ATTACHMENT C

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Waste Management

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Governor

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Director

Dee Freeman
Secretary

October 11, 2010

Ms. Jennifer Wendel
Superfund Site Evaluation Section
US EPA Region IV Waste Division
61 Forsyth Street SW, 11th Floor
Atlanta, GA 30303

Subject: Site Inspection Report
Transylvania Tanning Company Site
NCN000410007
Brevard, Transylvania County, NC

Dear Ms. Wendel:

Enclosed is the Site Inspection Report (SI) for the Transylvania Tannery site near Brevard, Transylvania County, North Carolina. The purpose of this investigation was to evaluate the threat posed to human health and the environment and to determine the need for additional CERCLA/SARA or other appropriate action. Based on this review, the NC Superfund Section recommends this site is given a status of No Further Remedial Action Planned (NFRAP) under CERCLA.

If you have any questions, please contact Jim Bateson at (919) 508-8449 or james.bateson@ncdenr.gov .

Sincerely

Harry Zinn, Environmental Engineer
Site Evaluation and Removal Branch
NC Superfund Section

cc: Scott Ross, file
Charlotte Jesneck w/o attachments

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SITE INSPECTION (SI)

Transylvania Tanning Co.
NCN000410007
Brevard, Transylvania County, NC 28712

October 11, 2010

Superfund Section
Division of Waste Management
North Carolina Department of Environment
And Natural Resources

Prepared by:

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EXECUTIVE SUMMARY

A citizen's petition received by US EPA Region 4 on October 26, 2006 lead to the listing of Transylvania Tanning Co. on CERCLIS on January 24, 2007. This petition voiced concerns not only for the property where the tannery buildings had been located (Tannery) but also an adjacent downstream parcel that may have been impacted. The downstream parcel (Development) is being considered for development into a housing development.

North Carolina Department of Environment and Natural Resources (DENR) located the Tannery on a Sanborn map dated 1931. The NC Directory of Manufacturing Firms listed the Transylvania Tannery Co. in its 1944, 1956 and 1960 editions. It was not listed in later editions. The site has no regulatory history. The tannery closed prior to passage of most regulatory laws. Based on the geographic location of this tannery in western North Carolina and the depiction of Bark Sheds on the 1924 Sanborn Map, it is believed that this facility used the vegetable tanning process. The waste associated with tanneries of this type can contain chromium, copper, lead and zinc

The Tannery property is located on the western side of Brevard and is bound by Cashiers Valley Road to the west, Oakdale Street to the east and Silversteen Drive to the south..The Tannery property is a vacant, undeveloped, overgrown 12-acre land parcel surrounded primarily by residences. The Development property is downstream of this parcel along Norton Creek and is bound by Aiken Street to the east, Rosman Highway (US 64) to the south, Carolina Avenue and McMinn Avenue to the west and Silversteen Avenue to the north. The 15-acre Development property is mostly open field surrounded by both residential and commercial properties.

On April 12-14, 2010, NC Superfund collected soil samples from the Tannery property and sediment samples from along Norton Creek and at its confluence with Nicholson Creek for this SI. Arsenic, copper and lead are the only contaminants detected in the soils on the Tannery property that are attributable to the site (>3x background) and above the North Carolina Inactive Hazardous Sites Branch's (IHSB) Soil Remedial Goals (SRGs). Chromium was also detected above background but below the SRG. The IHSB SRGs are based on a hazard quotient of 0.2 to account for multiple (average of 5) non-carcinogens in the same critical effect group. Since most of the samples only had one contaminant identified or the contaminants in those samples with multiple detections are not in the same critical effect group, the IHSB allows the adjustment of the site-specific SRGs to 5 times the listed SRGs. Based on these adjustments, only the two following samples exceed calculated site-specific SRGs. The lead found at the Leather Warehouse in sample 008SS (1076.9 mg/kg) is above the EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs) industrial exposure level of 800 mg/kg, and the level found at the south end of the Tannery Building in sample 010SS (446.2 mg/kg) is above the RSL residential exposure level of 400 mg/kg. Field screening of soils on the Development property using a Niton X-Ray Fluorescence (XRF) unit did not identify any contamination that poses a significant human health risk. Since the site is currently inactive and unoccupied, the risk to human health is not currently considered significant, however, if the usage of the site changes, this may become a concern.

Site overland drainage from both parcels enters Norton Creek, which flows south 0.33 miles to Nicholson Creek. Nicholson Creek flows south and east 1.2 miles to the French Broad River. Both Norton Creek and Nicholson Creek are classified as Class C waters and Trout Waters. Sediment samples were collected at four points along Norton Creek and on all three segments at the confluence of Norton Creek and Nicholson Creek. Chromium, copper, lead, nickel and zinc were detected above the Region 4 Sediment Screening Values in three sediments samples on Norton Creek immediately adjacent to the

Tannery and Development parcels. No contaminants were detected in the surface water pathway samples collected at locations further downstream.

Two community wells, located approximately 0.75 miles away, are the only potable wells within 1 mile of the site. None of the contaminants associated with the tannery operation are considered to be mobile in groundwater under the conditions known at this site. Also, the site is situated adjacent to a stream that is an effective groundwater discharge. The shallow groundwater beneath the site is not likely to travel far before discharging to this stream. Therefore, the groundwater pathway is not considered threatened and was not sampled.

Based on the findings of this SI, the Transylvania Tanning Co. site is recommended for No Further Remedial Action Planned (NFRAP) under CERCLA.

1.0 INTRODUCTION:

This Site Inspection (SI) for the Transylvania Tanning Co. site (NCN000410007) was performed by the NC Superfund Section under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (Ref. 1). The SI was conducted to assess the immediate or potential threat to human health and/or the environment.

A citizen's petition received by US EPA Region 4 on October 26, 2006 lead to the listing of the site on CERCLIS on January 24, 2007. This petition voiced concerns not only for the property where the tannery buildings had been located (Tannery) but also an adjacent downstream parcel that may have been impacted. At the time of the petition, the downstream parcel (Development) had been considered for a housing development. According to the petition, Norton Creek, which runs adjacent to both properties, was impacted by site activities for 40 years (Ref. 1).

On April 12 - 14, 2010, NC Superfund collected samples for the SI. On-site soil samples and sediment samples were collected. Based on the findings of this SI, the Transylvania Tanning Co. site is recommended for No Further Remedial Action Planned (NFRAP) under CERCLA.

2.0 SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

2.1 Location and Climate

The Tannery property is located on the western side of Brevard and is bound by Cashiers Valley Road to the west, Oakdale Street to the east and Silversteen Drive to the south. A smokestack is all that remains of the facility on-site and is the reference point for the site's geographic coordinates at 35.2305 ^{o} north latitude and -82.7418 ^{o} west longitude (Ref. 3).

The site is in the 11th Congressional District; county code is 88. The mean annual precipitation is 78.9 inches, the mean annual lake evaporation rate is 50 inches, thus yielding a net annual precipitation of 28.9 inches. The 2-year, 24-hour rainfall is 4.63 inches (Ref. 4).

2.2 Site Description

The Tannery property is located on the western side of Brevard and is bound by Cashiers Valley Road to the west, Oakdale Street to the east and Silversteen Drive to the south. The Tannery property is a vacant, undeveloped overgrown 12-acre land parcel owned by South Eastern Real Estate and Discount. It is surrounded primarily by residences (Fig. 1).

The Development property is downstream of this parcel along Norton Creek and is bound by Aiken Street to the east, Rosman Highway (US 64) to the south, Carolina Avenue and McMinn Avenue to the west and Silversteen Avenue to the north. The 15 acre Development property is mostly open field owned by Satpal Rathie. It is surrounded by both residential and commercial properties (Fig. 1).

2.3 Operational, Ownership and Regulatory History

On December 15, 1993 the City of Brevard authorized Asheville Radon and Environmental Consultants, Inc. to perform an environmental site inspection of the "Old Tannery Property". While heavy undergrowth prevented site access and any on-site sampling, a wetland delineation survey was recommended. Based on this survey additional soil sampling would be recommended if further development were to proceed (Ref. 6).

A study by North Carolina Department of Environment and Natural Resources (DENR) in November 2006 located Transylvania Tanning Co. on a Sanborn map dated 1931. The NC Directory of Manufacturing Firms listed the Transylvania Tannery Co. in its 1944, 1956 and 1960 editions. It was not listed in later editions (Ref. 7).

On November 28, 2007, an off-site reconnaissance was performed by DENR. Site access was not obtained for the Tannery property. An Niton X-Ray Fluoresence unit (XRF) was used to field screen the soils along the banks of Norton Creek where it passed under Silversteen Avenue. No significant readings were seen (Ref. 8).

The site has no regulatory history. The tannery closed prior to passage of most regulatory laws. There is no record that the site generated / disposed of process wastes. If process wastes were disposed, it does not appear that this occurred on site.

2.4 Waste Characteristics

Other than piles of concrete and building rubble, there are no waste piles on site. There are no drums, ponds, lagoons, or any signs of buried waste on site. The only intact remnants of the previous operations are a small 5 foot by 5 foot concrete vat approximately 1 foot deep located in the vicinity of the Leather Warehouse and the smokestack located on the site (Appendix B).

Based on the geographic location of this tannery in western North Carolina and the depiction of Bark Sheds on the 1924 Sanborn Map, it is believed that this facility used the vegetable tanning process. The waste associated with such tanneries would be chromium, copper, lead and zinc. Additional contaminants that could be present in the wastewater would be calcium hydroxide (lime), brine solutions and sulfuric acid used in the fleshing, unhairing, bating and pickling steps of the process (Ref. 9).

3.0 <u>WASTE/SOURCE SAMPLING</u>

3.1 Waste/Source Sample Collection and Results

Source samples for this SI consisted of composite surface soil samples collected in the vicinity of seven buildings identified on the Sanborn map. Two additional composite samples were collected from along the eastern side of the main tannery building (one on the north end one on the south end) and one grab sample from a background location. Table 1 lists all samples

collected for the SI, including seven sediment samples along Norton Creek and Nicholson Creek and a background sediment sample on Norton Creek. All sampling was conducted in April 2010. Duplicate samples were collected from some of these locations as well as some additional locations for field screening using the XRF unit. These results are discussed in the Soil Exposure section of this report.

All sampling for the SI sampling event was conducted by NC Superfund Section staff in accordance with the NC Superfund Section Quality Assurance Program Plan (QAPP) and Quality Assurance Standard Operating Procedures (QASOP). The QASOP adopts by reference the Field Branches Quality System and Technical Procedures, U. S. Environmental Protection Agency, Region 4. The Program Plan is derived directly from the EPA-Approved NC Department of Environmental and Natural Resources QA Plan for Data, 2004.

Samples were submitted to a Contract Laboratory Program (CLP) lab. Soil and sediment samples were analyzed for metals. All soil samples were surface soil. Table 1 provides a description of each soil sample location, date, and time. Table 2 summarizes soil sample results. Source soil sample locations are shown in Figure 2. Other sample locations are shown on Figure 3 and Figure 4. Figures are at the end of the report. Results are provided in Appendix A. Appendix B contains Chain of Custody forms, field log notes, sample geographic coordinates, and XRF Readings.

Table 2 summarizes results from on-site surface soil samples and compares these to the background soil sample (001SS). Only those compounds having at least one detection above the method reporting limit are show in Table 2. Levels that are J'd because they are below the method reporting limit are considered non-detect for CERCLA purposes. In these instances, the method reporting limit is shown in parentheses. Under CERCLA, only compounds greater than the background method reporting limit or equal to or greater than (>) 3 times the level detected in background are considered attributable to the site (Ref. 10).

Arsenic, copper and lead are the only contaminants detected in the on-site soils that are attributable to the site (> 3x background) and above the North Carolina Inactive Hazardous Sites Branch's (IHSB) Soil Remedial Goals (SRGs). The IHSB SRGs for arsenic and copper are based on non-carcinogenic endpoints and correspond to a hazard quotient of 0.2. IHSB guidance allows for site-specific SRGs to be calculated as long as the maximum cumulative hazard index is 1. Since arsenic and copper do not have a cumulative effect (they do not share the same critical effect group), each published SRG can be multiplied by 5 to yield a maximum cumulative hazard index of 1. Based on a site-specific arsenic SRG of 22 ppm (5x4.4) and a site-specific copper SRG of 3,100 ppm (5x620), no samples were detected above the site-specific SRGs. The SRG for lead is based on the USEPA guidance on lead cleanup levels and cannot be adjusted. The lead found in 008SS (1076.9 mg/kg) is above the EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs) industrial exposure level of 800 mg/kg, and the level found in 010SS (446.2 mg/kg) is above the RSL residential exposure level of 400 mg/kg; however, since this site is inactive with no worker exposure and is not currently a residential property, the site does not pose a current health risk. If site usage changes in the future, this may become a risk factor that would need further consideration.

Arsenic was detected in soils across most of the site and it was the only contaminant found in all but two of the samples on the Tannery Parcel. Arsenic contamination was a concern at another EPA Removal site (Ecusta Mill site) located approximately 3 miles northeast of this site. At the Ecusta Mill site, it was determined that the arsenic was naturally occurring in fill soils that had been relocated from borrow area located within the Brevard Fault Zone, a prominent geologic feature of the southeast that runs approximately 700 kilometers from Alabama to Virginia. Arsenic is known to exist in high concentrations due to mineralization in the shear zone of the Brevard Fault. Arsenopyrite in this zone can result in arsenic present in several percent range on mineralized surfaces in the bedrock, and therefore, results in elevated arsenic levels in the residual soils that form from that rock. The arsenic concentration found in the background fill soils collected from the borrow area for the Ecusta site ranged from 4.4 ppm to 52.8 ppm and averaged 34.9 ppm. These numbers are in the same range as those detected on the tannery property at Transylvania Tanning (Ref. 12).

A map was made by Brett Laverty of NC DENR Aquifer Protection to illustrate the location of groundwater wells around Brevard with arsenic detections and their proximity to the Brevard Fault Zone. The locations of the Ecusta site and Transylvania Tanning were added to indicate their location along this zone. The location of the Transylvania Tanning site within the Brevard Fault Zone is sufficient to explain the elevated levels in arsenic found in soils on the site.

3.2 Waste / Source Sample Conclusions

Based on these soil results, this site does not appear to currently pose a threat to human health. The levels of arsenic found in the soils are indicative of the site's location in the Brevard Fault Zone and not to site activities. Also, the soils are not above site-specific Soil Remedial Goals for arsenic or copper. While lead has been found on-site above the RSLs for residential and industrial use, the site is currently inactive and unoccupied. If site usage changes in the future, further evaluation of the risk to human health will need to be reevaluated.

4.0 GROUNDWATER PATHWAY

4.1 Hydrogeology

The site is located within the Blue Ridge geologic province and lies within the Brevard Fault Zone which is characterized by mylonitic and cataclastic rocks. The Brevard Fault Zone is a linear, southeast-dipping thrust fault that forms the boundary between the Inner Piedmont geologic belt to the southeast and the Blue Ridge geologic belt to the northwest. The geology in the vicinity of the site consists of moderate- to high-grade metamorphic rocks of the late Proterozoic age. The rock units include meta-sedimentary and meta-igneous rocks, including gneisses, amphibolites, metagabbros, and quartzite schist.

Soil and highly weathered rock, known as saprolite, overlie bedrock in most places in the Piedmont and mountain regions of North Carolina. The soil-saprolite and the underlying fractured bedrock represent a composite water-table aquifer system. There are no underlying aquifers. Groundwater occurs in two contrasting media: (a) clayey, granular soil/saprolite that

typically becomes less clayey with depth, and (b) underlying fractures and other planar openings in bedrock. The soil/saprolite zone is capable of storing water readily but transmits it slowly. In contrast, the bedrock fracture system has a relatively low storage capacity but is capable of transmitting water readily where interconnecting fractures occur.

The two site parcels occupy the full width of the floodplain of Norton Creek, where approximately ten to thirty foot of alluvial sand and gravel overlie the saprolite/bedrock aquifer. The relatively steep terrain surrounding this floodplain indicates that groundwater from the saprolite/bedrock aquifer is likely to be discharging upward into the alluvial aquifer beneath the site, and from there, shortly into Norton Creek. Significant contamination of groundwater in the saprolite/bedrock aquifer beneath the site or in its environs is not likely.

4.2 Groundwater Targets and Results

According to the North Carolina Department of Environment and Natural Resources, Division of Environmental Health, Public Water Supply Section, Source Water Protection (SWP) database, the only community wells in the vicinity of the site are two wells supplying the Waterford Place Subdivision approximately 0.75 miles northwest of the site. All other areas within 1 mile of the site are within the Extraterritorial Jurisdiction of the City of Brevard and are covered by the City of Brevard Public Utilities. On January 14, 2010, Mr. David Lutz, Public Services Director for the City of Brevard informed me that no private wells are being used inside the Brevard City Limits (Ref. 9).

4.3 Groundwater Pathway Conclusions

Two community wells are located approximately 0.75 miles away from the site and no other groundwater users are within 1 mile of the site. Since the contaminants associated with the tannery (chromium, copper, lead and zinc) are not considered mobile in groundwater and because the shallow groundwater at the site is likely to discharge to Norton Creek, these two wells were not sampled. The groundwater pathway is not considered significant.

5.0 SURFACE WATER PATHWAY

5.1 Hydrology and Targets

Site overland drainage from both parcels enters Norton Creek, which flows south 0.33 miles to Nicholson Creek. Nicholson Creek flows south and east 1.2 miles to the French Broad River. The 15-mile surface water pathway terminates in the French Broad River. The probable points of entry (PPEs) of site runoff to the surface water pathway run the entire length of each parcel since Norton Creek borders both parcels. Some current maps and the Sanborn Maps of the site identify the creek along the property as Brushy Creek. According to the North Carolina Floodplain Mapping Information System, Brushy Creek becomes Norton Creek approximately ½ mile upstream from the Tannery Parcel. According to a search at NC One Map at http://www.nconemap.net, no surface water intakes are located within the 15-mile surface water pathway from the site.

The U.S. Fish and Wildlife Service, National Wetlands Inventory (http://www.fws.gov/wetlands/Data/Mapper.html) shows only a few small isolated wetland parcels several miles downstream on the French Broad River (Ref. 11). According to the NC Division of Water Quality website at http://h2o.enr.state.nc.us/bims/reports/reportsWB.html, Norton Creek and Nicholson Creek are classified as Class C waters and are also designated as Trout Waters (Ref. 11).

5.2 Sediment Sample Results

Sediment samples were collected below the PPE on the Tannery Parcel on Norton Creek (002SD), upstream (Tannery Parcel) and downstream (Development Parcel) of Silversteen Avenue (003SD and 004SD) on Norton Creek and at the discharge point of the first drainage ditch from the Development Parcel into Norton Creek (005SD). Samples were also collected on Norton Creek (006SD) upstream of its confluence with Nicholson Creek and upstream and downstream on Nicholson Creek (007SD and 008SD) at the same confluence. A background sediment sample was collected from Norton Creek (001SD) approximately 25 feet downstream from Cashiers Valley Road. Sediment samples were analyzed for inorganics. Table 1 lists the samples. Sample findings are summarized in Tables 3 and 4. Results and field log notes are provided in Appendices A and B, respectively.

Aluminum, barium, calcium, chromium, cobalt, copper, iron, lead, nickel and zinc were contaminants identified as attributable to the site (> 3 x background), however, only three sample locations had detections above the EPA Region 4 Sediment Screening Values (SSVs). 002SD (collected midway along the Tannery Parcel) had chromium (SSV= 52.3 mg/kg) detected at 116.7 mg/kg. 003SD/103SD (collected at the southern end of the Tannery Parcel) had chromium detected at 183.3 mg/kg and copper (18.7 mg/kg) at 27 mg/kg. 005SD (collected below the northern end of the Development Parcel) had copper detected at 28 mg/kg, lead (30.2 mg/kg) at 52.3 mg/kg, nickel (15.9 mg/kg) at 26 mg/kg and zinc (124 mg/kg) at 170 mg/kg.

In addition to the laboratory analyzed samples, a field portable XRF unit was used to field screen deep sediment (18 inches - 24 inches) samples from 002SD, 003SD, 004SD and 005SD locations. Only silver and chromium were detected above the SSVs,. Silver (SSV= 2.0 mg/kg) was detected in 002SD deep at 24.5 mg/kg. Since silver was detected in only one sediment sample and one soil screening sample (SR Transect 1-6) it was disregarded. Chromium was detected in 002SD deep (238.91 mg/kg) and 003SD deep (259.6 mg/kg). This supports the chromium found in the laboratory analysis of the 002SD and 003SD shallow sediment samples. All of the sediment samples having exceedences of the SSVs were collected from locations adjacent to the Tannery Parcel and the Development parcel. No exceedences were found in any samples collected downstream from the parcels.

5.3 Surface Water Pathway Conclusions

A release of contaminants to Norton Creek has been documented. Nicholson Creek has been impacted but below the SSV. Both streams are classified as Trout Waters, however, the impact to the small fishery in Norton Creek is local and not considered significant.

6.0 SOIL AND AIR EXPOSURE PATHWAYS

6.1 Targets and Results

The Tannery Parcel is a vacant, overgrown and undeveloped. The Development Parcel is also vacant and undeveloped.

During the sampling event for this SI in April 2010, an XRF unit was used to field screen some of the source samples (shallow and deep) as well as along Norton Creek, and two transects across the Development Parcel. Transect 1 is located on the Development Parcel parallel to and approximately 100 feet south of Silversteen Road. Transect 2 is 300 feet long running west to east located in the middle of southern cleared portion of the Development Parcel (Fig. 3). Since no operations took place on the development parcel, field screening using the XRF unit was used to determine if any contamination from the Tannery Parcel had migrated downstream and onto the floodplain portion of the Development Parcel. Only analytes with readings above the % error (95% confidence level) readings were considered.

Arsenic, silver, cobalt, manganese and chromium were the inorganic compounds detected above the IHSB SRGs by the XRF unit. Arsenic was found in the field screening samples of 002SS and 006SS at levels similar to those found in the laboratory analyzed samples for these locations. It was also detected in one of the locations in Transect 1 on the development parcel (SR Transect 1-5 at 11.54 mg/kg) but below the site specific SRG of 22 mg/kg. Arsenic is not considered a chemical of concern due to the reasons discussed in the Waste/Source Sampling Section. Silver was detected using the XRF unit in only one soil sample (SR Transect 1-6 at 21.19 mg/kg) and one sediment sample (Sed 04 deep at 24.5 mg/kg). Since silver was only detected in one sediment sample and one soil screening sample and is not typically associated with the operation of a tannery, it was disregarded. Cobalt detections in several of the soil samples by XRF did not correlate well with the laboratory analysis for these same locations. Sample 006SS had a cobalt XRF reading of 388.51 mg/kg, the highest of all XRF readings, but was below the reported detection limit (7.7 mg/kg) for the laboratory analysis. Based on this poor correlation and on cobalt not being a contaminant associated with the site or operation, cobalt was not considered as a chemical of concern. Manganese was detected in three soil samples above the IHSB SRG of 370 mg/kg. The highest level was found in 006SS (584.44 mg/kg), however, the laboratory analysis of this sample had a concentration of 291.7 mg/kg. Based on the poor correlation between the laboratory analysis and the XRF readings, on the lack of any on-site soil release being documented (> 3 times background) by laboratory analysis, and on manganese not being a contaminant associated with the site or operation, manganese is not considered a chemical of concern. Chromium was detected in the shallow soil samples collected from the Tannery Parcel (002S, 006SS, 007SS, 009SS and 010SS). These reading correlated well with the laboratory analysis of the same locations. No detections were found in the other soil samples, shallow or deep.

Soil samples were collected from 4 locations (cb-1 through cb-4) along the creek bank along Norton Creek and analyzed using the XRF (Fig. 4). Cobalt and manganese were the only contaminants detected in these samples and were disregarded for the above mentioned reasons (Table 4).

6.2 Soil and Air Pathway Conclusions

On-site soil contamination with arsenic, copper and lead has been documented. Arsenic and copper were not found above site-specific SRGs. Of the ten locations sampled, the lead found in 008SS (1076.9 mg/kg) is above the EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs) industrial exposure level of 800 mg/kg, and the level found in 010SS (446.2 mg/kg) is above the RSL residential exposure level of 400 mg/kg; however, since this site is inactive with no worker exposure and is not a residential area, the site does not currently pose a health risk. If site usage changes in the future, further evaluation of the risk to human health will need to be reevaluated.

7.0 CONCLUSIONS

Soils on the Tannery Parcel have been contaminated with arsenic, chromium, copper and lead. Arsenic, chromium, and copper were below the site-specific SRGs. Only lead exceeded the RSL for residential and industrial use. The Development Parcel did not have any detections above the site-specific SRGs when sampled by the XRF unit. Both parcels are currently unoccupied and inactive. The site does not currently pose a human health risk. If site usage changes in the future, further evaluation of the risk to human health will need to be reevaluated.

Sediment in Norton Creek adjacent to the two parcels have been impacted by chromium, copper, lead, nickel and zinc above the Region 4 SSVs. Nicholson Creek has been impacted by chromium but not above the SSV. Norton Creek and Nicholson Creek are classified as Class C waters and Trout Waters. While the fishery in Norton Creek has been impacted, it is very localized and not considered significant.

The only two potable wells located within a mile of the site are approximately 0.75 miles from the site. Since the contaminants associated with the operation of a tannery are not mobile in groundwater and the shallow groundwater discharges to Norton Creek, these wells were not sampled and the groundwater pathway is not considered a pathway of concern.

Based on these findings, the site is not recommended for further remedial action under CERCLA.

References

1. US Environmental Protection Agency, Hazard Ranking System, Final Rule, 55FR 51532, 1990 and Comprehensive Environmental Response, Compensation,and Liability Act (42 U. S. C. 9601). Not included.

2. US Environmental Protection Agency, Superfund Chemical Data Matrix(SCDM). Office of Solid Waste and Emergency Response. Directive 9345.1-13.July 2009. Not included.

3. US Environmental Protection Agency, "Standard Operating Procedure to Determine Site Latitude and Longitude Coordinates," 1991. Calculation worksheet for Transylvania Tanning Co. 2 pages.

4. *Natural Resource Conservation Service National Water and Climate Center, Climate Narrative for Transylvania County, NC.;* National Oceanic and Atmospheric Administration (NOAA), *Precipitation Frequency Estimates*, NOAA Atlas 14; and Free Water Surface Evaporation (Inches), US Department of Commerce, National Weather Service, Ofice of Hydrology.

5. E-mail from Jennifer Wendel/R4/USEPA to James Bateson dated 11/06/2006 with attached citizen petition and Superfund Information Systems datasheets.

6. Asheville Radon & Environmental Consultants, Inc., Environmental Site Inspection for "Old Tannery Property" dated January 13, 1994.

7. Stanley, Jeanette NC Superfund Section Memos to File: Transylvania Tanning Co. dated 11/07/06and Site Discovery Initiative dated 8/19/09

8. Bartlett, Melanie NC Superfund Section Memos to File: Transylvania Tanning Co. dated 12/03/07 and Leather Tanning dated 12/14/07

9. Zinn, Harry NC Superfund Section Memos to File: Tannery Waste Streams dated 12/28/09; Transylvania Tanning Co. Schools dated 12/31/09; Transylvania Tanning Co. Public Water Supplies dated 12/23/09; and Transylvania Tanning Co. Private Well Usage dated 1/18/10

10. US Environmental Protection Agency, "Using Qualified Data to Document an Observed Release and Observed Contamination", EPA 540-F-904-28, OSWER 9285.7-14FS, PB94-963311, November 1996. 18 pages.

11. Wetlands Inventory map found at http://wetlandsfws.er.usgs.gov/imf/imf.jsp?site=NWI_CONUSNorth Carolina Water Bodies Classification found at http://h2o.enr.state.nc.us/bims/reports/basinsandwaterbodies/Transylvania.pdf

12. Shaw Engineering of North Carolina, P.C.: Technical Memorandum On Arsenic In The Fill In The Cellophane Area Former Ecusta Mill, Pisgah Forest, North Carolina dated 1/16/09

Table 1: Soil and Sediment Sample Locations

Number	Location	Comment:
TT-001-SS	Cashiers Valley Rd. beside Norton Creek	Grab, background soil (ms/msd)
TT-002-SS	Wash House	Composite, release
TT-003-SS	Dryer House	Composite, release
TT-004-SS	Hide House	Composite, release
TT-005-SS	Reprocess Shop	Composite, release
TT-006-SS	Leach House	Composite, release
TT-106-SS	Duplicate of 006	Duplicate
TT-007-SS	Bleach House	Composite, release
TT-008-SS	Leather Warehouse loading dock	Composite, release
TT-009-SS	Tannery east on the north end	3 pt composite, release
TT-010-SS	Tannery east on the south end	3 pt composite, release
TT-001-SD	Norton Creek below Cashiers Valley Rd	Grab, background sed. (ms/msd)
TT-002-SD	Norton Creek by Duckworth	Grab, release and release to fishery
TT-102-SD	Duplicate of 002	Duplicate
TT-003-SD	Norton Creek upstream of Silverstein	Grab, release and release to fishery
TT-004-SD	Norton Creek downstream of Silverstein	Grab, release and release to fishery
TT-005-SD	Norton Creek by Colwell	Grab, release and release to fishery
TT-006-SD	Norton Creek before Nicholson Creek	Grab, release and release to fishery
TT-007-SD	Nicholson Creek upstream of Norton Creek	Grab, background
TT-008-SD	Nicholson Creek downstream of Norton Creek	Grab, release and release to fishery

All samples were collected for inorganics only.

Table 2
Corrected Values for Qualified Data for Soil Samples

	SRGs (Site SRG)	RSL Res. RSL Indust.	001SS	002SS	003SS	004SS	005SS
Aluminum	15000.0	77,000 990,000	15000.0	14000.0	*19000.0*	9000.0	*19000.0*
Arsenic	4.4 (22)	22 260	2.3	**16.0**	**9.5**	4.7	6.8
Barium	3100.0	15,000 190,000	71.0	**610.0**	**320.0**	**240.0**	**330.0**
Beryllium	31.0	160 2,000	0.6J(0.7)	ND	**1.5J[1.3]**	**0.79J[0.7]**	**1.3J[1.1]**
Calcium			1600.0	**14000.0**	**14000.0**	**7300.0**	**7500.0**
Chromium	23000.0	120,000 1,500,000	18J [21.6]	**190J [158.3]**	**220J [183.3]**	55J[45.8]	**93J[77.5]**
Copper	620.0 (3100)	3,100 41,000	26.0	**390J[354.5]**	81J[73.6]	**100J[90.9]**	**150J[134.6]**
Iron	11000.0	55,000 720,000	*23000.0*	*45000.0*	*24000.0*	*14000.0*	*23000.0*
Lead	400.0	400 800	36J[46.8]	**480J[369.2]**	110J[84.6]	170J[130.8]	**440J[338.5]**
Magnesium			1800J[2160]	2200J[1833.3]	2200J[1833.3]	1300J[1083.3]	4100J[3416.7]
Manganese	370.0	1800 23,000	320J[384]	*560J[458.3]*	280J[233.3]	310J[258.3]	340J[283.3]
Nickel	310.0	1,500 20,000	8.3	18.0	14.0	7.6	20.0
Potassium			990.0	ND	1200.0	790.0	3400.0
Vanadium	1.1	390 5,200	*29.0*	*25.0*	*30.0*	*14.0*	*35.0*
Zinc	4700.0	23,000 310,000	74.0	**1800.0**	**270.0**	**250.0**	180.0

Bold = > 3x background all units are mg/kg
Italic = > SRG, Site- Specific SRG, Residential RSL, or Industrial RSL
Both = both

Value J ( ) this value is estimated. The number in ( ) is the Method Required Limit
Value J [ ] This value has an uncertain bias. The number in [ ] has been adjusted according to Directive 9285.7-14FS PB94-963311 EPA/540/F-94/028 Jul-94 Using Qualified Data to Document an Observed Release

Table 2 EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs) for Residential Levels and for Industrial Levels can be found at http://www.epa.gov/region9/superfund/prg

Table 2 (cont)
Corrected Values for Qualified Data for Soil Samples

	SRGs (Site SRG)	RSL Res. RSL Indust.	006SS	106SS	007SS	008SS	009SS	010SS
Aluminum	15000.0	77,000 990,000	*16000.0*	15000.0	*19000.0*	11000.0	*23000.0*	8700.0
Arsenic	4.4 (22)	22 260	**21.0**	**19.0**	2.7	**9.5**	2.6	**9.7**
Barium	3100.0	15,000 190,000	**810.0**	**730.0**	54.0	**440.0**	88.0	**900.0**
Beryllium	31.0	160 2,000	**2.7J[2.3]**	**2.3J[1.9]**	ND	ND	ND	ND
Calcium			**8500.0**	**8100.0**	2500.0	**14000.0**	2700.0	**16000.0**
Chromium	23000.0	120,000 1,500,000	**290J[241.7]**	**270J[225]**	48J[40]	**550J[458.3]**	35J[29.2]	**4100J[3416.7]**
Copper	620.0 (3100)	3,100 41,000	77J[70]	65J[59.1]	35J[31.8]	60J[54.5]	36J[32.7]	**910J[817.3]**
Iron	11000.0	55,000 720,000	*13000.0*	*14000.0*	*14000.0*	*48000.0*	*16000.0*	*59000.0*
Lead	400.0	400 800	65J[50]	61J[46.9]	28J[21.5]	***1400J[1076.9]***	24J[18.5]	***580J[446.2]***
Magnesium			2500J[2083.3]	2400J[2000]	740J[616.7]	1400J[1166.7]	1400J[1166.7]	1700J[1416.7]
Manganese	370.0	1800 23,000	350J[291.7]	340J[283.3]	94J[78.3]	*840J[700.0]*	160J[133.3]	310J[258.3]
Nickel	310.0	1,500 20,000	14.0	14.0	2.9	7.9	5.8	14.0
Potassium			1300.0	1300.0	610.0	690.0	1100.0	ND
Vanadium	1.1	390 5,200	*34.0*	*32.0*	*30.0*	*30.0*	*30.0*	*25.0*
Zinc	4700.0	23,000 310,000	150.0	150.0	35.0	**300.0**	60.0	**850.0**

Bold = > 3x background all units are mg/kg
Italic = > SRG, Site- Specific SRG, Residential RSL, or Industrial RSL
Both = both

Value J ( ) this value is estimated. The number in ( ) is the Method Required Limit
Value J [ ] This value has an uncertain bias. The number in [ ] has been adjusted according to Directive 9285.7-14FS PB94-963311 EPA/540/F-94/028 Jul-94 Using Qualified Data to Document an Observed Release

Table 2 EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs) for Residential Levels and for Industrial Levels can be found at http://www.epa.gov/region9/superfund/prg

Table 3

Corrected Values for Qualified Data for Sediment Samples

Analyte	EPA SSVs	001SD	002SD	003SD	103SD	004SD	005SD	006SD	007SD	008SD
Aluminum		4300	6800	7400	8900	**14000**	**15000**	4200	5400	6400
Arsenic	7.24	0.91J(1.3)	ND	ND	**2**	**3.7**	**3.3**	ND	ND	ND
Barium		27	52	67	73	71	**110**	ND	32	43
Calcium		270J(324)	**830**	**740**	**1400**	ND	**ND**	ND	ND	ND
Chromium	52.3	7.6J[9.12]	***140J[116.7]***	***220J[183.3]***	***160J[133.3]***	20J[16.7]	**43J[35.8]**	***48J[40]***	ND	***49J[40.8]***
Cobalt		ND	ND	ND	ND	ND	***120J[100]***	ND	ND	ND
Copper	18.7	7.4J[8.88]	14J[12]	20J[16.66]	**32J[27]**	27J[23]	**34J[28]**	5.1J[4]	4.1J[3]	8.3J[7]
Iron		10000	11000	13000	16000	30000	**32000**	7300	7400	10000
Lead	30.2	5.7J[7.4]	12J[9.2]	**26J[20]**	**21J[16.2]**	**23J[17.7]**	***67J[52.3]***	9.2J[7.1]	5.8J[4.5]	14J[10.8]
Magnesium		1300J[1560]	1600J[1333.3]	1700J[1416.7]	1800J[1500]	2600J[2166.7]	3100J[2588.3]	1000J[833.3]	920J[766.7]	1200J[1000]
Manganese		120J[144]	160J[133.3]	140J[116.7]	210J[175]	250J[208.3]	440J[366.7]	100J[83.3]	120J[100]	130J[108.3]
Nickel	15.9	4.4J[5.28]	5.6	6.4	7.3	12	***26***	3.3	3.2	4.5
Potassium		1200	1400	1600	1700	2600	3200	870	770	1200
Vanadium		11	12	14	16	22	**36**	8.1	10	12
Zinc	124	36	60	68	80	***110***	***170***	36	27	66

Bold = > 3x background all units are mg/kg

Italic = > SSV

Both = both

Value J ( ) this value is estimated. The number in ( ) is the Method Required Limit

Value J [ ] This value has an uncertain bias. The number in [ ] has been adjusted according to

Directive 9285.7-14FS PB94-963311 EPA/540/F-94/028 Jul-94 Using Qualified Data to Document an Observed Release

Document an Observed Release

Table 3. Region 4 Waste Management Division Sediment Screening Values (SSVs) for Hazardous Waste Sites.

found at http://www.epa.gov/region4/waste/ots/ecolbul.html#tbl3

TABLE 4

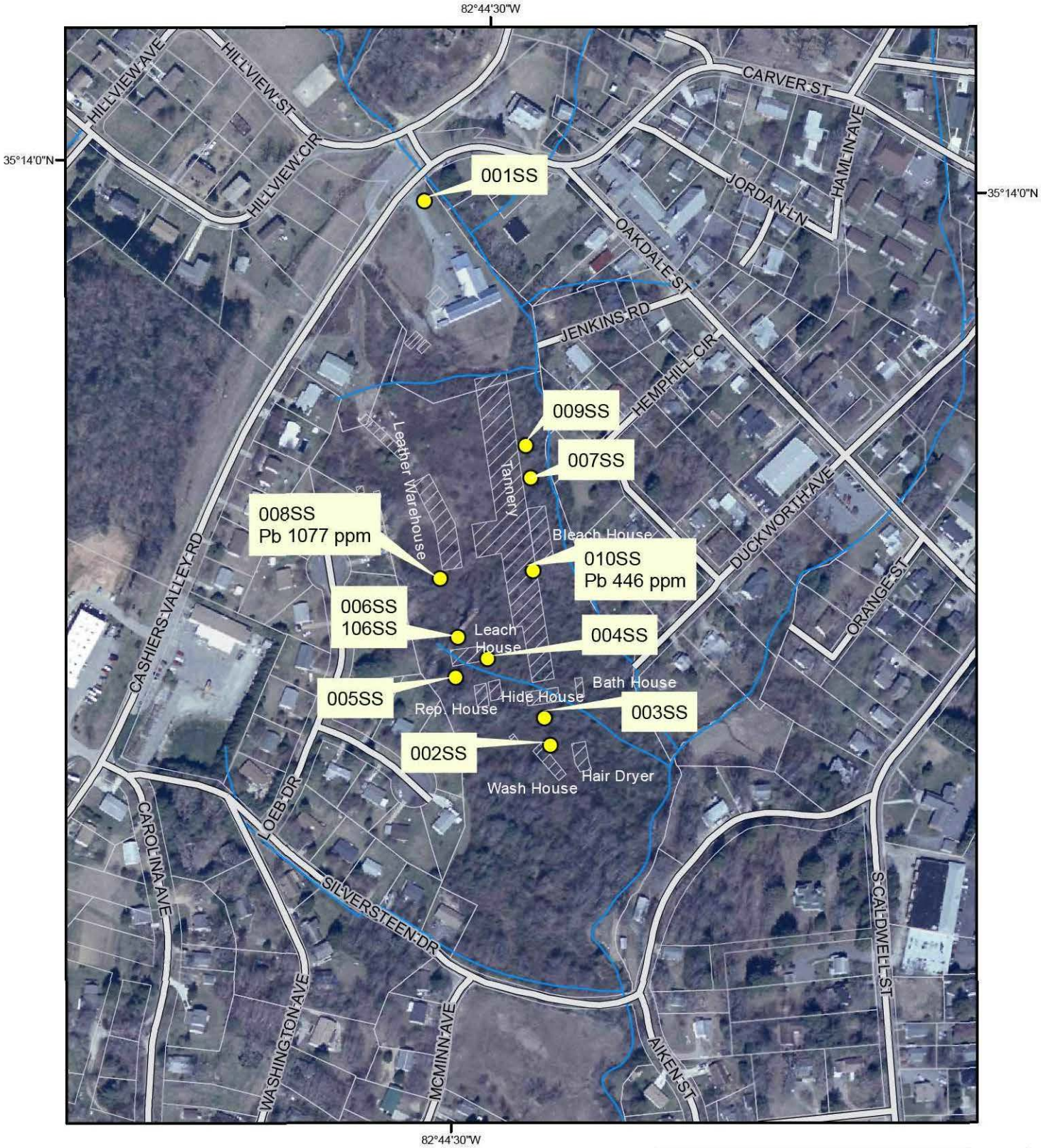
XRF Readings from 4/2010

				As	Ag	Co	Mn	Cr
		IHSB SRG		**22**	**78**	**4.7**	**370**	**23000**
16	Cal. Blank	4/13/2010 2:06	36.05	1.92	12.41	0.8	0.93	0.98
17	Low Blank	4/13/2010 2:10	60.88	ND	ND	ND	580.83	ND
18	Med. Blank	4/13/2010 2:14	60.51	103.66	ND	ND	580.73	407.91
19	Wash House deep	4/13/2010 2:22	60.5	ND	ND	295.95	288.51	ND
21	Hair Dryer deep	4/13/2010 2:26	60.51	ND	ND	ND	134.36	ND
22	East Tannery North deep	4/13/2010 2:31	60.13	ND	ND	ND	ND	ND
23	Bleach deep	4/13/2010 2:34	60.14	ND	ND	ND	239.23	ND
25	East Tannery South deep	4/13/2010 2:38	60.5	ND	ND	ND	236.43	ND
26	Bleach shallow (007SS)	4/13/2010 2:40	60.52	ND	ND	ND	241.44	ND
27	Wash House shallow (002SS)	4/13/2010 2:42	60.13	38.16	ND	ND	347.24	264.78
28	Leach shallow (006SS)	4/13/2010 2:45	60.15	28.24	ND	388.51	584.44	1186.8
29	East Tannery South shallow(010SS)	4/13/2010 2:47	60.53	ND	ND	ND	279.08	2513.4
31	East Tannery North shallow (009SS)	4/13/2010 2:51	60.12	ND	ND	ND	339.95	ND
36	Hide Building deep	4/13/2010 2:59	60.48	ND	ND	1243	258.44	ND
37	SR Transect 1-1	4/13/2010 3:09	60.14	ND	ND	ND	135.82	ND
38	SR Transect 1-2	4/13/2010 3:13	60.18	ND	ND	ND	335.06	ND
39	SR Transect 1-3	4/13/2010 3:17	60.15	ND	ND	ND	340	ND
40	SR Transect 1-4	4/13/2010 3:20	60.18	ND	ND	ND	233.8	ND
41	SR Transect 1-5	4/13/2010 3:24	60.13	11.54	ND	ND	239.82	ND
42	SR Transect 1-6	4/13/2010 3:26	60.15	ND	21.19	ND	418.42	ND
44	Creek Border 1	4/13/2010 3:32	60.15	ND	ND	ND	285.98	ND
45	Creek Border 2	4/13/2010 3:37	60.16	ND	ND	209.66	163.78	ND
46	Creek Border 3	4/13/2010 3:40	60.14	ND	ND	268.35	408.68	ND
47	SR Transect 2-1	4/13/2010 4:06	60.14	ND	ND	ND	361.59	ND
48	SR Transect 2-2	4/13/2010 4:10	60.13	ND	ND	ND	237.99	ND
50	SR Transect 2-3	4/13/2010 4:14	60.18	ND	ND	146.69	308.08	ND
51	SR Transect 2-4	4/13/2010 4:17	60.49	ND	ND	ND	292.12	ND
52	SR Transect 2-5	4/13/2010 4:22	60.16	ND	ND	200.56	339.08	ND
53	SR Transect 2-6	4/13/2010 4:25	60.12	ND	ND	ND	ND	ND
54	Creek Border South	4/13/2010 4:28	60.5	ND	ND	ND	378.1	ND
55	Cal. Blank	4/13/2010 23:11	38.03	2.08	11.78	1.06	1.07	0.88
56	Zero Blank	4/13/2010 23:14	61.56	ND	ND	ND	ND	ND
57	Low Blank	4/13/2010 23:16	31.11	ND	ND	ND	535.21	ND
58	Med. Blank	4/13/2010 23:19	60.83	143.65	ND	ND	519.06	ND
		Region 4 SSV		**7.24**	**0.13**			**52.3**
59	Sed 05 deep	4/13/2010 23:22	60.53	ND	ND	ND	285.66	ND
60	Sed 04 deep	4/13/2010 23:24	60.13	ND	24.5	ND	264.54	ND
61	Sed 03 deep	4/13/2010 23:26	60.13	ND	ND	ND	ND	259.6
65	Sed 02 deep	4/13/2010 23:30	60.16	ND	ND	249.53	187.17	238.91

