333-10 SPK	Ag 328.068	0.218	mg/L	91.6%	-0.2%	Ag	8/8/02	10:51:00 AM
22333-10 DSPK	Ag 328.068	0.219	mg/L	92.0%		Ag	8/8/02	12:48:13 PM
RB 8-7-02	Ag 328.068	0.000	mg/L			Ag	8/8/02	12:51:37 PM
LFB 8-7-02	Ag 328.068	0.123	mg/L			Ag	8/8/02	12:53:32 PM
22333-31	Ag 328.068	-0.026	mg/L			Ag	8/8/02	1:43:13 PM
22333-31 SPK	Ag 328.068	0.040	mg/L	26.4%	-20.2%	Ag	8/8/02	1:46:06 PM
22333-31 DSPK	Ag 328.068	0.067	mg/L	37.2%		Ag	8/8/02	1:49:01 PM
RB 8-6-02	As 188.979	0.000	mg/L			As	8/8/02	9:54:13 AM
LFB 8-6-02	As 188.979	2.300	mg/L	92.0%		As	8/8/02	9:56:28 AM
22333-10	As 188.979	0.260	mg/L			As	8/8/02	10:48:20 AM
22333-10 SPK	As 188.979	2.570	mg/L	92.4%	-0.8%	As	8/8/02	10:51:10 AM
22333-10 DSPK	As 188.979	2.610	mg/L	94.0%		As	8/8/02	12:48:23 PM
RB 8-7-02	As 188.979	0.008	mg/L			As	8/8/02	12:51:37 PM
LFB 8-7-02	As 188.979	2.700	mg/L	108.0%		As	8/8/02	12:53:42 PM
22333-31	As 188.979	0.322	mg/L			As	8/8/02	1:43:23 PM
22333-31 SPK	As 188.979	2.710	mg/L	95.5%	-0.9%	As	8/8/02	1:46:16 PM
22333-31 DSPK	As 188.979	2.760	mg/L	97.5%		As	8/8/02	1:49:11 PM
RB 8-6-02	Ba 233.527	0.000	mg/L			Ba	8/8/02	9:54:13 AM
LFB 8-6-02	Ba 233.527	2.260	mg/L	90.4%		Ba	8/8/02	9:56:18 AM
22333-10	Ba 233.527	4.220	mg/L			Ba	8/8/02	10:48:10 AM
22333-10 SPK	Ba 233.527	6.380	mg/L	86.4%	-1.2%	Ba	8/8/02	10:51:00 AM
22333-10 DSPK	Ba 233.527	6.540	mg/L	92.8%		Ba	8/8/02	12:48:13 PM
RB 8-7-02	Ba 233.527	0.001	mg/L			Ba	8/8/02	12:51:37 PM
LFB 8-7-02	Ba 233.527	2.620	mg/L	104.8%		Ba	8/8/02	12:53:32 PM
22333-31	Ba 233.527	2.430	mg/L			Ba	8/8/02	1:43:13 PM
22333-31 SPK	Ba 233.527	4.480	mg/L	82.0%	-7.6%	Ba	8/8/02	1:46:06 PM
22333-31 DSPK	Ba 233.527	5.280	mg/L	114.0%		Ba	8/8/02	1:49:01 PM
RB 8-6-02	Cd 226.502	-0.001	mg/L			Cd	8/8/02	9:54:13 AM
LFB 8-6-02	Cd 226.502	0.917	mg/L	91.7%		Cd	8/8/02	9:56:28 AM
22333-10	Cd 226.502	0.715	mg/L			Cd	8/8/02	10:48:20 AM
22333-10 SPK	Cd 226.502	1.430	mg/L	71.5%	1.1%	Cd	8/8/02	10:51:10 AM
22333-10 DSPK	Cd 226.502	1.400	mg/L	68.5%		Cd	8/8/02	12:48:23 PM
RB 8-7-02	Cd 226.502	0.000	mg/L			Cd	8/8/02	12:51:37 PM
LFB 8-7-02	Cd 226.502	1.050	mg/L	105.0%		Cd	8/8/02	12:53:42 PM
22333-31	Cd 226.502	0.070	mg/L			Cd	8/8/02	1:43:23 PM
22333-31 SPK	Cd 226.502	0.875	mg/L	80.5%	0.9%	Cd	8/8/02	1:46:16 PM
22333-31 DSPK	Cd 226.502	0.859	mg/L	78.9%		Cd	8/8/02	1:49:11 PM
RB 8-6-02	Cr 205.560	0.014	mg/L			Cr	8/8/02	9:54:13 AM
LFB 8-6-02	Cr 205.560	2.300	mg/L	92.0%		Cr	8/8/02	9:56:28 AM
22333-10	Cr 205.560	0.457	mg/L			Cr	8/8/02	10:48:20 AM
22333-10 SPK	Cr 205.560	2.650	mg/L	87.7%	2.4%	Cr	8/8/02	10:51:10 AM
22333-10 DSPK	Cr 205.560	2.530	mg/L	82.9%		Cr	8/8/02	12:48:23 PM
RB 8-7-02	Cr 205.560	0.007	mg/L			Cr	8/8/02	12:51:37 PM
LFB 8-7-02	Cr 205.560	2.660	mg/L	106.4%		Cr	8/8/02	12:53:42 PM
22333-31	Cr 205.560	0.300	mg/L			Cr	8/8/02	1:43:23 PM
22333-31 SPK	Cr 205.560	2.380	mg/L	83.2%	-1.0%	Cr	8/8/02	1:46:16 PM
22333-31 DSPK	Cr 205.560	2.430	mg/L	85.2%		Cr	8/8/02	1:49:11 PM

