NGK BERYLCO

NGK Metals Corporation

150 Tuckerton Road P.O. Box 13367 Reading, PA 19612 610 921-5000 Fax 610 921-5358

June 15, 2000

Mr. Tim Stewart
Tennessee Department of Environment and Conservation / Superfund
4th Floor L&C Annex
401 Church Street
Nashville , Tennessee 37243-1538

10079539

Re: NGK Metals Corporation
Athens, TN Facility

Dear Mr. Stewart:

Ms. Renee Lucchessi informed NGK Metals that the Department was missing Appendices 1 - 6 of the Report of Investigation and Remediation of Metal Contaminated Soils Former NGK Metals Corporation Facility 725 East Avenue , Athens Tennessee, prepared by TRIAD Environmental Consultants Inc., and submitted by NGK to the Department in December of 1998. Enclosed please find a copy of Appendix 1 through 9 to complete your files. Should you have any questions or require further information, please feel free to contact me at (610) 921-5147.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

cc: Art Becker
Mark Satterfield

ISO 9002

Certified ISO 9002

ISO 9002

APPENDIX 1

STEP'S NOVEMBER 21, 1997, PHASE I ENVIRONMENTAL AUDIT REPORT

PHASE I ENVIRONMENTAL AUDIT

NGK Metals Corporation
at
725 East Avenue
(McMinn County)
Athens, Tennessee

Submitted to:
Mr. John Manikas
General Manager
NGK Metals Corporation
725 East Avenue
Athens, Tennessee 37303

Submitted by:

Solutions To Environmental Problems, Inc.
1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

November 21, 1997
STEP Project No. 110-078-001

STEP

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APPENDIX A Photos

1.0 INTRODUCTION

Solutions To Environmental Problems, Inc., (STEP) has conducted a Phase I Environmental Audit at NGK Metals Corporation and associated property, 725 East Avenue, Athens, Tennessee (McMinn County). This audit was conducted for NGK Metals Corporation at the request of Mr. John Manikas. The observations and findings of this audit are presented in **Section 4.0** of this report. The audit was conducted during the period September 23, 1997, to October 17, 1997, and was designed to provide NGK Metals Corporation with the information needed to make cost-effective and timely decisions regarding the potential environmental liabilities associated with the aforementioned properties. The audit was conducted according to STEP's environmental auditing and due diligence protocol, the different phases of which are described below.

2.0 LIMITATIONS OF STUDY

The scope of this report is limited to the matters expressly covered; it was conducted using standard engineering and scientific judgment, principles, and practices. The following items, in particular, should be taken into account when using this report to evaluate the environmental risks associated with the parcels.

- The audit is based upon site observations and information provided by third-party individuals and organizations, which is assumed to be correct. Sometimes, information may have been provided by individuals whose knowledge of the history of the site may be incomplete. Except as provided in this report, STEP has made no independent investigations as to the accuracy or completeness of the information provided by these individuals or organizations.

- Descriptions of suspect environmental conditions contained herein have been based on visual observations and information provided by regulatory agencies. No other qualitative or quantitative chemical analysis has been performed.

;TEP makes no warranties, expressed or implied, including without limitations, as to the ıarketability of the sites or their fitness for particular use. Information in this report is not to be onstrued as legal advice. Warranties and liabilities as to the service performed are as described n the contractual terms and conditions.

;.0 ASSESSMENT PROTOCOL

The audit follows the protocol used by STEP on Phase I Audits. Before visiting the property, STEP personnel reviewed topographic maps of the area, property boundary information, environmental databases incorporating federal and state lists of contaminated sites, and local tax maps. Other pre-visit site tasks included calls to the local fire and health departments to obtain information regarding underground storage tanks, spills, health problems at the site or in the area, ε and visits to the local Soil Conservation Service (SCS) and other agencies to view historic aerial photographs of the site and vicinity, and to obtain soil information, wetlands maps, floodplain maps, etc.

The site visit consisted of a walkover of the NGK Metals Corporation and associated property. STEP conducted the site visit for visual inspection of the property to evaluate the site for evidence of environmental impairment. In addition, STEP examined the interior and perimeter of the property and also adjacent and nearby properties. The inspection was performed to look for evidence of contamination that may have resulted from historic or current use of the properties, adjacent properties, and nearby properties. The observations made during the site inspection are incorporated throughout this report. No samples of environmental media were obtained during the Phase I Audit.

Documentation of the site visits and observations was recorded on a checklist and by taking ographs to document the pertinent observations. Copies of files, documents, and drawings

hat STEP collected, and the checklist and copies of documents obtained from other agencies, are art of the project file and are available for inspection.

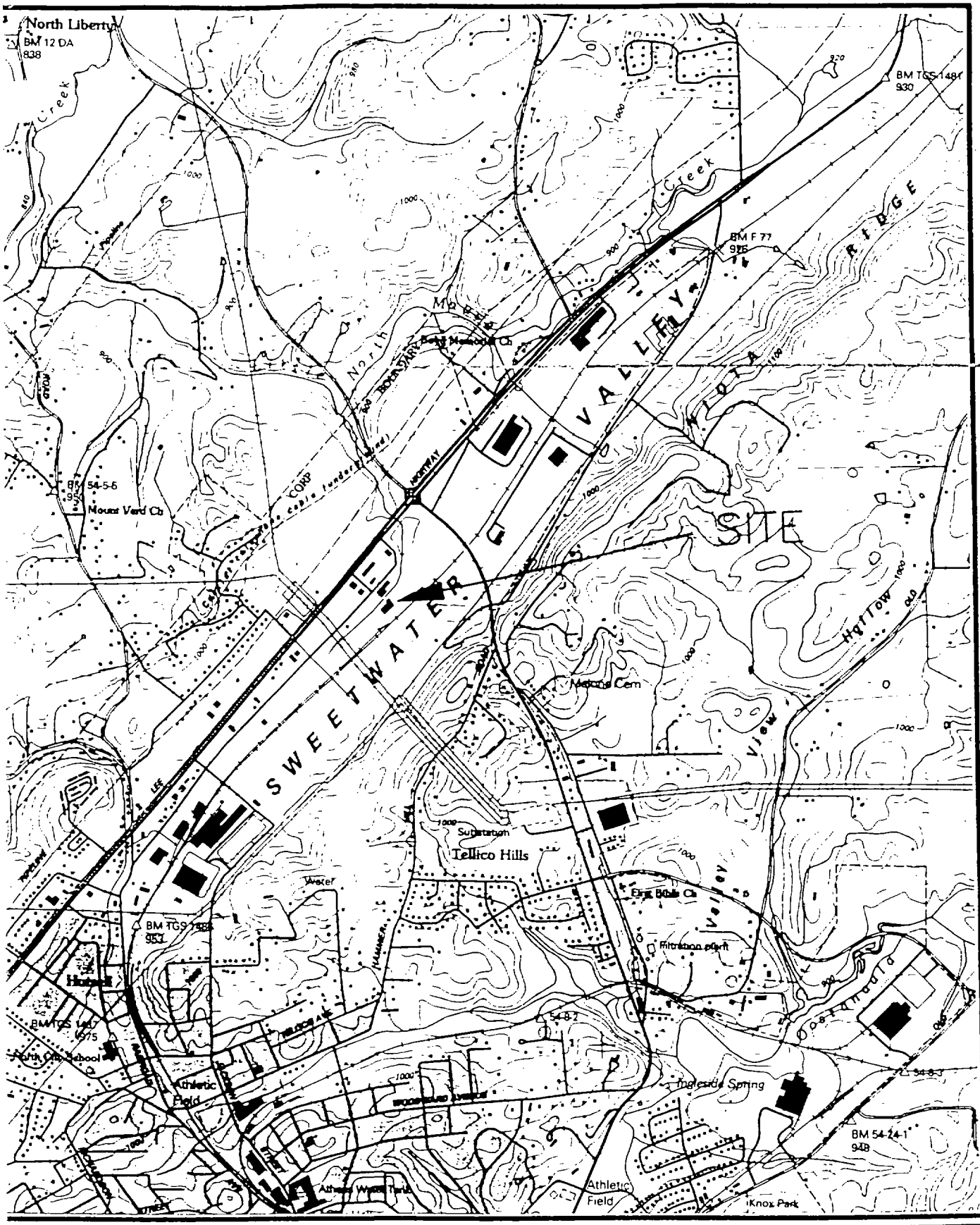
ollowing the site visit, additional calls were made to regulatory agencies to confirm data ollected by STEP during and subsequent to the visual inspection of the property. Additional isits were made to the appropriate regulatory agencies to review and/or obtain copies of pplicable files as needed.

.0 FINDINGS

.1 Business and Property Information

IGK Metals Corporation has been at the site in Athens, Tennessee, (McMinn County) since the r 970s. Before NGK Metals Corporation, the building was used by two different companies, recision Cast Products and Pet Creamery, dating back to the 1940s. The property before the 940s was vacant. This site is just south of the intersection of Lawn Street and East Avenue, as nown in Figure I-I. Figure I-II is a tax map that also shows the location of the site.

he property is broken up into 3 parcels totaling 9.7 acres. The largest parcel (3.79) acres ontains three structures, a brick building which houses the non-ferris tooling operations and ffice space, a metal building which is used for finished products, and two mobile office trailers sed for additional office space. The remaining 3 parcels (1.88, 2.00, and 2.04 acres) are vacant. ehicular and foot traffic access is only available to the parking area of the 3.79 acre parcel roperty since fencing surrounds this parcel. The other parcels have no vehicular access but is not nced so foot traffic access is available.

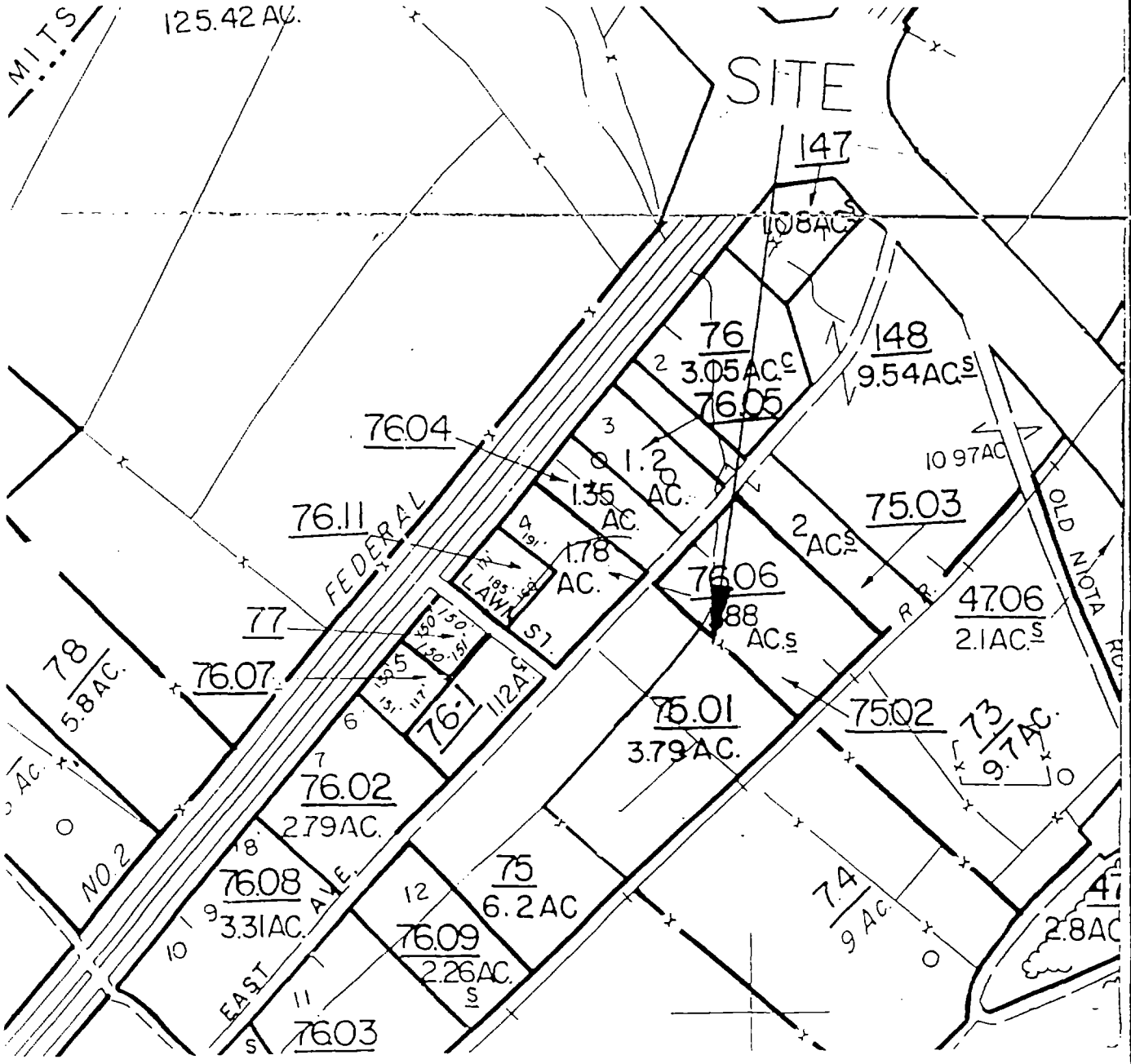


LOCATION MAP

2000'

NOTES:	ENVIRONMENTAL AUDIT
MAP TAKEN FROM ATHENS,	NGK METALS CORPORATION (ATHENS PLANT)
TN U.S.G.S. QUADRANGLE MAP	
LIMITED UPDATED 1990	
SITE LOCATION:	
725 EAST AVENUE	
ATHENS, TENNESSEE	

STEP
1006 FLOYD CULLER COURT
OAK RIDGE TN. 37830
(423) 481-7837



TAX MAP

FIGURE 1.11

NOTES:	ENVIRONMENTAL AUDIT
MAP PROVIDED BY	NGK METALS CORPORATION (ATHENS PLANT)
McMINN COUNTY PROPERTY	
ASSESSOR	
SITE LOCATION:	
725 EAST AVENUE	
ATHENS, TENNESSEE	

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1006 FLOYD CULLER COURT
OAK RIDGE TN. 37830
(423) 481-7837

The 3.79-acre parcel has very limited vegetation with almost the entire parcel being graveled, pavement, or concrete. The remaining parcels have vegetation consisting of grass (which is periodically mowed) and sparsely located eastern red cedar trees.

The drainage of the property is to the south to an unnamed tributary of the Little North Mouse Creek. No Federal Emergency Management Agency Flood Insurance Rate Map for this site was not available at the time of this report.

Information regarding prior ownership of the property was reviewed. (McMinn County Parcel Numbers 75.01, 75.02 and 75.03). The parcels 75.02 and 75.03 are vacant and have been vacant at least since the 1940s and parcel 75.01 has been occupied with a building structure since the late 1940s.

4.2 Regulatory File Review, Historical Data Review, and Prior Use Information

To evaluate the historical use of the site and surrounding property, STEP evaluated readily available historical information including:

1. Aerial photos - United States Department of Agriculture (USDA), 1992 and 1973 at various scales

2. Topographic maps - Tennessee Valley Authority, Athens Quadrangle, 7.5 minute, dated 1964, limited update 1990, 1 inch = 2000 feet

The following personnel were contacted to discuss property information and regulatory status/compliance issues:

Name	Department	Agencies\Company
Eston Williams	Aerial Photos, Wetland Maps	United States Department of Agriculture-Natural Resource Conservation Service (USDA - SCS)
Tanya Davis	Aerial Photos, Wetland Maps	United States Department of Agriculture-Natural Resource Conservation Service (USDA - SCS)
Staff	Superfund/Contaminated Sites of Solid/Hazardous Waste/Air Pollution	Tennessee Department of Environment and Conservation (TDEC) Chattanooga
Staff	UST Information	TDEC
Staff	Water Quality Information	TDEC
Staff	Environmental Health	McMinn County Health Department
John Manikas	Site History	NGK Plant Manager
Captain on Duty	Fire/Spills	Athens City Fire Department
Eston Williams	Previous Studies, Floodplain	United States Department of Agriculture-Natural Resource Conservation Service (USDA - SCS)
Staff	Sewer, Water, and Gas	Athens Utility Board
Larry Montee	Electricity/Transformers	Athens Utility Board
Lynne Woodside	Environmental History	NGK Corporate
Mark Satterfield	Plant History	Quality Engineer for NGK

The 1992 and 1973, aerial photos indicate that a building structure was present in the 1992 and 73 photos on parcel 75.01. All adjacent properties associated with the parcels were

commercial or vacant. No commercial or industrial landfills, abandoned industrial facilities, or other suspicious features, which could represent improper disposal of hazardous wastes, were observed on the property in any of the aerial photos.

The U.S. Department of the Interior, Fish and Wildlife Service, National Wetlands Inventory Map (1989) for the Athens Quadrangle was not available for review at SCS.

4.3 Surface and Ground Water Information

There is no ponding of surface water on the property. Surface water run-off, as mentioned before, is collected in an unnamed tributary and flowed northeast to the North Little Mouse Creek.

The property currently has municipally supplied potable water and is connected to sanitary sewer according to Athens Utility Board. No known hydrogeologic studies have been performed for the property.

4.4 PCB Information

One 15-KVA pole-mounted transformer and one 75-KVA pole mounted transformer are located on the northern and southern boundaries of parcel 75.01 and a pad mounted transformer is also located along the southern boundary of parcel 75.01. According to Mr. Larry Monteen of the Athens Utility Board these transformers are considered non-PCB containing. No other potential sources of PCBs were observed on the property. According to Lynne Woodside, NGK Corporate, small motors associated with some of the equipment used in the NGK process had PCB containing fluid. These fluids have been removed and properly disposed of according to NGK personnel.

4.5 Asbestos

Since portions of the main building located on parcel 75.01 were built in the 1940s and other portions added on at various times, the building materials (i.e. sheet rock, floor covering, ceiling tiles, roofing material, wall insulation, etc.) have a potential for containing asbestos. These materials and any other materials that may have the potential to contain asbestos should be tested for asbestos if remodeling or demolition of the facility should take place.

4.6 Radon and Other Health Issues

An EPA publication (EPA's Map of Radon Zones-Tennessee, September 1993) reported that 18 homes have been checked in McMinn County for radon exceeding the EPA-mandated threshold level of 4 picocuries per liter (pCi/L). Of the 18 houses tested in McMinn County, a mean value of 2.7 pCi/L was found with the highest reading being 8.8 pCi/L. However, since no living facilities are present at this site, radon concerns are minimal.

Personnel with the McMinn County Health Department are unaware of any known health problems in the immediate vicinity of the property.

The Athens City Fire Department indicated that NGK Metals had a small fire during a re-modeling phase but was very limited and only cased minor damage. They also had no knowledge of any past spills at the facility.

4.7 Aboveground and Underground Storage Tanks

The property has no above ground storage tanks (ASTs) or underground storage tanks (USTs).

4.8 Adjacent Property Information

A visual inspection of the adjacent properties was conducted during the site visit. There was no indication that adjacent properties were affecting the parcels. The properties bordering the site are listed below:

- **North** -Texas Hydraulics,
- **South** - Southern Railroad Property (tracks),
- **East** - Vacant Property, and
- **West** - Vacant Property.

4.9 Environmental Database Review

To check for contaminated sites and other environmentally regulated sites located within one mile of the subject parcels, STEP checked with various regulatory divisions of the TDEC located in oxville. The following summarizes these findings:

- National Priority List (Superfund) or state promulgated sites - No Superfund site is located within 1.0 mile radius according to the Tennessee Department of Environment & Conservation, Division of Superfund, Promulgated Site List dated December 5, 1995.

- Federal or State CERCLIS (Comprehensive Environmental Response, Cleanup & Liability Information System) sites - No CERCLIS site is located within 1.0 mile radius.

- Landfills - No licensed landfills are located within a 1.0 mile radius of the property.

- Injection Wells - No known injection wells are located within 1.0 mile of the property.

- Leaking USTs - No leaking USTs are known to be located within 1.0 mile of the property.

- Spill/dumping files - No spills or illegal dumping has been documented at the property.

4.10 Orders, Actions, and Legal Liabilities

Based on discussions with local and state officials, there is no evidence that the property is subject to any administrative orders or proceedings, actions by any regulatory authorities, or involved in

any legal proceedings such as civil or criminal cases resulting from environmental impairment, spills, or other common environmental concerns.

4.11 Permit Review

The property currently holds a TDEC Air Quality Permit and a Tennessee General Stormwater Baseline Permit. These permits are in the process of being transferred from the Athens, Tennessee facility to the Sweetwater, Tennessee facility.

4.12 Solid and Hazardous Waste Issues

Solid waste generated at the property is picked up by BFI sanitation department. No hazardous waste is generated on the property at this time. Bag house dust generated at the facility is considered an industrial waste and is shipped to the corporate landfill in Pennsylvania.

4.13 Other Issues of Significance

At the time of the site visit a large number of drums were located at the facility. All drums were sealed that were located on the outside of the building. The visual observation of the drums did not totally reveal the drum contents (i.e., some drums were either not labeled or the label was not visible). According to NGK personnel these drums either contained bag house dust, recyclable material, or were empty. During the file review at the TDEC Chattanooga Field Office, the Texas Hydraulics, Inc., facility which is located across the unnamed tributary to the north of the NGK property indicated some past environmental issues. The Texas Hydraulics, Inc., facility solid waste file indicated violation of The Tennessee Hazardous Waste Management Act and an issue concerning petroleum contaminated soils from compressors located on the south side of the Texas Hydraulics, Inc., facility. No other issues of significance were noted.

5.0 SUMMARY AND CONCLUSIONS

Based upon the work performed to date, the property was found to have no potential significant environmental risks. As mentioned before all drums/containers located outside of the facility were sealed and contents were bag house dust, recyclable material, or were empty according to NGK personnel. STEP suggests before removing the drums/containers and their substance that all drums be checked for proper labeling and if no labels are present, identify the contents and properly label the drum(s). Also, STEP suggests that all drums/containers be removed from the property before a property transaction takes place.

Contamination Issues

Contamination issues concerning the Texas Hydraulics, Inc., facility found during the file search have been resolved with the TDEC Chattanooga Field Office, and their was no indication that these issues affected the NGK property.

Compliance Issues

As stated previously, if demolition or renovation is to take place on the structure, an asbestos survey should be performed prior to demolition or renovation. No other current compliance issues were found concerning the subject property.

APPENDIX A

PHOTO 1. NGK METALS CORPORATION (ATHENS PLANT)
WHITE IN COLOR, VIEW LOOKING SOUTHWEST

PHOTO 2. UNNAMED TRIBUTARY OF NORTH LITTLE MOUSE CREEK
WHICH FLOWS BETWEEN NGK AND TEXAS HYDRAULICS.

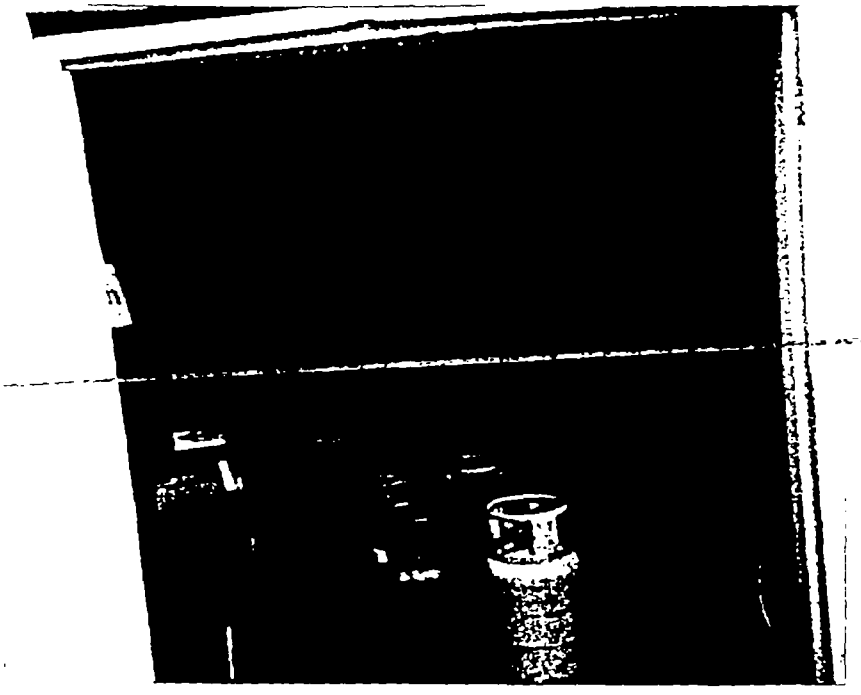

PHOTO 3. INSIDE STORAGE BUILDING OF NGK LOCATED AT THE SOUTHWEST CORNER OF PARCEL 75.01

PHOTO 4. VIEW OF THE WESTERN BOUNDARY OF PARCEL 75.01.

PHOTO 5. BAGHOUSE FACILITIES AT THE EASTERN SITE OF THE PLANT.

PHOTO 6. DRUM STORAGE AREA ALONG THE SOUTHERN BORDER OF PARCEL 75.01.

PHOTO 7. VIEW LOOKING NORTHEAST OF VACANT PARCELS.

PHOTO 8. VIEW LOOKING SOUTHEAST OF VACANT PARCELS.

PHOTO 9. VIEW LOOKING SOUTHWEST OF VACANT PROPERTY NEXT TO PARCEL 75.01.

APPENDIX 2

NOVEMBER 24, 1998, GRADIENT CORPORATION LETTER ON BERYLLIUM TOXICITY

Gradient Corporation
AN TT COMPANY

November 24, 1998

James M. Weaver, Esq.
Waller Lansden Dortch and Davis
Nashville City Center
511 Union Street, Suite 2100
Nashville, TN 37219-8966

Dear Mr. Weaver:

NGK Metals owns a parcel of land at 725 East Avenue, Athens, Tennessee. Beryllium has been detected in soil at the site at concentrations up to 38.6 mg/kg, concentrations which exceed the current Tennessee Remediation Guidance Level (RGL) value for beryllium of 0.2 mg/kg.

The U.S. Environmental Protection Agency (EPA) has recently reevaluated beryllium toxicity, including both cancer and non-cancer effects. Based on this recent reassessment, we have derived an updated RGL for beryllium. Using the same approach used by the Tennessee Division of Solid Waste Management to calculate RGLs, but substituting the latest EPA beryllium toxicity value and EPA-recommended soil ingestion rate for children, an updated RGL value of 320 mg/kg was derived for beryllium in soils. The remainder of this letter first explains the basis for the EPA reassessment of beryllium, and then details our derivation of a revised beryllium RGL value.

Basis for the US EPA Reassessment of Beryllium

The primary source of quantitative information on cancer and noncancer effects, for use in risk assessments and developing risk-based screening levels, is the EPA Integrated Risk Information System (IRIS).[1] The IRIS database provides EPA-recommended reference doses (RfDs) to evaluate noncancer health effects from oral exposures, reference concentrations (RfCs) to evaluate noncancer health effects from inhalation exposures, cancer slope factors (CSFs) to evaluate carcinogenicity from oral exposures, and air unit risks (UR) to evaluate carcinogenicity from inhalation exposures. Until 1998, the IRIS file listed an oral RfD, an oral CSF, and an inhalation UR value for beryllium. As a result, risk-based soil screening levels for beryllium developed prior to 1998 were typically based on consideration of the potential for oral carcinogenicity of beryllium (*i.e.*, agency soil screening levels were calculated using the former oral CSF of 4.3 kg-day/mg).

However, in April 1998, the EPA revised the beryllium IRIS file.[2] The IRIS revisions were subject to both internal EPA and external peer review. The most significant change was that the EPA no longer recommends the use of an oral CSF. Based on a comprehensive review of the published literature, the EPA concluded in the revised beryllium IRIS file that "the human carcinogenic potential of ingested beryllium cannot be determined." Specifically, the IRIS file explains that:

> "The chronic oral studies did not report increased incidences of tumors in rodents, but were conducted at doses below the MTD. The oral database, including the Schroeder and

[1] US EPA Integrated Risk Information System (IRIS) system. http://www.epa.gov/ngispgm3/iris/subst/0012.htm.
[2] US EPA Integrated Risk Information System (IRIS) file for beryllium. http://www.epa.gov/ngispgm3/iris/subst/0012.htm. Last revised by EPA 4/3/98. File accessed 10/21/98.

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Email: info@gradcorp.com

> Mitchener study previously used in the development of the oral slope factor on IRIS, is considered inadequate for the assessment of carcinogenicity. The basis for not using the Schroeder and Mitchener rat study is that the incidences of gross malignant tumors in the control and beryllium-exposed groups were not significantly different." (EPA, 1998, revised beryllium IRIS file)

In other words, it is no longer scientifically appropriate to consider beryllium to be an oral carcinogen, or to use the old beryllium CSF in risk assessments for deriving risk-based screening levels. (Note that beryllium is still considered to be a "likely" human carcinogen via *inhalation exposures; the EPA-recommended inhalation* UR for beryllium is still 0.0024 $m^3/\mu g$.)

The other change in the beryllium IRIS file relevant to oral exposures is that the oral RfD was revised somewhat, from the previous value of 0.005 mg/kg/day to the current value of 0.002 mg/kg/day. Because the rat study on which the original RfD was based found no adverse effects even at the highest dose tested, EPA derived a new beryllium RfD based on small intestinal lesions observed in a chronic dog study.

Derivation of a Revised Beryllium RGL Value

The Tennessee Division of Solid Waste Management's Remediation Guidance Levels (RGLs) are adapted from the "Action Levels" developed by EPA in 1990 for use in the RCRA Corrective Action Program.[3] These action levels for soil were derived considering cancer and noncancer risks associated with incidental ingestion of surface soil. For carcinogens, Action Levels (or RGLs) were calculated as follows:

$$\text{Action Level}_{soil} = \frac{\text{Target Cancer Risk } (10^{-6}) \times \text{Adult Body Weight (70 kg)} \times \text{Averaging Time (70 yrs)}}{\text{CSF} \times \text{Adult Soil Intake Rate (0.1 g/d)} \times \text{Exposure Duration (70 yrs)} \times (1\,\text{kg}/1000\,\text{g})}$$

Using this equation and the former oral CSF of 4.3 kg-day/mg, a cancer-based RGL of 0.2 mg/kg was set for beryllium.

Since EPA no longer recommends the use of an oral CSF, this RGL based on the former CSF should no longer be utilized. Instead, the RGL should be based on the noncancer effects of beryllium, *i.e.*, calculated using the beryllium RfD. The equation used to calculate Action Levels (or RGLs) for non-carcinogens is:

$$\text{Action Level}_{soil} = \frac{\text{RfD (mg/kg} \cdot \text{day)} \times \text{Child Body Weight (16 kg)}}{\text{Child Soil Intake Rate (g/day)} \times (1\,\text{kg}/1000\,\text{g})}$$

An updated RGL for beryllium can be calculated using this equation. For the RfD, EPA's revised value of 0.002 mg/kg-day should be used. For the soil intake rate, EPA recently lowered their recommended value for children from the previous value of 0.2 g of soil per day (200 mg/day) to a mean value 0.1 g of soil per day (100 mg/day).[4] Using the equation above, EPA's revised RfD, and EPA's revised child soil intake rate results in an updated non-cancer-based RGL of 320 mg/kg for beryllium.[5] Based on EPA's reassessment of the potential for cancer and non-cancer health effects from beryllium and EPA's reevaluation of soil ingestion

[3] Federal Register, Vol. 55, No. 145, Pg. 30865-30873, Friday July 27.
[4] US EPA, Exposure Factors Handbook, Volume 1, General Factors. EPA/600/P-95/002Fa. August.
[5] Note that even use of EPA's previous soil ingestion rate for children (0.2 g/day) would result in a revised RGL value of 160 mg/kg

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studies, this updated value is more scientifically appropriate. Since this value is derived using conservative exposure assumptions for a child residential scenario, it is protective for both residential and industrial site uses.

Since beryllium is still considered to be a "likely" human carcinogen via *inhalation* exposures, it is also appropriate to consider risk-based soil screening levels based on inhalation of wind-blown or fugitive dusts. In their 1996 Soil Screening Guidance, EPA derived a soil screening level of 1,300 mg/kg, considering inhalation of fugitive particulates, and using the beryllium inhalation UR.[6] This value is nearly 10 times greater that the revised RGL calculated above. Thus, the updated RGL of 320 mg/kg is protective of both potential noncancer health effects due to incidental ingestion of soil, as well as potential carcinogenicity due to inhalation of soil particles resuspended into the air as dusts.

In summary, the updated value of 320 mg/kg should be adopted as a remedial guidance level based on the recent EPA reevaluation of beryllium toxicity and carcinogenicity and EPA's revised soil ingestion rates. This updated RGL would be protective of both potential noncancer health effects due to incidental ingestion of soil, as well as potential carcinogenicity due to inhalation of soil particles resuspended into the air as dusts. Since even the maximum concentration (38.6 mg/kg) detected at NGK Metals' site at 725 East Avenue, Athens, Tennessee is well below the updated RGL of 320 mg/kg, the beryllium present at the site *does not* pose a risk to human health, even if the site were to be used as a residential property in the future.

Note that since risk-based RGLs are derived assuming that a receptor is equally exposed to all areas of a site, RGLs represent an acceptable site-wide average concentration and should not be applied on a point-by-point basis. Should any future sampling indicate higher concentrations that cause the site-wide average to exceed the updated RGL value, locations with the highest concentrations could be remediated with focused excavation.

If you have any questions, or if you would like additional information, feel free to call either me or our toxicologist, Tracey Slayton, at 617-576-1555.

Yours truly,

GRADIENT CORPORATION

Neil Shifrin (GMS)

Neil S. Shifrin, Ph.D.
Principal

[6] US EPA, Soil Screening Guidance: Technical Background Document, EPA/540/R-95/12, May 1996.

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APPENDIX 3

TEXAS HYDRAULICS' JANUARY 1998 SOIL SAMPLING AND ANALYSIS RESULTS

Athens Soil Sampling

Location	Cu	Be
1	126	3.43
2	99.1	2.22
3	59.9	1.68
4	71.2	1.82
5	114	2.77
6	30000	865
7	31.6	1.24
8	112	3.44
9	64.6(37.4Dup)	2.1(1.23Dup)
10	753	7.64
11	2130	19.2
12	12.8	0.21
13	14.1	0.93 .95
14	52.9	1.94
15	22.9	1.09
16	32.7	1.52
Exc 1	314	7.23
Exc 2	377	11.4
BG	17.1	0.671
US BG*	2 - 250	.1-10

centrations

*Soil Elemental Background Conectrations for United States

TEXAS HYDRAULICS INC.

3410 North Range Road P.O. Box 1067 Temple, Texas 76503-1067 Telephone: (254) 778-4701 Fax: (254) 774-9940

A DOVER INDUSTRIES COMPANY

TELEFAX TRANSMISSION

Date: 2-9-98

To: NGK Metals Fax #: 423-337-5540

ATTN: John Manikas

From: Jim West

This sheet is number 1 of 13 pages in this transmission.

Our fax number is (254) 774-9940.

Memo

TEXAS HYDRAULICS INC
A DOVER INDUSTRIES COMPANY

To: Reed Vivatson

From: Jim West

CC: Vernon Pontes

Date: January 27, 1998

Re: NGK Metals

Site Assessment on NGK metals, Athens, TN. By David Ford and Jim West. This is only a partial assessment; the extent of contamination needs to be addressed by NGK Metals.

SAMPLE RESULTS (REFER TO MAP)

Samples EXC #1 & #2

Under concrete slab possible septic tank readings are copper (#1 - 314 ppm #2 - 377 ppm)

Samples 1 - 5 North side plant open field

1-2 near fence line heading to creek, possible rain runoff towards creek

#1 - 126 ppm

#2 - 99.1 ppm

3-4 top side of field a little high not bad

#5 - sample taken 1 foot + deep

Results 114 ppm copper (possibly buried)

#6 - sample taken by new storage building

Copper - 30,000 ppm; Beryllium - 865 ppm.

#7-8-9 samples show trace levels of copper; small clean-up.

#10-11 samples taken South side driveway

#10 - 753 ppm copper, 7.64 beryllium

#11 - 2,130 ppm copper, 19.2 beryllium

#12 sample taken parking lot crossover.

12.8 ppm copper - beryllium 0.21/Refer back to #10, #11 this would probably be a small area to clean-up.

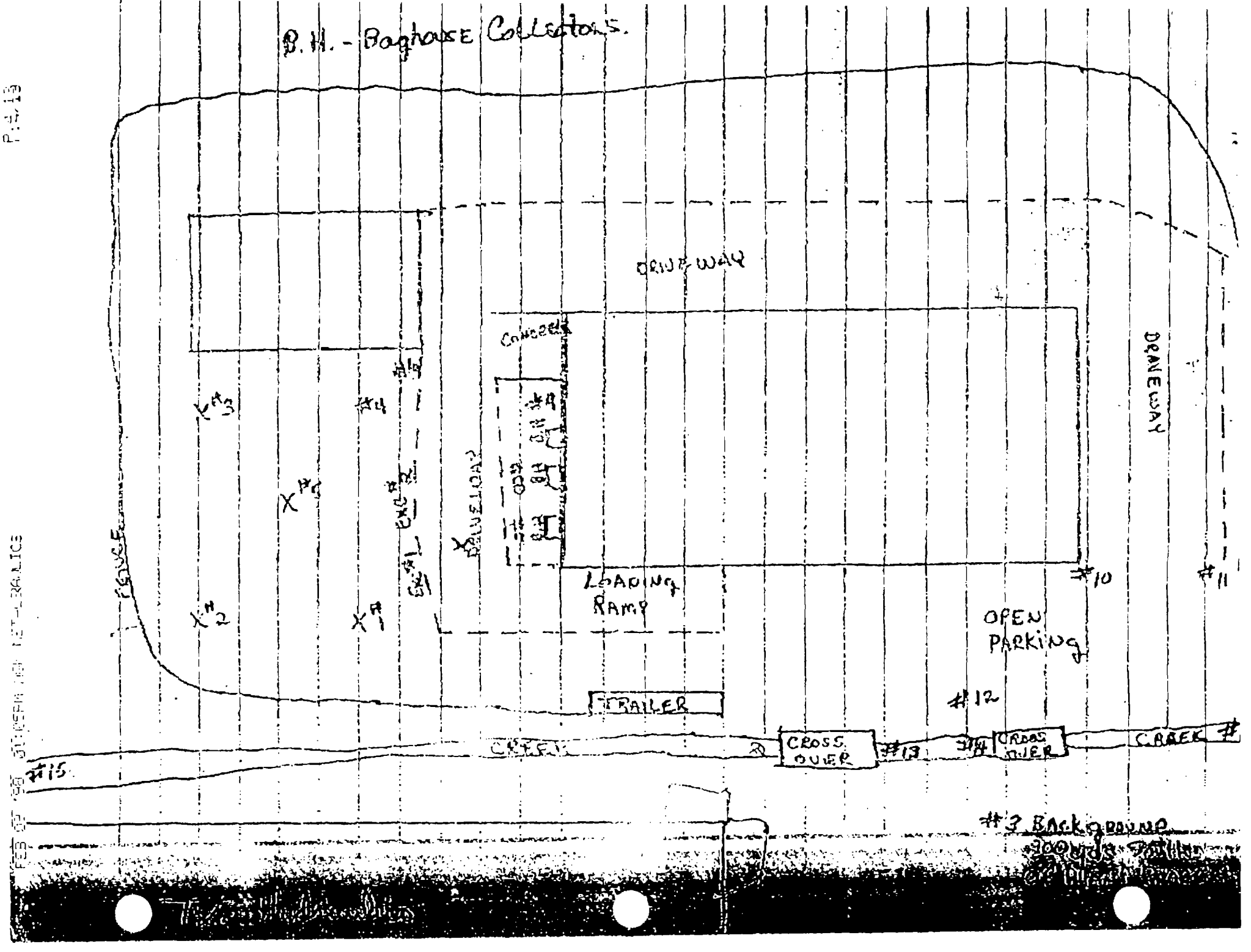
#13 - 16 Creek samples

Samples 13-14 possible rain water runoff-plus barium shows high 639 ppm.

Compared to background 213 ppm

Asbestos survey show that pattern storage room and spray booth contain asbestos (Ceiling Tile)

B.H. - Baghouse Collectors.



ANALYTICAL

INORGANIC REPORT

CLIENT: Texas Hydraulics
CLIENT PROJECT #: N/A
LOCATION: Texas Hydraulics, Tennessee

EXTRACTION METHOD:	3051	SAMPLE DATE:	1/6/98
ANALYTICAL METHOD:	See Notes Below	SAMPLE REC'D:	1/7/98
MATRIX:	SOIL	SAMPLE CONDITION:	GOOD
ANALYSIS BY:	KF	EXTRACTION DATE:	1/8&1/13/98
REPORT GENERATED BY:	LB	EXTRACT. HOLD TIME (DAYS):	1 & 0
QA REVIEW:	TC	ANALYSIS DATE:	1/9&1/13/98
BATCH NUMBER:	768 & 754	HOLDING TIME (DAYS):	3 & 7

SAMPLE ID:	Silver [1] ppm (mg/Kg)	Arsenic [1] ppm (mg/Kg)	Barium [1] ppm (mg/Kg)	Cadmium [1] ppm (mg/Kg)	Chromium [1] ppm (mg/Kg)	Lead [1] ppm (mg/Kg)	Selenium [1] ppm (mg/Kg)	Mercury [2] ppm (mg/Kg)	Beryllium [1] ppm (mg/Kg)	Copper [1] ppm (mg/Kg)
Method Blank	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sample #1	0.59	16.8	247	0.60	29.2	56.3	ND	0.11	3.45	126
Sample #2	ND	9.75	79.5	0.36	27.6	40.3	7.54	0.71	2.22	99.1
Sample #3	ND	13.1	68.9	0.51	25.4	43.0	ND	1.63	1.98	59.9
Sample #4	ND	11.2	72.5	0.35	27.9	51.9	ND	1.35	1.82	71.2
Sample #5	ND	13.7	83.7	0.40	23.3	95.2	ND	0.67	2.77	114
Sample #6	1.71	4.99	106	0.22	272	34.6	ND	ND	865	30000
Sample #7	ND	14.0	96.4	ND	28.6	40.5	ND	ND	1.24	31.6
Sample #8	0.53	9.09	291	0.49	25.9	80.3	ND	0.09	3.44	112
Sample #9	ND	18.9	81.1	0.66	30.9	57.6	ND	0.10	2.10	84.6
Sample #10	ND	1.92	22.5	0.41	16.2	27.0	ND	0.22	7.64	753
Sample #11	ND	1.39	79.1	0.29	17.3	27.4	ND	ND	19.2	2130
Sample #12	ND	ND	30.3	0.10	6.43	6.39	ND	ND	0.21	12.0
Sample #13	1.42	14.5	639	0.46	29.1	69.8	ND	ND	0.95	14.1
Sample #14	ND	16.2	184	0.48	40.0	74.1	ND	0.21	1.94	52.0
Sample #15	ND	30.5	255	1.04	48.1	79.6	ND	0.31	1.09	22.9
Sample #16	ND	23.0	197	0.70	33.1	75.5	ND	0.03	1.52	32.7
PQL (mg/Kg)	0.66	0.66	0.05	0.01	0.44	0.32	1.10	0.02	0.06	0.71
MDL (mg/Kg)	0.21	0.21	0.02	0.01	0.14	0.12	0.34	0.01	0.02	0.22

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7471A - Cold Vapor
ND - Not Detected at listed Practical Quantitation Limit (PQL)

Tien-Yu Chang
QA Review

0801009 / PPMETALS_SOIL

FEB 09 '98 01:05PM FROM METHAXHULTCS P.3/13

DHL ANALYTICAL

QUALITY ASSU ICE REPORT

METALS

DHL PROJECT #: 9701008
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: Texas Hydraulics, Tennessee
DATE ANALYZED: 1/9/98 & 1/13/98

LABORATORY CONTROL SAMPLE (LCS) - % RECOVERY

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
LCS	95	100	101	98	98	101	104	98	98	110

CONTINUING CALIBRATION VERIFICATION (CCV) - % RECOVERY

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
CCV #1	100	101	100	101	100	102	102	97	101	97
CCV #2	99	103	101	102	100	104	103	99	102	97
CCV #3	100	105	102	102	101	105	105	98	102	97
CCV #4	--	--	103	--	--	--	--	--	107	103

SAMPLE DUPLICATE ANALYSIS - RELATIVE PERCENT DIFFERENCE (RPD)

SAMPLE ID	Silver [1] ppm (mg/Kg)	Arsenic [1] ppm (mg/Kg)	Barium [1] ppm (mg/Kg)	Cadmium [1] ppm (mg/Kg)	Chromium [1] ppm (mg/Kg)	Lead [1] ppm (mg/Kg)	Selenium [1] ppm (mg/Kg)	Mercury [2] ppm (mg/Kg)	Beryllium [1] ppm (mg/Kg)	Copper [1] ppm (mg/Kg)
Sample #9	ND	18.9	81.1	0.66	30.9	57.8	ND	0.19	2.10	64.6
Sample #9 DUP	ND	12.6	83.7	0.44	21.9	52.7	ND	0.19	1.23	37.4
RPD=	0.00	40.0	3.16	40.0	34.1	9.23	0.00	5.41	52.3	53.3

MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD) - % RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
Sample #7 MS	100	100	135	102	96	125	105	95	104	88
Sample #7 MSD	99	94	68	100	99	95	100	94	102	86
RPD=	1.01	6.19	66.0	1.98	3.08	27.3	4.88	1.06	1.94	0.00

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7471A - Cold Vapor
ND - Not Detected at listed Method Detection Limit (MDL)

Tien-Yu Chang
QA Review

DHL ANALYTICAL

METALS REPORT

DHL PROJECT #: 9701008
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: Texas Hydraulics, Tennessee

EXTRACTION METHOD:	3015	SAMPLE DATE:	1/6/98
ANALYTICAL METHOD:	See Notes Below	SAMPLE REC'D:	1/7/98
MATRIX:	WATER	SAMPLE CONDITION:	GOOD
ANALYSIS BY:	KF	EXTRACTION DATE:	1/7 & 1/12
REPORT GENERATED BY:	LB	EXTRACT. HOLD TIME (DAYS):	1 & 0
QA REVIEW:	TC	ANALYSIS DATE:	1/8 &1/12
BATCH NUMBER:	752 & 766	HOLDING TIME (DAYS):	2 & 6

SAMPLE ID:	Silver [1] ppb (ug/L)	Arsenic [1] ppb (ug/L)	Barium [1] ppb (ug/L)	Cadmium [1] ppb (ug/L)	Chromium [1] ppb (ug/L)	Lead [1] ppb (ug/L)	Selenium [1] ppb (ug/L)	Mercury [2] ppb (ug/L)	Beryllium [1] ppb (ug/L)	Copper [1] ppb (ug/L)
Method Blank	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VP Creek	ND	ND	41.4	ND	ND	ND	ND	ND	ND	ND
E. Creek	ND	ND	41.8	ND	ND	ND	ND	ND	ND	ND
Down Stream	62.3	ND	40.9	ND	ND	ND	ND	ND	ND	ND
W. Creek	ND	ND	85.3	ND	92.2	ND	ND	ND	ND	77.3
PQL (ug/L)	26	27	2.0	1.7	18	15	43	0.07	2.5	28
MDL (ug/L)	8.3	8.4	0.6	0.5	5.5	4.6	13.6	0.02	0.8	6.9

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7470A - Cold Vapor
ND - Not Detected at listed Practical Quantitation Limit (PQL)

Tien-Yu Chang
QA Review

ANALYTICAL

QUALITY ASSURANCE REPORT

METALS

DHL PROJECT #: 9701060
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: Texas Hydraulics, Tennessee
DATE ANALYZED: 1/9/98 & 1/13/98

LABORATORY CONTROL SAMPLE (LCS) - % RECOVERY

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
LCS	101	101	97	99	100	100	99	97	100	96

CONTINUING CALIBRATION VERIFICATION (CCV) - % RECOVERY

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
CCV #1	99	101	99	101	101	101	101	97	101	97
CCV #2	98	101	99	100	101	103	102	98	101	96
CCV #3	100	104	101	103	103	106	104	N/A	102	97

SAMPLE DUPLICATE ANALYSIS - RELATIVE PERCENT DIFFERENCE (RPD)

SAMPLE ID.	Silver [1] ppb (ug/L)	Arsenic [1] ppb (ug/L)	Barium [1] ppb (ug/L)	Cadmium [1] ppb (ug/L)	Chromium [1] ppb (ug/L)	Lead [1] ppb (ug/L)	Selenium [1] ppb (ug/L)	Mercury [2] ppb (ug/L)	Beryllium [1] ppb (ug/L)	Copper [1] ppb (ug/L)
E. Creek	ND	ND	41.8	ND	ND	ND	ND	ND	ND	ND
E. Creek DUP	ND	ND	42.3	ND	ND	ND	ND	ND	ND	ND
RPD=	0.00	0.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD) - % RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

SAMPLE ID	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
Down Stream MS	91	98	95	95	98	98	98	97	98	93
Down Stream MSD	91	101	99	99	100	100	100	99	101	96
RPD=	0.00	3.02	4.12	4.12	2.02	2.02	2.02	2.04	3.02	3.17

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7470A - Cold Vapor
ND - Not Detected at listed Practical Quantitation Limit (PQL)

QA Review

FEB 09 '98 01:25PM HGK METALLAULICS P.02/12

DHL ANALYTICAL

METALS REPORT

DHL PROJECT #: 9801006
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: NGK Metals

EXTRACTION METHOD	3050	SAMPLE DATE:	1/5/98
ANALYTICAL METHOD	See Notes Below	SAMPLE REC'D:	1/6/98
MATRIX:	Soil	SAMPLE CONDITION:	GOOD
ANALYSIS BY:	KF	EXTRACTION DATE:	1/7/98
REPORTED BY:	KF	EXTRACT. HOLD TIME (DAYS):	0
QA REVIEW:	TC	ANALYSIS DATE:	1/7/98
BATCH NUMBER:	750 & 751	HOLDING TIME (DAYS):	2

SAMPLE ID:	Silver [1] ppm (mg/kg)	Arsenic [1] ppm (mg/kg)	Barium [1] ppm (mg/kg)	Cadmium [1] ppm (mg/kg)	Chromium [1] ppm (mg/kg)	Lead [1] ppm (mg/kg)	Selenium [1] ppm (mg/kg)	Mercury [2] ppm (mg/kg)	Beryllium [1] ppm (mg/kg)	Copper [1] ppm (mg/kg)
METHOD BLANK	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EXC #1	ND	12.0	195	ND	28.7	66.7	ND	0.43	7.23	314
EXC #2	ND	11.4	97.2	ND	41.9	29.2	ND	0.14	11.4	377
B. G.	ND	12.2	213	ND	22.6	51.3	ND	ND	0.671	17.1
PQL	0.70	0.73	0.07	0.06	2.30	1.80	2.00	0.02	0.04	0.58
MDL	0.22	0.23	0.02	0.02	0.72	0.58	0.64	0.01	0.01	0.18

Tien-Yu Chang
Data Review

DHL ANALYTICAL

TOTAL RESIDUE ANALYTICAL RESULTS

DHL PROJECT # : 9601008
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: Texas Hydraulics, Tennessee

ANALYTICAL METHOD:	160.3	SAMPLE DATE:		1/6/98
MATRIX:	Water	SAMPLE REC'D:		1/7/98
ANALYST:	JF/SS	SAMPLE CONDITION:		GOOD
REPORT GENERATED BY:	TC	ANALYSIS DATE:		1/14/98
QA REVIEW:	LB	HOLDING TIME (DAYS):		8
SAMPLE ID:	VP CREEK	E. CREEK	DOWN STREAM	W. CREEK
TS (mg/L)	482	436	443	904
PQL (mg/L)	1	1	1	1

SAMPLE DUPLICATE ANALYSIS-RELATIVE PERCENT DIFFERENCE(RPD)

SAMPLE ID	TS (mg/L)
E. CREEK	436
E. CREEK DUP	443
RPD=	1.59

Lee Bartholl
Data Review

DHL ANALYTICAL

QUALITY ASSURANCE REPORT

DHL Project Number: 9801006
Client: Texas Hydraulics
Soil samples were analyzed on 1/7/98

Laboratory Control Sample (LCS) - % Recovery

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
LCS	92	96	94	95	96	98	97	98	95	97

Continuing Calibration Verification (CCV) - % Recovery

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
CCV #1	93	99	100	100	98	100	100	101	98	99
CCV #2	98	99	98	101	101	102	100	95	99	100

Matrix Spike & Duplicate (MS/MSD) - % Recovery & Relative Percent Difference (RPD)

Sample ID	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
EXC #1 MS	100	94	98	102	92	105	99	104	107	84
EXC #1 MSD	99	87	89	98	87	101	97	93	95	81
RPD=	1.01	7.73	9.63	4.00	5.59	3.88	2.04	11.2	11.9	3.64

Sample Duplicate Analysis - Relative Percent Difference (RPD)

SAMPLE ID	Silver [1] ppm (mg/kg)	Arsenic [1] ppm (mg/kg)	Barium [1] ppm (mg/kg)	Cadmium [1] ppm (mg/kg)	Chromium [1] ppm (mg/kg)	Lead [1] ppm (mg/kg)	Selenium [1] ppm (mg/kg)	Mercury [2] ppm (mg/kg)	Beryllium [1] ppm (mg/kg)	Copper [1] ppm (mg/kg)
B.G.	ND	12.2	213	ND	22.6	51.3	ND	ND	0.671	17.1
B.G. DUP	ND	12.0	223	ND	22.2	50.0	ND	ND	0.717	18.0
RPD=	0.00	1.65	4.59	0.00	1.79	2.57	0.00	0.00	6.63	5.02

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7471 - Cold Vapor
ND - Not Detected at listed Practical Quantitation Limit (PQL)

Data Review

9801006 / RCRA_SOIL

FEB 09 '98 01:10PM DHL ANALYTICAL P.11/13

APPENDIX 4

STEP'S MARCH 31, 1998, LETTER REPORT OF SAMPLING AND ANALYSIS RESULTS AT THREE SOIL SAMPLING LOCATIONS

STEP Inc.

SOLUTIONS TO ENVIRONMENTAL PROBLEMS
1006 Floyd Culler Court • Oak Ridge, Tennessee 37830
Telephone 423/481-7837 • Fax 423/481-0290

March 31, 1998

Ms. Lynn Woodside
Environmental Compliance Division
NGK Metals Corporation
Tucker Road
Temple, Pennsylvania 19560

RE: **Results of sampling at three soil sampling locations; NGK Metals Corporation, 725 East Avenue Athens, Tennessee 37303**

Dear Ms. Woodside:

Seven soil samples were collected from three locations at the referenced facility. The locations were selected based on the results of previous sampling that was conducted by Texas Hydraulics (January 1998). The three locations were not marked by Texas Hydraulics in the field. Instead the locations were marked on a map provided to NGK, by Texas Hydraulics (see attached location map).

At the Texas Hydraulics #10 sampling point (STEP's 1A, 1B) and at the Texas Hydraulics #11 sampling point (STEP's 2A, 2B) STEP encountered concrete material at about 4 inches. These samples indicated lower levels of both copper and beryllium than did Texas Hydraulics, but the beryllium is still above the Tennessee Department of Solid Waste Management Remediation Guidance Levels for soil (0.20 parts per million). At Texas Hydraulics #6 sampling location (STEP's 3A, 3B, 3C) STEP took three different samples at depths 0 to 4" (3A), 4"to 8" (3B), and 8" to 12" (3C) again, fill material was encountered to about 6 to 8 inches and after that a very clay-like soil material was encountered. These sample results were again lower than the Texas Hydraulics findings, but copper in sample 3A is still above the Tennessee Department of Solid Waste Management Remediation Guidance Levels for soil (2,960.00 parts per million) and beryllium in all three samples is still above the 0.20 parts per million level.