➢ SRG or SSV

Map Extent:
Transylvania County

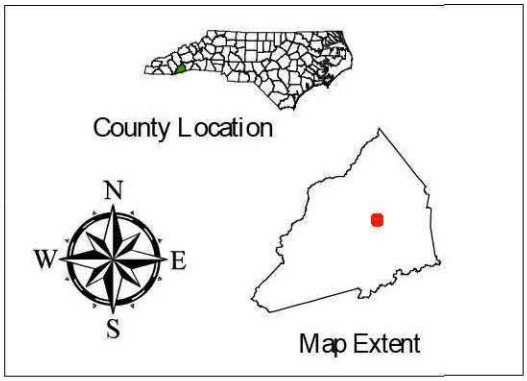
Site Map		
Site Name:	**Transylvania Tannery**	
Site Number:	NCN000410007	
Scale:	1:5,581	
Date:	February 21, 2010	
Figure	1	Prepared by: JMG

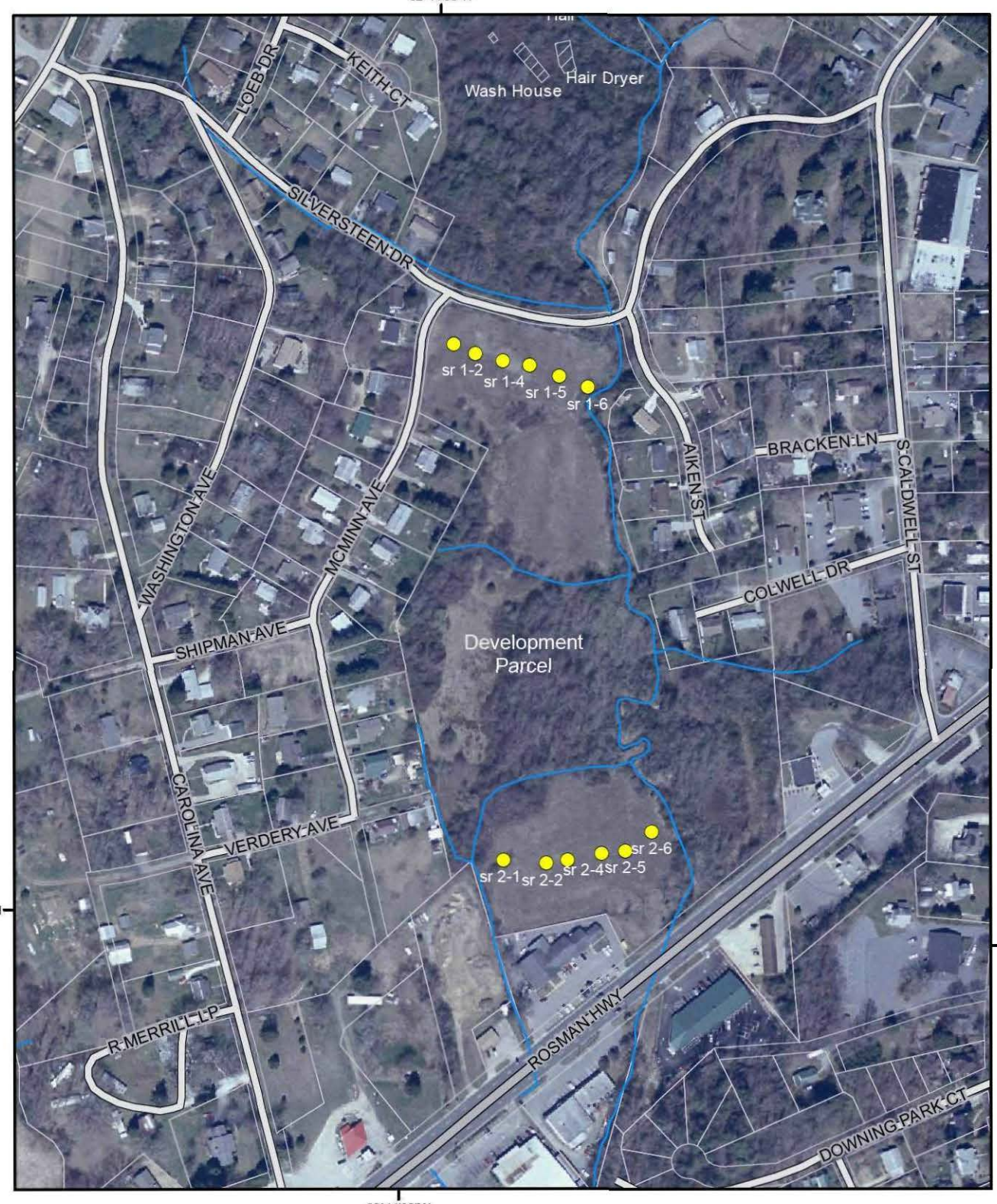


Tannery Soil Sample Locations			
Site Name:	Transylvania Tanning Co.	Date:	8/30/10
Site Number:	NCN000410007	Scale:	1:3,573
Figure:	2	Prepared by:	Harry Zinn

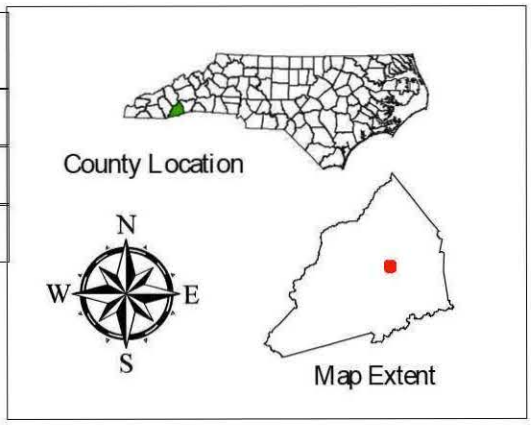
Legend

- Tannery soils
- Historic Tannery Facilities



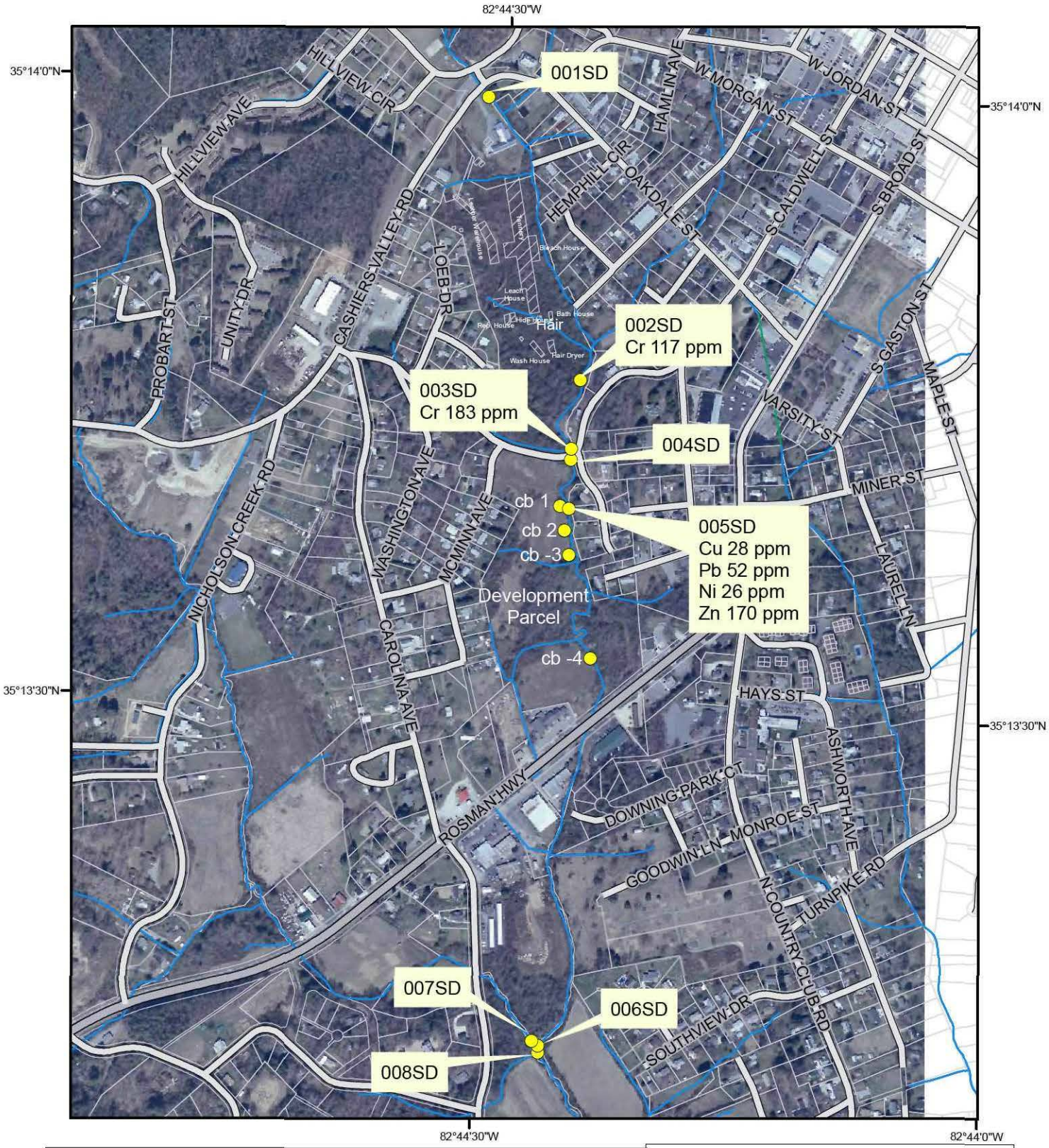


Development Soil Sample Locations			
Site Name:	Transylvania Tanning Co.	Date:	8/30/10
Site Number:	NCN000410007	Scale:	1:3,573
Figure:	3	Prepared by:	Harry Zinn

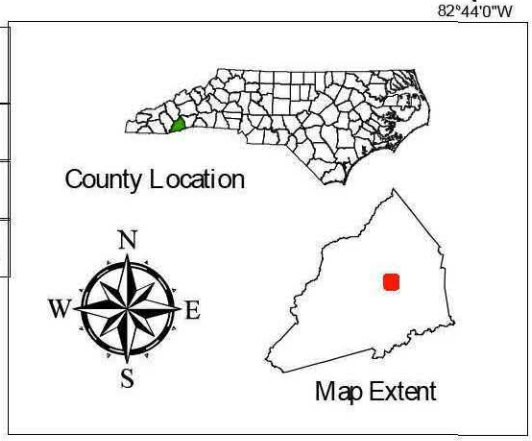


Legend

development soils

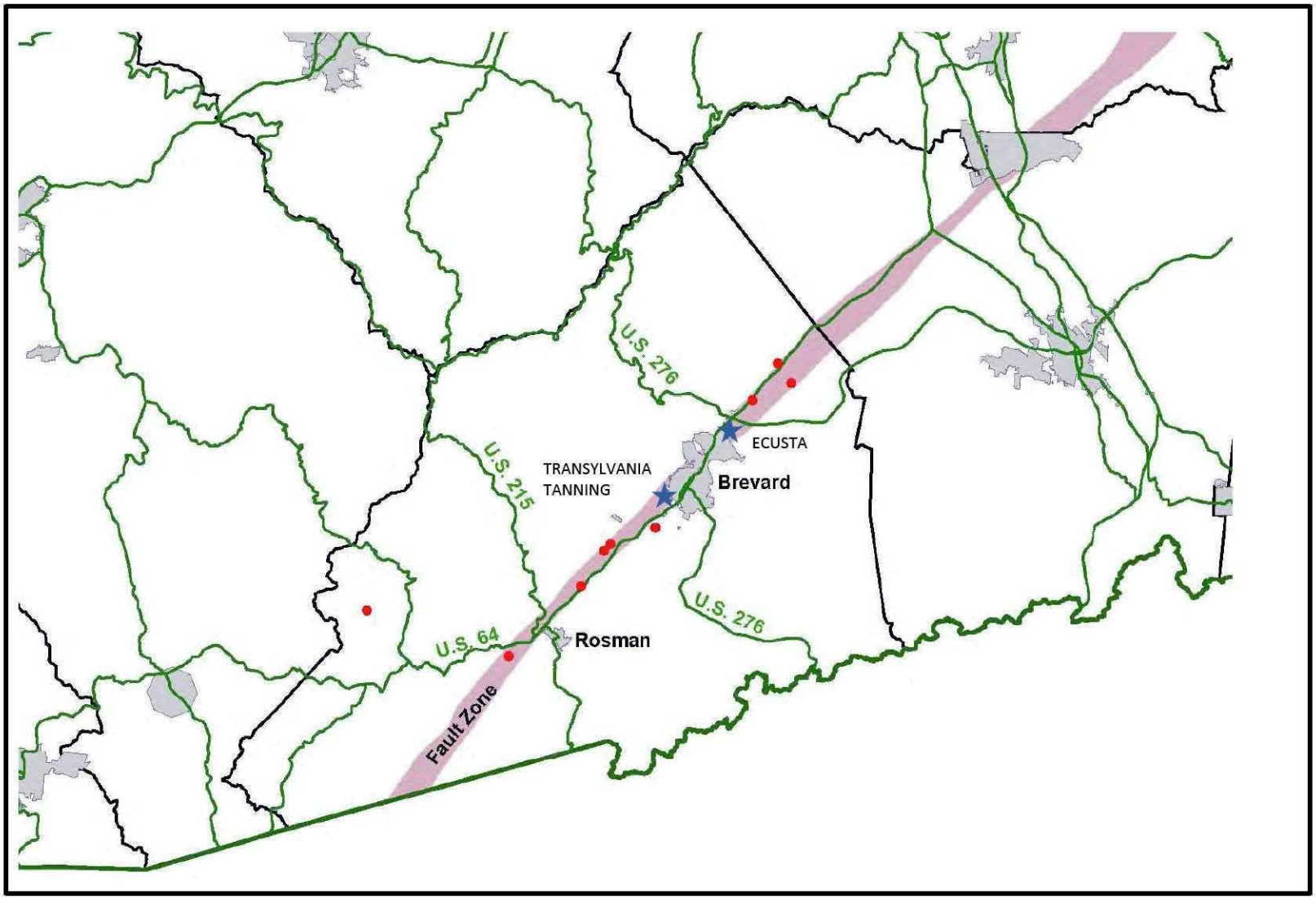


Sediment Sample Locations			
Site Name:	Transylvania Tanning Co.	Date:	8/30/10
Site Number:	NCN000410007	Scale:	1:8,000
Figure:	4	Prepared by:	Harry Zinn



Legend

Sediments



Sketch drawn by Brett Laverty of NC DENR Aquifer Protection depicting arsenic in groundwater around Brevard
Note the location of Ecusta and Transylvania Tanning

Appendix A

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

May 19, 2010

4SESD-MTSB

MEMORANDUM

SUBJECT: FINAL Analytical Report
Project: 10-0354, Transylvania Tanning Co
Superfund Remedial

FROM: Denise Goddard
Quality Assurance Section Chemist

THRU: Marilyn Maycock, Chief
Quality Assurance Section

TO: Jennifer Wendel

Attached are the final results for the analytical groups listed below. These analyses were performed in accordance with the associated contract Statement Of Work (SOW). In general, project data quality objectives have not been used to evaluate these data prior to release by the Quality Assurance Section. For a listing of specific data qualifiers and explanations, please refer to the Data Qualifier Definitions included in this report.

Analyses Included in this report:	Method Used:
Total Metals (TMTL)	
Total Metals	CLP Inorganics

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Report Narrative for Work Order C101701, Project: 10-0354
Inorganic Data Review and Validation Report
Site Name: **Transylvania Tanning Company, Brevard, NC**
Case No.: 40030, Project No. 10-0354, Work Order No. C101701
ELEMENT Sample IDs.: C101701-01 - 22
Sampling Date: 04/12-14/2010
Laboratory Performing Inorganic Analysis: ALS Datachem, Salt Lake City, UT
Date Received by Laboratory: 04/21/10
Date Received from Laboratory: 05/10/10

Analyses conducted: Total Metals

The ESAT Work Team has reviewed the above-captioned CLP data package consisting of twenty-two soil samples for Total Metals analysis by ICP-AES analysis according to the contract Statement of Work and EPA guidelines. This package presents acceptable contractual and technical performance with qualifications. Additonal details are provided below.

Examination of blank samples revealed apparent low-level contamination with several elements. Reported detection limits were adjusted as high as five times blank levels to discount possible false positives due to contamination.

The sample narrative noted that the sample cooler arrived at the laboratory at 10°C.

ICP-AES Analysis

PE Sample Results

The performance evaluation sample recoveries for metals were scored as warning high for magnesium. All positive results for magnesium were considered estimated and qualified as "J".

Other QA/QC Results

The percent relative standard deviation was greater than 20% for plasma multiple exposures and the reported result was greater than the method detection limit and less than the contract required quantitation limit for arsenic, selenium, and thallium results for samples listed in the attached table. The affected sample results were considered unusable and qualified "R".

The matrix spike percent recovery for antimony was 54%. The post-digestion spike recovery was 101%. All sample results for antimony were considered estimated and "J" qualified.

The matrix precision was above control limits for chromium (23 RPD), lead (26 RPD), and manganese (35 RPD). All sample results for chromium, lead, and manganese were considered estimated and "J" qualified.
Serial dilution percent difference was above control limits for beryllium (16%), cobalt (12%), and copper (12%). All sample results for beryllium, cobalt, and copper were considered estimated and "J" qualified.

A Stage 4 validation consisting of electronic and manual review was performed on the inorganic samples submitted for this case.

cc: Nardina Turner

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

SAMPLES INCLUDED IN THIS REPORT

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID	Laboratory ID	MD#	D#	Matrix	Date Collected
TT-001-SD	C101701-01	5QR8		Sediment	4/14/10 10:55
TT-001-SS	C101701-02	5QR9		Surface Soil	4/14/10 11:00
TT-002-SD	C101701-03	5QS0		Sediment	4/14/10 10:35
TT-002-SS	C101701-04	5QS1		Surface Soil	4/13/10 08:20
TT-003-SD	C101701-05	5QS2		Sediment	4/14/10 09:55
TT-103-SD	C101701-06	5QS3		Sediment	4/14/10 09:55
TT-003-SS	C101701-07	5QS4		Surface Soil	4/12/10 09:15
TT-004-SD	C101701-08	5QS5		Sediment	4/14/10 09:45
TT-004-SS	C101701-09	5QS6		Surface Soil	4/12/10 16:00
TT-005-SD	C101701-10	5QS7		Sediment	4/14/10 09:20
TT-005-SS	C101701-11	5QS8		Surface Soil	4/12/10 15:30
TT-006-SD	C101701-12	5QS9		Sediment	4/14/10 08:35
TT-006-SS	C101701-13	5QT0		Surface Soil	4/12/10 15:00
TT-106-SS	C101701-14	5QT1		Surface Soil	4/12/10 15:00
TT-007-SD	C101701-15	5QT2		Sediment	4/14/10 08:40
TT-007-SS	C101701-16	5QT3		Surface Soil	4/13/10 11:15
TT-008-SD	C101701-17	5QT4		Sediment	4/14/10 08:20
TT-008-SS	C101701-18	5QT5		Surface Soil	4/12/10 14:30
TT-009-SS	C101701-19	5QT6		Surface Soil	4/13/10 10:45
TT-010-SS	C101701-20	5QT7		Surface Soil	4/13/10 12:00

DATA QUALIFIER DEFINITIONS

U	The analyte was not detected at or above the reporting limit.
B-2	Reporting level elevated due to trace amounts of analyte present in the method blank.
CLP03	Baseline instability in calibration or preparation blanks
CLP04	Analyte reported as potential false positive (% RSD > 20%, and result > MDL, but < CRQL)
CLP26	PE sample recovery scored as warning-high.
CLP36	Identification/Concentration of analyte not confirmed by ICP-MS.
J	The identification of the analyte is acceptable; the reported value is an estimate.
O-2	Result greater than MDL but less than MRL.
O-5	Serial dilution precision outside method control limits
OM-1	Matrix Spike Recovery less than method control limits
OM-4	Matrix Precision outside method control limits
R	The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

ACRONYMS AND ABBREVIATIONS

CAS Chemical Abstracts Service

Note: Analytes with no known CAS identifiers have been assigned codes beginning with "E", the EPA ID as assigned by the EPA Substance Registry System (www.epa.gov/srs), or beginning with "R4-", a unique identifier assigned by the EPA Region 4 laboratory.

MDL Method Detection Limit - The minimum concentration of a substance (an analyte) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero.

MRL Minimum Reporting Limit - Analyte concentration that corresponds to the lowest demonstrated level of acceptable quantitation. The MRL is sample-specific and accounts for preparation weights and volumes, dilutions, and moisture content of soil/sediments.

TIC Tentatively Identified Compound - An analyte identified based on a match with the instrument software's mass spectral library. A calibration standard has not been analyzed to confirm the compound's identification or the estimated concentration reported.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-001-SD **Lab ID: C101701-01** **MD No: 5QR8 DATAC**

Station ID: TT001SD **Matrix: Sediment** **D No:**

Date Collected: 4/14/10 10:55

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	78		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	4300		mg/kg dry	26	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	0.50	U, J, CLP03, Q-2, QM-1	mg/kg dry	7.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	0.91	J, Q-2	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	27		mg/kg dry	26	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.33	J, Q-2, Q-5	mg/kg dry	0.64	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.010	U, J, CLP03, Q-2	mg/kg dry	0.64	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	270	J, Q-2	mg/kg dry	640	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	7.6	J, QM-4	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	3.0	J, Q-2, Q-5	mg/kg dry	6.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	7.4	J, Q-5	mg/kg dry	3.2	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	10000		mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	5.7	J, QM-4	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1300	J, CLP26	mg/kg dry	640	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	120	J, QM-4	mg/kg dry	1.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	4.4	J, Q-2	mg/kg dry	5.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1200		mg/kg dry	640	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	4.5	U	mg/kg dry	4.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.3	U	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	11	J, Q-2	mg/kg dry	640	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	0.098	R, CLP36, CLP04, Q-2	mg/kg dry	3.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	11		mg/kg dry	6.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	36		mg/kg dry	7.7	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-001-SS **Lab ID:** C101701-02 **MD No: 5QR9 DATAC**

Station ID: TT001SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/14/10 11:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	72		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	15000		mg/kg dry	28	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	1.2	U, J, CLP03, Q-2, QM-1	mg/kg dry	8.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	2.3		mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	71		mg/kg dry	28	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.60	J, Q-2, Q-5	mg/kg dry	0.70	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.10	U, J, CLP03, Q-2	mg/kg dry	0.70	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	1600		mg/kg dry	700	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	18	J, QM-4	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	8.6	J, Q-5	mg/kg dry	7.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	26	J, Q-5	mg/kg dry	3.5	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	23000		mg/kg dry	14	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	36	J, QM-4	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1800	J, CLP26	mg/kg dry	700	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	320	J, QM-4	mg/kg dry	2.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	8.3		mg/kg dry	5.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	990		mg/kg dry	700	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	4.9	U	mg/kg dry	4.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.4	U	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	76	J, Q-2	mg/kg dry	700	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	3.5	U	mg/kg dry	3.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	29		mg/kg dry	7.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	74		mg/kg dry	8.3	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-002-SD **Lab ID: C101701-03** **MD No: 5QS0 DATAC**

Station ID: TT002SD **Matrix: Sediment** **D No:**

Date Collected: 4/14/10 10:35

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	75		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	6800		mg/kg dry	26	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	7.9	U, J, QM-1	mg/kg dry	7.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	1.0	J, Q-2	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	52		mg/kg dry	26	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.43	J, Q-2, Q-5	mg/kg dry	0.66	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.038	U, J, CLP03, Q-2	mg/kg dry	0.66	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	830		mg/kg dry	660	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	140	J, QM-4	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	4.0	J, Q-2, Q-5	mg/kg dry	6.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	14	J, Q-5	mg/kg dry	3.3	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	11000		mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	12	J, QM-4	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1600	J, CLP26	mg/kg dry	660	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	160	J, QM-4	mg/kg dry	2.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	5.6		mg/kg dry	5.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1400		mg/kg dry	660	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	4.6	U	mg/kg dry	4.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.3	U	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	25	J, Q-2	mg/kg dry	660	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	0.081	R, CLP36, CLP04, Q-2	mg/kg dry	3.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	12		mg/kg dry	6.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	60		mg/kg dry	7.9	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-002-SS **Lab ID:** C101701-04 **MD No:** 5QS1 DATAC
Station ID: TT002SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/13/10 8:20

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	44		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	14000		mg/kg dry	45	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	11	J, Q-2, QM-1	mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	16		mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	610		mg/kg dry	45	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.95	J, Q-2, Q-5	mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	4.0		mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	14000		mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	190	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	8.1	J, Q-2, Q-5	mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	390	J, Q-5	mg/kg dry	5.6	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	45000		mg/kg dry	22	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	480	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	2200	J, CLP26	mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	550	J, QM-4	mg/kg dry	3.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	18		mg/kg dry	9.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1000	J, Q-2	mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	0.70	R, CLP36, CLP04, Q-2	mg/kg dry	7.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	2.2	U	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	170	J, Q-2	mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	5.6	U	mg/kg dry	5.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	25		mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	1800		mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-003-SD **Lab ID: C101701-05** **MD No: 5QS2 DATAC**

Station ID: TT003SD **Matrix: Sediment** **D No:**

Date Collected: 4/14/10 9:55

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	68		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	7400		mg/kg dry	29	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	8.8	U, J, QM-1	mg/kg dry	8.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	1.4	J, Q-2	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	67		mg/kg dry	29	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.57	J, Q-2, Q-5	mg/kg dry	0.73	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.093	U, J, Q-2, CLP03	mg/kg dry	0.73	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	740		mg/kg dry	730	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	220	J, QM-4	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	4.1	J, Q-2, Q-5	mg/kg dry	7.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	20	J, Q-5	mg/kg dry	3.7	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	13000		mg/kg dry	15	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	26	J, QM-4	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1700	J, CLP26	mg/kg dry	730	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	140	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	6.4		mg/kg dry	5.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1600		mg/kg dry	730	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	5.1	U	mg/kg dry	5.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.5	U	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	27	J, Q-2	mg/kg dry	730	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	3.7	U	mg/kg dry	3.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	14		mg/kg dry	7.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	68		mg/kg dry	8.8	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-103-SD **Lab ID: C101701-06** **MD No: 5QS3 DATAC**

Station ID: TT003SD **Matrix: Sediment** **D No:**

Date Collected: 4/14/10 9:55

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	66		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	8900		mg/kg dry	30	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	8.9	U, J, QM-1	mg/kg dry	8.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	2.0		mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	73		mg/kg dry	30	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.59	J, Q-2, Q-5	mg/kg dry	0.74	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.091	U, J, CLP03, Q-2	mg/kg dry	0.74	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	1400		mg/kg dry	740	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	160	J, QM-4	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	5.7	J, Q-2, Q-5	mg/kg dry	7.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	32	J, Q-5	mg/kg dry	3.7	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	16000		mg/kg dry	15	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	21	J, QM-4	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1800	J, CLP26	mg/kg dry	740	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	210	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	7.3		mg/kg dry	6.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1700		mg/kg dry	740	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	5.2	U	mg/kg dry	5.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.5	U	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	27	J, Q-2	mg/kg dry	740	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	3.7	U	mg/kg dry	3.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	16		mg/kg dry	7.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	80		mg/kg dry	8.9	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-003-SS **Lab ID:** C101701-07 **MD No:** 5QS4 DATAC
Station ID: TT003SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/12/10 9:15

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	46		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	19000		mg/kg dry	44	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	2.0	J, Q-2, QM-1	mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	9.5		mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	320		mg/kg dry	44	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	1.5	J, Q-5	mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.69	J, Q-2	mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	14000		mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	220	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	7.5	J, Q-2, Q-5	mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	81	J, Q-5	mg/kg dry	5.5	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	24000		mg/kg dry	22	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	110	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	2200	J, CLP26	mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	280	J, QM-4	mg/kg dry	3.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	14		mg/kg dry	8.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1200		mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	1.2	J, Q-2	mg/kg dry	7.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	2.2	U	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	210	J, Q-2	mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	5.5	U	mg/kg dry	5.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	30		mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	270		mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-004-SD **Lab ID: C101701-08** **MD No: 5QS5 DATAC**

Station ID: TT004SD **Matrix: Sediment** **D No:**

Date Collected: 4/14/10 9:45

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	50		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	14000		mg/kg dry	39	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	1.8	J, Q-2, QM-1	mg/kg dry	12	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	3.7		mg/kg dry	2.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	71		mg/kg dry	39	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.87	J, Q-2, Q-5	mg/kg dry	0.98	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.083	U, J, Q-2, CLP03	mg/kg dry	0.98	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	790	J, Q-2	mg/kg dry	980	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	20	J, QM-4	mg/kg dry	2.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	6.6	J, Q-2, Q-5	mg/kg dry	9.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	27	J, Q-5	mg/kg dry	4.9	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	30000		mg/kg dry	20	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	23	J, QM-4	mg/kg dry	2.0	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	2600	J, CLP26	mg/kg dry	980	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	250	J, QM-4	mg/kg dry	2.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	12		mg/kg dry	7.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	2600		mg/kg dry	980	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	6.9	U	mg/kg dry	6.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	2.0	U	mg/kg dry	2.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	29	J, Q-2	mg/kg dry	980	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	4.9	U	mg/kg dry	4.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	22		mg/kg dry	9.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	110		mg/kg dry	12	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-004-SS **Lab ID:** C101701-09 **MD No:** 5QS6 DATAC
Station ID: TT004SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/12/10 16:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	90		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	9000		mg/kg dry	22	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	5.8	J, Q-2, QM-1	mg/kg dry	6.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	4.7		mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	240		mg/kg dry	22	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.79	J, Q-5	mg/kg dry	0.55	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.79		mg/kg dry	0.55	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	7300		mg/kg dry	560	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	55	J, QM-4	mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	4.2	J, Q-2, Q-5	mg/kg dry	5.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	100	J, Q-5	mg/kg dry	2.8	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	14000		mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	170	J, QM-4	mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1300	J, CLP26	mg/kg dry	560	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	310	J, QM-4	mg/kg dry	1.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	7.6		mg/kg dry	4.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	790		mg/kg dry	560	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	0.66	R, CLP36, CLP04, Q-2	mg/kg dry	3.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.1	U	mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	100	J, Q-2	mg/kg dry	560	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	2.8	U	mg/kg dry	2.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	14		mg/kg dry	5.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	250		mg/kg dry	6.7	5/05/10	5/06/10	CLP ILM05.4 P

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Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-005-SD **Lab ID: C101701-10** **MD No: 5QS7 DATAC**

Station ID: TT005SD **Matrix: Sediment** **D No:**

Date Collected: 4/14/10 9:20

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	37		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	15000		mg/kg dry	54	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	1.7	J, Q-2, QM-1	mg/kg dry	16	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	3.3		mg/kg dry	2.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	110		mg/kg dry	54	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	1.0	J, Q-2, Q-5	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.082	U, J, Q-2, CLP03	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	1100	J, Q-2	mg/kg dry	1400	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	43	J, QM-4	mg/kg dry	2.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	120	J, Q-5	mg/kg dry	14	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	34	J, Q-5	mg/kg dry	6.8	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	32000		mg/kg dry	27	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	68	J, QM-4	mg/kg dry	2.7	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	3100	J, CLP26	mg/kg dry	1400	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	440	J, QM-4	mg/kg dry	4.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	26		mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	3200		mg/kg dry	1400	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	9.5	U	mg/kg dry	9.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	2.7	U	mg/kg dry	2.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	38	J, Q-2	mg/kg dry	1400	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	6.8	U	mg/kg dry	6.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	36		mg/kg dry	14	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	170		mg/kg dry	16	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-005-SS **Lab ID:** C101701-11 **MD No:** 5QS8 DATAC
Station ID: TT005SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/12/10 15:30

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	54		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	19000		mg/kg dry	37	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	7.2	J, Q-2, QM-1	mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	6.8		mg/kg dry	1.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	330		mg/kg dry	37	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	1.3	J, Q-5	mg/kg dry	0.92	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.49	J, Q-2	mg/kg dry	0.92	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	7500		mg/kg dry	920	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	93	J, QM-4	mg/kg dry	1.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	6.8	J, Q-2, Q-5	mg/kg dry	9.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	150	J, Q-5	mg/kg dry	4.6	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	23000		mg/kg dry	18	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	440	J, QM-4	mg/kg dry	1.8	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	4100	J, CLP26	mg/kg dry	920	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	340	J, QM-4	mg/kg dry	2.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	20		mg/kg dry	7.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	3400		mg/kg dry	920	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	1.1	R, CLP04, CLP36, Q-2	mg/kg dry	6.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.8	U	mg/kg dry	1.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	150	J, Q-2	mg/kg dry	920	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	4.6	U	mg/kg dry	4.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	35		mg/kg dry	9.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	180		mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P

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Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-006-SD **Lab ID: C101701-12** **MD No: 5QS9 DATAC**

Station ID: TT006SD **Matrix: Sediment** **D No:**

Date Collected: 4/14/10 8:35

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	73		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	4200		mg/kg dry	28	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	0.24	U, J, CLP03, Q-2, QM-1	mg/kg dry	8.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	0.61	R, CLP36, CLP04, Q-2	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	28	J, Q-2	mg/kg dry	28	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.33	J, Q-2, Q-5	mg/kg dry	0.69	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.024	U, J, CLP03, Q-2	mg/kg dry	0.69	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	360	J, Q-2	mg/kg dry	700	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	48	J, QM-4	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	2.3	J, Q-2, Q-5	mg/kg dry	6.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	5.1	J, Q-5	mg/kg dry	3.5	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	7300		mg/kg dry	14	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	9.2	J, QM-4	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1000	J, CLP26	mg/kg dry	700	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	100	J, QM-4	mg/kg dry	2.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	3.3	J, Q-2	mg/kg dry	5.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	870		mg/kg dry	700	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	4.9	U	mg/kg dry	4.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.4	U	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	14	J, Q-2	mg/kg dry	700	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	0.058	R, CLP36, CLP04, Q-2	mg/kg dry	3.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	8.1		mg/kg dry	6.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	36		mg/kg dry	8.3	5/05/10	5/06/10	CLP ILM05.4 P

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Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-006-SS **Lab ID:** C101701-13 **MD No:** 5QT0 DATAC
Station ID: TT006SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/12/10 15:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	65		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	16000		mg/kg dry	31	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	9.3	U, J, QM-1	mg/kg dry	9.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	21		mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	810		mg/kg dry	31	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	2.7	J, Q-5	mg/kg dry	0.77	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.34	J, Q-2	mg/kg dry	0.77	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	8500		mg/kg dry	770	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	290	J, QM-4	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	5.6	J, Q-2, Q-5	mg/kg dry	7.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	77	J, Q-5	mg/kg dry	3.9	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	13000		mg/kg dry	16	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	65	J, QM-4	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	2500	J, CLP26	mg/kg dry	770	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	350	J, QM-4	mg/kg dry	2.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	14		mg/kg dry	6.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1300		mg/kg dry	770	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	1.7	J, Q-2	mg/kg dry	5.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.5	U	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	460	J, Q-2	mg/kg dry	770	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	0.26	R, CLP36, CLP04, Q-2	mg/kg dry	3.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	34		mg/kg dry	7.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	150		mg/kg dry	9.3	5/05/10	5/06/10	CLP ILM05.4 P

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-106-SS **Lab ID:** C101701-14 **MD No:** 5QT1 DATAC
Station ID: TT006SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/12/10 15:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	68		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	15000		mg/kg dry	29	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	8.7	U, J, QM-1	mg/kg dry	8.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	19		mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	730		mg/kg dry	29	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	2.3	J, Q-5	mg/kg dry	0.73	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.33	J, Q-2	mg/kg dry	0.73	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	8100		mg/kg dry	730	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	270	J, QM-4	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	5.2	J, Q-2, Q-5	mg/kg dry	7.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	65	J, Q-5	mg/kg dry	3.6	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	14000		mg/kg dry	14	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	61	J, QM-4	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	2400	J, CLP26	mg/kg dry	730	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	340	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	14		mg/kg dry	5.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1300		mg/kg dry	730	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	2.0	J, Q-2	mg/kg dry	5.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.5	U	mg/kg dry	1.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	450	J, Q-2	mg/kg dry	730	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	0.14	R, CLP36, CLP04, Q-2	mg/kg dry	3.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	32		mg/kg dry	7.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	150		mg/kg dry	8.7	5/05/10	5/06/10	CLP ILM05.4 P

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Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-007-SD **Lab ID:** C101701-15 **MD No:** 5QT2 DATAC
Station ID: TT007SD **Matrix:** Sediment **D No:**

Date Collected: 4/14/10 8:40

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	75		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	5400		mg/kg dry	27	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	0.71	U, J, CLP03, Q-2, QM-1	mg/kg dry	8.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	1.0	J, Q-2	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	32		mg/kg dry	27	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.30	J, Q-2, Q-5	mg/kg dry	0.67	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.67	U	mg/kg dry	0.67	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	240	J, Q-2	mg/kg dry	670	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	5.3	J, QM-4	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	3.1	J, Q-2, Q-5	mg/kg dry	6.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	4.1	U, J, B-2, Q-5	mg/kg dry	3.3	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	7400		mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	5.8	J, QM-4	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	920	J, CLP26	mg/kg dry	670	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	120	J, QM-4	mg/kg dry	2.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	3.2	J, Q-2	mg/kg dry	5.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	770		mg/kg dry	670	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	4.7	U	mg/kg dry	4.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.3	U	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	11	J, Q-2	mg/kg dry	670	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	3.3	U	mg/kg dry	3.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	10		mg/kg dry	6.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	27		mg/kg dry	8.0	5/05/10	5/06/10	CLP ILM05.4 P

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Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-007-SS **Lab ID:** C101701-16 **MD No:** 5QT3 DATAC

Station ID: TT007SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/13/10 11:15

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	83		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	19000		mg/kg dry	24	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	0.98	U, J, CLP03, Q-2, QM-1	mg/kg dry	7.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	2.7		mg/kg dry	1.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	54		mg/kg dry	24	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.18	U, J, CLP03, Q-2, Q-5	mg/kg dry	0.61	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.030	U, J, CLP03, Q-2	mg/kg dry	0.61	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	2500		mg/kg dry	600	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	48	J, QM-4	mg/kg dry	1.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	1.1	J, Q-2, Q-5	mg/kg dry	6.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	35	J, Q-5	mg/kg dry	3.0	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	14000		mg/kg dry	12	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	28	J, QM-4	mg/kg dry	1.2	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	740	J, CLP26	mg/kg dry	600	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	94	J, QM-4	mg/kg dry	1.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	2.9	J, Q-2	mg/kg dry	4.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	610		mg/kg dry	600	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	0.37	R, CLP04, CLP36, Q-2	mg/kg dry	4.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.2	U	mg/kg dry	1.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	9.2	J, Q-2	mg/kg dry	600	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	3.0	U	mg/kg dry	3.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	30		mg/kg dry	6.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	35		mg/kg dry	7.3	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-008-SD **Lab ID: C101701-17** **MD No: 5QT4 DATAC**