MD Chemical
QC for 1022333 ICP Analysis

RB 8-6-02	Pb 220.353	-0.002	mg/L			Pb	8/8/02	9:54:13 AM
LFB 8-6-02	Pb 220.353	2.510	mg/L	100.4%		Pb	8/8/02	9:56:28 AM
22333-10	Pb 220.353	10.400	mg/L			Pb	8/8/02	10:48:20 AM
22333-10 SPK	Pb 220.353	12.600	mg/L	88.0%	1.2%	Pb	8/8/02	10:51:10 AM
22333-10 DSPK	Pb 220.353	12.300	mg/L	76.0%		Pb	8/8/02	12:48:23 PM
RB 8-7-02	Pb 220.353	-0.001	mg/L			Pb	8/8/02	12:51:37 PM
LFB 8-7-02	Pb 220.353	2.610	mg/L	104.4%		Pb	8/8/02	12:53:42 PM
22333-31	Pb 220.353	1.840	mg/L			Pb	8/8/02	1:43:23 PM
22333-31 SPK	Pb 220.353	3.770	mg/L	77.2%	-2.8%	Pb	8/8/02	1:46:16 PM
22333-31 DSPK	Pb 220.353	3.990	mg/L	86.0%		Pb	8/8/02	1:49:11 PM
RB 8-6-02	Zn 213.857	0.002	mg/L			Zn	8/8/02	9:54:13 AM
LFB 8-6-02	Zn 213.857	2.410	mg/L			Zn	8/8/02	9:56:18 AM
22333-10	Zn 213.857	68.100	mg/L			Zn	8/8/02	10:48:10 AM
22333-10 SPK	Zn 213.857	70.300	mg/L	88.0%	-0.3%	Zn	8/8/02	10:51:00 AM
22333-10 DSPK	Zn 213.857	70.700	mg/L	104.0%		Zn	8/8/02	12:48:13 PM
RB 8-7-02	Zn 213.857	0.029	mg/L			Zn	8/8/02	12:51:37 PM
LFB 8-7-02	Zn 213.857	2.510	mg/L			Zn	8/8/02	12:53:32 PM
22333-31	Zn 213.857	7.650	mg/L			Zn	8/8/02	1:43:13 PM
22333-31 SPK	Zn 213.857	10.100	mg/L	98.0%	-2.4%	Zn	8/8/02	1:46:06 PM
22333-31 DSPK	Zn 213.857	10.600	mg/L	118.0%		Zn	8/8/02	1:49:01 PM

MD Chemical QC for 1022333

ICP Analysis

SampleID	Analyte	Mean
LPC1		

2002/08/08 09:48:40 All analytes passed QC.