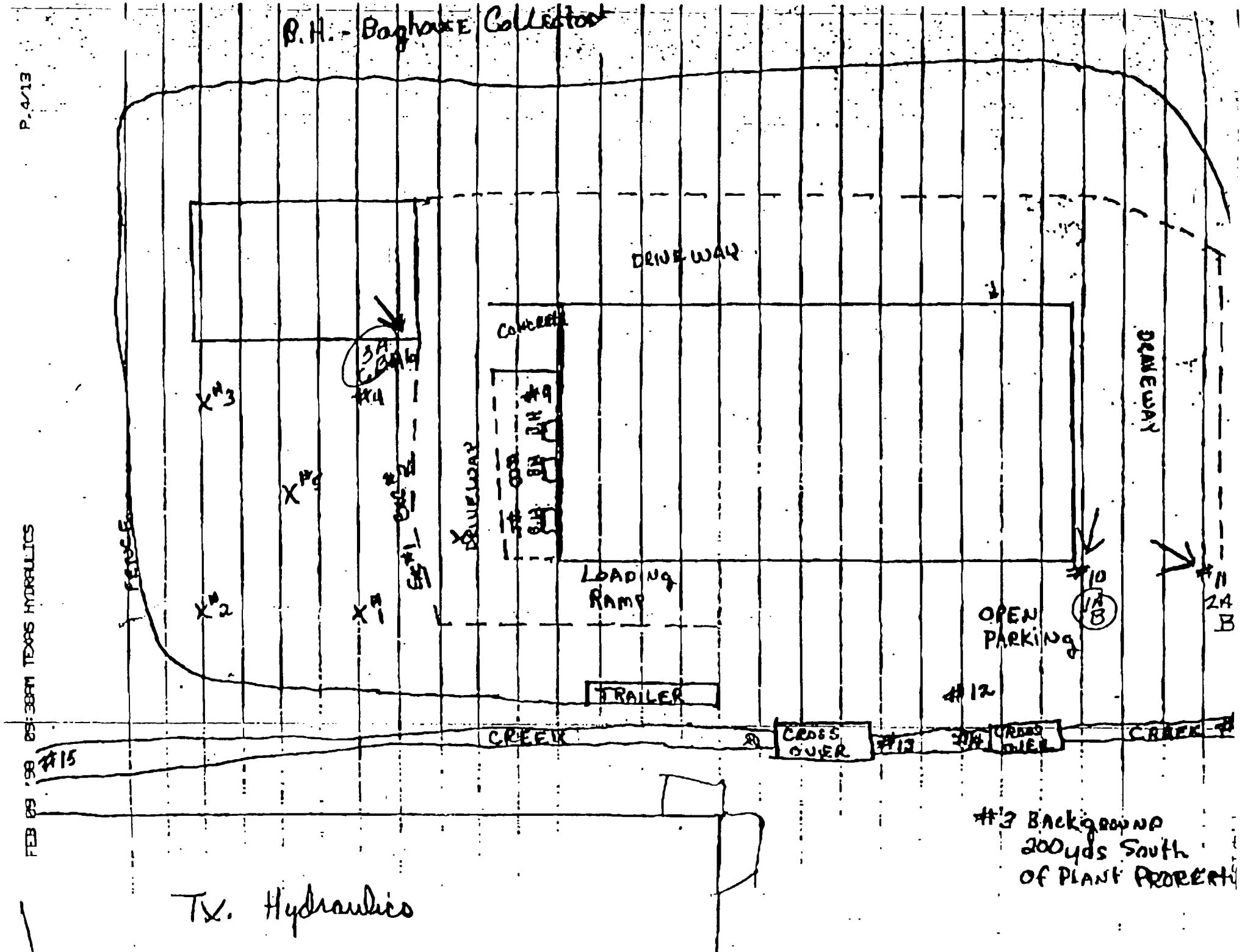
As we discussed by telephone on 3/30/98 these results indicate contamination at this site. Samples 3A, 3B, and 3C show the levels of beryllium and copper declining with depth, which may indicate only surface contamination. Also the blue material that was encountered may be copper sulfide and this was only noticed from 0 to 8" in depth.

We also discussed further options on 3/30/98 concerning this NGK site after your review of the above information please give me a call at 423-481-7837 ext.264 to talk about developing future actions and options at this site.

Sincerely,
Solutions To Environmental Problems, Inc.

Doug Hawn

Doug Hawn,
Project Manager


B.H. - Baghouse Collector
DRIVEWAY
CONCRETE
DRIVEWAY
DRIVEWAY
LOADING RAMP
OPEN PARKING
TRAILER
CREEK
CROSS OVER
CROSS OVER
CREEK
FENCE
#1
#2
#3
#4
#5
#9
#10
#11
#12
#13
#14
#15
#3 Background 200yds South of Plant Property
Tx. Hydraulics

Microbac

Microbac Laboratories, Inc.

Kenwill Division
505 East Broadway Avenue Maryville, TN 37804
423/977-1200 Fax: 423/984-8616

CERTIFICATE OF ANALYSIS # 9803-00104

S.T.E.P., INC.
DOUG HAWN
1093 COMMERCE PARK DR.

OAK RIDGE TN 37831-5479

Date Reported 3/26/98
Date Received 3/13/98
Date Sampled 3/13/98
Invoice No. 000462
Customer No. 8002
Cust P.O.

Subject: NGK; ATHENS, TN

ANALYSIS	RESULT	UNITS	METHOD	DATE	TECH
MPLE: 1 1A; 09:00					
PPER	50.6	MG/KG	SW846 6010	3/25/98	LAN
RYLLIUM	<1.25	MG/KG	SW846 6010	3/26/98	LAN
MPLE: 2 1B; 09:15					
PPER	77.1	MG/KG	SW846 6010	3/25/98	LAN
RYLLIUM	2.20	MG/KG	SW846 6010	3/26/98	LAN
MPLE: 3 2A; 09:30					
PPER	32.6	MG/KG	SW846 6010	3/25/98	LAN
RYLLIUM	<1.25	MG/KG	SW846 6010	3/26/98	LAN
MPLE: 4 2B; 09:45					
PPER	15.0	MG/KG	SW846 6010	3/25/98	LAN
RYLLIUM	<1.25	MG/KG	SW846 6010	3/26/98	LAN
MPLE: 5 3A; 10:00					
PPER	7454	MG/KG	SW846 6010	3/25/98	LAN
RYLLIUM	72.3	MG/KG	SW846 6010	3/26/98	LAN
MPLE: 6 3B; 10:15					
PPER	1200	MG/KG	SW846 6010	3/25/98	LAN
RYLLIUM	9.88	MG/KG	SW846 6010	3/26/98	LAN
MPLE: 7 3C; 10:45					
PPER	509	MG/KG	SW846 6010	3/25/98	LAN
RYLLIUM	6.46	MG/KG	SW846 6010	3/26/98	LAN

CERTIFICATE OF ANALYSIS CONTINUED ON NEXT PAGE.

The data and other information contained on this, and other accompanying documents, represents only the sample(s) analysed and is rendered upon the condition that it is not to be reproduced wholly or in part for advertising or other purposes without written approval from the laboratory.

APPENDIX 5

STEP'S JULY 10, 1998, PHASE II SAMPLING EVENT REPORT

PHASE II SAMPLING EVENT

Former NGK Metals Corporation Facility
at
725 East Avenue
(McMinn County)
Athens, Tennessee

Submitted to:
Ms. Lynne Woodside
Supervisor Environmental Affairs
NGK Metals Corporation
Tuckerton Road
Reading, Pennsylvania 19612

Submitted by:

Solutions To Environmental Problems, Inc.
1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

July 10, 1998
STEP Project No. 110-082-002

STEP

Introduction:

Solutions to Environmental Problems, Inc. (STEP) has completed the soils investigation as requested by NGK Metals Corporation. On June 6, 1998, soil sampling was performed at the former NGK Metals Corporation, Athens, Tennessee facility. The sampling was conducted to determine the approximate vertical and horizontal extent of potential copper and beryllium contamination in an area that is next to the old bag house. As directed, samples were obtained from the ground surface to a depth of twelve inches. The area of concern encompassed an area roughly 100' x 100' next to the old bag house collection area.

The analytical results were compared to the Tennessee Department of Solid Waste Management Remediation Guidance Levels (RGL) to determine if the concentrations exceeded industrial remediation values.

The sampling locations, soil sampling, analytical results, conclusions/findings, and recommendations that NGK may consider for future activities are discussed below.

Sampling Locations:

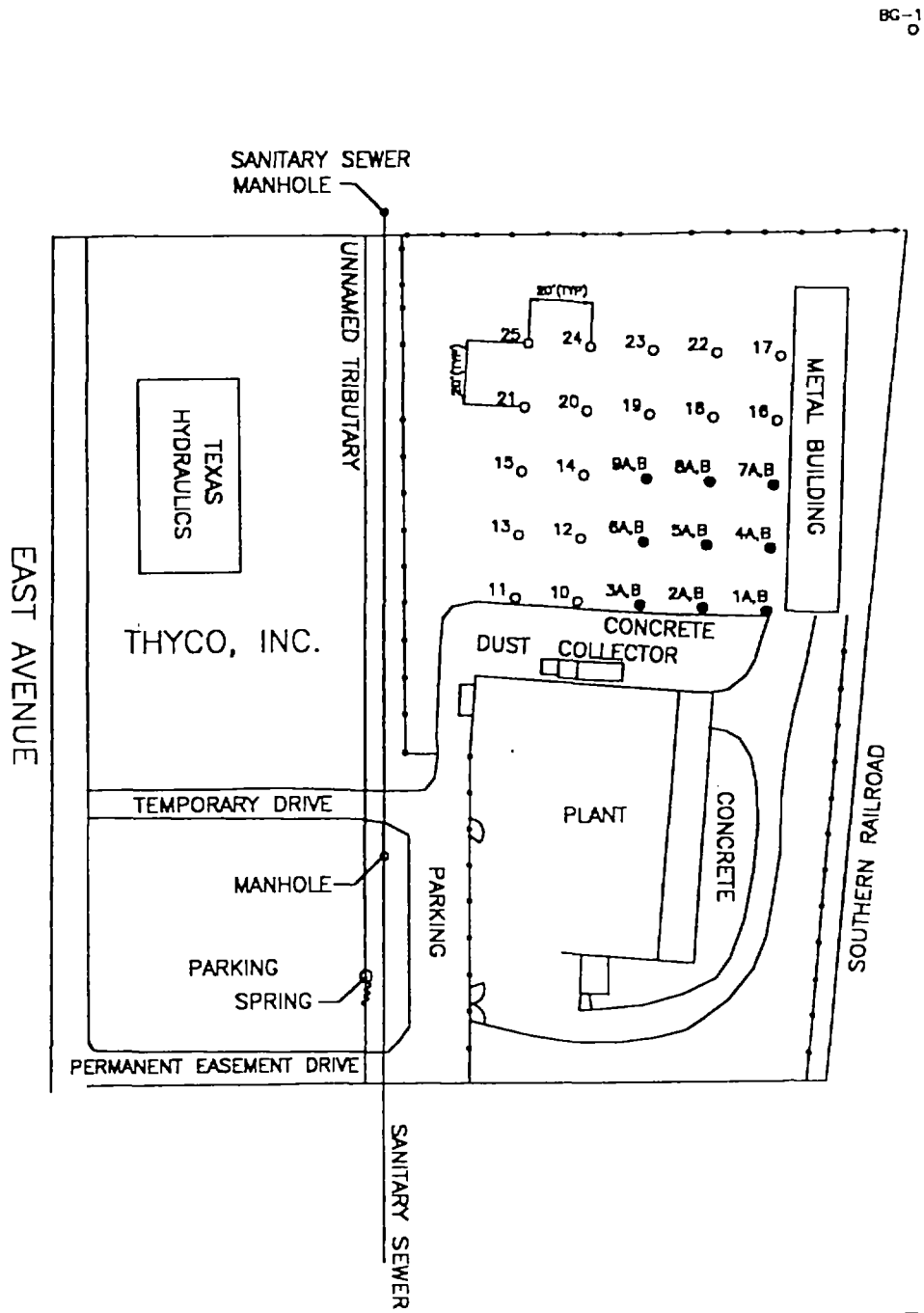
Previous soil investigations conducted at the site (January 1998, March 1998) had identified copper and beryllium concentrations that exceed the RGL (mainly on the east side of the facility). The current sampling effort consisted of obtaining thirty-two soil samples from 27 locations on a rectangular grid pattern. In addition, four samples were taken from potentially non-impacted areas for determining background concentrations.

Prior to sampling, the grid system was established by placing a wooden-stake at each node of a 20' rectangular grid. The stakes were labeled to coincide with the sample number to be obtained. The grid system was based on the previous sample results obtained. The grid was initiated at the corner of the concrete pad area on the north side of the facility (i.e sample 1A, B).

The background sampling locations were chosen at random, with BG-1 being in the northeastern-most corner of NGK the property. Background sample BG-2 was obtained approximately 200 yards southwest of the most southern parking area. The sampling locations are shown on Figure 1.

Soil Sampling:

Samples were collected by using a push and/or hand auger. The sampling equipment was decontaminated with alconox and deionized water, with the sampling tools air-dried before use at each location. The samples were collected at appropriate depths, composited, placed in clean sample containers, labeled and placed on ice within a cooler. Once the sampling was completed, the cooler was shipped via Federal Express to the laboratory for analysis. A composite sample was taken from 0"-6"in depth and another composite sample was taken from 6"-12" depth at 9 locations. Samples were also composited from 0"-12" at 18 sampling locations that also included the background samples. The samples that were taken from 0"to 6" were labeled with an "A" designation and the samples taken from 6"to 12" were labeled with a "B."



LEGEND

- ● A & B SAMPLE
  (A 0"– 6")
  (B 6" – 12")
- ○ 0" – 12" SAMPLE

FIGURE 1

NOTES:	SAMPLING LOCATIONS
BASE MAP PROVIDED BY CLIENT	NGK METALS FACILITY
	ATHENS, TENNESSEE
SITE LOCATION:	STEP 1006 FLOYD CULLER COURT OAK RIDGE TN. 37830 (423) 481-7837
725 EAST AVENUE	
ATHENS, TENNESSEE	

APPENDIX I

STEP

Sampling Results for NGK Athens Plant

Sample ID	Beryllium Results	Copper Results
NGK-1A	**38.6**	**3540***
NGK-1B	1.21	6.45
NGK-2A	2.72	41.8
NGK-2B	12.1	596
NGK-3A	1.44	5.77
NGK-3B	2.45	29.2
NGK-4A	9.4	780
NGK-4B	28.2	2580
NGK-5A	14.1	1220
NGK-5B	23.4	2380
NGK-6A	4.29	136
NGK-6B	1.19	10.5
NGK-7A	2	77
NGK-7B	9.49	782
NGK-8A	1.96	86.3
NGK-8B	1.75	61
NGK-9A	1.66	22.4
NGK-9B	1.93	49.7
NGK-10	1.71	23.1
NGK-11	1.36	5.73
NGK-12	1.25	12.8
NGK-13	1.14	27.9
NGK-14	1.31	24.8
NGK-15	1.2	8.33
NGK-16	3	398
NGK-17	4.28	352
NGK-18	4.91	344
NGK-19	1.31	30.7
NGK-20	3.17	387
NGK-21	1.24	5.49
NGK-22	2.34	63.7
NGK-23	1.59	36.8
NGK-24	1.2	7.36
NGK-25	1.39	11
NGK-BG-1	1.51	5.63
NGK-BG-2	1.81	2.12

Highest results for both beryllium and copper are in bold. All beryllium samples were above the Tennessee Department of Solid Waste Remediation Guidance Levels (RGLs) for soil. * Indicates the only copper sample above the RGLs.

APPENDIX II

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

CHAIN OF CUSTODY

Project Number: 110-092-110-002
Sampler: D. HAWN
Project Name: NGK Athens
SAE Quote: 060998A120

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	CU	Be							
69537	NGK-1A	6-16-98	0930	soil		X		✓	✓							
538	NGK-1B		0930					✓	✓							
539	NGK-2A		1034					✓	✓							
540	NGK-2B		1034					✓	✓							
541	NGK-3A		1042					✓	✓							
542	NGK-3B		1042					✓	✓							
543	NGK-4A		0945					✓	✓							
544	NGK-4B		0945					✓	✓							
69545	NGK-5A		1132					✓	✓							

Analysis Requested

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D
Darg Hawn Darg Hawn	6/16/98 1700						
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D
						CBB	6/17

Cooler Temperature When Recevied: 4

Laboratory Project Number: 104048

Cooler Seals Intact?

SPECIAL INSTRUCTIONS:

Normal
TurN
Around

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
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Phone 1-615-726-0177

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

CHAIN OF CUSTODY

Project Number: 110-082-110-002
Sampler: D. Hawn
Project Name: NGK Athens
SAE Quote: 060998A120

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Cu	Be
69546	NGK-5B	6-16-98	1132	soil		X		✓	✓
547	NGK-6A		1115					✓	✓
548	NGK-6B		1115					✓	✓
549	NGK-7A		1000					✓	✓
550	NGK-7B		1000					✓	✓
551	NGK-8A		1155					✓	✓
552	NGK-8B		1155					✓	✓
553	NGK-9A		1208					✓	✓
69554	NGK-9B		1208					✓	✓

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
Doug Hawn	6/16/98						
Doug Hawn	1700						
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
						CBB	6/17/

ler Temperature When Recevied:

Laboratory Project Number:

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:

Normal Turn Around

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STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

CHAIN OF CUSTODY

Project Number: 110-082-110-002
Sampler: D. Hawn
Project Name: NGK Athens
SAE Quote: 060998A120

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Cu	Be
69555	NGK-10	6-16-98	1052	Soil		X		✓	✓
556	NGK-11		1102					✓	✓
557	NGK-12		1125					✓	✓
558	NGK-13		1142					✓	✓
559	NGK-14		1228					✓	✓
560	NGK-15		1220					✓	✓
561	NGK-16		1010					✓	✓
562	NGK-17		1020					✓	✓
69563	NGK-18	✓	1149					✓	✓

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
Doug Hawn	6/18/98 1700						
Doug Hawn							

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
						CBB	6/19

Cooler Temperature When Recevied:

Laboratory Project Number:

Cooler Seals Intact?

Laboratory Bill Number:

SPECIAL INSTRUCTIONS:

Normal ~~[illegible]~~ Turn Around

SPECIALIZED ASSAYS, INC.

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STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

CHAIN OF CUSTODY

Project Number: 110-082-110-002
Sampler: D. Hawn
Project Name: NGK Athens
SAE Quote: 060998A120

Analysis Request

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Cu	Be					
69564	NGK-19	6-16-98	1100	Soil		X		✓	✓					
565	NGK-20		1240					✓	✓					
566	NGK-21		1237					✓	✓					
567	NGK-22		1202					✓	✓					
568	NGK-23		1306					✓	✓					
569	NGK-24		1300					✓	✓					
570	NGK-25		1251					✓	✓					
571	NGK-BG1		1326					✓	✓					
69572	NGK-BG-2		1316					✓	✓					

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:
Doug Hawn Doug Hawn	6/16/98 1700					
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:
						CJBB

Cooler Temperature When Recevied:

Laboratory Project Number:

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:

Normal Turn Around

SPECIALIZED ASSAYS, INC.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69537
Sample ID: NGK-1A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 9:30
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	38.6	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	3540	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69538
Sample ID: NGK-1B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 9:30
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.21	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	6.45	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69539
Sample ID: NGK-2A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:34
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.72	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	41.8	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69540
Sample ID: NGK-2B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:34
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	12.1	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	595.	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69541
Sample ID: NGK-3A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:42
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.44	mg/kg	0.96	0.96	1	6/19/98	6:51	R.Street	6010B	5966
Copper	5.77	mg/kg	0.96	0.96	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69542
Sample ID: NGK-3B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:42
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.45	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966
Copper	29.2	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69543
Sample ID: NGK-4A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 9:45
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	9.40	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	780.	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69544
Sample ID: NGK-4B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 9:45
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	28.2	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966
Copper	2580	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69545
Sample ID: NGK-5A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:32
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	14.1	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	1220	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69546
Sample ID: NGK-5B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:32
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	23.4	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	2330	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69547
Sample ID: NGK-6A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:15
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	4.29	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	136.	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69548
Sample ID: NGK-6B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:15
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.19	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	10.5	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
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Laboratory Certification Number: 02008

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69549
Sample ID: NGK-7A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:00
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.00	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	77.0	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69550
Sample ID: NGK-7B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:00
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	9.49	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	782.	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69551
Sample ID: NGK-8A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:55
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.96	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	86.3	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69552
Sample ID: NGK-8B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:55
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.75	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	61.0	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69553
Sample ID: NGK-9A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:08
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.66	mg/kg	0.96	0.96	1	6/19/98	6:51	R.Street	6010B	5966
Copper	22.4	mg/kg	0.96	0.96	1	6/19/98	6:51	R.Street	6010B	5966

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69554
Sample ID: NGK-9B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:08
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.93	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966
Copper	49.7	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69555
Sample ID: NGK-10
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:52
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.71	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	23.1	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69556
Sample ID: NGK-11
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:02
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.36	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966
Copper	5.73	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69557
Sample ID: NGK-12
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:25
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.25	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	12.8	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69558
Sample ID: NGK-13
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:42
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.14	mg/kg	1.00	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	27.9	mg/kg	1.00	1.00	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69559
Sample ID: NGK-14
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:28
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.31	mg/kg	0.96	0.96	1	6/19/98	7:03	R.Street	6010B	5967
Copper	24.8	mg/kg	0.96	0.96	1	6/19/98	7:03	R.Street	6010B	5967

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69560
Sample ID: NGK-15
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:20
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.20	mg/kg	1.02	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	8.33	mg/kg	1.02	1.00	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69561
Sample ID: NGK-16
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:10
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	3.00	mg/kg	1.00	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	398.	mg/kg	1.00	1.00	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69562
Sample ID: NGK-17
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:20
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	4.28	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	352.	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69563
Sample ID: NGK-18
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:49
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	4.91	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967
Copper	344.	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69564
Sample ID: NGK-19
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:00
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.31	mg/kg	1.01	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	30.7	mg/kg	1.01	1.00	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69565
Sample ID: NGK-20
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:40
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	3.17	mg/kg	0.99	0.99	1	6/19/98	7:03	R.Street	6010B	5967
Copper	387.	mg/kg	0.99	0.99	1	6/19/98	7:03	R.Street	6010B	5967

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69566
Sample ID: NGK-21
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:37
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.24	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967
Copper	5.49	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69567
Sample ID: NGK-22
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:02
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.34	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967
Copper	63.7	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69568
Sample ID: NGK-23
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 13:06
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.59	mg/kg	1.01	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	36.8	mg/kg	1.01	1.00	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69569
Sample ID: NGK-24
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 13:00
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.20	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	7.36	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69570
Sample ID: NGK-25
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:51
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.39	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967
Copper	11.0	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.
2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69571
Sample ID: NGK-BG-1
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 13:26
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.51	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	5.63	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

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Phone 1-615-726-0177

ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-092-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69572
Sample ID: NGK-BG-2
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 13:16
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.81	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	2.12	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny E. Hale, M.S., Laboratory Director

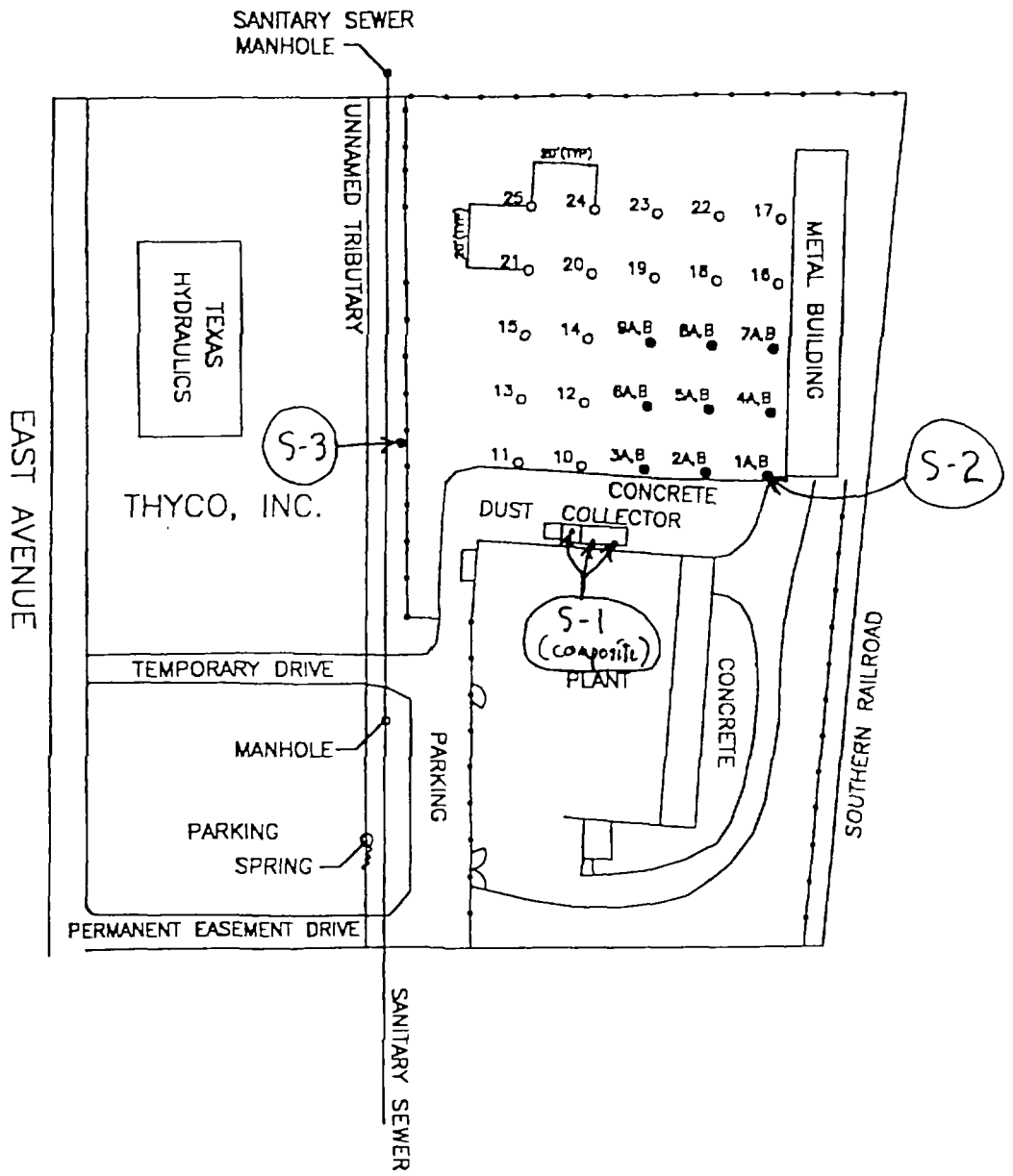
Laboratory Certification Number: 02008

APPENDIX 6

LABORATORY REPORTS FOR SOIL SAMPLES COLLECTED BY TRIAD ON NOVEMBER 5, 1998

11/5/98 SAMPLING LOCATIONS

BG-1



BG-2

LEGEND

- ● A & B SAMPLE
  - (A 0"– 6")
  - (B 6" – 12")
- ○ 0" – 12" SAMPLE

FIGURE 1

DATE: 6/26/98

NOT TO SCALE

NOTES:

BASE MAP PROVIDED BY CLIENT

SITE LOCATION:
725 EAST AVENUE
ATHENS, TENNESSEE

SAMPLING LOCATIONS
NGK METALS FACILITY
ATHENS, TENNESSEE

1006 FLOYD CULLER COURT
OAK RIDGE TN. 37830
(423) 481-7837
STEP
Solutions To Environmental Problems, Inc.

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV CONSULTANTS [illegible]
ERIK LEHNHOFF
[illegible] COMMERCE [illegible]
NASHVILLE TN [illegible]

Lab Number [illegible]
Sample ID [illegible]
Sample Type Soil
Site ID

Date Collected [illegible]
Time Collected [illegible]
Date Received [illegible]
Time Received [illegible]

Project [illegible]
Project Name [illegible] METALS/ATHENS SITE
Sampler [illegible]

Analyte	Result	Units	Report Limit	Report Limit	Qual Flags	Date	Time	Analyst	Method	Batch
METALS										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GENERAL CHEMISTRY PARAMETERS										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] Detected at the Report Limit

[illegible]

[illegible] Technical Director
[illegible] Laboratory Director
[illegible] Technical Services

Laboratory Cert Location Number [illegible]

COPY 3

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

[illegible]

[illegible]

Analyte	Result	[illegible]	Report Limit	[illegible]	[illegible]	Date	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]										
[illegible]										
[illegible]										
[illegible]										
[illegible]										
[illegible]										

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

COPY 3

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

[illegible]

Lab Number [illegible]
Sample ID [illegible]
Sample Type [illegible]
Site ID

Date Collected [illegible]
Time Collected [illegible]
Date Received [illegible]
Date Reported [illegible]

Project [illegible]
Project Name [illegible]
Sampler [illegible]

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Qual
[illegible]										
[illegible]										
[illegible]										
[illegible]										
[illegible]										
[illegible]										

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Laboratory Certification Number [illegible]

COPY 3

SPECIALIZED ASSAYS
ENVIRONMENTAL

7A-052964

2960 Foster Creighton Drive
Nashville, TN 37204
615-726-0177, 800-765-0980
FAX 615/726-3404

REFERRING CLIENT
Account: 6921
Triad Env. Consultants
Eric Lehnohoff
207 Donelson Pike, Ste 200
Nashville, TN 37214
Ph: 615-889-6888 Fax: 615-889-4004

Specialized Assays: (800) 765-098

LLING CONTROL NUMBER (FOR LAB USE ONLY): 120670

PROJECT #: 98-NGK01-01

P.O. #:

MPLERS (Signature-Please Print): Dwight Hinch (Dwight Hinch)

PROJECT NAME: NGK Metals/Athens Site

FOR LAB USE ONLY ACC#	SAMPLE DESCRIPTION	DATE	TIME	COMP	GRAB	# OF CONT	ANALYSIS REQUESTED
8-A142208	S-1	11/5/98	1158 ~~1145~~ TDH	X		1	Total Be, Cu, As; % Moisture
8-A142210	S-2	11/5/98	1205		X	2	Total Be, Cu; % Moisture ~~[illegible]~~ TDH Be, Cu by SPLP
8-A142209	S-3	11/5/98	1212		X	1	Total Be, Cu, As; % Moisture

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Received for Laboratory by:	Date / Time
Dwight Hinch	11/16/98 0834	Denton Hill	[signature]	1/16/98 11:04
Denton Hill	1106 11/16/98	R Caballero	Remarks: RUSH ALL ANALYSES	
R. Caballero	11/16 11:06			
			SAI Project #:	

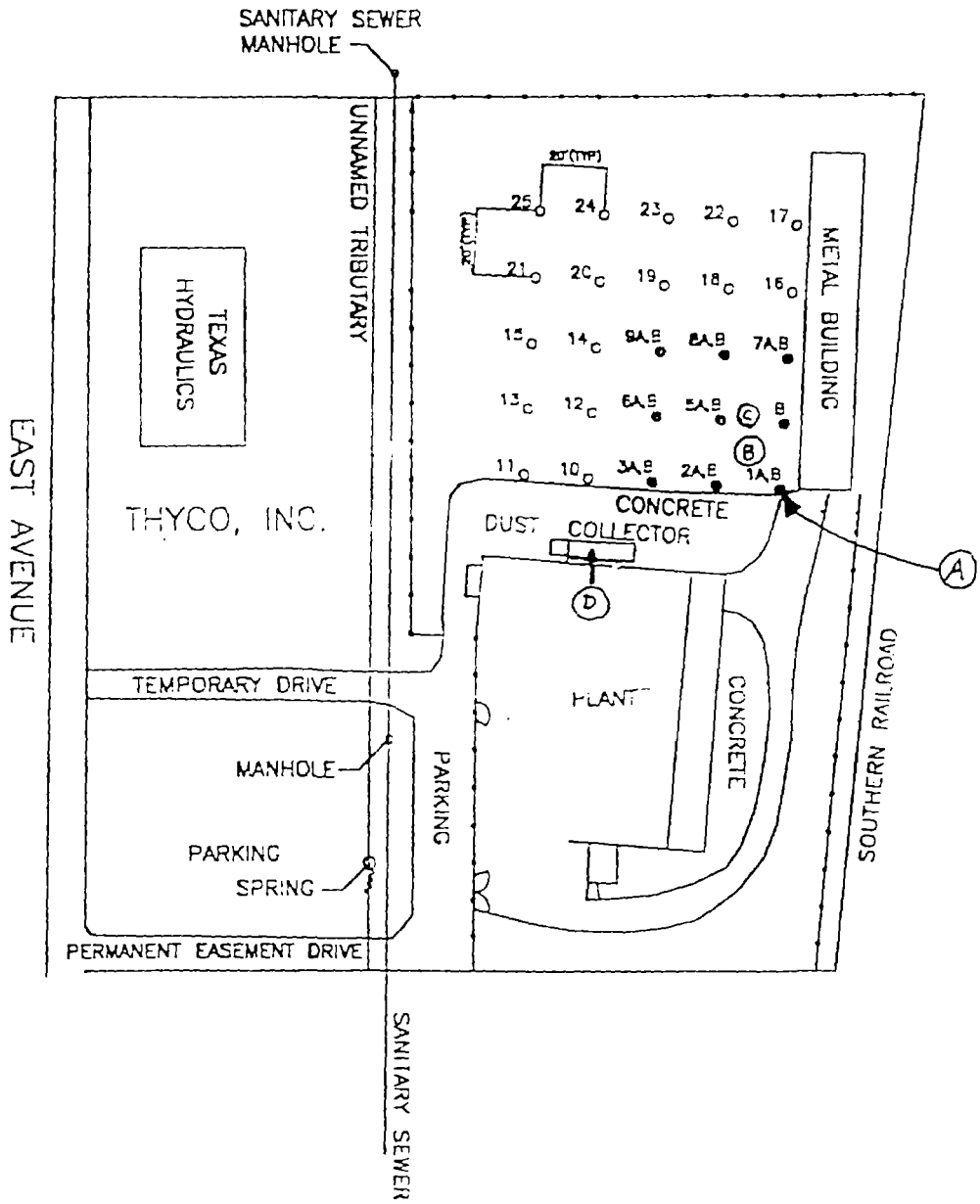
For further assistance in completing the chain of custody form please refer to the instructions found on the opposite sid

APPENDIX 7

LABORATORY REPORTS FOR SOIL SAMPLES COLLECTED BY TRIAD ON NOVEMBER 30, 1998

11/30/98 SAMPLING LOCATIONS

BG-1



BG-2

LEGEND

- ● A & B SAMPLE
  (A 0"– 6")
  (B 6" – 12")
- o 0" – 12" SAMPLE

FIGURE 1

DATE: 6/26/98

NOT TO SCALE

NOTES:	SAMPLING LOCATIONS
BASE MAP PROVIDED BY CLIENT	NGK METALS FACILITY
	ATHENS, TENNESSEE
SITE LOCATION:	STER 1008 FLOYD CULLER COURT OAK RIDGE TN 37830 (423) 481-7837
725 EAST AVENUE	
ATHENS, TENNESSEE	Solutions To Environmental Problems, Inc

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A149799
Sample ID: C-0.75
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:45
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Arsenic	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Barium	2.18	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Cadmium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Chromium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Lead	1.98	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Mercury	ND	mg/kg	0.10	0.10	1	12/ 2/98	13:02	R. Kelley	7471	7718
Selenium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Silver	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719

ND = Not detected at the report limit.

Report Approved By: JAMitchell Report Date: 12/ 3/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148946
Sample ID: A-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.01	1.00	1	12/ 1/98	15:53	C.Holmes	6010B	7182
Copper	2.64	mg/kg	1.01	1.00	1	12/ 1/98	15:53	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148947
Sample ID: A-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:30
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	6.21	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D , Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148948
Sample ID: A-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:35
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	3.81	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Lab Number: 98-A148949
Sample ID: A-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:40
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.90	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	ND	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148954
Sample ID: B-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.98	0.98	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	22.3	mg/kg	0.98	0.98	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148955
Sample ID: B-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:25
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.00	1.00	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	8.03	mg/kg	1.00	1.00	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148956
Sample ID: B-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:30
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.17	mg/kg	0.97	0.97	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	1.75	mg/kg	0.97	0.97	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148957
Sample ID: B-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:45
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.15	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny R. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148962
Sample ID: C-0.75
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:45
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.38	mg/kg	0.99	0.99	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	514.	mg/kg	0.99	0.99	1	12/ 1/98	15:56	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148958
Sample ID: C-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:10
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF FOSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	60100	7182
Copper	19.7	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	60100	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148959
Sample ID: C-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:15
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	5.01	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148960
Sample ID: C-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.02	1.00	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	7.14	mg/kg	1.02	1.00	1	12/ 1/98	15:56	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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Nashville, TN 37204-0566
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148961
Sample ID: C-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:25
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.18	mg/kg	0.98	0.98	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	2.17	mg/kg	0.98	0.98	1	12/ 1/98	15:56	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148950
Sample ID: D-1.5
Sample Type: Soil
Site ID:

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Date Collected: 11/30/98
Time Collected: 13:08
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	3.38	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	139.	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148951
Sample ID: D-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:12
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	6.37	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Lab Number: 98-A148952
Sample ID: D-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:16
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.19	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	ND	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

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P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148953
Sample ID: D-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.00	1.00	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	2.81	mg/kg	1.00	1.00	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
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Johnny A. Mitchell, Dir. Technical Services

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TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

CHAIN OF CUSTODY

Project Number: 98-NGK 01-01 | Sampler: JEFF POSTELL

Project Name: | SAE Quote:

Analysis Requested: Copper, Beryllium

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Copper	Beryllium	
148946	A -1.5	11/30/98	12:20	SOIL	X		1	X	X	24hr RUSH
47	A - 2.0		12:30							
48	A - 2.5		12:35							
49	A - 3.0		12:40							
50	D - 1.5		1:08							
51	D - 2.0		1:12							
52	D - 2.5		1:16							
148953	D - 3.0		1:20							

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:
Jeff Postell	11/30/98 PM 5:55	Dwight Hinch	11/30/98 PM 5:55	Dwight Hinch	11/30/98 5:58 PM	
	11/30/98 6:15 PM		12/3/98 8:19			Mr. Bailey

Cooler Temperature When Received: 4°

Laboratory Project Number: 122164

ler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

CHAIN OF CUSTODY

Project Number: 98-NGK01-01 | Sampler: JEFF POSTELL

Project Name: | SAE Quote:

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Copper	Beryllium					
148954	B-1.5	11/30/98	10:20	SOIL	X	X	1	X	X	24	hr	RUSH		
55	B-2.0		10:25											
56	B-2.5		10:30											
57	B-3.0		10:45											
58	C-1.5		11:10											
59	C-2.0		11:15											
60	C-2.5		11:20											
61	C-3.0		11:25											
148962	C-0.75		1:45											

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
Jeff Postell	11/30/98 5:55PM	Dwight Hinch	11/30/98 5:55 PM	Dwight Hinch	11/30/98 5:58 PM	[illegible]	11/30/ 5:5
[illegible]	11/30/98 6:15PM	[illegible]	11/30/98 1818			MB	11/30/ 18:

Cooler Temperature When Received:

Laboratory Project Number:

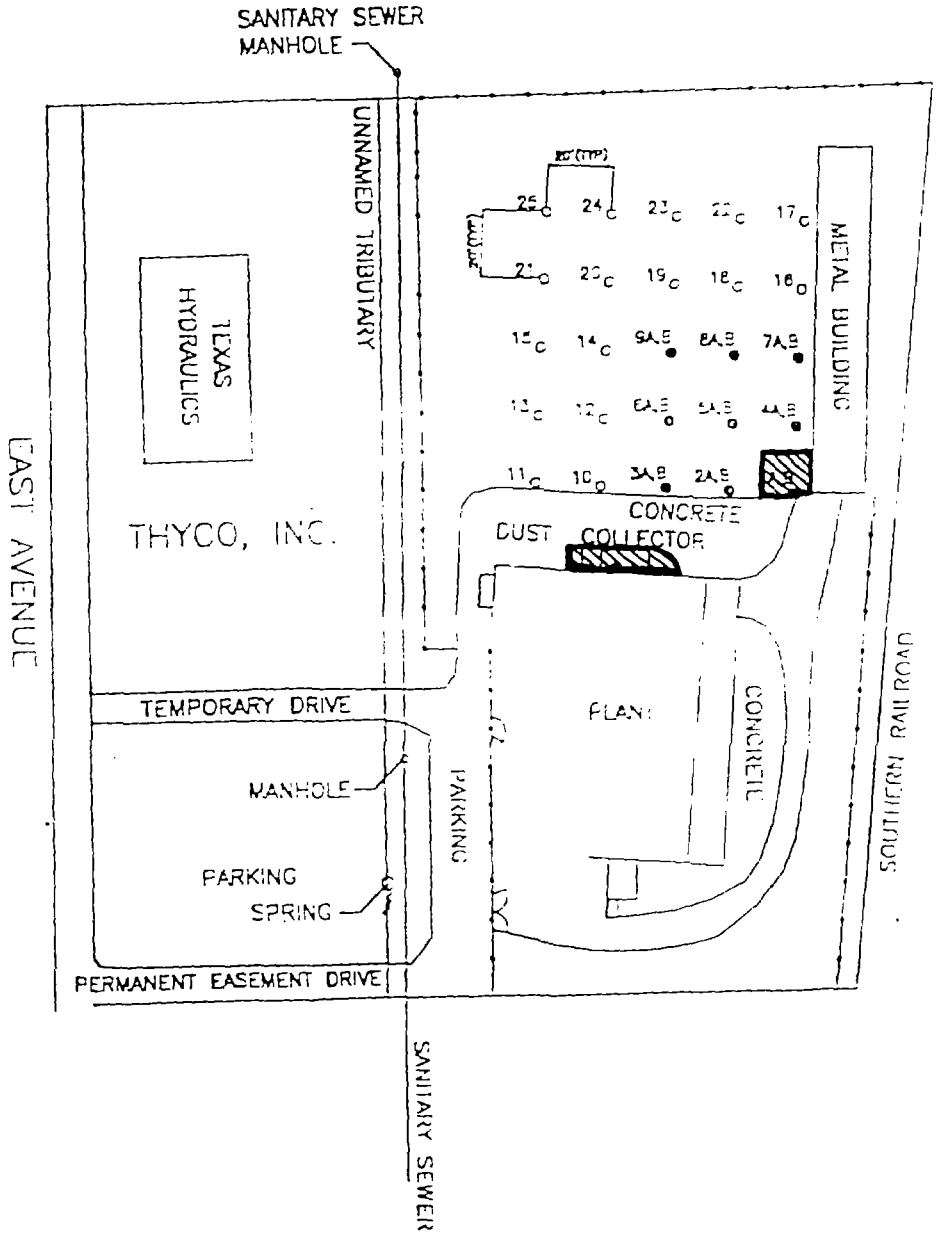
Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:

APPENDIX 8

FIGURE INDICATING EXCAVATED AREAS



Areas where soil was removed and disposed offsite

Notes:
1. Base map provided by client.
2. Approximately one foot of soil was removed from all designated areas.
3. Areas where soil was removed was backfilled with gravel.

PREPARED BY:

TriAD Environmental Consultants, Inc
207 Donelson Pike, Suite 200
Nashville, Tennessee 37214
Phone: 615-889-6888 Fax: 615-889-4004

FIGURE 1
PROPOSED REMEDIAL ACTION

NGK METALS SITE
ATHENS, TENNESSEE

DWG DATE: 12/3/98 SHEET 1 OF 1

APPENDIX 9

SOIL DISPOSAL MANIFESTS AND OTHER DOCUMENTATION

USA WASTE SERVICES, INC.

NON - HAZARDOUS WASTE MANIFEST

FOR OFFICE USE ONLY
Customer Acct. No.
Ticket No.

GENERATOR

NO. 099616

Name: NGR metals Corporation
Generating Location: Same
Address: 725 East Avenue
Athens, TN 37303
Phone No. 615-889-6888

USA WASTE APPROVAL NUMBER	WASTE DESCRIPTION	QUANTITY	UNITS
PBL-98-12-003	Copper + Beryllium Impacted Soil	9.87	T

UNITS
D - DRUM
B - BAG
C - CARTON
P - POUNDS
Y - YARD
O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law. That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Mark Satterfield — AUTHORIZED AGENT'S NAME (PRINT)
12-8-98 — DATE
Mark Satterfield — SIGNATURE

TRANSPORTER

Transporter's Name: Fox Waste
Address: 3331 St Elmo Avenue
Chattanooga, TN 37408
Phone No. 423-267-0166
Driver's Name: Dan Hartley
Vehicle's No.

I hereby certify that the above named material was picked up at the Generator site listed above and delivered without incident to the disposal facility listed below.

12-10-98 — SHIPMENT DATE
Dan Hartley — DRIVER'S SIGNATURE
12-10-98 — DELIVERY DATE
Dan Hartley — DRIVER'S SIGNATURE

DISPOSAL FACILITY

Site Name: Pine Bluff Landfill
Address: 13809 E. Cherokee Drive, Ball Ground, Ga 30107
Permit No. #028-039 D (SL)
Phone No. 770-479-2936
Time

I hereby certify that the above material has been accepted and that the information presented on this document are true and accurate.

Jenkins — NAME
12/15/98 — DATE
Stacy Jenkins — SIGNATURE

TRANSPORTER

USA WASTE SERVICES, INC.

NON - HAZARDOUS WASTE MANIFEST

FOR OFFICE USE ONLY
Customer Acct. No.
Ticket No.

GENERATOR

NO. 099617

Christy Danny Do this

Name NG Hatchery Gas Corporation
Address 725 East Avenue
Adams TN 37303
Phone No. 615-889-6888

Generating Location Same

USA WASTE APPROVAL NUMBER	WASTE DESCRIPTION	QUANTITY	UNITS
PBL-98-12-003	Copper + Beryllium Impacted Soil	9.65	T

UNITS
D - DRUM
B - BAG
C - CARTON
P - POUNDS
Y - YARD
O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Mark Satterfield — AUTHORIZED AGENT'S NAME (PRINT)
12-8-98 — DATE
Mark Satterfield — SIGNATURE

TRANSPORTER

Transporter's Name Fox Waste
Address 3331 St Elmo Avenue
Chattanooga, TN 37408
Phone No. 423-267-0166
Driver's Name Don Hartley
Vehicle's No. 329

I hereby certify that the above named material was picked up at the Generator site listed above and delivered without incident to the disposal facility listed below.

12-15-98 — SHIPMENT DATE
Don Hartley — DRIVER'S SIGNATURE
12-15-98 — DELIVERY DATE
Don Hartley — DRIVER'S SIGNATURE

DISPOSAL FACILITY

Site Name Pine Bluff Landfill
Address 13809 E. Cherokee Drive, Ball Ground, Ga 30107
Permit No. #028-039 D(SL)
Phone No. 770-479-2936
Time

I hereby certify that the above material has been accepted and that the information presented on this document are true and accurate.

D Lester — NAME
12/15/98 — DATE
[signature] — SIGNATURE

Dec-10-98 10:00A PINE BLUFF

WASTE MANAGEMENT

PINE BLUFF LANDFILL
13809 E. Cherokee Dr.
Ball Ground, GA 30107
770/479-2936
770/479-3265 Fax

Jeff
4 pages

Date: 12/15/1998 11:20 AM
TIME IN: 11:30 AM Finish: 0[illegible]
306-100 PO #: PBL 9812003
TRIAD ENVIRONMENTAL (NGF
PBL 9812003 (NGF METALS)
207 DONELSON PK SUITE 200
NASHVILLE TN 37214

Driver: Truck: 335
Manifest #: 99617

Description	Quantity	Rate	Amount
SOIL	7.65 TON	22.00	212.30

Source: TNACTH Type: SOIL District: IN
BVW 50320 TW 31520

TOTAL TAXES & SURCHARGES .00

Signature Don Hartley Total $212.30

Dec-16-98 10:01A PINE BLUFF

WASTE MANAGEMENT

PINE BLUFF LANDFILL
13809 E. Cherokee Dr.
Ball Ground, GA 30107
770/479-2936
770/479-3265 Fax

Date: 12/15/1998 [illegible]
TIME IN [illegible] [illegible]
[illegible]
TRIAD ENVIRONMENTAL (NGR)
[illegible] (NGR METALS)
[illegible] DONELSON PK SUITE [illegible]
[illegible]

Truck: [illegible]

Driver:
Manifest #: [illegible]

Description	Quantity	Rate	Amount
SOI	9.87 TON	33.00	317.14

Source: [illegible] Type: SOL District: IN
[illegible]

TOTAL TAXES & SURCHARGES .00

Signature Dan Hartter Total $317.14

Site: _____
Break: 1.11
Other: V.

Record Information

1. Site Name: NGK Metals
   (as entered in CERCLIS)

2. Site CERCLIS Number: TND[illegible]

3. Site Reviewer: Renee Lucchesi

4. Date: 4/[illegible]

5. Site Location: Athens McMinn, TN
   (City County, State)

6. Congressional District: 2

7. Site Coordinates: Single

   Latitude: [illegible] Longitude: [illegible]

Site Description

1. Setting: Urban

2. Current Owner: Private - Industrial

3. Current Site Status: Active

4. Years of Operation: Active Site, from and to dates: [illegible]

5. How Initially Identified: State Local Program

6. Entity Responsible for Waste Generation:

   - Manufacturing
   - Primary Metal Industries

7. Site Activities Waste Deposition:

   - Unknown

Waste Description

8. Wastes Deposited or Detected Onsite:

   - Solvents
   - Metals

NPL Characteristics Data Collection Form

Response Actions

9. Response/Removal Actions:

- Site Access Has Been Restricted

RCRA Information

10. For All Active Facilities, RCRA Site Status:

- Not Applicable

Demographic Information

11. Workers Present: Yes

12. Distance to Nearest Non-Worker Individual: [illegible] Feet - [illegible] Miles

13. Residential Population Within 1 Mile: [illegible]

14. Residential Population Within 4 Miles: [illegible]

Water Use Information

15. Local Drinking Water Supply Source:

- Ground Water (within 4 mile distance limit)

16. Total Population Served by Local Drinking Water Supply Source: [illegible]

17. Drinking Water Supply System Type for Local Drinking Water Supply Sources:

- Municipal (Services over 25 People)

18. Surface Water Adjacent to/Traversing Site:

- Stream

1. Site Name: DOE Metals

(as entered in CERCLIS)

2. Site CERCLIS Number: TND[illegible]14[illegible]

3. Site Reviewer: Renee Lucchesi

4. Date: 4[illegible]

5. Site Location: Athens McMinn, TN
(City, County, State)

6. Congressional District: [illegible]

7. Site Coordinates: Single

Latitude: [illegible] Longitude: [illegible]

	Score
Ground Water Migration Pathway Score (Sgw)	[illegible]
Surface Water Migration Pathway Score (Ssw)	[illegible]
Soil Exposure Pathway Score (Ss)	[illegible]
Air Migration Pathway Score (Sa)	[illegible]
Site Score	14.[illegible]

NOTE

Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PRESCORE 4.0 PAGE:

GROUND WATER MIGRATION PATHWAY SCORESHEET

GROUND WATER MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release to an Aquifer		
Aquifer:		
1. Observed Release	[illegible]	[illegible]

2. Potential to Release		
2a. Containment	[illegible]	[illegible]
2b. Net Precipitation	[illegible]	[illegible]
2c. Depth to Aquifer	[illegible]	[illegible]
2d. Travel Time	[illegible]	[illegible]
2e. Potential to Release		
(Lines 2a,2b,2c,2d)	[illegible]	[illegible]
3. Likelihood of Release	[illegible]	[illegible]
Waste Characteristics		
4. Toxicity/Mobility	*	[illegible]
5. Hazardous Waste Quantity	*	[illegible]
6. Waste Characteristics	[illegible]	[illegible]
Targets		
7. Nearest Well	[illegible]	[illegible]
8. Population		
8a. Level I Concentrations	**	[illegible]
8b. Level II Concentrations	**	[illegible]
8c. Potential Contamination	**	[illegible]
8d. Population (Lines 8a+8b+8c)	**	[illegible]
9. Resources	[illegible]	[illegible]
10. Wellhead Protection Area	[illegible]	[illegible]
11. Targets (Lines 7+8d+9+10)	**	[illegible]
12. Targets (Including overlying aquifers)	**	[illegible]
13. Aquifer Score	[illegible]	[illegible]
GROUND WATER MIGRATION PATHWAY SCORE (S gw)	[illegible]	[illegible]

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

TABLE 4.
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Factor Assigned
Likelihood of Release		
1. Observed Release	550	[illegible]
2. Potential to Release by Overland Flow		
2a. Containment	10	[illegible]
2b. Runoff	25	[illegible]
2c. Distance to Surface Water	25	[illegible]
2d. Potential to Release by Overland Flow (Lines 2a,2b,2c)	500	[illegible]
3. Potential to Release by Flood		
3a. Containment (Flood)	10	[illegible]
3b. Flood Frequency	50	[illegible]
3c. Potential to Release by Flood (Lines 3a x 3b)	500	[illegible]
4. Potential to Release (Lines 2d+3c)	500	[illegible]
5. Likelihood of Release	550	[illegible]

Waste Characteristics		
6. Toxicity/Persistence	*	[illegible]
7. Hazardous Waste Quantity	*	[illegible]
8. Waste Characteristics	[illegible]	[illegible]
Targets		
9. Nearest Intake	[illegible]	[illegible]
10. Population		
10a. Level I Concentrations	**	[illegible]
10b. Level II Concentrations	**	[illegible]
10c. Potential Contamination	**	[illegible]
10d. Population: Lines 10a+10b+10c	**	[illegible]
11. Resources		[illegible]
12. Targets (lines 9+10d+11)	**	[illegible]
13. DRINKING WATER THREAT SCORE	[illegible]	[illegible]

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT WORKSHEET

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	[illegible]	[illegible]
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	*	[illegible]
16. Hazardous Waste Quantity	*	[illegible]
17. Waste Characteristics	[illegible]	[illegible]
Targets		
18. Food Chain Individual	50	[illegible]
19. Population		
19a. Level I Concentrations	**	[illegible]
19b. Level II Concentrations	**	[illegible]
19c. Potential Human Food Chain Contamination	**	[illegible]
19d. Population: Lines 19a+19b+19c	**	[illegible]
20. Targets (lines 18+19d)	**	[illegible]
21. HUMAN FOOD CHAIN THREAT SCORE	[illegible]	[illegible]

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SURFACE WATER OVERLAND FLOW MIGRATION COMPONENT SCORESHEET

SURFACE WATER OVERLAND FLOW MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 11)	[illegible]	[illegible]
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Biomass	*	[illegible]
24. Hazardous Waste Quantity	*	[illegible]
25. Waste Characteristics	[illegible]	[illegible]
Targets		
26. Sensitive Environments		
26a. Level I Concentration	**	[illegible]
26b. Level II Concentration	**	[illegible]
26c. Potential Contamination	**	[illegible]
26d. Sensitive Environments (lines 26a-26c)	**	[illegible]
27. Targets (line 26d)	**	[illegible]
28. ENVIRONMENTAL THREAT SCORE	[illegible]	[illegible]
29. WATERSHED SCORE	[illegible]	[illegible]
30. SW: OVERLAND FLOW COMPONENT SCORE (line 28 x line 29)	[illegible]	[illegible]

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREPARER: [illegible] DATE: [illegible]

SOIL EXPOSURE PATHWAY SCORESHEET

SOIL EXPOSURE PATHWAY Factor Categories & Factors RESIDENT POPULATION THREAT	Maximum Value	Value Assigned
Likelihood of Exposure		
1. Likelihood of Exposure	[illegible]	[illegible]
Waste Characteristics		
2. Toxicity	*	[illegible]
3. Hazardous Waste Quantity	*	[illegible]
4. Waste Characteristics	[illegible]	[illegible]
Targets		
5. Resident Individual	[illegible]	[illegible]

6. Resident Population		
6a. Level I Concentrations	**	[illegible]
6b. Level II Concentrations	**	[illegible]
6c. Resident Population (lines 6a-6b)	**	[illegible]
7. Workers	[illegible]	[illegible]
8. Resources	[illegible]	[illegible]
9. Terrestrial Sensitive Environments	***	[illegible]
10. Targets (lines 5+6c+7+8+9)	**	[illegible]
11. RESIDENT POPULATION THREAT SCORE	**	[illegible]

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.
*** No specific maximum value applies, see HRS for details.