Station ID: TT008SD **Matrix: Sediment** **D No:**

Date Collected: 4/14/10 8:20

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	72		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	6400		mg/kg dry	28	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	0.66	U, J, CLP03, Q-2, QM-1	mg/kg dry	8.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	1.2	J, Q-2	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	43		mg/kg dry	28	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.40	J, Q-2, Q-5	mg/kg dry	0.69	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.026	U, J, CLP03, Q-2	mg/kg dry	0.69	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	510	J, Q-2	mg/kg dry	690	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	49	J, QM-4	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	3.3	J, Q-2, Q-5	mg/kg dry	6.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	8.3	J, Q-5	mg/kg dry	3.4	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	10000		mg/kg dry	14	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	14	J, QM-4	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1200	J, CLP26	mg/kg dry	690	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	130	J, QM-4	mg/kg dry	2.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	4.5	J, Q-2	mg/kg dry	5.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1200		mg/kg dry	690	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	4.8	U	mg/kg dry	4.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.4	U	mg/kg dry	1.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	25	J, Q-2	mg/kg dry	690	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	3.4	U	mg/kg dry	3.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	12		mg/kg dry	6.9	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	66		mg/kg dry	8.3	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-008-SS **Lab ID:** C101701-18 **MD No:** 5QT5 DATAC
Station ID: TT008SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/12/10 14:30

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	40		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	11000		mg/kg dry	50	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	15	U, J, QM-1	mg/kg dry	15	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	9.5		mg/kg dry	2.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	440		mg/kg dry	50	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.54	J, Q-2, Q-5	mg/kg dry	1.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.49	J, Q-2	mg/kg dry	1.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	14000		mg/kg dry	1200	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	550	J, QM-4	mg/kg dry	2.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	3.5	J, Q-2, Q-5	mg/kg dry	12	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	60	J, Q-5	mg/kg dry	6.2	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	48000		mg/kg dry	25	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	1400	J, QM-4	mg/kg dry	2.5	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1400	J, CLP26	mg/kg dry	1200	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	840	J, QM-4	mg/kg dry	3.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	7.9	J, Q-2	mg/kg dry	10	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	690	J, Q-2	mg/kg dry	1200	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	0.97	R, CLP04, CLP36, Q-2	mg/kg dry	8.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	2.5	U	mg/kg dry	2.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	65	J, Q-2	mg/kg dry	1200	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	6.2	U	mg/kg dry	6.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	30		mg/kg dry	12	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	300		mg/kg dry	15	5/05/10	5/06/10	CLP ILM05.4 P

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D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-009-SS **Lab ID:** C101701-19 **MD No:** 5QT6 DATAC

Station ID: TT009SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/13/10 10:45

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	77		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	23000		mg/kg dry	26	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	1.7	J, Q-2, QM-1	mg/kg dry	7.8	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	2.6		mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	88		mg/kg dry	26	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.32	J, Q-2, Q-5	mg/kg dry	0.65	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.068	U, J, CLP03, Q-2	mg/kg dry	0.65	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	2700		mg/kg dry	650	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	35	J, QM-4	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	2.9	J, Q-2, Q-5	mg/kg dry	6.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	36	J, Q-5	mg/kg dry	3.3	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	16000		mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	24	J, QM-4	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1400	J, CLP26	mg/kg dry	650	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	160	J, QM-4	mg/kg dry	2.0	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	5.8		mg/kg dry	5.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	1100		mg/kg dry	650	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	0.34	R, CLP04, CLP36, Q-2	mg/kg dry	4.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	1.3	U	mg/kg dry	1.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	11	J, Q-2	mg/kg dry	650	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	3.3	U	mg/kg dry	3.3	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	30		mg/kg dry	6.5	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	60		mg/kg dry	7.8	5/05/10	5/06/10	CLP ILM05.4 P

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4 Science and Ecosystem Support Division
980 College Station Road, Athens, Georgia 30605-2700
D.A.R.T. Id: 10-0354
Project: 10-0354, Transylvania Tanning Co - Reported by Denise Goddard

Total Metals

Project: 10-0354, Transylvania Tanning Co **Contract Lab Case: 40030**

Sample ID: TT-010-SS **Lab ID:** C101701-20 **MD No:** 5QT7 DATAC
Station ID: TT010SS **Matrix:** Surface Soil **D No:**

Date Collected: 4/13/10 12:00

CAS Number	Analyte	Results	Qualifiers	Units	MRL	Prepared	Analyzed	Method
E1642941	% Solids	46		%		5/05/10	5/06/10	CLP Inorganics
7429-90-5	Aluminum	8700		mg/kg dry	43	5/05/10	5/06/10	CLP ILM05.4 P
7440-36-0	Antimony	1.5	J, Q-2, QM-1	mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P
7440-38-2	Arsenic	9.7		mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-39-3	Barium	900		mg/kg dry	43	5/05/10	5/06/10	CLP ILM05.4 P
7440-41-7	Beryllium	0.64	J, Q-2, Q-5	mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-43-9	Cadmium	0.96	J, Q-2	mg/kg dry	1.1	5/05/10	5/06/10	CLP ILM05.4 P
7440-70-2	Calcium	16000		mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7440-47-3	Chromium	4100	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-48-4	Cobalt	3.0	J, Q-2, Q-5	mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7440-50-8	Copper	910	J, Q-5	mg/kg dry	5.4	5/05/10	5/06/10	CLP ILM05.4 P
7439-89-6	Iron	59000		mg/kg dry	22	5/05/10	5/06/10	CLP ILM05.4 P
7439-92-1	Lead	580	J, QM-4	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7439-95-4	Magnesium	1700	J, CLP26	mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7439-96-5	Manganese	310	J, QM-4	mg/kg dry	3.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-02-0	Nickel	14		mg/kg dry	8.7	5/05/10	5/06/10	CLP ILM05.4 P
7440-09-7	Potassium	870	J, Q-2	mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7782-49-2	Selenium	7.1	J, Q-2	mg/kg dry	7.6	5/05/10	5/06/10	CLP ILM05.4 P
7440-22-4	Silver	2.2	U	mg/kg dry	2.2	5/05/10	5/06/10	CLP ILM05.4 P
7440-23-5	Sodium	41	J, Q-2	mg/kg dry	1100	5/05/10	5/06/10	CLP ILM05.4 P
7440-28-0	Thallium	5.4	U	mg/kg dry	5.4	5/05/10	5/06/10	CLP ILM05.4 P
7440-62-2	Vanadium	25		mg/kg dry	11	5/05/10	5/06/10	CLP ILM05.4 P
7440-66-6	Zinc	850		mg/kg dry	13	5/05/10	5/06/10	CLP ILM05.4 P

Appendix B

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 40030 **R**

DAS No:

Region:	4	Date Shipped:	4/19/2010	**Chain of Custody Record**	Sampler Signature:
Project Code:	10-0354	Carrier Name:	FedEx	Relinquished By (Date / Time)	Received By (Date / Time)
Account Code:	302DD2C04ZZLA00	Airbill:	1663418245	1 [illegible] 4-19-10 12:00	
CERCLIS ID:	NCN000410007	Shipped to:	Datachem Laboratories, Inc. 960 West LeVoy Drive Salt Lake City UT 84123 (801) 266-7700	2.	
Spill ID:				3.	
Site Name/State:	Transylvania Tannery/NC			4.	
Project Leader:	Harry Zinn				
Action:	Site Inspection				
Sampling Co:	NC Superfund Section				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	ORGANIC SAMPLE No.	QC Type
MD5QR8	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT1 (Ice Only) (1)	TT-001-SD	S: 4/14/2010 10:55		--
MD5QR9	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT2 (Ice Only) (1)	TT-001-SS	S: 4/14/2010 11:00		--
MD5QS0	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT3 (Ice Only) (1)	TT-002-SD	S: 4/14/2010 10:35		--
MD5QS1	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT4 (Ice Only) (1)	TT-002-SS	S: 4/13/2010 8:20		--
MD5QS2	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT5 (Ice Only) (1)	TT-003-SD	S: 4/14/2010 9:55		--
MD5QS3	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT6 (Ice Only) (1)	TT-103-SD	S: 4/14/2010 9:55		Field Duplicate
MD5QS4	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT7 (Ice Only) (1)	TT-003-SS	S: 4/12/2010 9:15		--
MD5QS5	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT8 (Ice Only) (1)	TT-004-SD	S: 4/14/2010 9:45		--
MD5QS6	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT9 (Ice Only) (1)	TT-004-SS	S: 4/12/2010 16:00		--
MD5QS7	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT10 (Ice Only) (1)	TT-005-SD	S: 4/14/2010 9:20		--
MD5QS8	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT11 (Ice Only) (1)	TT-005-SS	S: 4/12/2010 15:30		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC: MD5QR8, MD5QR9	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TM ICP-AES = CLP TAL TM (no Hg) - Soil			

TR Number: **4-395328337-041910-0001**

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 40030 R
DAS No:

Region:	4	Date Shipped:	4/19/2010	Chain of Custody Record	Sampler Signature:
Project Code:	10-0354	Carrier Name:	FedEx	Relinquished By (Date / Time)	Received By (Date / Time)
Account Code:	302DD2C04ZZLA00	Airbill:	1663418245	1 [illegible] 4-19-10 12:00	
CERCLIS ID:	NCN000410007	Shipped to:	Datachem Laboratories, Inc. 960 West LeVoy Drive Salt Lake City UT 84123 (801) 266-7700	2.	
Spill ID:				3.	
Site Name/State:	Transylvania Tannery/NC			4.	
Project Leader:	Harry Zinn				
Action:	Site Inspection				
Sampling Co:	NC Superfund Section				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MD5QS9	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT12 (Ice Only) (1)	TT-006-SD	S: 4/14/2010	8:35		--
MD5QT0	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT13 (Ice Only) (1)	TT-006-SS	S: 4/12/2010	15:00		--
MD5QT1	Surface Soil/ Harry Zinn	L/G	TM ICP-AES (21)	TT14 (Ice Only) (1)	TT-106-SS	S: 4/12/2010	15:00		Field Duplicate
MD5QT2	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT15 (Ice Only) (1)	TT-007-SD	S: 4/14/2010	8:40		--
MD5QT3	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT16 (Ice Only) (1)	TT-007-SS	S: 4/13/2010	11:15		--
MD5QT4	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT17 (Ice Only) (1)	TT-008-SD	S: 4/14/2010	8:20		--
MD5QT5	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT18 (Ice Only) (1)	TT-008-SS	S: 4/12/2010	14:30		--
MD5QT6	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT19 (Ice Only) (1)	TT-009-SS	S: 4/13/2010	10:45		--
MD5QT7	Surface Soil/ Harry Zinn	L/G	TM ICP-AES (21)	TT20 (Ice Only) (1)	TT-010-SS	S: 4/13/2010	12:00		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC: MD5QR8, MD5QR9	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TM ICP-AES = CLP TAL TM (no Hg) - Soil			

TR Number: 4-395328337-041910-0001

REGION COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 40030
DAS No:
SDG No:
L

Date Shipped:	4/19/2010
Carrier Name:	FedEx
Airbill:	1663418245
Shipped to:	Datachem Laboratories, Inc. 960 West LeVoy Drive Salt Lake City UT 84123 (801) 266-7700

Chain of Custody Record

Sampler Signature: [signature]

Relinquished By	(Date / Time)	Received By	(Date / Time)
1. [signature]	4-19-10 1200		
2.			
3.			
4.			

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	FOR LAB USE ONLY Sample Condition On Receipt
MD5QR8	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT1 (Ice Only) (1)	TT-001-SD	S: 4/14/2010	10:55		
MD5QR9	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT2 (Ice Only) (1)	TT-001-SS	S: 4/14/2010	11:00		
MD5QS0	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT3 (Ice Only) (1)	TT-002-SD	S: 4/14/2010	10:35		
MD5QS1	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT4 (Ice Only) (1)	TT-002-SS	S: 4/13/2010	8:20		
MD5QS2	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT5 (Ice Only) (1)	TT-003-SD	S: 4/14/2010	9:55		
MD5QS3	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT6 (Ice Only) (1)	TT-103-SD	S: 4/14/2010	9:55		
MD5QS4	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT7 (Ice Only) (1)	TT-003-SS	S: 4/12/2010	9:15		
MD5QS5	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT8 (Ice Only) (1)	TT-004-SD	S: 4/14/2010	9:45		
MD5QS6	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT9 (Ice Only) (1)	TT-004-SS	S: 4/12/2010	16:00		
MD5QS7	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT10 (Ice Only) (1)	TT-005-SD	S: 4/14/2010	9:20		

Shipment for Case Complete?Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:	
	MD5QR8, MD5QR9				
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___	Shipment Iced? ___

TM ICP-AES = CLP TAL TM (no Hg) - Soil

'R Number: **4-395328337-041910-0001**

LABORATORY COPY

USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 40030
DAS No:
SDG No:
L

Date Shipped:	4/19/2010
Carrier Name:	FedEx
Airbill:	1663418245
Shipped to:	Datachem Laboratories, Inc. 960 West LeVoy Drive Salt Lake City UT 84123 (801) 266-7700

Chain of Custody Record

Sampler Signature: [signature]

Relinquished By	(Date / Time)	Received By	(Date / Time)
1 [signature]	4-19-10 12:00		
2.			
3.			
4.			

For Lab Use Only

Lab Contract No:
Unit Price:
Transfer To:
Lab Contract No:
Unit Price:

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	FOR LAB USE ONLY Sample Condition On Receipt
MD5QS8	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT11 (Ice Only) (1)	TT-005-SS	S: 4/12/2010	15:30		
MD5QS9	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT12 (Ice Only) (1)	TT-006-SD	S: 4/14/2010	8:35		
MD5QT0	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT13 (Ice Only) (1)	TT-006-SS	S: 4/12/2010	15:00		
MD5QT1	Surface Soil/ Harry Zinn	L/G	TM ICP-AES (21)	TT14 (Ice Only) (1)	TT-106-SS	S: 4/12/2010	15:00		
MD5QT2	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT15 (Ice Only) (1)	TT-007-SD	S: 4/14/2010	8:40		
MD5QT3	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT16 (Ice Only) (1)	TT-007-SS	S: 4/13/2010	11:15		
MD5QT4	Sediment/ Harry Zinn	L/G	TM ICP-AES (21)	TT17 (Ice Only) (1)	TT-008-SD	S: 4/14/2010	8:20		
MD5QT5	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT18 (Ice Only) (1)	TT-008-SS	S: 4/12/2010	14:30		
MD5QT6	Surface Soil/ Harry Zinn	L/C	TM ICP-AES (21)	TT19 (Ice Only) (1)	TT-009-SS	S: 4/13/2010	10:45		
MD5QT7	Surface Soil/ Harry Zinn	L/G	TM ICP-AES (21)	TT20 (Ice Only) (1)	TT-010-SS	S: 4/13/2010	12:00		

Shipment for Case Complete?Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt:	Chain of Custody Seal Number:	
	MD5QR8, MD5QR9				
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G		Custody Seal Intact? ___	Shipment Iced? ___

TM ICP-AES = CLP TAL TM (no Hg) - Soil

'R Number: 4-395328337-041910-0001

LABORATORY COPY

IF FOUND PLEASE RETURN TO:

NAME _____

COMPANY _____

STREET _____

CITY _____ STATE ____ ZIP ____

PHONE ____ _____

JOB BOOK

PROJECT NAME Transylvania Tanning

PROJECT NUMBER _____

CREW H Zinn / M Bartlett

DATE 4-12-10 BOOK # ____ OF ____

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CURVE FORMULAS

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin.} \frac{1}{2} D}$

$\text{Sin.} \frac{1}{2} D = \frac{50}{R}$

$\text{Sin.} \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin.} \frac{1}{2} D}$

$E = R \text{ ex. sec } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{I}{D}$

$\text{Tan. def.} = \frac{1}{2} \text{ chord def.}$

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve. very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

RIGHT ANGLE TRIANGLES. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$; $100 - 3.125 = 96.875 =$ Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

LEVELING. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574 d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3} d^2$. The combined correction is negative.

PROBABLE ERROR. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 = the sum of the squares of these differences and n=the number of observations, then the probable error of the mean $= \pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$

MINUTES IN DECIMALS OF A DEGREE

1'	.0167	11'	.1833	21'	.3500	31'	.5167	41'	.6833	51'	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

4-12-10

Arrived at site at 1:00 pm
Gained access to site from house
on Leach Dr. with permission from
home owner.

Traveled through numerous briars
to locate ~~Leach House~~ Leather Warehouse #3
Traced the outline of the foundations
chose 3 pts for composite samples
LW Leach 1 at South east corner of foundation
LW Leach 2 along building
LW Leach 3 along Western side of building
an open Vat is located in the
middle of the LW Leach building.
Vat is 5'x5' approximately 1' deep. TT0855

Leach building located 300 TT0635
R4121 4D Leach 1 South side of foundation
R4121 4E Leach 2 North side of foundation
R4121 5A Leach 3 West side of foundation
R4121 5B Leach 4 East side of foundation
Sample Collected @ 15:00 Soil is dark organic silt
LW Vat collected 14:30 Soil is dark moist organic silt

4-12-10

4-12-10

Locate Repro Building.
Collect Repro 1 on East side R 041215B
Collect Repro 2 on South side 15C
Repro 3 on West 15D
Repro 4 on North
Sample Collected at 1530 TT 0535
Dark organic silt w/ small amount of sand

Locate Hide House
Hide 1 South Side R 041214A
2 North B
West
East
Sample Collected at 1600 TT 0455
Sample was organic silt no sand slightly moist

[signature]
4-12-10

Tuesday April 13 2010
Sunny Upper 40's
Located Debris in area of Wash
Building Location. Delineated the building
outline.

Wash 1	North	R04B08	A
Wash 2	East	"	B
Wash 3	West	"	C
Wash 4	South	"	D

Sample Collected 8:20 TT02SS
Soil is Dark Brown to Black Organic Silt

Collected deep soil samples for XRF
Wash North Clay hit at 18 inches
Wash South Clay hit at 7 inches
clay soil collected

Located Dryer Bldg due east of Wash Bldg
approximately 50
Debris area with a lot of cinder clinkers

Dryer 1	South	R04B09	A
Dryer 2	East	"	B
Dryer 3	West	"	C

Sample Collected on 9:15 TT03SS
Soil is Dark Organic Silt. Clay was found
at 6" depth

[illegible] 4-13-10

4-13-10

Located Area of Tannery Building
Sample Composite north section of
east side of Tannery
East North 1 R041309D Light Brown ~~Clay~~ 713
Sandy Silt
East North 2 R041310A Same as 1
East North 3 R041310B Light Brown Sandy Clay
Sample Collected at 10:45 TT 09 SS

Bleach 1 North R041310C Light Tan Silty Sand
Bleach 2 East R041311A Same as 2
Bleach 3 South R041311B Same as 3
Sample Collected at 11:15 TT 07 SS

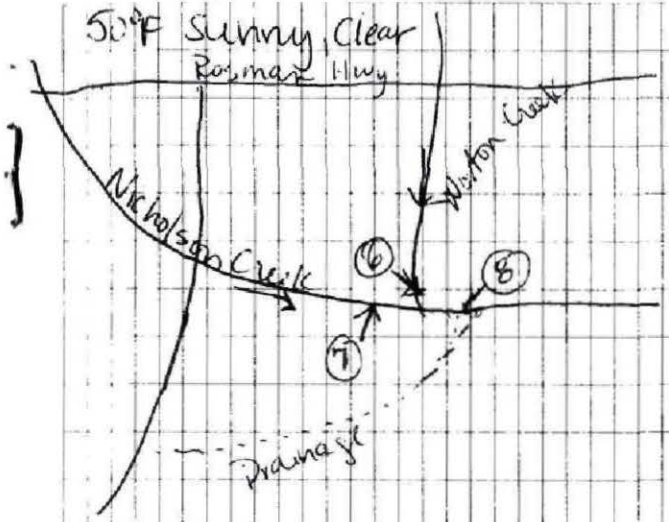
C MB

South Tan 1 (South) R041311C Dark
organic Silt
South Tan 2 (Mid)
R041311D Dark organic Silt
South Tan 3 R041311E same material
Sample Collected at 12:00 TT 10 SS

Melanie Barbitt

Transylvania Tannery 7/14/10

50°F Sunny, Clear



main channel of Nicholson - sandy and gravelly

SD-08 sandy (Downstream Nicholson)
820 HZ collected SD-08 [GPS R0414074]
- collected on North side of Nicholson just downstream of Norton Creek + upstream of drainage ditch
- bored in 2½' - all sand, no clay

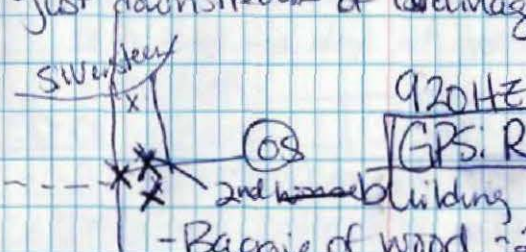
SD-06 sandy (Most Downstream Norton)
835 HZ collected SD-06
- collected from center of channel
[GPS R0414078]
Bored in - all sand 2' deep

Melanie Barnett

Transylvania Tannery 4/14/10

SD-07 Upstream Nicholson - ~50' upstream from Norton Creek
840 Hz collected SD-07
- Sandy - collected from depositional area near bend of creek [GPS R041407C]
- soil boring - started hitting clay ~2' down

SD-05 - Norton adjacent to Kathie property
- just downstream of drainage from field



920 Hz collected SD-05
[GPS: R041408A]
- Baggie of wood ~2' deep in creek

SD-04 - downstream of Silversteen
GPS [R041409A]
945 Hz collected SD-04
- Sandy w/some small gravel
- hit clay @ 9" w/boring

SD-03 - upstream of Silversteen
- small pipe draining from direction of site - ~10' upstream Silversteen
955 Hz collected SD-04 just down of pipe - mostly fine-grained sand
1000 Hz collected SD-104 (Duplicate)
- hit clay ~2½' deep
[GPS: R041409B]

Melanie Barlett

Transylvania Tannery 4/14/10

SD-02

Located SD-02 approximately 60 FT downstream from the outfall from the site and 80ft downstream from the offsite outfall.

SD-02 is sandy w/ course gravel

SD-02 collected at 10:35 R041410A

SD-02 deep was clay at approximately 1 FT depth.

SD-01 - Bkgd GPS R041411A

- ~25' downstream of Cashiers Valley Rd
- 1050 HZ collected SD-01

Sandy material - same as all other locations

- sand/gravel down to 2' - couldn't not go further

Bkgd SL

- 1055 MB collected adjacent to Bkgd SD ~25' South

GPS R041411B

Melanie Bartlett

IF FOUND PLEASE RETURN TO:

NAME _____

COMPANY _____

STREET _____

CITY _____ STATE ____ ZIP ____

PHONE ____ _____

JOB BOOK

PROJECT NAME Transylvania Tanning

PROJECT NUMBER _____

CREW H Zinn / M Bartlett

DATE 4-13-10 BOOK # ____ OF ____

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CURVE FORMULAS

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin.} \frac{1}{2} D}$

$\text{Sin.} \frac{1}{2} D = \frac{50}{R}$

$\text{Sin.} \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin.} \frac{1}{2} D}$

$E = R \text{ ex. sec } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{I}{D}$

Tan. def. = ½ chord def.

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve. very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

Right Angle Triangles. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$; $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

Leveling. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574 d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3} d^2$. The combined correction is negative.

Probable Error. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2—the sum of the squares of these differences and n=the number of observations, then the probable error of the mean $= \pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$

MINUTES IN DECIMALS OF A DEGREE

1'	.0167	11'	.1833	21'	.3500	31'	.5167	41'	.6833	51'	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.0167

4-13-10

14.00 Set up on Silverstein Rd

Run XRF

XRF machine blank Rd 16

XRF Low Blank Rd 17

XRF Med 1 Rd 18

XRF Rd 19 Wash Deep

Rd 20 Void

Rd 21 Dyer Deep

Rd 22 Tannery North

Rd 23 Bleach Deep

Rd 25 Tannery South Deep 24 Void

Rd 26 Bleach shallow

Rd 27 Wash House shallow

Rd 28 Leach shallow

Rd 29 South Tannery shallow

Rd 31 North Tannery shallow 30 Void

Rd 36 Hide building shallow 32 Void

33, 34, 35 Void

4-13-10

4/13/10

Transect - Sat pal Rethie - #1

Pt 1: Rd 37 GPS R041315A
Pt 2: Rd 38 GPS R041315B
Pt 3: Rd 39 GPS R041315C
Pt 4: Rd 40 GPS R041315D
Pt 5: Rd 41 GPS R041315E
Pt 6: Rd 42 GPS R041315F
Creek Border
Pt 1: Rd 44 GPS R041315G
Pt 2: Rd 45 GPS R041315H
Pt 3: Rd 46 GPS R041315I

Transect - #2

Pt 1: Rd 47 GPS R041315J MB
Pt 2: Rd 48 ~~GPS~~ ~~[illegible]~~ R041316C
Pt 3: Rd 50 GPS R041316B
Pt 4: Rd 51 GPS R041316D
Pt 5: Rd 52 GPS R041316E
Pt 6: Rd 53 GPS R041316F
Creek Border (South side)
Pt 4: Rd 54 GPS R041316G

Melanie Bartlett

4-14-00 11:00 Sunny mid 60's
Internal Calibration Check Rd 55
Blank Rd 56
Low Rd 57
Medium Rd 58

SD 05 deep Rd 59
SD 04 deep. Rd 60
SD 03 deep. Rd 61
SD 02 deep Rd 65 Rd 62, 63 64 Void

4-13-00

GPS Readings for Transylvania Tanning Company 4/12-14/2010

Station ID	Station Name	Sample	Time	Date	LongiTude	Latitude	HAE	Easting	Northing	MSL
1	LW 1	SS	02:18:43pm	4/12/2010	-82.74179687	35.23093443	2048.391	882891.64	560031.25	2146.728
2	LW 2	SS	02:21:03pm	4/12/2010	-82.7418867	35.23090454	2026.394	882864.42	560021.39	2124.73
3	LW 3	SS	02:23:59pm	4/12/2010	-82.74191095	35.23084027	2073.308	882856.31	559998.29	2171.645
4	leach bldg 1	NONE	02:58:41pm	4/12/2010	-82.74180312	35.23047326	2029.254	882883.45	559863.6	2127.597
5	leach bldg 2	NONE	03:00:36pm	4/12/2010	-82.74174189	35.23055755	2068.575	882902.88	559893.56	2166.917
6	leach bldg 3	NONE	03:02:18pm	4/12/2010	-82.74182188	35.23059417	2036.759	882879.51	559907.78	2135.1
7	repro 1	SS	03:27:59pm	4/12/2010	-82.74168443	35.23035408	2053.045	882917.23	559818.92	2151.391
8	repro 2	SS	03:30:37pm	4/12/2010	-82.74174553	35.23031664	2096.513	882898.49	559805.99	2194.859
9	repro 3	SS	03:31:44pm	4/12/2010	-82.74177443	35.230368	2081.259	882890.57	559824.99	2179.604
10	repro4	SS	03:35:12pm	4/12/2010	-82.74179542	35.23037979	2053.889	882884.47	559829.52	2152.233
11	hide 1	SS	04:03:17pm	4/12/2010	-82.74148622	35.23021398	2059.957	882974.46	559765.73	2158.309
12	hide 2	SS	04:05:01pm	4/12/2010	-82.74151723	35.23043653	2033.816	882968.26	559847.02	2132.164
13	hide 3	SS	04:05:54pm	4/12/2010	-82.74151998	35.23041369	2046.804	882967.12	559838.75	2145.152
14	hide 4	SS	04:07:04pm	4/12/2010	-82.74141575	35.23040052	2060.396	882998.05	559832.78	2158.746
15	wash 1	SS	08:37:16am	4/13/2010	-82.741135	35.22992455	2037.667	883075.3	559656.52	2136.026
16	wash 2	SS	08:43:04am	4/13/2010	-82.741038	35.22993374	2040.948	883104.37	559658.77	2139.309
17	wash 3	NONE	08:44:13am	4/13/2010	-82.74108539	35.22990135	2049.08	883089.78	559647.53	2147.441
18	wash 4	SS	08:45:44am	4/13/2010	-82.74102791	35.22987149	2052.802	883106.53	559636.02	2151.164
19	dryer 1	SS	09:15:55am	4/13/2010	-82.74103174	35.23008723	2030.49	883108.34	559714.52	2128.849
20	dryer 3	SS	09:17:34am	4/13/2010	-82.7410865	35.23009407	2081.841	883092.09	559717.63	2180.199
21	dryer 2	NONE	09:18:48am	4/13/2010	-82.7410456	35.23012004	2052.921	883104.66	559726.61	2151.28
22	tan n1	SS	10:37:07am	4/13/2010	-82.74132293	35.23190339	2039.729	883046.35	560378.31	2138.06
23	tan n2	SS	10:47:21am	4/13/2010	-82.74129891	35.23172169	2045.931	883051.03	560311.96	2144.265
24	tan n3	SS	10:53:53am	4/13/2010	-82.74132384	35.23166449	2042.863	883042.81	560291.44	2141.197
25	bleach 1	SS	11:01:33am	4/13/2010	-82.74128943	35.23158303	2045.043	883051.96	560261.43	2143.379
26	bleach 2	SS	11:03:28am	4/13/2010	-82.74125391	35.23152903	2053.074	883061.82	560241.39	2151.411
27	bleach 3	SS	11:06:35am	4/13/2010	-82.74131583	35.23149223	2067.733	883042.83	560228.7	2166.069
28	tan s1	SS	11:41:20am	4/13/2010	-82.741176	35.23077244	2052.561	883074.69	559965.35	2150.909
29	south tan 2	NONE	11:52:08am	4/13/2010	-82.74121002	35.23097344	2037.989	883067.3	560038.83	2136.334
30	tan s3	SS	12:01:51pm	4/13/2010	-82.74121216	35.23116585	2063.314	883069.3	560108.83	2161.656
31	sr 1-1				-82.74149963	35.2282451	2047.79	882943.46	559049.83	2146.167
32	sr 1-2				-82.74135438	35.22819933	2033.587	882986.18	559031.55	2131.966
33	sr 1-3	NONE	03:16:52pm	4/13/2010	-82.74116627	35.22816329	2048.624	883041.81	559016.32	2147.006
34	sr 1-4	NONE	03:20:19pm	4/13/2010	-82.74098031	35.22814442	2049.236	883097.05	559007.37	2147.621
35	sr 1-5	NONE	03:23:13pm	4/13/2010	-82.7407742	35.22809198	2032.034	883157.84	558985.98	2130.422
36	sr 1-6	NONE	03:26:15pm	4/13/2010	-82.74057984	35.22803328	2051.498	883215.04	558962.45	2149.89
37	cb -1	NONE	03:31:32pm	4/13/2010	-82.74057733	35.22773215	2046.969	883211.65	558852.9	2145.365
38	cb 2	NONE	03:36:13pm	4/13/2010	-82.74048801	35.22740929	2036.782	883233.88	558734.47	2135.183
39	cb -3	NONE	03:39:46pm	4/13/2010	-82.74039511	35.22708238	2048.961	883257.13	558614.54	2147.367
40	sr 2-1	NONE	04:05:40pm	4/13/2010	-82.74103301	35.22537542	2025.03	883043.36	558000.92	2123.45
41	sr 2-3	NONE	04:12:29pm	4/13/2010	-82.74059819	35.2253878	2021.671	883173.29	558000.52	2120.096
42	sr 2-2	NONE	04:16:09pm	4/13/2010	-82.7407415	35.22536727	2066.184	883130.24	557994.67	2164.608
43	sr 2-4	NONE	04:17:49pm	4/13/2010	-82.74036714	35.22543255	2057.84	883242.85	558014.2	2156.267
44	sr 2-5	NONE	04:22:02pm	4/13/2010	-82.74020575	35.22545548	2027.036	883291.33	558020.73	2125.465
45	sr 2-6	NONE	04:25:24pm	4/13/2010	-82.74003123	35.22556688	2020.862	883344.94	558059.28	2119.292
46	cb -4	NONE	04:28:06pm	4/13/2010	-82.739982	35.22570184	2037.5	883361.48	558107.81	2135.929
47	sd-08	SD	07:24:48am	4/14/2010	-82.74059745	35.22037632	2018.54	883104.8	556177.91	2117.027
48	sd-06	SD	07:33:40am	4/14/2010	-82.7405986	35.22046458	2025.998	883105.66	556210.02	2124.484
49	sd-07	SD	07:40:36am	4/14/2010	-82.74069659	35.22053001	2032.844	883077.32	556234.92	2131.328
50	sd-05	SD	08:21:50am	4/14/2010	-82.74042081	35.22769853	2045.879	883257.9	558838.91	2144.277
51	sd-04	SD	09:42:29am	4/14/2010	-82.74042259	35.22835866	2034.737	883266.42	559079.01	2133.127
52	sd-03	SD	09:57:53am	4/14/2010	-82.74042705	35.22851124	2039.253	883267.18	559134.55	2137.64
53	sd02				-82.74031715	35.22944106	2029.53	883312.73	559471.48	2127.906
54	sd-01	SD	11:02:58am	4/14/2010	-82.74200188	35.23320194	2048.271	882861.56	560858.22	2146.574
55	bkgd soil	NONE	11:04:21am	4/14/2010	-82.74210143	35.23316233	2040.557	882831.31	560844.93	2138.859
56	leach bldg 4	NONE	03:05:13pm	4/12/2010	-82.74168963	35.23050426	2039.348	882917.74	559873.59	2137.691

Reading No		Time	Duration	Units	Mo
16	Cal. Blank	4/13/2010 2:05	36.05	cps	46.09
17	Low Blank	4/13/2010 2:07	60.88	ppm	-1.2
18	Med. Blank	4/13/2010 2:14	60.51	ppm	2.81
19	Wash House deep	4/13/2010 2:22	60.5	ppm	-1.29
21	Hair Dryer deep	4/13/2010 2:26	60.51	ppm	-0.68
22	East Tannery North deep	4/13/2010 2:31	60.13	ppm	10.51
23	Bleach deep	4/13/2010 2:34	60.14	ppm	2.89
25	East Tannery South deep	4/13/2010 2:38	60.5	ppm	-4.56
26	Bleach shallow (007SS)	4/13/2010 2:40	60.52	ppm	3.85
27	Wash House shallow (002SS)	4/13/2010 2:42	60.13	ppm	1.16
28	Leach shallow (006SS)	4/13/2010 2:45	60.15	ppm	1.7
29	East Tannery South shallow(010S	4/13/2010 2:47	60.53	ppm	-2.07
31	East Tannery North shallow (009S	4/13/2010 2:51	60.12	ppm	7.38
36	Hide Building deep	4/13/2010 2:59	60.48	ppm	1.27
37	SR Transect 1-1	4/13/2010 3:09	60.14	ppm	1.3
38	SR Transect 1-2	4/13/2010 3:13	60.18	ppm	1.73
39	SR Transect 1-3	4/13/2010 3:17	60.15	ppm	1.3
40	SR Transect 1-4	4/13/2010 3:20	60.18	ppm	-0.07
41	SR Transect 1-5	4/13/2010 3:24	60.13	ppm	0.17
42	SR Transect 1-6	4/13/2010 3:26	60.15	ppm	0.36
44	Creek Border 1	4/13/2010 3:32	60.15	ppm	1.58
45	Creek Border 2	4/13/2010 3:37	60.16	ppm	0.13
46	Creek Border 3	4/13/2010 3:40	60.14	ppm	-0.11
47	SR Transect 2-1	4/13/2010 4:06	60.14	ppm	-0.6
48	SR Transect 2-2	4/13/2010 4:10	60.13	ppm	4.25
50	SR Transect 2-3	4/13/2010 4:14	60.18	ppm	-4.57
51	SR Transect 2-4	4/13/2010 4:17	60.49	ppm	1.08
52	SR Transect 2-5	4/13/2010 4:22	60.16	ppm	0.29
53	SR Transect 2-6	4/13/2010 4:25	60.12	ppm	2.11
54	Creek Border South	4/13/2010 4:28	60.5	ppm	-0.71
55	Cal. Blank	4/13/2010 23:11	38.03	cps	44.09
56	Zero Blank	4/13/2010 23:14	61.56	ppm	1.88
57	Low Blank	4/13/2010 23:16	31.11	ppm	-1.86
58	Med. Blank	4/13/2010 23:19	60.83	ppm	9.19
59	Sed 05 deep	4/13/2010 23:22	60.53	ppm	-4.41
60	Sed 04 deep	4/13/2010 23:24	60.13	ppm	-2.84
61	Sed 03 deep	4/13/2010 23:26	60.13	ppm	0.98
65	Sed 02 deep	4/13/2010 23:30	60.16	ppm	-0.9

Reading No		Mo Error	Zr	Zr Error	Sr	Sr Error
16	Cal. Blank	0	4.12	0	56.38	0
17	Low Blank	5.56	189.99	18.91	179.8	12.91
18	Med. Blank	6.85	384.45	25.11	178.48	13.2
19	Wash House deep	4.12	136.24	12.83	53.31	6.18
21	Hair Dryer deep	3.92	179.92	13.03	60.01	5.95
22	East Tannery North deep	8.34	361.03	27.08	31.29	6.98
23	Bleach deep	5.62	501.04	21.18	16.55	3.76
25	East Tannery South deep	5.06	340.11	19.32	55.9	6.52
26	Bleach shallow (007SS)	6.56	776.69	26.24	20.02	4.06
27	Wash House shallow (002SS)	3.36	81.18	9.49	82.15	6.52
28	Leach shallow (006SS)	4.8	223.39	17.7	300.89	14.06
29	East Tannery South shallow(010S	2.7	56.74	7.46	58.92	5.12
31	East Tannery North shallow (009S	6.88	531.56	25.2	26.01	5.09
36	Hide Building deep	3.22	121.9	10.03	95.34	6.44
37	SR Transect 1-1	5.47	463.31	20.78	32.91	4.88
38	SR Transect 1-2	4.06	336.92	14.72	17.59	3.15
39	SR Transect 1-3	2.88	91.14	7.77	11.17	2.46
40	SR Transect 1-4	3.67	217.84	12.44	24.56	3.66
41	SR Transect 1-5	3.68	161.82	11.6	22.51	3.73
42	SR Transect 1-6	4.08	205.01	13.5	32.5	4.58
44	Creek Border 1	3.99	234.15	13.47	29.59	4.11
45	Creek Border 2	3.46	151.22	10.78	21.51	3.5
46	Creek Border 3	4.39	242	15.08	36.43	4.94
47	SR Transect 2-1	2.81	86.33	7.84	20.73	3.16
48	SR Transect 2-2	3.15	95.79	8.2	19.97	3.11
50	SR Transect 2-3	3.27	153.8	11.07	24.9	3.8
51	SR Transect 2-4	3.65	141.34	10.97	26.61	3.97
52	SR Transect 2-5	4.22	207.95	13.9	28.8	4.46
53	SR Transect 2-6	4.57	245.31	15.3	29.11	4.56
54	Creek Border South	4.31	317.77	15.79	29.67	4.2
55	Cal. Blank	0	3.6	0	55.87	0
56	Zero Blank	3.97	54.56	8.75	0.09	2.16
57	Low Blank	5.6	192.34	19.13	174.2	12.86
58	Med. Blank	7.27	386.24	25.51	210.45	14.3
59	Sed 05 deep	6.12	460.25	23.88	28.68	5.46
60	Sed 04 deep	5.79	495.84	22.8	34.42	5.4
61	Sed 03 deep	4.81	368.19	17.68	26.34	4.27
65	Sed 02 deep	5.28	478.64	20.51	32.7	4.78

Reading No		Rb	Rb Error	Pb	Pb Error	Se
16	Cal. Blank	7.4	0	0.76	0	17.6
17	Low Blank	81.09	10.1	3.5	17.08	-1.63
18	Med. Blank	93.71	11.14	1021.39	69.57	9.82
19	Wash House deep	40.67	6.24	54.62	18.45	7.25
21	Hair Dryer deep	39.28	5.61	12.77	12.94	2.83
22	East Tannery North deep	15.84	6.27	26.07	23.61	-2.96
23	Bleach deep	21.7	4.71	41.96	16.43	-2.41
25	East Tannery South deep	54.84	7.32	40.62	17.86	3.38
26	Bleach shallow (007SS)	27	5.15	16.91	14.55	4.25
27	Wash House shallow (002SS)	22.22	4.31	278.97	27.85	9.3
28	Leach shallow (006SS)	39.91	6.38	51.49	18.38	2.84
29	East Tannery South shallow(010S	10.37	3.04	234.7	23.62	7.2
31	East Tannery North shallow (009S	42.37	7.04	10.91	16.43	7.62
36	Hide Building deep	22.55	3.96	120.26	18.28	0.16
37	SR Transect 1-1	53.6	6.82	0.62	13.22	14.17
38	SR Transect 1-2	30.45	4.44	-4.1	9.81	8.4
39	SR Transect 1-3	14.98	3.17	-3.17	8.83	2.79
40	SR Transect 1-4	39.18	5.05	10.58	11.4	5.79
41	SR Transect 1-5	36.46	5.18	-8.01	10.18	6.7
42	SR Transect 1-6	51.51	6.28	22.3	13.93	5.15
44	Creek Border 1	30.52	4.76	16.31	12.35	1.79
45	Creek Border 2	31.68	4.68	0.34	10.47	4.86
46	Creek Border 3	51.93	6.53	22.38	14.38	1.95
47	SR Transect 2-1	20.36	3.61	-0.68	9.37	5.51
48	SR Transect 2-2	28.61	4.14	14.91	10.77	2.79
50	SR Transect 2-3	37.54	5.12	9.8	11.46	-1.41
51	SR Transect 2-4	39.55	5.35	29.22	13.78	6.2
52	SR Transect 2-5	56.11	6.68	13.12	13.32	0.84
53	SR Transect 2-6	39.59	5.88	2.7	12.43	-2.33
54	Creek Border South	45.51	5.75	7.61	11.71	-3.02
55	Cal. Blank	6.54	0	0.74	0	18.41
56	Zero Blank	1.06	2.73	-16.67	11.18	1.96
57	Low Blank	78.9	10.08	20	20.04	17.47
58	Med. Blank	94.31	11.23	1038.92	70.39	11.85
59	Sed 05 deep	62.55	8.43	24.89	18.04	-2.91
60	Sed 04 deep	56.4	7.44	18.28	15.83	0.08
61	Sed 03 deep	44.23	5.96	19.25	13.82	2.32
65	Sed 02 deep	51.92	6.56	9.96	13.31	-1.3