Ag 328.068 0.5 mg/L

2002/08/08 09:48:31 QC value within limits for Ag 328.068 Recovery = 102.77%

2002/08/08 09:48:40 All analytes passed QC.

Ag 338.289 0.5 mg/L

2002/08/08 09:48:31 QC value within limits for Ag 338.289 Recovery = 99.65%

2002/08/08 09:48:40 All analytes passed QC.

As 188.979 2.2 mg/L

2002/08/08 09:48:31 QC value within limits for As 188.979 Recovery = 107.85%

2002/08/08 09:48:40 All analytes passed QC.

As 193.696 2.1 mg/L

2002/08/08 09:48:31 QC value within limits for As 193.696 Recovery = 104.39%

2002/08/08 09:48:40 All analytes passed QC.

Ba 233.527 2.0 mg/L

2002/08/08 09:48:31 QC value within limits for Ba 233.527 Recovery = 101.48%

2002/08/08 09:48:40 All analytes passed QC.

Ba 455.403 2.0 mg/L

2002/08/08 09:48:31 QC value within limits for Ba 455.403 Recovery = 101.60%

2002/08/08 09:48:40 All analytes passed QC.

Cd 226.502 2.1 mg/L

2002/08/08 09:48:31 QC value within limits for Cd 226.502 Recovery = 104.89%

2002/08/08 09:48:40 All analytes passed QC.

Cr 205.560 2.0 mg/L

2002/08/08 09:48:31 QC value within limits for Cr 205.560 Recovery = 100.64%

2002/08/08 09:48:40 All analytes passed QC.

Cr 267.716 2.0 mg/L

2002/08/08 09:48:31 QC value within limits for Cr 267.716 Recovery = 101.05%

2002/08/08 09:48:40 All analytes passed QC.

Pb 217.000 2.1 mg/L

2002/08/08 09:48:31 QC value within limits for Pb 217.000 Recovery = 106.84%

2002/08/08 09:48:40 All analytes passed QC.

Pb 220.353 2.1 mg/L

2002/08/08 09:48:31 QC value within limits for Pb 220.353 Recovery = 107.76%

2002/08/08 09:48:40 All analytes passed QC.

Zn 206.200 2.0 mg/L

2002/08/08 09:48:31 QC value within limits for Zn 206.200 Recovery = 99.80%

2002/08/08 09:48:40 All analytes passed QC.

Zn 213.857 2.1 mg/L

2002/08/08 09:48:31 QC value within limits for Zn 213.857 Recovery = 103.28%

MD Chemical QC for 1022333

ICP Analysis

SampleID	Analyte	Mean
LPC2		

2002/08/08 10:21:13 All analytes passed QC.

Ag 328.068 0.5 mg/L

2002/08/08 10:21:12 QC value within limits for Ag 328.068 Recovery = 104.87%

2002/08/08 10:21:13 All analytes passed QC.

Ag 338.289 0.5 mg/L

2002/08/08 10:21:12 QC value within limits for Ag 338.289 Recovery = 101.37%

2002/08/08 10:21:13 All analytes passed QC.

As 188.979 2.2 mg/L

2002/08/08 10:21:12 QC value within limits for As 188.979 Recovery = 108.68%

2002/08/08 10:21:13 All analytes passed QC.

As 193.696 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for As 193.696 Recovery = 106.55%

2002/08/08 10:21:13 All analytes passed QC.

Ba 233.527 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for Ba 233.527 Recovery = 103.54%

2002/08/08 10:21:13 All analytes passed QC.

Ba 455.403 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for Ba 455.403 Recovery = 104.67%

2002/08/08 10:21:13 All analytes passed QC.