PREscore 4.0 PAGE:
SOIL EXPOSURE PATHWAY SCORESHEET

SOIL EXPOSURE PATHWAY Factor Categories & Factors NEARBY POPULATION THREAT	Maximum Value	Value Assigned
Likelihood of Exposure		
12. Attractiveness Accessibility	[illegible]	[illegible]
13. Area of Contamination	[illegible]	[illegible]
14. Likelihood of Exposure	[illegible]	[illegible]
Waste Characteristics		
15. Toxicity	*	[illegible]
16. Hazardous Waste Quantity	*	[illegible]
17. Waste Characteristics	[illegible]	[illegible]
Targets		
18. Nearby Individual	[illegible]	[illegible]
19. Population Within 1 Mile	**	[illegible]
20. Targets (lines 18+19)	**	[illegible]
21. NEARBY POPULATION THREAT SCORE	**	[illegible]
SOIL EXPOSURE PATHWAY SCORE (Ss)	10	[illegible]

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREscore 4.0 PAGE:
AIR PATHWAY SCORESHEET

AIR MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release		

1. Observed Release		
2. Potential to Release		
2a. Gas Potential to Release	[illegible]	
2b. Particulate Potential to Release	[illegible]	
2c. Potential to Release	[illegible]	
3. Likelihood of Release	[illegible]	
Waste Characteristics		
4. Toxicity/Mobility	*	[illegible]
5. Hazardous Waste Quantity	*	
6. Waste Characteristics	[illegible]	[illegible]
Targets		
7. Nearest Individual	[illegible]	[illegible]
8. Population		
8a. Level I Concentrations	**	[illegible]
8b. Level II Concentrations	**	[illegible]
8c. Potential Contamination	**	[illegible]
8d. Population (lines 8a-8b-8c)	**	[illegible]
9. Resources		[illegible]
10. Sensitive Environments		
10a. Actual Contamination	***	[illegible]
10b. Potential Contamination	***	[illegible]
10c. Sens. Environments (lines 10a-10b)	***	[illegible]
11. Targets (lines 7-8d-9-10c)	**	[illegible]
AIR MIGRATION PATHWAY SCORE (Sa)	[illegible]	[illegible]

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.
*** No specific maximum value applies, see HRS for details.

PREscore 4.0 PAGE:
WASTE QUANTITY

1. WASTESTREAM QUANTITY SUMMARY TABLE, SOURCE: Contaminated soil

a. Wastestream ID	Contaminated soil
b. Hazardous Constituent Quantity (C) (lbs.)	[illegible]
c. Data Complete?	N
d. Hazardous Wastestream Quantity (W) (lbs.)	[illegible]
e. Data Complete?	NO
f. Wastestream Quantity Value (W/5,000)	[illegible]

Wastestream Constituent
Hazardous Substances Concent. Units Liquid Qualifier

Acetone	7.[illegible]E+[illegible]	ppb	N[illegible]
Benzene	[illegible].[illegible]E+[illegible]	ppb	N[illegible]
Bis (2-ethylhexyl) phthalate	1.[illegible]E+04	ppb	N[illegible]
Calcium	[illegible].1E+[illegible]	mg/kg	N[illegible]
Copper	7.3E+[illegible]	mg/kg	N[illegible]
Diethyl phthalate	1.1E+[illegible]	ppb	N[illegible]
Iron	7.[illegible]E+[illegible]	mg/kg	N[illegible]
Mercury	3.[illegible]E+[illegible]	mg/kg	N[illegible]
Sodium	[illegible].7E+[illegible]	mg/kg	N[illegible]

a. Wastestream ID	
b. Hazardous Constituent Quantity (C) (lbs.)	[illegible]
c. Data Complete?	N
d. Hazardous Wastestream Quantity (W) (lbs.)	[illegible]
e. Data Complete?	N
f. Wastestream Quantity Value (W[illegible])	[illegible]

PRESCORE 4.
WASTE QUANTITY

[illegible]

2. SOURCE HAZARDOUS WASTE QUANTITY FACTOR TABLE

a. Source ID	Contaminated [illegible]	
b. Source Type	Contaminated [illegible]	
c. Secondary Source Type	N.A.	
d. Source Vol. (yd³/gal) Source Area (ft²)	[illegible]	[illegible]
e. Source Volume Area Value	7.[illegible]0E+[illegible]	
f. Source Hazardous Constituent Quantity HCQ Value (sum of lb)	0.00E+00	
g. Data Complete?	N	
h. Source Hazardous Wastestream Quantity WSQ Value (sum of lb)	[illegible].[illegible]0E+[illegible]	
i. Data Complete?	N	
k. Source Hazardous Waste Quantity (HWQ) Value (2e, 2f, or 2h)	[illegible].[illegible]0E+[illegible]	

Source Hazardous Substances	Depth (feet)	Liquid	Concent.	Unit

Acetone	[illegible]	NO	[illegible]	ppm
Benzene	[illegible]	NO	[illegible]	ppm
Bis (2-ethylhexyl) phthalate	[illegible]	NO	[illegible]	ppm
Calcium	[illegible]	NO	[illegible]	ppm
Copper	[illegible]	NO	[illegible]	ppm
Diethyl phthalate	[illegible]	NO	[illegible]	ppm
Iron	[illegible]	NO	[illegible]	ppm
Mercury	[illegible]	NO	[illegible]	ppm
Sodium	[illegible]	NO	[illegible]	ppm

PRESCORE 4.0 PAGE: [illegible]
WASTE QUANTITY

3. SITE HAZARDOUS WASTE QUANTITY SUMMARY

No. Source ID	Migration Pathways	Vol. or Area Value	Constituent Wastestream Value	Hazardous Waste Quantity Value
1 Contaminated soil	GW-SW-SE	[illegible]	[illegible]	[illegible]

PRESCORE 4.0 PAGE: [illegible]
WASTE QUANTITY

4. PATHWAY HAZARDOUS WASTE QUANTITY AND WASTE CHARACTERISTICS SUMMARY TABLE

Migration Pathway	Contaminant Values		HWQ*	WC**
Ground Water	Toxicity Mobility	1.00E+[illegible]	1	[illegible]
SW: Overland Flow, DW	Tox. Persistence	4.00E+[illegible]	1	[illegible]
SW: Overland Flow, HFC	Tox. Persis. Bioacc.	[illegible]	1	[illegible]
SW: Overland Flow, Env	Etox. Persis. Bioacc.	[illegible]	10	[illegible]
SW: SW to SW, DW	Tox. Persistence	4.00E+[illegible]	10	[illegible]
SW: SW to SW, HFC	Tox./Persis. Bioacc.	2.00E+[illegible]	10	[illegible]
SW: SW to SW, Env	Etox./Persis. Bioacc.	[illegible]	10	[illegible]
Soil Exposure: Resident	Toxicity	1.00E+[illegible]	1	[illegible]
Soil Exposure: Nearby	Toxicity	1.00E+[illegible]	10	[illegible]
Air	Toxicity Mobility	[illegible]	0	[illegible]

* Hazardous Waste Quantity Factor Values
** Waste Characteristics Factor Category Values

Note: SW = Surface Water
GW = Ground Water

DW = Drinking Water Threat
HFC = Human Food Chain Threat
ENV = Environmental Threat

PREscore 4.0 PAGE: [illegible]
GROUND WATER PATHWAY AQUIFER SUMMARY

No.	Aquifer ID	Type	Overlaying No.	Inter-Connected with	Likelihood of Release	Factor
1		Karst	0	1	4-	[illegible]

Containment

No.	Source ID	HWS Value	Containment Value
1	Contaminated Soil	[illegible]	10

Containment Factor: 10

Net Precipitation

Net Precipitation (inches): 4.0

PREscore 4.0 PAGE: [illegible]
GROUND WATER PATHWAY LIKELIHOOD OF RELEASE AQUIFER

Aquifer:

Type of Aquifer: Karst

Overlaying Aquifer:

Inter-connected with: 1

OBSERVED RELEASE

No.	Well ID	Well Type	Distance (miles)	Level of Contamination
- N A and/or data not specified				

Observed Release Factor: 0

GROUND WATER PATHWAY LIKELIHOOD OF RELEASE AQUIFER

POTENTIAL TO RELEASE

Containment

Containment Factor	10

Net Precipitation

Net Precipitation Factor	1

Depth to Aquifer

A. Depth to Hazardous Substances	[illegible]	[illegible]
B. Depth to Aquifer from Surface	[illegible]	[illegible]
C. Depth to Aquifer (B - A)	[illegible]	[illegible]
Depth to Aquifer Factor	[illegible]	

Travel Time

Are All Layers Karst?	YES	
Thickness of Layer(s) with Lowest Conductivity	[illegible]	[illegible]
Hydraulic Conductivity (cm/sec)	[illegible]	
Travel Time Factor	[illegible]	

Potential to Release Factor [illegible]

GROUND WATER PATHWAY WASTE CHARACTERISTICS

Source: 1 Contaminated soil

Source Hazardous Waste Quantity Value: [illegible]

Hazardous Substance	Toxicity Value	Mobility Value	Toxicity Mobility Value
Acetone	10	1.00E+00	1.00E+01
Benzene	100	1.00E+00	1.00E+02
Bis (2-ethylhexyl) phthalate	100	1.00E-[illegible]	[illegible]
Calcium	[illegible]	1.00E+00	[illegible]
Copper	[illegible]	1.00E-[illegible]	[illegible]
Diethyl phthalate	1	1.00E+[illegible]	1.00E+[illegible]
Iron	1	1.00E+00	1.00E+00
Mercury	10000	2.00E-05	[illegible]
Sodium	0	1.00E+00	[illegible]

PREscore 4.0 PAGE: [illegible]
GROUND WATER PATHWAY WASTE CHARACTERISTICS

Hazardous Substances Found in an Observed Release

Well No.	Observed Release Hazardous Substance	Toxicity Value	Mobility Value	Toxicity Mobility Value

- N A and or data not specified

PREscore 4.0 PAGE: [illegible]
GROUND WATER PATHWAY WASTE CHARACTERISTICS

Toxicity Mobility Value from Source Hazardous Substances: [illegible]

Toxicity Mobility Value from Observed Release Hazardous Substances: [illegible]

Toxicity Mobility Factor: [illegible]

Sum of Source Hazardous Waste Quantity Values: [illegible]

Hazardous Waste Quantity Factor: [illegible]

Waste Characteristics Factor Category: [illegible]

PREscore 4.0 PAGE: [illegible]
GROUND WATER PATHWAY TARGETS FOR AQUIFER

Population by Well

Distance Level of

No.	Well ID	Sample Type	(miles)	Contamination Population

- N/A and/or data not specified

Level I Population Factor: [illegible]

Level II Population Factor: [illegible]

PREscore 4. PAGE: [illegible]

GROUND WATER PATHWAY TARGETS FOR AQUIFER

Potential Contamination by Distance Category

Distance Category (miles)	Population	Value
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Potential Contamination Factor: [illegible]

Nearest Well

Level of Contamination: Potential
Distance in miles: [illegible]

Nearest Well Factor: [illegible]

Resources

Resource Use: YES

Resource Factor: [illegible]

Wellhead Protection Area

No wellhead protection area

Wellhead Protection Area Factor: [illegible]

PREscore 4.0 PAGE:

SURFACE WATER PATHWAY SEGMENT SUMMARY

No.	Segment ID	Segment Type	Water Type	Start Point (mi)	End Point (mi)	Average Flow (cfs)
1	North Mouse Creek	River	Fresh	[illegible]	[illegible]	4
2		River	Fresh	[illegible]	[illegible]	[illegible]

PREscore 4.0 PAGE:

SURFACE WATER PATHWAY OVERLAND FLOW FLOOD COMPONENT LIKELIHOOD OF RELEASE

OBSERVED RELEASE

No.	Sample ID	Sample Type	Distance (miles)	Level of Contamination DW	HFC	[illegible]

- N/A and/or data not specified

==========

Observed Release Factor

PREscore 4.0 PAGE:

SURFACE WATER PATHWAY OVERLAND FLOW FLOOD COMPONENT LIKELIHOOD OF RELEASE

POTENTIAL TO RELEASE

Potential to Release by Overland Flow

Containment

No.	Source ID	HWQ Value	Containment Value
1	contaminated soil	[illegible]	10

==========

Containment Factor: 10

PREscore 4.0 PAGE: [illegible]

SURFACE WATER PATHWAY OVERLAND FLOW FLOOD COMPONENT LIKELIHOOD OF RELEASE

Distance to Surface Water

Distance to Surface Water: [illegible]

Distance to Surface Water Factor: [illegible]

Runoff

A. Drainage Area: [illegible]

B. 2-year, 24-hour Rainfall: [illegible]

C. Soil Group: [illegible]
Moderately-fine textured soils with low infiltration rates

Runoff Factor: [illegible]

==========

Potential to Release by Overland Flow Factor: [illegible]

PREscore 4.[illegible] PAGE:
SURFACE WATER PATHWAY OVERLAND FLOW FLOOD COMPONENT LIKELIHOOD OF RELEASE

Potential to Release by Flood

No. Source ID	HWQ Value	Flood Containment Value	Flood Frequency Value	Potential to Release by Flood

- N/A and/or data not specified

==========

Potential to Release by Flood Factor: [illegible]

PREscore 4.[illegible] PAGE: [illegible]
SW PATHWAY: OVERLAND/FLOOD DRINKING WATER THREAT WASTE CHARACTERISTICS

Source: 1 contaminated soil

Source Hazardous Waste Quantity Value: [illegible]

Hazardous Substance	Toxicity	Persistence	Toxicity

	Value	Value	Persistence Value
Acetone	10	4.0E-1	[illegible]
Benzene	100	4.0E-1	[illegible]
Bis (2-ethylhexyl) phthalate	100	1.0E+0	[illegible]
Calcium	[illegible]	1.0E+0	[illegible]
Copper	[illegible]	1.0E+0	[illegible]
Diethyl phthalate	[illegible]	1.0E+0	[illegible]
Iron	[illegible]	1.0E+0	[illegible]
Mercury	[illegible]	4.0E-1	[illegible]
Sodium	[illegible]	1.0E+0	[illegible]

PREscore 4.0 PAGE: [illegible]

SW PATHWAY: OVERLAND FLOOD DRINKING WATER THREAT WASTE CHARACTERISTICS

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Toxicity Value	Persistence Value	Toxicity Persistence Value

- N A and/or data not specified

PREscore 4.0 PAGE: [illegible]

SW PATHWAY: OVERLAND FLOOD DRINKING WATER THREAT WASTE CHARACTERISTICS

Toxicity Persistence Value from Source Hazardous Substances:	[illegible]
Toxicity Persistence Value from Observed Release Hazardous Substances:	[illegible]
Toxicity Persistence Factor:	[illegible]
Sum of Source Hazardous Waste Quantity Values:	[illegible]
Hazardous Waste Quantity Factor:	1
Waste Characteristics Factor Category:	10

PREscore 4.0 PAGE: [illegible]

SW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT DRINKING WATER THREAT TARGETS

Level I Concentrations

- N A and/or data not specified

Level II Concentrations

- N/A and/or data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or data not specified

PREscore 4.[illegible] PAGE: [illegible]
SW PATHWAY: OVERLAND FLOW-FLOOD COMPONENT DRINKING WATER THREAT TARGETS

Level I Concentrations

Intake	Distance Along the In-water Segment from the Probable Point of Entry (miles)	Population
- N/A and/or data not specified		

Population Served by Level I Intakes: [illegible]

Level I Population Factor: [illegible]E+[illegible]

PREscore 4.[illegible] PAGE: [illegible]
SW PATHWAY: OVERLAND FLOW-FLOOD COMPONENT DRINKING WATER THREAT TARGETS

Level II Concentrations

Intake	Distance Along the In-water Segment from the Probable Point of Entry (miles)	Population
- N/A and/or data not specified		

Population Served by Level II Intakes: [illegible]

Level II Population Factor: [illegible]E+[illegible]

PREscore 4. [illegible]

SW PATHWAY: OVERLAND FLOW FLOOD COMPONENT DRINKING WATER THREAT [illegible]

Potential Contamination

Intake ID	Average Annual Flow (cfs)	Population Served

- N/A and/or data not specified

Type of Surface Water Body	Total Population	Dilution-Weighted Population

- N/A and/or data not specified

Dilution-Weighted Population Served by Potentially Contaminated Intakes: [illegible]

Potential Contamination Factor: [illegible]

Nearest Intake

Location of Nearest Drinking Water Intake: N/A.

Nearest Intake Factor: [illegible]

Resources

Resource Use: YES

Resource Value: [illegible]

PREscore 4. [illegible]

SW PATHWAY: OVERLAND FLOOD HUMAN FOOD CHAIN THREAT WASTE CHARACTERISTICS

Source: [illegible] contaminated soil.

Source Hazardous Waste Quantity Value: [illegible]

Hazardous Substance	Toxicity Value	Persistence Value	Bio-accum. Value	Toxicity Persistence Bioaccum. Value
Acetone	10	[illegible]	[illegible]	[illegible]
Benzene	10	[illegible]	[illegible]	[illegible]
Bis-2-ethylhexyl phthalate	10	[illegible]	[illegible]	[illegible]

Calcium	[illegible]	[illegible]	[illegible]	[illegible]
Copper	[illegible]	1.[illegible]E+00	[illegible]	[illegible]
Diethyl phthalate	[illegible]	[illegible]	[illegible]	[illegible]
Iron	[illegible]	1.[illegible]E+0[illegible]	[illegible]	[illegible]
Mercury	[illegible]	4.[illegible]E-[illegible]	[illegible]	[illegible]
Sodium	[illegible]	1.[illegible]E+0[illegible]	[illegible]	[illegible]

PREscore 4.[illegible] PAGE: [illegible]
SW PATHWAY: OVERLAND FLOOD HUMAN FOOD CHAIN THREAT WASTE CHARACTERISTICS

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Toxicity Persistence Value	Toxicity Persistence Value	Bioaccum. Value	Toxicity Persistence Bioaccum. Value
- N A and/or data not specified					

PREscore 4.[illegible] PAGE: [illegible]
SW PATHWAY: OVERLAND/FLOOD HUMAN FOOD CHAIN THREAT WASTE CHARACTERISTICS

Toxicity Persistence Bioaccumulation Value from Source Hazardous Substances: [illegible]

Toxicity Persistence Bioaccumulation Value from Observed Release Hazardous Substances: [illegible]

Toxicity Persistence/Bioaccumulation Factor: [illegible]

Sum of Source Hazardous Waste Quantity Values: [illegible]

Hazardous Waste Quantity Factor: 1

Waste Characteristics Factor Category: [illegible]

PREscore 4. PAGE: [illegible]
SW PATHWAY: OVERLAND FLOW FLOOD COMPONENT HUMAN FOOD CHAIN THREAT TARGETS

Level I Concentrations

- N A and/or data not specified

Level II Concentrations

- N A and/or data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or data not specified

PREscore 4.0 PAGE:
OW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT HUMAN FOOD CHAIN THREAT TARGETS

Level I Concentrations

Fishery	Annual Production pounds	Human Food Chain Population Value
- N/A and/or data not specified		

Sum of Human Food Chain Population Values: [illegible]

Level I Concentration Factor: [illegible]

PREscore 4.0 PAGE:
OW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT HUMAN FOOD CHAIN THREAT TARGETS

Level II Concentrations

Fishery	Annual Production pounds	Human Food Chain Population Value
- N/A and/or data not specified		

Sum of Human Food Chain Population Values: [illegible]

Level II Concentrations Factor: [illegible]

PREscore 4.0 PAGE:
OW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT HUMAN FOOD CHAIN THREAT TARGETS

Potential Contamination

Fishery	Annnual Production (pounds)	Type of Surface Water Body	Average Annual Flow (cfs)	Pop. Value Pi	Dilution Weight Di	PiFDi
1 North Mouse Creek	[illegible]	River	4	[illegible]	[illegible]	[illegible]

Sum of (PiFDi): [illegible]

Potential Human Food Chain Contamination Factor: [illegible]

Food Chain Individual

Location of Nearest Fishery: North Mouse Creek
Distance from the Probable Point of Entry: [illegible] miles
Type of Surface Water Body: River
Dilution Weight: [illegible]
Level of Contamination: Potential

Food Chain Individual Factor: [illegible]

Source: 1 contaminated soil

Source Hazardous Waste Quantity Value: [illegible]

Hazardous Substance	Eco-toxicity Value	Persistence Value	Bio-accum. Value	Ecotoxicity Persistence Bioaccum. Value
Acetone	100	4.00E-01	5.00E-01	[illegible]
Benzene	100	4.00E-01	[illegible]	[illegible]
Bis (2-ethylhexyl) phthalate	1000	1.00E+00	[illegible]	[illegible]
Calcium	0	[illegible]	[illegible]	[illegible]
Copper	100	[illegible]	[illegible]	[illegible]
Diethyl phthalate	10	1.00E+00	[illegible]	[illegible]
Iron	10	[illegible]	[illegible]	[illegible]
Mercury	[illegible]	4.00E-01	[illegible]	[illegible]
Sodium	0	[illegible]	[illegible]	[illegible]

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Eco-toxicity Value	Persistence Value	Bio-accum. Value	[illegible] Bioaccum. Value

- N/A and/or data not specified

PREscore 4.0 PAGE: 4.
SW PATHWAY: WETLAND FLOW FLOOD ENVIRONMENTAL THREAT WASTE CHARACTERISTICS

Ecotoxicity Persistence Bioaccummulation Value from Source Hazardous Substances: [illegible]

Ecotoxicity Persistence Bioaccummulation Value from Observed Release Hazardous Substances: [illegible]

Ecotoxicity Persistence Bioaccummulation Factor: [illegible]

Sum of Source Hazardous Waste Quantity Values: [illegible]

Hazardous Waste Quantity Factor: [illegible]

Waste Characteristics Factor Category: [illegible]

PREscore 4.0 PAGE: 4
SW PATHWAY: WETLAND FLOW FLOOD ENVIRONMENTAL THREAT TARGETS

Level I Concentrations

- N/A and/or data not specified

Level II Concentrations

- N/A and/or Data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or Data not specified

SW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT ENVIRONMENTAL THREAT TARGETS

Level I Concentrations

Sensitive Environment	Distance from Probable Point of Entry to Sensitive Env. (miles)	Sensitive Environment Value
- N/A and/or data not specified		

Sum of Sensitive Environments Values:

Wetlands

Wetland	Distance from Probable Point of Entry to Wetland (miles)	Wetlands Frontage (miles)
- N/A and/or data not specified		

Total Wetlands Frontage: [illegible] Miles Total Wetlands Value: [illegible]

Sum of Sensitive Environments Value + Wetlands Value: [illegible]

Level I Concentrations Factor: [illegible]

SW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT ENVIRONMENTAL THREAT TARGETS

Level II Concentrations

Sensitive Environment	Distance from Probable Point of Entry to Sensitive Env. (miles)	Sensitive Environment Value
- N/A and/or data not specified		

Sum of Sensitive Environments Values:

Wetlands

Wetland	Distance from Probable Point of Entry to Wetland (miles)	Wetlands Frontage (miles)
- N/A and/or data not specified		

Total Wetlands Frontage: [illegible] Miles Total Wetlands Value: [illegible]

Sum of Sensitive Environments Value + Wetlands Value: [illegible]

Level II Concentrations Factor: [illegible]

SW PATHWAY: OVERLAND FLOW FLOOD COMPONENT ENVIRONMENTAL THREAT TARGETS

Potential Contamination

Sensitive Environments

Type of Surface Water Body	Sensitive Environment	Sensitive Environment Value

Wetlands

Type of Surface Water Body	Sensitive Environment	Wetlands Frontage	Wetlands Value

- N/A and/or data not specified

SW PATHWAY: OVERLAND FLOW FLOOD COMPONENT ENVIRONMENTAL THREAT TARGETS

Type of Surface Water Body	Sum of Sens. Environment Values (Si)	Sum of Wetland Frontage Values Wi	Dilution Weight (Di)	Di Wi

- N/A and/or data not specified

Sum of Di Wi-Si : [illegible]
Sum of Di Wi-Si, Ii : [illegible]

Potential Contamination Sensitive Environment Factor: [illegible]

PREscore 4.0 PAGE: [illegible]

SOIL EXPOSURE PATHWAY RESIDENT POPULATION THREAT LIKELIHOOD OF EXPOSURE

Likelihood of Exposure

No.	Source ID	Level of Contamination
1	contaminated soil	Level II

Likelihood of Exposure Factor: [illegible]

Source No.	Hazardous Substance	Depth (ft.)	Concent.	Cancer	RFD	Units
1	Acetone	[illegible]	[illegible]	[illegible]	[illegible]	ppm
1	Benzene	[illegible]	[illegible]	[illegible]	[illegible]	ppm
1	Bis (2-ethylhexyl) phthalate	[illegible]	[illegible]	[illegible]	[illegible]	ppm
1	Calcium	[illegible]	[illegible]	[illegible]	[illegible]	ppm
1	Copper	[illegible]	[illegible]	[illegible]	[illegible]	ppm
1	Diethyl phthalate	[illegible]	[illegible]	[illegible]	[illegible]	ppm
1	Iron	[illegible]	[illegible]	[illegible]	[illegible]	ppm
1	Mercury	[illegible]	[illegible]	[illegible]	[illegible]	ppm
1	Sodium	[illegible]	[illegible]	[illegible]	[illegible]	ppm

PREscore 4.0 PAGE: [illegible]

SOIL EXPOSURE PATHWAY RESIDENT POPULATION THREAT WASTE CHARACTERISTICS

Source: 1 contaminated soil

Source Hazardous Waste Quantity Value: [illegible]

Hazardous Substance	Toxicity Value
Acetone	10
Benzene	100
Bis (2-ethylhexyl) phthalate	100
Calcium	
Copper	[illegible]
Diethyl phthalate	1
Iron	1
Mercury	10000
Sodium	[illegible]

PREscore 4.0 PAGE: [illegible]

SOIL EXPOSURE PATHWAY RESIDENT POPULATION THREAT WASTE CHARACTERISTICS

Toxicity Factor: [illegible]

Sum of Source Hazardous Waste Quantity Values: [illegible]

Hazardous Waste Quantity Factor: [illegible]

Waste Characteristics Factor Category: [illegible]

PREscore 4.0 PAGE: [illegible]

SOIL EXPOSURE PATHWAY RESIDENT POPULATION THREAT TARGETS

Targets

Level I Population: [illegible] Value: [illegible]

Level II Population: [illegible] Value: [illegible]

Workers: [illegible] Value: [illegible]

Resident Individual: Potentia Value: [illegible]

Resources: NA Value: [illegible]

Terrestrial Sensitive Environment Value

- N/A and/or data not specified

==========

Terrestrial Sensitive Environments Factor: [illegible]

PREscore 4.0 PAGE: [illegible]

SOIL EXPOSURE PATHWAY NEARBY POPULATION THREAT LIKELIHOOD OF EXPOSURE

Likelihood of Exposure

Name of Source	Level of Contamination	Attractiveness Accessibility	Area of Contam. (sq. feet)
Contaminated soil	Level II	[illegible]	[illegible]

Highest Attractiveness/Accessibility Value: [illegible]
Sum of Eligible Areas Of Contamination (sq. feet): [illegible]
Area of Contamination Value: [illegible]

Likelihood of Exposure Factor Category:

Source No.	Hazardous Substance	Depth ft.	Concent.	Cancer	RFD	Units
1	Acetone	< 2	[illegible]	[illegible]	[illegible]	ppm
1	Benzene	< 2	[illegible]	[illegible]	[illegible]	ppm
1	Bis (2-ethylhexyl) phthalate	< 2	[illegible]	[illegible]	[illegible]	ppm
1	Calcium	< 2	[illegible]	[illegible]	[illegible]	ppm
1	Copper	< 2	[illegible]	[illegible]	[illegible]	ppm
1	Diethyl phthalate	< 2	[illegible]	[illegible]	[illegible]	ppm
1	Iron	< 2	[illegible]	[illegible]	[illegible]	ppm
1	Mercury	< 2	[illegible]	[illegible]	[illegible]	ppm
1	Sodium	< 2	[illegible]	[illegible]	[illegible]	ppm

PREscore 4.[illegible] PAGE: [illegible]

SOIL EXPOSURE PATHWAY NEARBY POPULATION THREAT WASTE CHARACTERISTICS

Source: 1 Contaminated Soil

Source Hazardous Waste Quantity Value: [illegible]

Hazardous Substance	Toxicity Value
Acetone	[illegible]
Benzene	[illegible]
Bis (2-ethylhexyl) phthalate	[illegible]
Calcium	
Copper	[illegible]
Diethyl phthalate	1
Iron	[illegible]
Mercury	[illegible]
Sodium	

PREscore 4.[illegible] PAGE: [illegible]

SOIL EXPOSURE PATHWAY NEARBY POPULATION THREAT WASTE CHARACTERISTICS

Toxicity Factor: [illegible]

Sum of Source Hazardous Waste Quantity Values: [illegible]

Hazardous Waste Quantity Factor: [illegible]

Waste Characteristics Factor Category: [illegible]

PREscore 4.[illegible] PAGE: [illegible]

SOIL EXPOSURE PATHWAY NEARBY POPULATION THREAT TARGETS

Nearby Individual

Population within 1/4 mile: 0.0

Nearby Individual Value: 0.0

Population Within 1 Mile

Travel Distance Category	Number of People	Value
[illegible] 1/4 mile	[illegible]	[illegible]
[illegible] 1/4 to 1/2 mile	4.[illegible]	[illegible]
[illegible] 1/2 to 1 mile	100.[illegible]	[illegible]

Population Within 1 Mile Factor: [illegible]

PREscore 4.[illegible] DATE: [illegible]

AIR PATHWAY LIKELIHOOD OF RELEASE

OBSERVED RELEASE

No. Sample ID	Distance (miles)	Level of Contamination

- N/A and/or data not specified

Observed Release Factor:

PREscore 4.[illegible] DATE:

AIR PATHWAY LIKELIHOOD OF RELEASE

Gas Migration Potential

GAS POTENTIAL TO RELEASE

Source ID	Source Type	Gas Contain. Value (A)	Gas Source Type Value (B)	Gas Migrtn. Potent. Value (C)	Sum (B+C)	Gas Potential to Rel. Value A(B+C)

- N/A and/or data not specified

Gas Potential to Release Factor:

PREscore 4.[illegible] PAGE: [illegible]
AIR PATHWAY LIKELIHOOD OF RELEASE

Source: contaminated soil

Gaseous Hazardous Substance	Hazardous Substance Gas Migration Potential Value
Acetone	[illegible]
Benzene	[illegible]
Bis (2-ethylhexyl) phthalate	[illegible]
Diethyl phthalate	[illegible]
Mercury	[illegible]

Average of Gas Migration Potential Value for [illegible] Hazardous Substances: [illegible]

Gas Migration Potential Value From Table [illegible]: [illegible]

PREscore 4.[illegible] PAGE: [illegible]
AIR PATHWAY LIKELIHOOD OF RELEASE

Particulate Migration Potential

PARTICULATE POTENTIAL TO RELEASE

Source ID	Source Type	Partic. Contamin. Value (A)	Partic. Source Type Value (B)	Partic. Migrtn. Potent. Value (C)	Sum B+C	Partic. Potential to Rel. Value A(B+C)
- N/A and/or data not specified						

Particulate Potential to Release Factor:

PREscore 4.[illegible] PAGE: [illegible]
AIR PATHWAY LIKELIHOOD OF RELEASE

Source: contaminated soil

Particulate Hazardous Substance
Bis (2-ethylhexyl) phthalate
Calcium
Copper

Diethyl phthalate
Iron
Mercury
Sodium

PREscore 4.0 PAGE: [illegible]
AIR PATHWAY WASTE CHARACTERISTICS

Hazardous Substance	Toxicity Value	Gas Mobility Value	Particulate Mobility Value	Toxicity Mobility Value

PREscore 4.0 PAGE: [illegible]
AIR PATHWAY WASTE CHARACTERISTICS

Hazardous Substances Found in an Observed Release

Sample ID	Observed Release Hazardous Substance	Particulate Toxicity Mobility Value	Gas Toxicity Mobility Value

- N/A and/or data not specified

- N/A and/or data not specified

PREscore 4.0 PAGE: [illegible]
AIR PATHWAY WASTE CHARACTERISTICS

Toxicity Mobility Value from Observed Release Hazardous Substances: [illegible]

Toxicity/Mobility Factor: [illegible]

Sum of Source Hazardous Waste Quantity Values: [illegible]

Hazardous Waste Quantity Factor:

Waste Characteristics Factor Category:
AIR PATHWAY TARGETS

PREscore 4.0 PAGE: [illegible]

Actual Contamination

No. Sample ID	Distance (miles)	Level of Contamination

- N A and or data not specified

Potential Contamination

Distance Categories Subject to Potential Contamination	Population	Value

Potential Contamination Factor: [illegible]
Potential Contamination Factor: [illegible]
Potential Contamination Factor: [illegible]
Potential Contamination Factor: [illegible]
Potential Contamination Factor: [illegible]
Potential Contamination Factor: [illegible]
Potential Contamination Factor: [illegible]

PREscore 4.[illegible] PAGE: [illegible]
2d -20.[illegible] [illegible] -[illegible]

Nearest Individual Factor

Distance in miles: Potentia

Nearest Individual Value: 4.9[illegible]

Resources

Resource Value: 4.935[illegible]

PREscore 4.[illegible] PAGE: [illegible]
2d -20.20s [illegible] -[illegible]

Actual Contamination, Sensitive Environments

Sensitive Environment	Distance (miles	Sensitive Environment Value

- N/A and/or data not specified

Actual Contamination, Wetlands

Distance Category	Wetland Acreage	Wetland Acreage Value

- N/A and/or data not specified

Sum of Sensitive Environments + Wetlands Values:

PRESCORE 4. PAGE:

Potential Contamination, Sensitive Environments

Sensitive Environment	Distance (miles	Sensitive Environment Value	Distance Weight	Weighted Value 10
		4.9[illegible]3958434047461500[illegible]		
[illegible]	[illegible]	6.96[illegible]		

Sum of Sensitive Environments Weighted Values 10: [illegible]

Potential Contamination, Wetlands

Distance	Wetland	Wetland	Distance	Weighted

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV

EPA ID: TND980314033 **Site Name:** NGK METALS **State ID:** 54-514

Alias Site Names:

City: ATHENS **County or Parish:** MCMINN **State:** TN

Refer to Report Dated: **Report Type:** SITE INSPECTION 001

Report Developed by:

DECISION:

Site: Break: 1.9 Other: V.

[X] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**

[X] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**

[ ] **1b. Site may qualify for action, but is deferred to:**

[ ] **2. Further Assessment Needed Under CERCLA:**

2a. Priority: [ ] **Higher** [ ] **Lower**

2b. Other: (recommended action) NFRAP (No Futher Remedial Action Planned

DISCUSSION/RATIONALE:

NGK Metals, located in Athens, McMinn County, Tennessee, fabricated aluminum castings, nonferrous castings, and hand tools from aluminum, beryllium and copper alloy raw materials. NGK Metals conducted an investigation and remediation of the facility under the TN Division of Solid Waste Management (Ronnie Bowers). The remediation consisted of excavation of contaminated soil from an small area of the site. The Division of Soild Waste concluded that no further remedial actions were necessary. The Tn Division of Superfund simultaneously conducted this SI and found some metal concentrations in the soil to be above 3x background, but concluded that there were no targets. Most of the SI samples were in areas of the site that were not addressed by the remedial action. The Prescore was calculated to be 14.70. EPA concurs with TN Division of Superfund that no further action is necessary, and therefore, assigns a NFRAP status to this CERCLIS site.

Site Decision Made by: NESTOR YOUNG

Signature: _____ **Date:** 08/07/2000

EPA Form # 9100-3

REMEDIAL SITE ASSESSMENT DECISION - EPA REGION IV

EPA ID: TND980314033 **Site Name:** NGK METALS **State ID:** 54-514

Alias Site Names:

City: ATHENS **County or Parish:** MCMINN **State:** TN

Refer to Report Dated: **Report Type:** PRELIMINARY ASSESSMENT 001

Report Developed by: STATE

DECISION:

- [ ] **1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:**
  - [ ] **1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)**
  - [ ] **1b. Site may qualify for action, but is deferred to:**
- [x] **2. Further Assessment Needed Under CERCLA:**
  - **2a. Priority:** [ ] **Higher** [x] **Lower**
  - **2b. Other: (recommended action)** Low

DISCUSSION/RATIONALE:

Inactive facility. Storm water data repeatedly showed elevated levels of copper. Soil and sediment samples are needed to determine if actual contamination exists.

Site Decision Made by: LIZA MONTALVO

Signature: _____ **Date:** 06/22/1999

EPA Form # 9100-3

NARAP 8/07/2000

Site Investigation
Narrative Report

NGK Metals
Athens, McMinn County, Tennessee

CERCLIS No. TND980314033
Tennessee File No. 54-514

Prepared for the
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF SUPERFUND (TDSF)
in cooperation with
WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

April 2000

Prepared By:	Reviewed By:	Reviewed By:
Renee Lucchesi	Tim Stewart	~~John Weakley~~ Suzanne Villiers

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EXECUTIVE SUMMARY
NGK METALS
TND980314033

Attached is the Site Investigation (SI) for the NGK Metals site. The site is located on East Avenue in the City of Athens in McMinn County, Tennessee. The site is a former beryllium alloy manufacturing facility. The site is presently owned by Applied Technologies, Incorporated for the manufacturing of specialized machinery. The property was purchased from Baker Realty in the summer of 1998.

The surrounding area is urban with commercial, industrial and residential development. UPS is across the street situated to the north of the site. Texas Hydraulics borders on the east while an ambulance service and Holston Gas Company are across the street northeast of the site. South of the site is an open field with a creek running through it as well as a raised railroad track. A small, unnamed tributary of Little North Mouse Creek borders the northwest side of the former NGK Metals property.

Groundwater within the four-mile radius of the site is used for domestic uses. The nearest domestic well is found approximately ½- ¾ mile from the site. A municipal well for the City of Athens is located approximately 1.7 miles southeast of the site. It is not believed that the site impacts any wells.

The nearest school is located approximately 1.8 miles from the site, and residential properties are within one mile of the site.

The address for this facility is:

NGK Metals
725 East Avenue N.E.
Athens, Tennessee 37303

The Tennessee Division of Superfund (TDSF) became aware of the NGK Metals site through a site discovery process of files research. TDSF completed a Preliminary Assessment (PA) of the site on November 15, 1998 and determined that further environmental assessments were required in order to characterize the potential contaminated source areas, threat to human health and environmental targets, and identify contaminates themselves.

The Site Investigation (SI) attempted to evaluate the former NGK Metals site as a candidate for consideration for the National Priority List (NPL), Hazard Ranking System (HRS) evaluation package, and or immediate remedial actions. Soil and sediment samples were collected to determine the types of substances migrating off site. In addition, information was obtained regarding both human and environmental populations in order to evaluate the threat of exposure by contact and migration of the various pathways.

The results of the SI sampling are as follows:

- An observed release of potentially hazardous substances to the groundwater pathway was not evaluated, due to two primary reasons. One reason being the lack of targets within a one-mile radius. The other reason is based on the fact that metals alone are not very mobile downward meaning; metals are not likely to travel through the soil to reach groundwater pathways.

- An observed release to the surface water pathway was not evaluated but not likely to be a concern due to lack of targets.

- An observed release to the soil exposure pathway was verified during the SI sampling. Several extractable organic and inorganic compounds were detected at three times the background level in several sample locations (Tables 2-4). However, the fence around the site limits accessibility, and there are no indications that the site is used by anyone for recreational purposes.

- Although air pathway was not evaluated, it is not likely to be of concern. There are no known reports of complaints or odors being emitted from the site. During site visits, there have been no observations of blowing dust.

Significant observed releases to soil exposure pathway have been documented in this SI. Acetone, Benzene, Bis (2-ethylhexyl) Phthalate, Diethyl Phthalate, Calcium, Copper, Iron, Mercury, and Sodium were all detected as three times the background. NK-SS-09 was the only sample taken that did not exceed background levels on any of the analyses.

Although observed releases to soil and sediment have been documented in this SI, TDSF recommends this site not be evaluated for HRS package and not be considered for listing in the National Priority List (NPL), primarily due to lack of targets.

REPORT:	Site Investigation Narrative Report
SITE:	NGK Metals Athens, McMinn County, Tennessee
CERCLIS:	TND980314033
TN FILE NO.:	54-514
PREPARED BY:	Renee Lucchesi, Environmental Specialist Tennessee Department of Environment and Conservation Division of Superfund (TDSF)
DATE:	January 2000

1.0 INTRODUCTION

The Tennessee Division of Superfund (TDSF), under cooperative agreement with the United States Environmental Protection Agency (EPA), conducted a Site Investigation (SI) at the former NGK Metals facility in Athens, McMinn County, Tennessee. This site investigation was performed under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). The investigation was conducted December 8, 1999 through April 1, 2000.

1.1 Objectives

The objectives of this investigation are to:

- Review existing historical information and data obtained from on-site inspections and a variety of other sources/studies.
- Evaluate sampling results obtained from field investigations.
- Examine the possible pathways by which contaminants could migrate from the site.
- Identify populations and environments potentially affected by these contaminants.

As a result of achieving the above objectives, a recommendation is made regarding no further action at this site.

1.2 Scope of Work

The scope of this investigation included the following activities:

- Obtain and review background materials relevant to HRS scoring of site.
- Obtain information on local water systems.
- Investigate site with regard to surface water use, airborne exposure.
- Determine location and distance to nearest potable well.
- Develop a detailed site sketch.
- Collect environmental samples from media such as soil and sediment.

2.0 SITE CHARACTERIZATION

2.1 Location

The former NGK Metals facility is bound by East Avenue on the northern side and railroad tracks on the southern side. The areas to the east and west are open fields with mostly industrial property surrounding. The geographic coordinates of the facility property are Latitude 35°26'52" and Longitude 084°36'43" (Ref. 1). The area is above the 100-year flood plain and has an elevation of 910 feet above sea level (Ref. 2). The site and surrounding areas are situated in Congressional District 2 (Ref. 3).

To reach the site, travel north out of Chattanooga on Interstate Highway 75, take exit 49 (Highway 30). Travel approximately 3 miles and turn east (left) onto Congress Parkway (Hwy. 11). Travel north for 2.4 miles and turn right onto Lawn Street. The former NGK Metals location is at the end of the road, southeast of the intersection of Lawn Street and East Avenue (Ref. 1).

McMinn County, Tennessee is climatologically characterized by moderate, rainy winters and hot, humid summers. The average winter temperature is approximately 41° F, and the average summer temperature is approximately 77° F. Rainfall data indicates an average annual precipitation depth of approximately 54 inches and a 1 year 24 hour rainfall event of 3.0 inches (Ref. 4). Rainfall distribution is fairly even throughout the year with late summer and early fall being the driest time and winter through mid spring being the wettest (Ref. 4).

2.2 Site Description

The total area of the NGK Metals facility is approximately 5.7 acres. The area surrounding the site is urban with commercial, industrial, and residential uses (Ref. 6). A tributary to Little North Mouse Creek is the small stream that flows adjacent to the facility property. The tributary originates in an undeveloped area above the site and flows through mostly agriculture/residential areas before draining into Little North Mouse Creek and eventually into North Mouse Creek (Ref. 1).

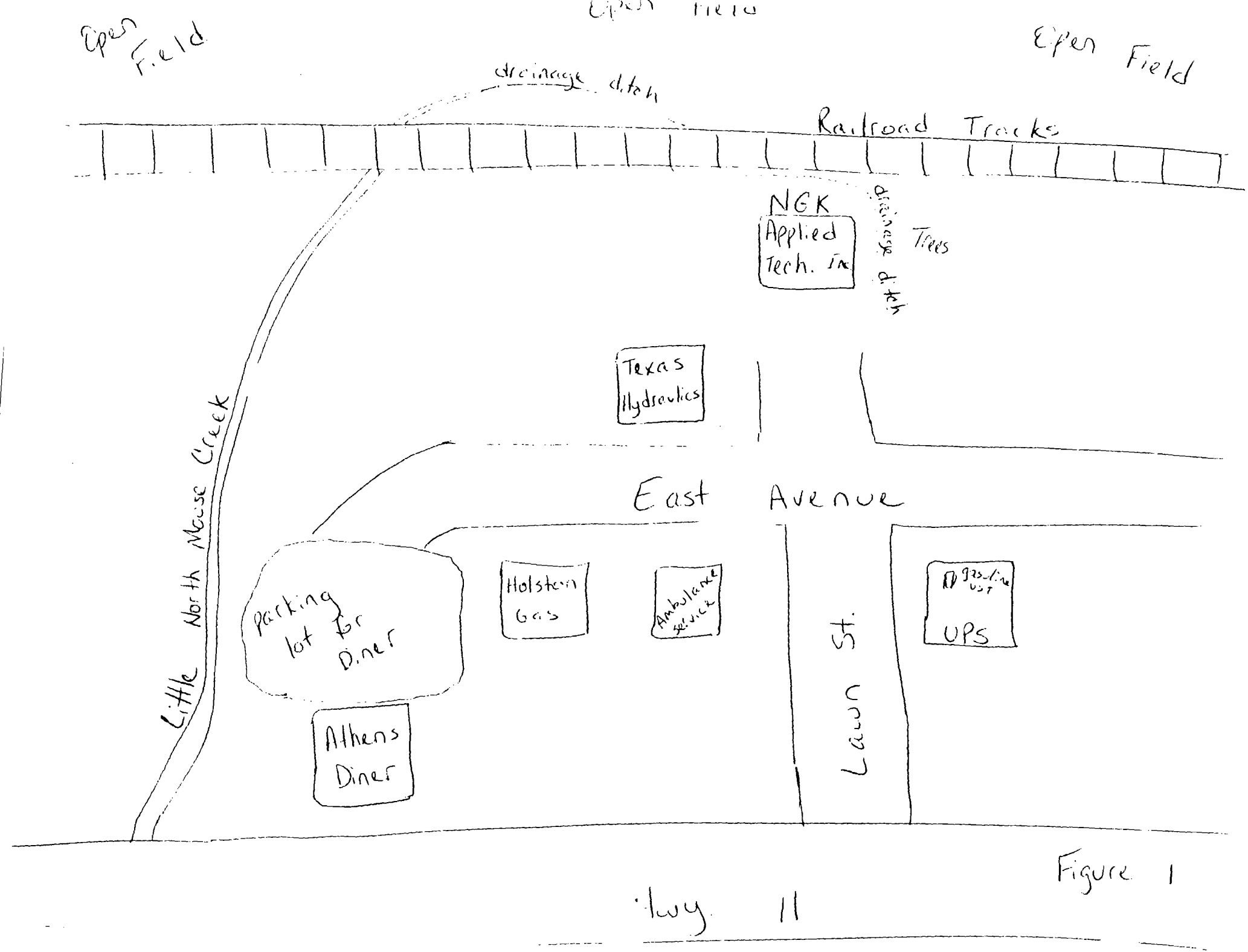

Open Field
Open Field
Open Field
drainage ditch
Railroad Tracks
NGK
Applied Tech. Inc
drainage ditch
Trees
Texas Hydraulics
East Avenue
Little North Mouse Creek
parking lot for Diner
Holston Gas
Ambulance service
Lawn St.
gasoline UST
UPS
Athens Diner
Hwy. 11

Figure 1

2.3 Site History

NGK Metals operated a beryllium alloy manufacturing facility at this location from late 1986 until early 1998. The company has been involved with other regulatory agencies in the past including the Tennessee Division of Water Pollution Control and Division of Air Pollution Control. Their concerns involved NPDES report limit exceedances of copper on storm water discharges, an unpermitted discharge, and air pollution record keeping errors.

NGK Metals formerly manufactured aluminum castings, nonferrous castings, and hand and edge tools from aluminum-, beryllium-, and copper-alloy raw materials at this facility. The property was purchased in September 1986 from Cabot Corporation (Ref. 7). The former owner, Cabot Corp., was also a manufacturer of beryllium alloyed intrinsic tools at this same site from 1975-1986. NGK Metals relocated to a location in Spring City, Tennessee during early 1998.

The former NGK Metals building is currently occupied by Applied Technologies for the manufacturing of specialized machinery. There are about ten to twelve employees that work at this facility, and a fence with locked gates surrounds the entire site (See Figure 2).

2.4 Previous Investigations and Remedial Action

Several sampling events were performed at the Site to determine a site-wide assessment. Texas Hydraulics, a neighboring facility, performed initial sampling at 19 sample locations as a result of a pre-acquisition investigation. All of the samples were analyzed for the 8 RCRA metals plus copper and beryllium.

Following this initial investigation by Texas Hydraulics, NGK Metals hired STEP, an environmental consulting firm, to conduct Phase I and Phase II Environmental Audit Investigations. Results from the initial investigation plus the Phase I and Phase II sampling events confirmed that shallow soil concentrations of beryllium and copper do exist in excess of apparent soil background levels. The highest concentrations of both copper and beryllium were found in the soil samples collected from the southeast corner of the grassy area on the northeastern side of the facility (see Figure 1 of text and Figure 1 of appendix F). This area receives storm water runoff from both the concrete driveway and concrete apron of the aluminum-sided storage building where the two join.

After STEP's Phase II sampling event, NGK Metals retained the services of TriAD to assist them in pursuing further investigation and remediation of the Site. Previous sampling reports indicated that the identified soil contamination had likely resulted from storm water dispersion of fugitive dust emissions from the baghouse area. Metals were the only constituents of potential concern likely to have been released from the facility to the ground surface-especially in the area of the baghouses.

TriAD sampled three areas on November 5, 1998. Sample "S-1" was sampled to check the immediate area around the former baghouse. The objective of sample "S-2" was to collect a "worst-case" soil sample from the known "hot spot" location and subject it to special testing to evaluate the environmental mobility of the target metals in the soil. Sample "S-3" was collected to help evaluate whether the surface soil contamination has significantly migrated from the grassy field into the watercourse located along the facility's western border.

Later TriAD performed another soil sampling visit to the Site to collect deeper soil samples from and around the identified "hot spot" areas on November 30, 1998. Each of the collected soil samples was analyzed for its total concentration of beryllium and copper. The laboratory reports and sampling data are included in Appendix F called site investigation and remedial action. It should be noted that beryllium is naturally present in the soils in that area. None of the metals approached the RGL values. Thus, this material does not seem to contain toxic constituents which might pose a significant threat to human health or the environment. The removal and off-site disposal of shallow soils from the two "hot spots" would eliminate any significant threat and effectively remediate the Site.

It was thus planned to excavate the soils to a depth of one foot from an approximately 10-foot square area in the corner of the concrete driveway and the storage building apron and from the unpaved areas around the concrete pad on which the main baghouse formerly sat. On December 8, 1998, a remedial subcontractor, Four Seasons Environmental, was used to excavate the approximately 29 cubic yards of soil from the two "hot spot" areas. No confirmation sampling was performed because TriAD's deeper soil sampling and analysis had demonstrated that there was no need to be concerned with soils below about one foot in depth. The excavated areas were backfilled to grade on December 8 with clean crushed limestone.

3.0 SAMPLING RATIONALE

3.1 Sampling Activity and Locations

Sampling activities for this site investigation were conducted December 14, 1999. TDSF staff collected a total of twelve (12) samples: ten (10) soil and two (2) sediment (Appendix B). All surface soil samples were collected at depths from 0-2 feet. The sediment samples were collected to evaluate the impact of site contaminant migration into the surface water pathway and wetlands. All samples were analyzed for volatile organics, extractable organics, and metals. Sample identification numbers and locations are found in Table 1 and Appendix G Study Plan.

4.0 GROUND WATER PATHWAY

4.1 Hydrogeologic Setting

The NGK Metals site is located in the Ridge and Valley Province of east Tennessee. Geologically, folded and faulted sedimentary rocks of the Ordovician and Cambrian ages characterize this region. The rock strata of this area are typically tilted up toward the northwest. The Lenoir Limestone underlies the site and is a part of the Ordovician age Chickamauga Group (Ref. 8).

The Lenoir Limestone consists of 25 to 500 feet thick nodular, argillaceous, gray limestone. In places, basal sedimentary breccia, conglomerate, quartz sand are present. Mosheim Limestone Members (dense, light to medium gray limestone) are near the base Ref. 8).

Ground water in McMinn County occurs principally in fractures in the underlying formations. The rocks have little or no primary porosity, but contain fractures caused by folding and faulting. In carbonate rocks, circulating ground water to a depth of about 300 feet frequently enlarges fractures. The siliceous rocks are less soluble and their fractures are rarely enlarged by solution. The fractures in siliceous rocks are usually open for the first few hundred feet, but at greater depth the weight of the overlying material tends to close them (Ref 9).

The yield of wells in area shale seems to be controlled by these lenses of limestone. Stringers of limestone appear to stop the downward percolation of water and concentrate it in solution cavities developed at the contact between shale and limestone. Historical records of industrial wells in McMinn County report well yields less than 100 gallons per minute (Ref. 9).

4.2 Targets

According to the Tennessee Division of Drinking Water Supply, residents in and around McMinn County, Tennessee use groundwater from springs and wells for drinking supplies. Some of these sources are found within 4 miles of the site. The nearest private well believed to be used for supplying drinking water is approximately ½- ¾ mile from the site (Ref. 10,11).

The majority of the population within a 4-mile radius of the site relies on municipal water supplied by the Athens Utility Board. A municipal supply well is located approximately 1.7 miles southeast of NGK Metals (Refs. 1,11). There have been no complaints of any groundwater contamination from the site.

Athens Utilities Board (AUB) has approximately 6,500 connections in Athens and the surrounding area and serves approximately 16,500 people. AUB's New Spring and Ingleside Spring each provide approximately 33% of their blended system (Ref. 11).

4.3 Conclusions

It is unlikely that area groundwater supplies have been significantly impacted by contaminant migration from the NGK Metals site. There is no evidence that contamination hazardous substances had been released to any aquifer or placed so that a release to an aquifer could occur. There are no significant targets within a one-mile radius, and metals alone are not very mobile downward. Therefore, no groundwater sampling was performed, and no observed release has been documented. The groundwater pathway was not evaluated during this SI.

5.0 SURFACE WATER PATHWAY

5.1 Hydrologic Setting

A small tributary to Little North Mouse Creek borders the site to the north. The tributary is a perennial stream, which flows at approximately 5 cubic feet per second (Ref. 6).

The Federal Emergency Management Agency (FEMA) shows the site does not lie within the 100- year flood zone. The elevation at this point is 910 feet above sea level (Ref. 2).

Surface water from the site flows directly into the tributary to Little North Mouse Creek (Ref. 1). The tributary and subsequent Little North Mouse Creek flow through an agricultural residential area and into North Mouse Creek, which is approximately 1.5 miles away. *There is a known fishery located approximately three miles from the site.*

The remainder of the site's 15- mile surface water pathway flows in North Mouse Creek through a rural agricultural valley. An active fish hatchery is located downstream near the end of the 15- mile surface water pathway (Refs. 6, 12).

5.2 Targets

There are no drinking water intakes within 15 miles downstream of the site. There are no schools or day care centers near the site. However, there is a diner located near the site that has a creek running through its parking lot. This is the same creek that runs through the backyard of the plant and the restaurant is located downstream from the site. This could be a potential hazard to children playing in the parking lot.

The low flow in the tributary to Little North Mouse Creek does not support recreational fishing. Fishing occurs near the mouth of Little North Mouse Creek at its crossing with

Mt. Verde Road. This area is approximately 1.5 miles from the site. Creel commonly harvested includes bluegill, bream and small catfish. The classified uses for Little North Mouse Creek are fish and aquatic life, recreation, irrigation, and livestock watering and wildlife (Ref. 13).