Reading No		Se Error	As	As Error	Hg	Hg Error
16	Cal. Blank	0	1.92	0	12.41	0
17	Low Blank	11.97	12.9	14.81	-11.09	28.47
18	Med. Blank	14.58	103.66	55.96	27.91	32.16
19	Wash House deep	9.76	-5.3	13.93	3.41	21.68
21	Hair Dryer deep	8.16	6.21	10.59	7.43	18.88
22	East Tannery North deep	15.07	0.18	18.78	-36.61	35.82
23	Bleach deep	8.42	-0.6	12.79	1.35	20.26
25	East Tannery South deep	9.91	11.23	14.71	-15.23	21.85
26	Bleach shallow (007SS)	9.15	-1.99	11.15	-6.47	20.2
27	Wash House shallow (002SS)	8.29	38.16	22.62	-14.65	16.44
28	Leach shallow (006SS)	9.58	28.24	16.1	14.49	22.62
29	East Tannery South shallow(010S	7.15	12.04	18.53	0.59	14.9
31	East Tannery North shallow (009S	11.35	9.56	13.67	-24.31	24.08
36	Hide Building deep	6.58	6.97	14.37	4.04	15.18
37	SR Transect 1-1	9.92	0.14	10.11	-22.55	19.26
38	SR Transect 1-2	7.24	0.49	7.55	8.53	15.54
39	SR Transect 1-3	6.13	-0.68	6.78	5.18	13.88
40	SR Transect 1-4	7.28	0.51	8.84	2.97	15.84
41	SR Transect 1-5	7.9	11.54	8.93	0.88	17.16
42	SR Transect 1-6	8.36	-6.2	10.36	21.19	19.51
44	Creek Border 1	7.34	-9.14	8.87	-3.76	16.56
45	Creek Border 2	7.3	5.59	8.58	-4.92	15.74
46	Creek Border 3	8.47	3.74	11.5	-7.9	19.06
47	SR Transect 2-1	6.52	-2.33	7.03	7.6	14.36
48	SR Transect 2-2	6.34	-3.41	8.08	-6.81	13.72
50	SR Transect 2-3	6.96	6.18	9.46	7.57	16.85
51	SR Transect 2-4	7.87	-12.47	9.74	-8.77	16.62
52	SR Transect 2-5	8.27	-1.47	10.31	10.93	19.74
53	SR Transect 2-6	8.18	-2.15	9.6	0.65	19.87
54	Creek Border South	7.17	-2.07	9	-22.66	16.22
55	Cal. Blank	0	2.08	0	11.78	0
56	Zero Blank	9.34	8.72	9.74	7.52	22.07
57	Low Blank	13.98	9.27	16.31	3.07	29.69
58	Med. Blank	14.91	143.65	57.55	10.64	31.61
59	Sed 05 deep	10.71	-6.81	13.64	13.28	26.94
60	Sed 04 deep	9.72	0.12	12.42	24.5	24.14
61	Sed 03 deep	8.27	-2.43	10.56	15.43	19.64
65	Sed 02 deep	8.31	1.62	10.55	0.86	19.76

Reading No		Zn	Zn Error	Cu	Cu Error	Ni
16	Cal. Blank	4.06	0	1.99	0	2.14
17	Low Blank	45.86	58.93	-3.38	97.37	-31.39
18	Med. Blank	226.11	70.55	100.06	105.17	-35.23
19	Wash House deep	268.01	54.59	54.19	72.41	-42.08
21	Hair Dryer deep	66.08	39.07	27.69	60.46	8.55
22	East Tannery North deep	15.44	75.38	352.17	146.3	-95.25
23	Bleach deep	30.74	40.85	118.46	69.85	-98.63
25	East Tannery South deep	113.73	50.07	99.03	78.66	-15.68
26	Bleach shallow (007SS)	17.02	40.48	36.61	67.82	14.05
27	Wash House shallow (002SS)	874.02	64.99	271.85	65.19	-15.4
28	Leach shallow (006SS)	146.21	50.04	146.54	77.23	-19.36
29	East Tannery South shallow(010S	329.94	43.17	398.35	61.32	20.04
31	East Tannery North shallow (009S	42.28	51.53	39.59	85.85	-112.75
36	Hide Building deep	179	36.77	50.79	48.54	-33.01
37	SR Transect 1-1	56.03	42.38	51.76	68.72	-18.13
38	SR Transect 1-2	48.97	31.2	36.77	48.27	-66.28
39	SR Transect 1-3	9.23	26.21	18.8	42.4	-102.43
40	SR Transect 1-4	56.15	32.83	1.21	49.06	-17.71
41	SR Transect 1-5	14.47	33.6	38.7	56.04	-13.1
42	SR Transect 1-6	46.79	38.01	22.16	59.65	-38.76
44	Creek Border 1	80.66	36.22	40.63	54.74	-25.95
45	Creek Border 2	29.1	32.2	33.05	51.71	-44.11
46	Creek Border 3	83.75	42.03	42.82	64.82	22.85
47	SR Transect 2-1	28.48	28.08	40.44	44.8	-41.74
48	SR Transect 2-2	26.18	28.22	40.4	45.28	2.92
50	SR Transect 2-3	25.52	32.94	32.9	53.34	-8.93
51	SR Transect 2-4	32.16	34.56	28	55.08	-158.85
52	SR Transect 2-5	53.51	39.85	45.07	63.35	-67.69
53	SR Transect 2-6	51.69	40.88	60.17	66.71	-19.53
54	Creek Border South	76.09	37.36	44.06	57.15	-112.66
55	Cal. Blank	3.53	0	1.97	0	2.72
56	Zero Blank	-0.32	41.02	-30.56	69.22	-112.2
57	Low Blank	85.5	62.18	73.17	102.19	-5.75
58	Med. Blank	300.43	74.66	114.94	107.02	-54.31
59	Sed 05 deep	66.58	54.35	40.96	88.75	24.85
60	Sed 04 deep	37.97	46.05	21.16	75.49	41.71
61	Sed 03 deep	18.36	37.14	41.76	61.97	-26.31
65	Sed 02 deep	66.49	41.34	49.66	65.38	-49.46

Reading No		Ni Error	Co	Co Error	Fe	Fe Error
16	Cal. Blank	0	0.8	0	1.08	0
17	Low Blank	126.43	19.7	255.24	25517.86	791.57
18	Med. Blank	130.52	93.9	239.76	20804.9	730.61
19	Wash House deep	95.3	295.95	213.83	23391.82	638.64
21	Hair Dryer deep	83.6	142.21	169.83	17994.4	513.48
22	East Tannery North deep	158.16	52.98	204.79	10150.07	612.86
23	Bleach deep	83.34	-58.19	173.63	18265.66	544.33
25	East Tannery South deep	100.81	146.22	212.09	22459.99	645.15
26	Bleach shallow (007SS)	91.48	58.9	160.56	14411.08	488.95
27	Wash House shallow (002SS)	75.86	77.33	151.94	15999.82	463.06
28	Leach shallow (006SS)	98.65	388.51	220.82	24147.97	652.92
29	East Tannery South shallow(010S	69.14	157.98	160.3	21327.13	487.09
31	East Tannery North shallow (009S	105.57	91.11	199.34	16913.42	605.95
36	Hide Building deep	65.09	124.43	112.22	9442.78	330.57
37	SR Transect 1-1	88.87	27.97	129.99	8878.79	392.63
38	SR Transect 1-2	62.74	19.88	89.06	5842.83	266.68
39	SR Transect 1-3	54.42	31.42	74.27	4270.62	218.2
40	SR Transect 1-4	69.31	78.9	132.92	13387.72	403.08
41	SR Transect 1-5	75.78	114.34	137.34	12366.62	411.53
42	SR Transect 1-6	80.92	132.63	179.46	20498.49	546.47
44	Creek Border 1	73.13	67.38	128.85	11349.11	389.46
45	Creek Border 2	70.19	209.66	139.89	13553.58	411.94
46	Creek Border 3	89.79	268.35	186.96	19738.25	556.09
47	SR Transect 2-1	59.95	46.97	97.61	7877.58	293.34
48	SR Transect 2-2	63.47	101.02	113.79	10736.59	340.29
50	SR Transect 2-3	73.64	146.69	144.64	14563.76	433.59
51	SR Transect 2-4	68.34	141.8	160.69	17650.41	486.12
52	SR Transect 2-5	82.83	200.56	181.39	19382.64	544.87
53	SR Transect 2-6	86.44	93.87	137.88	10185.98	410.61
54	Creek Border South	70.95	14.88	133.8	12126.76	411.04
55	Cal. Blank	0	1.06	0	1.04	0
56	Zero Blank	86.04	-47.08	45.24	35.36	118.92
57	Low Blank	129.12	-74.8	259.99	26694.35	816.31
58	Med. Blank	129.76	-84.39	237.71	21509.47	744.75
59	Sed 05 deep	116.4	29.79	209.82	18925.43	646.26
60	Sed 04 deep	102.79	78.29	175.22	14897.79	531.58
61	Sed 03 deep	81.65	54.86	141.38	12054.93	428.88
65	Sed 02 deep	85.28	249.53	146.41	10889.08	419.43

Reading No		Mn	Mn Error	Cr	Cr Error	La
16	Cal. Blank	0.93	0	0.98	0	
17	Low Blank	580.83	237.36	189.89	325.92	42.25
18	Med. Blank	580.73	239.4	407.91	354.38	18.25
19	Wash House deep	288.51	170.47	229.62	259.47	39.83
21	Hair Dryer deep	134.36	133.29	186.57	219.17	51.56
22	East Tannery North deep	214.67	221.72	283.88	386.74	43.5
23	Bleach deep	239.23	150.49	102.87	225.86	30.88
25	East Tannery South deep	236.43	168.85	-11.45	240.98	26.5
26	Bleach shallow (007SS)	241.44	145.87	48.65	216.56	18.05
27	Wash House shallow (002SS)	347.24	141	264.78	212.82	13.12
28	Leach shallow (006SS)	584.44	202.87	1186.88	351.62	43.24
29	East Tannery South shallow(010S	279.08	145.56	2513.48	345.11	29.42
31	East Tannery North shallow (009S	339.95	182.89	-105.37	242.37	41.08
36	Hide Building deep	258.44	110.77	29.6	158.09	26.25
37	SR Transect 1-1	135.82	127.22	53.68	207.83	21.04
38	SR Transect 1-2	335.06	111.95	-34.96	146.32	32.92
39	SR Transect 1-3	340	103.32	64.47	142.72	45.11
40	SR Transect 1-4	233.8	118.1	-13.16	165.82	49.55
41	SR Transect 1-5	239.82	125.81	70.31	186.37	43.1
42	SR Transect 1-6	418.42	156.7	-41.17	197.66	40.69
44	Creek Border 1	285.98	124.86	-62.64	165.82	42.78
45	Creek Border 2	163.78	115.69	105.03	182.09	33.4
46	Creek Border 3	408.68	163.35	170.62	230.35	49.09
47	SR Transect 2-1	361.59	110.79	-59.15	137.12	55.2
48	SR Transect 2-2	237.99	106.39	5.1	149.91	48.79
50	SR Transect 2-3	308.08	130.41	40.26	180.64	63.98
51	SR Transect 2-4	292.12	135.73	-72.75	177.54	53.31
52	SR Transect 2-5	339.08	152.7	-147.37	189.24	40.88
53	SR Transect 2-6	90.33	122.2	90.03	208.7	26.26
54	Creek Border South	378.1	137.88	56.22	187.56	14.39
55	Cal. Blank	1.07	0	0.88	0	
56	Zero Blank	50.75	105.43	136.85	212.28	-27.53
57	Low Blank	535.21	235.69	-45.18	302.32	-149.17
58	Med. Blank	519.06	234.92	216.01	335.54	39.91
59	Sed 05 deep	285.66	186.82	138.97	283.45	40.36
60	Sed 04 deep	264.54	161.59	138.19	248.21	54.95
61	Sed 03 deep	87.66	121.98	259.6	221.55	57.1
65	Sed 02 deep	187.17	133.64	238.91	226.32	49.19

Reading No		La Error	Ba	Ba Error	Cs	Cs Error
16	Cal. Blank					
17	Low Blank	36.72	1085.91	143.14	32.35	27.74
18	Med. Blank	31.84	587.7	106.49	19.39	25.4
19	Wash House deep	34.36	400.58	88.12	6.01	23.74
21	Hair Dryer deep	29.38	545.23	85.49	58.76	22.65
22	East Tannery North deep	46.11	229.47	93.65	40.63	33.32
23	Bleach deep	24.25	201.81	56.29	17.59	16.34
25	East Tannery South deep	28.3	410.99	82.04	0.27	20.22
26	Bleach shallow (007SS)	24.22	157.39	55.3	10.89	18.19
27	Wash House shallow (002SS)	25.14	511.9	91.13	29.24	22.06
28	Leach shallow (006SS)	33.33	1315.86	140.93	33.57	26.61
29	East Tannery South shallow(010S	29.02	573.85	95.78	21.77	21.93
31	East Tannery North shallow (009S	33.95	223.05	71.73	-10.37	20.55
36	Hide Building deep	25.97	501.03	85.94	48.93	22.61
37	SR Transect 1-1	27.61	292.22	73.2	9.19	20.35
38	SR Transect 1-2	22.64	255.63	57.66	32.5	16.93
39	SR Transect 1-3	30.14	139.8	55.39	34.32	21.48
40	SR Transect 1-4	26.86	372.03	68.45	31.33	18.51
41	SR Transect 1-5	28.9	346.76	73.83	17.91	19.1
42	SR Transect 1-6	28.62	441.8	80.57	29.68	20.33
44	Creek Border 1	29.27	369.75	75.47	22.5	20.13
45	Creek Border 2	26.18	311.3	67.83	25.61	19.12
46	Creek Border 3	30.54	408.39	79.61	23.56	20.56
47	SR Transect 2-1	30.72	248.18	63.7	7.4	18.49
48	SR Transect 2-2	27.24	249.08	59.45	19.98	17.9
50	SR Transect 2-3	32.53	352.55	73.59	7.18	19.29
51	SR Transect 2-4	29.32	344.75	71.19	42.28	20.69
52	SR Transect 2-5	27.3	345.3	72.25	31.87	18.6
53	SR Transect 2-6	27.38	434.61	86.72	40.95	21.63
54	Creek Border South	24.4	440.71	81.95	46.86	22.78
55	Cal. Blank					
56	Zero Blank	18.97	0.32	41.26	-7.21	20.6
57	Low Blank	87.75	1401.93	1136.43	-115.08	204.66
58	Med. Blank	33.89	676.11	110.31	23.13	25.32
59	Sed 05 deep	32.72	578.78	99.5	11.96	22.28
60	Sed 04 deep	28.18	617.56	86.77	34.34	19.2
61	Sed 03 deep	32.13	487.38	85.17	32.06	22.17
65	Sed 02 deep	26.55	492.54	76.6	49.83	20.39

Reading No		Te	Te Error	Sb	Sb Error	Sn
16	Cal. Blank					
17	Low Blank	-5.36	60.25	-111.66	119.68	22.47
18	Med. Blank	-47.29	54.76	-33.42	117.92	40.16
19	Wash House deep	-1.98	58.04	43.8	114.5	-10.43
21	Hair Dryer deep	-8.11	45.75	-114.86	81.71	-112.22
22	East Tannery North deep	-8.95	75.3	-251.53	170.31	-25.09
23	Bleach deep	9.2	44.52	-135.05	76.84	35.15
25	East Tannery South deep	21.78	54.04	31.69	101.25	50.74
26	Bleach shallow (007SS)	54.43	52.92	-88.23	86.96	-72.74
27	Wash House shallow (002SS)	-0.97	50.87	-74.01	99.88	208.13
28	Leach shallow (006SS)	-2.29	54.83	40.93	107.72	54.29
29	East Tannery South shallow(010S	-13.69	50.43	-51.98	100.25	-32.55
31	East Tannery North shallow (009S	-11.39	55.88	39.05	118.93	-31.57
36	Hide Building deep	16.59	49.67	-101.78	89.69	98.08
37	SR Transect 1-1	-17.4	50.41	-22.03	101.37	-59.18
38	SR Transect 1-2	21.5	42.35	-112.05	71.3	42.28
39	SR Transect 1-3	8.92	50.78	-83.94	93.03	129.86
40	SR Transect 1-4	31.09	46.05	-103.22	72.58	30.47
41	SR Transect 1-5	-7.74	47.24	-74.45	90.33	124.58
42	SR Transect 1-6	0.11	48.2	-119.2	85.31	43.58
44	Creek Border 1	-10.29	47.65	-62.84	88.98	-29
45	Creek Border 2	1.42	46.18	-75.92	83.01	-32.4
46	Creek Border 3	22.29	51.53	-92.61	90.21	22.35
47	SR Transect 2-1	-13.23	46.91	-16.43	87.06	-63.6
48	SR Transect 2-2	19.89	45.92	-56.91	76.08	50.56
50	SR Transect 2-3	2.13	49.43	-8.85	90.15	30.33
51	SR Transect 2-4	49.22	50.98	-158.42	79.4	-108.87
52	SR Transect 2-5	28.55	48.9	-224.47	78.9	44.63
53	SR Transect 2-6	-16.69	48.54	-211.65	95.96	107.9
54	Creek Border South	16.16	50.59	-96.49	89.91	-13.38
55	Cal. Blank					
56	Zero Blank	-8.43	57.51	1.87	120.08	-146.51
57	Low Blank	223.39	706.78	197.63	906	-783.31
58	Med. Blank	-15.95	55.27	16.84	117.38	-3.06
59	Sed 05 deep	-21.24	52.69	-39.23	106.12	-21.25
60	Sed 04 deep	28.02	46.58	-135.87	75.25	78.73
61	Sed 03 deep	-37.06	45.99	-3.81	93.36	49.49
65	Sed 02 deep	74.38	49.44	-124.87	71.92	56.29

Reading No		Sn Error	Cd	Cd Error	Ag	Ag Error
16	Cal. Blank					
17	Low Blank	160.01	-33.53	45.04	-106.39	275.9
18	Med. Blank	156.63	3.72	53.69	-1.37	267.62
19	Wash House deep	148.42	-60.72	40.76	78.07	255.2
21	Hair Dryer deep	115.57	27.42	40.85	-76.11	198.2
22	East Tannery North deep	204.39	18.21	67.75	-604.87	377.37
23	Bleach deep	113.62	9.2	34.23	-335.89	182.76
25	East Tannery South deep	136.36	-13.6	41.74	112.7	226.62
26	Bleach shallow (007SS)	120.35	-13.59	35.3	-81.56	205.57
27	Wash House shallow (002SS)	140.2	0.69	40.11	-398.79	220.34
28	Leach shallow (006SS)	144.7	-19.3	43.8	187.49	241.36
29	East Tannery South shallow(010S	131.11	1.5	42.32	-329.53	222.49
31	East Tannery North shallow (009S	150.15	-41.48	42.14	147.74	262.07
36	Hide Building deep	128.78	-6.35	36.06	-227.19	207.38
37	SR Transect 1-1	133.11	-23.92	39.37	-43.69	229.44
38	SR Transect 1-2	105.46	4.81	29.41	-380.14	166.15
39	SR Transect 1-3	133.26	10.68	42	-237.54	213.55
40	SR Transect 1-4	111.45	-34.1	28.19	-79.51	179.24
41	SR Transect 1-5	130.23	-9.96	36.65	-143.63	208.4
42	SR Transect 1-6	125.2	-8.27	36.77	-184.6	204.5
44	Creek Border 1	125.77	-34.23	34.17	91.89	212.36
45	Creek Border 2	115.45	-12.48	34.24	-297.49	191.51
46	Creek Border 3	126.83	4.7	39.85	-230.9	209.48
47	SR Transect 2-1	119.44	-54.3	30.84	-62.8	201.85
48	SR Transect 2-2	113.64	-20.97	32.7	-57.52	182.12
50	SR Transect 2-3	125.33	-19	38.23	-94.66	205.66
51	SR Transect 2-4	115.78	-10.65	33.84	-64.9	199.05
52	SR Transect 2-5	120.4	1.44	34.03	-466.8	194.83
53	SR Transect 2-6	138.56	9.28	38.84	-457.37	225.82
54	Creek Border South	126.46	-12.79	37.04	-95.37	212.21
55	Cal. Blank					
56	Zero Blank	147.12	-40.59	42.62	54.99	267.4
57	Low Blank	1170.74	-359.52	275.47	1949.31	2446.78
58	Med. Blank	148.84	-6.51	46.94	-45.1	256.03
59	Sed 05 deep	141.89	-31.63	40.9	10.94	243.36
60	Sed 04 deep	115.99	-23.89	28.77	-211.55	183.73
61	Sed 03 deep	129.47	-50.91	33.33	-49.15	212.41
65	Sed 02 deep	112.22	-11.26	30.94	-80.68	178.67

Reading No		Pd	Pd Error
16	Cal. Blank		
17	Low Blank	39.77	222.29
18	Med. Blank	153.36	216.51
19	Wash House deep	191.46	204.26
21	Hair Dryer deep	-77.18	145.43
22	East Tannery North deep	-310.88	320.23
23	Bleach deep	-141.36	134.23
25	East Tannery South deep	89.96	173.55
26	Bleach shallow (007SS)	-96.57	152.23
27	Wash House shallow (002SS)	-175.76	169.75
28	Leach shallow (006SS)	93.46	185.18
29	East Tannery South shallow(010S	19.52	176.54
31	East Tannery North shallow (009S	225.92	209.87
36	Hide Building deep	-89.13	156.37
37	SR Transect 1-1	38.03	177.78
38	SR Transect 1-2	-201.4	117.37
39	SR Transect 1-3	-67.78	163.56
40	SR Transect 1-4	-61.74	128.8
41	SR Transect 1-5	-35.02	157.47
42	SR Transect 1-6	-147.2	151.47
44	Creek Border 1	24.91	158.65
45	Creek Border 2	-4.75	146.25
46	Creek Border 3	-144.59	157.25
47	SR Transect 2-1	56.46	153.38
48	SR Transect 2-2	57.55	134.98
50	SR Transect 2-3	63.32	157.65
51	SR Transect 2-4	-110.56	144.95
52	SR Transect 2-5	-162.89	147.26
53	SR Transect 2-6	-318.27	170.95
54	Creek Border South	15.13	161.69
55	Cal. Blank		
56	Zero Blank	32.46	211.68
57	Low Blank	860.33	1984.51
58	Med. Blank	25.24	202.14
59	Sed 05 deep	39.35	189.59
60	Sed 04 deep	-167.54	131.54
61	Sed 03 deep	180.38	166.14
65	Sed 02 deep	-104.06	126.51

REFERENCE 3

LATITUDE AND LONGITUDE CALCULATION WORKSHEET #2

LI USING ENGINEER'S SCALE (1/60)

SITE NAME: Transylvania Tanning Co. CERCLIS #: NCN000410007

AKA: n.a. SSID: n.a.

ADDRESS: Silversteen Drive

CITY: Brevard STATE: NC ZIP CODE: 28712

SITE REFERENCE POINT: existing chimney

USGS QUAD MAP NAME: Brevard TOWNSHIP: - N/S RANGE: - E/W

SCALE: 1 : 24,000 MAP DATE: 1997 SECTION: - 1/4 - 1/4 - 1/4

MAP DATUM 1927 [1983] (CIRCLE ONE) MERIDIAN: -

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 7.5' MAP (attach photocopy)

LONGITUDE: 82 ° 37 ' 30.00 " LATITUDE: 35 ° 7 ' 30.00 "

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LONGITUDE: 82 ° 42 ' 30.00 " LATITUDE: 35 ° 12 ' 30.00 "

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM LATITUDE GRID LINE TO SITE REF POINT: 241

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A X 0.3304 = 79.63 "

C) EXPRESS IN MINUTES AND SECONDS (1' = 60") : 1 ' 19.63 "

D) ADD TO STARTING LATITUDE: 35 ° 12 ' 30.00 " + 1 ' 19.63 "

SITE LATITUDE: 35 ° 13 ' 49.63 "

35.2305 °

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM RIGHT LONGITUDE LINE TO SITE REF POINT: 365

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A X 0.3304 = 120.60 "

C) EXPRESS IN MINUTES AND SECONDS (1' = 60") : 2 ' 0.60 "

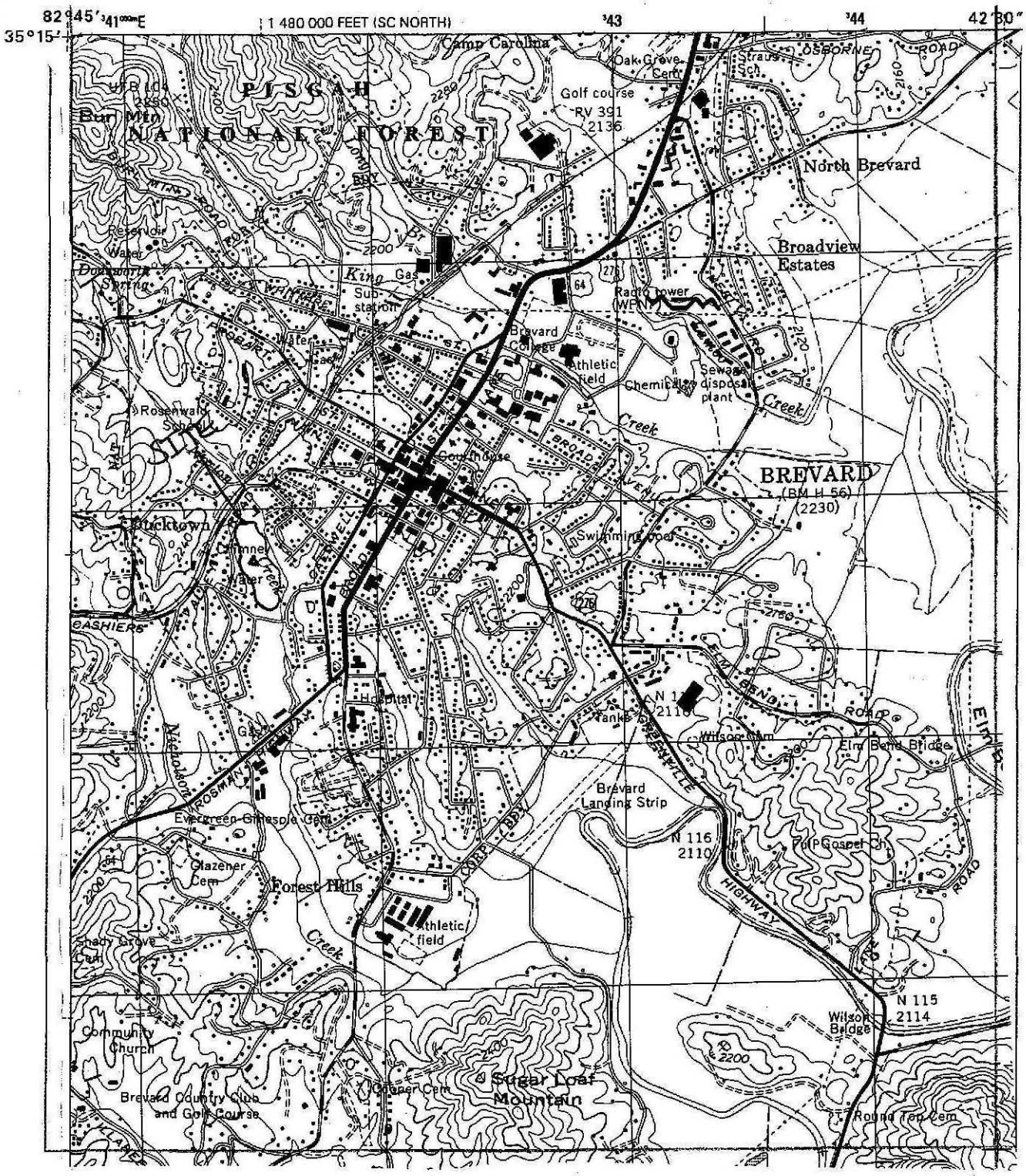
D) ADD TO STARTING LATITUDE: 82 ° 42 ' 30.00 " + 2 ' 0.60 "

SITE LONGITUDE: 82 ° 44 ' 30.60 "

82.7418 °

INVESTIGATOR: Melanie Bartlett DATE: 12/12/2007

SITE NAME: Transylvania Tanning Co. NUMBER: NCN000410007



TOPOGRAPHIC MAP QUADRANGLE NAME: Brevard SCALE: 1 : 24,000

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LATITUDE:	35 °	12 '	30.00 "	LONGITUDE:	82 °	42 '	30.00 "
		35.2083 °				82.7083 °	

REFERENCE 4

NOAA Atlas 14 Precipitation frequency estimates (inches)
Point Estimates
Data series Partial duration maxima
State NORTH CAROLINA
Station BREVARD
Lon (dd) -82.7053
Lat (dd) 35.2156
Elev (feet) 2155
MEAN PRECIPITATION FREQUENCY ESTIMATES

Freq (yr)	5-min	10-min	15-min	30-min	60-min	120-min	3-hr	6-hr	12-hr	24-hr	2-day	4-day	7-day	10-day	20-day	30-day	45-day	60-day
1	0.39	0.62	0.78	1.07	1.33	1.58	1.74	2.35	3.09	3.87	4.66	5.29	6.24	7.19	9.71	11.87	15.08	17.99
2	0.47	0.74	0.94	1.29	1.62	1.92	2.09	2.8	3.7	4.63	5.55	6.29	7.41	8.5	11.42	13.9	17.61	20.94
5	0.55	0.89	1.12	1.59	2.04	2.41	2.61	3.45	4.54	5.69	6.74	7.53	8.86	10.07	13.25	15.89	19.84	23.4
10	0.62	1	1.26	1.83	2.38	2.81	3.05	4.01	5.22	6.53	7.7	8.5	10.01	11.32	14.66	17.4	21.45	25.14
25	0.71	1.13	1.44	2.13	2.83	3.36	3.68	4.82	6.19	7.69	9.01	9.81	11.59	13.01	16.5	19.31	23.39	27.23
50	0.78	1.24	1.57	2.36	3.2	3.81	4.21	5.52	6.99	8.62	10.06	10.83	12.84	14.35	17.89	20.71	24.77	28.68
100	0.85	1.34	1.7	2.6	3.58	4.29	4.77	6.28	7.84	9.59	11.14	11.85	14.1	15.68	19.24	22.01	26.01	29.96
200	0.91	1.45	1.82	2.84	3.98	4.81	5.39	7.12	8.76	10.58	12.25	12.88	15.38	17.04	20.55	23.25	27.13	31.09
500	1	1.58	1.99	3.17	4.55	5.54	6.3	8.37	10.07	11.95	13.77	14.26	17.11	18.84	22.23	24.77	28.44	32.39
1000	1.07	1.69	2.12	3.43	5	6.15	7.07	9.44	11.17	13.03	14.95	15.31	18.45	20.23	23.46	25.86	29.32	33.25

Date/time: Tue Aug 10 16:11:12 EDT 2010

http://hdsc.nws.noaa.gov/hdsc/pfds/orb/nc_pfds.html

BREVARD, TRANSYLVANIA COUNTY, NORTH CAROLINA USA

WorldClimate

New Homes for $22,900
Mobile Homes & Manufactured Homes
-Buy New At The Factory For $22,900
www.FBHexpo.com

Weather Data For The Month
Search multiple engines for weather
data for the month
www.webcrawler.com

NC Mountain Rental Cabin
Located near Brevard, Hendersonville
and Asheville, NC
www.Branchnberry.com

Ads by Google

Weather station **BREVARD, TRANSYLVANIA COUNTY** is at about 35.21°N 82.73°W. Height about 670m / 2198 feet above sea level.

Average Rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
mm	124.9	137.6	162.5	119.8	150.3	140.9	150.1	164.5	129.2	135.1	137.4	150.3	1703.3
inches	4.9	5.4	6.4	4.7	5.9	5.5	5.9	6.5	5.1	5.3	5.4	5.9	67.1

Source: BREVARD, TRANSYLVANIA COUNTY data derived from NCDC TD 9641 Clim 81 1961-1990 Normals. 30 years between 1961 and 1990

Map of the area around BREVARD, TRANSYLVANIA COUNTY from tiger.census.gov.
Locations outside the continental US are not mapped.

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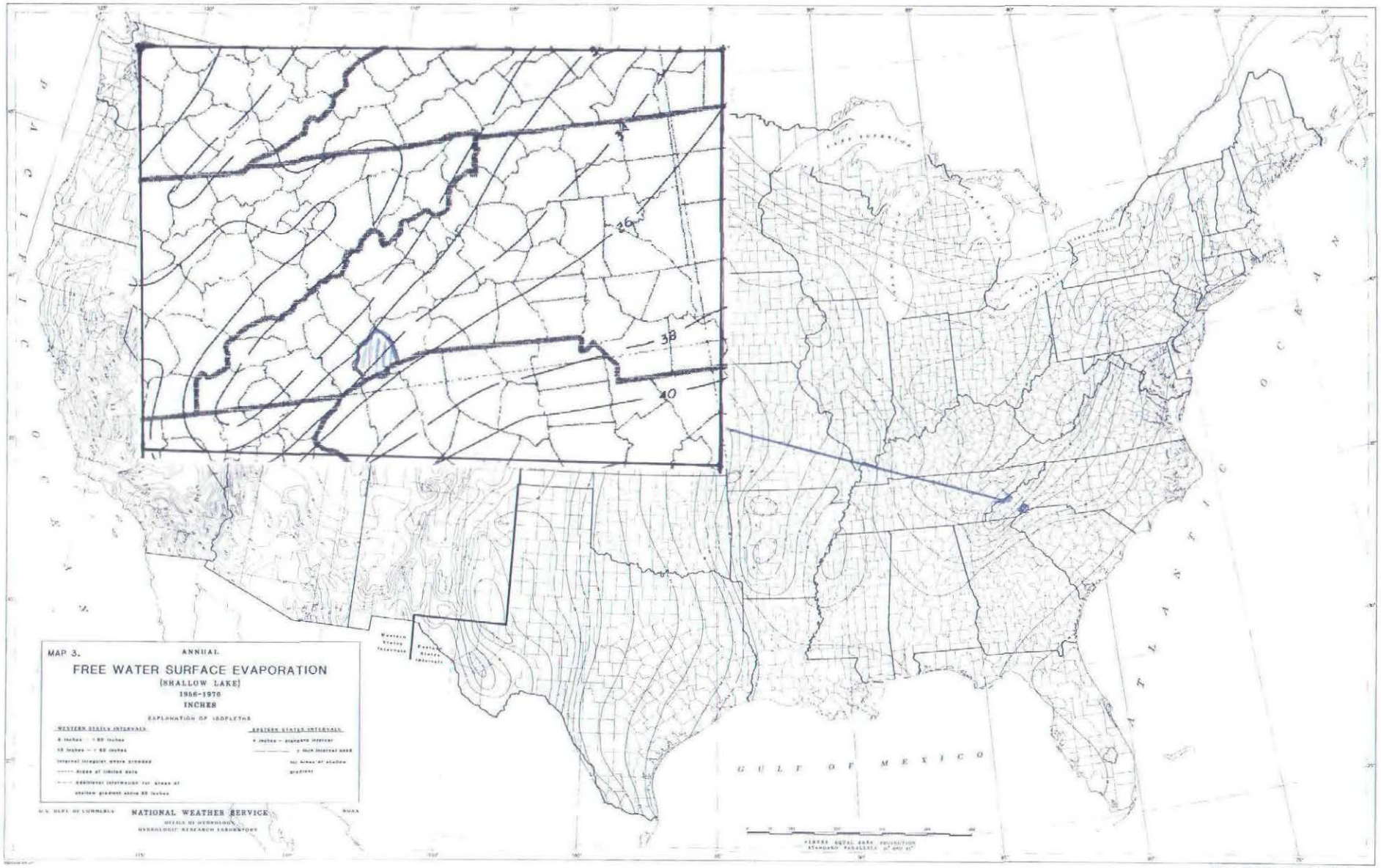

NOAA Technical Report NWS 33
Map 3 of 4: Annual FWS Evaporation

http://www.nws.noaa.gov/oh/hdsc/PMP_related_studies/TR33.pdf

REFERENCE 5

Subject: Fw: Possible toxic site
From: Wendel.Jennifer@epamail.epa.gov
Date: Mon, 06 Nov 2006 16:41:47 -0500
To: james.bateson@ncmail.net

----- Forwarded by Jennifer Wendel/R4/USEPA/US on 11/06/2006 04:41 PM -----

Karen Domanski <k0d@gaiaherbs.com>
10/26/2006 05:49 PM

To: Jennifer Wendel/R4/USEPA/US@EPA
cc:
Subject: Possible toxic site

Dear Ms Wendel:
Thank you for replying to my voice mail.
There is a 53 lot planned housing development called "Preston Meadows", file PHD - 05 - 06 PIN #8585-38-1389 which has been submitted to the City of Brevard Planning Department by Mr. Satpal Rathie, a Carey N.C. General Contractor/Owner of the property.
Briefly, There was a tannery on the original LARGER property which closed in 1947. Senator Charles Taylor now owns the original tannery site, but a piece was broken off and was held by one or two other owners before Mr. Rathie.
Our planning department told me they tested the tannery site within the last few years and found it toxic and discontinued any development plans. However, the piece across the street which has a NEW owner, Mr. Rathie...has not been tested, or tests have not been revealed to our Association (The McMinn Neighborhood Association - 20 families). I would also mention, no one has declared this site a superfund site, neither the Senator Taylor Tannery site or the broken off proposed development site.

Norton Creek runs from the original tannery site down through the proposed development site. For 30 years it killed all the fish in the stream as the tannery people flushed out wastes through the stream onto the creek and property. Also due to various changes from weather and land development, the creek has moved somewhat and now appears to run along the boarder of the proposed property to be developed. There is an old couple in their eighties living in the neighborhood now who remember this.

Two large companies investigated this property and mysteriously dropped the project after their investigations (it is also a FEMA Floodway, a flood plain and wetlands. It collects water for the surrounding area and does it's job very well. Even with 8" of rain our properties DO NOT FLOOD...but the land is very bogy....)
We want to know once and for all if this is a toxic site as Mr. Rathie is quite determined to push the project through. He will not reveal any level I,II EPA test results to us, insisting it's taken care of , therefore we cannot trust he will test or has tested in the correct areas.

We have new UDO laws and somehow the town elected to "grandfather" him in to move forward in his process.
There's so much wrong with this project, but finding out if this is a toxic site with do much to help our neighborhood association wrestle with the rest of the problematic issues. (like 500 truckloads of dirt dumped on the floodplain and 12 units per acre.!!)

Is the pin number a good enough location for you..I do also have a small site map and will do my best to get other identifying information for you. I have received your fax and believe this site is eligible for further investigations through the petition process. Please let me know the site to download the Citizen Petition.

Thank you for your time.
Karen Domanski
McMinn Neighborhood Association
24 McMinn Avenue
Brevard, NC 28712
WK 828-883-5903

October 27, 2006

Superfund Division
EPA Region 4
61 Forsyth Street
Atlanta, GA 30303

Attn: Jennifer Wendel

Under the authority of CERCLA Section 105 (d), as amended, the Petitioner:

Karen A. Domanski (McMinn Neighborhood Association)
24 McMinn Ave
Brevard, North Carolina 28712

Hereby requests that Region 4 of the United States Environmental Protection Agency (Superfund Division) conduct a preliminary assessment of the suspected release of a hazardous substance, pollutant, or contaminant at the following location:

"The parcel is boarded by Silversteen Avenue, Aiken Street, McMinn Avenue and is parallel to Rosman Highway (which is Hwy 64). The proposed development site is 14.63 Acres of land within the City Limits of the City of Brevard, NC". There is a 53 lot planned housing development called "Preston Meadows", file PHD – 05 – 06 PIN #8585-38-1389 which has been submitted to the City of Brevard Planning Department by Mr. Satpal Rathie, a Carey N.C. General Contractor/Owner of the property.

The Petitioner is affected by the release of tannery contaminants:

Briefly, there was a tannery on the adjacent property to the proposed development (Preston Meadows) which closed in 1947. Senator Charles Taylor now owns the original tannery site, however Preston Meadows was broken off and was held by one or two other owners before Mr. Rathie.
Our planning department told me they tested the tannery site within the last few years and found it toxic and discontinued any development plans. However, Preston Meadowns, across the street which has a NEW owner, Mr. Rathie...has not been tested, or tests have not been revealed to our Association (The McMinn Neighborhood Association – 20 families). I would also mention, no one has declared either site a superfund site.

Norton Creek runs from the original tannery site downstream through the proposed development site. For 40 years it killed all the fish in the stream as the tannery people flushed out wastes through the stream onto the creek and property. Also due to various changes from weather and land development, the creek has moved somewhat and now appears to run along the boarder of the proposed property to be developed.

Two large companies investigated this property and mysteriously dropped the project after their investigations (it is also a FEMA Floodway, a flood plain and wetlands. It collects water for the surrounding area and does it's job very well. Even with 8" of rain our properties DO NOT FLOOD...but the land is very bogy....)