Cd 226.502 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for Cd 226.502 Recovery = 107.76%

2002/08/08 10:21:13 All analytes passed QC.

Cr 205.560 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for Cr 205.560 Recovery = 102.54%

2002/08/08 10:21:13 All analytes passed QC.

Cr 267.716 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for Cr 267.716 Recovery = 103.15%

2002/08/08 10:21:13 All analytes passed QC.

Pb 217.000 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for Pb 217.000 Recovery = 108.12%

2002/08/08 10:21:13 All analytes passed QC.

Pb 220.353 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for Pb 220.353 Recovery = 104.79%

2002/08/08 10:21:13 All analytes passed QC.

Zn 206.200 2.0 mg/L

2002/08/08 10:21:12 QC value within limits for Zn 206.200 Recovery = 101.17%

2002/08/08 10:21:13 All analytes passed QC.

Zn 213.857 2.1 mg/L

2002/08/08 10:21:12 QC value within limits for Zn 213.857 Recovery = 104.52%

2002/08/08 10:56:45 All analytes passed QC.

MD Chemical QC for 1022333

ICP Analysis

SampleID	Analyte	Mean
	Ag 328.068	0.5 mg/L

2002/08/08 10:56:35 QC value within limits for Ag 328.068 Recovery = 103.35%

2002/08/08 10:56:45 All analytes passed QC.

	Ag 338.289	0.5 mg/L

2002/08/08 10:56:35 QC value within limits for Ag 338.289 Recovery = 100.37%

2002/08/08 10:56:45 All analytes passed QC.

	As 188.979	2.2 mg/L

2002/08/08 10:56:35 QC value within limits for As 188.979 Recovery = 108.52%

2002/08/08 10:56:45 All analytes passed QC.

	As 193.696	2.1 mg/L

2002/08/08 10:56:35 QC value within limits for As 193.696 Recovery = 107.06%

2002/08/08 10:56:45 All analytes passed QC.

	Ba 233.527	2.0 mg/L

2002/08/08 10:56:35 QC value within limits for Ba 233.527 Recovery = 102.96%

2002/08/08 10:56:45 All analytes passed QC.

	Ba 455.403	2.1 mg/L

2002/08/08 10:56:35 QC value within limits for Ba 455.403 Recovery = 106.29%

2002/08/08 10:56:45 All analytes passed QC.

	Cd 226.502	2.2 mg/L

2002/08/08 10:56:35 QC value within limits for Cd 226.502 Recovery = 108.41%

2002/08/08 10:56:45 All analytes passed QC.

	Cr 205.560	2.1 mg/L

2002/08/08 10:56:35 QC value within limits for Cr 205.560 Recovery = 103.45%

2002/08/08 10:56:45 All analytes passed QC.

	Cr 267.716	2.1 mg/L

2002/08/08 10:56:35 QC value within limits for Cr 267.716 Recovery = 102.29%

2002/08/08 10:56:45 All analytes passed QC.

	Pb 217.000	2.1 mg/L

2002/08/08 10:56:35 QC value within limits for Pb 217.000 Recovery = 107.34%

2002/08/08 10:56:45 All analytes passed QC.

	Pb 220.353	2.1 mg/L

2002/08/08 10:56:35 QC value within limits for Pb 220.353 Recovery = 105.66%

2002/08/08 10:56:45 All analytes passed QC.

	Zn 206.200	2.0 mg/L

2002/08/08 10:56:35 QC value within limits for Zn 206.200 Recovery = 101.12%

2002/08/08 10:56:45 All analytes passed QC.

	Zn 213.857	2.1 mg/L

2002/08/08 10:56:35 QC value within limits for Zn 213.857 Recovery = 104.66%

MD Chemical QC for 1022333

ICP Analysis

SampleID	Analyte	Mean
LPC1		

2002/08/08 12:43:02 All analytes passed QC.

Ag 328.068 0.5 mg/L

2002/08/08 12:43:01 QC value within limits for Ag 328.068 Recovery = 104.73%

2002/08/08 12:43:02 All analytes passed QC.