There are no known wetlands or critical habitats immediately downstream of the site. The majority of the site's 15 mile surface water pathway is found in a small creek meandering through an agricultural valley. Known U.S. threatened or endangered species in McMinn County, Tennessee include the Hellbender, Tennessee cave salamander, the Swainson's Warbler, the Grasshopper Sparrow and the Flame Chub (Ref. 14). None of which are aquatic organisms.

5.3 Previous Investigations

Storm water data collected at the site from August 1993 through September 1995 repeatedly showed elevated levels of copper (304 µg/l, 77 µg/l, 272 µg/l, 68 µg/l and 60 µg/l). The levels reported exceeded the Risk Assessment Guidance for Region IV's Preliminary Remediation Goal (PRG) of 6.54 micrograms per liter (chronic screening value). (Ref. 17) This data could possibly imply that surface water had been impacted at the time of sampling. Further data would be required to determine if pollution exists to the point that surface water would be impacted.

5.4 Conclusions

The impact of surface water pollution from the site is limited because of the lack of targets. There are no drinking water intakes located within 15 miles downstream of the site, the nearest documented fishery is 1.5 miles downstream, and no sensitive environments have been identified within one mile of the site. Judging that the only potential hazard is the possibility of children playing in the creek located behind the diner, no surface water samples were taken.

6.0 SOIL EXPOSURE AND AIR PATHWAYS

6.1 Physical Conditions

The soil underlying the site is mapped as the Leadvale silt loam, eroded undulating phase by the Soil Conservation Service. The subsoil may be a firm and friable yellowish brown, weakly mottled from two to eight feet with the parent material consisting of local alluvium originating chiefly from shale. (Ref. 15)

This soil is low to moderate in fertility and low in content of organic matter. It is medium to strongly acidic. The surface layer is permeable to moisture, but the subsoil is

firm enough to retard infiltration. The capacity for holding moisture is moderate. (Ref. 15)

There is slight staining from waste foundry sand on concrete areas on the property. Otherwise there are no other visible areas of soil contamination and no evidence that dumping disposal of hazardous substances occurred on site (Ref. 6).

6.2 Soil and Air Targets

There is currently an active facility on the site with approximately 10-12 employees. The site is surrounded by a respectable fence, which can be shut and locked. The nearest school (Ingleside Elementary School) is approximately 1.8 miles from the site (Ref. 1). The nearest resident can be found between ½- ¾ mile of the site. There are approximately zero residents within ¼ mile of the site. The total population within a four-mile radius of the site is approximately 2519 (Ref. 16).

6.3 Soil Sample Locations

A total of ten surface soil samples were taken at the site, identified as NK-SS-01 through NK-SS-10 (Table 1). A background surface soil sample, NK-SS-01, was collected from the field immediately southwest of the site. All samples were taken at a depth less than one foot.

Two sediment samples were collected from along the Little North Mouse Creek bank, which runs alongside of the site. NK-SD-01 was collected upstream of the site, and NK-SD-02 was collected downstream from the site approximately 100 feet past the fence.

Sampling was conducted on December 14, 1999. Access to the site property was granted prior to the sampling date. For soil and sediment samples, one container each for volatiles, semi-volatiles, and metals was collected at each point for analysis.

6.4 Soil Sample Analytical Results

Ten surface soil samples were collected on site property, and two sediment samples were extracted from the Little Mouse Creek, which runs alongside and through the back yard of the property. Analyses performed on these samples were volatiles, semi-volatiles, and metals.

Volatiles such as methylene chloride, toluene, and m&p-xylene were detected in all of the samples taken. However, none of the samples proved to be significantly above the background level. Acetone and benzene were detected at concentrations that were more than three times the background level in a few of the samples. Acetone was detected highest in sample NK-SS-10, which was taken next to the building on the southwest side. Benzene was detected highest in sample NK-SS-02.

Metals results indicated elevated levels of calcium, iron, copper, and mercury in all of the samples taken. All twelve samples showed significant concentrations, but only a few of the samples exceeded the background level by three times. Copper was detected at concentrations that were more than three times the background level in only two samples.

Semi-volatile results indicated elevated levels of bis(2-ethylhexyl) phthalate and diethyl phthalate in several of the samples. NK-SS-03, taken in the southeastern area of the site in the grassy area, represented the highest level of contamination of both of these semi-volatile chemicals. NK-SS-10, taken on the southwest corner of the site, exhibited estimated concentrations of several other chemicals, but none proved to be significantly above the background level.

TABLES 2-4 below show the analytical results for volatile organic, inorganic, and extractable organic compounds that are **3X background** or higher collected by the Division of Superfund personnel (Appendix B).

TABLE 2: VOLATILE ORGANIC (in ppb)

PARAMETERS	NK-SS-01	NK-SS-02	NK-SS-03	NK-SS-08	NK-SS-10	NK-SD-01
ACETONE	U	530	350	230	**750**	240
BENZENE	0.6	**2.0**	1.2	U	1.8	U

TABLE 3: INORGANICS / METALS (in mg/kg)

PARAMETERS	NK-SS-01	NK-SS-06	NK-SS-08	NK-SS-10	NK-SD-02
CALCIUM	2070.00	2400.00	3560.00	2340.00	**8130.00**
COPPER	20.00	44.00	**72.70**	47.80	26.10
IRON	23000.00	33200.00	34000.00	25800.00	**69700.00**
MERCURY	0.12	**3.20**	2.75	0.18	0.11
SODIUM	7.00	24.00	21.00	**37.00**	U

TABLE 4: EXTRACTABLE ORGANICS (in ppb)

PARAMETERS	NK-SS-01	NK-SS-03	NK-SS-05	NK-SS-06	NK-SS-07	NK-SS-10	NK-SD-01	NK-SD-02
Bis(2-ethylhexyl) phthalate	201	**17800**	3710	138	173	2280	697	2890
Diethyl phthalate	U	**10900**	629	1170	1180	7670	1420	624

NOTE: (bold represents highest 3 X background concentrations)

6.5 Soil Exposure Pathway Conclusions

The elevated concentrations of solvents present in the soil could be partially attributable to the surrounding businesses. Various fleet truck and small maintenance shops are present in the immediate surrounding area. An underground storage tank is located across the street on the UPS facility. However, no leaks have been reported, according to TN Underground Storage Tank Division. A cylinder gas plant is located across the street, as well as a hydraulics facility located next door to the site. Fuel from vehicles in the parking lot could also be a contributing factor.

Elevated levels of acetone could be merely a lab artifact. The parking lots surrounding the site could be a major contribution to the elevated levels of benzene, due to the gasoline run-off. However, benzene levels never exceeded 5 parts per billion, which is the standard for Underground Storage Tanks Regulations.

No schools or day care centers are located near the site, and the nearest resident lives between 1/4-1/2 mile away from the site. The creek is not used for recreational purposes, and the property has a respectable fence to keep people off the site. The drainage ditch does however, run through the parking lot of the diner situated about 200-300 feet away from the site. This could be a potential problem to children playing in the drainage ditch creek, but there are no true targets within a 1-mile radius of the site.

6.6 Air Exposure Pathway Conclusions

Industrial setting surrounds the site, and the nearest resident is more than 1/2 mile away. Air sampling was not conducted during this Site Investigation. There are no known reports of complaints or odors being emitted from the site. During site visits there have been no observations of blowing dust.

7.0 SUMMARY AND CONCLUSIONS

NGK Metals operated a beryllium alloy manufacturing facility at this location from late 1986 until early 1998. The former facility is near the Ingleside community in Athens, Tennessee (McMinn County). Baker Realty Company marketed the site for sale, which was later bought in late July or early August of 1999 by Applied Technologies, Incorporated.

NGK Metals had been involved with other regulatory agencies in the past including the Tennessee Division of Water Pollution Control and Division of Air Pollution Control. Their concerns involved NPDES report limit exceedances on storm water discharges and an unpermitted discharge and air pollution record keeping errors.

Other than facility monitored storm water discharge reports and minor staining on concrete areas, there was no other visual evidence of contaminated soil, on-site waste disposal ponds, or open landfilling areas, which would impact the soil or air pathways. There was no evidence of direct connections, or indirect connection to the groundwater pathway.
This Site Investigation (SI) attempted to evaluate the NGK Metals site as a candidate for consideration for the National Priority List (NPL), Hazard Ranking System (HRS) evaluation package, and/or immediate remedial actions.

Soil and sediment samples were collected on 12/14/99 and analyzed for metals, volatiles, and extractable organic compounds. The purpose of the SI was to determine the type and concentration of contaminated compounds on-site and migrating off-site at levels three times background. In addition, information was obtained regarding both human and environmental populations in order to evaluate the threat of exposure by contact and migration of the various pathways.

The results of the SI sampling are as follows:

- An observed release of potentially hazardous substances to the groundwater pathway was not evaluated, due to two primary reasons. One reason being the lack of targets within a one-mile radius. The other reason is based on the fact that metals alone are not very mobile downward meaning; metals are not likely to travel through the soil to reach groundwater pathways.

- An observed release to the surface water pathway was not evaluated but not likely to be a concern due to lack of targets.

- An observed release to the soil exposure pathway was verified during the SI sampling. Several extractable volatiles, inorganic compounds, and metals were detected at three times the background level. However, the fence around the site limits accessibility, and there are no indications that the site is used by anyone for recreational purposes.

- Although air pathway was not evaluated, it is not likely to be of concern. There are no known reports of complaints or odors being emitted from the site. During site visits there have been no observations of blowing dust.

Although observed releases to soil and sediment have been documented in this SI, TDSF recommends the former NGK Metals site not be evaluated for a HRS package and not be considered for listing in the National Priority List (NPL), primarily due to lack of targets.

REFERENCES

1. U.S.G.S. Topographical Map, Quadrants 125 NE.

2. FEMA Flood Insurance Rate Map, revised April 2, 1993.

3. Tennessee Blue Book, "Area Congressional District" 1991-1994.

4. U.S. Department of Commerce, "Normal Annual Total Precipitation for Eastern U.S." June 1968.

5. Tennessee Division of Water Pollution Control, Storm Water Information for NGK Metals.

6. Davis, J. and Lucchesi, R., (TDSF) Trip reports & contact logs.

7. NGK Metals' Quit Claim Deed, page 375 and property tax map.

8. Swingle, Tennessee Division of Geology, "Geologic Map of Tennessee, East-Central Sheet", 1966.

9. DeBuchananne and Richardson, Tennessee Division of Geology, Bulletin 58, "Ground Water Resources of East Tennessee" 1956.

10. Tennessee Division of Water Supply, Water Well Program, Well Search for Athens, February 8, 2000.

11. Tennessee Division of Water Supply, Public Water System Data Athens Utility Board, May 17, 1994.

12. U.S.G.S. Topographical Map showing 15-mile surface water pathway.

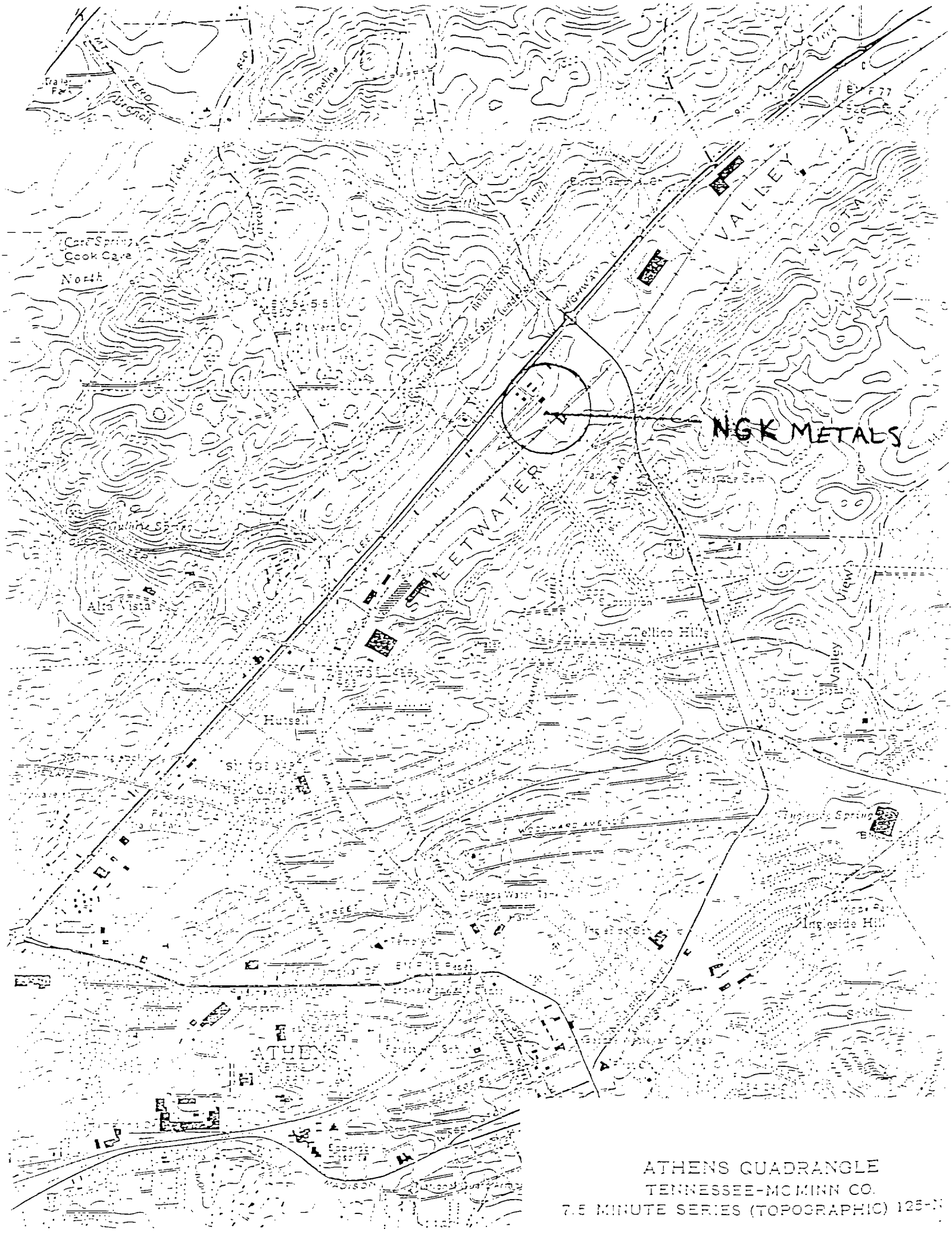
13. Tennessee Division of Water Pollution Control, State of Tennessee Water Quality Standards, July 1995.

14. Weakley, J. (TDSF), Memo regarding critical habitat and endangered species information for NGK Metals area, September 22, 1998.

15. U.S. Soil Conservation Service, Soil Survey, McMinn County, TN, July 1958.

16. U.S. Department of Commerce, "1990 Census of Population, Tennessee" July 1992.

17. EPA Region IV, Waste Management Division, "OTS Guidance Document".



ATHENS QUADRANGLE
TENNESSEE-MCMINN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC) 125-N

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF ATHENS, TENNESSEE

McMINN COUNTY

PANEL 3 OF 5

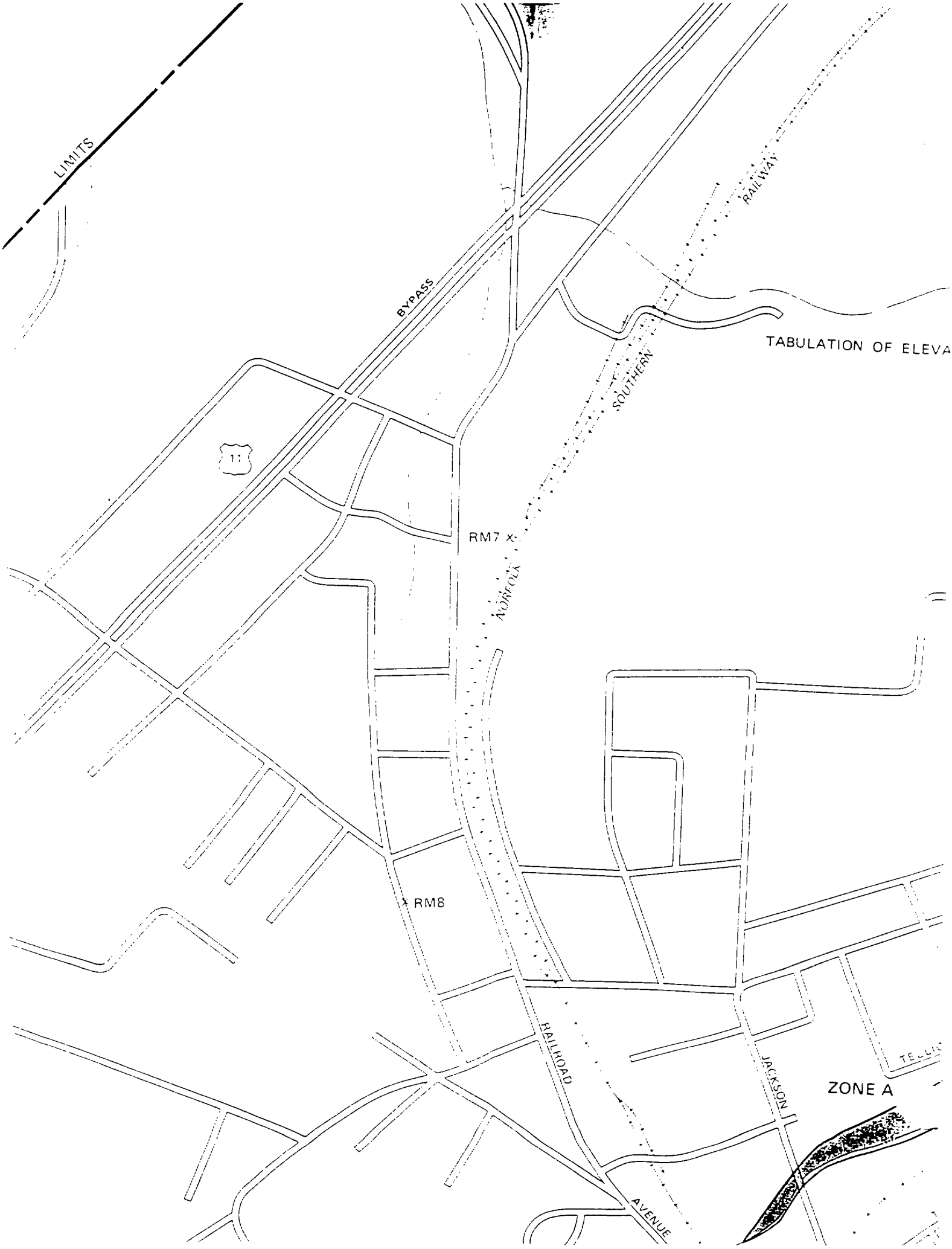
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER

470211 0003 C

MAP REVISED:

DECEMBER 4, 1986


LIMITS
BYPASS
11
RAILWAY
SOUTHERN
TABULATION OF ELEVA
RM7
NORFOLK
RM8
RAILROAD
JACKSON
AVENUE
ZONE A

Site Investigation
For
NGK Metals

Reference 3
Tennessee Blue Book excerpts

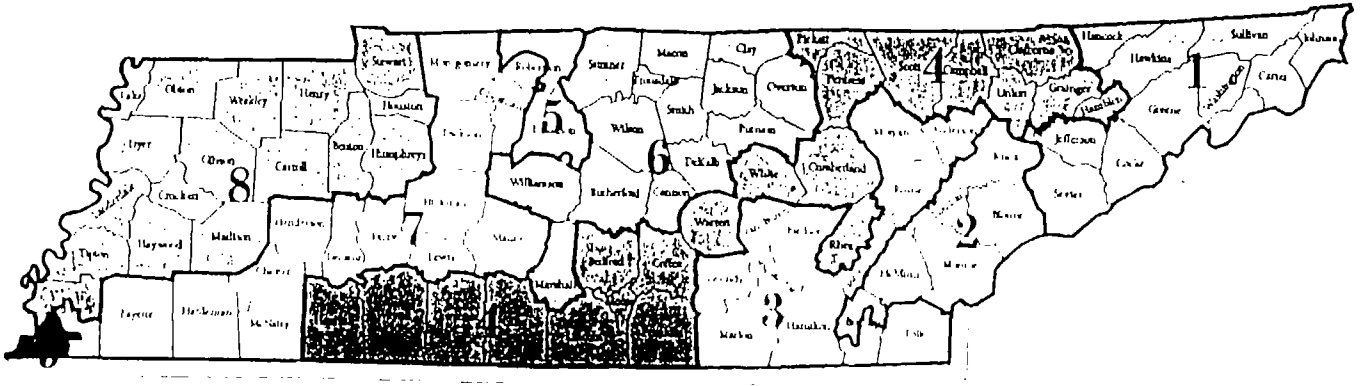
TENNESSEE BLUE BOOK 1995-1996

BICENTENNIAL EDITION

(1796-1996)

RILEY C. DARNELL
Secretary of State

*U.S. House of Representative Districts



1st Carter, Cocke, Greene, Hancock, Hawkins, Jefferson, Johnson, Knox in part, Sevier, Sullivan, Unicoi, Washington

2nd Blount, Bradley in part, Knox in part, Loudon, McMinn, Monroe

3rd Anderson, Bledsoe, Bradley in part, Grundy, Hamilton, Marion, Meigs, Morgan, Polk, Roane, Sequatchie, Van Buren

4th Bedford, Campbell, Claiborne, Coffee,

4th Cumberland, Fentress, Franklin, Giles, Grainger, Hamblen, Hardin, Knox in part, Lawrence, Lincoln, Moore, Pickett, Rhea, Scott, Union, Warren, Wayne, White

5th Davidson in part, Robertson in part

6th Cannon, Clay, Davidson in part, DeKalb, Jackson, Macon, Marshall, Overton, Putnam, Rutherford, Smith, Sumner, Trousdale, Williamson, Wilson

7th Cheatham, Chester, Decatur, Dickson, Fayette, Hardeman, Henderson, Hickman, Lewis, McNairy, Maury, Montgomery, Perry, Robertson in part, Shelby in part

8th Benton, Carroll, Crockett, Dyer, Gibson, Haywood, Henry, Houston, Humphreys, Lake, Lauderdale, Madison, Obion, Shelby in part, Stewart, Tipton, Weakley

9th Shelby in part

*Map shows approximate area served. Narrative describes counties in each district.

Reference No. 8

U.S. DEPARTMENT OF COMMERCE
C. R. Smith, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
Robert M. White, Administrator

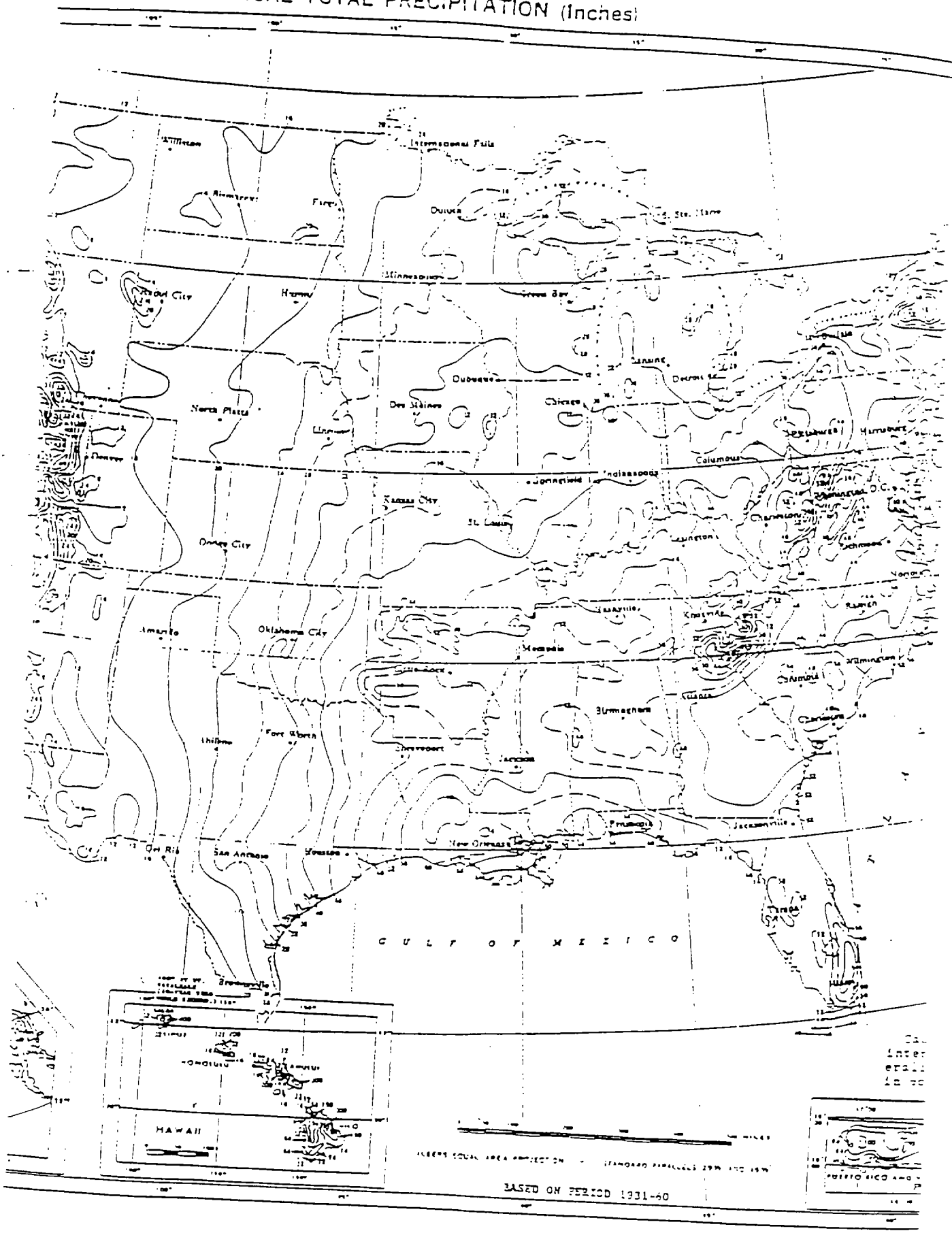
ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

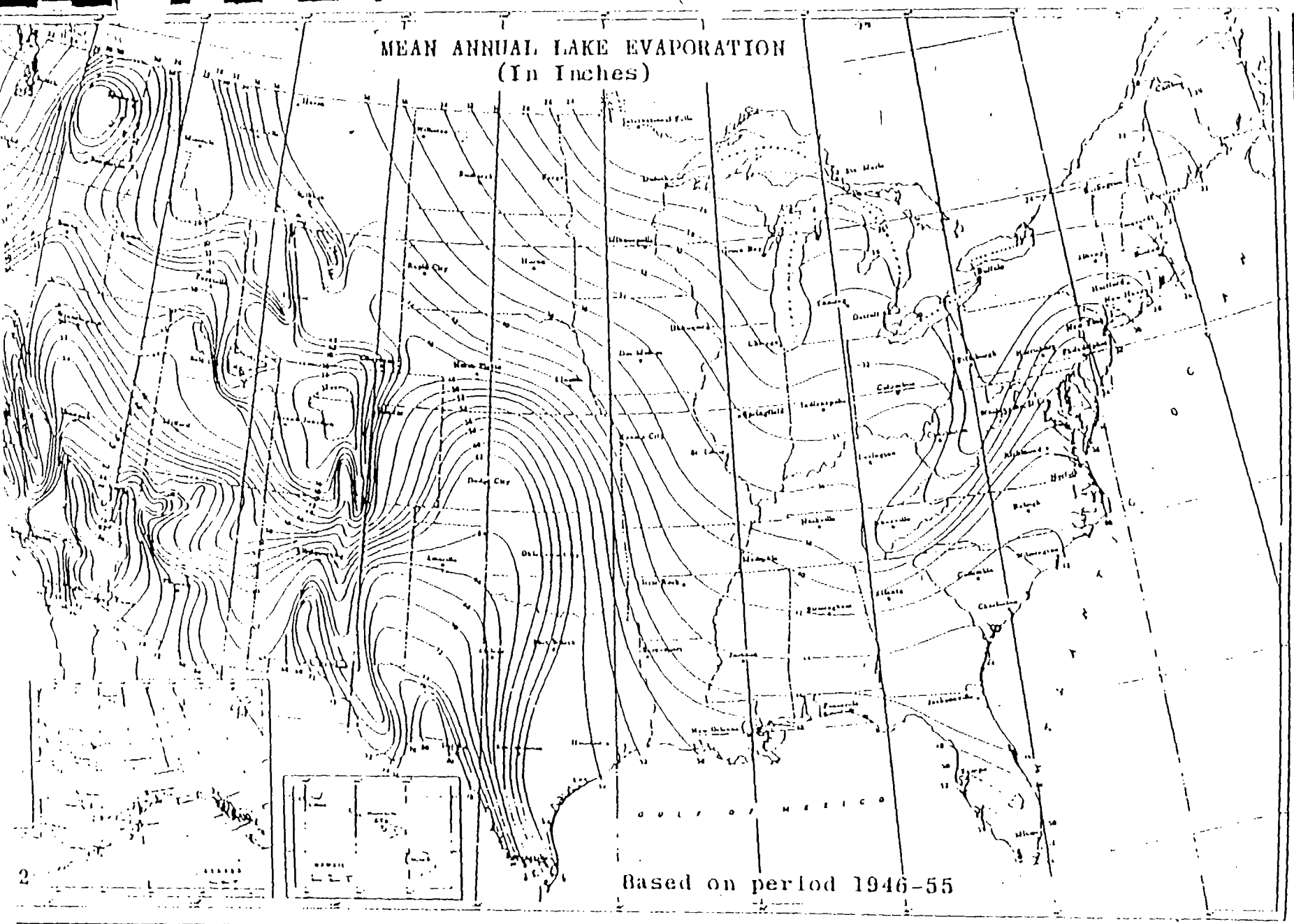
JUNE 1968

REPRINTED BY THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
1983

For sale through the National Climatic Data Center, Federal Building, Asheville, N.C. 28801 Attn: Publications.

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)





MEAN MAY-OCTOBER EVAPORATION IN PERCENT OF ANNUAL

JUN 07 1993 RECEIVED

MAY 12 1993

Spoke with Woodside and Ex in full, no offica Extension, etc

NGK Metals Corporation

P.O. Box 13367 Reading, PA 19612-3367 215 921-5000 Fax 215 921-5358

PLS 6/9
TPW
[redacted]
JDH 6/17
[redacted]
AGI 6/22
[redacted]
VMJ 6/25
[redacted]

RECEIVED
MAY 12 1993

CERTIFIED/RETURN RECEIPT
May 3, 1993

Division of Water Pollution Control
6th Floor, L & C Annex
401 Church Street
Tennessee Department of
Environment & Conservation
Nashville, TN 37243-1534

file: Industrial Stormwater 1993 (McMinn)

Re: NGK Metals Corporation
725 East Avenue, NE
Athens, TN 37303
NPDES Permit No.: TNR000544

Gentlemen:

On April 26, 1993, NGK received a Tennessee Baseline General 1 Permit for Storm Water Discharges Associated with Industrial Activity. The general permit requires a Storm Water Pollution Prevention Plan be prepared within 180 days of permit coverage, with the date of coverage being 11/1/92 - 9/26/97. NGK is requesting an extension of this deadline to allow for 180 days from the date NGK received the permit. NGK has taken steps to minimize the potential for materials to come in contact with storm water by performing such tasks as installing a roof over storage areas. Should you have any questions on the request for an extension, please contact me at 215-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor,
Environmental Affairs

nc
0018N

cc: M. Satterfield

McMinn Co
CFO

NOV 03 1993

NGK Metals Corporation

P.O. Box 13367 Reading, PA 19612-3367 215 921-5000 Fax 215 921-5350

FLS 11-8
TPW
[redacted]
JDH 11/21
[redacted]
MTD 12-3
[redacted]
VMJ 11/22
[redacted]
JEC 12-3

October 29, 1993

look up permit & assure proper county filing
copy of a monitoring report was sent to MCD

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
540 McCallie Avenue, Suite 550
Chattanooga, TN 37406-3399

File
Industrial S/W
McMinn Co.

Re: NPDES TNR00-0544
Storm Water Data

Dear Sir/Madam:

This letter serves as notification to the Department that the copper concentration (0.304 mg/l) in the August 2, 1993 storm water sample exceeded the report level of 0.018 mg/l (total) listed on the back of the reporting form. The concentration of all other parameters which we are required to monitor were below report levels.

NGK is presently investigating potential sources of the copper. Through the implementation of the Storm Water Pollution Prevention Plan, NGK expects to reduce the potential for contaminates to enter the storm sewer. Material handling and housekeeping practices shall be further addressed in order to reduce the risk of storm water contamination.

Should you have any questions regarding this information, please contact me at 215-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor
Environmental Affairs

nc
0018N

MAR 10 1994

NGK BERYLCO

NGK Metals Corporation

P.O. Box 13367 Reading, PA 19612-3367 215 921-5000 Fax 215 921-5358

March 9, 1994

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
540 McCallie Avenue, Suite 550
Chattanooga, TN 37406-3399

Re: NPDES TNR00-0544
Storm Water Data

Dear Sir/Madam:

On December 28, 1993, NGK Metals Corporation collected a storm water sample from outfall S02 in compliance with the requirements of NPDES permit number TNR00-0544.

In the event analytical sampling results exceed report levels, NGK is required to submit a copy of the results to your office. As you will note from the attached analysis the copper concentration of 0.077 mg/l and the suspended solids concentration of 344 mg/l exceed the report levels of 0.018 and 200 mg/l respectively.

The results from this sampling event will be included in the once per year report submitted to the Church Street office prior to its November 1 due date.

Should you have any questions regarding this information, please contact me at 610-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

nc
Enc.
0018N

cc: M. Satterfield - Athens
S. Link - SAK

M.J. Reider Associates, Inc.
LICENSED ANALYTICAL LABORATORIES

CERTIFICATE OF ANALYSIS

Attention: Mark Satterfield
Reported to: NGK Metals Corp.
725 East Ave. NE
Athens TN 37303

Identification: Shipping NW Stormwater

Date of Report: 01/10/94

Lab ID.: 698 12/29/93 A
Acct Rep: Richard Wolfe
Date Received: 12/29/93
Date Collected: 12/28/93
Time Collected: 16:30
Collected by: CST

CHEMISTRY	Result	Unit	Date	Procedure	Analyst
pH	6.91	su	12/29	EPA 150.1	WHC
Nitrogen,Ammonia	0.11	mg/l	12/30	EPA 350.3	MEB
Biochemical Oxygen Demand	5	mg/l	12/29	EPA 405.1	MEB
Chemical Oxygen Demand	98	mg/l	01/07	EPA 410.4	CMB
Solids, Total Suspended	344	mg/l	01/06	EPA 160.2	JLP
Oil and Grease	4.9	mg/l	01/03	EPA 413.1	LMB

INORGANIC					
Arsenic, Total	0.001	mg/l	01/03	EPA 206.2	HIM
Beryllium, Total	0.004	mg/l	01/03	EPA 200.7	MES
Cadmium, Total	<0.001	mg/l	12/30	EPA 200.7	MES
Chromium, Total	<0.004	mg/l	01/03	EPA 200.7	MES
Copper, Total	0.077	mg/l	12/30	EPA 200.7	MES
Lead, Total	<0.05	mg/l	12/30	EPA 200.7	MES
Nickel, Total	0.010	mg/l	12/30	EPA 200.7	MES

M.J. Reider Associates, Inc.

Distribution of Report:
NGK-Athens

Per: Richard A Wolfe
Technical Director

PENNSYLVANIA DER / U.S. ENVIRONMENTAL PROTECTION AGENCY #06-003 ☐ NEW JERSEY DEP #77903 ☐ FDA #42146
107 ANGELICA STREET ☐ READING, PENNSYLVANIA 19611-1999 ☐ (215) 374-5129 FAX (215) 374-7234

MJRA-#20

NOV 04 1994

NGK BERYLCO

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 Fax 610 921-5358

October 31, 1994

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
540 McCallie Avenue, Suite 550
Chattanooga, TN 37406-3399

file
McMinn Co
S/W - 1994

Re: NPDES TNR00-0544
Storm Water Data

Dear Sir/Madam:

On October 12, 1994, NGK Metals Corporation collected a storm water sample from outfall S01 in compliance with the requirements of NPDES permit number TNR00-0544.

In the event analytical sampling results exceed report levels, NGK is required to submit a copy of the results to your office. As you will note from the attached analysis the copper concentration of 0.272 mg/l exceeds the report levels of 0.018 mg/l.

The results from this sampling event have been included in the once per year report submitted to the Church Street office.

Should you have any questions regarding this information, please contact me at 610-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

nc
Enc.
0018N

cc: M. Satterfield - Athens

EN 29002/ISO 9002
ANSI-ASQC Q92
APPROVED BY BVQI NAI

Certified ISO 9002

EN 29002/ISO 9002 BS 5750
APPROVED BY BVQI

M. J. Reider Associates, Inc.
LICENSED ANALYTICAL LABORATORIES

CERTIFICATE OF ANALYSIS

Attention: Mark Satterfield
Reported to: NGK Metals Corp.
725 East Ave. NE
Athens TN 37303

Date of Report: 10/26/94
Project Number: 9414450
Lab ID: 0698-94-0026660
Account Rep: Richard Wolfe
Date Received: 10/14/94
Date Collected: 10/12/94
Time Collected: 14:25
Collected By: CLIENT

Sample Description: South Outfall

	Results	Unit	Date	Procedure	Analyst
CHEMISTRY					
NITROGENS					
Nitrogen,Ammonia	0.09	mg/l	10/20	EPA 350.3	JLP
OTHER					
Biochemical Oxygen Demand	3	mg/l	10/14	EPA 405.1	CMB
Chemical Oxygen Demand	19	mg/l	10/20	EPA 410.1	CMB
Oil and Grease	1.2	mg/l	10/17	EPA 413.1	LS
PHYSICAL					
pH	7.85	su	10/14	EPA 150.1	CMB
RESIDUES					
Solids, Total Suspended	20	mg/l	10/17	EPA 160.2	JL.
INORGANIC					
TOTAL					
Arsenic, Total	<0.001	mg/l	10/24	EPA 206.2	HIM
Beryllium, Total	0.006	mg/l	10/18	EPA 200.7	MES
Cadmium, Total	<0.001	mg/l	10/18	EPA 200.7	MES
Chromium, Total	<0.004	mg/l	10/18	EPA 200.7	MES
Copper, Total	0.272	mg/l	10/18	EPA 200.7	MES
Lead, Total	<0.02	mg/l	10/21	EPA 200.7	MES
Nickel, Total	0.014	mg/l	10/18	EPA 200.7	MES

Distribution of Report:
Mark Satterfield - NGK Metals Corp.
Lynn Woodside - NGK Metals Corp.

M. J. Reider Associates, Inc.
Reviewed and Approved by:

Richard Wolfe
Technical Director

PENNSYLVANIA DER / U.S. ENVIRONMENTAL PROTECTION AGENCY #06-003 ☐ NEW JERSEY DEP #77903 ☐ FDA #42146
107 ANGELICA STREET ☐ READING, PENNSYLVANIA 19611-1999 ☐ (610) 374-5129 FAX (610) 374-7234

MAR 28 1995

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 Fax 610 921-5358

November 1, 1994

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ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
Attn: Compliance and Enforcement
6th Floor L & C Annex
401 Church Street
Nashville, TN 37243-1534

Re: NPDES TNR00-0544
Storm Water Monitoring Report

Dear Sir/Madam:

Enclosed please find 2 copies of the storm water report for the monitoring year 11/01/93 to 10/31/94. There are two outfalls at the Athens facility. Outfall S01 was sampled October 12, 1994, outfall S02, which receives runoff primarily from gravel driveways, was sampled on December 28, 1993.

Analysis of the storm water samples revealed copper concentrations of 0.272 and 0.077 mg/l, exceeding the report value of 0.018 mg/l. NGK is presently investigating potential sources of the copper. In addition, the total suspended solids result for S02 had a level of 344 mg/l. Through the implementation of the Storm Water Pollution Prevention Plan, NGK expects to reduce the potential for contaminates to enter the storm sewer. Material handling and housekeeping practices shall be further addressed in order to minimize the risk of storm water contamination. The results of these sampling events have been submitted to the local Water Pollution Control Field Office.

As noted in last years submission investigation of the storm water outfalls for non-storm water discharges, revealed one such discharge. There is a cooling tower on site which blows down to the storm sewer. This water is used for non-contact cooling and is not chemically treated. An estimated 575 gallons per day is discharged. NGK has requested guidance from the Department on what if any action is needed to comply with applicable regulations for this discharge.

Please direct any phone calls or correspondence to myself at the location identified above.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

nc
Enc.
0018N

cc: M. Satterfield

RECEIVED

NOV 4 1994

ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/01/93 TO 10/31/94

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue, NE
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY" : 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR : 2
TOTAL NUMBER OF STORM EVENTS SAMPLED 2

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR:

A ...DRAINAGE AREA OF OUTFALL
B ... PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C ... PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D ...PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E. .. PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F .. RAINFALL AMOUNT OF THE STORM EVENT SAMPLED. IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT

OUTFALL NO. S 0 1 A 34,000 ☒ SQ FEET ☐ ACRES

B 100 % C 95 % D 5 % E 0 % F 0.10 INCHES

PARAMETER	QUALITY OR CONCENTRATION MINIMUM	AVERAGE	MAXIMUM	REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
BOD, 5-DAY (00310)			3	50	mg/l	1	COMP
TOTAL S. SOLIDS (00530)			20	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.09	4	mg/l	1	COMP.
OIL AND GREASE (00550)			1.2	15	mg/l	1	GRAB
pH (00400)			7.85	4.0 - 9.0	stand.	1	GRAB
COD			19	100	mg/l	1	Comp
Arsenic Total			< 0.001	0.36	mg/l	1	Comp
Beryllium Total			0.006	1.0	mg/l	1	Comp
Cadmium Total			< 0.001	0.004	mg/l	1	Comp

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? ☒ YES ☐ NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? ☐ YES ☒ NO
*PE not certified in TN.

HAS THE PLAN BEEN IMPLEMENTED? ☒ YES ☐ NO

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? ☒ YES ☐ NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? ☒ YES ☐ NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION See cover letter.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RECEIVED NOV 4 1994 ENFORCEMENT & COMPLIANCE TN DEPT. WPC

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/01/93 TO 10/31/94

FACILITY NAME NGK Metals Corporation

ADDRESS 725 East Avenue, NE

CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544

CONTACT PERSON Lynne Woodside

PHONE NUMBER (610) 921-5303

Note Read instructions on back before completing this form

OUTFALL NO S 0 1 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Chromium Total			< 0.004	1.0	mg/l	1	Comp
Copper Total			0.272	0.018	mg/l	1	Comp
Lead Total			< 0.02	0.082	mg/l	1	Comp
Nickel Total			0.014	1.4	mg/l	1	Comp

CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RECEIVED

STORM WATER MONITORING REPORT

MONITORING YEAR 11/01/93 TO __/__/__

NOV 4 1994

ENFORCEMENT & COMPLIANCE ASSURANCE

FACILITY NAME NGK Metals Corporation

ADDRESS 725 East Avenue, NE

CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TN0070344

CONTACT PERSON Lynne Woodside

PHONE NUMBER (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY" 2

TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR 2

TOTAL NUMBER OF STORM EVENTS SAMPLED 2

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR:

A DRAINAGE AREA OF OUTFALL
B PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F RAINFALL AMOUNT OF THE STORM EVENT SAMPLED. IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT

OUTFALL NO S 0 2 A 2,500 [X] SQ FEET [ ] ACRES

B 70 % C 12 % D 58 % E 30 % F Not Recorded INCHES

PARAMETER	QUALITY OR CONCENTRATION MINIMUM	AVERAGE	MAXIMUM	REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
BOD, 5-DAY (00310)			5	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			344	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.11	4	mg/l	1	COMP.
OIL AND GREASE (00550)			4.9	15	mg/l	1	GRAB
pH (00400)			6.91	4.0 - 9.0	stand.	1	GRAB
COD			98	100	mg/l	1	Comp
Arsenic Total			0.001	0.36	mg/l	1	Comp
Beryllium Total			0.004	1.0	mg/l	1	Comp
Cadmium Total			< 0.001	0.004	mg/l	1	Comp

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? [X] YES [ ] NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? [ ] YES [X] NO

*PE not certified in TN.

HAS THE PLAN BEEN IMPLEMENTED? [X] YES [ ] NO

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? [X] YES [ ] NO

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NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RECEIVED

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/01/93 TO 10/31/94

NOV 4 1994

ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

FACILITY NAME NGK Metals Corporation

ADDRESS 725 East Avenue, NE

CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544

CONTACT PERSON Lynne Woodside

PHONE NUMBER (610) 921-5303

Note Read instructions on back before completing this form.

OUTFALL NO S 0 2 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Chromium Total			< 0.004	1.0	mg/l	1	Comp
Copper Total			0.077	0.018	mg/l	1	Comp
Lead Total			< 0.05	0.082	mg/l	1	Comp
Nickel Total			0.010	1.4	mg/l	1	Comp

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NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

NOV 09 1994

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 Fax 610 921-5358

November 1, 1994

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NOV 4 1994

ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

file: McMinn C. SW-1994 Industrial

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
Attn: Compliance and Enforcement
6th Floor L & C Annex
401 Church Street
Nashville, TN 37243-1534

Re: NPDES TNR00-0544
Storm Water Monitoring Report

Dear Sir/Madam:

Enclosed please find 2 copies of the storm water report for the monitoring year 11/01/93 to 10/31/94. There are two outfalls at the Athens facility. Outfall S01 was sampled October 12, 1994, outfall S02, which receives runoff primarily from gravel driveways, was sampled on December 28, 1993.

Analysis of the storm water samples revealed copper concentrations of 0.272 and 0.077 mg/l, exceeding the report value of 0.018 mg/l. NGK is presently investigating potential sources of the copper. In addition, the total suspended solids result for S02 had a level of 344 mg/l. Through the implementation of the Storm Water Pollution Prevention Plan, NGK expects to reduce the potential for contaminates to enter the storm sewer. Material handling and housekeeping practices shall be further addressed in order to minimize the risk of storm water contamination. The results of these sampling events have been submitted to the local Water Pollution Control Field Office.

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EN 29002/ISO 9002
ANSI/ASQC Q92
APPROVED BY BVQI (NA)

Certified ISO 9002

EN 29002/ISO 9002 BS 5750

Please direct any phone calls or correspondence to myself at the location identified above.

Sincerely,

Lynne Woodside 5303 EXTENSION

Lynne Woodside
Supervisor, Environmental Affairs

nc
Enc.
0018N

cc: M. Satterfield

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NOV 4 1994

ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/01/93 TO 10/31/94

FACILITY NAME: NGK Metals Corporation
ADDRESS: 725 East Avenue, NE
CITY: Athens COUNTY: McMinn

NPDES PERMIT NUMBER: TNR00-0544
CONTACT PERSON: Lynne Woodside
PHONE NUMBER: (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY": 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR: 2
TOTAL NUMBER OF STORM EVENTS SAMPLED: 2

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR

A ..DRAINAGE AREA OF OUTFALL
B ....PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C .. PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D .. PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E ....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F ..RAINFALL AMOUNT OF THE STORM EVENT SAMPLED: IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT

OUTFALL NO. S.O.1. A 34,000 [X] SQ FEET [ ] ACRES

B 100 % C 95 % D 5 % E 0 % F 0.10 INCHES

PARAMETER	QUALITY OR CONCENTRATION MINIMUM	AVERAGE	MAXIMUM	REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
BOD, 5-DAY (00310)			3	50	mg/l	1	COMP
TOTAL S. SOLIDS (00530)			20	200	mg/l	1	COMP
NITROGEN, AMMONIA (00610)			0.09	4	mg/l	1	COMP
OIL AND GREASE (00550)			1.2	15	mg/l	1	GRAB
pH (00400)			7.85	4.0 - 9.0	stand.	1	GRAB
COD			19	100	mg/l	1	Comp
Arsenic Total			< 0.001	0.36	mg/l	1	Comp
Beryllium Total			0.006	1.0	mg/l	1	Comp
Cadmium Total			< 0.001	0.004	mg/l	1	Comp

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? [X] YES [ ] NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? [ ] YES [X] NO
*PE not certified in TN.

HAS THE PLAN BEEN IMPLEMENTED? [X] YES [ ] NO

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? [X] YES [ ] NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? [X] YES [ ] NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION See cover letter.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RECEIVED NOV 4 1994 ENFORCEMENT & COMPLIANCE TN DEPT. WPC

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/01/93 TO 10/31/94

FACILITY NAME NGK Metals Corporation

ADDRESS 725 East Avenue, NE

CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544

CONTACT PERSON Lynne Woodside

PHONE NUMBER (610) 921-5303

Note Read instructions on back before completing this form.

OUTFALL NO S 0 1 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
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Copper Total			0.272	0.018	mg/l	1	Comp
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NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RECEIVED

STORM WATER MONITORING REPORT

MONITORING YEAR 11/01/93 TO __/__/__

NOV 4 1994

ENFORCEMENT & COMPLIANCE

FACILITY NAME NGK Metals Corporation

ADDRESS 725 East Avenue, NE

CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TN0070054

CONTACT PERSON Lynne Woodside

PHONE NUMBER (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY" 2

TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR 2

TOTAL NUMBER OF STORM EVENTS SAMPLED 2

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E PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F RAINFALL AMOUNT OF THE STORM EVENT SAMPLED. IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT

OUTFALL NO S 0 2 A 2,500 [X] SQ FEET [ ] ACRES

B 70 % C 12 % D 58 % E 30 % F Not Recorded INCHES

PARAMETER	QUALITY OR CONCENTRATION MINIMUM	AVERAGE	MAXIMUM	REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
BOD, 5-DAY (00310)			5	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			344	200	mg/l	1	COMP
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OIL AND GREASE (00550)			4.9	15	mg/l	1	GRAB
pH (00400)			6.91	4.0 - 9.0	stand.	1	GRAB
COD			98	100	mg/l	1	Comp
Arsenic Total			0.001	0.36	mg/l	1	Comp
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NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RECEIVED

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/01/93 TO 10/31/94

NOV 4 1994

ENFORCEMENT & COMPLIANCE
IN DEPT. WPC

FACILITY NAME NGK Metals Corporation

ADDRESS 725 East Avenue, NE

CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544

CONTACT PERSON Lynne Woodside

PHONE NUMBER (610) 921-5303

Note: Read instructions on back before completing this form.

OUTFALL NO. S 0 2 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Chromium Total			< 0.004	1.0	mg/l	1	Comp
Copper Total			0.077	0.018	mg/l	1	Comp
Lead Total			< 0.05	0.082	mg/l	1	Comp
Nickel Total			0.010	1.4	mg/l	1	Comp

RTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE ICUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE I AM AWARE THAT RE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
CHATTANOOGA ENVIRONMENTAL FIELD OFFICE
540 McCALLIE AVE., SUITE 550
CHATTANOOGA, TENNESSEE 37402-2013
(615) 634-5745 FAX (615) 634-6389

due date

file

McMinn Co
S/W Industrial
1994

December 29, 1994

Certified Mail

Mr. John Manikas, General Manager
NGK Metals Corporation
725 East Avenue
Athens, Tennessee 37303

Re: *Notice of Violation*
Unpermitted Discharge
McMinn County

Dear Mr. Manikas:

On December 16, 1994, Jill Davis of this office conducted an inspection of NGK Metals after receiving a storm water monitoring report (NPDES Storm Water Permit No. TNR000544) which stated that there was a dry weather discharge which consisted of non-contact cooling water. Although there was no discharge during the inspection, the discharge pipe was observed. Mr. Satterfield, the facility representative stated that the discharge primarily occurred during the summer. Also noted near a roll-off box was a slight amount of waste foundry sand spillage. This spillage could possibly account for the storm water report level exceedence for copper in this past year's monitoring report.

Please be informed that the discharge of the non-contact cooling water without a valid waste water discharge permit is a violation of the Water Quality Control Act, Tennessee Code Annotated, 69-3-101, et. seq. Enforcement actions which can result for violations of the Act include a civil penalty of up to ten thousand dollars ($10,000) per day for each day a violation occurs Until a permit is obtained, no discharging can be allowed

due date → Please respond in writing by January 31, 1995, with a detailed description of what steps have been taken to prevent a recurrence of the non-contact cooling water discharge. If you desire to obtain a permit for the discharge, please complete and submit the enclosed

application. Also include in your response what steps have been taken to reduce the amount of spillage around the roll-off box. If you feel that the roll-off box may not be the cause of the high copper levels in the storm water, then please discuss what steps you plan to take to identify the source and reduce the copper contamination in the storm water.

Thank you for the cooperation extended during the inspection. If you have any questions, please contact Jill Davis at (615)634-5705.

Sincerely,

Philip L. Stewart, P.E.
Manager, Chattanooga Field Office
Division of Water Pollution Control

05/jed/ngk
Enclosure
cc: Division of Water Pollution Control, Industrial Facilities Section, Nashville
cc: Division of Water Pollution Control, Enforcement and Compliance Section, Nashville
cc: Lynne Woodside, NGK Metals Corporation, Tuckerton Road, P.O. Box 13367, Reading, PA 19612-5000

NOV Response

Review

NGK BERYLCO

NGK Metals Corporation

725 East Avenue Athens, TN 37303 615 745-6871 Fax 615 745-6874

January 3, 1995

Certified Mail

Mr. Philip L. Stewart, P.E.
Manager, Chattanooga Field Office
Division of Water Pollution Control
540 McCallie Ave., Suite. 550
Chattanooga, TN 37402

file:
Industrial
S/W - 199
McMinn
008 ESC

Re: Unpermitted Discharge

Dear Mr. Stewart:

I am in receipt of your letter dated December 29, 1994 regarding the notice of violation of unpermitted discharge.

On December 17, 1994 NGK, Athens, TN contacted Tri City Plumbing to install a sump pump with reservoir to dump discharge from our cooling tower, non contact cooling water, to the city sewer system. This should be complete by January 10, 1995 (it is currently approximately 75% complete).

As for the waste foundry sand spillage, plans have been made to relocate the 20 yard roll-off to accommodate a dry storage area. Richard Harrill and Sons, General Contractors, should complete this project by February 17, 1995.

If you have any questions, please call me at (615) 745-6871.

Sincerely,

John J. Manikas

John J. Manikas
General Manager

JJM/ced

cc: Jill Davis, E.I.T. Division of Water Pollution Control, Chattanooga Field Office, Chattanooga

cc: Lynne Woodside, NGK Metals Corporation, Tuckerton Road, P.O. Box 13367, Reading, Pa 19612-5000

NOV 06 1995

PLS 11/8
TPW 11/9
JED 11-13
VMJ 11-14
AGI 11-15

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 FAX 610 921-5358

October 25, 1995

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
Attn: Compliance and Enforcement
6th Floor L & C Annex
401 Church Street
Nashville, TN 37243-1534

Re: NPDES TNR00-054
Storm Water Monitoring Report

Dear Sir/Madam:

Enclosed please find 2 copies of the storm water report for the monitoring year 11/01/94 to 10/31/95. There are two outfalls at the Athens facility. Samples were collected September 13, 1995 and immediately placed in appropriately preserved bottles. Samples were analyzed by M. J. Reider Associates in Reading, Pennsylvania.

Analysis of the storm water samples revealed copper concentrations of 0.068 and 0.060 mg/l, exceeding the report value of 0.018 mg/l. NGK is presently investigating potential sources of the copper.