We want to know once and for all if this is a toxic site as Mr. Rathie is quite determined to push the project through. He will not reveal any level I,II EPA test results to us, insisting it's taken care of , therefore we cannot trust he will test or has tested in the correct areas.

Type of substances involved: Typical tannery contaminants, mercury, chromium, lead any and all heavy metal contaminants.

Nature and history of Tannery:
Opened in the early 1900's and closed in 1947 flushing toxic waste in property and creeks for over 40 years, killing all fish in creek.

State and Local authorities you have contacted about the threatened release:
Brevard Planning Department. Said they tested Senator's Taylor's site and chose not to develop. No records of testing were made available for us to review.

Submitted by:
Karen A. Domanski

Karen A. Domanski

U.S. Environmental Protection Agency

Superfund Information Systems

Superfund Site Information

Site Documents

Data Element Dictionary (DED)

Order Superfund Products

Superfund Site Information

TRANSYLVANIA TANNING CO.

Site Information

Site Info | Aliases | Operable Units | Contacts Actions | Contaminants | Site-Specific Documents

Site Name: TRANSYLVANIA TANNING CO.
Street: SILVERSTEEN AVE
City / State / ZIP: BREVARD, NC

NPL Status: Not on the NPL
Non-NPL Status: PA Start Needed

EPA ID: NCN000410007
EPA Region: 04
County: TRANSYLVANIA

Federal Facility Flag: Not a Federal Facility

Return to Search Results **Return to Search Superfund Site Information**

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U.S. Environmental Protection Agency

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Superfund Site Information

Site Documents

Data Element Dictionary (DED)

Order Superfund Products

Superfund Site Information

TRANSYLVANIA TANNING CO.

Actions

Site Info | Aliases | Operable Units | Contacts
Actions | Contaminants | Site-Specific Documents

OU	Action Name	Qualifier	Lead	Actual Start	Actual Completion
00	DISCOVERY		F		01/24/2007

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URL: http://cfpub.epa.gov/supercpad/cursites/cactinfo.cfm
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REFERENCE 6

I am enclosing some contract forms and attachments for a Phase I or Phase II audit which will indicate the scope of such an Environmental Impact Study.

I hope that the attached inspection report meets with your requirements. Should you have any questions, please let me know.

The statement for our work to date of $600 is attached. This fee should be paid regardless of the additional work you may contract with us.

We appreciate the opportunity of working with you.

Sincerely,

Eric Wellisch, President
Asheville Radon & Environmental Consultants, Inc.

Enclosures

ASHEVILLE RADON & ENVIRONMENTAL CONSULTANTS, INC.
P.O. BOX 8624 • ASHEVILLE, NC 28814 • (704) 252-2577

MR. DEE A. FREEMAN
City Manager
City of Brevard
151 W. Main St
Brevard, N.C. 28712

January 12, 1994

STATEMENT

Environmental Site
INSPECTION
Old Tannery Property

The fee for this Environmental Inspection is $ 600 00

Analytical testing N/A $ —

Total $ 600 00

Payment is due on receipt. Thank you.

ASHEVILLE RADON & ENVIRONMENTAL CONSULTANTS, INC.
P.O. BOX 8624 • ASHEVILLE, NC 28814 • (704) 252-2577

ENVIRONMENTAL SITE INSPECTION

To: Dee A. Freeman
City Manager
City of Brevard, North Carolina 28712

From: Eric Wellisch, President
Asheville Radon & Environmental Consultants, Inc.

As requested by Mayor Peterson and authorized by Dee A. Freeman, City Manager, an Environmental Site Inspection was carried out of the "Old Tannery Property" located in Brevard, North Carolina. It was the purpose of this inspection to determine, if possible, whether or not environmental hazards exist at this site. Accordingly, Dr. Eric Wellisch and Dr. Lorence Rapoport visited the "Old Tannery Property" site on January 6, 1994. The results of this inspection is summarized as follows:

1. Location

The property consists of 12.2 acres of land (Tax Map No. B-07-1-01-031) located within the Brevard city limits, east of Cashiers Valley Road and west of Caldwell Road. It is an oval-shaped piece of low lying land bounded on the west by a subdivision of houses off Silverstein Road. The southern and eastern boundary of the site is the "Brushy Creek" which empties into "Norton Creek" north of the site. Silverstein Road makes a loop to the south of the property and runs to the north, parallel to "Brushy Creek." A row of houses lies between the creek and Silverstein Road.

2. Accessibility

Heavy undergrowth of bushes and vines extending 4-8 feet in height prevented us from accessing the property and thus we were not able to see or examine any of the remnants of any buildings or chemical vats remaining from the old Transylvania Tanning Company which closed down some 30 years ago. There is a tall brick chimney extending approximately 100-150 feet in height in the northern section of the site, but we could not examine the boiler section connected with this chimney. We must assume that much of any concrete (block) structure has collapsed and has been buried over the years.

3. Environmental Assessment

a. Examination of maps in the geological survey office of the North Carolina Department of Economic and Community Development showed that the land along Brushy Creek within the site is in the flood plain or, at best, in its fringe. We also understand that according to Mr. Don Owen, the Director of Public Works of the City of Brevard, the site has poor drainage, i.e., the ground stays wet for long periods of time. These conditions would have a negative impact on contamination due to previous land usage or potential present dumping. Any waste products due to faulty sewers or abandoned septic systems of the surrounding homes at higher elevation would almost certainly find their way into the lower property and the creek.

A major concern is the possibility that all or a portion of this property is jurisdictional wetland. A discussion with Mr. Bob Twomey of the U.S. Department of Agriculture, Division of Soil Conservation, in Brevard confirmed that the soil is "Toxaway Silt Loam" which is hydric soil of poor drainage. This is conducive to the growth of "hydrophytic" (wetland type) vegetation which appears to be growing in this area. A wetland delineation survey needs to be carried out to determine the extent of these apparent conditions.

b. Examination of the records of the Asheville office of the North Carolina Department of Environment, Health and Natural Resources showed an environmental incident close to the site originating at the Duke Power Operations Center in 1991. Leakage of a gasoline underground storage tank resulted in 8 monitor wells to determine the extent of soil contamination. Although Ms. Jan Anderson, hydrologic engineer, stated this incident to be of "low priority," it is still active (as of January 7, 1994).

c. Personal observations of the site indicate some dumping at the eastern boundary of the property near Brushy Creek, where some old automobile tires and other junk can be seen from Silverstein Drive. The extent of this dumping could not be determined.

4. Conclusions and Recommendations

a. Regardless of contemplated land usage-housing development, industrial or recreational--a wetland delineation survey must be carried out to determine the potential best usage of this property. Based on this survey and its recommendations, the

extent of soil contamination by chemicals, metals or other toxins should be determined.

b. The amount of structural debris, the possible existence of old underground storage tanks and the potential for ground water contamination, as indicated in the Environmental Assessment Section, must be ascertained.

c. The soundness of the chimney and its potential usage within current environmental regulation needs to be examined.

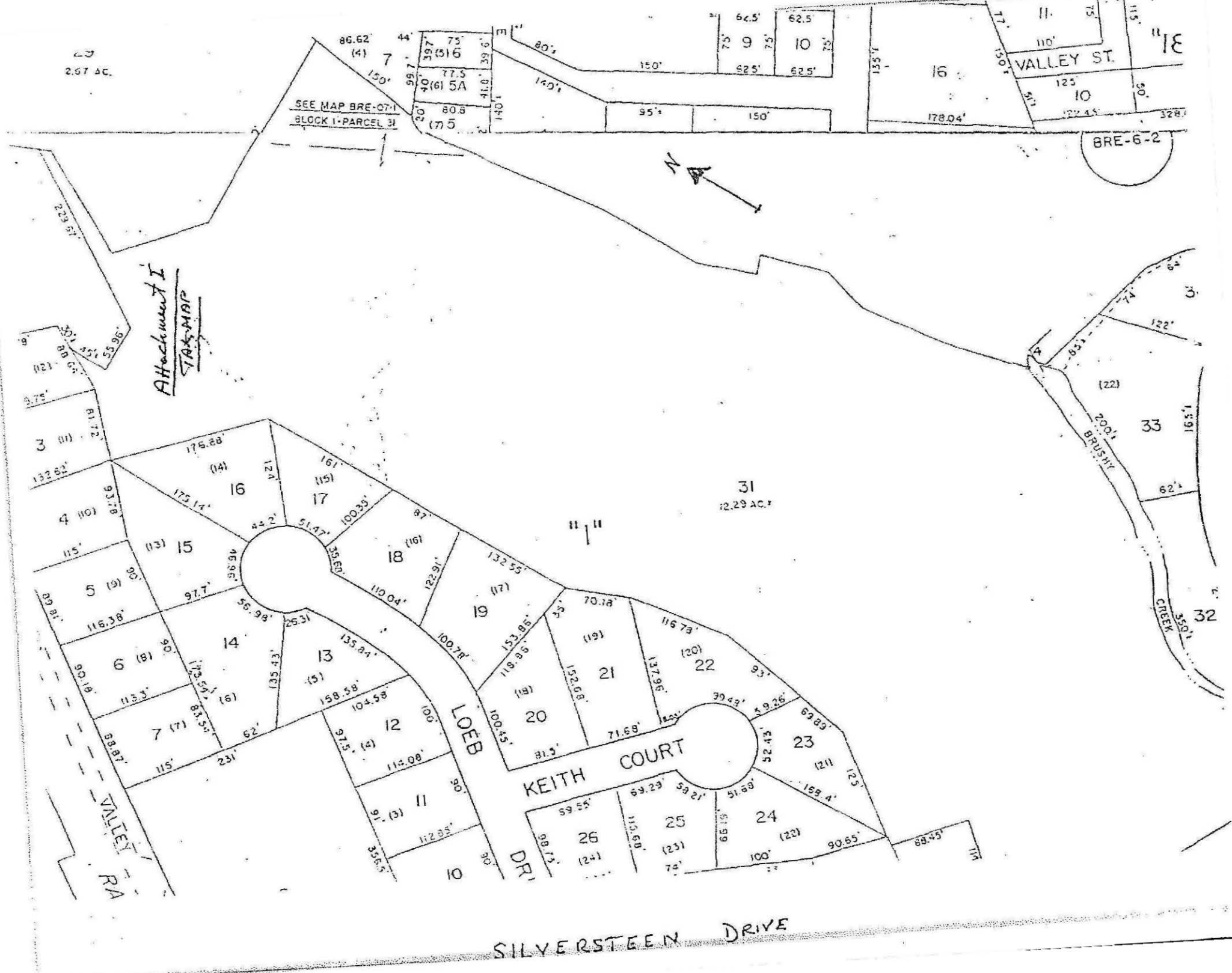
Based on our environmental site inspection, we must recommend that the wetland delineation survey be done as soon as possible to determine the potential value of this property to the City of Brevard based on its future planning.

Positive conclusions to this wetland survey will require a Phase II Environmental Audit to provide the City with quantitative answers to the potential environmental problems indicated by this inspection.

Included in such an audit is a ¼ mile circumferential inspection for potential environmental hazards and a 50 year chain of title to provide an indication of prior land utilization.

In order to carry out any further work as recommended above some of the land must be cleared throughout its length and width to make it accessible. We have discussed this access problem with Mr. Don Owen, Director of Public Works, who has assured us of his assistance in providing the required access.

Attachments: I - Taxmap
II - Orthophoto Map
III - FEMA Map - Flood plain


Attachment I
TAX MAP
SEE MAP BRE-07-1
BLOCK 1-PARCEL 31
VALLEY ST.
BRE-6-2
BRUSHY CREEK
LOEB DR.
KEITH COURT
VALLEY RA
SILVERSTEEN DRIVE
31
12.29 AC.

ORTHOPHOTO MAP SECTION OF

Attachment II

E 882,000

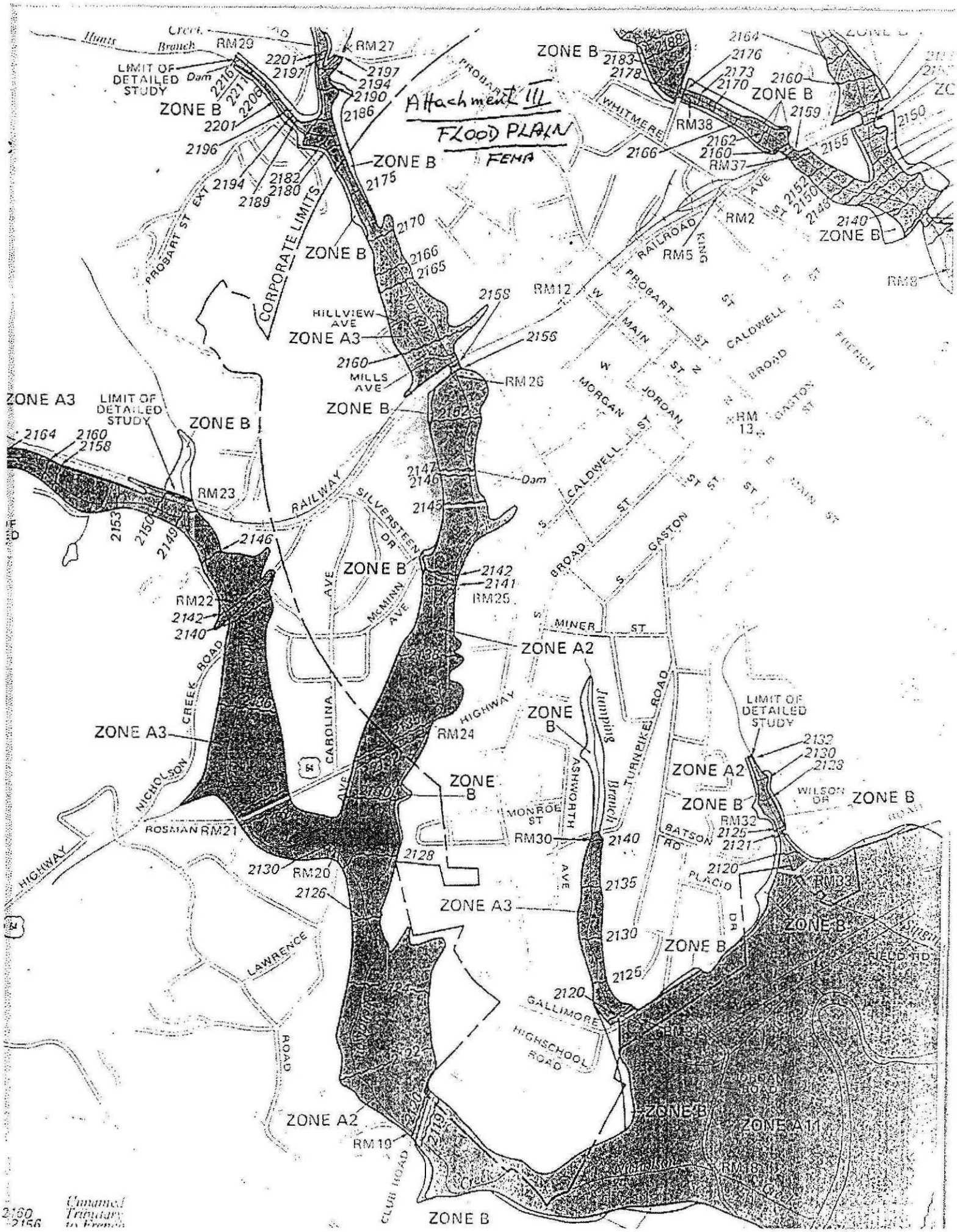
E 884,000

MATC

Attachment III

FLOOD PLAIN

FEMA



ASHEVILLE RADON & ENVIRONMENTAL CONSULTANTS, INC.
P.O. BOX 8624 • ASHEVILLE, NC 28814 • (704) 252-2577

Mr Dee A. Freeman
City Manager, Brevard
151 W Main St
Brevard, NC 28712

Jan 14/94

Dear Mr Freeman,

We omitted to enclose the information indicated in my letter to you regarding the scope of Phase I / Phase II Environmental Audits. I am therefore sending you this info with my apology. As a follow-up to our report I would like to talk to you sometimes next week to see if you have any questions and to determine the timing of any further work.

Sincerely

ASHEVILLE RADON & ENVIRONMENTAL CONSULTANTS, INC.
P.O. BOX 8624 • ASHEVILLE, NC 28814 • (704) 252-2577

Agreement and Authorization

In accordance with our recent verbal/telephone discussions we herewith agree to carry out one of the following environmental services:

A - Preliminary site inspection

B - Phase I environmental audit

C - Phase II environmental audit

It is mutually understood that any of the above inspection/audit will be carried out in accordance with guidelines as outlined in the attachment and as specifically applicable to the service required by the contracting agent.

Asheville Radon and Environmental Consultants, Inc. "AREC" agrees to carry out the required service_____ for the agreed to contract price of $_____. The cost for quantitative sampling and testing as may be required is to be charged additionally at invoice.

This contract becomes binding for all parties when:

A - Countersigned by the contracting agent

B - All pertinent data have been furnished to AREC including an in depth title search, if available.

C - An initial deposit of 20% of the contract price has been received by "AREC"

This contract has been prepared in two counterparts.

Date_____ Date_____

_____
Signature of officer for AREC

_____
Signature of contracting agent

_____
Name of contracting corporation

ASHEVILLE RADON & ENVIRONMENTAL CONSULTANTS

166 E. CHESTNUT STREET ASHEVILLE, N.C. 28801 • 704-252-2577

Items to be considered for a Phase I/Phase II Environmental Audit

1. "AREC" is familiar with all applicable federal, state and local environmental laws and ordinances at the property location.

2. "AREC" has inspected the site including all buildings, structures, improvements on land and surface waters on site and adjacent in accordance with the attached qualitative/quantitative check list as may be applicable.

3. "AREC" has reviewed the chain of title for the property for at least the last 50 years and is familiar with current and prior uses of the property which can be related to any potentially hazardous materials or conditions existing currently or in prior years on this property or its surroundings.

4. "AREC" has checked all prior federal, state or local records regarding any environmental infractions which may have occurred on or near the property in question, including any prior designation of the site as a hazardous waste site or hazardous materials disposal site.

5. "AREC" has reviewed appropriate aerial photographs of the property and surrounding area.

6. "AREC" has reviewed any tests previously made and available on the site in question or has initiated pertinent soil tests in case of potential serious soil contamination. These quantitative tests to be related to Phase II audits only.

7. "AREC" has determined the existence, location, and past or present status of all above ground or underground storage tanks in accordance with EPA and state regulations.

8. "AREC" is familiar with the existence of any environmental threat to ground water wells on or near the property.

9. "AREC" can make definitive conclusions as to existence of hazardous materials including friable or nonfriable asbestos on the site in question, i.e. contained in any of the buildings.

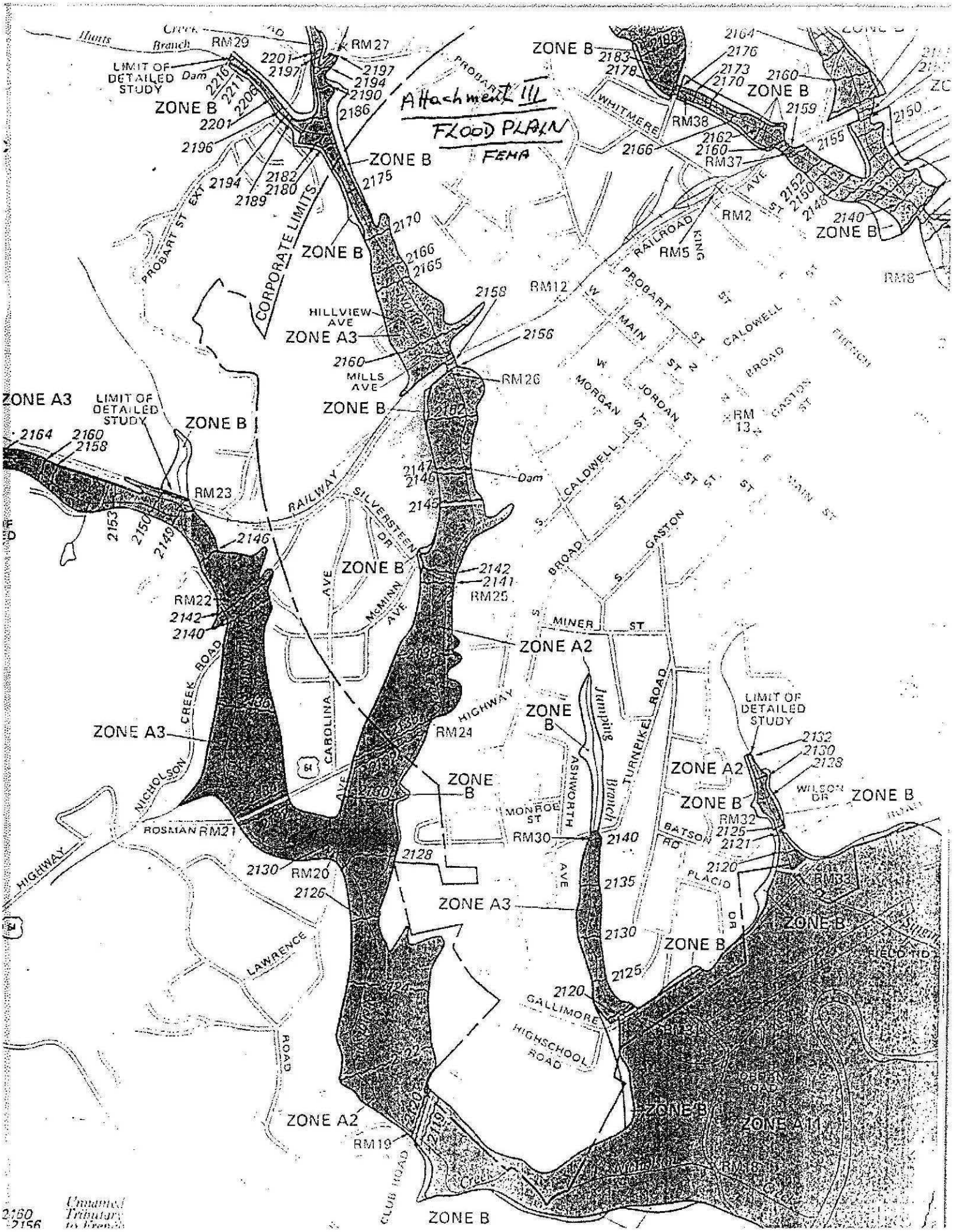
10. "AREC" has ascertained the existence of high tension wires on or near the property or the source of any hazardous emission of gaseous pollutants which could have a negative environmental impact on the property.

ASHEVILLE RADON & ENVIRONMENTAL CONSULTANTS

166 E. CHESTNUT STREET ASHEVILLE, N.C. 28801•704-252-2577

QUALITATIVE/QUANTITATIVE CHECKLIST

_____Public water supply
_____Individual well-water supply
_____Asbestos insulation
_____Urea-formaldehyde foam insulation
_____Individual septic system
_____Public sewer lines
_____Settling, slippage, sliding, or other soil problems
_____Flooding, grading, or drainage problems
_____Depressions, mounds or soft spots
_____Traces of concete, metal, or asphalt indicating prior commercial use
_____Ravines or earth embankment that may indicate former dumping
_____Discoloring of soil or vegetation
_____Oil sheen in wet areas
_____Malfunctioning septic systems
_____Contamination of well water
_____Proximity of property to former or current waste disposal sites
_____Proximity of property to former, current, or proposed commercial establishments, such as industrial plants, gas stations and military facilities
_____Underground gas or oil tanks
_____Proximity of property to former, current, or proposed mines or gravel pits
_____Proximity of property to farms
_____Elevated radon levels on the property
_____Elevated radon levels in the neighborhood
_____Pipelines carrying oil, gas, or chemicals underneath or adjacent to the property
_____Existance of pipeline rights-of-way or easements over or adjacent to the property
_____Use of lead-base paint (any paint prior to 1978) on any surfaces
_____Other (describe)
Hi Tension Wires
Golf Course - fertilizer
Sources of Air Emission


Attachment III
FLOOD PLAIN
FEMA
Hunts Branch
RM29
RM27
LIMIT OF DETAILED STUDY
Dam
ZONE B
ZONE A3
ZONE A2
ZONE A1
CORPORATE LIMITS
PROBART ST EXT
HILLVIEW AVE
MILLS AVE
RM26
RM12
RM2
RM5
RM8
RM38
RM37
RM13
RM23
RM22
RM25
RM24
RM21
RM20
RM19
RM18
RM30
RM32
RM33
RAILROAD
RAILWAY
SILVERSTEEN DR
McMINN AVE
CAROLINA AVE
HIGHWAY
CREEK ROAD
NICHOLSON
ROSMAN
LAWRENCE
ROAD
CLUB ROAD
GALLIMORE
HIGHSCHOOL ROAD
MONROE ST
ASHWORTH AVE
Jumping Branch
TURNPIKE ROAD
MINER ST
BATSON RD
PLACID DR
WILSON DR
WHITMERE
PROBART ST
W MAIN ST
MORGAN ST
JORDAN ST
CALDWELL ST
BROAD ST
GASTON ST
KING ST
Channel Tributary to French

ORTHOPHOTO MAP SECTION OF TH

Attachment II

E 882,000

E 884,000

MATC

REFERENCE 7

MEMO

TO: File
FROM: Jeanette Stanley, Environmental Chemist, NC Superfund Section
DATE: November 7, 2006
SUBJECT: Charles Taylor Tannery/ aka Transylvania Tanning Co
Brevard, Transylvania Co., NC

The Transylvania Tanning Co. is visible on a 1931 Sanborn map of Brevard, Transylvania Co., NC. On the Sanborn map, this tannery is alongside "Brushy Creek". The NC Directory of Manufacturing Firms lists the Transylvania Tanning Co. in the 1944, 1956 and 1960 editions. Later editions (through 1976) do not list an active tannery in Brevard.

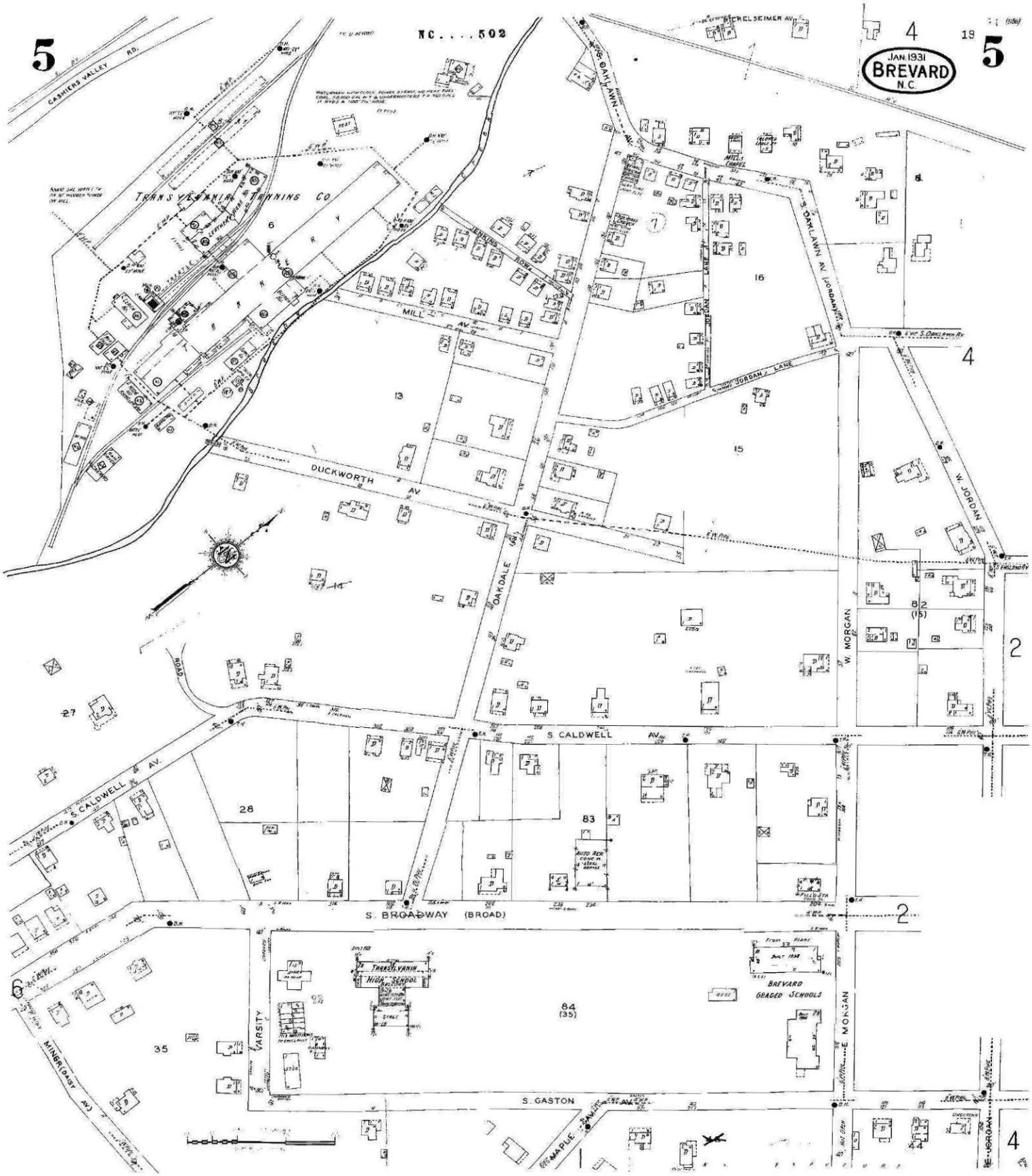
An earlier reconnaissance in the Brevard area was unsuccessful in locating this tannery. Recent emails (Oct. 30 and Nov. 6, 2006) have helped pinpoint this location.

Apparently, the name of the creek has been changed to Norton Creek, and most street names have changed since 1931. The most recent USGS topographic map shows the location of a chimney reported to still be standing. Attached are maps showing the location of this former tannery. Floodplain maps show that the old tannery lies within the 100-year floodplain.

Attached are several maps of the area, with handwritten notes.

Research into the typical steps in tanning process provides guidance on contaminants expected to be associated with an old tannery:

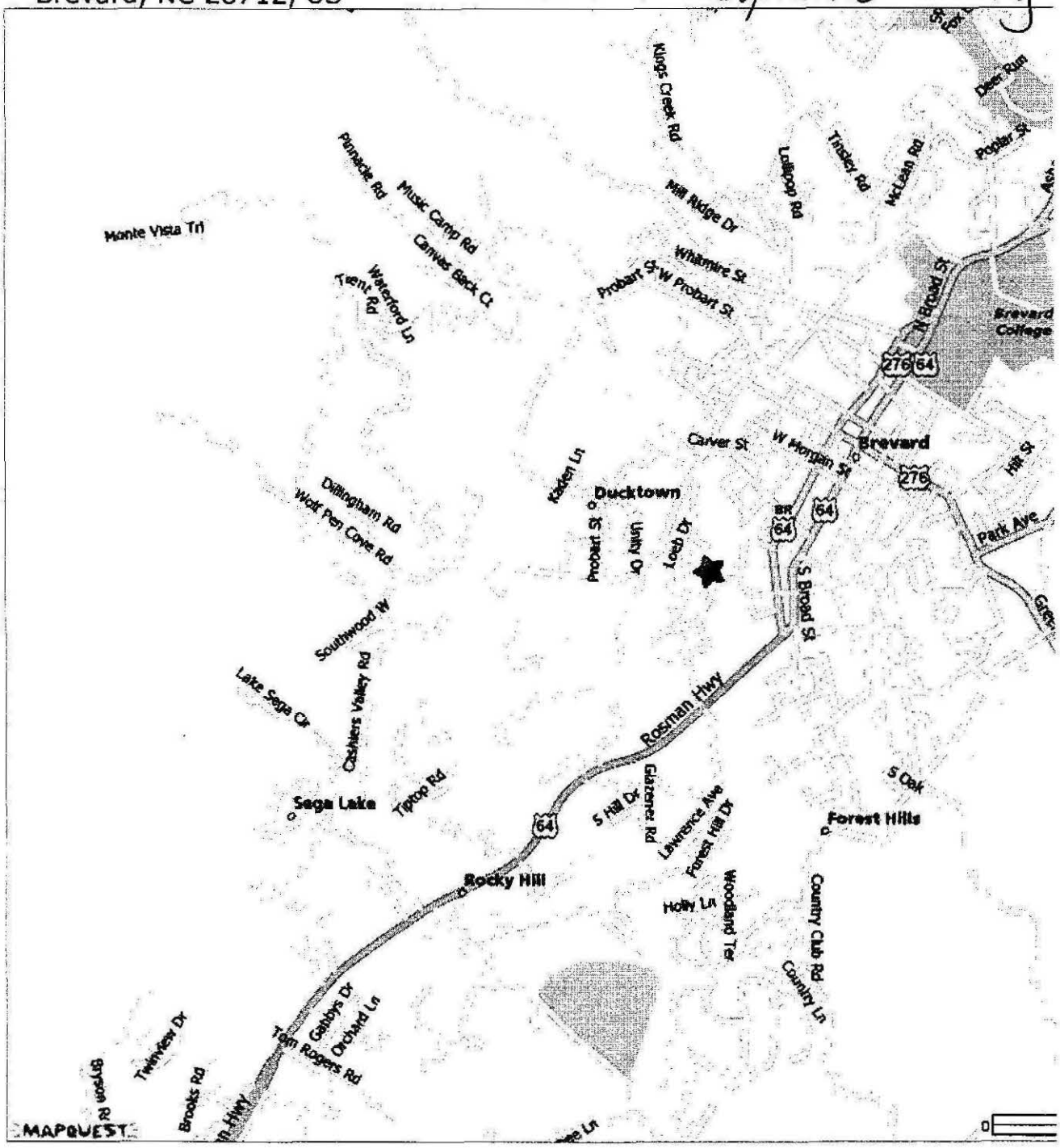
1. leather is soaked in a brine
2. Detergent solution & soak
3. Hair removal with calcium hydroxide (lime) alone or with a sharpening agent (arsenic or cyanide, both of which are no longer used), or sodium sulfide or sodium sulfhydrate. Unhairing with sulfide at pH >11.5 causes a BOD effluent
4. Fresh liming step
5. Deliming salt (ammonium sulfate), lowers pH to 8-9.
6. Enzymes/bating
7. Pickling with sulfuric acid to pH <3.
8. Tanning chemical – usually chrome sulfate
9. pH raised with Sodium bicarbonate
10. At this point, tanned hide considered to be "in the blue", and ready for selection for use and further refinement


NC....502
JAN. 1931
BREVARD
N.C.
CASHIERS VALLEY RD.
TRANSYLVANIA TANNING CO.
MILL AV.
DUCKWORTH AV.
OAKDALE
S. OAKLAWN AV.
JORDAN LANE
W. JORDAN
W. MORGAN
S. CALDWELL AV.
S. BROADWAY (BROAD)
TRANSYLVANIA HIGH SCHOOL
BREVARD GRADED SCHOOLS
VARSITY
E. MORGAN
S. GASTON
MAPLE
MINBROOKS AV.
AUTO REPAIR
BICKELSEIMER AV.

MAPQUEST.

Charles Taylor Tannery/
aka Transylvania Tanning Co.

★ **Silversteen Dr & Mcminn Ave**
Brevard, NC 28712, US



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There is a smoke stack from Tannery still standing

Charles Taylor Tannery Site

SEWER IMPROVEMENT PLAN FOR
Nolan Creek
Development - West
Preston Meadows Subdivision
Mr. Satpal Rathie
Re Corporation
Property Management & Development
LOCATED ON U.S. HIGHWAY 64 WEST
BREVARD, NC
TRANSYLVANIA COUNTY
NORTH CAROLINA

PROJECT SUMMARY

APPROVED

COLWELL DRIVE

PROPOSED FUTURE BUILDING

U.S. 64

AIKEN STREET

Creek

Creek

SILVERSTEEN DRIVE

RATHIE COURT

VERDERY AVE

McMINN AVENUE

PROJECT SUMMARY

TYPICAL SECTION

PLAN VIEW

TYPICAL LOT LAYOUT

GRAPHIC SCALE - FEET

PRELIMINARY
DO NOT USE FOR CONSTRUCTION

T.E. ALLEN ENGINEERING PC
CONSULTING ENGINEERS
PO BOX 103
ROSMAN, NORTH CAROLINA 28772
(828) 877-4863
FAX (828) 877-4863

SITE PLAN
Preston Meadows Subdivision
U.S. Highway 64 West - Rosman Hwy
Transyvania County

Vertical Scale: NONE
Horizontal Scale: 1"=50'
Issue Date: 9-29-2006

C-1
SHEET 1 OF

RECEIVED 10-5-06

PHD-05-0

MEMO TO: File
FROM: Jeanette Stanley
DATE: August 19, 2009
SUBJECT: Site Discovery Initiative
Tannery Industry

Jeanette Stanley, Chemist, NC Superfund Section

Because the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) was not enacted until 1980, NC Superfund recognized that many tanneries would have closed prior to this date, leaving behind undocumented contamination. In light of this possibility, NC Superfund undertook the task of reviewing NC Directories of Manufacturing Firms, starting with the 1938 volume, and going through the 1976 volume. In addition, NC Superfund reviewed Sanborn Fire Insurance maps dating back to the late 1880s. These old maps are the best source for industrial locations dating from 1880s – 1930s. Tanneries were one of many industry categories considered during this document review process.

Several tanneries in other parts of the country are listed on the Superfund National Priorities List (NPL), and they have posed serious threats to human health and the environment.

The tanning process generally follows this process:

1. Leather is soaked in brine, and then is soaked in a detergent solution.
2. Hair removal is accomplished with calcium hydroxide (lime) alone or with a sharpening agent (arsenic or cyanide, both of which are no longer used), or sodium sulfide or sodium sulfhydrate. Unhairing with sulfide at pH >11.5 causes a BOD effluent.
3. After hair removal, there is a fresh liming step followed by a deliming salt (ammonium sulfate) which lowers the pH to 8-9.
4. Subsequent steps include enzymes/bating and pickling with sulfuric acid to pH <3.
5. The leather is then tanned, using a tanning chemical – often chrome sulfate, or tannin derived from bark.
6. Then, the pH is raised with sodium bicarbonate
7. At this point, tanned hide considered to be "in the blue", and ready for selection for use and further refinement.

Contaminants often associated with tanneries include arsenic, cyanide, and low pH from the brine. Chemical-based tanneries used chromium. Leather finishing chemicals often consisted of solvents, and some tanneries used chlorinated solvents. Many tanneries in NC have been found to have used tannins extracted from tree bark (particularly chestnut), as the tanning chemical rather than chromium, and these have not had chromium associated with them.

Of the approximately 20 tannery facilities identified by NC Superfund's document search, about half have been studied under CERCLA, although most of these investigations did not include sampling. Most of those studied have been found to be associated with chestnut bark tanning operations. Some remain to be studied, and some have not yet been positively located. Most of the tanning operations were small operations. However, five tanneries employed more than 150 people: Hans Rees in Asheville, International Shoe/Burke Tannery in Morganton, Andrews Tanning in Andrews, AC Lawrence in Hazelwood, and Transylvania Tanning in Brevard. Soil sampling conducted by the NC Superfund Section at three chestnut bark tannery sites did not detect constituents that could be attributed to any tanning process.

Several NC tanneries are suspected of being chemical based tanneries. The AC Lawrence Tannery in Waynesville, NC is a 20-acre site adjacent to Benfield Industries, an NPL site. The AC Lawrence facility operated for 90 years. While AC Lawrence was primarily a chestnut bark tanning operation, surface soil around the warehouse and in a ditch contained lead, arsenic, zinc, phthalates, naphthalene, and several polycyclic aromatic hydrocarbons. One area of soil contained up to 7,200 mg/kg (ppm) of chromium. Groundwater underneath the site contained lead and chromium above groundwater standards. This contaminated groundwater was near former residential dwellings, but the aquifer no longer served residential properties for drinking water. No release to the surface water pathway was documented. AC Lawrence was recommended for NFRAP under CERCLA in 1998, and is currently listed on the NC Inactive Hazardous Sites Branch inventory.

A smaller tannery in Goldsboro (Drutan) was also suspected of being a chemical tannery. A recent Preliminary Assessment/Site Inspection of this site resulted in no further action under CERCLA.

Transylvania Tanning in Brevard, NC is known to have been one of the larger tannery operations in the State, so remaining on-site waste volumes may be large. The operation there is known to have used the chestnut bark process, and associated wastes therefore may have arsenic, cyanide, or low pH. It is not confirmed whether or not chromium was used at this tannery. Transylvania Tannery is located in a densely developed residential area, with residences located within 200 feet of houses, and access to the property is unrestricted.