Ag 338.289 0.5 mg/L

2002/08/08 12:43:01 QC value within limits for Ag 338.289 Recovery = 101.71%

2002/08/08 12:43:02 All analytes passed QC.

As 188.979 2.1 mg/L

2002/08/08 12:43:01 QC value within limits for As 188.979 Recovery = 105.77%

2002/08/08 12:43:02 All analytes passed QC.

As 193.696 2.1 mg/L

2002/08/08 12:43:01 QC value within limits for As 193.696 Recovery = 102.95%

2002/08/08 12:43:02 All analytes passed QC.

Ba 233.527 2.0 mg/L

2002/08/08 12:43:01 QC value within limits for Ba 233.527 Recovery = 102.87%

2002/08/08 12:43:02 All analytes passed QC.

Ba 455.403 2.0 mg/L

2002/08/08 12:43:01 QC value within limits for Ba 455.403 Recovery = 102.01%

2002/08/08 12:43:02 All analytes passed QC.

Cd 226.502 2.1 mg/L

2002/08/08 12:43:01 QC value within limits for Cd 226.502 Recovery = 104.11%

2002/08/08 12:43:02 All analytes passed QC.

Cr 205.560 2.0 mg/L

2002/08/08 12:43:01 QC value within limits for Cr 205.560 Recovery = 99.26%

2002/08/08 12:43:02 All analytes passed QC.

Cr 267.716 2.1 mg/L

2002/08/08 12:43:01 QC value within limits for Cr 267.716 Recovery = 101.66%

2002/08/08 12:43:02 All analytes passed QC.

Pb 217.000 2.1 mg/L

2002/08/08 12:43:01 QC value within limits for Pb 217.000 Recovery = 106.66%

2002/08/08 12:43:02 All analytes passed QC.

Pb 220.353 2.0 mg/L

2002/08/08 12:43:01 QC value within limits for Pb 220.353 Recovery = 102.49%

2002/08/08 12:43:02 All analytes passed QC.

Zn 206.200 1.9 mg/L

2002/08/08 12:43:01 QC value within limits for Zn 206.200 Recovery = 97.15%

2002/08/08 12:43:02 All analytes passed QC.

Zn 213.857 2.1 mg/L

2002/08/08 12:43:01 QC value within limits for Zn 213.857 Recovery = 103.70%

MD Chemical QC for 1022333

ICP Analysis

SampleID	Analyte	Mean
LPC2		

2002/08/08 13:21:48 All analytes passed QC.

Ag 328.068 0.5 mg/L

2002/08/08 13:21:37 QC value within limits for Ag 328.068 Recovery = 108.72%

2002/08/08 13:21:48 All analytes passed QC.

Ag 338.289 0.5 mg/L

2002/08/08 13:21:37 QC value within limits for Ag 338.289 Recovery = 105.27%

2002/08/08 13:21:48 All analytes passed QC.

As 188.979 2.2 mg/L

2002/08/08 13:21:37 QC value within limits for As 188.979 Recovery = 111.53%

2002/08/08 13:21:48 All analytes passed QC.

As 193.696 2.2 mg/L

2002/08/08 13:21:37 QC value within limits for As 193.696 Recovery = 109.66%

2002/08/08 13:21:48 All analytes passed QC.

Ba 233.527 2.1 mg/L

2002/08/08 13:21:37 QC value within limits for Ba 233.527 Recovery = 107.90%

2002/08/08 13:21:48 All analytes passed QC.

Ba 455.403 2.1 mg/L

2002/08/08 13:21:37 QC value within limits for Ba 455.403 Recovery = 108.04%

2002/08/08 13:21:48 All analytes passed QC.

Cd 226.502 2.2 mg/L

2002/08/08 13:21:37 QC value within limits for Cd 226.502 Recovery = 110.39%

2002/08/08 13:21:48 All analytes passed QC.

Cr 205.560 2.1 mg/L

2002/08/08 13:21:37 QC value within limits for Cr 205.560 Recovery = 105.71%

2002/08/08 13:21:48 All analytes passed QC.