Should you have any questions on this report, please feel free to contact me at 610-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor,
Environmental Affairs

nc
Enc.
0257N

cc: TN Dept. of Env. & Conservation, Chattanooga
M. Satterfield - NGK

Certified ISO 9002

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/1/94 TO 10/31/95

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue, NE
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY" 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR 2
TOTAL NUMBER OF STORM EVENTS SAMPLED: 1

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR

A ....DRAINAGE AREA OF OUTFALL
B .....PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C.....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D .. PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E .....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F ..RAINFALL AMOUNT OF THE STORM EVENT SAMPLED; IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT

OUTFALL NO. S 0.1 A 34,000 ☒ SQ FEET ☐ ACRES

B 100 % C 95 % D 5 % E 0 % F 0.6 INCHES

PARAMETER	QUALITY OR CONCENTRATION MINIMUM	AVERAGE	MAXIMUM	REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
BOD, 5-DAY (00310)			6	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			24	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.32	4	mg/l	1	COMP
OIL AND GREASE (00550)			< 1	15	mg/l	1	GRAB
pH (00400)			6.80	4.0 - 9.0	stand.	1	GRAB
COD			31	100	mg/l	1	Comp.
Arsenic Total			0.003	0.36	mg/l	1	Comp.
Cadmium Total			< 0.001	0.004	mg/l	1	Comp.
Chromium Total			0.006	1.0	mg/l	1	Comp.

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? ☒ YES ☐ NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? ☐ YES ☒ NO*

HAS THE PLAN BEEN IMPLEMENTED? ☒ YES ☐ NO

*PE not certified in TN

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? ☒ YES ☐ NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? ☐ YES ☒ NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhiro Niwa	95	10	31
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11 / 1 / 94 TO 10 / 31 / 95

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue, NE
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5303

Note: Read instructions on back before completing this form

OUTFALL NO S 0 1 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Copper Total			0.068	0.018	mg/l	1	Comp.
Lead Total			< 0.02	0.082	mg/l	1	Comp.
Nickel Total			0.019	1.4	mg/l	1	Comp.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THO INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE TH THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	95	10	31
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

CN-0808

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/1/94 TO 10/31/95

FACILITY NAME: NGK Metals Corporation
ADDRESS: 725 East Avenue, NE
CITY: Athens COUNTY: McMinn

NPDES PERMIT NUMBER: TRN00-0544
CONTACT PERSON: Lynne Woodside
PHONE NUMBER: (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY": 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR: 2
TOTAL NUMBER OF STORM EVENTS SAMPLED: 2

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR.

A.....DRAINAGE AREA OF OUTFALL
B.....PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C.....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D.....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN FIELD)
E.....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F.....RAINFALL AMOUNT OF THE STORM EVENT SAMPLED; IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT.

OUTFALL NO. S 0 2 A 2,500 ☒ SQ FEET ☐ ACRES

B 70 % C 12 % D 58 % E 30 % F 0.6 INCHES

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
BOD, 5-DAY (00310)			5	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			110	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.17	4	mg/l	1	COMP.
OIL AND GREASE (00550)			< 1	15	mg/l	1	GRAB
pH (00400)			6.80	4.0 - 9.0	stand.	1	GRAB
COD			27	100	mg/l	1	Comp.
Arsenic Total			< 0.001	0.36	mg/l	1	Comp.
Cadmium Total			< 0.001	0.004	mg/l	1	Comp.
Chromium Total			0.006	1.0	mg/l	1	Comp.

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? ☒ YES ☐ NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? ☐ YES ☒ NO *

HAS THE PLAN BEEN IMPLEMENTED? ☒ YES ☐ NO

*PE not certified in TN

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? ☒ YES ☐ NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? ☐ YES ☒ NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	95	10	31
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/1/94 TO 10/31/95

FACILITY NAME: NGK Metals Corporation
ADDRESS: 725 East Avenue, NE
CITY: Athens COUNTY: McMinn

NPDES PERMIT NUMBER: TNR00-0544
CONTACT PERSON: Lynne Woodside
PHONE NUMBER: (610) 921-5303

Note: Read instructions on back before completing this form

OUTFALL NO. S.O.2 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Copper Total			0.060	0.018	mg/l	1	Comp.
Lead Total			< 0.02	0.082	mg/l	1	Comp.
Nickel Total			0.020	1.4	mg/l	1	Comp.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOS INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	95	10	31
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

CN-0998

DEC 1 6 1996

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 Fax 610 921-5358

December 12, 1996

PLS 12/20
TPW 12/23
JED
VMJ 1/7
ok logged

Tennessee Department of Environment & Conservation
Division of Water Pollution Control
Attn: Compliance and Enforcement
6th Floor L&C Annex
401 Church Street
Nashville, TN 37243-1534

Re: NPDES TNR00-054
Storm Water Monitoring Report

file [illegible] Co 5/[illegible]
Industrial [illegible]

Dear Sir/Madam:

Enclosed please find 2 copies of the storm water report for the monitoring year 11/01/95 to 10/31/96 There are two outfalls at the Athens facility. Samples were collected November 1, 1996 and immediately placed in appropriately preserved bottles Samples were analyzed by M J. Reider Associates in Reading, Pennsylvania.

Analysis of the storm water samples revealed copper concentrations of 0.049 and 0.156 mg/l, at S01 and S02 respectively exceeding the report value of 0.018 mg/l. In addition, the chemical oxygen demand level at S01 was 101 mg/l slightly exceeding the report level of 100 mg/l NGK is presently investigating potential sources of the copper and COD

Should you have any questions on this report, please feel free to contact me at 610-921-5147

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

nc

cc. TN Dept of Env. & Conservation, Chattanooga
M Satterfield - NGK

EN 29002/ISO 9002
ANSI ASQC Q92
APPROVED BY BVQI INA

Certified ISO 9002

EN 29002/ISO 9002/BS 5750
APPROVED BY BVQI

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/1/95 TO 10/31/96

FACILITY NAME: NGK Metals Corporation
ADDRESS: 725 East Avenue
CITY: Athens COUNTY: McMinn

NPDES PERMIT NUMBER: TNR00-0544
CONTACT PERSON: Lynne Woodside
PHONE NUMBER: (610) 921-5147

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY": 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR: 2
TOTAL NUMBER OF STORM EVENTS SAMPLED: 1

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR:

A ....DRAINAGE AREA OF OUTFALL
B .....PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C.....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D ....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E.....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F.....RAINFALL AMOUNT OF THE STORM EVENT SAMPLED; IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT

OUTFALL NO. S.0.1 A 34,000 ☒ SQ FEET ☐ ACRES

B 100 % C 95 % D 5 % E 0 % F 0.5 INCHES

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
BOD, 5-DAY (00310)			8	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			32	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.23	4	mg/l	1	COMP.
OIL AND GREASE (00550)			< 1	15	mg/l	1	GRAB
pH (00400)			6.90	4.0 - 9.0	stand.	1	GRAB
COD			101	100	mg/l	1	Comp
Arsenic Total			< 0.001	0.36	mg/l	1	Comp
Cadmium Total			< 0.001	0.004	mg/l	1	Comp
Chromium Total			< 0.004	1.0	mg/l	1	Comp

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? ☒ YES ☐ NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? ☐ YES ☒ NO *

*PE not certified in TN

HAS THE PLAN BEEN IMPLEMENTED? ☒ YES ☐ NO

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? ☒ YES ☐ NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? ☐ YES ☒ NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	96	12	12
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/1/95 TO 10/31/96

FACILITY NAME: NGK Metals Corporation
ADDRESS: 725 East Avenue
CITY: Athens COUNTY: McMinn

NPDES PERMIT NUMBER: TNR00-0544
CONTACT PERSON: Lynne Woodside
PHONE NUMBER: (610)921-5147

Note: Read instructions on back before completing this form.

OUTFALL NO. S 0 1 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Copper Total			0.049	0.018	mg/l	1	Comp
Lead Total			0.006	0.082	mg/l	1	Comp
Nickel Total			0.009	1.4	mg/l	1	Comp

CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	96	12	12
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

CN-0968

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11 / 1 / 95 TO 10 / 31 / 96

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5147

Note: Read instructions on back before completing this form

OUTFALL NO. S 0 2 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Copper Total			0.156	0.018	mg/l	1	Comp
Lead Total			0.018	0.082	mg/l	1	Comp
Nickel Total			0.227	1.4	mg/l	1	Comp

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasutoto Niwa	'96	12	12
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

CN-0286

State of Tennessee
Department of Environment & Conservation
Division of Water Pollution Control

NOTICE OF INTENT
for
Baseline General Permit to Discharge
Storm Water Associated with Industrial Activity

RECEIVED
OCT - 1 1992

I. OWNER/OPERATOR

Name: NGK Metals Corporation	A. Owner/Operator Type. (Check one) 01.☐ Federal 02.☐ State 03.☐ City 04.☐ County 05.☐ Management Group 06.☒ Private 99.☐ Other
Mailing Address: P. O. Box 13367	
City: Reading	State: PA Zip: 19612-3367 Phone: (215) 921-5303
Contact Person: Lynne Woodside	B. 1.☐ Owner 2.☐ Operator 3.☒ Owner/Operator

II. FACILITY IDENTIFICATION

Facility Name: NGK Metals Corporation	County: McMinn
Street Address: 725 East Avenue,N.E.	Contact Person: John J. Manikas
City: Athens	State: TN Zip: 37303 Phone: (615)745-6871

III. SITE DETAILS

Enter facility location: 35° 34' 05"
Latitude: 35 deg. 26 min. 52 sec.
84° 35' 37"
Longitude: 84 deg. 36 min. 43 sec.

☐ Check box to indicate required map (8.5"x11") with facility and receiving streams highlighted and identified is attached.

Area of facility property: 5.67 ☐ sq.ft. ☒ acres
Area of undeveloped land: 3.77 ☐ sq.ft. ☒ acres
Area of impervious surfaces: 30,000 ☒ sq.ft. ☐ acres
Area of pavement: 0 ☐ sq.ft. ☐ acres

IV. INDUSTRIAL INFORMATION

A. SIC Code(s): List primary SIC code first, etc. These are 4-digit numbers.

1. 3366 2. _____ 3. _____ 4. _____

B Nature of business (keywords):

Manufacturing of beryllium alloys.

C. Activities at facility: (Check all that apply)

01.☒ Manufacturing 02.☐ Storage/Distribution
03.☐ Vehicle Storage 04.☐ Trucking Terminal
05.☐ Vehicle Maintenance 06.☐ Hazardous Waste TSD
07.☐ Outside Waste Disposal 08.☐ Recycling
09.☐ Wastewater Treatment 10.☐ Land Application
11.☐ Landfill 12.☐ Solid Waste Mgt. Unit
99.☐ Other _____

STATE USE ONLY

Date NOI Received: 10-01-92	Field Office JAN 1993 CFO	☐ Individual Permit Rationale
Date of Coverage: 11-01-92	NPDES General Permit No.: TNR00 0544	Reviewer. 4/5/93

CN-0941

V. MATERIAL HANDLING

A. Types of material stored and/or handled outside: (Check all that apply)

01. ☐ Stone, clay, sand
02. ☒ Raw supply/finished metal
03. ☐ Scrap metal
04. ☐ Solvents
05. ☐ Paints
06. ☐ Petroleum products
07. ☐ Wood treating products
08. ☐ Pesticides
09. ☐ Hazardous wastes
10. ☐ Coal
11. ☐ Salt or other deicing chemicals
12. ☐ Plastics
99. ☐ Other (Please list.)

B. Existing practices used to prevent exposure to storm water of material storage, handling or material handling equipment, or to minimize contaminated runoff. (Check all that apply.)

01. ☐ Oil/water separator
02. ☐ Containment
03. ☐ Berms (pervious, impervious)
04. ☐ Storm water detention
05. ☐ Leachate collection
06. ☒ Overhead coverage
07. ☐ Covering with tarpaulins, etc.
08. ☐ Chemical treatment
99. ☐ Other (Please list.)

VI. DISCHARGE POINTS & WATERS RECEIVING THE DISCHARGES

A. Does your facility's storm water discharge directly to: (Check one)

1. ☐ Storm drain system — Owner of system: (Name) _____
2. ☒ Waters of the State (e.g., stream, river, lake) either directly or via ditch, etc.

Approximate distance to receiving stream or sinkhole: 220 ~~miles~~ feet

Number of storm water discharge points: 1 ☒ exact or ☐ estimate

B. Name(s) of Waters of the State: Tributary to Little Mouse Creek

VII. EXISTING PERMITS

A. ☐ NPDES Permit	B. ☐ RCRA Permit	C. Air Pollution Control Permit(s)
TN N/A	No. N/A	☒ yes ☐ no
D. Facility on SARA 313 list	E. Dun and Bradstreet No.	
☒ yes ☐ no	N/A	

VIII. ADDITIONAL INFORMATION

A. ☐ Existing storm water sampling data is submitted. Please indicate methods of sampling.

B. Comments or additional information to describe facility

IX. CERTIFICATION AND SIGNATURE (MUST BE SIGNED BY PRESIDENT, V.P. OR EQUIVALENT, OR RANKING ELECTED OFFICIAL)

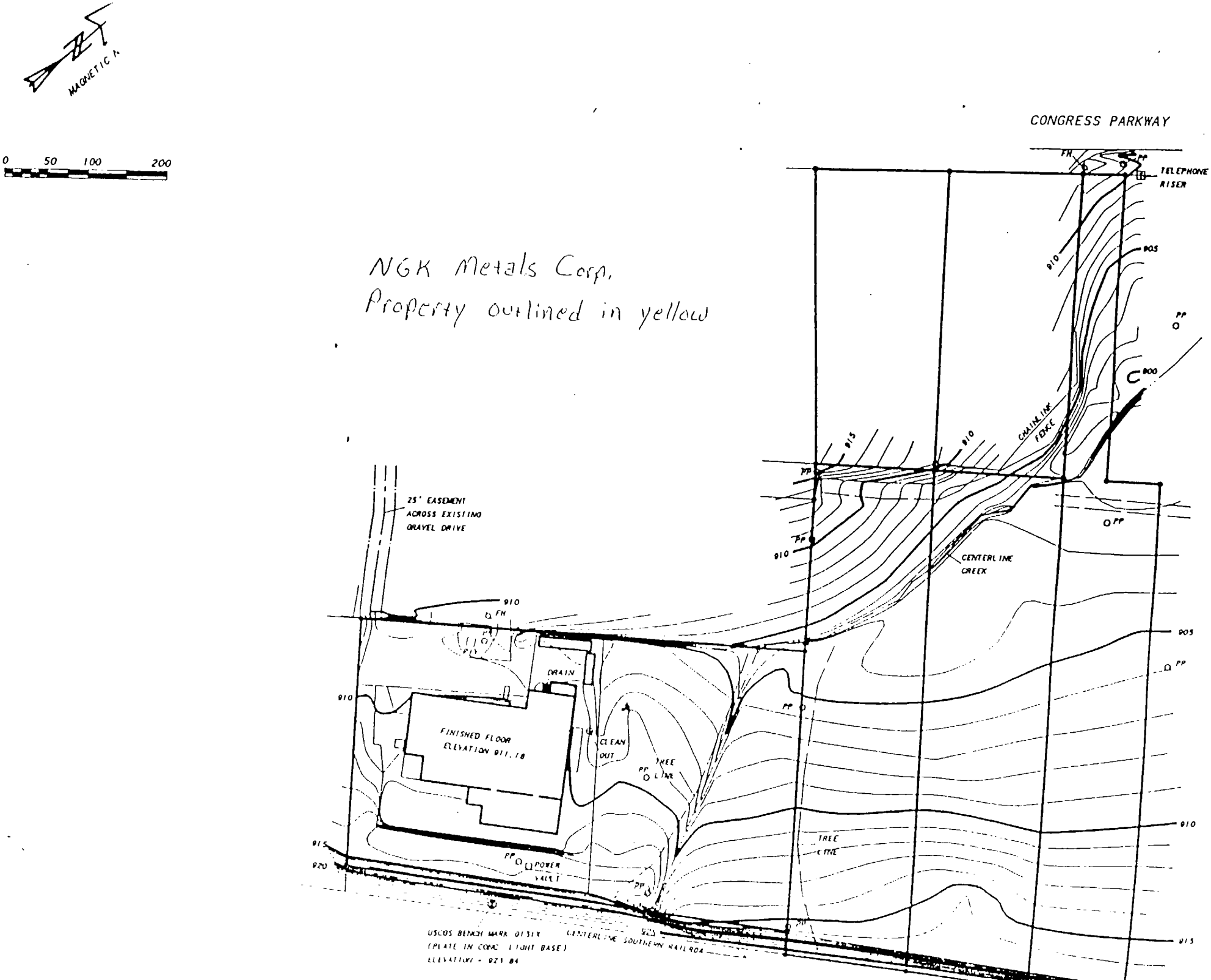
"I certify under penalty of law that I have personally examined and am familiar with the information submitted in the attached document; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Printed Name: Yasuhito Niwa Title: Vice President, Administration

Signature: Yasuhito Niwa Date: 9/24/92

Please submit form to the following address:

Stormwater NOI Processing
Division of Water Pollution Control
401 Church Street
Department of Environment & Conservation
Nashville, Tennessee 37243-1534


MAGNETIC N
0 50 100 200
CONGRESS PARKWAY
NGK Metals Corp.
Property outlined in yellow
TELEPHONE RISER
FH
PP
905
910
900
915
920
CHAINLINK FENCE
CENTERLINE CREEK
25' EASEMENT ACROSS EXISTING GRAVEL DRIVE
DRAIN
FINISHED FLOOR ELEVATION 911.18
CLEAN OUT
TREE LINE
POWER VAULT
USCOS BENCH MARK 0131X
(PLATE IN CONC LIGHT BASE)
ELEVATION = 923.84
CENTERLINE SOUTHERN RAILROA

TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF SUPERFUND
OFFICE CORRESPONDENCE

DATE: October 29, 1998

TO: Division of Superfund File 54-514

FROM: Jill Davis

SUBJECT: NGK Metals
McMinn County

On October 29, 1998, I conducted a visual inspection of the former NGK Metals facility on East Avenue. The facility was closed and locked with a 'for sale' sign attached to the fence.

From the entrance, there was only a small amount of staining on a concrete driveway. This area was near a previous storage area of waste foundry sand. I did not access the back of the building. There were no signs of staining in the drainage-way upstream or downstream of the facility.

A small perennial stream crosses in front of the facility. Waste foundry sand or other dark colored waste was not apparent in the stream.

FROM	DATE
TO	

DATE: February 8, 2000

CONTACT: Luke Ewing

RE: updated well information

PROJECT # : 54-514

I met with Luke Ewing with Tennessee Water Supply Division in the Nashville Central Office. He gave me updated copies of the wells that are located in quadrants 125NE and 125NW that falls within McMinn County. Mr. Ewing informed me that there are a lot more wells that are in the area, but this information represents about 25-30% of the total wells.

I then asked if I could get an updated copy of the 4-mile topography map to locate any residents in the area. The most recent topo map that he had dated back to 1944. He told me that it was a ridiculous idea to count the number of houses, since it is such an old map. He said that a good place to achieve resident information would be to contact the tax assessor's office in that county.

SIGNATURE Rene Lucchesi

DATE: February 9, 2000

CONTACT: Paul Nightengale

RE: Cabot Corp

PROJECT # : 54-514

I contacted Cabot Corporation, which formerly operated a facility at the same site of NGK Metals. NGK Metals bought the property from Cabot Corp. in 1986. However, Cabot Corp. no longer runs a facility in Tennessee. I contacted the company, which is located in Boston, Massachusetts, by referring to the Thomas Register of 1998. I finally spoke with the company's attorney, Mr. Paul Nightengale. He was unsure of the type of facility that Cabot Corp. formerly owned in Athens, Tennessee. He assumed that NGK Metals simply bought over the operation of manufacturing beryllium copper alloyed intrinsic tools. Therefore, primarily the same metals and chemicals were used during NGK Metals' and Cabot Corporation's production period. Mr. Nightengale told me that if he found out any different information, he would let me know.

Rene Ricchioi

DATE: February 9, 2000

CONTACT: Mr Newberry, Athens Utilities Board

RE: information on wells in a 1-mile radius

PROJECT # : 54-514

I contacted Mr Newberry in the afternoon I had prepared a list of questions that I needed answered concerning groundwater information in a 1-4 mile radius around the former NGK Metals site Mr. Newberry informed me that he had only been in his current position for a couple of months, but he would help me out as much as he could He suggested that I send him a list of questions that I needed answered, so I organized my notes and typed out a list of questions I then made a copy of the site location, and faxed the map and questions to him the next day I informed him that my supervisor and I would be in Athens on Feb 15th to visit the site On that day we would be stopping by Athens Utilities Board to get whatever information that we could

Signature: Rene Lucchesi

DATE: February 9, 2000

FROM: Renee Lucchesi, TDEC- Division of Superfund

TO: Mr. Newberry, Athens Utility Board

RE: information on the former site of NGK Metals (1-mile radius)

1. Where are the public utilities water intakes?
2. Where are your supply lines within 1-mile radius?
3. Where are the municipal wells?
4. Do the wells have designated wellhead protection area?
5. Where is the nearest private drinking well?
6. Where is the nearest resident?
7. Do you know of anyone using well water as primary drinking source?
8. Do you know who owns the pipeline running through the site?

TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF SUPERFUND
OFFICE CORRESPONDENCE

DATE: February 15, 2000

TO: Division of Superfund File 54-514

FROM: Renee Lucchesi

SUBJECT: NGK Metals
McMinn County

On February 15, 2000, Tim Stewart and I visited the former site of NGK Metals located at the intersection of East Avenue and Lawn Street. The facility is currently occupied by Applied Technologies, Incorporated, which manufacture specialized machinery. There is a fence that encompasses the entire site.

Railroad tracks are located behind the site on the south side. A drainage ditch runs along the west side of the site, while a creek runs in front of the facility. Several different industries are located in the same general vicinity including UPS, Texas Hydraulics, an ambulance service, a gas cylinder plant, and a diner.

There are no schools or day cares near the site. The nearest resident is approximately ½-mile away from the site.

THIS INSTRUMENT PREPARED BY
HIGGINS, BIDDLE & CHESTER, ATTORNEYS
ATHENS, TENNESSEE 37303

ADDRESS OF PROPERTY OWNER AND
TO WHICH TAX STATEMENT SHALL BE
MAILED: NGK Metals Corporation
PO Box 13367
Reading, Pa. 19612-3367

375

QUIT CLAIM DEED

THIS INSTRUMENT made and entered into on this the 30th day of September, 1986, by and between CABOT CORPORATION, a Delaware Corporation with properties located in Athens, McMinn County, Tennessee, hereinafter referred to as party of the first part; and NGK Metals Corporation, Delaware Corporation with an office at Tuckerton Rd., Temple, Pa., hereinafter referred to as party of the second part.

WITNESSETH:

THAT for and in consideration of the sum of One Dollar ($1.00) cash in hand paid, the receipt of which is hereby acknowledged, the party of the first part conveys and quitclaims unto the party of the second part, all its right, title and interest in and to the following described real estate, to-wit:

TRACT 1.
LYING AND BEING SITUATED in the First Civil District of McMinn County, Tennessee, and within the Corporate Limits of the City of Athens, the same being a lot or tract lying on the North side of the Southern Railroad and being bounded on the Northwest, Northeast and Southwest by East Tennessee Machine Tool Works, Inc., and also on the Northwest by the center line of a spring branch and containing 1.99 acres, more or less, according to the survey of Morgan Watkins, Engineer, bearing date of April 10, 1973, said lot being more particularly described as follows, to-wit:

BEGINNING at the Northwest corner of the within described property at the point where the West line of the Western most roadway leading from East Avenue into the Old Pet Milk Plant building crosses said branch; thence along the center line of said branch, North 43 deg. 31' East, 294 feet along the center line of said branch and with the meanderings thereof down stream to a point; thence South 47 deg. 00' East, 5 feet to a stake which is 243 feet Southwest of the Sherman Concrete Pipe Co. line marked by a fence which separates the Sherman Concrete Pipe Co. from East Tennessee Machine Tool Works, Inc.; thence South 47 deg. 00' East, 307.5 feet to the fence line running along the North line of the Southern Railroad; thence South 48 deg. 12' West, 295.4 feet along said fence line to an iron pin; thence North 47 deg. 00' West, 288.6 feet along a severance line with East Tennessee Machine Tool Works, Inc. to the center of said creek at the point of BEGINNING.

This property is conveyed subject to the easement rights of Southern Railway Company, Inc.

By Release of Right of Way and Restrictions, Basil W. Turbyfill, as successor to East Tennessee Machine Tool Works, Inc., released all interest of East Tennessee Machine Tool Works, Inc. in said Right of Way and Restrictions which instrument is of record in Deed Book 9-H, Pages 497-498 in the Register's Office for McMinn County, Tennessee, to which reference is hereby made.

BEING THE SAME PROPERTY conveyed unto Kawecki Berylco Industries, Inc. by Trustee's Deed dated March 24, 1975, of record in Deed Book 7-O, Page 753-755 in the Register's Office for McMinn County, Tennessee, to which reference is hereby made. Kawecki Berylco Industries, Inc. changed its name to Cabot Berylco, Inc. on October 15, 1980, and on October 1, 1982, Cabot Berylco, Inc. was merged into the Cabot Corporation, the party of the first part herein.

TRACT 2.
LYING AND BEING in the First Civil District of McMinn County, Tennessee, and in the City of Athens, being more particularly described as follows:, to-wit:

BEGINNING in the West line of Sherman Concrete Pipe Co. at the Northernmost corner of the property described and at an iron pin 177.1 feet from East Avenue, thence with Sherman Concrete South 47 deg. 11 min. East 326 feet to the fence along Southern Railroad, thence with the Railroad South 46 deg. 39 min. West 243.2 feet to an iron pin, thence leaving the Railroad, North 47 deg. 00 min. West 312.5 feet to an iron pin in a ditch, thence North 43 deg. 31 min. East 241.9 feet to the beginning, containing 1.8 acres, according to a survey prepared by Morgan Watkins Engineering Co., Inc. dated July 10, 1978, Drawing No. 78189.

BEING THE same property conveyed to Kawecki Berylco Industries, Inc. by Warranty Deed of East Tennessee Machine Tool Works, Inc. dated August 21, 1978, recorded in Deed Book 8-K, pages 563-564, in the Register's Office for McMinn County, Tennessee, to which reference is hereby made. Kawecki Berylco Industries, Inc. changed its name to Cabot Berylco, Inc. on October 15, 1980, and on October 1, 1982, Cabot Berylco, Inc. was merged into the Cabot Corporation, the party of the first part herein.

IN TESTIMONY WHEREOF, the party of the first part has hereunto set its signature, this the day and date first above written.

CABOT CORPORATION

By: [illegible]
Its: Executive Vice President

377

STATE OF Pennsylvania)
)
COUNTY OF Philadelphia)

PERSONALLY APPEARED before me, Sharon A. Davis, a Notary Public, in and for Philadelphia County, Norton A. Sloan with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged himself to be Executive Vice President of CABOT CORPORATION, the within named bargainor, a corporation, and that he as such Executive Vice President being authorized so to do, executed the foregoing instrument by signing the name of the corporation by himself as such Executive Vice President.

WITNESS MY HAND and seal at office, this 30th day of September, 1986.

Sharon A. Davis
Notary Public

My Commission Expires: _____.

SHARON A. DAVIS
Notary Public Phila., Phila. Co.
My Commission Expires Feb. 6, 1989

AFFIDAVIT

THE UNDERSIGNED Norton A. Sloan, hereby makes oath that $ 147,500.00 is the greater of the actual consideration or value of the property hereinabove described as of the date of this instrument.

AFFIANT

Sworn to and subscribed to before me, this 30th day of September, 1986.

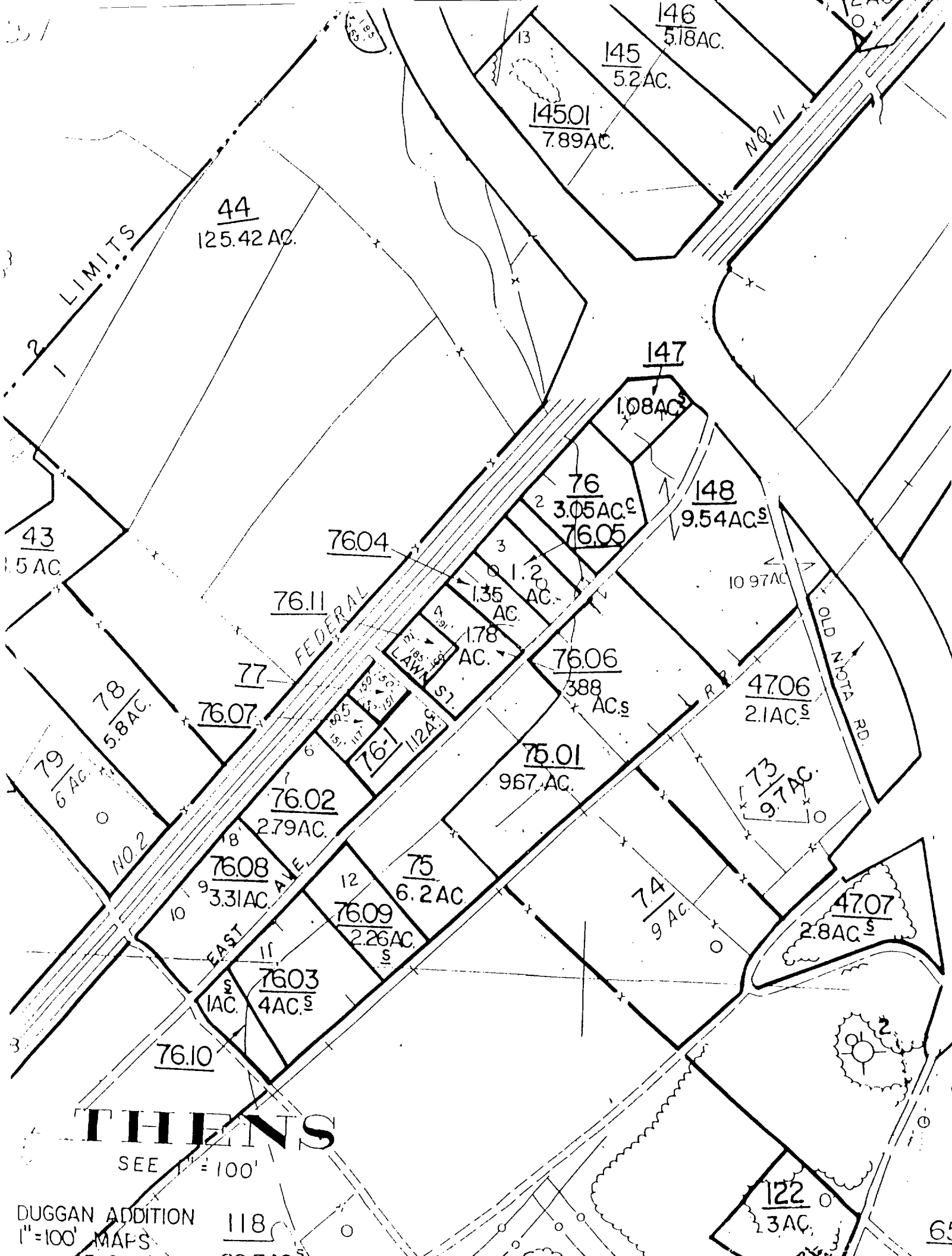
Sharon A. Davis
NOTARY PUBLIC OR REGISTER OF DEEDS

My Commission Expires: _____.

SHARON A. DAVIS
Notary Public, Phila., Phila. Co.
My Commission Expires Feb. 6, 1989

I Certify that State Tax is Paid
State Tax ... $ 413.00
Certificate Fee .50
Total Paid $ 413.50

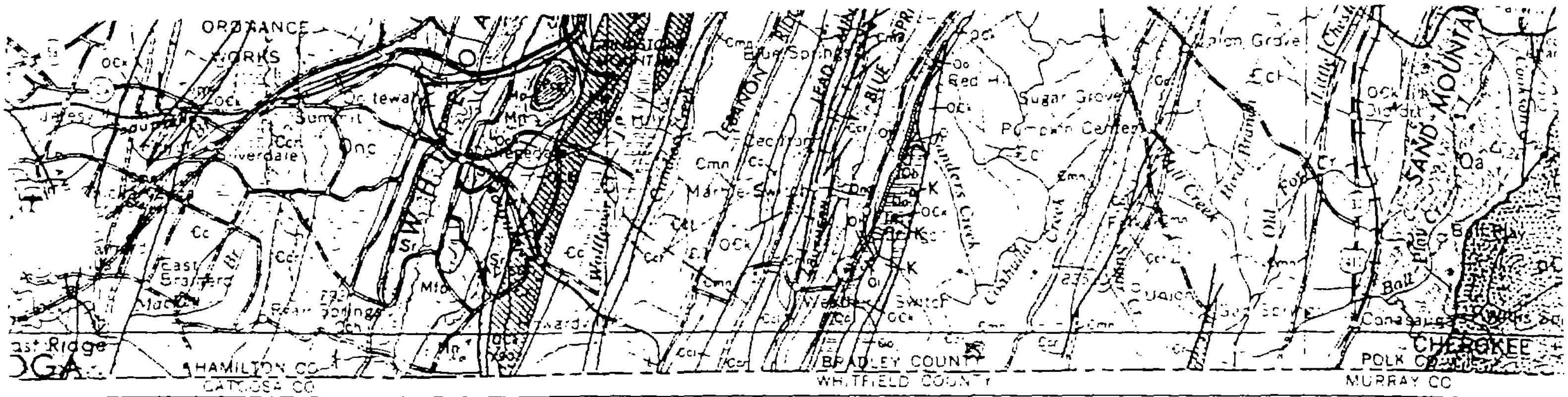
STATE OF TENNESSEE



146
5.18AC.
145
5.2AC.
145.01
7.89AC.
NO. 11
44
125.42 AC.
LIMITS
147
1.08AC.s
76
3.05AC.c
76.05
148
9.54AC.s
43
76.04
1.2 AC.
1.35 AC.
1.78 AC.
10.97AC
76.11
FEDERAL
LAWN ST.
76.06
388 AC.s
OLD NIOTA RD.
47.06
2.1AC.s
77
78
5.8AC.
76.07
76-1
1.12AC.
75.01
9.67 AC.
73
9.7AC.
79
6 AC.
76.02
2.79AC.
NO. 2
76.08
3.31AC.
EAST AVE.
75
6.2AC.
76.09
2.26AC.s
74
9 AC.
47.07
2.8AC.s
76.03
4AC.s
1AC.s
76.10
THENS
SEE 1" = 100'
DUGGAN ADDITION
1" = 100' MAPS
118
122
3AC.

Site Investigation
For
NGK Metals

Reference 8
Geologic Map of Tennessee, East-Central Sheet



EAST–CENTRAL SHEET

GEOLOGIC MAP OF TENNESSEE

1966

WILLIAM D. HARDEMAN
STATE GEOLOGIST

Scale 1:250,000

5 0 5 10 Statute Miles

CONTOUR INTERVAL 100 FEET WITH SUPPLEMENTARY CONTOURS AT 50-FOOT INTERVALS

EXPLANATION

CUMBERLAND PLATEAU AND VALLEY AND RIDGE

CSO

...ian, Devonian, and ...tions

...containing all or portions ...the Chattanooga, Rockwood

Mp — **Pennington Formation**
Highly variegated clay shale distinctive, contains siltstone and locally gray, fine-grained sandstone Thickness 200 to 700 feet

Mn — **Newman Limestone**
Gray limestone sequence near Cumberland Plateau and on Whiteoak Mountain Shaly limestone, shale, siltstone, and sandstone on Chilhowee Mountain Thickness about 700 feet

Mfp — **Fort Payne Formation**
Bedded chert, calcareous and dolomitic, somewhat crinoidal and minor shale Thin green shale Maury at base Average thickness about 200 feet

Mg — **Grainger Formation**
Gray to green shale with siltstone and fine-grained glauconitic sandstone in some areas quartz-pebble conglomerate. Thickness about 1,200 feet.

Greasy Cove Formation
Gray argillaceous limestone, calcareous shale, siltstone, and fine-grained sandstone Equivalent to Newman Limestone Maximum preserved thickness about 200 feet

Mgg (Greasy Cove and Grainger Formations)

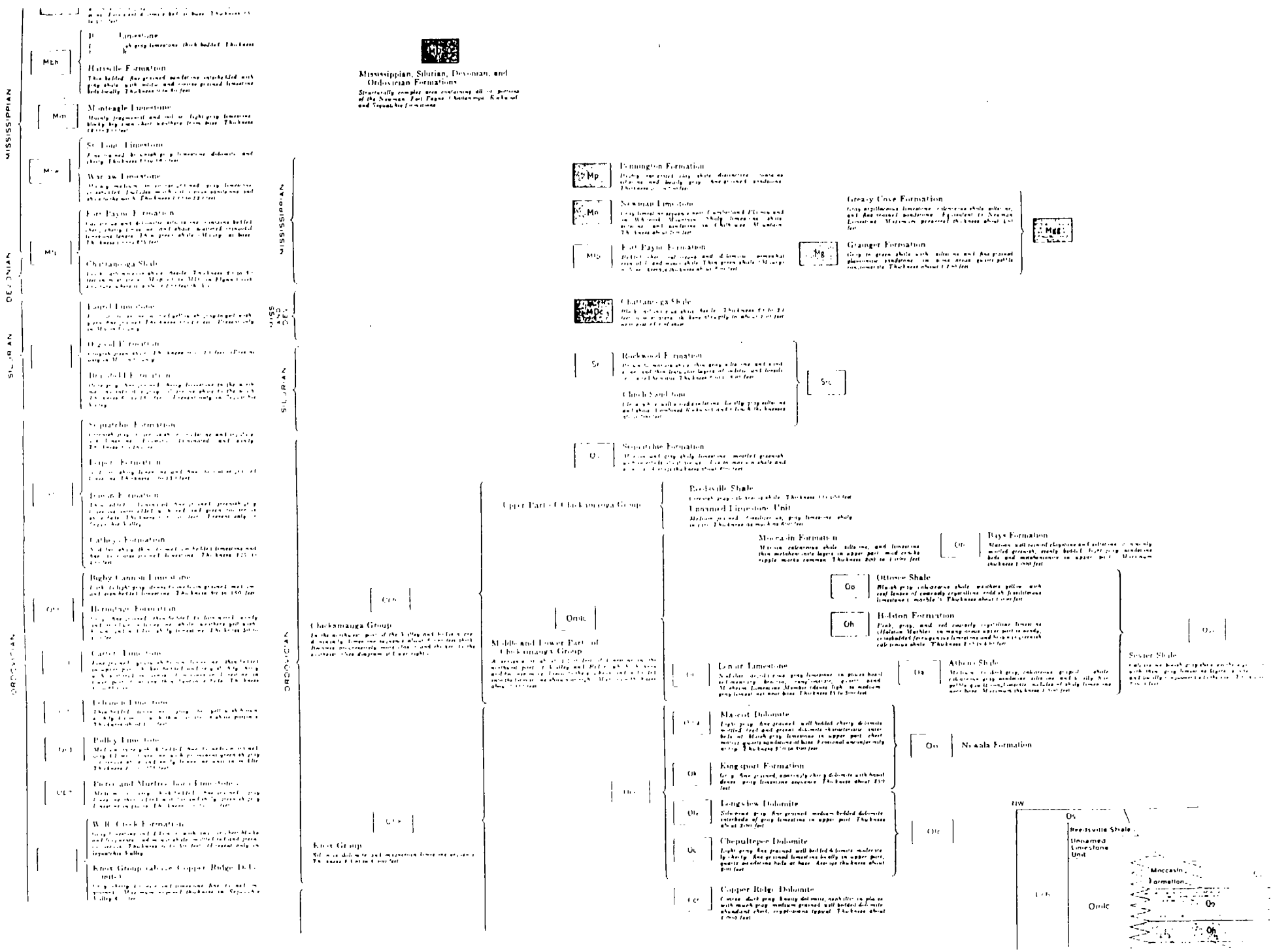
MDc — **Chattanooga Shale**
Black carbonaceous shale fissile Thickness 20 to 30 feet in most areas thickens abruptly to about 100 feet near east edge of sheet

Sr — **Rockwood Formation**
Brown to maroon shale, thin gray siltstone and sandstone, and thin lenticular layers of oolitic and fossiliferous red hematite Thickness 200 to 800 feet.

Clinch Sandstone
Clean, white, well-sorted sandstone, locally gray siltstone and shale Combined Rockwood and Clinch thicknesses about 700 feet

Src (Rockwood Formation and Clinch Sandstone)

Sequatchie Formation



Mississippian, Silurian, Devonian, and Ordovician Formations
Structurally complex area containing all or portions of the Newman, Fort Payne, Chattanooga, Rockwood and Sequatchie Formations
MISSISSIPPIAN
DEVONIAN
SILURIAN
ORDOVICIAN
Mbh
Hartselle Formation
Mm
Monteagle Limestone
Mw
St. Louis Limestone
Warsaw Limestone
Mfp
Fort Payne Formation
Chattanooga Shale
Sequatchie Formation
Lenoir Formation
Bigby Cannon Limestone
Hermitage Formation
Carter Limestone
Pulley Limestone
Pierce and Murfree Bore Limestone
Wall Creek Formation
Knox Group (above Copper Ridge Dolomite)
Mp
Pennington Formation
Mn
Newman Limestone
Mfp
Fort Payne Formation
Mg
Grainger Formation
Mgg
Greasy Cove Formation
MDc
Chattanooga Shale
Sr
Rockwood Formation
Clinch Sandstone
Src
Os
Sequatchie Formation
Upper Part of Chickamauga Group
Reedsville Shale
Unnamed Limestone Unit
Moccasin Formation
Oh
Bays Formation
Oo
Ottosee Shale
Oh
Holston Formation
Ol
Lenoir Limestone
Oa
Athens Shale
Sevier Shale
Oc
Chickamauga Group
Omlc
Middle and Lower Part of Chickamauga Group
Ok
Mascot Dolomite
Ok
Kingsport Formation
Ol
Longview Dolomite
Oc
Chepultepec Dolomite
Oc
Copper Ridge Dolomite
Oo
Nowala Formation
Olc
Knox Group
NW
Os
Reedsville Shale
Unnamed Limestone Unit
Moccasin Formation
Oh
Omlc
Oo
Oh

Rockwood
COALING GROUNDS RIDGE
PHILLIPS RIDGE
BACON RIDGE
ROANE
PAINT ROCK RIDGE
TENNESSEE
RIVER
KARNS CREEK RIDGE
Athens
MOUNTAIN

State of Tennessee

DEPARTMENT OF CONSERVATION

DIVISION OF GEOLOGY

BULLETIN 58

PART I

GROUNDWATER RESOURCES OF EAST TENNESSEE

By

G. D. DeBUCHANANNE

and

R. M. RICHARDSON

Prepared in cooperation with the U. S. Geological Survey

NASHVILLE, TENNESSEE

1956

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth of water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
141	2 mi. NE.	Swafford		Valley	710	18		48	Dolomite	Oma	12		D			D	Well reported never dry in 60 years.
	RICEVILLE																
142	1½ mi. S.	Perkinson		do.	755	50	50	6	Shale	Ꞓc	20	6/49	J			D,S	
143	2½ mi. SW.	Charles Buckner		Slope	740	80		6	Dolomite	Ꞓcr			L			D	
	CALHOUN																
144	3 mi. N.	O. G. Ramsey		Valley	800				do.	On			J			D,S	Water always muddy.
145	4 mi. E.	Swafford		do.	840	20		36	Limestone	Oo	10	6/49	B			D	
	RICEVILLE																
146-S	5½ mi. SE.	H. L. Shamblin		Slope	760				Dolomite	O-Ꞓk				65	60	D	
147	4 mi. SE.	Virgil Key		do.	860	54	3	6	Limestone	Oo	45		B			D	
148	3 mi. SE.	Lloyd Gibson	J. Dodson	Valley	780		8	6	do.	Oo	13		B			D	
149	2 mi. SE.	McKamey		do.	780	50	40	8	Dolomite	Oma	42	6/49	J			D	
	CALHOUN																
150	2 mi. NW.	J. F. Moore		do.	850	30		36	Shale	Ꞓc	15	7/49	J			D	
151-S	4 mi. NW.	Andrew		do.	700				Dolomite	O-Ꞓk				35	60	D	
152-S	4½ mi. N.	J. A. Bacon		do.	720				Shale	Ꞓc				85	60	D	
153	4½ mi. NW.	O. F. Michaels		Slope	800	29		36	Dolomite	O-Ꞓk	10		B			D	
	BIG SPRING																
154-S	5½ mi. E.			do.	730				Shale	Ꞓc				175	58	D	
155	5 mi. SE.	Bradford		Valley	710	30		3	do.	Ꞓc	10	6/49				D	Well reported to go dry every year.
156	3½ mi. E.	Hill		Slope	880	31		49	Dolomite	O-Ꞓk	17		B			D	
157	5½ mi. E.	Hills View School	Biegler	Valley	710	90	90		Shale	Ꞓc	60	8/49	J			P	
	RICEVILLE																
158-S	4 mi. W.	James O'Wright		do.	800				Dolomite	O-Ꞓk				2	60	D	
159-S	5½ mi. W.	G. Swafford		do.	735				Sandstone	Ꞓrs				8	60	D	
160	4½ mi. NW.	D. E. McKinney		do.	745	19		48	Shale	Ꞓc	13		P			D	
161-S	6½ mi. NW.	C. A. Vaughn		do.	840				Dolomite	O-Ꞓk				8	60	D	
	TEN MILE																
162-S	4 mi. S.	D. J. Steener		Slope	855				Limestone	Olme				2	60	D	
163-S	5½ mi. S.	Mrs. N. J. Kennedy		do.	790				Shale	Ꞓr				4	65	D	
164-S	6 mi. S.	Ed Elliott		do.	790				Dolomite	O-Ꞓk				7	61	D	
	DECATUR																
165-S	4 mi. E.	W. C. Arnold		Valley	860				Shale	Ꞓr				4	60	D	
166-S	5 mi. E.	Olie H. Goins		Slope	1,000				do.	Ꞓr				2	60	D	
167	6½ mi. E.	T. F. McKinney		do.	880	23		60	do.	Ꞓc	15		B			D	
168	7 mi. E.	Clyde Hutsell		do.	920	80		6	do.	Ꞓr	75		J			D	
	SIOTA																
169	6 mi. NW.	W. A. Brown	Jim Harrell	do.	925	49	8	6	Dolomite	Oc	45	6/49	J			D	
170	6 mi. W.	Earl Simpson		do.	975	40		48	do.	O-Ꞓk	20	6/49	J			D	
171	5½ mi. W.	R. H. Lingefelt		Valley	990	25		36	Shale	Ꞓc	20		J			D,S	
	DECATUR																
172	6 mi. E.	E. B. Bohanon	Jim Harrell	do.	915	65		6	do.	Ꞓc	50	6/49	B			D	
173	2 mi. E.	Ray Womac		Ridge	955	26			Dolomite	O-Ꞓk	84		B			D	
	ERIE																
174	2 mi. SW.	Albert Clower		Slope	860	14		10	Shale	Ꞓr	7		P			D	
175	1½ mi. SE.	R. C. Wilkes		do.	1,060	40			Dolomite	Oc	25		J			D	
	MT. VERNON																
176	3 mi. SW.	Sherman Lowe		do.	1,020	15			Shale	On	12		B			D,S	

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
104	3 mi. NW.	Mt. Lebanon School		Slope	870	75	51	6	Shale	Ꞓc	50		L		59	P	
105	1½ mi. NW.	W. L. Davis		Hilltop	800	27		36	do.	Ꞓc	15		L		60	D,S	
	ATHENS																
106	2½ mi. W.	Sam Elder		Valley	810	100		6	do.	Ꞓc			J			D,S	
107	2½ mi. NW.	The Russell School		do.	830	75		6	do.	Ꞓc	40		L		59	P	
108	4 mi. NW.	Glen Allen	Godsey	Ridge	1,000	179	60	6	Dolomite	Oe	70		L			D	
109-S	5½ mi. W.	A. C. Stanford		Valley	840				do.	O-Ꞓk				250	57	D	Water slightly turbid.
110-S	do.	Dallas Vincent		do.	820				Shale	Ꞓc				250	52	D	
	DECATUR																
111	3 mi. SE.	J. C. Vincent		Slope	900	60		36	Dolomite	O-Ꞓk	48		L			D	
	RIDEVILLE																
112-S	4 mi. N.	Luther Lewis		do.	850				Shale	Ꞓc				475	58	D	
113	5½ mi. NW.	Pine Hill School		Hilltop	800	42			do.	Ꞓc			L			P	
114	2 mi. E.	M. C. Melton		Valley	800	47		6	Dolomite	Oma	17		T			D,S	
115-S	do.	Bill Davis		do.	800				do.	Oma				500	58	D	Spring occasionally flooded by stream.
116-S	do.	do.		do.	790				do.	Oma				1,500	58		
117-S	2½ mi. S.	Fred and Charles Parkinson		do.	750				do.	Ok				500	55	D	
118-S	do.	H. F. Parkinson		do.	750				do.	Oma				500	58	S	
119	4 mi. E.	O. M. Hay		Ridge	1,020	90		6	Limestone	Ob	50		J		60	D,S	Water sample analyzed.
120	do.	Gus Thompson		do.	1,040	112		6	do.	Ob	40		B			D	Water becomes muddy in rainy weather.
121	do.	Poplar Hill School		Valley	880	115		6	Shale	Oa			L			P	
	ATHENS																
122-S	2½ mi. SW.	Cedar Springs		do.	830				Dolomite	Oma				200	60	D	
123	1½ mi. S	Jesse H. Guinn	Godsey	Slope	900	128		6	Limestone	Oo	60		L			D	
124	3 mi. S.	C. Underdown		do.	86			4	do.	Oo	40		L			D	
	ENGLEWOOD																
125	3 mi. SW.	Zion Hill School		Valley	840	54		6	Shale	Ꞓc	18		L		59	P	
126-S	1 mi. W.	John Payne		Slope	840				do.	Ꞓc				175	59	D	
127	3½ mi. W.	Fred Peel		do.	910	25		36	do.	Ꞓc	15		L		59	D	
128	2½ mi. W.	Robert Hutson		do.		36		36	do.	Ꞓc	20		J			D	
129	3 mi. W.	R. M. Harriel	Jim Harrell	do.		107	20	6	Dolomite	Oe	45		T			D	
	BIG SPRING																
130-S	5½ mi. E.	Whiteside Spring		Valley	780				do.	O-Ꞓk				500	59	S	Water sample analyzed.
	DECATUR																
131-S	4 mi. S.	McCorkle Spring		do.	830				Limestone	Olmc				1,000	59		Water slightly milky.
	ATHENS																
132	In town	Mayfield Creamery		Slope	880	120		6	Dolomite	Oma			T	100		In	
	NIOTA																
133-S	1½ mi. SW.	Glenn Spring		Valley	910				Limestone	Ol				300	59	D	
	CALHOUN																
134	½ mi. E.	Mrs. Lewis		Slope	745	75		24	Dolomite	Oe	50		B			D	
	CHARLESTON																
135	2 mi. SE.	Ralph Green		Hilltop	745	49		24	Shale	Oa	28		B			D	
	CALHOUN																
136-S	3 mi. E.	R. A. McBrian		Valley	800				Limestone	Ob				4	60	D	
137	4½ mi. SE.	Harrison		Slope	805	31		36	Dolomite	O-Ꞓk	15		B			D	
138	5 mi. E.	Fred Clark		Valley	795	31		36	do.	O-Ꞓk	17		B			D	
139	6 mi. E	G. W. Burns		Ridge	785	50		6	Shale	Ꞓc	18	6/49	J			D	
140-S	3½ mi. E.	Lena Burns		Valley	740				Limestone	Oo				2	60	D	

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	ATHENS																
77	In town	Mayfield Creamery	Herb Hairrell	Slope	860	84	30	6	Shale	Ꞓa	10	...	T	135	60	In	
78-S	3½ mi. SE.	J. Clayton	.....	do.	800	...	...	...	do.	Ꞓc	...	...	...	25	60		
	NIOTA																
79	3 mi. SE.	Mt. Harmony School	.....	Hilltop	1,010	60	...	6	do.	Ꞓa	30	...	J	...	...	P	
80-S	do.	A. Jackson	.....	Valley	970	...	...	...	do.	Ꞓa	...	...	...	20	60	S	
	ATHENS																
81	3 mi. NE.	J. R. Hicks	.....	Slope	980	60	...	6	do.	Ꞓa	30	...	L	...	60	D	
	ENGLEWOOD																
82	In town	City of Englewood	Herb Hairrell	Valley	860	139	106	8	do.	Ꞓc	30	...	T	90	59	P	Well tested at 90 gpm for 24 hours. Water sample analysed.
	ATHENS																
83	2 mi. NE.	R. T. Chambers	.....	Hilltop	1,020	70	...	36	Dolomite	Oc	65	...	J	...	...	D	
	NIOTA																
84	2½ mi. E.	Geo. L. Thomas	Godsey	Valley	1,000	127	...	6	do.	Oc	50	...	J	...	59	D,S	
	ATHENS																
85	3½ mi. N.	N. Liberty School	.....	do.	840	70	...	6	Shale	Ꞓc	...	...	L	...	59	P	
	NIOTA																
86	3½ mi. SE.	W. H. Torbett	.....	do.	980	68	...	6	do.	Ꞓa	28	...	J	...	59	D,S	Water sample analysed.
	ENGLEWOOD																
87	2 mi. NW.	Oak Grove School	.....	Slope	850	50	...	36	do.	Ꞓc	...	...	P	...	60	Ab	
88-S	do.	Cooper's Cave Spring	.....	Valley	860	...	...	...	Dolomite	Ꞓcr	...	...	...	900	59	S	
89-1	do.	Mart Shoemaker	.....	Hilltop	890	259	...	6	do.	Ꞓcr	80	...	L	...	58	S	
	ATHENS																
89-2	4½ mi. E.	do.	Jim Hairrell	do.	880	136	35	3	do.	Ꞓcr	38	...	L	...	59	S	
	RICEVILLE																
90	In town	Riceville School	.....	Valley	800	60	...	6	do.	Oen	20	...	T	...	60	P	Well supplies 300 students. Water sample analysed.
	DECATUR																
91	5 mi. SE.	Idlewild School	.....	do.	800	22	22	24	Shale	Ꞓc	5		L	...	...	P	
	RICEVILLE																
92-S	1 mi. NW.	Thompson Spring	.....	do.	760	...	...	...	do.	Ꞓc	...	...	...	1,800	58	D	
93-S	2 mi. W.	Peck Spring	.....	do.	820	...			do.	Ꞓc	...	...	...	250	58	D,S	Water sample analysed.
94-S	5 mi. N.	Ward Spring	.....	do.	780	...			Dolomite	O-Ꞓk	...	...	...	500	57	D,S	
	DECATUR																
95	4½ mi. SE.	Sam Wade	.....	Hilltop	820	75	24	6	Shale	Ꞓc	20	...				D	
	RICEVILLE																
96-S	3½ mi. NE.	Cate Spring	.....	Slope	780	...	...	...	do.	Ꞓc	...	...	...	1,000	57	D,S	
97	3½ mi. N.	Underwood Heirs	.....	do.	820	18	...	6	do.	Ꞓc	15	...	P			D	
98-S	5 mi. N.	Jess Norwood	.....	Valley	800	...	...	...	do.	Ꞓc	...	...	...	200	58	D	
	ATHENS																
99	4 mi. W.	Mouse Creek School	.....	Slope	900	50	...	...	do.	Ꞓc	...	...	L	...	60	P	
100-S	3 mi. W.	Arnett Cave	.....	Valley	840	...		...	do.	Ꞓc	...	...	...	1,000	...	D	
	RICEVILLE																
101	4 mi. N.	Albert King	.....	Slope	870	64	65	12	Dolomite	O-Ꞓk	25	3/49	B	...	60	D,S	
102-S	3½ mi. N.	W. T. Roberts	.....	Valley	820	...	...	...	Shale	Ꞓc	...	...	...	100	59	D,S	
103-S	do.	L. J. King	.....	do.	830	...	...	...	do.	Ꞓc	...	...	...	150	55	D	