County	City	Industry	Facility name	Status & #*	Ref.	Notes
			Corp.		15	
Wayne	Goldsboro	Leather, shoe	Barry of Goldsboro	175	10	Barry Lane
Buncombe	Asheville	Leather, Tannery	Hans Rees' Sons	225	1, 2	Lyman and Riverside; 1925 Sanborn map shows tannery
Burke	Morganton	Leather, Tannery	Burke Tannery			According to "Drummond's Pictorial Atlas of NC" (1922), this was the largest tannery in the south
Burke	Morganton	Leather, Tannery	International Shoe	175	1	no address;
Catawba	Conover (Newton?)	Leather, Tannery	Lackawanna Leather on Inactive Sites List; NFRAP	<10	14, 15	8th St E, 710; (estab 1970); finish upholstery leather; could not find anything at 8th St address (2006); Somerset Dr, 106 appears to be inactive sites address
Cherokee	Andrews	Leather, Tannery	Andrews Tanning Co.	125	1	not in 1956 directory
Cherokee	Andrews	Leather, Tannery	J.P. Cover & Sons		2	see 1924 & 1949 Sanborn map
Guilford	Greensboro	Leather, Tannery	McLeod Leather & Belting (14); Page Belting (Concord, NH)	53	1, 10, 14, 15	Scott Ave, 910; (estab 1919); leather belting (10) & textile leathers (14)
Haywood	Hazelwood	Leather, Tannery	A. C. Lawrence, Div. of Swift & Co. in 1956, 68 A. AKA Swift & Co. (8)	225	1, 7, 8, 9, 10, 14, 15	Listed on CERCLA (estab 1894)
Jackson	Sylva	Leather, Tannery	Armour Leather	125	1	no address;
Jackson	Sylva	Leather, Tannery	Parson's Tanning		2	1933 Sanborn
Nash	Rocky Mount	Leather, Tannery	Dacy, Inc.	<50	8	Boone Rd, 1536
Surry	Elkin	Leather, Tannery	Chemurgy Corp.	<25	9	no address;
Surry	Elkin	Leather, Tannery	Elkin Tanning Co.	20	1, 3, 10	Main St E, 209 (3)
Transylvania	Brevard	Leather, Tannery	Transylvania Tanning Co.	275	1, 7, 8	also shown in 1956 directory
Transylvania	Rosman	Leather, Tannery	Toxaway Tanning Co.	88	1, 2	See Sanborn
Wayne	Goldsboro	Leather, Tannery	Drutan Products	75	9, 10, 14	Hwy 117 N; (estab 1958); grain & chamois leather from hides, soda ash, sulfuric acid
Cherokee	Andrews	Leather, Tannery chem.	Teas Extract Co.	88	1, 2, 3	Home office, Nashville, TN (1); see 1924 & 1949 Sanborn map
Buncombe	Arden	Machine	E. A. Industries	175	15	Glenn Bridge Rd (estab 1954); hydraulic machines
Buncombe	Asheville	Machine	Product Engineering	<50	15	Sweeten Creek Rd, 2700 (estab 1968); valves 7 machinery
Catawba	Hickory	Machine	Central Tool & Mfg	<20	15	17th St SW; 1021; aircraft & tools
Catawba	Hickory	Machine	Crescent Machine Co.	<20	14	11th St NW, 123; (estab 1945); repair machine parts
Catawba	Hickory	Machine	Gregg Machine Repair	<20	15	1st Ave SW; 3913; (estab 1961); truck repairs
Catawba	Hickory	Machine	Precision Industries	<20	14	2nd Ave NW, 1144; (estab 1950);
Catawba	Hickory	Machine	Producers Tool & dye	<10	15	Highland Ave, 1127;

1. NC Directory of Manufacturing Firms – 1944, located in State Library of North Carolina. Only 52 counties showed industries of potential concern to NC Superfund.

2. Sanborn Maps

3. NC Directory of Manufacturing Firms, 1948 (not a very valuable ref., but does have some street addresses)

4. Dept. of Commerce Industrial Directory & Reference book, 1938.

5. Site Universe Report, Zeller, Craig, RPM, USEPA; Memo to Green, Richard D. et. al. January 23, 2001.

6. Fertilizer plant search, Nov. 2002 memo, Jeanette Stanley.

7. NC Directory of Manufacturing Firms, 1956 (or 1958 supplement)

8. NC Directory of Manufacturing Firms, 1960

8.5. 1962 supplement to 1960 directory

9. NC Directory of Manufacturing Firms, 1964

10. NC Directory of Manufacturing Firms, 1968

11. *Navassa – The Town and its People.* Eulis A. Willis. 1995.

12. De Rossett, W. L. , "Wilmington, N.C., 1902.

13. Lead Smelter Sites apparently unknown to federal and state authorities" (see Mike Deaton; google search)

14. NC Directory of Manufacturing Firms, 1972

15. NC Directory of Manufacturing Firms, 1976

*Note that where the source provided a range for the number of employees (e.g. 16 – 25), the average of the two number is entered here. Where source provided a range of 0 – 50, "<50" was entered. For industries showing estimated populations as greater ranges (e.g. 500 – 1000), the average was listed. Starting in 1964, the 0 – 50 size category was broken down into 0 – 25 and 25 – 50. For those businesses that were listed prior to 1964 and showed a 0 – 25 size in 1964, the number of employees was changed from <50 to <25. For those showing 25 – 50 employees, the listing was left at <50.

Other potential industries not listed above:

REFERENCE 8

December 3, 2007

MEMO

To: File

From: Melanie Bartlett Melanie Bartlett

Subject: Transylvania Tanning Co.
Brevard, Transylvania County
Off-site Reconnaissance

On Wednesday, November 28, 2007, Melanie Bartlett and Jeanette Stanley of the NC Superfund Section completed an off-site reconnaissance at the above-mentioned site. Due to lack of permission from Mr. Charles Taylor, the property owner, we did not access the site proper.

The site is accessible to the public and is primarily surrounded by residential properties. The nearest residences to the facility are located along Loeb Drive, Keith Court, Hemphil Avenue, and Duckworth Avenue. The upper property which previous including the manufacturing operations is covered and overgrown with brush. The lower property is primarily an open field.

One structure, a brick tower, is remaining on the original tannery site. There was no evidence present of other structures or specific stressed vegetation.

XRF readings along the bank of the adjacent creek showed nothing of significance present.

GPS for Transylvania Tanning Co., 11/28/07

Reading	Longitude	Latitude	Height Above Elliptioid	Elevation above MSL	File Name	Horizontal Precision	Std Deviation
1	-82.740423	35.2284	617.633	648.994	R041313A.cor	1.5	0.007593
2	-82.740033	35.22466	620.926	652.297	R041314A.cor	1.4	0.001509

XRF Readings 11/28/07

Index	Reading No	Time	Type	Duration	Units	Sequence	SAMPLE	Flags	Mo	Mo Error	Zr	Zr Error	Sr	Sr Error
1A	42	11/28/2007 10:30	BULK	51.5	ppm	Final	R041313A	-99.9	-5.03	6.13	847.79	29.89	28.41	5.11
1B	43	11/28/2007 10:33	BULK	62.27	ppm	Final	R041313A	-99.9	-3.2	5.96	918.62	28.97	27.37	4.68
2A	44	11/28/2007 10:35	BULK	60.58	ppm	Final	R041314A	-99.9	-7.81	5.77	1048.84	29.3	23.89	4.26
2B	45	11/28/2007 10:38	BULK	60.88	ppm	Final	R041314A	-99.9	-8.88	4.85	613.63	23.92	25.18	4.42

XRF Readings 11/28/07

Index	Rb	Rb Error	Pb	Pb Error	Se	Se Error	As	As Error	Hg	Hg Error	Zn	Zn Error	Cu	Cu Error
1A	45.93	6.64	31.11	15.42	-0.99	8.98	-0.19	10.64	18.38	14.56	108.4	46.92	-30.49	66.03
1B	43.87	6.09	12.71	12.64	3.9	8.61	2.07	8.91	6.71	12.78	57.12	40.63	-17.19	60.29
2A	36.16	5.35	12.17	11.74	6.36	8.09	6.48	8.59	16.08	12.14	103.03	39.3	21.1	55.15
2B	38.72	5.68	8.9	11.47	-3.12	7.59	-5.29	7.57	1.95	12.04	55.83	38.78	-35.88	56.36

XRF Readings 11/28/07

Index	Ni	Ni Error	Co	Co Error	Fe	Fe Error	Mn	Mn Error	Cr	Cr Error	La	La Error	Ba	Ba Error
1A	27.23	86.61	124.63	178.71	13826.41	490.54	266.71	150.01	-15.8	96.99	-3.18	29.61	430.01	102.32
1B	80.72	81.72	68.2	166.66	14157.59	463.22	178.92	132.6	0.84	91.38	38.28	26.96	560.68	87.2
2A	13.79	70.35	-16.95	132.84	9980.2	373.84	109.78	111.5	-10.03	79.9	38.61	28.61	438.74	79.1
2B	0.66	73.59	16.92	144.77	10922.57	404.93	369.18	140.18	-23.56	82.93	-10.87	24.2	375.53	86.82

XRF Readings 11/28/07

Index	Cs	Cs Error	Te	Te Error	Sb	Sb Error	Sn	Sn Error	Cd	Cd Error	Ag	Ag Error	Pd	Pd Error
1A	-6.31	26.39	-8.32	64.64	170.95	133.02	-177.64	160.01	-58.69	47.15	345.47	287.82	285.58	225.52
1B	20.29	20.04	33.12	49.42	12.76	92.24	141.08	125.37	17.41	38.37	-219.02	197.78	-144.67	145.86
2A	15.33	19.87	-44.42	44.06	13.08	89.3	-7.22	122.79	-50.35	33.16	-10.08	204.23	177.84	158.34
2B	6.96	24.5	10.22	59.39	102.89	122.61	-111.34	146.3	2.65	51.22	91.88	261.39	155.7	209.06

MEMO

TO: File

FROM: Harry Zinn, Environmental Engineer, NC Superfund Section

DATE: December 29, 2009

SUBJECT: Leather Tanning memo from Melanie Bartlett on December 14, 2007
Transylvania Tanning Co
Brevard, Transylvania Co., NC

Melanie Bartlett's memo dated December 14, 2007 identified the wrong website for her source of information. The correct website link is;
http://www.epa.gov/ttn/chief/ap42/ch09/final/c9s15.pdf

December 14, 2007

MEMO

To: File

From: Melanie Bartlett Melanie Bartlett

Subject: Leather Tanning

Information concerning the leather tanning process can be obtained at the following website:

http://www.epa.gov/ttnchie1/ap42/ch09/final/c9s15.pdf

There are two primary types of tanning: chrome and vegetable. Each is explained at this location on EPA's website.

9.15 Leather Tanning

9.15.1 General[1-4]

Leather tanning is the process of converting raw hides or skins into leather. Hides and skins have the ability to absorb tannic acid and other chemical substances that prevent them from decaying, make them resistant to wetting, and keep them supple and durable. The surface of hides and skins contains the hair and oil glands and is known as the grain side. The flesh side of the hide or skin is much thicker and softer. The three types of hides and skins most often used in leather manufacture are from cattle, sheep, and pigs.

Tanning is essentially the reaction of collagen fibers in the hide with tannins, chromium, alum, or other chemical agents. The most common tanning agents used in the U. S. are trivalent chromium and vegetable tannins extracted from specific tree barks. Alum, syntans (man-made chemicals), formaldehyde, glutaraldehyde, and heavy oils are other tanning agents.

There are approximately 111 leather tanning facilities in the United States. However, not every facility may perform the entire tanning or finishing process. Leather tanning and finishing facilities are most prevalent in the northeast and midwest states; Pennsylvania, Massachusetts, New York, and Wisconsin account for almost half of the facilities. The number of tanneries in the United States has significantly decreased in the last 40 years due to the development of synthetic substitutes for leather, increased leather imports, and environmental regulation.

9.15.2 Process Description[1-2,5-6]

Although the title of this section is "Leather Tanning", the entire leathermaking process is considered here, not just the actual tanning step. "Leather tanning" is a general term for the numerous processing steps involved in converting animal hides or skins into finished leather. Production of leather by both vegetable tanning and chrome tanning is described below. Chrome tanning accounts for approximately 90 percent of U. S. tanning production. Figure 9.15-1 presents a general flow diagram for the leather tanning and finishing process. Trimming, soaking, fleshing, and unhairing, the first steps of the process, are referred to as the beamhouse operations. Bating, pickling, tanning, wringing, and splitting are referred to as tanyard processes. Finishing processes include conditioning, staking, dry milling, buffing, spray finishing, and plating.

9.15.2.1 Vegetable Tanning -

Heavy leathers and sole leathers are produced by the vegetable tanning process, the oldest of any process in use in the leather tanning industry. The hides are first trimmed and soaked to remove salt and other solids and to restore moisture lost during curing. Following the soaking, the hides are fleshed to remove the excess tissue, to impart uniform thickness, and to remove muscles or fat adhering to the hide. Hides are then dehaired to ensure that the grain is clean and the hair follicles are free of hair roots. Liming is the most common method of hair removal, but thermal, oxidative, and chemical methods also exist. The normal procedure for liming is to use a series of pits or drums containing lime liquors (calcium hydroxide) and sharpening agents. Following liming, the hides are dehaired by scraping or by machine. Deliming is then performed to make the skins receptive to the vegetable tanning. Bating, an enzymatic action for the removal of unwanted hide components after liming, is performed to impart softness, stretch, and flexibility to the leather. Bating and deliming are usually performed together by placing the hides in an aqueous solution of an ammonium salt and proteolytic

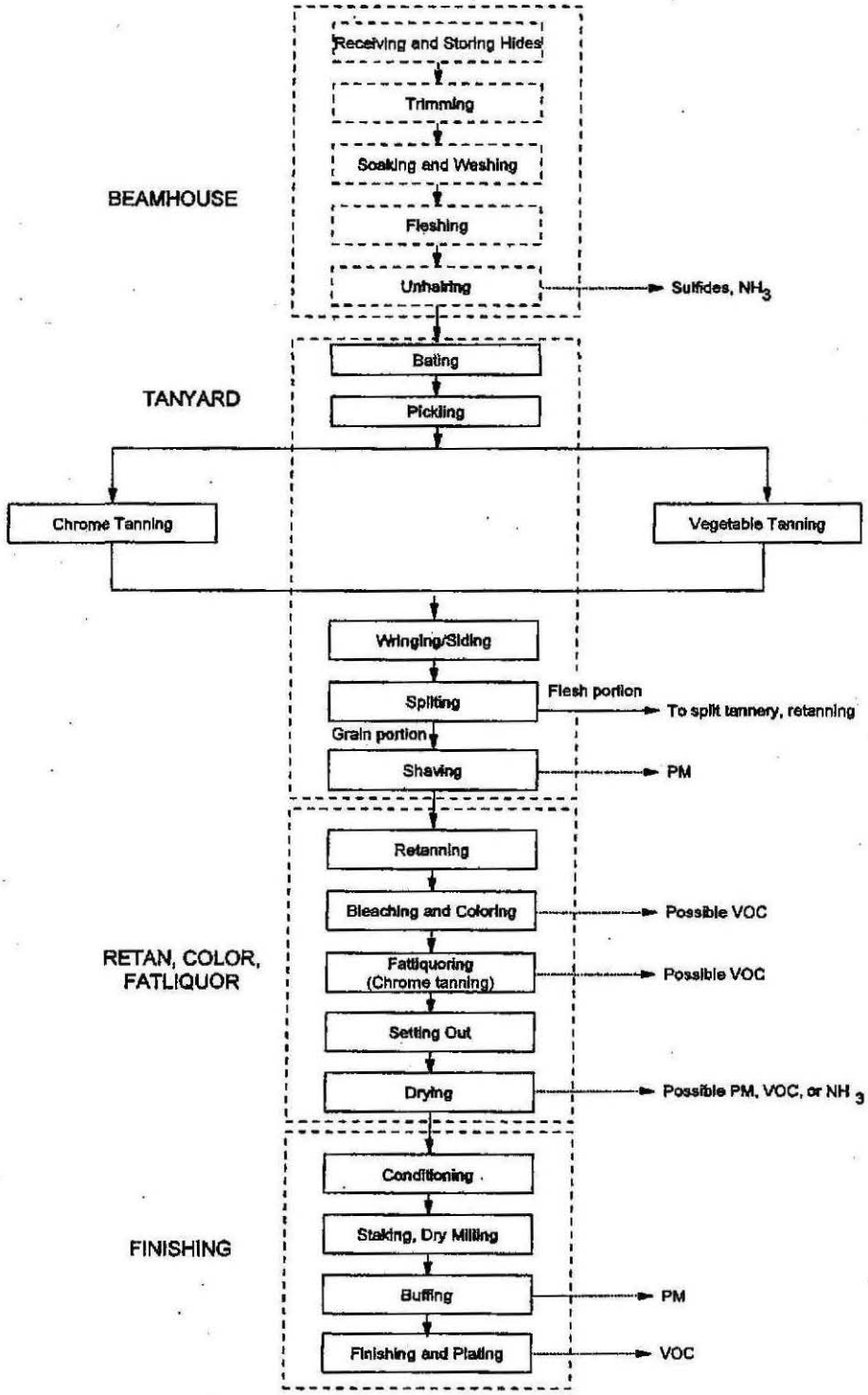


Figure 9.15-1. General flow diagram for leather tanning and finishing process.

enzymes at 27° to 32°C (80° to 90°F). Pickling may also be performed by treating the hide with a brine solution and sulfuric acid to adjust the acidity for preservation or tanning.

In the vegetable tanning process, the concentration of the tanning materials starts out low and is gradually increased as the tannage proceeds. It usually takes 3 weeks for the tanning material to penetrate to the center of the hide. The skins or hides are then wrung and may be cropped or split; heavy hides may be retanned and scrubbed. For sole leather, the hides are commonly dipped in vats or drums containing sodium bicarbonate or sulfuric acid for bleaching and removal of surface tannins. Materials such as lignosulfate, corn sugar, oils, and specialty chemicals may be added to the leather. The leather is then set out to smooth and dry and may then undergo further finishing steps. However, a high percentage of vegetable-tanned leathers do not undergo retanning, coloring, fatliquoring, or finishing.

Leather may be dried by any of five common methods. Air drying is the simplest method. The leather is hung or placed on racks and dried by the natural circulation of air around it. A toggling unit consists of a number of screens placed in a dryer that has controlled temperature and humidity. In a pasting unit, leathers are pasted on large sheets of plate glass, porcelain, or metal and sent through a tunnel dryer with several controlled temperature and humidity zones. In vacuum drying, the leather is spread out, grain down, on a smooth surface to which heat is applied. A vacuum hood is placed over the surface, and a vacuum is applied to aid in drying the leather. High-frequency drying involves the use of a high frequency electromagnetic field to dry the leather.

9.15.2.2 Chrome Tanning -

Chrome-tanned leather tends to be softer and more pliable than vegetable-tanned leather, has higher thermal stability, is very stable in water, and takes less time to produce than vegetable-tanned leather. Almost all leather made from lighter-weight cattle hides and from the skin of sheep, lambs, goats, and pigs is chrome tanned. The first steps of the process (soaking, fleshing, liming/dehairing, deliming, bating, and pickling) and the drying/finishing steps are essentially the same as in vegetable tanning. However, in chrome tanning, the additional processes of retanning, dyeing, and fatliquoring are usually performed to produce usable leathers and a preliminary degreasing step may be necessary when using animal skins, such as sheepskin.

Chrome tanning in the United States is performed using a one-bath process that is based on the reaction between the hide and a trivalent chromium salt, usually a basic chromium sulfate. In the typical one-bath process, the hides are in a pickled state at a pH of 3 or lower, the chrome tanning materials are introduced, and the pH is raised. Following tanning, the chrome tanned leather is piled down, wrung, and graded for the thickness and quality, split into flesh and grain layers, and shaved to the desired thickness. The grain leathers from the shaving machine are then separated for retanning, dyeing, and fatliquoring. Leather that is not subject to scuffs and scratches can be dyed on the surface only. For other types of leather (i. e., shoe leather) the dye must penetrate further into the leather. Typical dyestuffs are aniline-based compounds that combine with the skin to form an insoluble compound.

Fatliquoring is the process of introducing oil into the skin before the leather is dried to replace the natural oils lost in beamhouse and tanyard processes. Fatliquoring is usually performed in a drum using an oil emulsion at temperatures of about 60° to 66°C (140° to 150°F) for 30 to 40 minutes. After fatliquoring, the leather is wrung, set out, dried, and finished. The finishing process refers to all the steps that are carried out after drying.

9.15.2.3 Leather Finishing

Leathers may be finished in a variety of ways: buffed with fine abrasives to produce a suede finish; waxed, shellacked, or treated with pigments, dyes, and resins to achieve a smooth, polished surface and the desired color; or lacquered with urethane for a glossy patent leather. Water-based or solvent-based finishes may also be applied to the leather. Plating is then used to smooth the surface of the coating materials and bond them to the grain. Hides may also be embossed.

9.15.3 Emissions and Controls[2,4,6]

There are several potential sources of air emissions in the leather tanning and finishing industry. Emissions of VOC may occur during finishing processes, if organic solvents are used, and during other processes, such as fatliquoring and drying. If organic degreasing solvents are used during soaking in suede leather manufacture, these VOC may also evaporate to the atmosphere. Many tanneries are implementing water-based coatings to reduce VOC emissions. Control devices, such as thermal oxidizers, are used less frequently to reduce VOC emissions. Ammonia emissions may occur during some of the wet processing steps, such as deliming and unhairing, or during drying if ammonia is used to aid dye penetration during coloring. Emissions of sulfides may occur during liming/unhairing and subsequent processes. Also, alkaline sulfides in tannery wastewater can be converted to hydrogen sulfide if the pH is less than 8.0, resulting in release of this gas. Particulate emissions may occur during shaving, drying, and buffing; they are controlled by dust collectors or scrubbers.

Chromium emissions may occur from chromate reduction, handling of basic chromic sulfate powder, and from the buffing process. No air emissions of chromium occur during soaking or drying. At plants that purchase chromic sulfate in powder form, dust containing trivalent chromium may be emitted during storage, handling, and mixing of the dry chromic sulfate. The buffing operation also releases particulates, which may contain chromium. Leather tanning facilities, however, have not been viewed as sources of chromium emissions by the States in which they are located.

References for Section 9.15

1. K. Bienkiewicz, *Physical Chemistry Of Leathermaking*, Krieger Publishing Co., Malabar, FL, 1983.

2. *Development Document For Effluent Limitations Guidelines And Standards For The Leather Tanning And Finishing Point Source Category*, EPA-440/1-82-016, U. S. Environmental Protection Agency, Research Triangle Park, NC, November, 1982.

3. *1992 Census Of Manufactures*, U. S. Department of Commerce, Bureau of Census, Washington, DC, April 1995.

4. Telecon, A. Marshall, Midwest Research Institute, with F. Rutland, Environmental Consultant, Leather Industries of America, August 7, 1996.

5. *1996 Membership Directory*, Leather Industries of America Inc.

6. M. T. Roberts and D. Etherington, *Bookbinding And The Conservation Of Books, A Dictionary Of Descriptive Terminology*.

7. T. C. Thorstensen, *Practical Leather Technology*, 4th Ed., Krieger Publishing Co., Malabar, FL, 1993.

8. *Locating And Estimating Air Emissions From Sources Of Chromium*, EPA-450/4-84-007g, U. S. Environmental Protection Agency, Research Triangle Park, NC, July 1984.

MEMO

TO: File

FROM: Harry Zinn, Environmental Engineer, NC Superfund Section

DATE: December 28, 2009

SUBJECT: Tannery Waste Streams
Transylvania Tanning Co
Brevard, Transylvania Co., NC

Information concerning the waste streams involved with tanneries was obtained from the following website http://www.inece.org/mmcourse/chapt5.pdf.

The two primary types of tanning; chrome and vegetable, are described. While no definitive proof can be found on which process was used at this facility, the timeline of its operation, the existence of several other tanneries in western North Carolina that have been associated with vegetable tanning, and the depiction of bark sheds on the 1931 Sanborn map are strong indicators that vegetable tanning was the process used at this facility.

According to the above mentioned literature, the waste associated with the tannery that may be found on-site would be chromium, copper, lead and zinc. Additional contaminants that could be present in the wastewater would be calcium hydroxide (lime), brine solutions and sulfuric acid used in the fleshing, unhairing, bating and pickling steps of the process.

MEMO

TO: File

FROM: Harry Zinn, Environmental Engineer, NC Superfund Section

DATE: December 31, 2009

SUBJECT: Transylvania Tanning Co Schools
Brevard, Transylvania Co., NC

According to a mapquest search, the nearest school to the properties is the First Baptist School located at 94 S Gaston Street in Brevard, NC. It is located approximately 1500 feet from the properties. No daycares or nurseries are located by the properties.

MAPQUEST.

Sorry! When printing directly from the browser your directions or map may not print correctly. For best results, try clicking the Printer-Friendly button.

1 **First Baptist School**
94 S Gaston St, Brevard, NC
(828) 883-9839

2 **Brevard High School**
609 N Country Club Rd, Brevard, NC
(828) 884-4103

3 **Communities In School Nc Inc**
225 Rosenwald Ln, Brevard, NC
(828) 877-3274

4 **Brevard Elementary School**
601 Greenville Hwy, Brevard, NC
(828) 884-2001

5 **Brevard Middle School**
400 Fisher Rd, Brevard, NC
(828) 884-2091

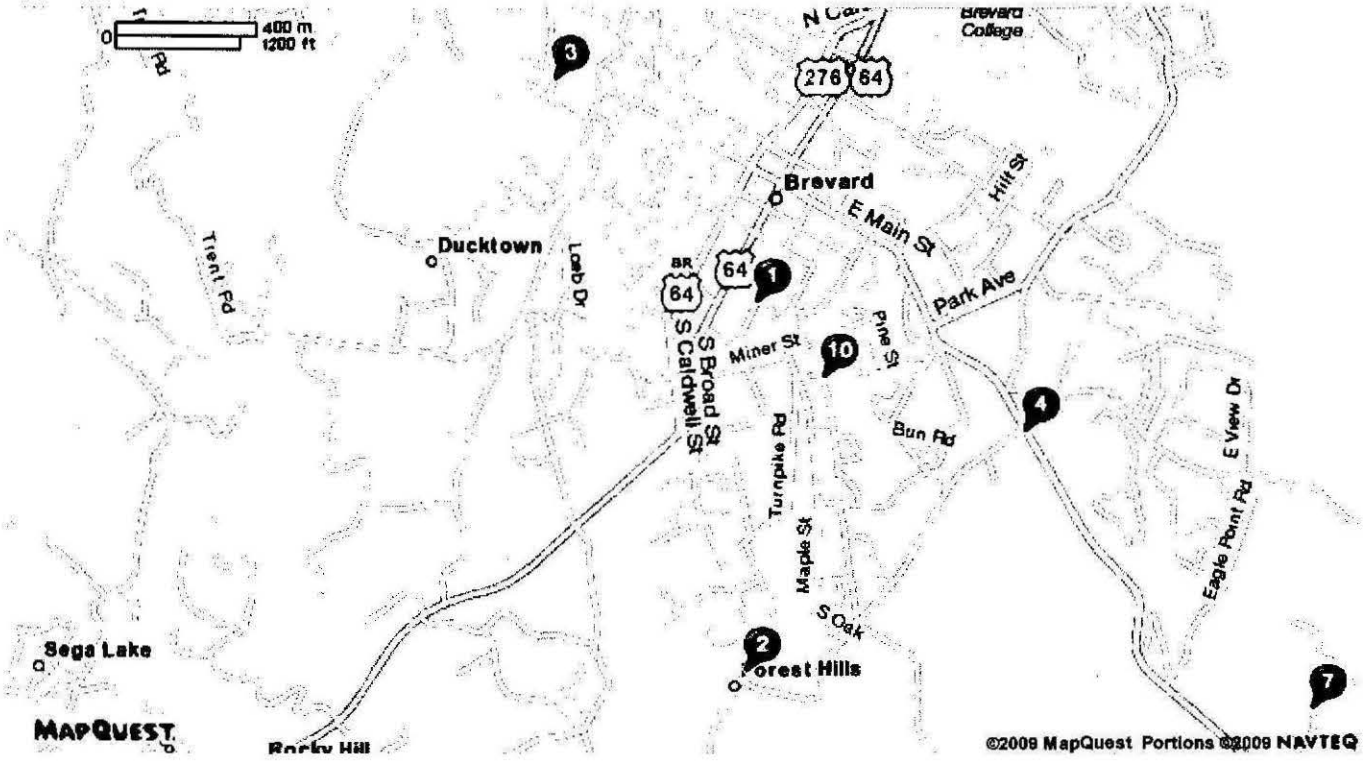
6 **Trans County School System**
609 N Country Club Rd, Brevard, NC
(828) 883-4396

7 **Bethany Baptist Church & Schl**
135 Bert Lane Rd, Brevard, NC
(828) 884-5791

8 **Transylvania County Sch System**
609 N Country Club Rd, Brevard, NC
(828) 883-5819

9 **Davidson River School**
970 Ecusta Rd, Brevard, NC
(828) 884-9567

10 **FACE Fellowship Academy**
172 Grove St, Brevard, NC
(828) 884-7221



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MEMO

TO: File

FROM: Harry Zinn, Environmental Engineer, NC Superfund Section

DATE: December 23, 2009

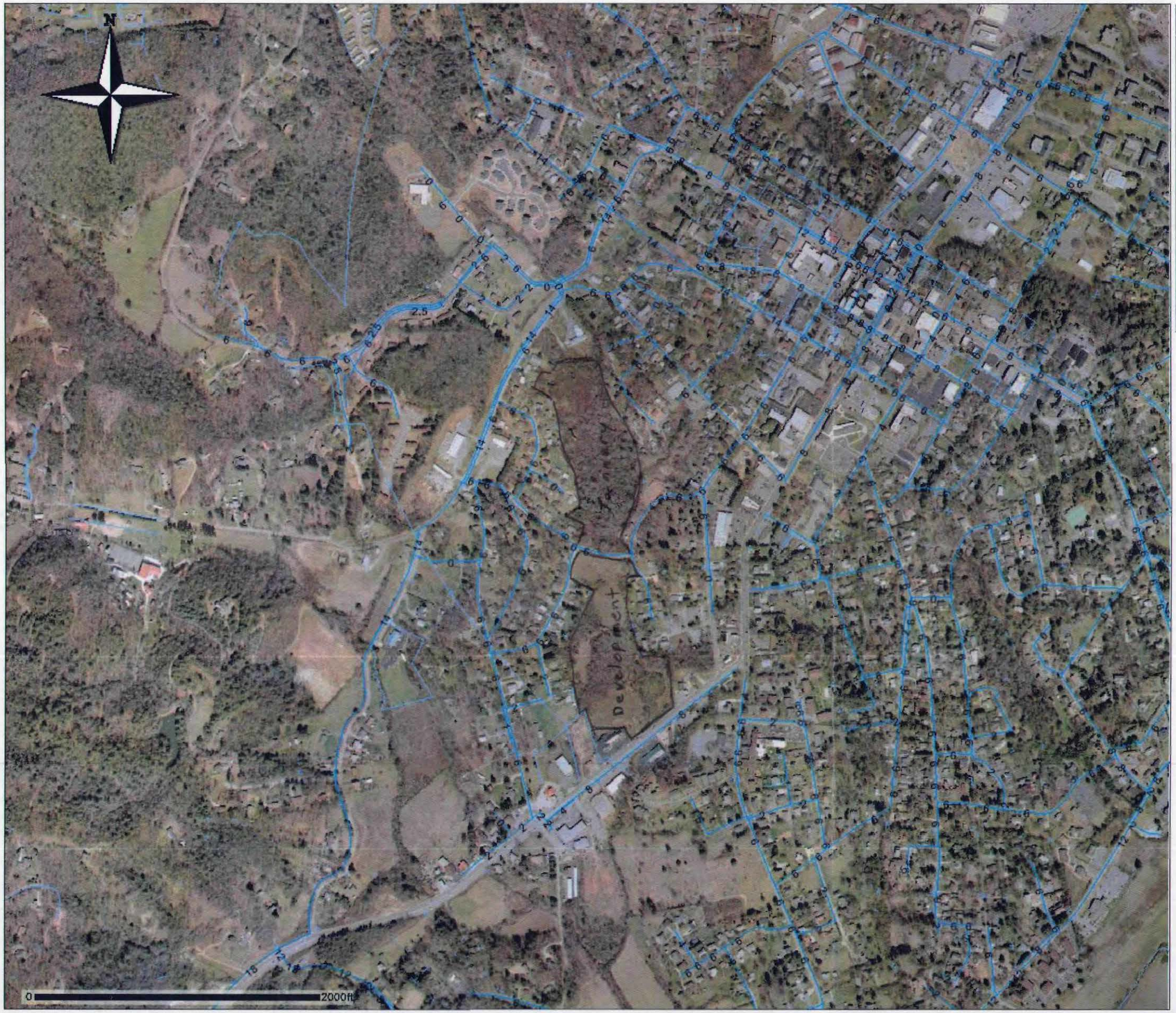
SUBJECT: Transylvania Tanning Co Public Water Supplies
Brevard, Transylvania Co., NC

In order to determine if well users were located in close proximity to the site, I accessed the Transylvania County website at http://www.transylvaniacounty.org/ I then linked to the arcims GIS website at http://arcims.webgis.net/nc/transylvania/default.asp.

I zoomed in to the site vicinity and activated the Parcel lines, Water lines and aerial imagery (2008) layers. This produced a map (figure 2) that shows total coverage of the area around the site with water supplied by the City of Brevard system. The source for the City of Brevard system is Cathey's Creek Treatment plant over 2.5 miles away from the site and upstream on the French Broad River.

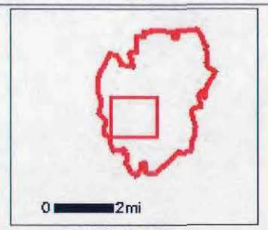
According to the North Carolina Department of Environment and Natural Resources, Division of Environmental Health, Public Water Supply Section, Source Water Protection (SWP) database, the only community wells in the vicinity of the site are two wells supplying the Waterford Place Subdivision approximately 0.75 miles northwest of the site. These wells are topographically upgradient from the site.

According to the map provided by NC One Map at http://www.nconemap.net no surface water intakes are located within the 15 mile surface water pathway from the site.



Transylvania County, NC

Map Legend
- Parcel Lines
- Water Lines
- Aerial Imagery08
- Labels: Water Lines



Vicinity Map

DISCLAIMER: The information contained on this page is NOT to be construed or used as a "legal description". Map information is believed to be accurate but accuracy is not guaranteed.

Transylvania Tannery Waterlines

MEMO

TO: File

FROM: Harry Zinn, Environmental Engineer, NC Superfund Section

DATE: January 18, 2010

SUBJECT: Transylvania Tanning Co Private Well Usage
Brevard, Transylvania Co., NC

On January 14, 2010, I met with Mr. David Lutz, Public Services Director for the City of Brevard. Mr. Lutz informed me that no private wells are being used inside the Brevard City Limits.

REFERENCE 10

PB94-963311

United States Environmental Protection Agency

Solid Waste and Emergency Response

EPA 540-F-94-028
OSWER 9285.7-14FS
PB94-963311
November 1996

EPA

Using Qualified Data to Document an Observed Release and Observed Contamination

Office of Emergency and Remedial Response (5204G)

Quick Reference Fact Sheet

This fact sheet discusses the use of the U.S. Environmental Protection Agency's (EPA) Contract Laboratory Program (CLP) data and other sources of data qualified with a "J", "U", or "UJ" qualifier or flag. This guidance provides a management decision tool for the optional use of qualified data to document an observed release and observed contamination by chemical analysis under EPA's Hazard Ranking System (HRS). The analyte and sample matrix (i.e., soil or water) specific adjustment factors given in this fact sheet allow biased CLP and non-CLP data to be adjusted to meet the HRS criteria for documenting an observed release and observed contamination with data that are of known and documented quality. This fact sheet does not address using qualified data for identifying hazardous substances in a source.

INTRODUCTION

The EPA established the HRS to rank hazardous waste sites for National Priorities List (NPL) purposes under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). This fact sheet was developed in response to a need to determine the usability of qualified data for site assessment and HRS scoring purposes. This fact sheet illustrates that qualified data are often of sufficiently known and documented quality, and may be used in establishing an observed release and observed contamination. This fact sheet explains the rationale for why some qualified data may be used for HRS purposes; presents the background information needed to use qualified data with and without adjustment factors; provides examples of qualified data use; and discusses issues raised during the development of the adjustment factor approach.

Under the HRS, chemical analytical data are often used to demonstrate an observed release and observed contamination when the release sample concentration is three times the background concentration and background levels are greater than or equal to the appropriate detection limit; or if the release sample concentration is greater than or equal to the appropriate quantitation limit when background levels are below the appropriate detection limit. The release must also be at least partially attributable to the site under investigation (*Hazard Ranking System, Final Rule*, 40 CFR Part 300, App. A). The data used to establish the release must be of known and documented quality. (*Hazard Ranking System Guidance Manual*, Interim Final, November 1992, OSWER Directive 9345.1-07). Data that cannot be validated may not be of known and documented quality. For more information on observed release and observed contamination, refer to the fact sheets: *Establishing an Observed Release*, September 1995, PB94-963314; *Establishing Areas of Observed Contamination*, September 1995, PB94-963312; and *Establishing Background Levels*, September 1995, PB94-963313. The factor of three represents the minimum difference in sample results that demonstrate an increase in contaminant concentration above background levels, with reasonable confidence.

Although much of the analytical data used for identifying an observed release is generated under EPA's CLP, this fact sheet applies to all data regardless of the source of the data (non-CLP data). EPA procedures require that

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CLP analytical data be reviewed, or validated by EPA or third party reviewers, to ensure the data are of known and documented quality and that the determination be discussed in a data validation report that accompanies the analytical results. Based on this data validation, CLP data are classified into three categories: (1) data for which all quality control (QC) requirements have passed contract-required acceptance criteria; (2) data for which at least one QC requirement has not met acceptance criteria; and (3) data for which most or all QC requirements have not met acceptance criteria. Data in the first category typically are not qualified. Data in the second category are often qualified with a "J" qualifier and, as discussed in this fact sheet, are usually usable for HRS purposes. Data in the third category are usually qualified by an "R" qualifier and are not usable for HRS purposes.

Whether data are placed into the second or third category is determined by the amount of bias associated with the analytical results. Data validation evaluates biases resulting from laboratory analytical deficiencies or sample matrices to determine whether the data are usable. Bias indicates that the reported concentration is either higher or lower than the true concentration, and the data validation report identifies the direction of the bias or if the bias is unknown.

The EPA CLP also sets minimum quantitation limits for all analytes; the Contract Required Quantitation Limit (CRQL) for organic analytes and the Contract Required Detection Limit (CRDL) for inorganic analytes. For HRS purposes and for this fact sheet, the term CRQL refers to both the contract required quantitation limit and the contract required detection limit. (40 CFR Part 300, App. A). The CRQLs are substance specific levels that a CLP laboratory must be able to routinely and reliably detect in specific sample matrices (i.e., soil, water, sediment). The CRQLs are usually set above most instrument detection limits (IDLs) and method detection limits (MDLs).

CONSIDERATIONS FOR NON-CLP DATA

Because various laboratories and analytical methods may be used to develop non-CLP data, the following list provides the general information sufficient for determining whether non-CLP data are usable for HRS purposes.

(1) Identification of the method used for analysis. Methods include RCRA methods, SW-846, EPA methods, etc.
(2) Quality control (QC) data. Check each method of analysis to determine if specific QC requirements are defined. If not, seek out another method.
(3) Instrument-generated data sheets for sample results. These data sheets would be the equivalent of Form I's in CLP data.
(4) MDLs and sample quantitation limits (SQLs). The analytical method should provide the MDL. The SQL is an adjusted MDL using sample specific measurements such as percent moisture and weight.
(5) Data validation report.

USE OF BIASED QUALIFIED DATA

In the past, all qualified data have been inappropriately perceived by some people as data of low confidence or poor quality and have not been used for HRS evaluation. With careful assessment of the nature of the analytical biases or QC deficiencies in the data on a case-by-case basis, qualified data can represent an additional resource of data for establishing an observed release. Further, the D.C. District Court of Appeals in 1996 upheld EPA's case-by-case approach to assess data quality. In reviewing the use of qualified data to identify an observed release, the Court stated that if there are deficiencies in the data, "...the appropriate response is to review the deficiencies on a 'case-by-case basis' to determine their impact on 'usability of the data.'" The Court also stated with regards to data quality that, "...EPA does not face a standard of absolute perfection....Rather, it is statutorily required to 'assure, to the maximum extent *feasible,*' that it 'accurately assesses the relative degree of risk' posed by sites" [*Board of Regents of the University of Washington, et al., v. EPA*, No. 95-1324, slip op. at 8-10 (D.C. Cir. June 25, 1996).]

As discussed in this fact sheet, the application of adjustment factors to "J" qualified data can serve as a management decision tool to "adjust," or take into account, the analytical uncertainty in the data indicated by the qualifier, thereby making qualified data usable for HRS evaluation. The use of adjustment factors to account for the larger uncertainty in "J" qualified data is a conservative approach enabling a quantitative comparison of the data for use in documenting an observed release. It should be noted that the use of

adjustment factors only addresses analytical variability and does not take into account variabilities which may be introduced during field sampling. Some guidelines for using the adjustment factor approach are discussed in Exhibit 1.

CLP QA/QC PROCEDURES

CLP qualifiers are applied to analytical data based on the results of various Quality Assurance/Quality Control (QA/QC) procedures used at the laboratory. EPA analytical methods use a number of QA/QC mechanisms during sample analysis in order to assess qualitative and quantitative accuracy (*Contract Laboratory Program Statement of Work for Inorganic Analyses*, Document No. ILM02.0; *Contract Laboratory Program Statement of Work for Organic Analyses*, Document No. OLM1.8; *Quality Assurance/Quality Control Samples*, Environmental Response Team Quality Assurance Technical Information Bulletin; *Test Methods for Evaluating Solid Waste (SW-846): Physical and Chemical Methods*, Document No. SW-846). To assess data quality, the laboratory uses matrix spikes, matrix spike duplicates, laboratory control samples, surrogates, blanks, laboratory duplicates, and quarterly blind performance evaluation (PE) samples. The Agency assumes that if biases are found in the QA/QC samples, the field sample concentrations may also be biased.

Surrogates are chemically similar to the analytes of interest. They are added or "spiked" at a known concentration into the field samples before analysis. Also, selected target analytes are "spiked" into samples at a specified frequency to assess potential interferences from the sample matrix. These samples are called matrix spikes. Comparison of the known concentration of the surrogates and matrix spikes with their actual analytical results reflects the analytical accuracy. Because the surrogates are expected to behave similarly to the target analytes, they may indicate bias caused by interferences from the sample matrices. These types of interferences from the sample matrix are known as matrix effects (*CLP National Functional Guidelines for Inorganic Data Review*, Publication 9240.1-05-01; *CLP National Functional Guidelines for Organic Data Review*, Publication 9240.1-05; *Test Methods for Evaluating Solid Waste (SW-846): Physical and Chemical Methods*, Document No. SW-846).