Cr 267.716 2.2 mg/L

2002/08/08 13:21:37 QC value within limits for Cr 267.716 Recovery = 106.88%

2002/08/08 13:21:48 All analytes passed QC.

Pb 217.000 2.2 mg/L

2002/08/08 13:21:37 QC value within limits for Pb 217.000 Recovery = 108.93%

2002/08/08 13:21:48 All analytes passed QC.

Pb 220.353 2.1 mg/L

2002/08/08 13:21:37 QC value within limits for Pb 220.353 Recovery = 107.64%

2002/08/08 13:21:48 All analytes passed QC.

Zn 206.200 2.0 mg/L

2002/08/08 13:21:37 QC value within limits for Zn 206.200 Recovery = 102.16%

2002/08/08 13:21:48 All analytes passed QC.

Zn 213.857 2.2 mg/L

2002/08/08 13:21:37 QC value within limits for Zn 213.857 Recovery = 107.73%

MD Chemical QC for 1022333

ICP Analysis

SampleID	Analyte	Mean
LPC3		

2002/08/08 14:14:03 All analytes passed QC.

Ag 328.068 0.5 mg/L

2002/08/08 14:13:52 QC value within limits for Ag 328.068 Recovery = 107.72%

2002/08/08 14:14:03 All analytes passed QC.

Ag 338.289 0.5 mg/L

2002/08/08 14:13:52 QC value within limits for Ag 338.289 Recovery = 103.86%

2002/08/08 14:14:03 All analytes passed QC.

As 188.979 2.3 mg/L

2002/08/08 14:13:52 QC value within limits for As 188.979 Recovery = 114.84%

2002/08/08 14:14:03 All analytes passed QC.

As 193.696 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for As 193.696 Recovery = 111.20%

2002/08/08 14:14:03 All analytes passed QC.

Ba 233.527 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for Ba 233.527 Recovery = 108.87%

2002/08/08 14:14:03 All analytes passed QC.

Ba 455.403 2.1 mg/L

2002/08/08 14:13:52 QC value within limits for Ba 455.403 Recovery = 105.56%

2002/08/08 14:14:03 All analytes passed QC.

Cd 226.502 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for Cd 226.502 Recovery = 112.99%

2002/08/08 14:14:03 All analytes passed QC.

Cr 205.560 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for Cr 205.560 Recovery = 109.01%

2002/08/08 14:14:03 All analytes passed QC.

Cr 267.716 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for Cr 267.716 Recovery = 106.96%

2002/08/08 14:14:03 All analytes passed QC.

Pb 217.000 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for Pb 217.000 Recovery = 111.51%

2002/08/08 14:14:03 All analytes passed QC.

Pb 220.353 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for Pb 220.353 Recovery = 111.30%

2002/08/08 14:14:03 All analytes passed QC.

Zn 206.200 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for Zn 206.200 Recovery = 108.34%

2002/08/08 14:14:03 All analytes passed QC.

Zn 213.857 2.2 mg/L

2002/08/08 14:13:52 QC value within limits for Zn 213.857 Recovery = 112.00%

APPENDIX H

Kansas Geological Survey | Hydrology | Water Well Database Query

Township: 29S, Range: 16E, Section: 9

Select location of well to view details.
Click on column heading to sort.

Save Data to File

Township: 29S, Range: 16E, Section: 9

No data was returned from the query. There are no wells in the database from that area.

Select Again

Kansas Geological Survey
Comments to webadmin@kgs.ku.edu
URL=http://www.kgs.ku.edu/Magellan/WaterWell/index.html
Display Programs Updated June 17, 2002
Data added continuously.

Kansas Geological Survey | Hydrology | Water Well Database Query

Township: 29S, Range: 16E, Section: 8

Select location of well to view details.
Click on column heading to sort.

Save Data to File

Township: 29S, Range: 16E, Section: 8

No data was returned from the query. There are no wells in the database from that area.