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
38-S	2 mi. NW.	Denton Spring		Valley	900				Shale	Ꞓc				300	59	D,S	
39	2½ mi. W.	Harry Evans	Jim Harrell	Hilltop	870	36	30	6	do.	Ꞓc	29		J			D	
40-S	2½ mi. W.	Armvine Spring		Valley	900				Dolomite	Oc				400	58	D	
41	do.	Cas Henderson	Jim Harrell	do.	940	111	96	6	do.	Oc	0		J			D,S	Flowing well.
42	4 mi. NW.	H. J. Wagner		do.	1,025	31			do.	Ꞓcr	2		L			D,S	
43	2½ mi. NW.	J. B. Smith		Hilltop	960	25			Shale	Ꞓc	22		B			D	
	ERIE																
44	2½ mi. SW.	J. B. Terry	Jim Harrell	Slope	920	51	30	6	Dolomite	Ꞓcr			J			D	
45	2½ mi. SW.	Mac Heskell	do.	do.	940	124		6	Shale	Ꞓc	4		J			D	
	ETOWAH																
46-1	In town	City of Etowah		Valley	840	250		8	do.	Oa			T	150		P	Well reported to flow when not being pumped.
46-2	do.	do.		do.	840	250		8	do.	Oa			T	35		P	Do.
46-3	do.	do.		do.	820	250		6	do.	Oa			T	40		P	Do.
46-4	do.	do.		do.	840	401		8	do.	Oa	11		T	150		P	
47-S	1½ mi. S.	Fowler Spring		do.	760				do.	Ꞓc				250	60	P	
48	do.	Chilhowee Motor Court		do.	800	92		6	Dolomite	O-Ꞓk	77		J	5	60	In	
49-S	2½ mi. N.	Crockett Spring		do.	870				do.	Oa				500	60	S	
50	do.	W. F. Moses		Slope	900	30		6	Shale	Oa	15		L		60	D	
51-S	2 mi. SE.	Tuggle Spring		Valley	780				do.	Ꞓc				500	57	D,S	
52-S	do.	Meshadden Spring		do.	840				do.	Ꞓc				500	57	D,S	
53-S	3 mi. S.	Cave Spring		do.	860				Dolomite	O-Ꞓk				1,000	55	D,S	
	DELANO																
54-S	3 mi. W.	Dodd Spring		do.	750				do.	O-Ꞓk				1,000	59	D,S	
55-S	do.	J. H. Trow		do.	760				do.	O-Ꞓk				200	59	D	

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	ETOWAH																
56-S	4½ mi. W.	Ford Elrod		Hilltop	800				Shale	Ꞓc				8	57	D	
57	3 mi. E.	Conasauga School		do.		50			do.	Oa	30		L		59	P	
58	4 mi. E.	W. L. Tallant		Slope	840	26		6	do.	Oa	12	12/48	B		62	D	Water sample analyzed.
	MT. VERNON																
59-S	6 mi. S.	White Cliff		Valley	1,900				do.	ocm				20			
	ETOWAH																
60	1½ mi. N.	J. L. Bain		Slope	880	50		6	do.	Oa	6	1/49	P			D	
61	2½ mi. N.	L. S. Blair	Herb Harrell	do.	900	100	78	6	Dolomite	Oc	60		J			D	
62-S	3 mi. N.	Chestnut Spring		Valley	800				do.	Ꞓcr				1,000	57		
63	2½ mi. NW.	Wesleyana School		Slope	800	60		6	Shale	Ꞓc			L		58	P	
64	do.	Alec Humphries		Valley	760	17		36	do.	Ꞓc	3	1/49	B			D	
65	3½ mi. W.	Gravel Hill School		do.	860	75		6	do.	Ꞓc			L			P	
66	3 mi. W.	J. E. Ross		do.	780	34	35	24	Dolomite	Ꞓcr	29	1/49	B			D	
67-S	3 mi. W.	G. E. Ross		do.	770				do.	O-Ꞓk				100	5	S	
68-S	2 mi. W.	Good Spring		do.	860				Limestone	Oh				50	57	D	
	DELANO																
69	4½ mi. NW.	C. F. Rowland		do.	770	13	12	24	Shale	Ꞓc	0	1/49	B			D	
70	4 mi. NW.	J. L. Rowland		Hilltop	790	20	27	24	do.	Ꞓc	15	1/49				D	
71	2 mi. N.	Carlock School		Slope	780	100		6	Dolomite	O-Ꞓk			J		61	P	
	ATHENS																
72-S-1	In town	Ingleside Spring		Valley	850				do.	Ok				1,500	58	P	Owned by Commissioners Athens Board of Water Works. Water sample analyzed.
72-S-2	do.	do.		do.	850				do.	Ok				350	59	P	Do.
73	do.	Athens Table Co.	Bayless	Slope	950	420		6	do.	Oc	60		L	25	59	In	
74	do.	Athens Hosiery Mill		Valley	960	125	125	6	do.	Ꞓcr	95		T	25	60	In	
75-S	2 mi. NW.	Guthrie Spring		do.	840				do.	Ꞓcr				1,000	55	D	
	ETOWAH																
76	4 mi. N.	F. P. Cantrell		Hilltop	860	48	40	6	Shale	Ꞓc	23		L			D	

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY

Shown on Plates 7, 8, 13, and 14

Method of lift: A, air lift; B, bucket; C, centrifugal; J, jet pump; L, lift pump; P, pitcher pump; T, turbine pump.
Use of water: Ab, abandoned; D, domestic; In, industrial; Ir, irrigation; P, public supply; S, stock

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth of water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	NIOTA																
1-S	4 mi. NE.	Ball Spring		Valley	990				Dolomite	Ꞓcr				150	58	D	Spring subject to flooding by stream.
2	3½ mi. E.	Ford Miller		Hilltop	1,180	36			Graywacke	ꞓcl	26	6/48	B			D	
3	3 mi. E.	Mrs. H. J. Dougnerty	Hugh Armstrong	Slope	1,020	40		5	Limestone	Ol			J			D	
4	4 mi. E.	J. L. Barker	Bob Harold	do.	1,030	38		6	do.	Ol	20		L	6		D	
	ERIE																
5	3 mi. SE.			Valley	990			6	Dolomite	Olv				10	58	Ab	Flowing well. Water sample analyzed.
6	4 mi. S.	Clyde Foster	J. M. Godsey	Slope	1,020	62	60	6	Shale	Ꞓc	30		J			D,S	Water occasionally muddy.
7-S	2½ mi. E.	Malone Spring		Valley					Dolomite	Oma				500	59	D,S	
	ENGLEWOOD																
8-S	1½ mi. N.	Jim Barnett		Slope					do.	Oc		9/45		255			
9	4 mi. N.	Newt Hicks	Jim Hairrell	do.	940	30	2	6	do.	Ꞓcr	6		J			D,S	
10	2 mi. N.	Gordon Kinser	J. M. Godsey	do.	900	47	25	6	Shale	Ꞓc	23		J	10		D,S	Water becomes muddy after prolonged pumping.
11	In town	Mack Reynolds		Valley	880	180		8	do.	Ꞓc			L	25		In	
12-S	2 mi. N.	Hicks-Brown		do.	810				do.	Ꞓc				488	60	D,S	
13-1	In town	Mack Reynolds		do.	880	183		6	do.	Ꞓc	183		J	25		P	
13-2	do.	do.		do.	860	140		6	do.	Ꞓc	25		T	50		D,In	
13-3	do.	Englewood Water Works		do.	880	300		8	do.	Ꞓc			T			In, P	
13-4	do.	do.		do.	880	200		8	do.	Ꞓc			T			P	
14	3 mi. NE.	Ida McClung		do.	900	54	40	6	do.	Ꞓc	25		J			D,S	
15	1½ mi. E.	J. F. Hamilton		Hilltop	860	20			do.	Ꞓc	16		P	3	61	D	
16	1 mi. S.	E. W. Bryant	Jim Hairrell	Valley		34		6	Dolomite	Ꞓcr	23		J	4		D	
17-S	3 mi. E.	Arthur Hamilton		do.	850				do.	Ꞓcr		9/45		171	60	S	
18	2 mi. SE.	John R. Miller	Jim Hairrell	Hilltop		56	18		do.	On	47		L	3		D	Water occasionally muddy.
19	1 mi. SE.	W. H. Lee	Maxwelroy a	do.		90	18	6	do.	Ꞓcr	84		B			D	
20	3 mi. N.	James Howell	Jim Hairrell	Slope		125		6	do.	Ꞓcr			J			D,S	
	ERIE																
21	3½ mi. SE.	E. C. Anderson		Valley	980	45			do.	Ok	30		J			D,S	
22	2½ mi. S.	Joe McClure	J. M. Godsey	Slope	970	45	30	6	Shale	Ꞓc	23		J	10		D,S	
23	4 mi. S.	Iru Haun		Valley	1,060	23			Dolomite	Oc	12		J			D,S	
24	do	J. M. Godsey	J. M. Godsey	do.	1,020	110	100	6	do.	Oma			J			D,S	
	SWEETWATER																
25	3½ mi. SW.	John Thomas		Hilltop	970	54		6	do.	Oma	29	4/48	J	5		D	Well can be pumped dry in 30 minutes.
26	4½ mi. SW.	Ralph A. Sutherland	Jim Hairrell	do.	1,020	57	40	6	Shale	Ꞓc	29		J	6		D,S	
	NIOTA																
27	3½ mi. N.	Sanford Anderson	J. M. Godsey	Slope	960	130		6	Dolomite	Oma	54		L	4	61	D,S	
28	2 mi. N.	R. L. Thomas	Walt Clemons	Valley	970	120		6	do.	Ꞓcr	30	6/48				D,S	
29	½ mi. E.	Town of Niota		Hilltop	1,000	316		6	Limestone	Ꞓma	17		T	25		P	
30	In town	Crescent Hosiery	J. M. Godsey	Valley	970	75	65	6	Shale	Ꞓa	20		T	55		In, P	Well tested at 85 gpm for 30 hours.
31	1 mi. SE.	Neel Knox	do.	Slope	1,040	72		6	Dolomite	Ꞓcr	20		J			D,S	
32-S	1 mi. W.	John Cates		Valley	940				do.	Oma				500		D	
33	3 mi. NE.	J. L. Burn	J. M. Godsey	Slope	970	100		6	Limestone	Ol	15		L	40		D,S	
34-S	3½ mi. NE.	Lee Gregory		Valley	1,000				Dolomite	Olv				150	59	D,S	
35	2½ mi. N.	Gus Roberts	Herb Hairrell	do.	1,080	195	100	5	do.	Oc	110		B			D	
36	2 mi. NE.	J. B. Wilson	Hugh Armstrong	Hilltop	1,010	86	20	6	Limestone	Ꞓcm	25		J			D,S	
37	1½ mi. E.	Alfred Stevens		Slope	1,100	60			Dolomite	Ꞓcr	22	8/48	B			D	

TABLE 51.—DISCHARGE MEASUREMENTS OF SELECTED SPRINGS IN McMINN COUNTY

Spring	Location	Date of measurement	Discharge (gpm)	Temperature (°F)		Remarks
				Air	Water	
Thompson (no. 92 S)	1 mile northwest of Riceville	3/28/31	1,210	54	57	Clear
		7/ 1/31	a2,000	91	59	Do.
		10/12/31	615	78	59	Do.
		6/19/50	1,221	86	60	Do.
		7/17/50	997	78	59	Do.
		8/14/50	1,001	81	59	Do
		9/14/50	1,236	73	59	Do.
		10/23/50	1,034	68	59	.....
		11/16/50	1,012	58	58	.....
		12/19/50	1,181	38	58	.....
		1/18/51	1,497	53	58	.....
		2/14/51	1,372	47	57	.....
		3/12/51	1,738	48	57	.....
		4/16/51	1,700	51	59	.....
		5/15/51	1,232	70	59	.....
		6/19/51	1,145	85	59	.....
Big	1 mile south of Niota	3/30/31	1,050	50	56	Cloudy
		7/ 2/31	754	86	60	Murky
		10/12/31	287	83	60	Clear
Kennedy	4 miles east of Decatur	4/ 3/31	970	61	56	Clear
		7/15/31	90	83	59	Do.
		11/ 2/31	31	57	57	Do.
Clear	8 miles north of Riceville	4/ 3/31	1,050	61	56	Clear
		7/15/31	531	89	59	Milky
		11/ 2/31	108	60	58	Clear
Ingleside (no. 72-S 1)	Athens	4/16/31	1,850	74	58	Clear
		7/ 1/31	1,270	78	59	Murky
		10/12/31	1,180	82	59	Clear
Fowler (no. 47-S)	1½ miles south of Etowah	4/16/31	1,340	74	59	Clear
		7/ 1/31	368	94	60	Do.
		10/29/31	375	55	59	Do.
Hicks Brown (no. 12 S)	2 miles north of Englewood	4/17/31	934	75	54	Clear
		7/ 1/31	620	90	60	Murky
		10/29/31	458	59	59	Muddy
		6/19/50	924	92	62	Clear
		7/17/50	829	88	63	Do
		8/14/50	802	88	61	Do.
		9/14/50	786	78	61	Do
		10/23/50	717	70	60	.....
		11/16/50	677	59	59	.....
		12/19/50	1,142	27	58	.....
		1/18/51	1,103	53	59	.....
		2/14/51	1,617	70	59	.....
		3/12/51	1,472	52	59	.....
		4/16/51	2,021	57	59	.....
		5/15/51	1,507	83	60	.....
		6/19/51	987	87	60	.....

a Rain raised lake level. Discharge too great

TABLE 51.—DISCHARGE MEASUREMENTS OF SELECTED SPRINGS IN McMINN COUNTY—Continued

Spring	Location	Date of measurement	Discharge (gpm)	Temperature (°F)		Remarks
				Air	Water	
Arnwine (no. 40 S)	3½ miles west of Niota	4/16/31	2,300	68	59	Clear
		7/ 1/31	1,290	88	59	Do.
		10/12/31	513	84	59	Do.
		6/19/50	1,823	87	63	Do.
		7/17/50	2,035	85	62	Do.
		8/14/50	1,648	85	62	Do
		9/14/50	3,069	87	62	Do.
		10/23/50	1,715	75	61	.....
		11/16/50	1,489	67	59	.....
		12/19/50	2,216	40	56	.....
		1/18/51	2,830	55	57	.....
		2/14/51	3,182	61	58	.....
		3/12/51	3,504	49	57	.....
		4/16/51	3,543	60	58	.....
		5/15/51	2,460	80	61	.....
		6/19/51	1,944	86	61	.....
Crockett (no. 49 S)	2½ miles north of Etowah	6/19/50	535	92	60	Clear
		7/17/50	362	88	60	Do
		8/14/50	261	84	60	Do
		9/14/50	562	83	60	Do
		10/23/50	305	72	60	.....
		11/16/50	190	63	60	.....
		12/19/50	590	35	58	.....
		1/18/51	549	57	58	.....
		2/14/51	789	66	59	.....
		3/12/51	979	51	59	.....
		4/16/51	986	68	59	.....
		5/15/51	504	83	60	.....
		6/19/51	321	86	59	.....
Dodd (no. 54 S)	3 miles west of Delano	6/19/50	1,321	88	60	Clear
		7/17/50	1,050	88	60	Do
		8/14/50	1,109	83	60	Do.
		9/14/50	1,409	79	60	Do.
		10/23/50	1,052	71	60	.....
		11/16/50	956	68	59	.....
		12/19/50	1,180	30	58	.....
		1/18/51	1,193	55	59	.....
		2/14/51	1,229	69	59	.....
		3/12/51	1,487	49	59	.....
		4/16/51	1,431	68	59	.....
		5/15/51	1,015	85	60	.....
		6/19/51	957	89	60	.....
Glenn (no. 133 S)	1½ miles southwest of Niota	6/19/50	1,813	86	61	Clear
		7/17/50	2,315	86	60	Do.
		8/14/50	1,978	83	59	Do.
		9/14/50	3,287	79	60	Do
		10/23/50	1,855	69	59	.....
		11/16/50	1,823	59	59	.....
		12/19/50	2,604	25	58	.....
		1/18/51	2,993	51	59	.....
		2/14/51	3,661	61	59	.....
		3/12/51	3,753	49	58	.....
		4/16/51	3,844	56	58	.....
		5/15/51	2,826	82	60	.....
		6/19/51	2,163	88	60	.....

Analyses of representative samples of ground water from McMinn County are given in table 56

McMinn County

(Area 435 square miles, population 32,021)

General Features

McMinn County lies in the south central part of the region covered by this report. It is somewhat triangular in outline and is bounded by Meigs, Bradley, Polk, Monroe, and Loudon Counties.

Athens, the county seat, is about 60 miles southwest of Knoxville and 55 miles northeast of Chattanooga, it has a population of 8,618. Englewood, Etowah, Niota, Calhoun, and Riceville are smaller towns and communities.

The county has excellent facilities for transportation. A main line of the Southern Railway System runs through the middle of the county, and a main line of the Louisville & Nashville Railroad runs through the eastern part. A branch line of the Louisville & Nashville Railroad from Englewood connects with the Southern Railway System at Athens. In addition to the excellent railroad facilities, paved U. S. Highway 11 crosses the middle of the county and U. S. Highway 411 runs through its eastern part. Paved State Highways 30 and 39 and all weather county roads cross the county from east to west.

The county is about equally divided between industry and agriculture. Industries include hosiery mills, stove works, roller mills, and others at Athens. Etowah, a division point on the Louisville & Nashville Railroad, is the home of hosiery mills and textile plants. Englewood has several hosiery mills and clothing manufacturing plants.

Geology

Most of McMinn County lies in the Valley and Ridge physiographic province, and the surface forms of alternating ridges and valleys are characteristic of this province. Part of Stone Mountain, in the extreme southeastern corner of the county, is in the Blue Ridge province.

The oldest rocks exposed are east of the Great Smoky fault. These rocks are of Early Cambrian or pre-Cambrian age and include the Sandsuck shale, the Cochran conglomerate and the Nichols shale. The rocks are predominantly clastic. Those lying above the Sandsuck shale are Early Cambrian in age.

The youngest consolidated rocks exposed in McMinn County are those of the Ottosee shale of Middle Ordovician age. The oldest rocks exposed in the portion of the county lying within the Valley and Ridge province are the sandstones and shales of the Rome formation of Early Cambrian age.

Ground Water

Ground water in McMinn County occurs principally in fractures in the underlying formations. The rocks have little or no primary porosity, but contain fractures caused by folding and faulting. In carbonate rocks, fractures are frequently enlarged by circulating ground water to a depth of about 300 feet. The siliceous rocks are less soluble and their fractures are rarely enlarged by solution. The fractures in siliceous rocks are usually open for the first few hundred feet, but at greater depth the weight of the overlying material tends to close them.

Five towns in McMinn County have public water supplies. Calhoun, Niota, and Englewood are supplied by wells; Etowah uses 4 wells and 1 spring, and Athens uses 2 springs.

Wells and springs are used by many of the industries. Most of the wells yield less than 100 gpm, but a few have higher yields. In rural areas, domestic supplies are obtained from wells and springs, many of which are equipped with electric pumps

Site Investigation
For
NGK Metals

Reference 10
Tennessee Division of Water Supply
Well Search for Athens, February, 2000

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY

RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE 0125NE TN

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 1 MCMINN	10700782	SHERLIN T SUNSET DR	04/15/1977	100 85	0	43 Steel	-				344
0125NE 1 MCMINN	10700829	TATE H	10/02/1977	80 65	10 25	22 Steel	-	Good			344 Residential
0125NE 1 MCMINN	10701165	DEBBIE KENNEDY MT VERD	07/17/1983 02/06/1985	205 160	5 67	42 Steel	Open Hole 42 - 205	Good	352958 843718	F	598 Residential
0125NE 1 MCMINN	10701234	RAY SEATON	08/21/1984	107 95	5 65	104 Plastic	Screen 104 - 107	Good	352730 843500		528 Monitor
0125NE 1 MCMINN	10701319	RAY ROBINSON MT VERD RD	10/20/1985	105 80	3 30	105 Steel	Slotted 95 - 100		352500 843500		630 Residential
0125NE 1 MCMINN	10701344	EARL EASTER FAIRVIEW RD	09/25/1986	185 80	20	21 Steel	Open Hole 21 - 185	Good	352730 843500		598 Residential
0125NE 1 MCMINN	10701426	DARRELL WALDEN OLD MT VERD RD	11/17/1986	95 90	7 30	83 Steel	Open Hole 83 - 95		352730 843500		630 Residential
0125NE 1 MCMINN	10701521	RONNIE WATSON MT VERD RD	03/07/1987	555 555	50 100	109 Steel	Open Hole 109 - 555	Good	352730 843500		598 Residential
0125NE 1 MCMINN	10701540	JOE PALMER HAYWOOD DR (OFF	07/29/1987	280 0	1 30	41 Steel	Open Hole 41 - 280	Good	352730 843500		598 Residential
0125NE 1 MCMINN	10701547	HARVEY LUNSFORD MT VERD RD	09/22/1987 04/26/1988	100 80	8 10	38 Steel	Open Hole 38 - 100		352924 843702	S	630 Residential
0125NE 1 MCMINN	10701731	ROBERT LEWIS CONGRESS PARKWA	01/06/1989	580 200	4 30	41 Steel	Open Hole -		352730 843500		598 Residential
0125NE 1 MCMINN	10701759	MIRACLE HOMES MT VERD	04/17/1989	465 485	5 120	76 Steel	Open Hole 76 - 465		352730 843500		608 Residential
0125NE 1 MCMINN	92003436	RON MILLER CO RD 252	07/13/1992	135 135	20 60	62 Steel	Open Hole 62 - 135	Unknown			598 Residential

TENNESSEE DEPARTMENT OF ENVIRONMENT AND C ERVATION - DIVISION OF WATER SUPPLY

RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE 0125NE TN

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 1 MCMINN	95005244 D0015539	JOHN RAMSEY HYDE	10/17/1995	225 210	30 80	146 Steel	Open Hole 146 - 225	Unknown			598 Residential
0125NE 1 MCMINN	96003713 D0020975	MICHAEL ALLMON HENRY RD	07/25/1996	565 480	3 120	105 Steel	Open Hole 105 - 565				608 Residential
0125NE 2 MCMINN	10701475	DANNY JOHNSON SLACK RD	07/31/1986	72 52	10	35 Steel	Open Hole 35 - 72	Good	352730 842730		623 Residential
0125NE 2 MCMINN	10701513	BOYD REYNOLDS OLD NOTIA RD	12/20/1986	145 80	3 40	49 Steel	Open Hole 49 - 145		352730 843230		598 Residential
0125NE 2 MCMINN	91002107	WILLIAM A MORGAN SR UPPER RIVER	12/12/1990	305 285	12 100	125 Steel	Open Hole 125 - 305	Unknown			598 Residential
0125NE 2 MCMINN	92000656	DANNY LYLES FAIRVIEW	01/19/1992	185 170	10 60	41 Steel	Open Hole 41 - 185	Unknown			598 Residential
0125NE 2 MCMINN	92000659	SAMUEL R NEIL OLD KINGSTON	08/02/1991	165 120	10 60	104 Steel	Open Hole 104 - 165	Unknown			598 Residential
0125NE 2 MCMINN	93000988	MARVIN MILLER FLAUN RD	01/16/1993	325 160	1 60	83 Steel	Open Hole 83 - 325				598 Residential
0125NE 2 MCMINN	93003375	RALPH HYDE KINGSTON HILL	08/17/1993	305 290	40 90	126 Steel	Open Hole 126 - 305	Unknown			598 Residential
0125NE 2 MCMINN	96003424 D0019200	ATHENS UTILITY DIST TELLICO AVE	08/15/1996 09/09/1996	322 34	15 12	98 Steel	Open Hole 98 - 322	Unknown 016571	352742 843415	F	571 Test
0125NE 2 MCMINN	96003425 D0021701	ATHENS UTILITY DIST OFF HWY 305	08/16/1996 09/09/1996	183 51	 20	77 Steel	Open Hole 77 - 183	 016573	352732 843424	F	571 Test
0125NE 2 MCMINN	96003426 D0021702	ATHENS UTILITY DIST TELLICO AVE	08/20/1996 09/09/1996	204 71	800 15	20 Steel	Open Hole 20 - 204	Unknown 016548	352748 843410	F	571 Test
0125NE 2 MCMINN	96003427 D0021703	ATHENS UTILITY DIST TELLICO AVE	08/21/1996 09/09/1996	163 63	800 15	83 Steel	Open Hole 83 - 163	Unknown 016549	352750 843405	F	571 Test

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY

RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE 0125NE TN

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 2	96003428	ATHENS UTILITY DIST	08/22/1996	182	15	20	Open Hole	Unknown	352743	F	571
MCMINN	D0021704	TELLICO AVE	09/09/1996	30	15	Steel	20 - 182	016550	843413		Test
0125NE 2	97000022	CITY OF ATHENS	12/09/1996	143	1400	83	Open Hole	Good	352751	F	571
MCMINN	D0021656	TELLICO AVE	07/10/1997	123	17	Steel	83 - 143	019009	843408		Municipal
0125NE 2	97000026	ATHENS UTILITY DISTR	12/02/1996	204	800	20	Slotted	Good	352748	F	571
MCMINN	D0021702	TELLICO AVE	07/10/1997	71	15	Steel	20 - 130	016548	843410		Test
0125NE 2	97004743	TERESA CARTER	09/22/1997	265	20	104	Open Hole	Unknown			598
MCMINN	D0024777	FAIRVIEW		250	80	Steel	104 - 265				Residential
0125NE 3	91000760	MIKE FRANK	05/25/1990	125	50	41		Unknown			598
MCMINN		OLD MADISONVILL		52	38		-				Residential
0125NE 3	92000434	JOHN LETHCO	08/21/1991	345	5	138	Open Hole				608
MCMINN				330	40	Plastic	138 - 345				Residential
0125NE 3	96000117	MARTY JENKINS	12/29/1995	345	4	99	Open Hole	Unknown			598
MCMINN	D0015562	GAMBLE RD		165	60	Steel	99 - 345				Residential
0125NE 3	96000886	GONZALEZ ROSALTA	02/29/1996	125	40	59	Open Hole	Unknown	352852	F	598
MCMINN	D0015571	CO RD 420 154	04/08/1997	55	20	Steel	59 - 125	019095	843023		Residential
0125NE 3	96003879	BILL BARBER	08/16/1996	165	6	83	Open Hole		352856	F	598
MCMINN	D0021158	CO RD 420 150	04/08/1997	125	60	Steel	83 - 165	019094	843023		Residential
0125NE 3	96004475	DEWAYNE SPURLIN	09/13/1996	385	3	146	Open Hole	Unknown	352815	F	598
MCMINN	D0022226	CO RD 422 290	10/21/1996	210	30	Steel	146 - 385	017976	843100		Residential
0125NE 3	96004477	WILLIAM M PEELER	09/27/1996	205	5	62	Open Hole	Unknown	352850	F	598
MCMINN	D0022234	CO RD 420 162	04/08/1997	84	20	Steel	62 - 205	019096	843022		Residential
0125NE 3	96005444	STACY LOW	11/21/1996	285	40	41	Open Hole	Unknown	352857	F	598
MCMINN	D0022263	CO RD 420	04/08/1997	135	20	Steel	41 - 285	019093	843030		Residential
0125NE 3	97000436	CHUCK JOHNSTON	02/04/1997	145	20	84	Open Hole	Unknown	352900	F	598
MCMINN	D0022277	GAMBLE	04/08/1997	130	40	Steel	84 - 145	019092	843022		Residential

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY

RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE 0125NE TN

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 3 MCMINN	98000991 D0032836	GARY JOHNSON 444 CO RD	03/31/1998	265 170	10 20	41 Steel	Open Hole 41 - 265	Unknown			598 Residential
0125NE 4 MCMINN	10700785	STEVENS J SHERWOOD DR	06/08/1977	70 62	0	40 Steel	-				344
0125NE 4 MCMINN	10701110	CITY OF ATHENS	08/26/1982	185 170	103 35	110 Steel	-	Good	352534 843524	S	598 Municipal
0125NE 4 MCMINN	10701219	EDNA SEWELL CONGRESS PKWY R	04/15/1984 03/19/1985	126 80	5	40 Steel	Open Hole 40 - 126	Good	352910 843513	S	598 Residential
0125NE 4 MCMINN	10701222	DON MELTON HI NO 11 OLD RD	06/06/1984 01/17/1985	366 340	15 500	243 Steel	Open Hole 243 - 366		352508 843912	F	598 Residential
0125NE 4 MCMINN	10701317	ROBERT PARKER SPRING CREEK	01/06/1986	250 210	25 40	124 Steel	Open Hole 124 - 250	Good	352500 843500		637 Residential
0125NE 4 MCMINN	10701391	JIM ADAMS TENN AVE	05/21/1986	505 200	5	82 Steel	Open Hole 82 - 505	Good	352500 843500		598 Residential
0125NE 4 MCMINN	10701428	DALE WOODS CO ROAD 709	09/23/1986	630 570	3 140	80 Steel	Open Hole 145 - 630	Good	352500 843500		637 Residential
0125NE 4 MCMINN	10701429	GENA WOODEN MT VERD	10/24/1986	510 215	8 60	87 Steel	Open Hole 87 - 510	Good	352500 843500		637 Residential
0125NE 4 MCMINN	10701432	PAT WALKER OFF MT VERD	09/25/1986	390 222	6 60	82 Steel	Open Hole 82 - 390	Good	352500 843500		637 Residential
0125NE 4 MCMINN	10701433	A R VAUGHN CEDAR SPRINGS	06/30/1986	250 160	12 38	42 Steel	Open Hole 42 - 250	Good	352500 843500		637 Residential
0125NE 4 MCMINN	10701435	CLAY TEAGUE LONG MILL RD	07/30/1986	125 105	25 40	71 Steel	Open Hole 71 - 125	Good	352500 843500		637 Residential
0125NE 4 MCMINN	10701437	SLOAN HOMES SUBURBAN HILLS	08/20/1986	435 430	25 90	130 Steel	Open Hole 130 - 435	Good	352500 843500		637 Residential

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY

RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE 0125NE TN

QUAD / NTH COUNTY		WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE MCMINN	4	10701442	RAY NORWOOD ROCKY MT	07/30/1986	165 130	8 8	21 Steel	Open Hole 21 - 165	Good	352500 843500		637 Residential
0125NE MCMINN	4	10701452	DON HARRIS ROGERS CREEK	04/11/1986	210 90	6 18	38 Steel	 38 - 210	Good	352500 843500		637 Residential
0125NE MCMINN	4	10701453	AMY FORREST CO ROAD 709	12/08/1986	450 230	6 80	100 Steel	Open Hole 100 - 450	Good	352500 843500		637 Residential
0125NE MCMINN	4	10701457	RONALD DOBB MT VERD RD	01/21/1986	310 285	15 78	98 Steel	Open Hole 98 - 310	Good	352500 843500		637 Residential
0125NE MCMINN	4	10701469	DOT ARMOUR HWY 30	07/19/1986	150 148	14 70	145 Steel	Open Hole 145 - 150	Good	352500 843500		637 Residential
0125NE MCMINN	4	10701512	LAMAR DUGGAN CRESTWOOD DR	04/11/1987	505 425	2 100	119 Steel	Open Hole 119 - 505	Good	352500 843500		598 Residential
0125NE MCMINN	4	10701570	KENNETH BLACK ELLIS RD	11/06/1987	180 175	50 40	29 Steel	Open Hole 29 - 180		352500 843500		598 Residential
0125NE MCMINN	4	10701571	GEORGIA GILBERT NEW ENGLEWOOD R	10/09/1987	200 190	20 40	87 Steel	Open Hole 87 - 200		352500 843500		598 Residential
0125NE MCMINN	4	10701729	CHURCH OF JESUS	12/29/1988	225 48	7	42 Steel	Open Hole 42 - 225	Good	352500 843500		1 Irrigation
0125NE MCMINN	4	91002348	DILMUS CRUISE LANDFILL	05/13/1991	175 160	15 80	157 Steel	Open Hole 157 - 175				608 Residential
0125NE MCMINN	4	92002202	GEORGE CLARK INGESIDE AVE	06/03/1992	800 400	2 100	87 Steel	Open Hole 87 - 800	Unknown			598 Residential
0125NE MCMINN	4	94000561 D0004607	CARL ANDERSON 139 CO RD 675	02/24/1994 06/27/1994	145 130	40 60	83 Steel	Open Hole 83 - 145	Unknown 008101	352445 843710	F	598 Residential
0125NE MCMINN	4	96003423 D0019199	CITY OF ATHENS HWY 305	08/13/1996 09/09/1996	322 27	 20	41 Steel	Open Hole 41 - 322	 016572	352708 843446	F	571 Test

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CC _RVATION - DIVISION OF WATER SUPPLY

RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE 0125NE TN

QUAD / NTH COUNTY		WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE MCMINN	4	99001467 D0030447	LARRY HICKS BLACKBURN RD	03/02/1999	365 250	10 100	230 Steel	Open Hole 230 - 365	Unknown			598 Residential
0125NE MCMINN	5	10701017	SHELTON	07/02/1981	390 0		42 Steel	-	Good	352712 843332	S	254 Residential
0125NE MCMINN	5	10701181	JOHN PATTERSON FAIRVIEW	11/14/1983 03/27/1985	215 210	10 50	42	Open Hole 42 - 215	Good	352712 335200	S	6 Other
0125NE MCMINN	5	10701184	GENE HAUN MT CUMBERLAND M	11/28/1983 11/19/1984	452 434	20 88	95	Open Hole 95 - 452	Good	353000 843500	S	6 Residential
0125NE MCMINN	5	10701240	DOUGLAS JOHNSON SLACK RD.	07/20/1984	90 55	15 20	35 Steel	Open Hole 35 - 90		352500 843230		528 Residential
0125NE MCMINN	5	10701249	KELLEY SHEPPARD OLD ENGLEWOOD R	09/19/1984	406 200	1	105 Steel	Open Hole 105 - 406	Good	352500 843230		598 Residential
0125NE MCMINN	5	10701250	WAYNE CARDEN OLD ENGLEWOOD R	09/14/1984	226 215	10	169 Steel	Open Hole 169 - 226		352500 843230		598 Residential
0125NE MCMINN	5	10701255	DAVID CHAMBERS HWY 11	08/16/1984	505 300	3	163 Steel	Open Hole 163 - 505	Good	352500 843230		598 Residential
0125NE MCMINN	5	10701284	JACK FUGATE FAIRVIEW RD	04/30/1985	185 170	15	83 Steel	Open Hole 83 - 185		352500 843230		598 Residential
0125NE MCMINN	5	10701364	JIM MAJORS OLD MADISONVILL	08/05/1985	405 375	20	63 Steel	Open Hole 63 - 405	Bad	352500 843230		10000 Residential
0125NE MCMINN	5	10701479	JAMES MAJORS OLD MADISONVILL	08/16/1985	405 380	12 40	41 Steel	Open Hole 41 - 405	Good	352500 843230		598 Residential
0125NE MCMINN	5	10701480	MIKE SMITH SLACK ROAD	06/30/1986	105 80	40 30	74 Steel	Open Hole 74 - 105	Good	352500 843230		598 Residential
0125NE MCMINN	5	10701635	DARREN GIBSON	06/28/1988	305 265	8 50	105 Steel	Open Hole 105 - 305	Good	352500 843230		608 Residential

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QUAD / NTH COUNTY		WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE	5	10701682	ALLEN GALYON	05/23/1988	195	30	61			352500		598
MCMINN			MADISONVILLE		150		Steel	1 - 195		843230		Residential
0125NE	5	10701684	GENE PILKEY	09/29/1988	160	40	126	Open Hole		352500		598
MCMINN			SLACK ROAD		155	60	Steel	126 - 160		843230		Residential
0125NE	5	10701742	STEVE MCCASLYN	04/29/1989	420	6	210	Open Hole		352500		598
MCMINN			BETWEEN MASHBUR		345	170	Steel	0 - 420		843230		Residential
0125NE	5	10701743	LARRY PATTERSON	05/02/1989	140	15	84	Open Hole		352500		598
MCMINN			FAIRVIEW ROAD		100	40	Steel	0 - 140		843230		Residential
0125NE	5	91000753	DAVID A SELF	12/05/1990	165	6	62	Open Hole	Unknown			598
MCMINN			ENGLEWOOD NOTIA		125	50	Steel	-				Residential
0125NE	5	91002127	TEDDY GRAVES	06/13/1991	305	3	146	Open Hole	Unknown			598
MCMINN			SLACK RD		220	100	Steel	146 - 305				Residential
0125NE	5	92000425	STEVE TALLENT	09/11/1991	365	5	159	Open Hole				608
MCMINN					350	100	Steel	159 - 365				Residential
0125NE	5	92000661	TOM COPPINGER	02/05/1992	125	30	83	Open Hole	Unknown			598
MCMINN			WILDWOOD		100	30	Steel	83 - 125				Residential
0125NE	5	92003430	JERRY W CAVRULL	09/17/1992	245	10	62	Open Hole	Unknown			598
MCMINN			SLACK RD		235	30	Steel	62 - 245				Residential
0125NE	5	93000763	EVELYN MOORE	11/21/1992	125	10	105	Open Hole				608
MCMINN			CUMBERLAND CHUR		110	40	Steel	105 - 125				Residential
0125NE	5	93001766	JOHN WILEY	01/29/1993	165	10	105	Open Hole				608
MCMINN			KELLY HILL		140	70	Steel	105 - 165				Residential
0125NE	5	93003369	STEVE BARNETT	08/12/1993	105	21	62	Open Hole	Good			598
MCMINN			OLD ETOWAH		90	30	Steel	62 - 105				Residential
0125NE	5	94000095	ED PRYOR	12/16/1993	185	10	83	Open Hole	Unknown			598
MCMINN		D0004595	SLACK		165	40	Steel	83 - 185				Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 5 MCMINN	94000566 D0004605	BOB MCCAY 583 CO RD 110	02/22/1994 08/09/1994	345 160	4 83	125 Steel	Open Hole 125 - 345	Unknown 010163	352455 843310	F	598 Residential
0125NE 5 MCMINN	94001353 D0004634	LINDA JONES 578	04/16/1994 08/09/1994	285 270	40 78	188 Steel	Open Hole 188 - 285	Unknown 010162	352525 843250	F	598 Residential
0125NE 5 MCMINN	94002042 D0008184	TRACY & KI WADE CO ROAD 574	06/06/1994	205 180	5 60	104 Steel	Open Hole 104 - 205	Unknown			598 Residential
0125NE 5 MCMINN	95002858 D0014068	KENNTH TILEY CO RD 439 335	06/15/1995 09/25/1995	205 185	15 90	104 Steel	Open Hole 104 - 205	Unknown 015359	352728 843306	F	598 Residential
0125NE 5 MCMINN	95003159 D0012690	TOM HUTH CO RD 576 153	07/14/1995 09/25/1995	365 162	4 67	125 Steel	Open Hole 125 - 365	Unknown 015354	352518 843300	F	598 Residential
0125NE 5 MCMINN	95003950 D0014031	GARY COLEMAN SLACK	08/02/1995	145 130	15 50	62 Steel	Open Hole 62 - 145	Unknown			598 Residential
0125NE 5 MCMINN	96001697 D0015592	STEVE SONGER HWY 39 EAST	04/17/1996	305 290	15 60	119 Steel	Open Hole 119 - 305	Unknown			598 Residential
0125NE 5 MCMINN	97001488 D0024801	DAVID CARROLL CO RD SLACK RD	04/10/1997	505 280	1 100	104 Steel	Open Hole 104 - 505	Unknown			598 Residential
0125NE 5 MCMINN	97001490 D0024807	HERMAN COLEMAN CO RD 435 201	04/24/1997	165 150	10 70	104 Steel	Open Hole 104 - 165	Unknown			598 Residential
0125NE 5 MCMINN	97002802 D0026193	JOEL WEBB RD 444	07/10/1997	385 360	20 80	179 Steel	Open Hole 179 - 385				608 Residential
0125NE 5 MCMINN	98001548 D0032842	CLAYTON JACKSON SLACK	04/24/1998	225 140	6 60	124 Steel	Open Hole 124 - 225	Unknown			598 Residential
0125NE 6 MCMINN	10701214	MANCIL F FAIRMAN OLD ENGLEWOOD N	05/05/1984 03/21/1985	166 160	25 499	60 Steel	Open Hole 60 - 160	Good	352830 843055	S	598 Residential
0125NE 6 MCMINN	10701310	DAVID MCCASLIN CUNNINGHAM	09/15/1985	390 340	25 70	210 Steel	Open Hole -	Good	352500 843000		637 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 6 MCMINN	10701446	BILLY MORROW MASHBORN	05/09/1986	290 260	3 60	80 Steel	Open Hole 80 - 290	Good	352500 843000		637 Residential
0125NE 6 MCMINN	10701447	GLENN MOSES SLACK	09/30/1986	105 86	18 22	41 Steel	Open Hole 41 - 105	Good	352500 843000		637 Residential
0125NE 6 MCMINN	10701451	JOHNSON REAL ES HOUSER HILL	08/11/1986	210 193	15 80	185 Steel	Open Hole 185 - 210	Good	352500 843000		637 Residential
0125NE 6 MCMINN	10701460	JAMES CURTIS SLACK	08/13/1986	210 180	15 42	90 Steel	Open Hole 90 - 210	Good	352500 843000		637 Residential
0125NE 6 MCMINN	10701464	GEORGE BAXTER NIOTA RD	06/03/1986	410 330	4 22	62 Steel	Open Hole 62 - 410	Good	352500 843000		637 Residential
0125NE 6 MCMINN	10701470	BOB AITSLATT OLD ENGLEWOOD	11/03/1986	105 98	40 16	69 Steel	Open Hole 69 - 105	Good	352500 843000		637 Residential
0125NE 6 MCMINN	10701516	DAVID BULL ENGLEWOOD NOTIA	01/10/1987	145 120	15 100	104 Steel	Open Hole 104 - 145		352500 843000		598 Farm
0125NE 6 MCMINN	10701517	DAVID BULL MANILLA	01/12/1987	300 289	15 170	167 Steel	Open Hole 167 - 200		352500 843000		598 Residential
0125NE 6 MCMINN	10701545	LARRY DOCKERY ZOIN HILL	08/15/1987	180 160	20 70	62 Steel	Open Hole 62 - 180	Good	352500 843230		598 Residential
0125NE 6 MCMINN	10701628	BILLY JOE KNOX	03/12/1988	285 265	15 150	168 Steel	Open Hole 168 - 285		352500 843000		608 Residential
0125NE 6 MCMINN	10701658	GEORGE BELCHER BLACK CHAPEL RD	11/22/1987	230 200	10 110	103 Steel	Open Hole 103 - 230	Good	352500 843000		630 Residential
0125NE 6 MCMINN	10701785	JEFF RUESSLL ROCKY MT	06/30/1989	125 70	2 25	32 Steel	Open Hole 32 - 125		352500 840000		598 Residential
0125NE 6 MCMINN	90000951	JOHN HALE WILDWOOD EASTES	01/08/1990	100 80	15 4	41 Steel	Open Hole 41 - 100	Unknown			598 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 6 MCMINN	91002077	JOHN MILLER ZION HILL	05/24/1991	185 175	10 20	83 Steel	Open Hole 83 - 185	Unknown			598 Residential
0125NE 6 MCMINN	91002121	CLAUDE SYVESTER ZION HILL	07/10/1991	205 150	10 60	104 Steel	Open Hole 104 - 205	Unknown			598 Residential
0125NE 6 MCMINN	93001911	JACK KINCAID #436 MASHBURN	02/04/1993	148 125	30 60	49 Steel	Open Hole 49 - 148				6 Residential
0125NE 6 MCMINN	93002477	MERRITT ENTREKIN MASHBURN RD	05/24/1993	405 190	2 60	185 Steel	Open Hole 185 - 405	Unknown			598 Residential
0125NE 6 MCMINN	93005215 D0004627	ANN NATTER 430	11/29/1993	245 235	15 100	125 Steel	125 - 245	Unknown			598 Residential
0125NE 6 MCMINN	94000235	HOMER HALL CO RD 575	09/05/1993	125 120	50 60	100 Steel	Open Hole 100 - 125	Unknown			528 Residential
0125NE 6 MCMINN	94002484 D0008190	ROBERT BLEDSOE COUNTY #431 RD	06/26/1994 10/05/1994	405 280	10 81	106 Steel	Open Hole 106 - 405	Unknown 010239	352550 843025	T	598 Residential
0125NE 6 MCMINN	94003702 D0008160	LARRY L REED CO RD 520 105	09/05/1994 09/25/1995	230 225	50 44	79 Steel	Open Hole 79 - 230	Unknown 015355	352508 843006	F	598 Residential
0125NE 6 MCMINN	94003711 D0008169	KIN BATES MASHBURN CTY RD	09/23/1994 12/20/1994	145 130	15 30	104 Steel	Open Hole 104 - 145	Unknown 010334	352610 843143	F	598 Residential
0125NE 6 MCMINN	94004880 D0011303	HAROLD KING ROAD #435	11/01/1994	189 60	12 30	42 Steel	Open Hole 42 - 189				6 Residential
0125NE 6 MCMINN	95000314 D0012702	JAMES D CANTRELL 435	01/03/1995 03/21/1995	185 110	15 60	83 Steel	Open Hole 83 - 185	Unknown 010456	352516 843135	F	598 Residential
0125NE 6 MCMINN	95002537 D0014060	GEORGE R SCHULTZ CO RD 568 185	06/01/1995 09/25/1995	145 34	10 21	62 Steel	Open Hole 62 - 145	Unknown 015353	352506 843200	F	598 Residential
0125NE 6 MCMINN	95003160 D0012682	GEORGE POGGI CO RD 436 522	07/07/1995 09/25/1995	165 89	8 41	62 Steel	Open Hole 62 - 165	Unknown 015358	352624 843038	F	598 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 6 MCMINN	95003702 D0009030	JAMES BROCK CO RD 520 143	06/14/1995 09/25/1995	125 100	20 50	83 Steel	Open Hole 83 - 125	015356	352504 843005	F	608 Residential
0125NE 6 MCMINN	95005439 D0015553	MIKE PRESSWOOD MASHBURN RD	11/19/1995	145 135	40 80	125 Steel	Open Hole 125 - 145	Unknown			598 Residential
0125NE 6 MCMINN	96000121 D0015546	D GENE DAVIS MASHBURN RD	11/29/1995 04/09/1996	305 250	25 80	125 Steel	Open Hole 125 - 305	Unknown 016717	352545 843230	F	598 Residential
0125NE 6 MCMINN	96000123 D0015557	ROBERT W THOMAS TOM MARTIN RD	12/12/1995 04/09/1996	125 60	20 4	19 Steel	Open Hole 19 - 125	Unknown 016716	352450 843002	F	598 Residential
0125NE 6 MCMINN	96001694 D0015603	DANA K UNDERDOWN CO ROAD 437	05/07/1996	505 480	1 70	125 Steel	Open Hole 125 - 505	Unknown			598 Residential
0125NE 6 MCMINN	97005563 D0024790	BROWN TONY 145 CO. RD 433	10/20/1997 01/28/1998	145 70	20 40	62 Steel	Open Hole 62 - 145	Fair 020519	352548 843117	F	598 Residential
0125NE 6 MCMINN	97005569 D0024796	CHAD SMITH 150 CO. RD 438	11/05/1997 01/28/1998	205 140	15 70	125 Steel	Open Hole 125 - 205	Unknown 020518	352548 843214	F	598 Residential
0125NE 6 MCMINN	98002251 D0032855	HERBERT HALLOWAY JORDON RD	05/29/1998	205 170	10 20	41 Steel	Open Hole 41 - 205	Unknown			598 Residential
0125NE 7 MCMINN	10701011	KNOY H.L..	08/30/1981	290 0		21 Steel	-	Good	352323 843639	S	254 Residential
0125NE 7 MCMINN	10701212	DAVID DERRICK PINEY GROVE	06/28/1984	245 220	3	84 Steel	Open Hole 84 - 245		352230 843500		598 Residential
0125NE 7 MCMINN	10701241	HERB RADSHAW CLAY HILL RD	07/10/1984	280 251	8 90	158 Steel	Open Hole 158 - 280	Good	352230 843500		528 Residential
0125NE 7 MCMINN	10701252	BUDDY THOMPSON CLAY HILL RD	08/20/1984	206 185	30	63 Steel	Open Hole 63 - 206	Good	352230 843500		598 Residential
0125NE 7 MCMINN	10701270	R G WATSON ROAD #630	11/17/1984	100 85	5 20	23 Steel	Open Hole 23 - 100		352230 843500		630 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 7 MCMINN	10701280	CALLIE CARMLEY UNION HILL RD	05/19/1985	146 108	15	83 Steel	Open Hole 83 - 146		352230 843500		598 Residential
0125NE 7 MCMINN	10701285	LARRY BARKER OFF PINEY GROVE		326 305	10	83 Steel	Open Hole 83 - 326		352230 843500		598 Residential
0125NE 7 MCMINN	10701477	DAVID HACKER CLAY HILL RD	06/10/1986	125 80	4 60	62 Steel	Open Hole 62 - 125	Good	352230 843500		598 Residential
0125NE 7 MCMINN	10701482	GARY BROWN LAYMAN ROAD	08/05/1986	105 75	30 40	62 Steel	Open Hole 62 - 105		352230 843500		598 Residential
0125NE 7 MCMINN	10701529	RAY HUCKABY LAYMAN RD	07/08/1987	103 65	15 40	41 Steel	Open Hole 41 - 103	Good	352230 843500		598 Residential
0125NE 7 MCMINN	10701530	ERIC BURNS LAYMAN RD	06/20/1987	125 60	15 40	41 Steel	Open Hole 41 - 125	Good	352230 843500		598 Residential
0125NE 7 MCMINN	10701607	BILL PASLEY PINEY GROVE	10/02/1987	250 180	30 48	91 Steel	Open Hole 91 - 250	Fair	352354 843508	S	637 Residential
0125NE 7 MCMINN	10701714	CECIL WOMAC CEDAR SPRINGS R	04/30/1988	130 120	15 40	20 Steel	Open Hole 20 - 130		352230 843500		630 Residential
0125NE 7 MCMINN	10701764	BRETT POWERS PINEY GROVE	06/07/1989	280 260	50 100	146 Steel	Open Hole -	Good	352230 843500		598 Residential
0125NE 7 MCMINN	91002072	RICKY POWERS CLAY HILL	06/07/1991	485 440	1	41 Steel	41 - 485	Sulphur			598 Residential
0125NE 7 MCMINN	91002103	PAUL WILLIAMS 657	05/10/1991	270 140	6 50	84	Open Hole 84 - 270				6 Residential
0125NE 7 MCMINN	92000627	E H COLEMAN UNDER DOWN	09/05/1991	305 280	20 20	41 Steel	Open Hole 41 - 305	Unknown			598 Residential
0125NE 7 MCMINN	92000628	GEORGE LASHER SR UNION HILL	09/16/1991	145 0	8 20	26 Steel	Open Hole 26 - 145				598 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 7 MCMINN	92000631	CHRIS ANDERSON UNION HILL	09/16/1991	245 230	10 30	20 Steel	Open Hole 20 - 245	Unknown			598 Residential
0125NE 7 MCMINN	92000632	BESSIE HORNWOOD LARRY ELLIS	11/20/1991	165 150	40 49	104 Steel	Open Hole 104 - 165	Good			598 Residential
0125NE 7 MCMINN	92002243	VADONNA MOFFIT CEADER SPRINGS	05/02/1992	305 290	10 30	155 Steel	Open Hole 155 - 305	Unknown			608 Residential
0125NE 7 MCMINN	92003431	L E ROBERTS PINE GROVE	09/03/1992	145 130	6 50	83 Steel	Open Hole 83 - 145	Unknown			598 Residential
0125NE 7 MCMINN	93001530	TERRY BOWAN CO RD 657	04/29/1993	165 150	10 60	62 Steel	Open Hole 62 - 165	Unknown			598 Residential
0125NE 7 MCMINN	93003373	LOUIS W BREEDEN CO RD 669	09/02/1993	145 98	10 10	20 Steel	Open Hole 20 - 145	Good			598 Residential
0125NE 7 MCMINN	94000562 D0004608	JOHN BENSON CO RD 675	02/25/1994	205 55	5 20	41 Steel	Open Hole 41 - 205	Unknown			598 Residential
0125NE 7 MCMINN	94001354 D0004644	GARLEN TEAGUE 658	04/30/1994	105 85	20 30	62 Steel	Open Hole 62 - 105	Unknown			598 Residential
0125NE 7 MCMINN	94002491 D0008203	MIKE HUCKABEY LAYMAN RD	07/07/1994 10/05/1994	105 70	10 20	60 Steel	Open Hole 60 - 105	Unknown 010238	352305 843635	T	598 Residential
0125NE 7 MCMINN	94003113 D0008216	DARRELL TORBETT UNION HILL RD	08/01/1994	365 190	2 40	59 Steel	Open Hole 59 - 365	Unknown			598 Residential
0125NE 7 MCMINN	94003703 D0008158	JEFF MOSE LONGMILL RD	09/10/1994	365 185	2 40	79 Steel	Open Hole 79 - 365	Unknown			598 Residential
0125NE 7 MCMINN	94004179 D0008170	MICHAEL HYATT CLAY HILL RD	09/28/1994 12/20/1994	405 220	4 185	124 Steel	Open Hole 124 - 405	Unknown 010330	352428 843716	F	598 Residential
0125NE 7 MCMINN	95001135 D0012670	JOHN SULLIVAN CEDAR SPRINGS	03/14/1995	105 75	20 15	41 Steel	Open Hole 41 - 105	Unknown			598 Residential

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0125NE 7 MCMINN	95003947 D0014038	ERIC BURNS RALPH LAYMAN	08/15/1995	245 90	4 20	41 Steel	Open Hole 41 - 245	Unknown			598 Residential
0125NE 7 MCMINN	96005439 D0022267	KEVIN THOMPSON CO RD 675 500	12/10/1996 02/04/1997	145 120	15 10	41 Steel	Open Hole 41 - 145	Unknown 019190	352326 843718	F	598 Residential
0125NE 7 MCMINN	98000654 D0032821	HERB WEST CLAY HILL	02/02/1998	145 120	15 20	62 Steel	Open Hole 62 - 145	Unknown			598 Residential
0125NE 7 MCMINN	98001357 D0032484	WILLIAM BEASHEARS CO RD 729	03/02/1998	205 47	9 48	42 Steel	Open Hole 42 - 205				6 Residential
0125NE 7 MCMINN	98004086 D0032626	TERRY AKINS CLAY HILL RD	09/12/1998	185 160	6 80	42 Steel	Open Hole 42 - 185				608 Residential
0125NE 7 MCMINN	99001436 D0036277	ROBERT SMITH 658 CO RD 1317	03/17/1999	305 290	15 60	125 Steel	Open Hole 125 - 305	Unknown			598 Residential
0125NE 7 MCMINN	99002023 D0036286	JIM PATRICK 669	04/04/1999	165 150	15 20	20 Steel	Open Hole 20 - 165	Unknown			598 Residential
0125NE 8 MCMINN	10700436	STRICKLAND R	06/23/1970	228 207	12 70	71 Steel	-	Good	352245 843330	S	6 Residential
0125NE 8 MCMINN	10700674	STRICKLAND L R	11/26/1974	124 0	9	71	-		352245 843330	S	6 Residential
0125NE 8 MCMINN	10700842	MOSES C	05/06/1978	228 210	25 60	90 Steel	-	Good	352250 843330	S	550
0125NE 8 MCMINN	10701089	BLANKENSHIP LARRY	06/22/1982	105 95	10 30	60 Steel	-	Good	352329 843420	S	598 Residential
0125NE 8 MCMINN	10701097	BENSON RALPH	06/19/1982	265 240	25 100	105 Steel	-	Good	352449 843423	S	598 Residential
0125NE 8 MCMINN	10701111	STEPHENS HUB	08/27/1982	145 135	10 50	110 Steel	-	Good	352457 843409	S	598 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 8	10701153	STEVE AKINS	05/10/1983	425		257	Open Hole	Good	352427	S	598
MCMINN		SHOWBARN	03/26/1985	0	950	Steel	257 - 425		843411		Residential
0125NE 8	10701164	GENE RUDD	04/29/1983	105	30	63	Open Hole	Good	352000	S	598
MCMINN		OLD ETOWAH & AT	11/19/1984	80	56	Steel	63 - 105		843000		Residential
0125NE 8	10701248	ROBERT BOGGESS	09/12/1984	266	4	126	Open Hole	Good	352230		598
MCMINN		MT CUMBERLAND R		140		Steel	126 - 266		843230		Residential
0125NE 8	10701331	WAYNE ALLMAN	02/08/1986	465	2	185	Open Hole	Good	352230		598
MCMINN		SHOWBARN		385		Steel	185 - 465		843230		Residential
0125NE 8	10701339	FRANK NORWOOD	10/09/1985	285	10	95	Open Hole	Good	352230		598
MCMINN		ZION HILL RD		105		Steel	95 - 285		843230		Residential
0125NE 8	10701410	JAMES GARREN	08/19/1986	107	50	53	Open Hole		352230		6
MCMINN		OFF HWY 30		68	30		53 - 107		843230		Residential
0125NE 8	10701483	BRUCE HANEY	10/20/1986	150	2	83	Open Hole		352230		598
MCMINN		BIVENS ROAD		90	30	Steel	83 - 150		843230		Residential
0125NE 8	10701486	NATHAN BIVENS	05/22/1986	165	20	63	Open Hole		352230		598
MCMINN		GOODSPRINGS ROA		160	40	Steel	63 - 165		843230		Farm
0125NE 8	10701487	MIKE TALLENT	08/15/1986	300	21	104	Open Hole		352230		598
MCMINN		CASEY GAP		145	80	Steel	104 - 300		843230		Residential
0125NE 8	10701499	GERALD D POATS	05/12/1987	445	4	50	Open Hole	Good	352230		598
MCMINN		SHOWBARN RD		320	60	Steel	50 - 445		843230		Residential
0125NE 8	10701519	ROBERT HOLMES	11/05/1984	105	10	62	Open Hole		352435	S	598
MCMINN		OLD ETOWAH RD	11/19/1984	95	50	Steel	62 - 105		843308		Residential
0125NE 8	10701532	LARRY MILLER	04/27/1987	205	7	99	Open Hole	Good	352230		598
MCMINN		BULL RD		160	60	Steel	99 - 205		843230		Residential
0125NE 8	10701555	CHESTER MOSES	10/20/1986	500	2	125	Open Hole		352500		598
MCMINN		HWY 30		140	120	Steel	125 - 500		843500		Residential