Laboratory control samples are zero blind samples which contain known concentrations of specific analytes and are analyzed in the same batch as field samples. Their results are used to measure laboratory accuracy. Blanks are analyzed to detect any extraneous contamination introduced either in the field or in the laboratory.

Laboratory duplicates are created when one sample undergoes two separate analyses. The duplicate results are compared to determine laboratory precision. Quarterly blind PE samples are single blind samples that evaluate the laboratory's capability of performing the specified analytical protocol.

CLP and other EPA analytical methods include specifications for acceptable analyte identification, target analytes, and minimum and maximum percent recovery of the QA/QC compounds. Data are validated according to guidelines which set performance criteria for instrument calibration, analyte identification, and identification and recovery of QA/QC compounds (*CLP Statement of Work and SW-846*). The *National Functional Guidelines for Data Review*, used in EPA validation, was designed for the assessment of data generated under the CLP organic and inorganic analytical protocols (*CLP Statement of Work; National Functional Guidelines for Data Review*). The guidelines do not preclude the validation of field and other non-CLP data. Thus, many EPA Regions have also adapted the *National Functional Guidelines for Data Review* to validate non-CLP data. Data which do not meet the guidelines' performance criteria are qualified to indicate bias or QA/QC deficiencies. The data validation report usually explains why the data were qualified and indicates the bias direction when it can be determined. Validated data that are not qualified are considered unbiased and can be used at their reported numerical value for HRS evaluation.

QUALIFIER DEFINITIONS

Most EPA validation guidelines use the data qualifiers presented in Exhibit 2 (*CLP National Functional Guidelines for Data Review*). Other qualifiers besides these may be used; the validation report should always be checked for the exact list of qualifiers and their meanings.

It should be emphasized that not meeting one or some of the contract required QA/QC acceptance criteria is often an indication that the sample was difficult to analyze, not that there is low confidence in the analysis (i.e., the

EXHIBIT 1 GUIDELINES FOR THE USE OF ADJUSTMENT FACTORS
• The use of adjustment factors identified in this fact sheet is a management tool for the optional use of "J" qualified data generated under CLP or other sources of data to document an observed release.
• Adjusted qualified data should be used with non-qualified data whenever possible.
• EPA maintains a "worst sites first" policy for placing sites on the NPL (*Additional Guidance on "Worst Sites" and "NPL Caliber Sites" to assist in SACM Implementation*, OSWER Directive 9320.2-07).
• EPA Regions should use adjustment factors with discretion on a case-by-case basis and should always carefully consider the use of qualified data in borderline cases.
• Resampling and/or reanalysis may be warranted if qualified data do not appear adequate to document an observed release.
• EPA Regions may substitute higher adjustment factors based on documented, justifiable reasons but may never use a lower adjustment factor value.
• The adjustment factors should only be applied to analytes listed in the tables. These adjustment factors should not be interpolated or extrapolated to develop factors for analytes not listed in the tables.
• The adjustment factors apply only to "J" qualified data above the CRQL.
• Detection below the CRQL is treated as non-quantifiable for HRS purposes.
• "UJ" data may be used under strict circumstances as explained in this fact sheet.
• The adjustment factors only apply to biased "J" qualified data, not to other "J" qualified data.
• The adjustment factors do not apply to "N", "NJ", or "R" qualified data. These data can not be used to document an observed release for HRS purposes.

analysis is "under control" and can be adequate for HRS decision making). Often "J", "U", and "UJ" qualified data fall into this category.

There are instances when qualified data cannot be used since the uncertainty of the results is unknown. For example, violations of laboratory instrument calibration and tuning requirements, and gross violations of holding times reflect the possibility that the results are of unknown quality (i.e., the analysis is "out of control"). Most often these data would be qualified with an "R" or an "N" (not usable for HRS purposes).

USING "U" QUALIFIED DATA

The "U" qualifier simply means that the reported concentration of the analyte was at or below the CRQL--there can be confidence that the true concentration is at or below the quantitation limit. Therefore, "U" qualified data can be used for establishing background levels. If the release sample concentration is above this level, as specified in the HRS, an observed release can be established. The quantitation limit for that analyte could be used as a maximum background concentration if a more conservative background level seems appropriate.

USING "J" QUALIFIED DATA

As discussed previously, some "J" qualified data can be used in establishing an observed release if the uncertainty in the reported values is documented. Qualified data should always be carefully examined by the Regions to determine the reasons for qualification before use in HRS evaluation. Resampling and/or reanalysis may be warranted if qualified data only marginally document an observed release. Whenever possible, qualified data should be used in conjunction with non-qualified data.

As described in Exhibit 2, "J" qualified data indicates that bias has been detected in the sample analysis and although the analyte is definitively present, the reported concentration is an estimate. Depending on the reasons and the direction of bias, with the use of adjustment factors, "J" qualified data can represent data of known and documented quality sufficient for use in establishing an observed release and observed contamination under the HRS.

USING "UJ" QUALIFIED DATA

A combination of the "U" and "J" qualifiers indicates that the reported value may not accurately represent the concentration necessary to positively detect the analyte in the sample. Under limited conditions, "UJ" qualified data can be used to represent background concentrations for establishing an observed release. These conditions are: instances when there is confidence that the background concentration is not detectable above the CRQL, the background concentration is biased high, and the sample measurement establishing the observed release equals or exceeds the CRQL.

DIRECTION OF BIAS IN "J" QUALIFIED DATA

It is important to understand the direction of bias associated with "J" qualified data before using the data to document an observed release. Qualified data may have high, low, or unknown bias. A low bias means that the reported concentration is likely an underestimate of the true concentration. For example, data may be biased low when sample holding times for volatile organic compounds (VOCs) are moderately exceeded or when recovery of QA/QC compounds is significantly less than the amount introduced into the sample. Low surrogate recovery would also indicate a low bias. A high bias means the reported concentration is likely an overestimate of the true concentration. For example, data may be biased high when recovery of QA/QC compounds is significantly higher than the amount in the sample. A bias is unknown when it is impossible to ascertain whether the concentration is an overestimate or an underestimate. For example, an unknown bias could result when surrogate recoveries exceed method recovery criteria and matrix spike/matrix spike duplicate compounds below method recovery criteria fail the relative percent difference (RPD) criteria in the same sample.

Despite the bias, certain qualified data may be used without application of adjustment factors for determining an observed release under certain circumstances. The following are examples of using "J" qualified data without adjustment factors:

- Low bias release samples are likely to be underestimates of true concentrations. If the reported concentration of a low bias release sample is three times above unbiased background levels, these release samples would still meet the HRS criteria. The true concentrations would still be three times above the background level.

- High bias background samples are likely to be overestimates of true concentrations. If the reported concentration of unbiased release samples are three times above the reported background concentration, they would still meet the HRS observed release criteria because they would still be three times above the true background concentration.

The above examples show that both low bias "J" qualified release samples at their reported concentrations and high bias "J" qualified background samples may be used at their reported concentrations in these situations.

High bias release samples may not be used at their reported concentrations because they are an overestimate of true concentrations in this situation; resampling and/or re-analysis of the release samples should be considered. The true difference in the background and release concentrations may be less than the HRS criteria for establishing an observed release. The reported concentration for low bias background concentrations may not be compared to release samples because it is most likely an underestimate of background level; the release sample concentration may not significantly exceed the true background concentration. However, in lieu of re-sampling and/or re-analysis, high bias release data and low bias background data may be used with adjustment factors which compensate for the probable uncertainty in the analyses.

ADJUSTMENT FACTORS FOR BIASED "J" QUALIFIED DATA

Applying adjustment factors to "J" qualified data will enable EPA to be more confident that the increase in contaminant concentrations between the background and

EXHIBIT 2 EPA CLP DATA QUALIFIERS AND THEIR USABILITY FOR DOCUMENTING AN OBSERVED RELEASE	
Usable*	**Not Usable**
"U" The substance or analyte was analyzed for, but no quantifiable concentration was found at or above the CRQL (*CLP National Functional Guidelines for Data Review*).	"N" The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification" (*CLP National Functional Guidelines for Data Review*).
"J" The analyte was positively identified--the associated numerical value is the approximate concentration of the analyte in the sample. The "J" qualifier indicates that one or more QA/QC requirements have not met contract required acceptance criteria, but the instrumentation was functioning properly during the analysis. For example, a "J" qualifier may indicate that the sample was difficult to analyze or that the value may lay near the low end of the linear range of the instrument. "J" data are considered biased, but provide definitive analyte identification (*CLP National Functional Guidelines for Data Review*).	"R" The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte can not be verified and the result has been rejected. A sample result may be qualified with an "R" qualifier when the instrument did not remain "in control" or the stability or sensitivity of the instrument were not maintained during the analysis (*CLP National Functional Guidelines for Data Review*).
"UJ" The analyte was not quantifiable at or above the CRQL. In addition to not being quantifiable, one or more QA/QC requirements have not met contract acceptance criteria (*CLP National Functional Guidelines for Data Review*).	"NJ" The analysis indicates the presence of the analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration (*CLP National Functional Guidelines for Data Review*).

* Usable under certain circumstances as explained in this fact sheet.

release samples is due to a release. The adjustment factors are applied as "safety factors" to compensate for analytical uncertainty, allowing biased data to be used for determining an observed release. Dividing the high bias result by an adjustment factor deflates it from the high end of the acceptable range towards a low bias value. Multiplying a low bias concentration by an adjustment factor inflates it to the high end of the acceptable range.

Tables 1 through 4 (pages 11 - 18) present analyte and matrix-specific adjustment factors to address the analytical uncertainty when determining an observed release using high bias release samples and low bias background data. The factors are derived from percent recoveries of matrix spikes, surrogates, and laboratory control samples in the CLP Analytical Results Database (CARD) from January 1991 to March 1996. A total of 32,447 samples were reviewed for volatile organic analytes; 32,913 samples for semivolatile organic analytes; 59,508 samples for pesticides/PCB analytes; and 5,954 samples for inorganic analytes.

The range of CARD data for each analyte includes 97 percent of all percent recoveries in the database, discarding outliers. The adjustment factors are ratios of percent recovery values at the 98.5 and 1.5 percentiles. The ratios generally show a consistent pattern.

Adjustment factors have been determined for all analytes in the CLP Target Compound List (organic analytes) and Target Analyte List (inorganic analytes). A tiered approach was used to derive the organic adjustment factors. Percent recoveries for surrogates were

examined first, followed by matrix spike recoveries. When both matrix spike and surrogate data were available for the same analyte, the larger adjustment factor (representing more extreme high and low percent recoveries) was used. Laboratory control samples were used to calculate the inorganic adjustment factors. Quarterly blind sample data were not used to determine adjustment factors because of the small data set available. A default adjustment factor of 10 was used for analytes when percent recovery data were unavailable.

Adjustment factors do not correct the biased sample concentration to its true value, as such "correction" is not possible. CARD data do not differentiate and quantify individual sources of variation. Instead, the ratio of percentile used to develop adjustment factors represents a "worst-case" scenario. Adjustment factors either inflate background values to the high end of the range or deflate release data to the low end. Therefore, adjustment factors compensate or adjust for the apparent analytical variability when comparing a high bias value to a low bias value (see Exhibit 3).

USING THE ADJUSTMENT FACTORS

This section of the fact sheet demonstrates how adjustment factors can be used with "J" qualified data for HRS scoring purposes, including documentation and detection limit issues.

Documentation Requirements for Using Qualified Data

In using "J" qualified data to determine an observed release, include a discussion of "J" qualifiers from the data validation report and cite it as a reference in the site assessment report or HRS documentation record. If adjustment factors are applied to "J" qualified data, reference and cite this fact sheet. These steps will ensure that the direction of bias is documented and will demonstrate how biases have been adjusted.

Detection Limit Restrictions

Adjustment factors may only be applied to "J" qualified data with concentrations above the CLP CRQL for organics or CRDL for inorganics. "J" qualified data with concentrations below the CRQL can not be used to document an observed release except as specified in the previous section entitled "Using "UJ" Qualified Data."

Application of Factors

Exhibit 3 shows how to apply the factors to "J" qualified data. Multiply low bias background sample results by the analyte-specific adjustment factor or the default factor of 10 when an analyte-specific adjustment factor is not available. The resulting new background value effectively becomes a high bias value that may be used to determine an observed release. Divide high bias release sample data by the analyte-specific adjustment factor or the default factor of 10 when an analyte-specific adjustment factor is not available. The resulting new release sample value effectively becomes a low bias value that may be used to determine an observed release.

Note: High bias background data, low bias release data, and unbiased data may be used at their reported concentrations.

Note: Adjusted release and background values must still meet HRS criteria (e.g., release concentration must be at least three times above background level) to determine an observed release.

Examples Using Trichloroethene in Soil and Water

1. *Release water sample is unbiased, background water sample is unbiased but all data are qualified with a "J" due to an contractual laboratory error not analytical error.*

Background sample value: 12 μg/L (J) *no bias*
Release sample value: 40 μg/L (J) *no bias*

The CRQL for trichloroethene is 10 μg/Kg for soil and 10 μg/L for water.

In this example, the qualification of the data is not related to bias in the reported concentrations. Thus, using adjustment factors is not needed and an observed release is established if all other criteria are met.

2. *Release soil sample data is biased low, background soil sample data is biased high.*

Background sample value: 12 μg/Kg (J) *high bias*
Release sample value: 40 μg/Kg (J) *low bias*

In this example, the direction of bias indicates that the true release value may be higher and the true background value may be lower than reported values. The release sample concentration still exceeds background by more than three times, so an observed release is established, provided all other HRS criteria are met. Using adjustment factors is not needed.

EXHIBIT 3 USE OF ADJUSTMENT FACTORS FOR "J" QUALIFIED DATA		
Type of Sample	**Type of Bias**	**Action Required**
Background Sample	No Bias	None: Use concentration without factor
	Low Bias	Multiply concentration by factor
	High Bias	None: Use concentration without factor
	Unknown Bias	Multiply concentration by factor
Release Sample	No Bias	None: Use concentration without factor
	Low Bias	None: Use concentration without factor
	High Bias	Divide concentration by factor
	Unknown Bias	Divide concentration by factor

3. *Release soil sample data is unbiased, background soil sample is biased low.*

Background sample value: 12 μg/Kg (J) *low bias*
Release sample value: 30 μg/Kg *no bias*

In this example, the true background value is assumed to be less than the reported value; however, an observed release may still be possible. To use the data to establish an observed release, multiply the background sample data value by the adjustment factor given for trichloroethene in soil (2.11). No adjustment factor is needed for the release sample.

New background sample value:
(12 μg/Kg) x (2.11) = 25.32 μg/Kg (J) *high bias*

The release sample concentration does not meet or exceed the new background level by three times, so an observed release is not established.

4. *Release water sample data is biased high, background water sample data is unbiased.*

Background sample value: 15 μg/L *no bias*
Release sample value: 70 μg/L (J) *high bias*

In this example, the true release value may be lower than the reported value; however, an observed release may still be possible. To use the data to establish an observed release, divide the release sample by the adjustment factor for trichloroethene in water (1.66). No adjustment factor is needed for the background sample.

New release sample value:
(70 μg/L) ÷ (1.66) = 42.17 μg/L (J) *low bias*

The new release sample concentration does not meet or exceed the background level by three times, so an observed release is not established.

5. *Release soil sample data has unknown bias; background soil sample data has unknown bias.*

The following example is the most conservative approach to using adjustment factors with qualified data.

Background sample value: 20 μg/Kg (J) *unknown bias*
Release sample value: 325 μg/Kg (J) *unknown bias*

In this example, it is not possible to determine from the reported values if an observed release is possible. To use the data to establish an observed release, divide the release sample value and multiply the background sample value by the adjustment factor given for trichloroethene in soil (2.11).

New release sample value:
(325 μg/Kg) ÷ (2.11) = 154.03 μg/Kg (J) *low bias*

New background sample value:
(20 μg/Kg) x (2.11) = 42.2 μg/Kg (J) *high bias*

The new release sample is at least three times the new background concentration, so an observed release is established, provided all other HRS criteria are met.

ISSUES WITH USING ADJUSTMENT FACTOR APPROACH

Some issues were raised regarding the application of adjustment factors to qualified data during the Agency's internal review process.

One issue is that "J" qualifiers are added to analytical results for many reasons that may or may not affect the accuracy and precision of the analytical result. The application of an adjustment factor to "J" qualified data in which bias is not affected could be considered overly conservative.

All qualified data should be carefully evaluated to determine if the data are biased. Based on the reasons for bias, the use of an adjustment factor should only be considered as a management tool that provides a quick screening of the data for site assessment, not a means for correcting the biased value to a true value. Application of adjustment factors are intended for use with qualified data reported at or above the CRQL and may not be applicable to data which are qualified but technically sound. As stated previously, qualified data should always be carefully reviewed on a case-by-case basis prior to use in HRS evaluation.

Another issue is the validity of "10" as a default adjustment factor. A default adjustment factor of 10 was a policy decision based on the range of adjustment factors and an industry approach. The default was chosen in order to account for the maximum variability regardless of the direction of the bias. Therefore, the default value of 10 is generally considered to be a conservative adjustment factor. EPA reviewed the use of the default value of 10 and determined that this value was conservative.

Even if using adjustment factors is sometimes overly conservative, this approach is preferable to not using the data at all. EPA maintains a "worst sites first" policy that only the sites considered most harmful to human health and/or the environment should be listed. EPA considers the use of adjustment factors appropriate as a management decision tool. However, discretion is needed when applying adjustment factors. The use of adjustment factors may not be appropriate in all cases.

USE OF OTHER ADJUSTMENT FACTORS

EPA Regions may substitute higher, but never lower, adjustment factor values for the ones listed in this fact sheet on a case-by-case basis when technically justified. For example, other adjustment factors may be applied to conform with site-specific Data Quality Objectives (DQOs) or with Regional Standard Operating Procedures (SOPs) (*Data Quality Objectives Process for Superfund*, Publication 9355.9-01).

SUMMARY

For site assessment purposes, EPA Regions should not automatically discard "J" qualified data. However, site-specific data usability determinations may result in the data's not being used.

Data qualified under the EPA's CLP or from other sources of validated data may be used to demonstrate an observed release if certain measures are taken to ensure that the bias of the data qualifier is adjusted using the factor approach specified in this fact sheet. (This fact sheet provides a management decision tool for making qualified data usable for documenting an observed release.) The analyte and matrix-specific adjustment factors provided in Tables 1 through 4 of this fact sheet present these adjustment factors.

The scope of this fact sheet is limited to the situations described in Exhibit 1. The use of qualified analytical data without the adjustment factors presented in this fact sheet is limited. Higher adjustment factors may be substituted by EPA Regions on a case-by-case basis when technically justified by site-specific DQOs or SOPs.

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TABLE 1 FACTORS FOR VOLATILE ORGANIC ANALYTES				
VOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
1,1,1-TRICHLOROETHANE	—	10.0	—	10.0
1,1,2,2-TETRACHLOROETHANE	—	10.0	—	10.0
1,1,2-TRICHLOROETHANE	—	10.0	—	10.0
1,1-DICHLOROETHANE	—	10.0	—	10.0
1,1-DICHLOROETHENE	7,031	2.71	5,015	2.35
1,2-DICHLOROETHANE-D4	32,446	1.52	25,516	1.38
1,2-DICHLOROETHENE (TOTAL)	—	10.0	—	10.0
1,2-DICHLOROPROPANE	—	10.0	—	10.0
2-BUTANONE	—	10.0	—	10.0
2-HEXANONE	—	10.0	—	10.0
4-METHYL-2-PENTANONE	—	10.0	—	10.0
ACETONE	—	10.0	—	10.0
BENZENE	7,024	1.97	5,001	1.64
BROMODICHLOROMETHANE	—	10.0	—	10.0
BROMOFORM	—	10.0	—	10.0
BROMOFLUOROBENZENE	32,444	1.7	25,518	1.26
BROMOMETHANE	—	10.0	—	10.0
CARBON DISULFIDE	—	10.0	—	10.0

TABLE 1 FACTORS FOR VOLATILE ORGANIC ANALYTES				
VOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
CARBON TETRACHLORIDE	—	10.0	—	10.0
CHLOROBENZENE	7,018	2.0	5,015	1.54
CHLOROETHANE	—	10.0	—	10.0
CHLOROFORM	—	10.0	—	10.0
CHLOROMETHANE	—	10.0	—	10.0
CIS-1,3-DICHLOROPROPENE	—	10.0	—	10.0
DIBROMOCHLOROMETHANE	—	10.0	—	10.0
ETHYLBENZENE	—	10.0	—	10.0
METHYLENE CHLORIDE	—	10.0	—	10.0
STYRENE	—	10.0	—	10.0
TETRACHLOROETHENE	—	10.0	—	10.0
TOLUENE-D8	32,447	1.63	25,526	1.21
TRANS-1,3-DICHLOROPROPENE	—	10.0	—	10.0
TRICHLOROETHENE	6,988	2.11	4,938	1.66
VINYL CHLORIDE	—	10.0	—	10.0
XYLENE (TOTAL)	—	10.0	—	10.0

TABLE 2 FACTORS FOR SEMIVOLATILE ORGANIC ANALYTES				
SEMIVOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
1,2,4-TRICHLOROBENZENE	6,792	4.83	4,605	3.71
1,2-DICHLOROBENZENE-D4	32,848	4.22	21,506	3.0
1,3-DICHLOROBENZENE	—	10.0	—	10.0
1,4-DICHLOROBENZENE	6,796	6.0	4,599	3.85
2,2'-OXYBIS(1-CHLOROPROPANE)	—	10.0	—	10.0
2,4,6-TRIBROMOPHENOL	32,605	9.38	21,509	3.57
2,4,5-TRICHLOROPHENOL	—	10.0	—	10.0
2,4,6-TRICHLOROPHENOL	—	10.0	—	10.0
2,4-DICHLOROPHENOL	—	10.0	—	10.0
2,4-DIMETHYLPHENOL	—	10.0	—	10.0
2,4-DINITROPHENOL	—	10.0	—	10.0
2,4-DINITROTOLUENE	6,798	4.88	4,623	3.52
2,6-DINITROTOLUENE	—	10.0	—	10.0
2-CHLORONAPHTHALENE	—	10.0	—	10.0
2-CHLOROPHENOL-D4	32,798	4.08	21,506	2.92
2-FLUOROBIPHENYL	32,913	3.38	21,532	2.84
2-FLUORPHENOL	32,781	5.05	21,511	3.34
2-METHYLNAPHTHALENE	—	10.0	—	10.0
2-METHYLPHENOL	—	10.0	—	10.0
2-NITROANILINE	—	10.0	—	10.0
2-NITROPHENOL	—	10.0	—	10.0
3,3'-DICHLOROBENZIDINE	—	10.0	—	10.0
3-NITROANILINE	—	10.0	—	10.0
4,6-DINITRO-2-METHYLPHENOL	—	10.0	—	10.0
4-BROMOPHENYL-PHENYLETHER	—	10.0	—	10.0

TABLE 2 FACTORS FOR SEMIVOLATILE ORGANIC ANALYTES				
SEMIVOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
4-CHLORO-3-METHYLPHENOL	6,715	6.26	4,609	4.46
4-CHLOROANILINE	—	10.0	—	10.0
4-CHLOROPHENYL-PHENYLETHER	—	10.0	—	10.0
4-METHYLPHENOL	—	10.0	—	10.0
4-NITROANILINE	—	10.0	—	10.0
4-NITROPHENOL	6,627	9.33	4,586	5.96
ACENAPHTHENE	6,773	4.68	4,600	3.63
ACENAPHTHYLENE	—	10.0	—	10.0
ANTHRACENE	—	10.0	—	10.0
BENZO(A)ANTHRACENE	—	10.0	—	10.0
BENZO(A)PYRENE	—	10.0	—	10.0
BENZO(B)FLUORANTHENE	—	10.0	—	10.0
BENZO(G,H,I)PERYLENE	—	10.0	—	10.0
BENZO(K)FLUORANTHENE	—	10.0	—	10.0
BIS(2-CHLOROETHOXY)METHANE	—	10.0	—	10.0
BIS(2-CHLOROETHYL)ETHER	—	10.0	—	10.0
BIS(2-ETHYLHEXYL)PHTHALATE	—	10.0	—	10.0
BUTYLBENZYLPHTHALATE	—	10.0	—	10.0
CARBAZOLE	—	10.0	—	10.0
CHRYSENE	—	10.0	—	10.0
DI-N-BUTYLPHTHALATE	—	10.0	—	10.0
DI-N-OCTYLPHTHALATE	—	10.0	—	10.0
DIBENZ(A,H)ANTHRACENE	—	10.0	—	10.0
DIBENZOFURAN	—	10.0	—	10.0
DIETHYLPHTHALATE	—	10.0	—	10.0

TABLE 2 FACTORS FOR SEMIVOLATILE ORGANIC ANALYTES				
	SOIL MATRIX		WATER MATRIX	
SEMIVOLATILE ORGANIC ANALYTES	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
DIMETHYLPHTHALATE	—	10.0	—	10.0
FLUORANTHENE	—	10.0	—	10.0
FLUORENE	—	10.0	—	10.0
HEXACHLOROBENZENE	—	10.0	—	10.0
HEXACHLOROBUTADIENE	—	10.0	—	10.0
HEXACHLOROCYCLOPENTADIENE	—	10.0	—	10.0
HEXACHLOROETHANE	—	10.0	—	10.0
INDENO(1,2,3-CD)PYRENE	—	10.0	—	10.0
ISOPHORONE	—	10.0	—	10.0
N-NITROSO-DI-N-PROPYLAMINE	6,725	4.92	4,513	4.0
N-NITROSODIPHENYLAMINE(1)	—	10.0	—	10.0
NAPHTHALENE	—	10.0	—	10.0
NITROBENZENE-D5	32,867	3.96	21,533	2.73
PENTACHLOROPHENOL	6,597	72.5	4,550	10.12
PHENANTHRENE	—	10.0	—	10.0
PHENOL-D5	32,855	3.85	21,489	3.53
PYRENE	6,543	11.86	4,612	5.67
TERPHENYL-D14	32,899	4.35	21,541	6.32

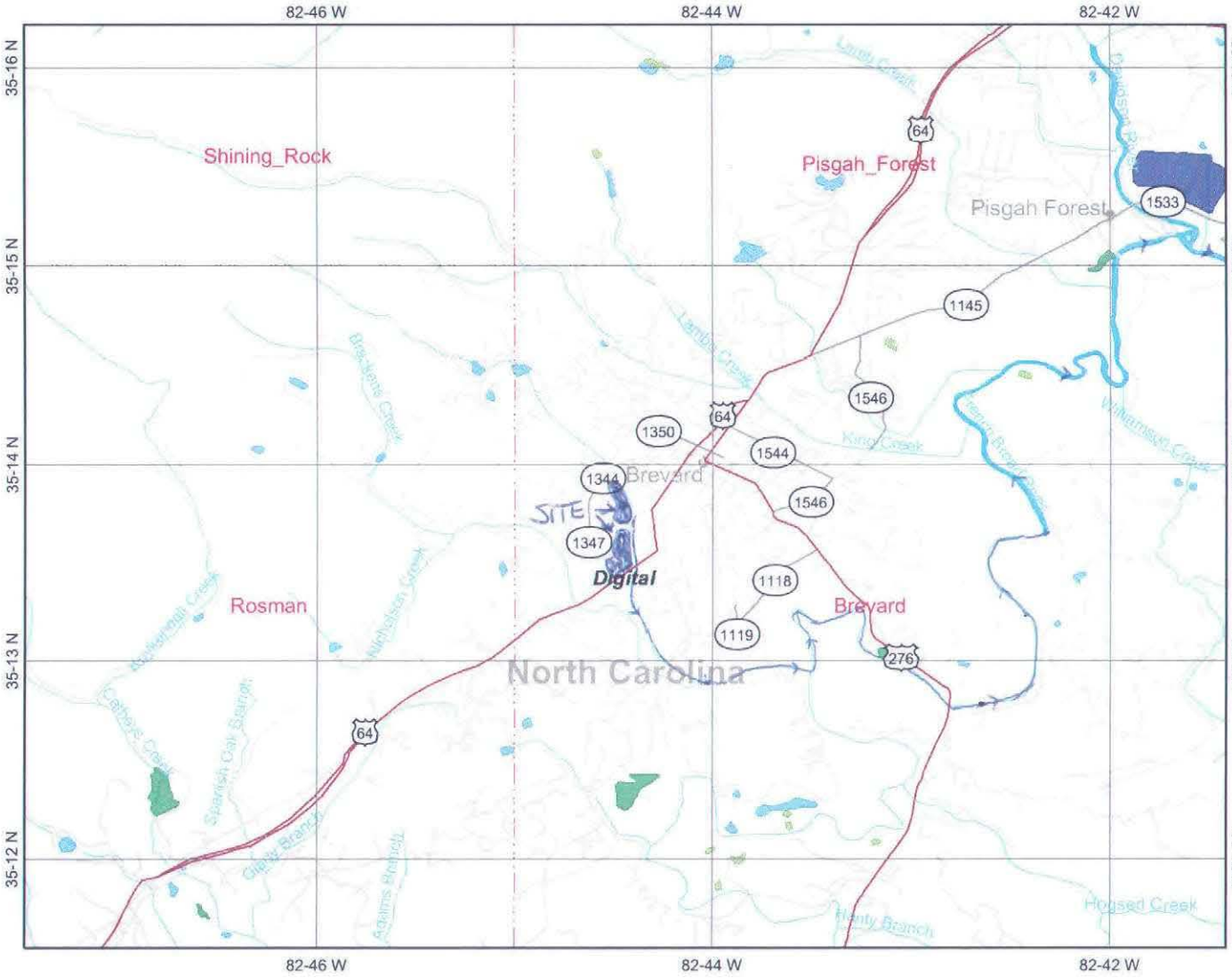
TABLE 3 FACTORS FOR PESTICIDES/PCB ANALYTES				
VOLATILE ORGANIC ANALYTES	SOIL MATRIX		WATER MATRIX	
	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
4,4'-DDD	—	10.0	—	10.0
4,4'-DDE	—	10.0	—	10.0
4,4'-DDT	5,343	12.82	3,850	7.14
ALDRIN	5,526	14.26	3,829	6.63
ALPHA-BHC	—	10.0	—	10.0
ALPHA-CHLORDANE	—	10.0	—	10.0
AROCLOR-1016	—	10.0	—	10.0
AROCLOR-1221	—	10.0	—	10.0
AROCLOR-1232	—	10.0	—	10.0
AROCLOR-1242	—	10.0	—	10.0
AROCLOR-1248	—	10.0	—	10.0
AROCLOR-1254	—	10.0	—	10.0
AROCLOR-1260	—	10.0	—	10.0
BETA-BHC	—	10.0	—	10.0
DECACHLOROBIPHENYL	57,315	17.79	33,592	10.0
DELTA-BHC	—	10.0	—	10.0
DIELDRIN	5,539	11.93	3,861	4.87

TABLE 3 FACTORS FOR PESTICIDES/PCB ANALYTES				
	SOIL MATRIX		WATER MATRIX	
VOLATILE ORGANIC ANALYTES	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
ENDOSULFAN I	—	10.0	—	10.0
ENDOSULFAN II	—	10.0	—	10.0
ENDOSULFAN SULFATE	—	10.0	—	10.0
ENDRIN	5,521	14.13	3,850	5.33
ENDRIN ALDEHYDE	—	10.0	—	10.0
ENDRIN KETONE	—	10.0	—	10.0
GAMMA-BHC (LINDANE)	5,545	11.79	3,832	10.0
GAMMA-CHLORDANE	—	10.0	—	10.0
HEPTACHLOR	5,548	7.88	3,836	5.26
HEPTACHLOR EPOXIDE	—	10.0	—	10.0
METHOXYCHLOR	—	10.0	—	10.0
TETRACHLORO-M-XYLENE	59,508	8.5	33,787	5.29
TOXAPHENE	—	10.0	—	10.0

TABLE 4 FACTORS FOR INORGANIC ANALYTES				
	SOIL MATRIX		WATER MATRIX	
INORGANIC ANALYTES	Number of CARD Samples Reviewed	Factor	Number of CARD Samples Reviewed	Factor
ALUMINUM	5387	1.66	6208	1.30
ANTIMONY	5392	1.98	6170	1.27
ARSENIC	5675	1.74	6303	1.35
BARIUM	5360	3.99	6201	1.25
BERYLLIUM	5399	1.28	6208	1.25
CADMIUM	5385	1.41	6166	1.29
CALCIUM	5383	1.28	6201	1.24
CHROMIUM	5389	1.29	6210	1.30
COBALT	5392	1.25	6212	1.27
COPPER	5394	1.22	6205	1.25
CYANIDE	3281	1.55	225	1.36
IRON	5391	1.34	6216	1.27
LEAD	5982	1.44	6384	1.31
MAGNESIUM	5397	1.23	6210	1.24
MANGANESE	5395	1.24	6214	1.28
MERCURY	5954	1.83	256	1.50
NICKEL	5400	1.35	6210	1.29
POTASSIUM	3874	17.49	6175	1.24
SELENIUM	5620	2.28	6278	1.41
SILVER	5392	1.74	6215	1.42
SODIUM	5024	25.43	6195	1.26
THALLIUM	5621	1.86	6253	1.37
VANADIUM	5393	1.34	6212	1.25
ZINC	5404	1.50	6224	1.29

REFERENCE 11

Trans Tan Wetlands



Legend

- Interstate
- Major Roads
- Other Road
- Interstate
- State highway
- US highway
- Roads
- Cities
- USGS Quad Index 24K
- Lower 48 Wetland Polygons
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine
- Lower 48 Available Wetland Data
- Non-Digital
- Digital
- No Data
- Scan
- NHD Streams
- Counties 100K
- States 100K
- South America
- North America

Scale: 1:60,578

Map center: 35° 13' 53" N, 82° 44' 26" W

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

North Carolina Waterbodies Listed by County

Records Found: 310

Note: Waterbodies are listed in more than one county if they cross county lines.

Search Parameters:
County: Transylvania
Class: %
SpDes: %
Name: %
Index#: %

Name of Stream	Description	Curr. Class	Date	Basin	Stream Index #
		Transylvania County			
TOXAWAY RIVER (Lake Toxaway)	From source to Dam at Lake Toxaway Estates, Inc.	B;Tr	07/01/73	Savannah	4-(1)
TOXAWAY RIVER	From Dam at Lake Toxaway Estates, Inc. to North Carolina-South Carolina State Line	C	07/01/61	Savannah	4-(4)
Rock Creek	North Carolina Portion	C	07/01/61	Savannah	4-10
Bearpen Creek	From source to Rock Creek	C;Tr	07/01/73	Savannah	4-10-1
Cobb Creek	From source to North Carolina-South Carolina State Line	C;Tr	07/01/73	Savannah	4-11
Bear Creek	From source to North Carolina-South Carolina State Line	C;Tr	07/01/73	Savannah	4-12
Horsepasture River	From a point approximately 0.60 mile downstream of N.C. Hwy. 281 (Bohaynee Road) to NC-SC state line	B;Tr,ORW	07/01/09	Savannah	4-13-(12.75)
Bearcamp Creek	From source to North Carolina-South Carolina State Line	C;Tr	07/01/73	Savannah	4-13-13
Whitewater River	From Little Whitewater Creek to North Carolina-South Carolina State Line	C;Tr,HQW	08/01/90	Savannah	4-14-(1.5)
Democrat Creek	From source to Whitewater River	C;Tr,HQW	08/01/90	Savannah	4-14-3
Waddle Branch	From source to Whitewater River	C;Tr,HQW	08/01/90	Savannah	4-14-4
Corbin Creek	From source to Whitewater River	C;Tr,HQW	08/01/90	Savannah	4-14-5
Thompson River	From source to North Carolina-South Carolina State Line	C;Tr	07/01/73	Savannah	4-14-6
Reid Branch	From source to Thompson River	C;Tr	07/01/73	Savannah	4-14-6-1

Name of Stream	Description	Curr. Class	Date	Basin	Stream Index #
Nicholson Creek	From source to French Broad River	C;Tr	07/01/73	French Broad	6-28
Graham Creek	From source to Nicholson Creek	B;Tr	07/01/73	French Broad	6-28-1
Brackens Creek	From source to Graham Creek	C	09/01/74	French Broad	6-28-1-1
Keystone Camp Branch	From source to Water Supply Intake	C;HQW	08/03/92	French Broad	6-28-1-2-(1)
Keystone Camp Branch	From Water Supply Intake to Graham Creek	B	04/01/58	French Broad	6-28-1-2-(2)
Norton Creek (Tucker Creek)	From source to Nicholson Creek	C;Tr	07/01/73	French Broad	6-28-2
Brushy Creek (Norton Creek)	From source to Brevard Water Supply Intake	C;Tr	08/03/92	French Broad	6-28-2-1-(1)
Brushy Creek (Norton Creek)	From Brevard Water Supply Intake to Norton Creek	B;Tr	07/01/73	French Broad	6-28-2-1-(2)
Hunts Branch	From source to Norton Creek	C	07/01/73	French Broad	6-28-2-2
Cateechee Branch	From source to French Broad River	B	04/01/58	French Broad	6-29
North Fork French Broad River	From source to Indian Creek	B;Tr,HQW	08/01/02	French Broad	6-3-(0.5)
North Fork French Broad River	From Indian Creek to French Broad River	B;Tr	08/01/02	French Broad	6-3-(6.5)
Courthouse Creek	From source to North Fork French Broad River	C;Tr,HQW	08/01/90	French Broad	6-3-1
Coalney Branch	From source to Courthouse Creek	C;Tr,HQW	08/01/90	French Broad	6-3-1-1
Chestnut Creek	From source to Courthouse Creek	C;Tr,HQW	08/01/90	French Broad	6-3-1-2
Mill Station Creek	From source to Courthouse Creek	C;Tr,HQW	08/01/90	French Broad	6-3-1-3
Tucker Creek	From source to North Fork French Broad River	C;Tr	07/01/73	French Broad	6-3-10
Bracken Creek	From source to Tucker Creek	C;Tr	07/01/73	French Broad	6-3-10-1
North Fork Tucker Creek	From source to Tucker Creek	C;Tr	07/01/73	French Broad	6-3-10-2
Johnnies Creek	From source to Tucker Creek	C;Tr	07/01/73	French Broad	6-3-10-3
Methany Creek	From source to Tucker Creek	C;Tr	07/01/73	French Broad	6-3-10-4
Jake Branch	From source to Tucker Creek	C;Tr	07/01/73	French Broad	6-3-10-5
Jason Branch	From source to North Fork French Broad River	C;Tr	07/01/73	French Broad	6-3-11
Lamance Creek	From source to North Fork French Broad River	C;Tr	07/01/73	French Broad	6-3-12

REFERENCE 12

Shaw Engineering of North Carolina, P.C.
Three Independence Pointe, Suite 107
Greenville, SC 29615
864.254.9285
FAX: 864.254-9286

Shaw® Shaw Engineering of North Carolina, P.C.

TECHNICAL MEMORANDUM
ON
ARSENIC IN THE FILL IN THE CELLOPHANE AREA
FORMER ECUSTA MILL, PISGAH FOREST, NORTH CAROLINA

High levels of arsenic were detected in the fill material used under the slabs within the Cellophane Plant Area at the Former Ecusta Mill, Pisgah Forest, North Carolina. Based on numerous field observations and borings, there is a clear distinction between the lighter reddish brown fill material and the darker native material. Three soil borings were installed to determine the thickness of the fill material and obtain soil sample for arsenic analysis. **Figure 1** shows the general "Cellophane Plant Area" and the soil boring locations. The fill materials consists of lighter reddish brown sandy gravelly clay with rusty oxidized rocks and high arsenic content, while the native material consists of darker silty clay and organic material and has low levels of arsenic. The thickness of the fill material ranges from 2.5 feet at Building 71 to 4.5 feet at Building 101.

The purpose of this technical memorandum is to determine if the fill material has been impacted with plant operations after it was brought on-site and to classify it as a waste material or not.

Arsenic in the Fill Material

As part of the approved TCRA Work Plan for the Building Slabs, soil samples were collected below the Building Slabs and analyzed using X-Ray Fluorescence (XRF) in the field; while selected samples were sent to laboratory for confirmation. XRF and laboratory results are comparable to each other. **Figure 1** shows the former building locations. Soil samples were collected from under the slabs of each building as per the approved TCRA Work Plan. A correlation between XRF and laboratory results was developed for soil samples from the Olin Disposal Area. Attached **Figure 2** shows that XRF results are generally higher than the corresponding laboratory results. This provides confidence in using XRF results to make field decisions.

Table 1 presents analytical results for arsenic in the fill material at the Cellophane Plant Area. **Table 1** also includes analytical summaries for lead, mercury, and zinc. Building 82 fill material appears to have higher arsenic concentrations than the rest of the fill material and Building 82 is isolated from the Cellophane Plant area and was used for solvent recovery. Therefore, Building 82 fill material was not

considered in this analysis. The Cellophane Plant fill non-native fill data are presented in two groups – fill not impacted by lead and/or PAHs and fill impacted by lead and/or PAHs. The average arsenic content of the non-native fill material not impacted by site activities (lead or PAHs) was 28.3 mg/kg and a standard deviation of 25.3 mg/kg. The highest value of 124 mg/kg was detected at Building 67.

Lead concentration exceeding 400 mg/kg were detected in isolated samples at Buildings 106, 101, and 95. PAH concentrations exceeded site remediation goals established in the TCRA Work Plan in one soil sample each at Buildings 106 and 95. A total of 9 samples had site remediation goal exceedances for lead and/or PAHs. Sand blasting may have occurred at Building 106 which is isolated from the rest of the Cellophane Plant Area. The highest arsenic concentration in these samples was 577 in Bldg 95 SW GS03 soil sample. The next highest arsenic concentration in this set was 38.7 mg/kg. The overall average arsenic content of all non-native fill material was 33.4 mg/kg and a standard deviation of 58.9 mg/kg.