Select Again

Kansas Geological Survey
Comments to webadmin@kgs.ku.edu
URL=http://www.kgs.ku.edu/Magellan/WaterWell/index.html
Display Programs Updated June 17, 2002
Data added continuously.

Kansas Geological Survey | Hydrology | Water Well Database Query

Township: 29S, Range: 16E, Section: 17

Select location of well to view details.
Click on column heading to sort.

Save Data to File

Township: 29S, Range: 16E, Section: 17

No data was returned from the query. There are no wells in the database from that area.

Select Again

Kansas Geological Survey
Comments to webadmin@kgs.ku.edu
URL=http://www.kgs.ku.edu/Magellan/WaterWell/index.html
Display Programs Updated June 17, 2002
Data added continuously.

Kansas Geological Survey | Hydrology | Water Well Database Query

Township: 29S, Range: 16E, Section: 16

Select location of well to view details.
Click on column heading to sort.

Save Data to File

Township: 29S, Range: 16E, Section: 16

No data was returned from the query. There are no wells in the database from that area.

Select Again

Kansas Geological Survey
Comments to webadmin@kgs.ku.edu
URL=http://www.kgs.ku.edu/Magellan/WaterWell/index.html
Display Programs Updated June 17, 2002
Data added continuously.

APPENDIX I

Regression: Lead conc.

	constant	XRF
coefficient	151.993281	1.03577011
std error of coef	84.2252707	0.03082808
t-ratio	1.8046	33.5983
significance	16.8900%	0.0058%
beta-weight		0.9987

standard error of regression	142.651192
coefficient of determination	99.73%
adjusted coef of determination	99.65%

number of observations	5
residual degrees of freedom	3

t-statistic for computing 95%-confidence intervals	3.1824

Predicted values and residuals

Lead conc.	predicted	residual	XRF
6230	6230.928	-0.928046	5869
757	708.20183	48.798171	537
848	1057.2564	-209.2564	874
1620	1508.8521	111.14788	1310
543	492.76165	50.238353	329

Analysis of variance

	sum of squares	df
regression	22971253.11	1
residual	61048.08787	3
total	23032301.2	4

F-ratio	1128.8439
degrees of freedom	(1, 3)
significance	0.00580%

If there are as many coefficients in the regression model as there are observations in the sample, then it will always be possible to fit the model perfectly to the data, even if the independent variables actually have no relationship to the dependent variable. The F-ratio provides a method for seeing whether the average variability in the dependent variable explained per independent variable in the model is significantly greater than one would expect to see explained purely due to "geometry".

XRF	Lead conc.
5869	**6230**
537	757
874	848
1310	1620
329	543

Regression: Zin conc.

	constant	XRF
coefficient	1351.63382	0.21606284
std error of coef	1112.50141	0.3353917
t-ratio	1.2150	0.6442
significance	31.1285%	56.5305%
beta-weight		0.3486

standard error of regression	1208.90662
coefficient of determination	12.15%
adjusted coef of determination	-17.13%

number of observations	5
residual degrees of freedom	3

t-statistic for computing 95%-confidence intervals	3.1824

XRF	Zin conc.
4970	**1090**
877	1090
1160	1610
3459	2350
4029	3750

Analysis of variance

	sum of squares	df
regression	606514.3275	1
residual	4384365.672	3
total	4990880	4

F-ratio	0.4150
degrees of freedom	(1, 3)
significance	56.53053%

If there are as many coefficients in the regression model as there are observations in the sample, then it will always be possible to fit the model perfectly to the data, even if the independent variables actually have no relationship to the dependent variable. The F-ratio provides a method for seeing whether the average variability in the dependent variable explained per independent variable in the model is significantly greater than one would expect to see explained purely due to "geometry".

Predicted values and residuals

Zin conc.	predicted	residual	XRF
1090	2425.4661	-1335.466	4970
1090	1541.1209	-451.1209	877
1610	1602.2667	7.7332838	1160
2350	2098.9952	251.00481	3459
3750	2222.151	1527.849	4029