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0125NE MCMINN	8	10701556	CHESTER MOSES HWY 30	05/15/1987	325 0	12 85	147 Steel	Open Hole 147 - 325		352500 843500		598 Residential
0125NE MCMINN	8	10701561	GLENN ROWLAND WILDWOOD RD	09/20/1987	260 180	3 20	29 Steel	Open Hole 29 - 260		352230 843230		598 Residential
0125NE MCMINN	8	10701564	WALTER LOUTHAN BULL	11/05/1987	143 120	3 60	79 Steel	Open Hole 79 - 143		352230 843230		598 Residential
0125NE MCMINN	8	10701585	JERRY STANDRIDGE HWY 30	08/12/1987	250 185	12 70	137 Steel	Open Hole 138 - 250	Good	352237 843337	S	637 Residential
0125NE MCMINN	8	10701645	PHIL HAYDOCK SHOWBARN RD	04/18/1988	145 128	30 90	105 Steel	Open Hole 105 - 145	Good	352230 843230		598 Farm
0125NE MCMINN	8	10701672	DAN BELL HWY 30#	06/21/1988	800 120	3 150	209 Steel	Open Hole 209 - 800	Good	352230 843230		598 Residential
0125NE MCMINN	8	10701683	SAMUEL W BROWN MOORE MILL	07/28/1988	200 160	8 50	73 Steel	Open Hole 73 - 200		352230 843230		598 Residential
0125NE MCMINN	8	10701700	JAMES RIDEN GOLF COURSE RD	12/04/1988	130 0		63 Steel	Open Hole 63 - 130	Good	352230 843230		609 Residential
0125NE MCMINN	8	10701702	JAMES RIBEN WESLEY ANN RD	12/04/1988 04/19/1989	157 80	100 40	105 Steel	Open Hole 105 - 157	Good 002292	352250 843400	F	609 Residential
0125NE MCMINN	8	10701739	GREG AUSTIN OLD ETOWAH	03/18/1989	84 80	30 20	63 Steel	Open Hole 0 - 84		352230 843230		598 Residential
0125NE MCMINN	8	10701740	JIM ELLIS ELKINS ROAD	03/15/1989	226 180	20 60	105 Steel	Open Hole 0 - 225		352230 843230		598 Residential
0125NE MCMINN	8	90002564	MIKE WARD	06/13/1990	405 120	30 8	83 Steel	-				598 Residential
0125NE MCMINN	8	91000195	JAMES KENNDY MT CUMBERLAND	10/15/1990	445 200	4	127 Steel	Open Hole 0 - 445	Good			598 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 8 MCMINN	91002116	WAYNE STRICKLAND WESLYANA	01/21/1991	220 190	39 20	146 Steel	Open Hole 146 - 220	Unknown			598 Residential
0125NE 8 MCMINN	91002117	RALPH BLANKSHIP OLD ETOWAH	05/01/1991	305 190	4 40	167 Steel	Open Hole 167 - 305	Unknown			598 Residential
0125NE 8 MCMINN	91003791	DANNY WEBB OLD ETOWAH RD	10/09/1991	125 100	20 15	20 Steel	Open Hole 20 - 125	Unknown			598 Residential
0125NE 8 MCMINN	93000987	APRIL SMITH WESLEYANNA GOOD	01/27/1993	305 168	2 30	62 Steel	Open Hole -	Unknown			598 Residential
0125NE 8 MCMINN	93001528	J W JOHNSON WESLEYANNA GOOD	04/23/1993	170 150	8 40	104 Steel	Open Hole 104 - 170				598 Residential
0125NE 8 MCMINN	93004230	JIM KELLY WESLEYANNA GOOD	09/16/1993	125 115	20 60	83 Steel	Open Hole 83 - 125	Unknown			598 Residential
0125NE 8 MCMINN	94000965 D0004623	CLEL BRANNON WOLD WOOD	04/05/1994 08/09/1994	245 185	15 33	62 Steel	Open Hole 62 - 245	Unknown 010165	352425 843235	F	598 Residential
0125NE 8 MCMINN	94001352 D0004636	MARK PRESS KITT 585	04/19/1994 08/09/1994	145 65	15 10	41 Steel	Open Hole 41 - 145	Unknown 010164	352433 843255	F	598 Residential
0125NE 8 MCMINN	94001356 D0004648	DAVID CULBERSON OLD ETOWAH	05/06/1994	145 120	10 50	104 Steel	Open Hole 104 - 145	Unknown			598 Residential
0125NE 8 MCMINN	94002482 D0008199	VIRGIL SHADDEN CORNER 550 &561	07/01/1994 10/05/1994	225 155	10 90	146 Steel	Open Hole 146 - 225	Unknown 010236	352315 843242	F	598 Residential
0125NE 8 MCMINN	95001411 D0009073	DARRON MELTON ATHENS ETOWAH R	03/27/1995 05/24/1995	365 340	3 80	60 Steel	Open Hole 60 - 365	 010530	352430 843346	F	608 Residential
0125NE 8 MCMINN	95002541 D0014056	BENNIE BIVENS BIVENS RD	05/23/1995 07/24/1995	105 68	7 27	62 Steel	Open Hole 62 - 105	Unknown 015426	352235 843254	F	598 Residential
0125NE 8 MCMINN	95002542 D0014055	WILL COOK WATSON RD	05/22/1995 07/24/1995	245 120	4 17	62 Steel	Open Hole 62 - 245	Unknown 015425	352306 843633	F	598 Residential

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0125NE 8 MCMINN	95002857 D0014067	CHERYL LEATHERWOOD CO RD 609 129	06/15/1995 09/06/1995	145 118	7 60	83 Steel	Open Hole 83 - 145	Unknown 015364	352317 843308	F	598 Residential
0125NE 8 MCMINN	95003655 D0012700	STEVE SMITH CO RD 561 1950	07/29/1995 09/25/1995	165 145	30 40	62 Steel	Open Hole 62 - 165	Unknown 015352	352334 843325	F	598 Residential
0125NE 8 MCMINN	95005631 D0014972	LYNN COPPINGER WILD RD	11/21/1995	125 95	10 30	21 Steel	Open Hole 21 - 125				608 Residential
0125NE 8 MCMINN	95005639 D0014957	WINDER MASHBURN GOOD SPRINGS	10/17/1995	145 110	18 40	42 Steel	Open Hole 42 - 145				608 Residential
0125NE 8 MCMINN	96001288 D0015585	THOMAS BUILDERS INC WILDWOOD RD	04/08/1996 07/31/1996	505 70	2 40	39 Steel	Open Hole 39 - 505	Unknown 016634	352428 843300	F	598 Residential
0125NE 8 MCMINN	96003303 D0021140	JAMES E SLACK MT CUMBERLAND R	07/23/1996	205 130	6 20	85 Steel	Open Hole 85 - 205	Unknown			598 Residential
0125NE 8 MCMINN	96003884 D0021159	MONTY LARSON BIVENS CIRCLE R	08/21/1996	225 205	30 60	83 Steel	Open Hole 83 - 225	Unknown			598 Residential
0125NE 8 MCMINN	97000594 D0023090	DARRELL BURTON OLD ATHENS	02/07/1997	225 195	3 50	21 Steel	Open Hole 21 - 225				608 Residential
0125NE 8 MCMINN	97001491 D0024806	J M HADDOCK ZION HILL RD	04/17/1997	165 135	8 40	62 Steel	Open Hole 62 - 165	Unknown			598 Residential
0125NE 8 MCMINN	97002692 D0024830	ALLEN LANDIS HWY 30 1622	06/05/1997	225 160	8 50	125 Steel	Open Hole 125 - 225	Unknown			598 Residential
0125NE 8 MCMINN	97003367 D0024848	CHARLES B COX ROSS ELKINS RD	07/28/1997	145 110	40 40	83 Steel	Open Hole 83 - 145	Unknown			598 Farm
0125NE 8 MCMINN	97005568 D0024795	MARSHALL SHAW 295 CO. RD #550	11/04/1997 01/28/1998	365 160	3 70	106 Steel	Open Hole 106 - 365	Unknown 020508	352301 843255	F	598 Residential
0125NE 8 MCMINN	98002990 D0032863	LARRY TACKETT CO RD 602	06/25/1998	125 80	20 30	62 Steel	Open Hole 62 - 125	Unknown			598 Residential

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QUAD / NTH COUNTY		WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE MCMINN	8	98004050 D0030409	MARVIN MOORE ARBIN WATSON	08/05/1998	205 190	30 20	41 Steel	Open Hole 41 - 205	Unknown			598 Residential
0125NE MCMINN	8	98005084 D0030424	TONY MORGAN 554 CO RD	09/14/1998	445 200	8 150	188 Steel	Open Hole 188 - 445				598 Residential
0125NE MCMINN	8	99000061 D0036557	LEVINE DEVELOPERS 607	12/01/1998	330 265	100 63	63	Open Hole 63 - 330				6 Residential
0125NE MCMINN	8	99000554 D0036321	VIC WOOTEN OLD ETOWAH	12/10/1998	125 70	40 40	62 Steel	Open Hole 62 - 125	Unknown			598 Residential
0125NE MCMINN	8	99001435 D0030449	TRUMAN S GABBARD 573	03/08/1999	285 110	5 20	41 Steel	Open Hole 41 - 245	Unknown			598 Residential
0125NE MCMINN	8	99002020 D0030448	JIM LAMB WILDWOOD	03/08/1999	245 100	10 40	83 Steel	Open Hole 83 - 245	Unknown			558 Residential
0125NE MCMINN	8	99002025 D0036288	JAMES BURDICK 561 CO RD 1949	04/12/1999	305 215	4 40	62 Steel	Open Hole 62 - 305	Unknown			598 Residential
0125NE MCMINN	9	10700774	BOWERY J L	06/25/1977	210 0	10 70	65 Steel	-	Good	352356 843025	S	527 Residential
0125NE MCMINN	9	10700880	WAGGONER I	05/10/1979	106 62	20 40	42 Steel	-		352410 843105	S	6 Residential
0125NE MCMINN	9	10701044	DEVILLE P.		205 0	10	184 Steel	-		352430 843110	S	598 Residential
0125NE MCMINN	9	10701091	WITT PETE	04/28/1982	220 190	5 150	126 Steel	-	Good	352247 843408	S	598 Residential
0125NE MCMINN	9	10701162	P.J. REED ZION HI	06/29/1983 03/26/1985	305 140	8	84 Steel	Open Hole 84 - 305		352417 843108	F	598 Residential
0125NE MCMINN	9	10701211	CHARLES PRICE OLD ETOWAH RD	03/09/1984 03/26/1985	226 160	3 693	84 Steel	Open Hole 84 - 226	Good	352454 843400	S	598 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 9 MCMINN	10701223	FLOYD SMITH ZION HILL	07/01/1984 03/26/1985	125 110	5	42 Steel	Open Hole 42 - 125	Good	352351 843110	S	598 Residential
0125NE 9 MCMINN	10701245	LARRY LETHAM OLD FEDERAL RD	11/05/1984	105 90	20	83 Steel	Open Hole 83 - 105	Good	352230 843000		598 Residential
0125NE 9 MCMINN	10701253	STEVE CANTRELL WILDWOOD RD	09/12/1984	246 180	5	147 Steel	Open Hole 147 - 246	Good	352230 843000		598 Residential
0125NE 9 MCMINN	10701350	DUFF CALVIN ZION HILL -NEAR	04/06/1986	305 305	3	68 Steel	Open Hole 68 - 305	Good	352230 843000		598 Residential
0125NE 9 MCMINN	10701390	ERNIE WATSON LION HILL RD	10/21/1985	3051 180	0	63 Steel	Open Hole 63 - 305	Good	352230 843000		598 Residential
0125NE 9 MCMINN	10701421	ENGLEWOOD CHURC ENGLEWOOD SUBDI	07/15/1986	230 170	7 90	84 Steel	Open Hole 84 - 230		352230 843000		609 Residential
0125NE 9 MCMINN	10701500	ROSS ELIKINS CASEY	07/22/1986	345 235	7 150	180 Steel	Open Hole 180 - 345		352230 843000		598 Residential
0125NE 9 MCMINN	10701509	TERRY DOCKERY ZOIN HILL	01/06/1987	105 60	25 30	33 Steel	Open Hole 33 - 105	Good	352230 843000		598 Residential
0125NE 9 MCMINN	10701589	RALPH BLAKENSHIP ZION HILL	08/10/1987 12/16/1987	200 190	50 60	180 Steel	Open Hole 180 - 200	Good 026596	352312 843238	S	637 Residential
0125NE 9 MCMINN	90002566	CLAUDE MARTIN ZION HILL	06/04/1990	150 80	20 7	62 Steel	Open Hole -				598 Residential
0125NE 9 MCMINN	90003036	JIM RUSSEL HWY 411	09/06/1990	265 185	4 60	74 Steel	Open Hole - 265				608 Residential
0125NE 9 MCMINN	91002079	HELEN GARDNER WATSON	05/22/1991	185 180	20 30	159 Steel	Open Hole 159 - 185	Unknown			598 Residential
0125NE 9 MCMINN	91002114	LYNN COLTHARP ELKINS	03/20/1991	225 210	30 40	62 Steel	Open Hole 62 - 225	Unknown			598 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 9 MCMINN	91002636	HOMER HALL OFF HWY 39	06/17/1991	210 180	6 60	63 Steel	Open Hole 63 - 210	Unknown			528 Farm
0125NE 9 MCMINN	92001966	JOE GARDNER ELKINS RD	04/03/1992	390 380	10 100	105 Steel	Open Hole 105 - 360	Unknown			528 Residential
0125NE 9 MCMINN	92003429	WAYNE COVINGTON ZION HILL	09/19/1992	205 170	5	125 Steel	Open Hole 125 - 205	Unknown			598 Residential
0125NE 9 MCMINN	92003433	I E ALDRIDGE KIRLAND SUBDIVI	09/10/1992	185 100	7 20	82 Steel	Open Hole 82 - 185				598 Residential
0125NE 9 MCMINN	92003434	GARY M ARMSTRONG TOM MARTIN	09/11/1992	145 80	15 20	41 Steel	Open Hole 41 - 145	Unknown			598 Other
0125NE 9 MCMINN	92004208	FLOYD SMITH ZOIN HILL RD	11/16/1992	185 170	40 20	41 Steel	Open Hole 41 - 185	Unknown			598 Residential
0125NE 9 MCMINN	93000447	SHIRLEY THOMAS COUNTY RD 415	01/07/1993	305 290	2 80	104 Steel	Open Hole 104 - 305				598 Residential
0125NE 9 MCMINN	93000449	TIM FOX KIRLAND CORD 51	01/04/1993	405 180	2 40	62 Steel	Open Hole 62 - 405	Unknown			598 Residential
0125NE 9 MCMINN	93005213 D0004586	BILL FRAZIER OLD ETOWAH	12/08/1993	185 150	10 40	83 Steel	Open Hole 83 - 285	Unknown			598 Residential
0125NE 9 MCMINN	94000941 D0004609	BIVION ANDERSON ZOIN HILL RD	03/18/1994	165 155	20 80	125 Steel	Open Hole 125 - 165	Unknown			598 Residential
0125NE 9 MCMINN	94004393 D0008132	CHURCH OF CASTEEL 517	10/20/1994	305 145	4 30	62 Steel	Open Hole 62 - 305				598 Residential
0125NE 9 MCMINN	94004597 D0008138	TONY MORGAN ZION HILL LT 1	11/06/1994 02/14/1995	205 60	8 31	20 Steel	Open Hole 20 - 205	Unknown 010412	352336 843110	F	598 Residential
0125NE 9 MCMINN	95002259 D0014029	CARL WAYNE MARTIN CO RD 516 # 331	05/10/1995 07/24/1995	165 130	6 37	42 Steel	Open Hole 42 - 165	Unknown 015427	352353 843053	F	598 Residential

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE 9 MCMINN	95002532 D0014070	FLORACE BIGGAM ZION HILL SPUR	06/16/1995 07/24/1995	145 0	14 36	41 Steel	Open Hole 41 - 145	Unknown 015429	352408 843150	F	598 Residential
0125NE 9 MCMINN	95002856 D0014069	AFFANIE PRESLEY ZION HILL SPUR	06/16/1995 07/24/1995	105 45	10 20	41 Steel	Open Hole 41 - 105	Unknown 015428	352407 843150	F	598 Residential
0125NE 9 MCMINN	95003021 D0014071	GEORGE BEARFIELD CO RD 516	06/18/1995 07/24/1995	285 275	50 40	62 Steel	Open Hole 62 - 285	Unknown 015430	352418 843152	F	598 Residential
0125NE 9 MCMINN	95003162 D0012679	RANDY LEE OLD ENGLEWOOD	07/03/1995	285 215	30 60	125 Steel	Open Hole 125 - 285	Unknown			598 Residential
0125NE 9 MCMINN	95005433 D0015549	BRIAN ROGERS CO RD 550	11/10/1995 04/09/1996	165 115	15 20	41 Steel	Open Hole 41 - 165	Unknown 016718	352340 843124	F	598 Residential
0125NE 9 MCMINN	96000118 D0015558	ANDY DAUGHERTY KIRKLAND ESTATE	12/12/1995 04/09/1996	145 105	30 30	60 Steel	Open Hole 60 - 145	Unknown 016740	352415 843004	F	598 Residential
0125NE 9 MCMINN	96001284 D0015578	MORGAN/GUINN TONY/JES ZION HILL RD	03/18/1996 04/09/1996	145 65	15 20	39 Steel	Open Hole 39 - 145	Unknown 016719	352342 843129	F	598 Residential
0125NE 9 MCMINN	96001699 D0015591	SAMMY DUNCAN ZION HILL RD	04/17/1996	145 110	20 40	59 Steel	Open Hole 59 - 145	Unknown			598 Residential
0125NE 9 MCMINN	96002724 D0015617	JESS H GUINN JR ZION HILL RD	06/16/1996 09/03/1996	105 55	30 10	41 Steel	Open Hole 41 - 105	Unknown 016541	352336 843126	F	598 Residential
0125NE 9 MCMINN	96002910 D0021136	BUD BAREFIELD ZION HILL RD	07/12/1996 09/03/1996	265 210	6 80	129 Steel	Open Hole 129 - 265	Unknown 016542	352424 843057	F	598 Residential
0125NE 9 MCMINN	96003887 D0021169	LARRY LEMONS ZION HILL RD	08/30/1996	105 80	25 20	41 Steel	Open Hole 41 - 105	Unknown			598 Residential
0125NE 9 MCMINN	96003889 D0021173	TONY MORGAN ZION HILL ROAD	08/31/1996 09/03/1996	105 60	20 15	41 Steel	Open Hole 41 - 105	Unknown 016640	352330 843132	F	598 Residential
0125NE 9 MCMINN	96005073 D0022252	JERRY STANDRIDGE ZION HILL RD	10/28/1996	145 80	8 10	20 Steel	Open Hole 20 - 145	Unknown			598 Residential

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QUAD / NTH COUNTY		WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WATER QUAL TAG NUMBER	LATITUDE LONGITUDE	A / C LOG	DRILLER USE
0125NE	9	97002093	DONALD N CLOWN	05/18/1997	105	30	41	Open Hole	Unknown	352322	F	598
MCMINN		D0024821	CO RD 545	01/28/1998	55	20	Steel	41 - 105	020507	843138		Residential
0125NE	9	97002095	GREG EVANS	05/16/1997	125	8	41	Open Hole	Unknown	352332	F	598
MCMINN		D0024818	596 CO RD 550	01/28/1998	60	20	Steel	41 - 125	020506	843134		Residential
0125NE	9	97004439	JOHN MORGAN	09/08/1997	145	7	62	Open Hole				598
MCMINN		D0024870	COUNTY RD 565		115	40	Steel	62 - 145				Residential
0125NE	9	97005564	TED ROGERS JR	10/20/1997	125	40	41	Open Hole	Unknown	352434	F	598
MCMINN		D0024791	250 CO. RD 520	01/28/1998	104	40	Steel	41 - 125	020520	843019		Residential
0125NE	9	98001544	MIKE PRESSWOOD	04/13/1998	125	20	41	Open Hole	Unknown			598
MCMINN		D0032838	ZION HILL 550		60	20	Steel	41 - 125				Residential
0125NE	9	98001553	ANGELA M MASSENGILL	05/12/1998	125	20	41	Open Hole	Unknown	352424	F	598
MCMINN		D0032847	CO RD 564	09/08/1998	60	20	Steel	41 - 125	020374	843136		Residential
0125NE	9	98002875	LEVING DEVELOPEMENT	06/10/1998	145	25	63	Open Hole				6
MCMINN		D0032515	CO RD 570		70		Steel	63 - 145				Residential
0125NE	9	98002876	LEVING DEVELOPEMENT	06/11/1998	165	40	56	Open Hole				6
MCMINN		D0032516	CO RD 570		70	30	Steel	56 - 165				Residential
0125NE	9	98005088	LYNN BROWN	09/24/1998	125	10	62	Open Hole	Unknown			598
MCMINN		D0030380	520		95	30	Steel	62 - 125				Residential

Site Investigation
For
NGK Metals

Reference 11
Tennessee Division of Water Supply
Public Water System Data for Athens Utility Board

PUBLIC WATER SYSTEM DATA

Key Identification Number: 0000024

Name of Water System: ATHENS UTILITIES BOARD
Mailing Address: 100 ENGLEWOOD ROAD
City: ATHENS County: MCMINN
Zip Code: 37303 Office Phone: 745-4501 Plant Phone: 745-6273

Title of Person	Name	Certification	Interviewed	Correspondence
GEN. MANAGER	GEORGE USRY			✓
SUPERINTENDENT	RICHARD YARBROUGH			✓
REG. COMPLIANCE COORD.	MIKE STONE		✓	✓
CHIEF OPERATOR	KENNETH J. FERGUSON		✓	✓
OPERATORS	DON COLEMAN, RONNIE WOOD		✓	

No		Source Name	INTAKE LOCATION USGS Map LATITUDE LONGITUDE River Mile DEG	MIN	SEC	MARK (ONE ONLY) Surface	Ground	Purchased	TREATMENT Aeration	Prechlorination	Coagulation	Sedimentation	Filtration	Corrosion Control	Softening	Taste & Odor Control	Iron Removal	Fluoride Adjustment	Disinfection
1	R	OOSTANAULA CREEK - (BACK-UP)	35	27	32	X													
	A		84	34	29														
2	R	INGLESIDE SPRING	35	27	24		X												
	A		84	34	49														
3	R	PLANT (SINGLE ENTRY PT. FOR ALL SOURCES)	35	27	44					X	X	X	X	X		X		X	X
	A		84	34	50														
4	R	NEW SPRING	35	27	23		X												
	A		84	34	51														

Name of Systems Served By This System	Other Systems Connected To This System
NIOTA WATER SYSTEM	CALHOUN CHARLESTON U.D.
	RICEVILLE U.D.
	HIWASSEE UTILITIES COMMISSION

Plant Classification: WT4
Distribution Classification: D52 Date Laboratory Certified: 1-14-99
Design Capacity: 2880 (gpm) Filter Area: 1440 (sq ft) Filter Rate: 2.0 (gpm/ft²)
Raw Water Pump Capacity: 2@1440, 1@2880 (gpm) Finished Water Pump Capacity: 2@1440 1@2880 (gpm)
Distribution Storage, Gravity Flow: 4X1.0 = 4.0 (million gallons) Emergency Power Only: NONE (gal/day)
Clearwell Capacity: 1.0 (million gallons) Date Cross Connection Control Program Approved: 3-30-87
Date of Last Inorganic Chemical Analysis: 3-5-97 Date of Last Organic Chemical Analysis: 6-22-98-(NITRAZINE EDB + DBCP)
Date of Last Radionuclide Analysis: 6-22-98 Date Emergency Plan Approved: EXPIRED 12-31-96 NEEDS TO BE UPDATED Last Rating: 100
Number of Wholesale Customers: 1 Number of Meters: 6,445 Date of Last Survey: 3-6-96
Remarks:

Date of Survey	Number of Connections	Household Factor	Population Served	Average Daily Pumpage (million gallons)	Maximum Daily Pumpage (million gallons)	Engineer	Rating	Year
1-14-99	6,445	2.55	16,435	2.36	3.31	MHF	90	1999
3-6-96	6,063	2.55	15,461	2.24	3.28	CLB	100	1996
10-13-94	5,768	2.55	14,708	2.24	3.33	CLB	98	1994

PH-0355 WOC-(12-88)

PUBLIC WATER SYSTEM DATA

Key Identification Number

Name of Water System

Mailing Address

City County

Zip Code Office Phone Plant Phone

Title of Person	Name	Certification	Interviewed	Correspondence

Source			INTAKE LOCATION			MARK (ONE ONLY)			TREATMENT										
			USGS Map LATITUDE LONGITUDE River Mile																
No.		Name	DEG	MIN	SEC	Surface	Ground	Purchased	Aeration	Prechlorination	Coagulation	Sedimentation	Filtration	Corrosion Control	Softening	Taste & Odor Control	Iron Removal	Fluoride Adjustment	Disinfection
1	R	WELL NO. 4	35	27	41		X												
	A		84	34	20														
2	R	WELL NO. 7	35	27	43		X												
	A		84	34	19														
3	R																		
	A																		
4	R																		
	A																		

Name of Systems Served By This System	Other Systems Connected To This System

Plant Classification

Distribution Classification Date Laboratory Certified

Design Capacity (gpm) Filter Area (sq ft) Filter Rate (gpm/ft²)

Raw Water Pump Capacity (gpm) Finished Water Pump Capacity (gpm)

Distribution Storage, Gravity Flow (million gallons) Emergency Power Only (gal/day)

Clearwell Capacity (million gallons) Date Cross Connection Control Program Approved

Date of Last Inorganic Chemical Analysis Date of Last Organic Chemical Analysis

Date of Last Radionuclide Analysis Date Emergency Plan Approved Last Rating

Number of Wholesale Customers Number of Meters Date of Last Survey

Remarks

Date of Survey	Number of Connections	Household Factor	Population Served	Average Daily Pumpage (million gallons)	Maximum Daily Pumpage (million gallons)	Engineer	Rating	Year

WATER FIELD SHEET
Division of Water Supply

SYSTEM ATHENS UTILITIES BOARD DATE JAN. 14, 1999

COUNTY McMINN PWSID 0000024

SAMPLES REQUIRED PER MONTH 15 REPORTS SUBMITTED (12/12) NONE LATE

MONTH	NOV (97)	DEC (97)	JAN (98)	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
SAMPLES RUN	20	20	20	20	20	20	20	20	20	20	20	20
ORGANISM/100 ML	0	0	0	0	0	0	0	0	0	0	0	0

REMARKS

1. The turbidity laboratory was recertified.
2. The chlorine residual was satisfactory (1.8 PPM).
3. Emergency Operation Plan Expired (12-31-96).
4. Chlorine residual must be reported on flushing records.
5. The Bacteriological Sampling Plan is inadequate; a map is needed.

PH-0343
DWS (Rev 3-91)

Sanitary Survey Rating

System: ATHENS UTILITIES BOARD

Date: JAN. 14, 1999

I. SOURCE AND FACILITY (25)

Points in this section may be assessed progressively. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0 For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0.

	Deficiency	Points	Deduction	Comments
A.	Adequate Supply 1200-5-1-.02, .16 and .17(13)	(4-8)		✓
B.	Duplicate Pumps 1200-5-1-.17(13)	(2-4)		✓
C.	Protection Against Contamination 1200-5-1-.02(1), .05(12), .16 and .17(3) and (16)	(1-3)		✓
D.	Wellhead Protection Provisions (If applicable) 1200-5-1-.34	(1-3)		✓
E.	Intake 1200-5-1-.02 and .16	(1-2)		✓
F.	Aerator 1200-5-1-.02	(2-4)		✓
G.	Chemical Feeders 1200-5-1-.05 (8) and .17 (36)	(2-4)		✓
H.	Mixing 1200-5-1-.02	(2-4)		✓
I.	Flocculation 1200-5-1-.02	(1-4)		✓
J.	Sedimentation 1200-5-1-.02	(2-4)		✓
K.	Filtration 1200-5-1-.17(12) and (27)	(1-4)		✓
L.	Re-Wash (i.e. Filter-to-Waste) 1200-5-1-.17(35)	(3)		✓
M.	Turbidimeters 1200-5-1-.05(11) and .17(1) including alarm and automatic shut-off capability	(2-5)		✓
N.	Disinfection 1200-5-1-.02, .17(4), (11) and (28)	(1-10)		✓
O.	Contact Time - Disinfection 1200-5-1-.02, .17(28), and (29)	(1-3)		✓
P.	Master Meter 1200-5-1-.02, .17(2) and (3)	(2)		✓
Q.	Pumping Equipment 1200-5-1-.02 and .17(13)	(2-3)		✓
R.	Maintenance and Security of Equipment, Buildings and Grounds 1200-5-1-.17(17)*	(1-6)		✓
S.	Laboratory Facilities 1200-5-1-.02, .14, .17(3), (17), and (26)	(2-5)		✓
T.	Safety 1200-5-1-.02	(1-2)		✓
U.	Sludge Handling Unit 1200-5-1-.02	(2-5)		✓

V.	Unsanitary Conditions 1200-5-1-.02, .17(17)	(1-5)		✓
W.	Fluoridation Techniques 1200-5-1-.17(20)	(0-3)		✓
X.	Design Capacity 1200-5-1-.05(10)	(1-3)		✓

Deficiency Subtotal 0

* Note: 1200-5-1-.17(3), (17) and (19) are more specific rule cites per equipment and facility condition; 1200-5-1-.18(2) may also apply.

II. Operation (25)

A.	*Certified Operator - Plant 1200-5-1-.17(1) and Distribution 1200-5-3-.04(2)*	(11-15)		✓
B.	Laboratory-Process Monitoring (excluding Turbidity and Chlorine Residual Monitoring) 1200-5-1-.17(3)	(2-11)		✓
C.	Public Notification 1200-5-1-.18(4) and .19	(2-5)		✓
D.	Submission of Operation Reports (MORs) 1200-5-1-.17(2)	(1-4)		✓
E.	Recordkeeping 1200-5-1-.20 and 1200-5-1-.17(2), (10), (32) and (33)	(2-5, 2 ea)		✓
F.	Emergency Plan 1200-5-1-.17(7)	(1-4)	4	NEEDS UPDATE
G.	Submission of Plans and Specifications 1200-5-1-.05	(2-7)		✓
H.	Construction Projects 1200-5-1-.05(4)-(6) and .17(8) and (19)	(2-5)		✓
I.	Reporting Requirements 1200-5-1-.18	(2-5)		✓
J.	Enforcement 68-221-712(a)	(2-5)		✓
K.	Customer Complaints 1200-5-1-.17(24)	(1-3)		✓

Deficiency Subtotal 4

III. Water Quality and Water Quality Monitoring (25)*

A.	Turbidity Monitoring			
	a. Daily sample 1200-5-1-.08(1), .17(26), .31(4) and .31(5)(c)	(1-5)		✓
	b. Repeat sample 1200-5-1-.08(2)	(6)		✓
B.	Continuous Chlorine Residual Monitoring 1200-5-1-.17(4),17(30), .31(5)(b) 5 and (c)2.	(1-3)		✓
C.	Primary Chemicals Compliance Monitoring			
	a. Inorganic sample 1200-5-1-.09(1)	(3)		✓
	b. Inorganic samples Confirmation 1200-5-1-.09(2)	(3)		✓
	c. Synthetic Organic sample 1200-5-1-.10(1)	(3)		✓

	d. Synthetic Organic sample Confirmation 1200-5-1-.10(2)	(3)		✓
	e. Radionuclides 1200-5-1-.11	(3)		✓
	f. Sodium 1200-5-1-.24	(3)		✓
	g. Trihalomethane 1200-5-1-.23	(3)		✓
	h. Volatile Organic Chemicals 1200-5-1-.26	(3)		✓
	i. Confirmation Samples	(3)		✓
D.	Secondary Chemicals Monitoring 1200-5-1-.12	(3)		✓
E.	Microbiological			
	a. Regular sample 1200-5-1-.07	(1-11)		✓
	b. Repeat samples 1200-5-1-.07(1)	(6-11)		✓
	c. Bacteriological Sampling Plan 1200-5-1-.07(1)(c)	(2-3)	-2	✓
F.	Lead and Copper Monitoring			
	a. Regular sampling 1200-5-1-.33	(5)		✓
	b. Documentation 1200-5-1-.33	(1-3)		✓
	c. Corrosivity 1200-5-1-.21	(3-4)		✓
G.	Turbidity Compliance			
	a. Monthly average 1200-5-1-.06(3)(a)	(5-9)		✓
	b. Two day average 1200-5-1-.06(3)(b)	(5-9)		✓
	c. 95% of samples not <.5 NTU	(5-9)		✓
H.	Primary Chemicals, Compliance with MCLs			
	a. Inorganic chemicals 1200-5-1-.06(1)(b)	(6-11)		✓
	b. Organic chemicals 1200-5-1-.06(2)	(6-11)		✓
	c. Radionuclides 1200-5-1-.06(5)	(6-11)		✓
	d. Trihalomethane 1200-5-1-.22(3)	(6-11)		✓
	e. Volatile Organic Chemicals (Regulated) 1200-5-1-.25	(6-11)		✓
I.	Secondary Chemicals 1200-5-1-.12	(3)		✓
J.	Microbiological Compliance Monthly average 1200-5-1-.06(4)(a)	(3-11)		✓
K.	Lead and Copper Action Level 1200-5-1-.21	(2-4)		✓

Deficiency Subtotal 2

* Refer also to 1200-5-1-.05(11) and (12), .08(2), and .17(3) and (25)

IV. DISTRIBUTION AND CROSS CONNECTION (25)

Points in this section may be assessed progressively. For the second survey in which no substantial progress is made the point penalty may be multiplied by 2.0. For the third survey in which no substantial progress is made the point penalty may be multiplied by 3.0 .

A.	Chlorine Residual 1200-5-1-.17(4)	(4-6)		✓
B.	Adequate Storage 1200-5-1-.17(14)	(4-6)		✓
C.	Notification, Inspection and Disinfection of New or Existing Facilities 1200-5-1-.17(8), (19) and .20(1)	(5)		✓
D.	Maintenance of Reservoirs and Tanks 1200-5-1-.17(16), (17), (33) and (34)	(1-4)		
E.	Flushing Program 1200-5-1-.17(10) and (23)	(3-6)	3	NEED TO REPORT CL2 RESIDUAL
F.	Fire Hydrants 1200-5-1-.17(18)	(2-6)		✓
G.	Adequate Pressure 1200-5-1-.17(9)	(3-5)		✓
H.	Valves and Blow-offs 1200-5-1-.17(10) and (23)	(1-3)		✓
I.	Map of Distribution System 1200-5-1-.17(15)	(1-3)	1	A MAP IS NEEDED
J.	Pump Stations 1200-5-1-.02(1) and .17(9) and (13)	(2-3)		✓
K.	Approved Cross Connection Policy or Ordinance 1200-5-1-.17(6)	(7)		✓
L.	Working Program 1200-5-1-17(6)	(1-5)		✓

Deficiency Subtotal 4
Total Deficiency Points 10
Overall Rating 90

Inspector's Signature Mohammed H. Falah

Additional Comments/Explanation:

ENVIRONMENTAL ASSISTANCE CENTER
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
540 McCALLIE AVENUE, SUITE 550
CHATTANOOGA, TENNESSEE 37402
PHONE (423) 634-5745 STATEWIDE 1-888-891-8332 FAX (423) 634-6389

DRINKING WATER MONITORING PROGRAM

Athens Utilities Board
January 1999

1. Raw Water

   a. Collect a representative sample--7 days per week
   b. Amount of raw water treated
   c. Analyses and Frequency
      1. Temperature - daily
      2. Turbidity - daily
      3. Alkalinity (total) - daily
      4. pH - daily
      5. Hardness - daily
      6. Free CO2 - daily
      7. Iron - daily
      8. Manganese - daily
      9. Fluoride - daily
      10. Bacteriological - daily
      11. Jar Tests as needed, at least once per week

2. Settled Water

   a. Collect a representative sample before filteration
   b. Analyses and Frequency--7 days per week

3. Finished Water

   a. Collect a representative sample--7 days per week
   b. Analyses and Frequency
      1. Turbidity - every four hours
      2. Chlorine Residual (free) - continuously
      3. Alkalinity (total) - daily
      4. pH - daily
      5 Hardness - daily
      6. Free CO2 - daily
      7. Iron - daily
      8. Manganese - daily
      9. Fluoride - daily
      10. Bacteriological - daily
   c. Chlorine, pounds or gallons used
   d Fluoride, pounds or gallons used

4. Distribution System

a. Collect representative samples from distribution system--5 days per week
b. Amount of water pumped to system
c. Frequency and Analyses
    1. Chlorine Residual (free) - 5 days per week
    2. Fluoride - 5 days per week
    3. Iron - 5 days per week
    4. Manganese - 5 days per week
    5. Bacteriological: Total of fifteen (15) per month to be tested by the System.

Site Investigation
For
NGK Metals

Reference 12
15-Mile Surface Water Pathway

Site Investigation
For
NGK Metals

Reference 13
State of Tennessee Water Quality Standards

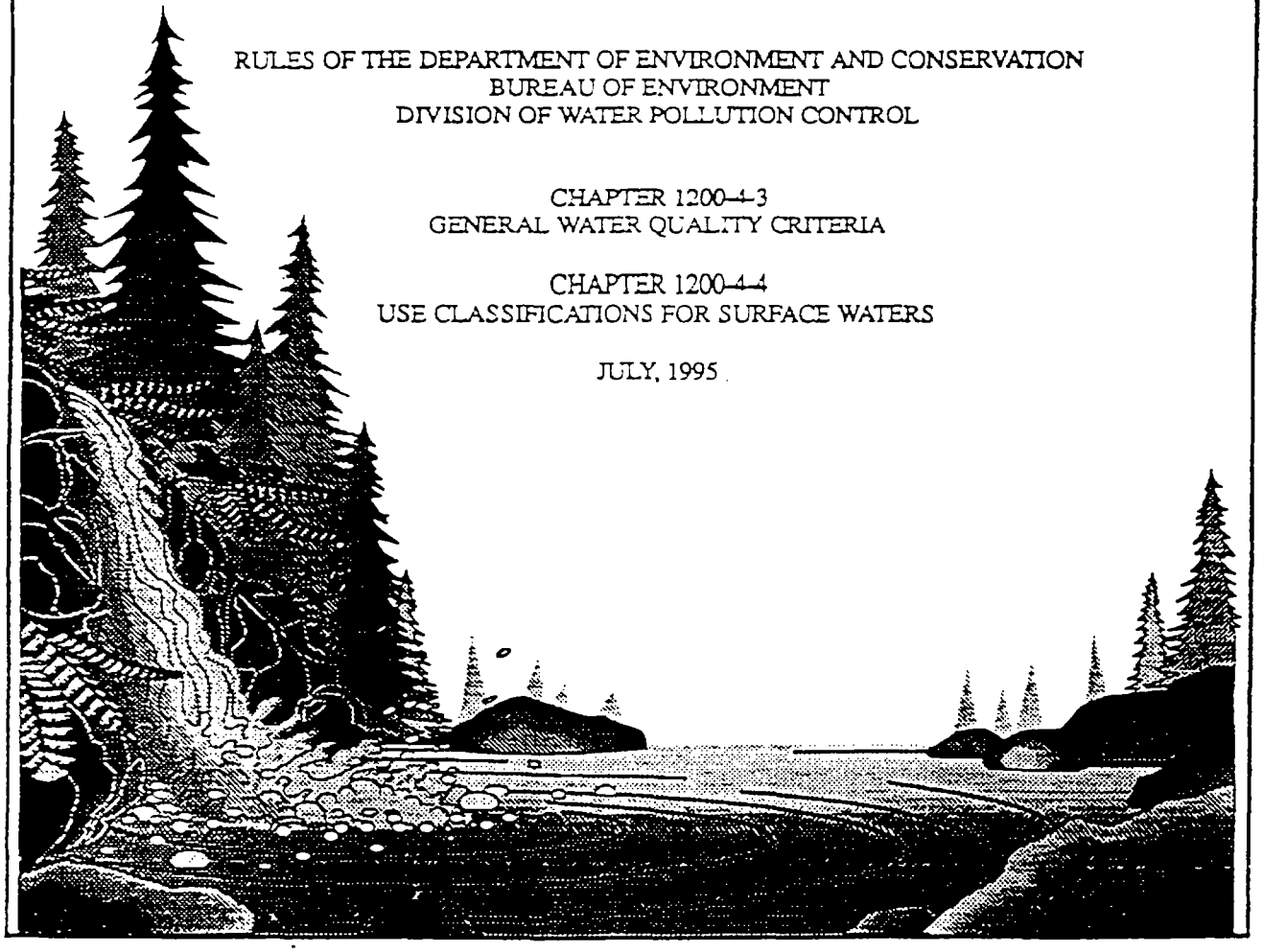
STATE OF TENNESSEE
WATER QUALITY STANDARDS

RULES OF THE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
BUREAU OF ENVIRONMENT
DIVISION OF WATER POLLUTION CONTROL

CHAPTER 1200-4-3
GENERAL WATER QUALITY CRITERIA

CHAPTER 1200-4-4
USE CLASSIFICATIONS FOR SURFACE WATERS

JULY, 1995



(Rule 1200—4—3—.03, continued)

(h) Taste or Odor - The waters shall not contain substances which will result in taste or odor that would prevent the use of the water for industrial processing.

(i) Toxic Substances - The waters shall not contain toxic substances whether alone or in combination with other substances, which will adversely affect industrial processing.

(j) Other Pollutants - The waters shall not contain other pollutants in quantities that may adversely affect the water for industrial processing.

(3) *Fish and Aquatic Life.*

(a) Dissolved Oxygen - The dissolved oxygen shall be a minimum of 5.0 mg/l except in limited sections of streams where it can be clearly demonstrated that (i) the existing quality of the water due to irretrievable man-induced conditions cannot be restored to the desired minimum of 5.0 mg/l dissolved oxygen; or (ii) the natural background quality of the water is less than the desired minimum of 5.0 mg/l. Such exceptions shall be determined on an individual basis, but in no instance shall the dissolved oxygen concentration be less than 3.0 mg/l. The dissolved oxygen concentrations shall be measured at mid-depth in waters having a total depth of ten (10) feet or less, and at a depth of five (5) feet in waters having a total depth of greater than ten (10) feet. The dissolved oxygen concentration of recognized trout waters shall not be less than 6.0 mg/l. The above criteria are applicable to tailwaters. The dissolved oxygen concentration of trout waters which have been designated as supporting a naturally reproducing population shall not be less than 8.0 mg/l.

(b) pH - The pH value shall lie within the range of 6.5 to 8.5 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.

(c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life.

(d) Turbidity or Color - There shall be no turbidity or color in such amounts or of such character that will materially affect fish and aquatic life.

(e) Temperature - The maximum water temperature change shall not exceed 3°C relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2°C per hour. The temperature of recognized trout waters shall not exceed 20°C. There shall be no abnormal temperature changes that may affect aquatic life unless caused by natural conditions. The temperature of impoundments where stratification occurs will be measured at mid-depth in the epilimnion for warm water fisheries and mid-depth in the hypolimnion for cold water fisheries. In the case of large impoundments (100 acres or larger) subject to stratification and recognized as trout waters, the temperature of the hypolimnion shall not exceed 20°C. The temperature in flowing streams shall be measured at mid-depth.

(f) Taste or Odor - The waters shall not contain substances that will impart unpalatable flavor to fish or result in noticeable offensive odors in the vicinity of the water or otherwise interfere with fish or aquatic life. References include, but are not limited to: Quality Criteria for Water (section 304(a) of Public Law 92-500 as amended).

(g) Toxic Substances - The waters shall not contain substances or a combination of substances including disease - causing agents which, by way of either direct exposure or indirect exposure through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), physical deformations, or restrict or impair growth in fish or aquatic life or their offspring. References on this subject include, but are not limited to: Quality Criteria for Water (Section 304(a) of Public Law 92-500 as amended), Federal Regulations under Section 307 of Public Law 92-500 as amended. The following criteria are for the protection of fish and aquatic life.

(Rule 1200—4—3—.03, continued)

(g)

Compound	Criterion Maximum Concentration ug/l (CMC)	Criterion Continuous Concentration ug/l (CCC)
Arsenic (III)	360	190
Cadmium*, dissolved	1.8/3.9/8.6	0.7/1.1/2.0
Chromium, total	—	100
Chromium, VI	16	11
Copper*, dissolved	9.2/17.7/34.1	6.5/11.8/21.4
Lead*, dissolved	33.8/81.7/197	1.3/3.2/7.7
Mercury	2.4	0.012
Nickel*, dissolved	789/1418/2549	87.7/158/283
Selenium	20	5
Silver*, dissolved	1.23/4.1/13.4	—
Zinc*, dissolved	65.0/117/211	58.9/106/191
Cyanide	22	5.2
Chlorine (TRC)	19	11
Pentachlorophenol**	20	13
Aldrin	3	—
g-BHC - Lindane	2	0.08
Chlordane	2.4	0.0043
4-4'-DDT	1.1	0.001
Dieldrin	2.5	0.0019
a-Endosulfan	0.22	0.056
b-Endosulfan	0.22	0.056
Endrin	0.18	0.0023
Heptachlor	0.52	0.0038
Heptachlor epoxide	0.52	0.0038
PCB, each aloclor	—	0.014
Toxaphene	0.73	0.0002

*Criteria for these metals are expressed as a function of total hardness (mg/L), as follows (values displayed above correspond to a total hardness of 50, 100 and 200 mg/L, respectively):

$$CMC = \exp(m_A[\ln(hardness)] + b_A) \qquad CCC = \exp(m_C[\ln(hardness)] + b_C)$$

	m_A	b_A	m_C	b_C
Cadmium	1.128	-3.828	0.7852	-3.490
Copper	0.9422	-1.464	0.8545	-1.465
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	3.3612	0.8460	1.1645
Silver	1.72	-6.52		
Zinc	0.8473	0.8604	0.8473	0.7614

**Criteria for pentachlorophenol are expressed as a function of pH. Values displayed above correspond to a pH of 7.8 and are calculated as follows:

$$CMC = \exp(1.005(pH) - 4.830) \qquad CCC = \exp(1.005(pH) - 5.290)$$

(7) Lower Tennessee River Basin (Including Conasauga Basin) (Cont.)

STREAM	DESCRIPTION	DOMESTIC WATER SUPPLY	INDUST WATER SUPPLY	FISH & AQUATIC LIFE	RECRE-ATION	IRRIG-ATION	LIVESTOCK WATERING & WILDLIFE	NAVIG-ATION	TROUT STREAM	NATURALLY REPRODUCING TROUT STREAM
North Potato Creek	Mile 0.0 to North Carolina Tenn State Line)			X	X	X	X			
Burra Burra Creek	Mile 0.0 to 1.5			X	X	X	X			
Brush Creek	Mile 0.0 to Origin		X	X	X	X	X			
Belcher Creek	Mile 0.0 to Origin			X	X	X	X			
Doweese Creek	Mile 0.0 to Origin	X		X	X	X	X			
Conasauga Creek	Mile 0.0 to Cog Hill Mill Dam			X	X	X	X		X	
Conasauga Creek	Cog Hill Mill Dam to Ruralville Mill			X	X	X	X			
Cane Creek	Mile 0.0 to 3.2			X	X	X	X			
Cane Creek	Mile 3.2 to Origin			X	X	X	X			
Unnamed Branch	Mile 0.0 to Origin			X	X	X	X			
Crockett Spring Cr	Mile 0.0 to Origin			X	X	X	X			
Conasauga Creek	Ruralville Mill to Origin			X	X	X	X		X	
Gee Creek	Mile 0.0 to Origin			X	X	X	X		X	
Spring Creek	Mile 0.0 to Origin			X	X	X	X			
Yellow Creek	Mile 0.0 to Origin			X	X	X	X		X	
Big Lost Creek	Mile 0.0 to Origin			X	X	X	X		X	
Little Lost Creek	Mile 0.0 to Origin			X	X	X	X		X	
Smith Creek	Mile 0.0 to Origin			X	X	X	X		X	
Wolf Creek	Mile 0.0 to Origin			X	X	X	X		X	
Turtletown Creek	Mile 0.0 to N. Carolina Line			X	X	X	X		X	
Brushy Creek	Mile 0.0 to N. Carolina Line			X	X	X	X		X	
Coker Creek	Joe Brown Highway to Origin			X	X	X	X		X	
Hiwassee River	Mile 23.9 to 34.4	X	X	X	X	X	X	X		
North Mouse Creek	Mile 0.0 to 10.0	X	X	X	X	X	X			
Spring Creek	Mile 0.0 to 18.7		X	X	X	X	X			
Spring Creek	Mile 18.7 to Origin			X	X	X	X			
Dry Valley Creek	Mile 0.0 to 7.0			X	X	X	X			
Dry Valley Creek	Mile 7.0 to 9.5			X	X	X	X			
Dry Valley Creek	Mile 9.5 to Origin			X	X	X	X			
North Mouse Creek	Mile 10.0 to 30.1		X	X	X	X	X			
Little North Mouse Cr	Mile 0.0 to 4.1			X	X	X	X			
Little North Mouse Cr	Mile 4.1 to Origin			X	X	X	X			
North Mouse Creek	Mile 30.1 to Origin			X	X	X	X			
Ocoee Creek	Mile 0.0 to 26.0	X	X	X	X	X	X			
Ocoee Creek	Mile 26.0 to 28.0		X	X	X	X	X			
Ocoee Creek	Mile 28.0 to 33.8		X	X	X	X	X			
Ocoee Creek	Mile 33.8 to 37.5	X	X	X	X	X	X			
Ocoee Creek	Mile 37.5 to Origin			X	X	X	X			

(7) Lower Tennessee River Basin (Including Conasauga Basin)

Hiwassee River	Mile 34.4 to 64.9 (North Carolina Line)	X	X	X	X	X	X		X	

All other surface waters named and unnamed in the Lower Tennessee River Basin with the exception of wet weather conveyances, which have not been specifically noted shall be classified

				X	X	X	X			

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

September 22, 1998

MEMORANDUM

RECEIVED
SEP 28 1998
ENVIRONMENTAL ASSISTANCE CENTER AT CHATTANOOGA

To: Mr. Frank Grubbs, Deputy Director
Division of Superfund, TDEC

From: Andrew N. Barrass, Ph. D.,
Environmental Review Coordinator
Division of Natural Heritage, TDEC

Subject: Project review information for endangered species and critical or sensitive habitat

Please be advised that a review of our Division's Biological Conservation Data System, BCD, indicates **no** recorded threatened and/or endangered species within the proposed project sites nor an approximate one mile radius of the proposed project. Our records do indicate additional species occurrence records within an approximate four mile radius of the proposed project site(s) and the described fifteen mile surface water pathway. The review is for the proposed **NGK Metals, Inc. preliminary site review [TDSF #54-514], along unnamed tributary to Little North Mouse Creek to North Mouse Creek, near Athens, McMinn County, TN** project site(s). The species occurrence record information, critical or sensitive habitats, and managed areas are listed by quad map and are attached.

The results of our review do not mean that a comprehensive biological survey has been completed. We would suggest that a survey of the project sites be conducted prior to project implementation. Please notify our office of your findings.

Please be advised, however, that this information is sensitive to the protection of rare habitat, threatened or endangered species, and natural areas which our Department has the responsibility to protect. Therefore, we would request that this information **only** be used as a research tool by your professional staff and not be made available to the public or anyone outside of your Division.

We recognize the importance of stream bank habitat to improving water quality and preventing soil erosion. We would suggest that stream bank, stream side and riparian zones be restored to habitat that is representative of eco-specific communities found within the project area. Any restoration activities should include the use of native plant species.

In order to comply with the National Environmental Policy Act consideration should be given to the comprehensive and *cumulative* impacts associated with the project actions. Based upon the information provided, it is probable that any proposed stream crossing will impact instream, aquatic, habitat and riparian habitat as part of the construction. Techniques for streamside reconstruction and sediment retention are outlined in the following documents prepared by our Department:

1. **Tennessee Erosion Control Handbook, July 1992.**

2. **Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites, March 1992.**

3. **Riparian Restoration and Streamside Erosion Control Handbook, November 1994.**

Please refer to the documents when planning measures to lessen the construction impacts.

In addition to our standard project review and data search of the **Biological Conservation Data System,** we typically include information from the **Rivers and Wetlands Assessment Program** data base. This project has compiled a comprehensive database of State and Federal agency evaluated (jurisdictional) wetland sites. These programs are currently without staff. In order to continue to provide needed wetlands data, I will include wetlands data as part of the GIS formatted review. Should any of the agency evaluated wetland sites occur within the fifteen mile **PPE** search corridor or the one mile radius search area, these will be listed within Tables as part of the GIS information sheet attached

We appreciate the opportunity to assist you with your pre-project planning. If we can be of further assistance with your project or by interpreting data elements please contact our office in Nashville, telephone **615/532-0431**.

Please find attached the listings of the various data occurrences or elements from our Biological Conservation Data System, BCD, that have been retrieved from our computer data bases. The information provided is current for this quarter of the calendar year. Our information is continuously being updated and future searches may result in expanded data listings for this specific project investigation.

Definitions of BCD Data Elements:

COUNTYNAME = Tennessee County Name

MANAME = Managed Area Name

QUADNAME = Quad Map Name

SCOMNAME = State Listed, Species Common Name

SITENAME = Site Name for Natural Area, Critical or Sensitive Habitat

SNAME = Species Name

Attachments: (4)

Habitat Information for State and/or Federally Listed Species and Critical or Sensitive Habitat For Locations Within a One Mile Radius of the Project Site and a Fifteen Mile Stream Segment Downstream of the Project

The following habitat description(s) has been retrieved from our national data base for the purpose of scientific field review and population determinations. The following species occurrence record(s) are associated with primarily the **PPE** for the proposed project along upper *North Mouse Creek* and associated watershed.