Arsenic in the Native Material

As part of the approved TCRA Work Plan for the Building Slabs, soil samples were collected from the native material below the Building Slabs and analyzed using XRF in the field. **Table 1** presents analytical results for arsenic in the native material below the fill material at the Cellophane Plant Area. Arsenic was detected only in one of 13 soil samples. The detected value (7 mg/kg) was very close to the limit of detection (LOD).

Potential Sources of Arsenic in the Fill Material

After a detailed review of historical plant operations and construction drawings, it was determined that there are two possible sources of arsenic in the fill material --- process associated with the production of cellophane film material and the source of the fill material. The Cellophane Plant process information was reviewed and it was determined that arsenic was not used in the process. Former Ecusta Mill employees, Jack Garren and Fred Finley, identified the source of fill material at the Cellophane plant to be a small hill at the present location of the Ecusta Credit Union and Jennings Builders Supply and Hardware (see **Figure 3**). The suspected source of the fill material is visually similar to the fill material at the Cellophane Plant Area. Ten soil and two rock samples were collected from two areas from suspected source of fill material. Six samples were analyzed for arsenic using XRF and six samples were sent to Pace Laboratory for analysis. **Table 2** provides a summary of analytical results for arsenic. Data shows a highly variable arsenic content; however, the XRF dataset and the laboratory dataset are statistically similar. The average arsenic content of the fill source material was 54.1 mg/kg and a standard deviation was 55.7 mg/kg for the laboratory data. The overall (laboratory and XRF data) average arsenic content of

the fill source material (soil samples only) was 40.3 mg/kg and a standard deviation was 38.7 mg/kg for the laboratory data. This is not surprising as source of fill material is located on the Brevard Fault Zone, a prominent geologic feature of southeast that runs approximately 700 kilometers from Alabama to Virginia. Arsenic is known to exist in high concentrations due to mineralization in the shear zone of the Brevard Fault. There is visual evidence of sulferization that can result in arsenic present in several percent range on the mineralized surfaces.

Statistical Comparison of Arsenic in the Fill Material to Background/Source of Fill

In order to compare fill material to the background survey, the arsenic data set distribution from the site fill material was compared to the background distribution to determine if the fill material was impacted after it was brought on to the former Ecusta Mill site. Averages of two populations (sets) were compared using the "independent t-test" (Berthouex and Brown, 1994).

Independent t-test

The following procedure is said to be robust because the central limit effect will tend to make the distributions of the averages and their differences normal even though the parent distributions are not normal. Let's say that background and site-specific metal concentrations are random variables, Y_b and Y_s, respectively, with mean values μ_b and μ_s; and variances σ_b^2 and σ_s^2. The expected value of difference between the averages of the two distributions is

$$E(\overline{Y_b} - \overline{Y_s}) = \mu_b - \mu_s$$

where $\overline{Y_b}$ and $\overline{Y_s}$ are populations of sample averages for background and site, respectively. If data are from random samples, the variance of difference is

$$V(\overline{Y_b} - \overline{Y_s}) = \frac{\sigma_b^2}{n_b} + \frac{\sigma_s^2}{n_s}$$

where n_b and n_s are the sample sizes.

Since distribution variances are unknown, they are estimated from the sample data by computing

$$s_b^2 = \frac{\Sigma(y_b - \overline{y_b})^2}{n_b - 1}$$

and

$$s_s^2 = \frac{\Sigma(y_s - \overline{y_s})^2}{n_s - 1}$$

where y_b and y_s are data points from background and site with averages $\overline{y_b}$ and $\overline{y_s}$.

These estimates can be pooled if the population variances are of equal magnitude:

$$s_{pool}^2 = \frac{(n_b - 1)\, s_b^{\,2} + (n_s - 1)\, s_s^{\,2}}{n_b + n_s - 2}$$

The pooled variance is the weighted average of the sample variances. Then the estimated variance of the difference is

$$V(\overline{Y_b} - \overline{Y_s}) = \frac{s_{pool}^2}{n_b} + \frac{s_{pool}^2}{n_s} = s_{pool}^2 \left(\frac{1}{n_b} + \frac{1}{n_s} \right)$$

As per the central limit theory, averages of subsets of a population follow a normal distribution. Therefore, we can use the Student's t-distribution to compute the confidence interval for difference of averages. The 95 percent confidence interval for difference of averages is given by

$$(\overline{y_b} - \overline{y_s}) \pm t_{n_b+n_s-2,\alpha/2} \left[s_{pool} \left(\frac{1}{n_b} + \frac{1}{n_s} \right)^{1/2} \right]$$

where α is 5 percent for 95 percent confidence interval. If two populations are the same then the expected difference of means (zero) should be within the confidence interval as calculated above.

Thus, for background and site data to have statistically similar distributions, two conditions must be met. First, the confidence interval for the difference of averages should include zero. Second, the two sample variances should not differ by more than a factor of ten. In other words, two standard deviations should be within a factor of 3.16. An additional condition was applied to detect potentially contaminated locations. Concentrations greater than two times the maximum in the background set were considered to be from a potentially contaminated location (hot spot). If any potentially contaminated location was

identified, then two sets were not considered statistically similar. If any of these conditions were not satisfied, two populations were considered to be statistically different.

Application of Independent t-test to Cellophane Plant Data

Table 3 presents application of independent t-test to Cellophane Plant fill data as site data and source fill data as the background data. Both XRF and laboratory data (soil samples only) for the source fill area were combined into one set of 10 data points for the background data. The Cellophane Plant fill data consisted of only XRF data, although five XRF results were confirmed by laboratory analysis. Only one value for arsenic exceeded the maximum arsenic value in the background set. This sample also had leads concentration (561.3 mg/kg) greater than the site remediation goal of 400 mg/kg and will be excavated and disposed off-site. **Table 3** shows that the arsenic distribution in the non-native fill material is similar to the source of fill material whether soils impacted for lead/PAHs is included or excluded in the site data. In other words, the fill material has not been impacted with the site activities with regards to arsenic after it was imported.

Conclusions

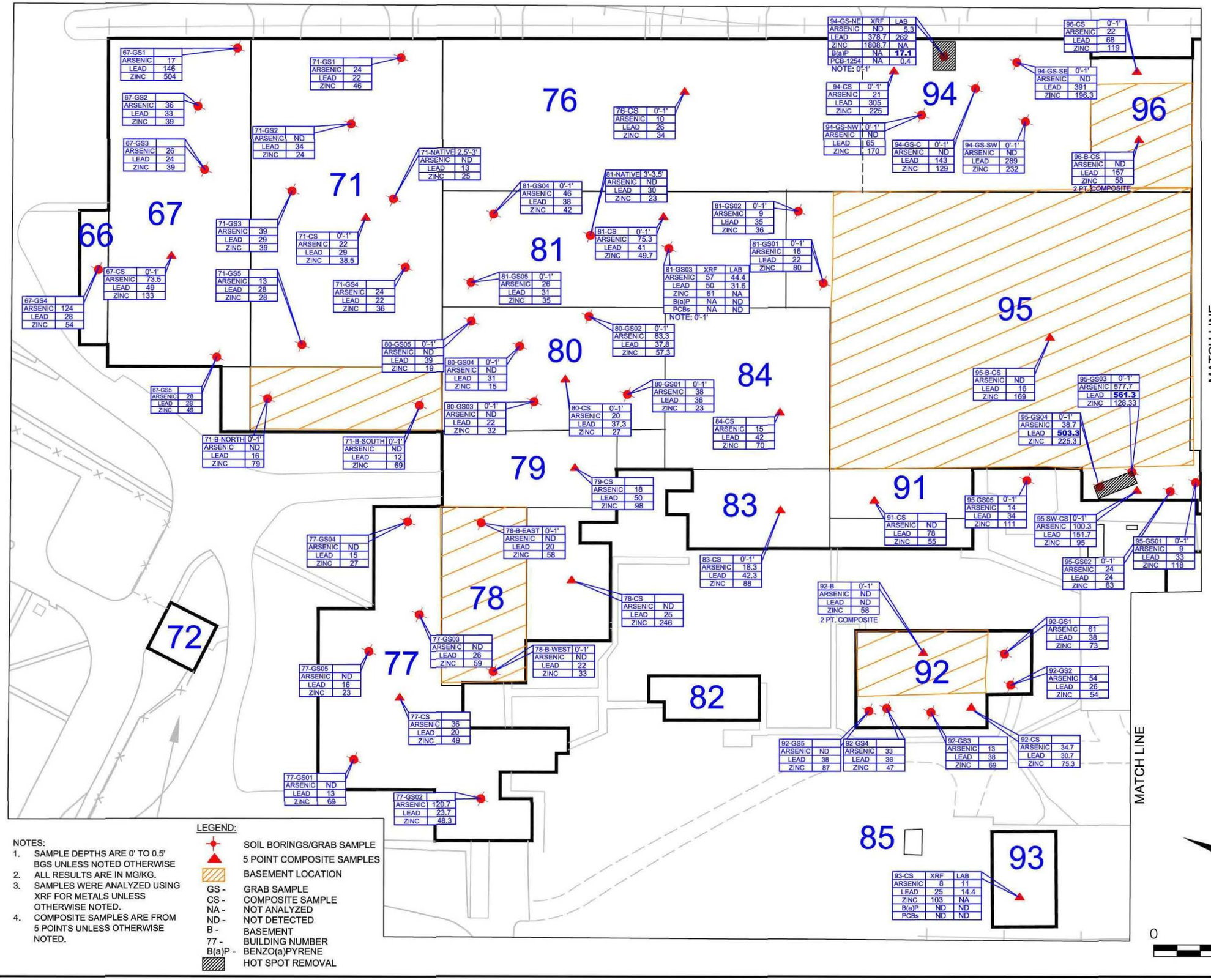
Arsenic found in the fill material underneath the Cellophane Plant Area is naturally occurring and not related to releases from the plant operations, i.e., not a waste material, for the following reasons:

- Arsenic was not used in the plant operations
- Arsenic was not present in any of the raw material used in the Cellophane process
- Arsenic concentrations and distribution are similar in the fill material and source area of the fill
- Arsenic in the source area of the fill is naturally occurring

Although the fill material is considered at background, high arsenic fill material will be managed on-site in accordance with risk evaluation based on planned development and future exposure.

References

Berthouex, P.M., and L.C. Brown, 1984. Statistics for Environmental Engineers. Lewis Publishers, Boca Raton, Florida.



NOTES:
1. SAMPLE DEPTHS ARE 0' TO 0.5' BGS UNLESS NOTED OTHERWISE
2. ALL RESULTS ARE IN MG/KG.
3. SAMPLES WERE ANALYZED USING XRF FOR METALS UNLESS OTHERWISE NOTED.
4. COMPOSITE SAMPLES ARE FROM 5 POINTS UNLESS OTHERWISE NOTED.

LEGEND:
- SOIL BORINGS/GRAB SAMPLE
- 5 POINT COMPOSITE SAMPLES
- BASEMENT LOCATION
- GS - GRAB SAMPLE
- CS - COMPOSITE SAMPLE
- NA - NOT ANALYZED
- ND - NOT DETECTED
- B - BASEMENT
- 77 - BUILDING NUMBER
- B(a)P - BENZO(a)PYRENE
- HOT SPOT REMOVAL

66. OFFICES
67. SHIPPING
71. ESSENTIAL MATERIALS
76. STORAGE BUILDING
77. R.C. BUILDING
78. TOP COATER BUILDING
79. CAFETERIA
80. SHEETING
81. SLITTING
82 SOLVENT RECOVERY
83. COATING TOWERS
84. LAG STORAGE
91. LABORATORY
92. COATING BATH MIX PLANT
93. EMPTY DRUM STORAGE
94. SHOPS & STORES
95. CASTING ROOM
96. COAGULATING BATH
97. V.R. ROOM
98. PX STORAGE
99. CHEMICAL BUILDING
100. FILM DEVELOPMENT BUILDING
101. WOOD PULP STORAGE
105. CHEMICAL TANK FARM
106. FIELD SHOPS

SOIL SAMPLING SUMMARY
OLIN FILM PLANT

CLIENT: DAVIDSON RIVER VILLAGE LLC

LOCATION: ECUSTA MILL PISGAH FOREST, NORTH CAROLINA

PM: RK | CHECKED: AB | FIGURE: 1-A

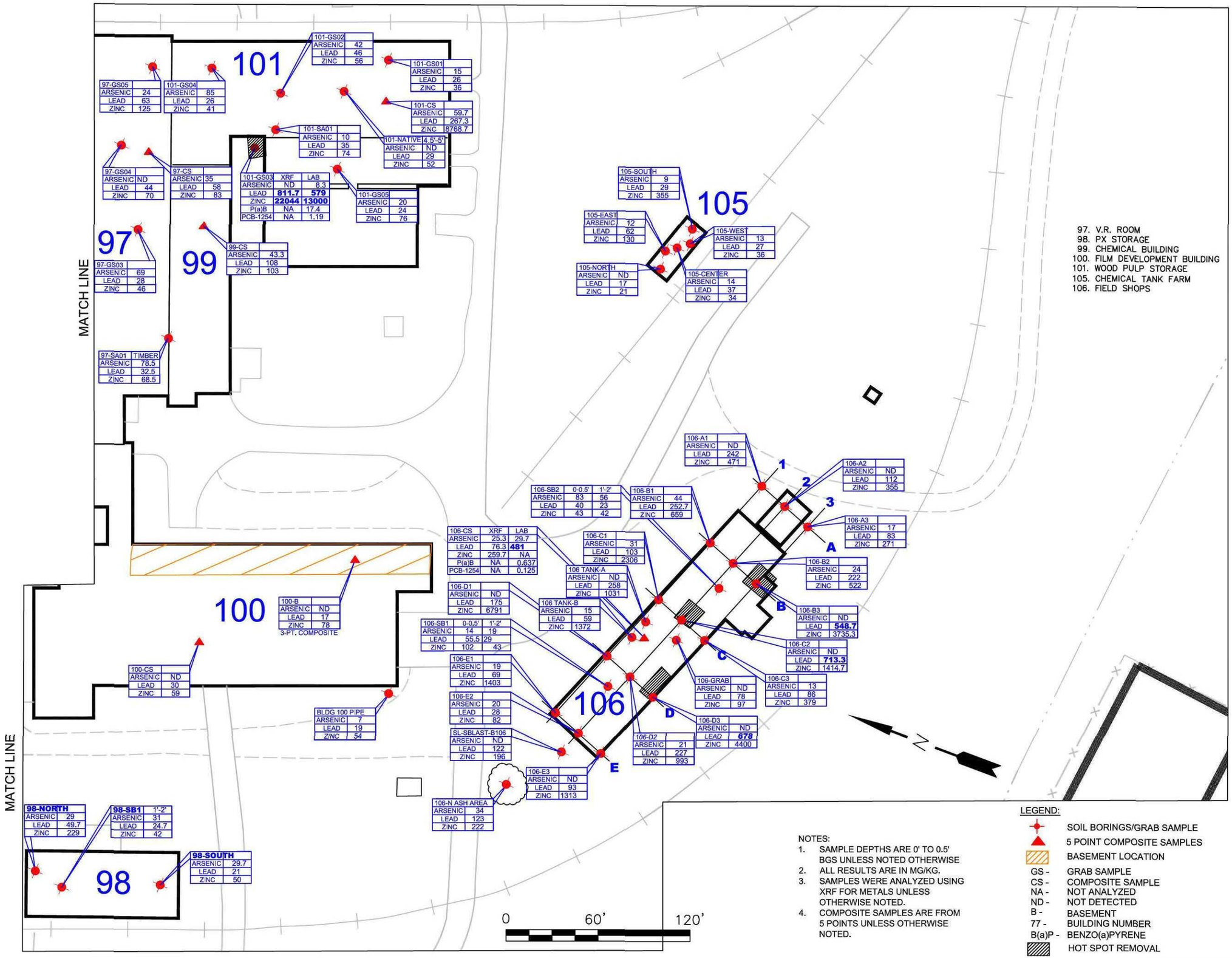
DESIGNED: RS | DETAILED: | PROJECT NO.: 131497

Shaw
11560 GREAT OAKS WAY
SUITE 500
ALPHARETTA, GA 30022
(770) 475-8994 (TEL)
(770) 777-9545 (FAX)

ACAD FILE: FIGURE-FILM01.DWG

DRAWING DATE: 1/16/09

OFFICE: Alpharetta



NOTES:

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2. ALL RESULTS ARE IN MG/KG.
3. SAMPLES WERE ANALYZED USING XRF FOR METALS UNLESS OTHERWISE NOTED.
4. COMPOSITE SAMPLES ARE FROM 5 POINTS UNLESS OTHERWISE NOTED.

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- 5 POINT COMPOSITE SAMPLES
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- GS - GRAB SAMPLE
- CS - COMPOSITE SAMPLE
- NA - NOT ANALYZED
- ND - NOT DETECTED
- B - BASEMENT
- 77 - BUILDING NUMBER
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- HOT SPOT REMOVAL

CLIENT: DAVIDSON RIVER VILLAGE LLC

LOCATION: ECUSTA MILL PISGAH FOREST, NORTH CAROLINA

DESIGNED: RS

DETAILED:

PROJECT NO.: 131497

PM: RK

CHECKED: AB

FIGURE: 1-B

SOIL SAMPLING SUMMARY OLIN FILM PLANT

Shaw™
11560 GREAT OAKS WAY
SUITE 500
ALPHARETTA, GA 30022
(770) 475-8994 (TEL)
(770) 777-9545 (FAX)

OFFICE: Alpharetta

DRAWING DATE: 1/19/09

ACAD FILE: FIGURE-FILM01.DWG

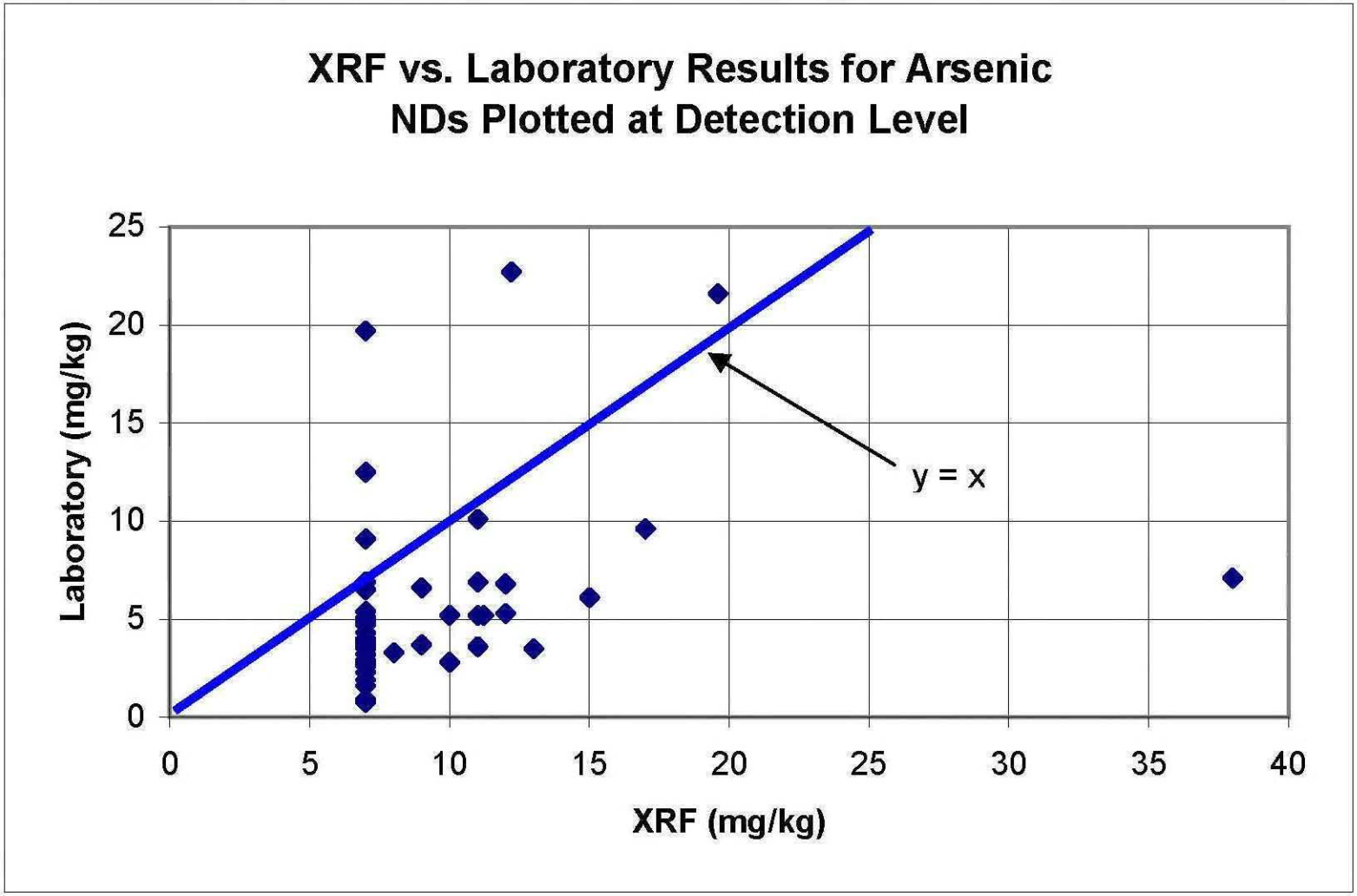

Figure 2: Correlation Between XRF and Laboratory Data for Arsenic in Soil Samples at the Olin Disposal Area

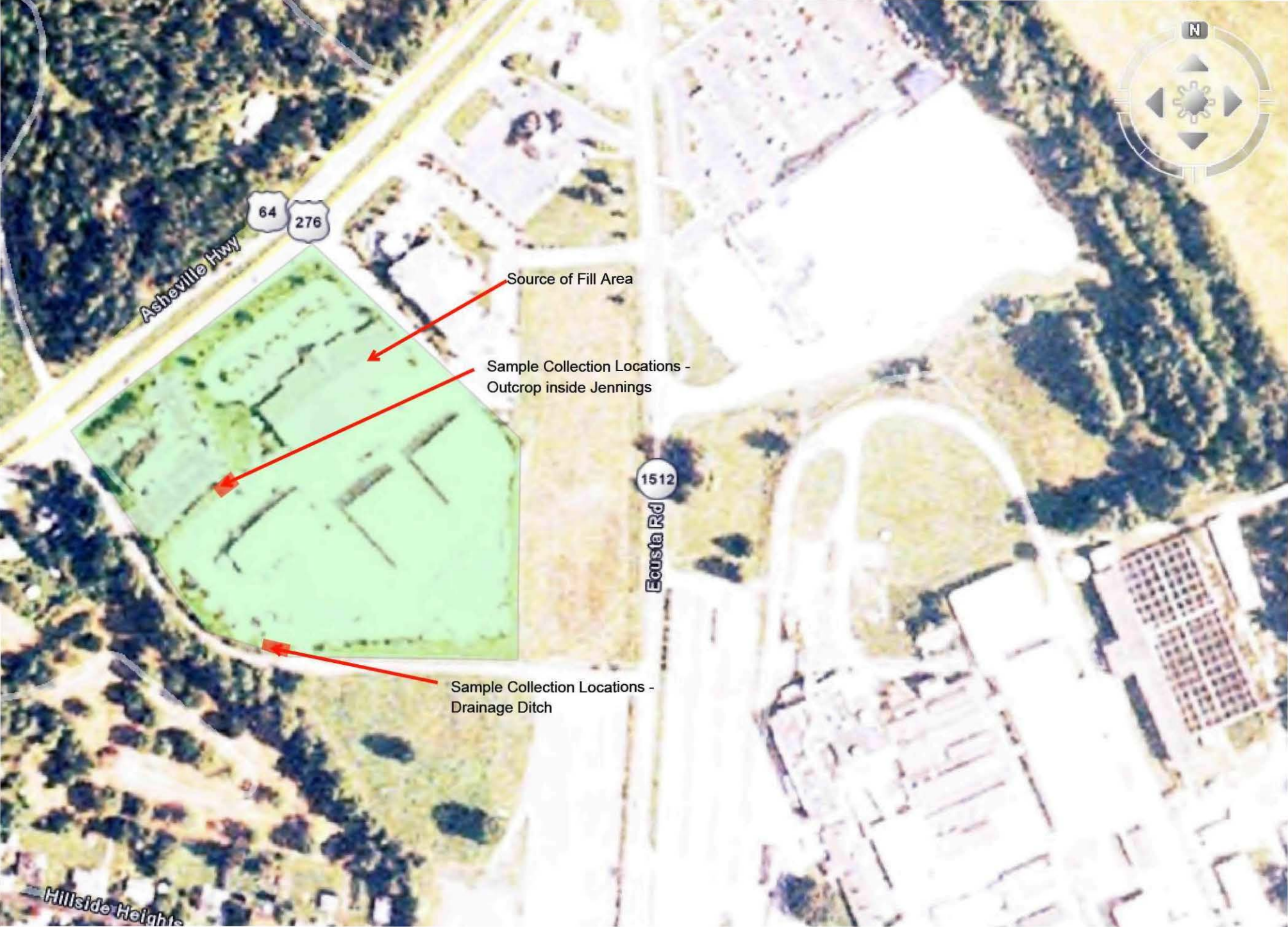
N
64
276
Asheville Hwy
Source of Fill Area
Sample Collection Locations -
Outcrop inside Jennings
1512
Ecusta Rd
Sample Collection Locations -
Drainage Ditch
Hillside Heights

Table 1
Summary of Analytical Results in Fill and Native Material at the Cellophane Plant Area

Building	Sample Location	Sample Depth	Arsenic (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Zinc (mg/kg)	Comments
SUBSLAB SAMPLES FROM NON-NATIVE FILL NOT IMPACTED BY SITE ACTIVITIES							
M	SL-SBLAST-B106	0-0.5 ft bgs	<LOD	122	<LOD	196	
106	BLDG 106 Grab	0-0.5 ft bgs	<LOD	78	<LOD	97	
106	BLDG 106 TANK - A	0-0.5 ft bgs	<LOD	258	<LOD	1031	
106	BLDG 106 TANK - B	0-0.5 ft bgs	15	59	<LOD	1372	
106	BLDG 106 - N ASH AREA	0-0.5 ft bgs	34	123	22	222	
106	BLDG 106 - A1	0-0.5 ft bgs	<LOD	242	<LOD	471	
106	BLDG 106 - A2	0-0.5 ft bgs	<LOD	112	<LOD	355	
106	BLDG 106 - A3	0-0.5 ft bgs	17	83	<LOD	271	
106	BLDG 106 - B1	0-0.5 ft bgs	44	252.7	<LOD	659	Average of triplicates
106	BLDG 106 - B2	0-0.5 ft bgs	24	222	<LOD	522	
106	BLDG 106 - C1	0-0.5 ft bgs	31	103	<LOD	2306	
106	BLDG 106 - C3	0-0.5 ft bgs	13	86	9	379	
106	BLDG 106 - D1	0-0.5 ft bgs	<LOD	175	<LOD	6791	Result exceeds default SRG for zinc but is below site RG for zinc when accounted for only two non-carcinogens present.
106	BLDG 106 - D2	0-0.5 ft bgs	21	227	<LOD	993	
106	BLDG 106 - E1	0-0.5 ft bgs	19	69	<LOD	1403	
106	BLDG 106 - E2	0-0.5 ft bgs	20	28	<LOD	82	
106	BLDG 106 - E3	0-0.5 ft bgs	<LOD	93	<LOD	1313	
106	BLDG 106 SB1	1-2 ft bgs	19	29	<LOD	43	
106	BLDG 106 SB1 (R2)	0-0.5 ft bgs	14	55.5	<LOD	102	Average of duplicates
106	BLDG 106 SB2	1-2 ft bgs	56	23	<LOD	42	
106	BLDG 106 SB2 (R2)	0-0.5 ft bgs	83	40	<LOD	43	Average of duplicates
105	BLDG 105 - CENTER	0-0.5 ft bgs	14	37	<LOD	34	
105	BLDG 105 - NORTH	0-0.5 ft bgs	<LOD	17	<LOD	21	
105	BLDG 105 - SOUTH	0-0.5 ft bgs	9	29	<LOD	355	
105	BLDG 105 - EAST	0-0.5 ft bgs	12	62	<LOD	130	
105	BLDG 105 - WEST	0-0.5 ft bgs	13	27	<LOD	36	
101	BLDG 101 - SA01 (Seeping)	0-0.5 ft bgs	10	35	<LOD	74	
101	BLDG 101 CS	0-0.5 ft bgs	59.7	267.3	<LOD	8768.7	Average of triplicates; result exceeds default SRG for zinc but is below site RG for zinc when accounted for only two non-carcinogens present.
101	BLDG 101 GS01	0-0.5 ft bgs	15	26	<LOD	36	
101	BLDG 101 GS02	0-0.5 ft bgs	42	46	<LOD	56	
101	BLDG 101 GS04	0-0.5 ft bgs	85	26	<LOD	41	
101	BLDG 101 GS05	0-0.5 ft bgs	20	24	<LOD	76	
100	BLDG 100 - CS	0-0.5 ft bgs	<LOD	30	<LOD	59	
100	Bldg 100 Pipe	0-0.5 ft bgs	7	19	<LOD	54	
99	BLDG 99 - CS	0-0.5 ft bgs	43.3	108	<LOD	103	Average of triplicates
98	BLDG 98 (SOUTH)	0-0.5 ft bgs	29.7	21	<LOD	50	Average of triplicates
98	BLDG 98 (NORTH)	0-0.5 ft bgs	29	49.7	<LOD	229	Average of triplicates
98	BLDG 98 SB1	1-2 ft bgs	31	24.7	<LOD	42	Average of triplicates
97	BLDG 97 - SA01 (Timber)	0-0.5 ft bgs	78.5	32.5	<LOD	68.5	Average of duplicates
97	BLDG 97 CS	0-0.5 ft bgs	35	58	<LOD	83	
97	BLDG 97 GS03	0-0.5 ft bgs	69	28	<LOD	46	
97	BLDG 97 GS04	0-0.5 ft bgs	<LOD	44	<LOD	70	
97	BLDG 97 GS05	0-0.5 ft bgs	24	63	<LOD	125	
96	BLDG 96 CS	0-1 ft bgs	22	68	<LOD	119	
95	B95 SW-CS	0-1 ft bgs	100.3	151.7	<LOD	95	Average of triplicates
95	BLDG 95 SW GS01	0-1 ft bgs	9	33	<LOD	118	
95	BLDG 95 SW GS02	0-1 ft bgs	24	24	<LOD	63	
95	BLDG 95 SW GS05	0-1 ft bgs	14	34	<LOD	111	
94	B94-CS	0-1 ft bgs	21	305	<LOD	225	Average of triplicates
94	B94-GS-Center	0-1 ft bgs	<LOD	143	<LOD	129	
94	B94-GS-NW	0-1 ft bgs	<LOD	65	<LOD	170	
94	B94-GS-SE	0-1 ft bgs	<LOD	391	<LOD	196.3	Average of triplicates
94	B94-GS-SW	0-1 ft bgs	<LOD	289	11	232	
93	BLDG 93 - CS	0-0.5 ft bgs	8	25	<LOD	103	**Lab confirmation result:** Arsenic = 11 mg/kg, Lead = 14.4 mg/kg, Mercury = 0.029 mg/kg, PCBs = ND, PAHs = ND except pyrene at 453 ug/kg
92	BLDG 92 CS	0-0.5 ft bgs	34.7	30.7	<LOD	75.3	Average of triplicates
92	BLDG 92 GS1	0-0.5 ft bgs	61	38	<LOD	73	
92	BLDG 92 GS2	0-0.5 ft bgs	54	26	<LOD	54	
92	BLDG 92 GS3	0-0.5 ft bgs	13	38	<LOD	69	
92	BLDG 92 GS4	0-0.5 ft bgs	33	36	<LOD	47	
92	BLDG 92 GS5	0-0.5 ft bgs	<LOD	38	<LOD	87	
91	B91-CS	0-.5 ft bgs	<LOD	78	<LOD	55	
84	B84-CS	0-0.5 ft bgs	15	42	<LOD	70	
83	BLDG 83 CS	0-1 ft bgs	18.3	42.3	<LOD	88	Average of triplicates
81	BLDG 81 - CS	0-1 ft bgs	75.3	41	<LOD	49.7	Average of triplicates
81	BLDG 81 GS01	0-1 ft bgs	18	22	<LOD	80	
81	BLDG 81 GS02	0-1 ft bgs	9	35	<LOD	36	
81	BLDG 81 GS03	0-1 ft bgs	57	50	<LOD	61	**Lab confirmation result:** Arsenic = 44.4 mg/kg, Lead = 31.6 mg/kg, Mercury = 0.021 mg/kg, PCBs = ND, VOCs = ND except acetone at 122 ug/kg

Table 1
Summary of Analytical Results in Fill and Native Material at the Cellophane Plant Area

Building	Sample Location	Sample Depth	Arsenic (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Zinc (mg/kg)	Comments
SUBSLAB SAMPLES FROM NON-NATIVE FILL NOT IMPACTED BY SITE ACTIVITIES							
81	BLDG 81 GS04	0-1 ft bgs	46	38	<LOD	42	
81	BLDG 81 GS05	0-1 ft bgs	26	31	<LOD	35	
80	BLDG 80 - CS	0-1 ft bgs	20	37.3	<LOD	27	Average of triplicates
80	BLDG 80 GS01	0-1 ft bgs	38	36	<LOD	23	
80	BLDG 80 GS02	0-1 ft bgs	83.3	37.8	<LOD	57.3	Average of 4 samples
80	BLDG 80 GS03	0-1 ft bgs	<LOD	22	<LOD	32	
80	BLDG 80 GS04	0-1 ft bgs	<LOD	31	<LOD	15	
80	BLDG 80 GS05	0-1 ft bgs	<LOD	39	<LOD	19	
79	BLDG 79 CS	0-0.5 ft bgs	18	50	<LOD	98	
78	BLDG 78 CS	0-0.5 ft bgs	<LOD	25	<LOD	246	
77	BLDG 77 CS	0-0.5 ft bgs	36	20	<LOD	49	
77	BLDG 77 GS01	0-0.5 ft bgs	<LOD	13	<LOD	69	
77	BLDG 77 GS02	0-0.5 ft bgs	120.7	23.7	<LOD	48.3	Average of triplicates
77	BLDG 77 GS03	0-0.5 ft bgs	<LOD	26	<LOD	59	
77	BLDG 77 GS04	0-0.5 ft bgs	<LOD	15	<LOD	27	
77	BLDG 77 GS05	0-0.5 ft bgs	<LOD	16	<LOD	23	
76	B76-SL-CS	0-1 ft bgs	10	26	<LOD	34	
71	B71-SL-CS	0-1 ft bgs	22	29	<LOD	38.5	Average of duplicates
71	B71-SL-GS1	0-0.5	24	22	<LOD	46	
71	B71-SL-GS2	0-0.5	<LOD	34	<LOD	24	
71	B71-SL-GS3	0-0.5	39	29	<LOD	39	
71	B71-SL-GS4	0-0.5	24	22	<LOD	36	
71	B71-SL-GS5	0-0.5	13	28	<LOD	28	
67	B67-SL-CS	0-1 ft bgs	73.5	49	<LOD	133	Average of duplicates
67	B67-SL-GS1	0-0.5 ft bgs	17	146	<LOD	504	
67	B67-SL-GS2	0-0.5 ft bgs	36	33	<LOD	39	
67	B67-SL-GS3	0-0.5 ft bgs	26	24	<LOD	39	
67	B67-SL-GS4	0-0.5 ft bgs	124	28	<LOD	54	
67	B67-SL-GS5	0-0.5 ft bgs	28	28	<LOD	49	
	Average		**28.3**	**68.3**		**349.9**	<LOD calculated at +/- value given by XRF
	Std Deviation		**25.3**	**75.1**		**1154.2**	<LOD calculated at +/- value given by XRF
SUB-SLAB SAMPLES EXCEEDING RGs FOR LEAD OR PAHs							
106	BLDG 106 CS	0-0.5 ft bgs	25.3	76.3	<LOD	259.7	Average of triplicates. **Lab confirmation result:** Arsenic = 29.7 mg/kg, Lead = 481 mg/kg, Mercury = 0.16 mg/kg, PCB-1254 = 0.125 mg/kg, Benzo(a) pyrene = 637 ug/kg, and other PAHs at low levels
106	BLDG 106 - B3	0-0.5 ft bgs	<LOD	548.7	15.7	3735.3	Average of triplicates
106	BLDG 106 - C2	0-0.5 ft bgs	<LOD	713.3	<LOD	1414.7	Average of triplicates
106	BLDG 106 - D3	0-0.5 ft bgs	<LOD	678	<LOD	4400	
101	BLDG 101 GS03	0-0.5 ft bgs	<LOD	811.7	<LOD	22044.3	Average of triplicates. **Lab confirmation result:** Arsenic = 8.3 mg/kg, Lead = 579 mg/kg, Mercury = 0.27 mg/kg, Zinc = 13,000 mg/kg, PCB-1254 = 1.19 mg/kg, Benzo(a)pyrene = 17,400 ug/kg, and other PAHs.
101	BLDG 101 GS03 (SUPP)	0-1 ft bgs	<LOD	689.3	<LOD	18595	Average of triplicates
95	BLDG 95 SW GS03	0-1 ft bgs	577.7	561.3	<LOD	128.33	Average of triplicates
95	BLDG 95 SW GS04	0-1 ft bgs	38.7	503.3	<LOD	225.3	Average of triplicates
94	B94-GS-NE	0-1 ft bgs	<LOD	378.7	<LOD	1808.7	Average of triplicates. **Lab confirmation result:** Arsenic = 5.3 mg/kg, Lead = 262 mg/kg, Mercury = 0.31 mg/kg, PCB-1254 = 0.4 mg/kg, Benzo(a)pyrene = 17,100 ug/kg, and other PAHs and VOCs; Pesticides = ND, Herbicides = ND
	Average for ALL Non-Native Fill		**33.4**	**109.7**		**821.0**	
	Std Deviation for ALL Non-Native Fill		**58.9**	**165.3**		**3003.2**	
BASEMENT / NATIVE MATERIAL SAMPLES							
M	PIPELINE VAULT FLOOR	0-0.5 ft bgs	7	21	<LOD	72	
M	SL-RP#2-FL	5-6 ft bgs	<LOD	27	<LOD	14	
101	Native Material Below Fill, Bldg 101	4.5-5.0 ft bgs	<LOD	29	<LOD	52	
100	BLDG 100 - BASEMENT	0-0.5 ft bgs	<LOD	17	<LOD	78	
96	BLDG 96 Basement CS	0-0.5 ft bgs	<LOD	157	<LOD	58	
95	BLDG 95 Basement CS	0-0.5 ft bgs	<LOD	16	<LOD	169	
92	BLDG 92 BASEMENT	0-1 ft bgs	<LOD	<LOD	<LOD	58	
81	Native Material Below Fill, Bldg 81	3.0-3.5 ft bgs	<LOD	30	<LOD	23	
78	BLDG 78 BASEMENT EAST	0-1 ft bgs	<LOD	20	<LOD	58	
78	BLDG 78 BASEMENT WEST	0-1 ft bgs	<LOD	22	<LOD	33	
71	BLDG 71 BMENT#1 - NORTH	0-1 ft bgs	<LOD	16	<LOD	79	
71	BLDG 71 BMENT#2 - SOUTH	0-1 ft bgs	<LOD	12	<LOD	69	
71	Native Material Below Fill, Bldg 71	2.5-3.0 ft bgs	<LOD	13	<LOD	25	

CS = Composite Sample
LOD = Level of detection
XRF = X-Ray Fluorescence

Table 2
Arsenic in Background Soils/Source of Fill Material Near Ecusta Mill Site

Sample	Arsenic (mg/kg)	Remarks
LABORATORY DATA		
Background 1	52.8	Reddish gray sandy clay; From outcrop inside Jennings
Background 2	4.4	Reddish gray sandy clay; From outcrop inside Jennings
Background 3	47.5	Reddish gray sandy clay; From outcrop inside Jennings
Background 4	34.9	Reddish gray sandy clay; From outcrop inside Jennings
Background 5	162	Rock with mineralization stain; From outcrop inside Jennings
Background 6	22.8	Rock with light staining; From outcrop inside Jennings
Average	**54.1**	
Std. Deviation	**55.7**	
XRF DATA		
Ditch Clay	140.3	Average of 134, 141, and 146; Reddish sandy clay; From Ditch
Red Clay #2	9	Reddish gray sandy clay; From ditch
Red Clay #3	19	Reddish gray sandy clay; From ditch
Red Clay #4	41	Reddish gray sandy clay; From ditch
Red Clay #5	17	Reddish gray sandy clay; From ditch
Red Clay #6	37	Reddish gray sandy clay; From ditch
Average	**43.9**	
Std. Deviation	**48.8**	
ALL SOIL SAMPLES ONLY		
Average	**40.3**	
Std. Deviation	**38.7**	

Table 3
Statistical Evaluation of Aresnic in Fill Material at the Cellophane Plant at the Former Ecusta Mill

Set	Arsenic in Background Soils or Source of Fill Material				Fill Material at the Cellphane Plant Area				Pooled Variance	Standard Deviation of Difference	t-95%	Difference - 95% Confidence Interval		Hot Spots?	Statistically Similar?	
	# of Samples	Maximum	Mean	Standard Deviation	# of Samples	Maximum	Mean	Standard Deviation				Lower Limit	Upper Limit		Mean	Standard Deviation
All Non-Native Fill Material	10	140.3	40.3	38.7	105	577.7	33.4	58.9	3.3E+03	19.0	2.0	(45.0)	31.2	Maybe	Yes	Yes
Non-Native Fill Material Not Impacted for Lead or PAHs	10	140.3	40.3	38.7	96	124.0	28.3	25.3	7.1E+02	8.9	2.0	(29.8)	5.8	No	Yes	Yes

Note: All concentrations are in mg/Kg.

Fill Material At the Cellophane Plant Area

Fill Material Containing Rusty Oxidized Rocks at the Cellophane Plant Area

Background Material at the Jennings Builders Supply and Hardware

Mineralized Rock at the Jennings Builders Supply and Hardware