One mile radius search:

[There are no records within this search area]

Fifteen mile stream segment search:

Flame Chub: *[1993]*
HEMITREMIA FLAMMEA *Springs and spring-fed streams, usually over gravel (Page and Burr 1991).**

_____
[species occurrence or record date and file or survey information]

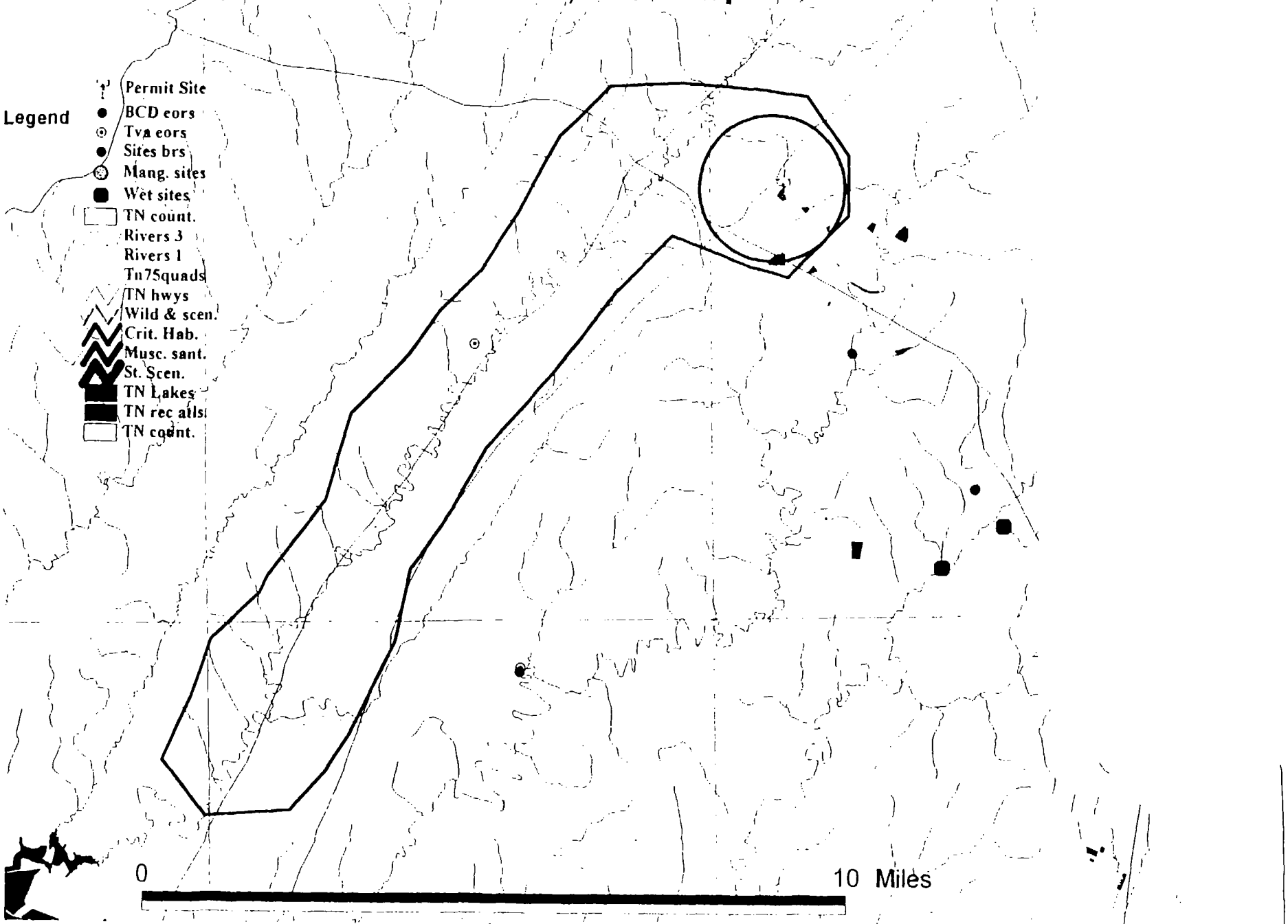
Because the habitat for the animal species listed is very specific, you may wish to request further information from Mr. Smoot Major, in our office in Nashville. He may be reached by telephone at **615/741-9141**.

Note: **Should the project require further environmental program permits from our Department, please attach a complete copy of this review or assessment to the permit application.**

QUADNAME:.....	SCOMNAME:.....	SNAME:.....	FEDERAL	STATE	SRANK:.....
CALHOUN	HELLBENDER	CRYPTOBRANCHUS ALLEGANIENSIS	D		S3
ATHENS	TENNESSEE CAVE SALAMANDER	GYRINOPHILUS PALLEUCUS	T		S2
·S	SWAINSON'S WARBLER	LIMNOTHLYPIS SWAINSONII	D		S3
NS	GRASSHOPPER SPARROW	AMMODRAMUS SAVANNARUM	D		S4
.A	GRASSHOPPER SPARROW	AMMODRAMUS SAVANNARUM	D		S4
NIOTA	FLAME CHUB	HEMITREMIA FLAMMEA	D		S4
NIOTA	FLAME CHUB	HEMITREMIA FLAMMEA	D		S4

7 Records Processed

along tributary to Little North Mouse Creek to North Mouse Creek,
ne Athens, McMinn Co. TN DHN-anb/DSFath..n.apr



Site Investigation
For
NGK Metals

Reference 15
Soil Survey, McMinn County

s 1948, No. 4 Issued October 1957

SOIL SURVEY

McMinn County Tennessee

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
TENNESSEE AGRICULTURAL EXPERIMENT STATION
TENNESSEE VALLEY AUTHORITY

and Apison soils. A small acreage occurs along the base of Starr Mountain.

The surface layer to a depth of about 10 inches is yellowish-gray or grayish-yellow loam. The sublayers are similar to those of the undulating phase. Bedrock shale is at depths ranging from 2 to about 8 feet. A few sandstone and quartzite cobbles or fragments occur in those areas along the base of Starr Mountain.

The fertility is low, and there is not much organic matter in the surface layer. The soil is medium to strongly acid. It is permeable to moisture and plant roots, but the firm subsoil retards infiltration somewhat and increases the erosion hazard.

Use suitability.—Practically all of this soil is under cutover deciduous forest. It is well suited to tilled crops, but fairly long rotations are needed because of its low fertility and moderately strong slopes. Practically all of the crops commonly grown produce well where proper management that includes adequate fertilization is used. Stands of the more exacting legumes and grasses are more difficult to maintain than on some of the more productive soils. For further discussion of use and management, see group 15 in the section, Use and Management of Soils.

Jefferson loam, eroded rolling phase (5 to 12 percent slopes) (Jb).—This phase consists of rolling areas of Jefferson loam that have been eroded to the extent that the plow layer now consists of remnants of the original surface soil mixed with subsoil. Most areas occur on gentle foot slopes in association with Lehew, Montevallo, and Apison soils.

The plow layer to a depth of about 5 inches is grayish-yellow loam. This material is underlain by the more yellowish firm but friable clay loam similar to that in the subsoil of the undulating phase of Jefferson loam. Bedrock shale is at depths of 2 to 8 feet.

In some patches on the stronger slopes the subsoil is exposed and the plow layer is yellow or yellowish-brown firm but friable clay loam. A small acreage that has slopes as steep as 25 percent is included with this phase.

This soil is not high in fertility and is low in organic matter. It is medium to strongly acid. It is fairly permeable to moisture, but because of the rolling surface and the firm subsoil that retards infiltration, erosion is a hazard where the soil is cultivated. The capacity for holding moisture for plants is fair to moderate. The soil responds well if properly fertilized.

Use suitability.—Practically all of this soil has been cleared and cultivated. About 50 percent is used for crops, and about 30 percent for pasture, much of which is unimproved. A small part is idle. Corn, tobacco, cotton, small grains, and lespedeza are the chief crops. Most of the soil is not highly fertilized, and yields are moderate.

Because of the rather strong slopes and somewhat retarded infiltration of moisture, this soil is not suited to intensive use for row crops. Where good management is practiced, productivity probably can be maintained under a 4-year rotation in which a cultivated crop is grown only for 1 year. However, on much of the acreage a cropping system consisting chiefly of small grains and hay and pasture crops is preferable. The more exacting legumes and grasses can be grown where fertility is increased to a high level, but stands are more difficult to maintain than on some of the more fertile soils of the county. For further discussion of use and management, see group 15 in the section, Use and Management of Soils.

Leadvale silt loam, undulating phase (2 to 5 percent slopes) (Lb).—This moderately well drained soil consists of local alluvium washed chiefly from Litz and Sequoia soils, which originate from predominantly acid shale in which there are occasional lenses of limestone or other calcareous material. This soil lies as very gentle foot slopes along drainageways and is associated with Litz and Sequoia soils. Practically all of it is in the Litz-Cotaco and Sequoia-Litz-Cotaco soil associations. A few areas are in the Needmore-Dandridge soil association.

Profile description:

0 to 7 inches, light yellowish-brown to pale-yellow friable silt loam.
7 to 16 inches, yellowish-brown moderately firm but friable silty clay loam.
16 to 24 inches, yellowish-brown, somewhat mottled with gray, moderately compact silty clay.
24 to 60 inches, mottled gray, yellow, and brown firm or compact silty clay, platy structure of parent shale in much of material, bedrock shale at depths of 8 to 10 feet.

The surface layer in some places, especially on the smoother parts, is darker and is brown when moist.

This soil is low to moderate in fertility and low in content of organic matter. It is medium to strongly acid. The surface layer is permeable to moisture, but the subsoil is firm enough to retard infiltration. The capacity for holding moisture is moderate. Since the lower subsoil is not very permeable to roots, this soil is somewhat less well suited to alfalfa and other deep-rooted legumes than the Decatur, Dewey, and Hermitage soils.

Use suitability.—Practically all of this soil has been cleared and is now used for crops or pasture. Rotations consisting chiefly of corn, small grains, and hay crops are used. In some sections tobacco responds well to fertilization and is of high quality. Most of the acreage receives some fertilizer, and a great part has been limed. Crop yields are moderate.

This soil is well suited to most crops commonly grown because of the smooth surface, fairly good permeability, and favorable response to fertilization. However, its retarded internal drainage and low fertility make it poorly suited to alfalfa. The more permeable open soils are better suited to truck crops.

If adequately fertilized, this soil is productive of most of the grasses and legumes used for pasture or hay. Where fertility is kept high, the soil can be used in a fairly short rotation, but the more sloping parts need erosion control. For a further discussion of use and management, see group 5 in the section, Use and Management of Soils.

Leadvale silt loam, eroded rolling phase (5 to 12 percent slopes) (La).—This phase consists of rolling areas of Leadvale silt loam that have been so eroded that the plow layer now consists of a mixture of surface soil and subsoil materials. The areas are widely distributed on foot slopes in association with Litz and Sequoia soils. A great part of the acreage is in the Litz-Cotaco and Sequoia-Litz-Cotaco soil associations.

The plow layer is grayish-yellow silt loam, and the sublayers are similar to those of Leadvale silt loam, undulating phase. The more exposed parts in many places have lost all of the surface layer and now have a plow layer of yellowish-brown firm but friable silty clay loam.

are especially needed for legume-and-grass hay and pasture crops. The response to potassium can be expected to be good. Boron also is needed for alfalfa. Where row crops are grown continuously, nitrogen fertilizer will be beneficial. Where short rotations that include the more desirable legumes are used, nitrogen fertilizer may not be required. Good tilth is easily maintained. Special practices to control erosion are necessary in very few places.

Because good stands of high-quality grazing vegetation are not difficult to maintain, these soils are especially desirable for pasture. Their good moisture supply makes them favorable for midsummer grazing, as vegetation thrives during the dry periods longer than on most of the upland soils.

Management Group 4

Management group 4 consists of very gently sloping soils derived from local alluvium. They occur along drainageways and are permeable and deep to bedrock. Greendale cherty silt loam has enough chert to interfere somewhat with cultivation. The soils of this group differ from those of group 3 chiefly in having a lower natural fertility. They differ also in parent material. The soils of group 4 consist of material derived from shale, sandy rock, and cherty limestone; whereas the soils of group 3 consist of material derived predominantly from high-grade limestone.

All the soils of group 4 are medium to strongly acid. On the whole they have good tilth; and when they are properly fertilized, their productivity is not difficult to maintain.

The soils of management group 4 and the yields of principal crops that can be expected from each under two levels of management are shown in table 9.

Present use and management.—A great part of the acreage of these soils has been cleared and is now used for crops and pasture. Corn is the chief crop, and bluegrass and whiteclover make up most of the pasture vegetation. Alfalfa, small grains, and tobacco are also grown. Some areas of these soils are used almost continuously for corn. In some places corn is rotated with small grains; in others, pasture is allowed to remain for considerable periods. Fertilization is not heavy.

Use suitability and suggested management.—Because of their smooth surface, favorable tilth, good permeability, and relatively great depth to bedrock, the soils of management group 4 are well suited to intensive use. Corn and legume-and-grass mixtures for hay and pasture are well suited. The better drained soils, as the Barbourville and Greendale, are suited to many kinds of crops, including tobacco, alfalfa, and certain truck crops.

High yields require heavy fertilization. Although continuous row crops may be grown, it is considered good management to use a short rotation that includes the more desirable legumes. Tilth is easily maintained, and special practices for controlling runoff water normally are not required.

All of these soils are productive of pasture where adequately fertilized. Lime, potassium, and phosphorus are all generally deficient. Like the soils of management groups 1 and 3, the moisture relations of these soils are more favorable for midsummer grazing than those of most of the upland soils. Slow internal drainage shortens their winter grazing season, but good stands of fall-sown grains and legumes are more easily obtained than on many of the soils of the uplands.

Management Group 5

The soils of management group 5 are friable and permeable in the upper 1½ to 2 feet, but below this the material is much firmer and has impaired internal drainage. Bedrock is at depths of 3 to 10 feet or more. Fertility moderate to low, and the content of organic matter is low. These soils are medium to strongly acid. Their capacity for holding moisture available to plants is moderately high. Tilth is good, but field operations on the Monongahela and Leadvale soils are delayed by wetness following prolonged rains. Runoff is difficult to control only where it comes directly onto areas of the Pace and Leadvale soils from adjoining higher lying slopes.

The soils of management group 5 and the yields of principal crops that can be expected from each under two levels of management are given in table 10.

TABLE 9.—*Soils of management group 4: Expected average acre yields of the principal crops under two levels of management*

[Yields in columns A are to be expected under present management; those in columns B are to be expected under the suggested management. Blank spaces indicate either crop is not grown under the management specified or soil is unsuited to its production]

Soil	Corn		Wheat		Lespedeza		Alfalfa		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Barbourville loam	28	50	13	20	0.8	1.6	2.3	2.9	1,200	1,700	75	120
Cotaco loam [2]	25	48	10	18	.7	1.5					75	120
Cotaco silt loam [2]	30	50	13	20	.8	1.6					85	150
Greendale cherty silt loam	25	48	11	20	.9	1.7	2.2	2.9	1,100	1,500	75	105
Greendale silt loam	32	55	15	24	1.1	1.9	2.5	3.2	1,600	2,100	95	145
Whitesburg silt loam	35	55	14	21	1.1	1.9					110	150

[1] Cow-acre-days is the number of days 1 acre will graze a mature animal (cow, horse, or steer) without injury to the pasture.

[2] Yields in columns A can be expected without artificial drainag those in columns B can be expected under adequate drainage.

ABLE 10.—*Soils of management group 5: Expected average acre yields of the principal crops under two levels of management*

. columns A are to be expected under present management; those in Columns B are to be expected under the suggested manage-nt. Blank spaces indicate either crop is not grown under the management specified or soil is unsuited to its production]

Soil	Corn		Wheat		Lespedeza		Alfalfa		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
advale silt loam, undulating phase	22	44	11	18	0.8	1.5			1,000	1,400	65	120
onongahela silt loam [2]	20	35	11	18	.8	1.5					65	120
ce silt loam, undulating phase	25	52	13	23	1.0	1.6	2.4	3.0	1,300	1,700	80	120

[1] Cow-acre-days is the number of days 1 acre will graze a mature animal (cow, horse, or steer) without injury to the pasture.

[2] Yields in columns A can be expected without artificial drainage; those in columns B can be expected under adequate drainage.

Present use and management.—A great part of the reage is used mainly for corn, small grains, hay, and sture. Lespedeza is the most common hay crop. Fer-ization is not heavy, but lime has been used on much of acreage.

Use suitability and suggested management.—The smooth rface, ability to respond to proper fertilization, fairly h water-supplying capacity, and ease of tillage and servation make these soils well suited to intensive use. ey are suited to most general farm crops except alfalfa. cause of slow internal drainage, the Monongahela soil general is not well suited to such crops as potatoes. A ear rotation of corn, a small grain, and red clover is d. Because of low fertility, these soils require rtilization with all plant nutrients, lime, and matter if they are to produce high yields. Good n is easily maintained on the Pace soils, but tillage of st areas of the Monongahela and Leadvale soils when wet will cause clodding.

These soils require fertilization, especially with phos-rus and lime, for successful production of pasture. perly seeded and fertilized, bluegrass, fescue, and ino clover or white clover make good permanent ture. The more slowly drained parts are not well suited to winter pasture crops. They are colder and hold excess moisture longer than some soils of the uplands.

Management Group 6

Brown well-drained soils on old local alluvial slopes and stream terraces are in management group 6. Most of them have firm but permeable subsoils. Among the soils of this group, the Cumberland have the firmest subsoils and the Sequatchie the most permeable. All of them have at least a moderate depth to bedrock, in most places a depth greater than 5 or 6 feet. The surface of the soils is smooth, the gradient in but few places exceeding 5 percent. The surface layers are friable and have good tilth. The natural fertility is, on the whole, moderate to high. The content of organic matter is moderate. All of the soils of this group are medium to strongly acid. Their capacity for holding moisture available to plants is moderate to high, and runoff is not difficult to control.

The soils of management group 6 and the yields of principal crops that can be expected from each under two levels of management are given in table 11.

BLE 11.—*Soils of management group 6: Expected average acre yields of the principal crops under two levels of management*

[Ds in columns A are to be expected under present management; those in columns B are to be expected under the suggested management]

Soil	Corn		Wheat		Lespedeza		Alfalfa		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
a loam, eroded undulating phase	36	60	15	25	1.0	1.7	2.6	3.6	1,500	1,900	85	125
berland silt loam, undulating phase	40	65	18	27	1.2	1.8	2.9	3.6	1,600	2,000	95	140
berland silty clay loam, eroded undulating ase	38	60	16	26	1.1	1.7	2.8	3.5	1,500	1,900	90	130
ah silt loam, undulating phase	35	55	15	24	1.0	1.6	2.6	3.4	1,400	1,800	85	130
er loam, undulating phase	36	58	15	23	1.1	1.7	2.7	3.4	1,400	1,800	85	125
ntage silt loam, undulating phase	38	60	16	25	1.1	1.7	2.8	3.5	1,500	1,900	90	130
tchie fine sandy loam, undulating phase	34	55	14	23	1.0	1.6	2.6	3.4	1,400	1,800	65	105
nesboro loam, eroded undulating phase	35	55	14	23	.9	1.6	2.5	3.4	1,400	1,800	80	125

re-days is the number of days 1 acre will graze a mature animal (cow, horse, or steer) without injury to the pasture.

OF IMPORTANT CHARACTERISTICS—Continued

Subsoil		Depth of profile [3]	Parent rock or parent material	General drainage
Color [2]	Consistence			
		Feet		
Yellowish brown	Firm, friable	5–15	Mixed general alluvium originating from sandstone and shale; some limestone in places.	Moderately well drained.
Yellowish brown	Firm, friable	2–12	Mixed general alluvium originating from sandstone and shale; some limestone in places.	Somewhat excessively drained
Yellow	Friable	2–12	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow	Friable	2–12	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow	Friable	2–10	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow grading to mottled	Firm, friable	2–10	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow grading to mottled	Firm, friable	2–8	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow grading to mottled	Firm, friable	2–8	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellowish brown, weakly mottled.	Firm, friable	3–10	Local alluvium originating chiefly from shale	Moderately well drained.
llowish brown, weakly mottled.	Firm, friable	2–8	Local alluvium originating chiefly from shale	Somewhat excessively drained.
Reddish brown and brownish yellow.	Friable	1–2	Acid sandy and fine-grained shale	Somewhat excessively drained.
Reddish brown and brownish yellow.	Friable	1–2	Acid sandy and fine-grained shale	Somewhat excessively drained.
Reddish brown and brownish yellow.	Friable	½–1½	Acid sandy and fine-grained shale	Excessively drained.
Reddish brown and brownish yellow.	Friable	½–1½	Acid sandy and fine-grained shale	Excessively drained.
Reddish brown and brownish yellow.	Friable	1–2	Acid sandy and fine-grained shale	Somewhat excessively drained.
Reddish brown and brownish yellow.	Friable	1–2	Acid sandy and fine-grained shale	Somewhat excessively drained.
Brownish yellow	Friable	1–2	Acid fissile shale with limestone lenses	Somewhat excessively drained.
rownish yellow	Friable	½–1½	Acid fissile shale with limestone lenses	Somewhat excessively drained.
rownish yellow	Friable	1–2	Acid fissile shale with limestone lenses	Well drained.
rownish yellow	Friable	½–1½	Acid fissile shale with limestone lenses	Somewhat excessively drained.
rownish yellow	Friable	½–1	Acid fissile shale with limestone lenses	Excessively drained.
ownish yellow	Friable	½–1	Acid fissile shale with limestone lenses	Excessively drained.
ownish yellow	Friable	½–1	Acid fissile shale with limestone lenses	Excessively drained.

SOILS OF McMINN COUNTY, TENNESSEE: SUMMARY

Map symbol	Soil	Management group [1]	Slope range	Surface soil color [2]
	Holston loam—Continued		*Percent*	
Hn	Eroded undulating phase	10	2–5	Light yellowish brown
Hg	Eroded rolling phase	15	5–12	Light yellowish brown
Ja	Jefferson fine sandy loam, rolling phase	15	3–12	Yellowish gray
	Jefferson stony fine sandy loam:			
Jf	Rolling phase	15	3–12	Yellowish gray
Je	Hilly phase	18	12–25	Yellowish gray
	Jefferson loam:			
Jd	Undulating phase	10	2–5	Yellowish gray
Jc	Rolling phase	15	5–12	Yellowish gray
Jb	Eroded rolling phase	15	5–12	Grayish yellow
	Leadvale silt loam:			
[illegible]	Undulating phase	5	2–5	Light yellowish brown
La	Eroded rolling phase	15	5–12	Grayish yellow
Lc	Lehew-Montevallo loams, hilly phases	23	12–25	Light reddish brown and grayish yellow.
	Lehew-Montevallo shaly loams:			
Le	Eroded hilly phases	23	12–25	Light reddish brown and brownish yellow.
Lh	Steep phases	23	25–60	Light reddish brown and grayish yellow.
Lg	Eroded steep phases	23	25–60	Light reddish brown and brownish yellow.
Lf	Lehew-Montevallo loams, rolling phases	11	5–12	Light reddish brown and grayish yellow.
Lr	Lehew-Montevallo shaly loams, eroded rolling phases	11	5–12	Light reddish brown and brownish yellow.
Lv	Litz silt loam, rolling phase	11	5–12	Light yellowish brown
	Litz shaly silt loam:			
Lt	Eroded rolling phase	21	5–12	Brownish yellow
Lu	Eroded undulating phase	11	2–5	Brownish yellow
Lj	Litz silt loam, hilly phase	21	12–25	Light yellowish brown
Lo	Litz shaly silt loam, eroded hilly phase	21	12–25	Brownish yellow
Ls	Litz silt loam, steep phase	23	25–60	Light yellowish brown
	Litz shaly silt loam, eroded steep phase	23	25–60	Brownish yellow

See footnotes at end of table.

1990 CENSUS POPULATION FACTOR

CODE	COUNTY	FACTOR
001	ANDERSON	2.47
003	BEDFORD	2.59
005	BENTON	2.46
007	BLEDSOE	2.64
009	BLOUNT	2.51
011	BRADLEY	2.61
013	CAMPBELL	2.65
015	CANNON	2.60
017	CARROLL	2.50
019	CARTER	2.49
021	CHEATHAM	2.82
023	CHESTER	2.59
025	CLAIBORNE	2.65
027	CLAY	2.51
029	COCKE	2.58
031	COFFEE	2.57
033	CROCKETT	2.53
035	CUMBERLAND	2.55
037	DAVIDSON	2.36
039	DECATUR	2.45
041	DE KALB	2.50
043	DICKSON	2.65
045	DYER	2.52
047	FAYETTE	2.97
049	FENTRESS	2.64
051	FRANKLIN	2.64
053	GIBSON	2.48
055	GILES	2.58
057	GRAINGER	2.64
059	GREENE	2.52
061	GRUNDY	2.75
063	HAMBLEN	2.56
065	HAMILTON	2.50
067	HANCOCK	2.65
069	HARDEMAN	2.73
071	HARDIN	2.56
073	HAWKINS	2.58
075	HAYWOOD	2.74
077	HENDERSON	2.54
079	HENRY	2.42
081	HICKMAN	2.63
083	HOUSTON	2.55
085	HUMPHREYS	2.56
087	JACKSON	2.52
089	JEFFERSON	2.55
091	JOHNSON	2.52
093	KNOX	2.42
095	LAKE	2.50
097	LAUDERDALE	2.68
099	LAWRENCE	2.62
101	LEWIS	2.58
103	LINCOLN	2.57
105	LOUDON	2.54
107	MCMINN	2.55
109	MCNAIRY	2.51
111	MACON	2.57
113	MADISON	2.55
115	MARION	2.67
117	MARSHALL	2.57
119	MAURY	2.62
121	MEIGS	2.64
123	MONROE	2.63
125	MONTGOMERY	2.72
127	MOORE	2.72
129	MORGAN	2.74
131	OBION	2.53
133	OVERTON	2.59
135	PERRY	2.57
137	PICKETT	2.52
139	POLK	2.66
141	PUTNAM	2.45
143	RHEA	2.57
145	ROANE	2.53
147	ROBERTSON	2.77
149	RUTHERFORD	2.69
151	SCOTT	2.78
153	SEQUATCHIE	2.67
155	SEVIER	2.58
157	SHELBY	2.65
159	SMITH	2.61
161	STEWART	2.53
163	SULLIVAN	2.49
165	SUMNER	2.77
167	TIPTON	2.86
169	TROUSDALE	2.56
171	UNICOI	2.46
173	UNION	2.75
175	VAN BUREN	2.69
177	WARREN	2.57
179	WASHINGTON	2.45
181	WAYNE	2.65
183	WEAKLEY	2.47
185	WHITE	2.57
187	WILLIAMSON	2.88
189	WILSON	2.79

TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF SUPERFUND

OFFICE CORRESPONDENCE

RECEIVED
JAN 20 1999
ENVIRONMENTAL ASSISTANCE
CENTER AT CHATTANOOGA

January 14, 1999

TO: Jill Davis, EAC-CH

FROM: John T. Weakley JTW

SUBJECT: PC-GEMS Data

Attached is the PC-GEMS information for latitude 35° 34′ 05″ longitude 84° 35′ 37″

NGK Metals

1990 Census Data - Block Group Level
LAT: 0353411 LONG: 0843523

miles	0-.25	.25-.5	.5-1	1-2	2-3	3-4	
KM	0.00- 0.4	0.4- 0.8	0.8- 1.6	1.6- 3.2	3.2- 4.8	4.8- 6.4	TOTAL
RING TOTALS	0	0	0	1598	258	663	2519

1990 Census Data - Block Level
LAT: 0353411 LONG: 0843523

KM	0.00- 0.4	0.4- 0.8	0.8- 1.6	1.6- 3.2	3.2- 4.8	4.8- 6.4	TOTAL
RING TOTALS	0	0	134	471	549	1038	2192

Office of Technical Services Supplemental Guidance to RAGS: Region 4 Bulletins **(October, 1996)**

United States Environmental Protection Agency, Region 4

Waste Management Division

61 Forsyth St.

Atlanta, GA 30303

Phone: 404-562-9714

Fax: 404-562-8628

For best quality hard-copy save and print this document as a PostScript file.
Click on any HYPETREXT link in this color to move around the document.

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Ecological

1. Ecological Introduction
2. Preliminary Risk Evaluation
3. Ecological Screening Values
   - Table 1 Freshwater Surface Water Screening Values
   - Table 2 Saltwater Screening Values
   - Table 3 Sediment Screening Values
4. Endpoint Selection
5. Natural Resource Trustees

Index
Human Health

1. Human HealthIntroduction
2. Data collection and Evaluation
3. Toxicity

Program. NOAA Technical Memorandum NOS OMA 52.
4. Long, ER, DD MacDonald, SL Smith, and FD Calder. 1995. "Incidence of Adverse Biological Effects with Ranges of Chemical Concentrations in Marine and Estuarine Sediments." Environmental Management 19(1): 81-97.

Table 1 Table 2 Table 3 TOP

Table 1. Region 4 Waste Management Division Freshwater Surface Water Screening Values for Hazardous Waste Sites[1]

Priority Pollutants

Compound	Acute Screening Values (ug/L)	Chronic Screening Values (ug/L)
Antimony	1300 (2s)	160 (2s)
Arsenic III	360*	90*
Beryllium	16 (6s)	0.53 (1s)
Cadmium2	1.79*	0.66*
Chromium (III)2	984.32*	117.32*
Chromium (VI)	16*	11*
Copper2	9.22*	6.54*
Lead2	33.78*	1.32*
Mercury	2.40*	0.012*3
Nickel2	789.00*	87.71*
Selenium	20.00*	5.00*
Silver2	1.23*	0.012(1s)
Thallium	140.00(3s)	4.00 (2s)
Zinc2	65.04*	58.91*
Cyanide	22*	5.2*
2,3,7,8-TCDD-Dioxin	0.1	0.00001[3

NGK METALS

SITE INVESTIGATION

APPENDIX A

Acrolein	6.8(3s)	2.1 (1s)
Acrylonitrile	755 (4s)	75.5
Benzene	530 (7s)	53
Bromoform	2930 (2s)	293
Carbon Tetrachloride	3520 (3s)	352
Chlorobenzene	1950 (5s)	195
2-Chloroethylvinyl Etheru	35400 (1s)	3540
Chloroform	2890 (3s)	289
1,2-Dichloroethane	11800 (3s)	2000 (1s)
1,1-Dichloroethylene	3030 (3s)	303
1,2-Dichloropropane	5250 (3s)	525
1,3-Dichloropropylene (cis and trans)	606 (2s)	24.4 (1s)
Ethylbenzene	4530 (5s)	453
Methyl Bromide	1100 (1s)	110
Methyl Chloride	55000 (1s)	5500
Methylene Chloride	19300 (3s)	1930
1,1,2,2-Tetrachloroethane	932 (3s)	240 (1s)
Tetrachloroethylene	528 (5s)	84 (1s)
Toluene	1750 (5s)	175
1,2-Trans-Dichloroethylene	13500 (1s)	1350
1,1,1-Trichloroethane	5280 (2s)	528
1,1,2-Trichloroethane	3600(3s)	940(1s)
2-Chlorophenol	438 (5s)	43.8
2,4-Dichlorophenol	202 (3s)	36.5 (1s)
2,4-Dimethylphenol	212 (3s)	21.2
2-Methyl-4,6-Dinitrophenol (4,6-Dinitro-O-Cresol)	23 (4s)	2.3
2,4-Dinitrophenol	62 (3s)	6.2
2-Nitrophenol	-	3500
4-Nitrophenol	828 (3s)	82.8
3-Methyl-4-Chlorophenol(P-Chloro-M-Cersol)	3 (1s)	0.3
Pentachlorophenol[4] (pH 7.8)	20 *	13*

U.S. EPA REGION IV

SDMS

Unscannable Material Target Sheet

DocID: 10079539 Site ID: TND 980314 033

Site Name: NGK METALS

Nature of Material:

Map:	✓	Computer Disks:	
Photos:		CD-ROM:	
Blueprints:		Oversized Report:	
Slides:		Log Book:	

Other (describe):

Amount of material: #1 4 Mile Radius Map

Please contact the appropriate Records Center to view the material.

NGK METALS

SITE INVESTIGATION

APPENDIX B

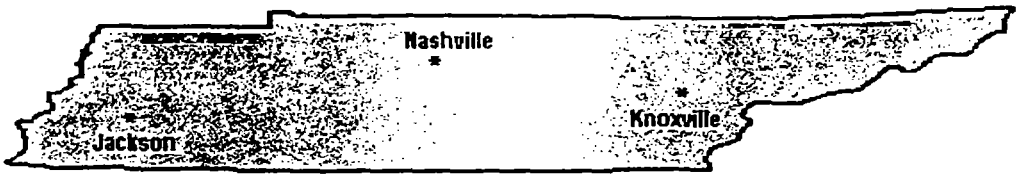
RECEIVED
JAN 2 4 2000
ENVIRONMENTAL ASSISTANCE
CENTER AT CHATTANOOGA

FROM	DATE
RLH	1/14/00
TO	
ENV ADM	1/14/00

ENVIRONMENTAL LABORATORIES REPORT ROUTING

PLEASE REVIEW AND ROUTE AS INDICATED:

____Air Pollution Control, 9th floor, L&C Annex, 401 Church St., Nashville, TN 37243-1531, Attn:
____DOE Oversight, 761 Emory Valley Road, Oak Ridge, TN 37830-7072, Attn:
____Groundwater Protection, 10th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1540, Attn:
____Radiological Health, 3rd floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1532, Attn:
____Solid Waste Management, 5th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1535, Attn:
____Superfund, 4th floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1538, Attn:
____Water Pollution Control, 6th floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1534, Attn:
____Water Supply, 6th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1549, Attn:
____Underground Storage Tanks, 4th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1541, Attn:
✓Chattanooga Environmental Assistance Center, 540 McCallie Ave., Suite 550, Chattanooga, TN, 37402, Attn: Craig Stannard
____Columbia Environmental Assistance Center, 2484 Plus Park Drive, Columbia, TN 38401, Attn:
____Cookeville Environmental Assistance Center, 1221 South Willow Ave., Cookeville, TN 38506, Attn:
____Jackson Environmental Assistance Center, 362 Carriage House Drive, Jackson, TN 38305, Attn:
____Johnson City Environmental Assistance Center, 2305 Silverdale Road, Johnson City, TN 37601, Attn:
____Knoxville Environmental Assistance Center, 2700 Middlebrook Pike, Knoxville, TN 37921, Attn:
____Memphis Environmental Assistance Center, 2510 Mt. Moriah, Suite E-645, Perimeter Park, Memphis, TN 38115-1520, Attn:
____Nashville Environmental Assistance Center, 537 Brick Church Pike, Nashville, TN 37243, Attn:
____Joelton Environmental Assistance Center, 3000 Morgan Road, Joelton, TN 37080, Attn:
____Jackson Branch Laboratory, 295 Summar Avenue, P.O. Box 849, Jackson, TN, 38302-0849, Attn:
____Knoxville Branch Laboratory, 1522 Cherokee Trail, Knoxville, TN 37920, Attn:
____Charlie Mickle, Laboratory Quality Assurance, 630 Hart Lane, Nashville, TN, 37247-0801
____Debbie Arnwine, Aquatic Biology, 630 Hart Lane, Nashville, TN, 37247-0801
____OTHER



STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 HART LANE
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM - PA/SI, CFO**
540 McCALLIE AVE, SUITE 550
CHATTANOOGA, TN 37402

CRAIG STANNARD
(615)634-5758

Lab ID: 9912157
Sampling Agency: HWM_11_CFO

Billing Code: 327.38-11

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Jerry W. Bingham
Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calibration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed
eceived out of holding time

Printed: January 13, 2000

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SS-01
Station No.: NK-SS-01
Collected: 12/14/99 09:25:00 By CS
ity: 54

Lab Number: 9912157-01B
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	45	12/27/99	JWB	
BENZENE	X,J 0.6	PPB	4.5	12/27/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.5	12/27/99	JWB	
BROMOFORM	U	PPB	4.5	12/27/99	JWB	
BROMOMETHANE	U	PPB	9.0	12/27/99	JWB	
2-BUTANONE (MEK)	U	PPB	45	12/27/99	JWB	
CARBON DISULFIDE	U	PPB	9.0	12/27/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.5	12/27/99	JWB	
VINYL ACETATE	U	PPB	9.0	12/27/99	JWB	
CHLOROBENZENE	U	PPB	4.5	12/27/99	JWB	
CHLOROETHANE	U	PPB	9.0	12/27/99	JWB	
CHLOROFORM	U	PPB	4.5	12/27/99	JWB	
CHLOROMETHANE	U	PPB	9.0	12/27/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.5	12/27/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.5	12/27/99	JWB	
1,2-DICHLOROETHANE	X,J 3.4	PPB	4.5	12/27/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.5	12/27/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.5	12/27/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.5	12/27/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.5	12/27/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.5	12/27/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.5	12/27/99	JWB	
ETHYLBENZENE	X,J 2.6	PPB	4.5	12/27/99	JWB	
METHYLENE CHLORIDE	X 86	PPB	4.5	12/27/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	45	12/27/99	JWB	
STYRENE	U	PPB	4.5	12/27/99	JWB	
2-HEXANONE	U	PPB	9.0	12/27/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.5	12/27/99	JWB	
TETRACHLOROETHENE	X,J 1.5	PPB	4.5	12/27/99	JWB	
TOLUENE	X 140	PPB	4.5	12/27/99	JWB	
1-TRICHLOROETHANE	U	PPB	4.5	12/27/99	JWB	
2-TRICHLOROETHANE	U	PPB	4.5	12/27/99	JWB	
TRICHLOROETHENE	U	PPB	4.5	12/27/99	JWB	
TRICHLOROFLUOROMETHANE	X 8.1	PPB	9.0	12/27/99	JWB	
VINYL CHLORIDE	U	PPB	9.0	12/27/99	JWB	
o-XYLENE	X,J 2.7	PPB	4.5	12/27/99	JWB	
m&p-XYLENE	X 8.9	PPB	4.5	12/27/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SS-02
Station No.: NK-SS-02
C ected: 12/14/99 10:00:00 By CS
ty: 54

Lab Number: 9912157-02B
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	A,X 530	PPB	61	12/29/99	JWB	
BENZENE	X,J 2.0	PPB	6.1	12/29/99	JWB	
BROMODICHLOROMETHANE	U	PPB	6.1	12/29/99	JWB	
BROMOFORM	U	PPB	6.1	12/29/99	JWB	
BROMOMETHANE	U	PPB	12	12/29/99	JWB	
2-BUTANONE (MEK)	X,J 56	PPB	61	12/29/99	JWB	
CARBON DISULFIDE	U	PPB	12	12/29/99	JWB	
CARBON TETRACHLORIDE	U	PPB	6.1	12/29/99	JWB	
VINYL ACETATE	U	PPB	12	12/29/99	JWB	
CHLOROBENZENE	U	PPB	6.1	12/29/99	JWB	
CHLOROETHANE	U	PPB	12	12/29/99	JWB	
CHLOROFORM	U	PPB	6.1	12/29/99	JWB	
CHLOROMETHANE	U	PPB	12	12/29/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	6.1	12/29/99	JWB	
1,1-DICHLOROETHANE	U	PPB	6.1	12/29/99	JWB	
1,2-DICHLOROETHANE	U	PPB	6.1	12/29/99	JWB	
1,1-DICHLOROETHENE	U	PPB	6.1	12/29/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	6.1	12/29/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	6.1	12/29/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	6.1	12/29/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	6.1	12/29/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	6.1	12/29/99	JWB	
ETHYLBENZENE	X,J 1.9	PPB	6.1	12/29/99	JWB	
METHYLENE CHLORIDE	X 52	PPB	6.1	12/29/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	61	12/29/99	JWB	
STYRENE	U	PPB	6.1	12/29/99	JWB	
2-HEXANONE	U	PPB	12	12/29/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	6.1	12/29/99	JWB	
TETRACHLOROETHENE	U	PPB	6.1	12/29/99	JWB	
TO[illegible]IENE	X 110	PPB	6.1	12/29/99	JWB	
TRICHLOROETHANE	U	PPB	6.1	12/29/99	JWB	
[illegible]-TRICHLOROETHANE	U	PPB	6.1	12/29/99	JWB	
TRICHLOROETHENE	U	PPB	6.1	12/29/99	JWB	
TRICHLOROFLUOROMETHANE	X,J 5.2	PPB	12	12/29/99	JWB	
VINYL CHLORIDE	U	PPB	12	12/29/99	JWB	
o-XYLENE	X,J 2.2	PPB	6.1	12/29/99	JWB	
m&p-XYLENE	X 8.4	PPB	6.1	12/29/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.
A: POSSIBLE LAB ARTIFACT PRODUCED BY PRESERVATIVE AND HUMUS FOUND IN SOME SOILS.

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SS-03
Station No.: NK-SS-03
Collected: 12/14/99 10:05:00 By CS
ity: 54

Lab Number: 9912157-03B
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	X,A 350	PPB	44	12/29/99	JWB	
BENZENE	X,J 1.2	PPB	4.4	12/29/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.4	12/29/99	JWB	
BROMOFORM	U	PPB	4.4	12/29/99	JWB	
BROMOMETHANE	U	PPB	8.8	12/29/99	JWB	
2-BUTANONE (MEK)	X 48	PPB	44	12/29/99	JWB	
CARBON DISULFIDE	U	PPB	8.8	12/29/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.4	12/29/99	JWB	
VINYL ACETATE	U	PPB	8.8	12/29/99	JWB	
CHLOROBENZENE	U	PPB	4.4	12/29/99	JWB	
CHLOROETHANE	U	PPB	8.8	12/29/99	JWB	
CHLOROFORM	U	PPB	4.4	12/29/99	JWB	
CHLOROMETHANE	U	PPB	8.8	12/29/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.4	12/29/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.4	12/29/99	JWB	
1,2-DICHLOROETHANE	U	PPB	4.4	12/29/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.4	12/29/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.4	12/29/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.4	12/29/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.4	12/29/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.4	12/29/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.4	12/29/99	JWB	
ETHYLBENZENE	U	PPB	4.4	12/29/99	JWB	
METHYLENE CHLORIDE	X,J 1.7	PPB	4.4	12/29/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	44	12/29/99	JWB	
STYRENE	U	PPB	4.4	12/29/99	JWB	
2-HEXANONE	U	PPB	8.8	12/29/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.4	12/29/99	JWB	
TETRACHLOROETHENE	U	PPB	4.4	12/29/99	JWB	
TOLUENE	X 5.8	PPB	4.4	12/29/99	JWB	
1-TRICHLOROETHANE	U	PPB	4.4	12/29/99	JWB	
2-TRICHLOROETHANE	U	PPB	4.4	12/29/99	JWB	
TRICHLOROETHENE	U	PPB	4.4	12/29/99	JWB	
VINYL CHLORIDE	U	PPB	8.8	12/29/99	JWB	
o-XYLENE	U	PPB	4.4	12/29/99	JWB	
m&p-XYLENE	X,J 1.2	PPB	4.4	12/29/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.
A: POSSIBLE LAB ARTIFACT PRODUCED BY PRESERVATIVE AND HUMUS FOUND IN SOME SOILS.

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SS-04
Station No.: NK-SS-04
C ˋected: 12/14/99 10:45:00 By CS
ty: 54

Lab Number: 9912157-04B
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	48	12/29/99	JWB	
BENZENE	X,J 1.0	PPB	4.8	12/29/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.8	12/29/99	JWB	
BROMOFORM	U	PPB	4.8	12/29/99	JWB	
BROMOMETHANE	X 5.7	PPB	9.6	12/29/99	JWB	
2-BUTANONE (MEK)	U	PPB	48	12/29/99	JWB	
CARBON DISULFIDE	U	PPB	9.6	12/29/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.8	12/29/99	JWB	
VINYL ACETATE	U	PPB	9.6	12/29/99	JWB	
CHLOROBENZENE	U	PPB	4.8	12/29/99	JWB	
CHLOROETHANE	U	PPB	9.6	12/29/99	JWB	
CHLOROFORM	U	PPB	4.8	12/29/99	JWB	
CHLOROMETHANE	U	PPB	9.6	12/29/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.8	12/29/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.8	12/29/99	JWB	
1,2-DICHLOROETHANE	X,J 1.4	PPB	4.8	12/29/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.8	12/29/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.8	12/29/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.8	12/29/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.8	12/29/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.8	12/29/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.8	12/29/99	JWB	
ETHYLBENZENE	X,J 1.2	PPB	4.8	12/29/99	JWB	
METHYLENE CHLORIDE	X 48	PPB	4.8	12/29/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	48	12/29/99	JWB	
STYRENE	U	PPB	4.8	12/29/99	JWB	
2-HEXANONE	U	PPB	9.6	12/29/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.8	12/29/99	JWB	
TETRACHLOROETHENE	X,J 0.7	PPB	4.8	12/29/99	JWB	
TOLUENE	X 87	PPB	4.8	12/29/99	JWB	
·TRICHLOROETHANE	U	PPB	4.8	12/29/99	JWB	
.-TRICHLOROETHANE	U	PPB	4.8	12/29/99	JWB	
TRICHLOROETHENE	U	PPB	4.8	12/29/99	JWB	
TRICHLOROFLUOROMETHANE	X 6.5	PPB	9.6	12/29/99	JWB	
VINYL CHLORIDE	U	PPB	9.6	12/29/99	JWB	
o-XYLENE	X,J 1.1	PPB	4.8	12/29/99	JWB	
m&p-XYLENE	X,J 4.6	PPB	4.8	12/29/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.

Project/Site No.:	54514	Lab Number:	9912157-05B
Project Name:	NGK METALS	Matrix:	SOIL
Site Description:	NK-SS-05	Received:	12/15/99 15:00:00 By LJB
Station No.:	NK-SS-05	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 11:15:00 By CS	Priority:	
ity:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	41	12/27/99	JWB	
BENZENE	U	PPB	4.1	12/27/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.1	12/27/99	JWB	
BROMOFORM	U	PPB	4.1	12/27/99	JWB	
BROMOMETHANE	U	PPB	8.2	12/27/99	JWB	
2-BUTANONE (MEK)	U	PPB	41	12/27/99	JWB	
CARBON DISULFIDE	U	PPB	8.2	12/27/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.1	12/27/99	JWB	
VINYL ACETATE	U	PPB	8.2	12/27/99	JWB	
CHLOROBENZENE	U	PPB	4.1	12/27/99	JWB	
CHLOROETHANE	U	PPB	8.2	12/27/99	JWB	
CHLOROFORM	U	PPB	4.1	12/27/99	JWB	
CHLOROMETHANE	U	PPB	8.2	12/27/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.1	12/27/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.1	12/27/99	JWB	
1,2-DICHLOROETHANE	U	PPB	4.1	12/27/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.1	12/27/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.1	12/27/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.1	12/27/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.1	12/27/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.1	12/27/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.1	12/27/99	JWB	
ETHYLBENZENE	X,J 0.9	PPB	4.1	12/27/99	JWB	
METHYLENE CHLORIDE	X 4.2	PPB	4.1	12/27/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	41	12/27/99	JWB	
STYRENE	U	PPB	4.1	12/27/99	JWB	
2-HEXANONE	U	PPB	8.2	12/27/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.1	12/27/99	JWB	
TETRACHLOROETHENE	U	PPB	4.1	12/27/99	JWB	
TOLUENE	X 26	PPB	4.1	12/27/99	JWB	
1-TRICHLOROETHANE	U	PPB	4.1	12/27/99	JWB	
2-TRICHLOROETHANE	U	PPB	4.1	12/27/99	JWB	
CHLOROETHENE	U	PPB	4.1	12/27/99	JWB	
VINYL CHLORIDE	U	PPB	8.2	12/27/99	JWB	
o-XYLENE	X,J 1.1	PPB	4.1	12/27/99	JWB	
m&p-XYLENE	X,J 3.6	PPB	4.1	12/27/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.

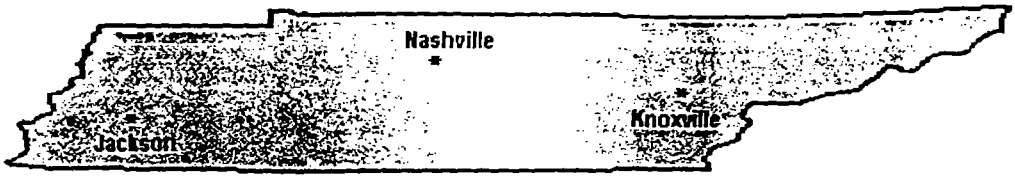
Project/Site No.:	54514	Lab Number:	9912157-06B
Project Name:	NGK METALS	Matrix:	SOIL
Site Description:	NK-SS-06	Received:	12/15/99 15:00:00 By LJB
Station No.:	NK-SS-06	Sampling Agency:	HWM_11_CFO
C ected:	12/14/99 11:20:00 By CS	Priority:	
.ty:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	44	12/27/99	JWB	
BENZENE	U	PPB	4.4	12/27/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.4	12/27/99	JWB	
BROMOFORM	U	PPB	4.4	12/27/99	JWB	
BROMOMETHANE	U	PPB	8.8	12/27/99	JWB	
2-BUTANONE (MEK)	U	PPB	44	12/27/99	JWB	
CARBON DISULFIDE	U	PPB	8.8	12/27/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.4	12/27/99	JWB	
VINYL ACETATE	U	PPB	8.8	12/27/99	JWB	
CHLOROBENZENE	U	PPB	4.4	12/27/99	JWB	
CHLOROETHANE	U	PPB	8.8	12/27/99	JWB	
CHLOROFORM	U	PPB	4.4	12/27/99	JWB	
CHLOROMETHANE	U	PPB	8.8	12/27/99	JWB	
DIBROMOCHLOROMETHANE	B,X,J 2.1	PPB	4.4	12/27/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.4	12/27/99	JWB	
1,2-DICHLOROETHANE	U	PPB	4.4	12/27/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.4	12/27/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.4	12/27/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.4	12/27/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.4	12/27/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.4	12/27/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.4	12/27/99	JWB	
ETHYLBENZENE	X,J 0.8	PPB	4.4	12/27/99	JWB	
METHYLENE CHLORIDE	X 19	PPB	4.4	12/27/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	44	12/27/99	JWB	
STYRENE	U	PPB	4.4	12/27/99	JWB	
2-HEXANONE	U	PPB	8.8	12/27/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.4	12/27/99	JWB	
TETRACHLOROETHENE	U	PPB	4.4	12/27/99	JWB	
T[illegible]UENE	X 23	PPB	4.4	12/27/99	JWB	
[illegible]TRICHLOROETHANE	U	PPB	4.4	12/27/99	JWB	
[illegible]-TRICHLOROETHANE	U	PPB	4.4	12/27/99	JWB	
TRICHLOROETHENE	U	PPB	4.4	12/27/99	JWB	
VINYL CHLORIDE	U	PPB	8.8	12/27/99	JWB	
o-XYLENE	X,J 1.2	PPB	4.4	12/27/99	JWB	
m&p-XYLENE	X,J 3.7	PPB	4.4	12/27/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.



STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 HART LANE
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM - PA/SI, CFO**
540 McCALLIE AVE, SUITE 550
CHATTANOOGA, TN 37402

CRAIG STANNARD
(615)634-5758

Lab ID: 9912159
Sampling Agency: HWM_11_CFO

Billing Code: 327.38-11

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Jerry W. Bingame
Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calibration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed
´ Received out of holding time

Printed: January 13, 2000

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SS-07
Station No.: NK-SS-07
Collected: 12/14/99 13:10:00 By
ty: 54

Lab Number: 9912159-01B
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	41	12/30/99	JWB	
BENZENE	U	PPB	4.1	12/30/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.1	12/30/99	JWB	
BROMOFORM	U	PPB	4.1	12/30/99	JWB	
BROMOMETHANE	U	PPB	8.2	12/30/99	JWB	
2-BUTANONE (MEK)	U	PPB	41	12/30/99	JWB	
CARBON DISULFIDE	U	PPB	8.2	12/30/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.1	12/30/99	JWB	
VINYL ACETATE	U	PPB	8.2	12/30/99	JWB	
CHLOROBENZENE	U	PPB	4.1	12/30/99	JWB	
CHLOROETHANE	U	PPB	8.2	12/30/99	JWB	
CHLOROFORM	U	PPB	4.1	12/30/99	JWB	
CHLOROMETHANE	U	PPB	8.2	12/30/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.1	12/30/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.1	12/30/99	JWB	
1,2-DICHLOROETHANE	U	PPB	4.1	12/30/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.1	12/30/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.1	12/30/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.1	12/30/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.1	12/30/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.1	12/30/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.1	12/30/99	JWB	
ETHYLBENZENE	X,J 1.6	PPB	4.1	12/30/99	JWB	
METHYLENE CHLORIDE	X 58	PPB	4.1	12/30/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	41	12/30/99	JWB	
STYRENE	U	PPB	4.1	12/30/99	JWB	
2-HEXANONE	U	PPB	8.2	12/30/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.1	12/30/99	JWB	
TETRACHLOROETHENE	U	PPB	4.1	12/30/99	JWB	
TOLUENE	X 84	PPB	4.1	12/30/99	JWB	
-TRICHLOROETHANE	U	PPB	4.1	12/30/99	JWB	
-TRICHLOROETHANE	U	PPB	4.1	12/30/99	JWB	
...ICHLOROETHENE	U	PPB	4.1	12/30/99	JWB	
VINYL CHLORIDE	U	PPB	8.2	12/30/99	JWB	
o-XYLENE	U	PPB	4.1	12/30/99	JWB	
m&p-XYLENE	X 6.3	PPB	4.1	12/30/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SS-08
Station No.: NK-SS-08
Collected: 12/14/99 10:50:00 By CS
ity: 54

Lab Number: 9912159-02B
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	X,A 230	PPB	49	12/29/99	JWB	
BENZENE	U	PPB	4.9	12/29/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.9	12/29/99	JWB	
BROMOFORM	U	PPB	4.9	12/29/99	JWB	
BROMOMETHANE	U	PPB	9.8	12/29/99	JWB	
2-BUTANONE (MEK)	U	PPB	49	12/29/99	JWB	
CARBON DISULFIDE	U	PPB	9.8	12/29/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.9	12/29/99	JWB	
VINYL ACETATE	U	PPB	9.8	12/29/99	JWB	
CHLOROBENZENE	U	PPB	4.9	12/29/99	JWB	
CHLOROETHANE	U	PPB	9.8	12/29/99	JWB	
CHLOROFORM	U	PPB	4.9	12/29/99	JWB	
CHLOROMETHANE	U	PPB	9.8	12/29/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.9	12/29/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.9	12/29/99	JWB	
1,2-DICHLOROETHANE	U	PPB	4.9	12/29/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.9	12/29/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.9	12/29/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.9	12/29/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.9	12/29/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.9	12/29/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.9	12/29/99	JWB	
ETHYLBENZENE	X,J 0.8	PPB	4.9	12/29/99	JWB	
METHYLENE CHLORIDE	X 27	PPB	4.9	12/29/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	49	12/29/99	JWB	
STYRENE	U	PPB	4.9	12/29/99	JWB	
2-HEXANONE	U	PPB	9.8	12/29/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.9	12/29/99	JWB	
TETRACHLOROETHENE	U	PPB	4.9	12/29/99	JWB	
TOLUENE	X 47	PPB	4.9	12/29/99	JWB	
1,1-TRICHLOROETHANE	U	PPB	4.9	12/29/99	JWB	
2-TRICHLOROETHANE	U	PPB	4.9	12/29/99	JWB	
CHLOROETHENE	U	PPB	4.9	12/29/99	JWB	
VINYL CHLORIDE	U	PPB	9.8	12/29/99	JWB	
o-XYLENE	X,J 0.8	PPB	4.9	12/29/99	JWB	
m&p-XYLENE	X,J 3.1	PPB	4.9	12/29/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.
A: POSSIBLE LAB ARTIFACT PRODUCED BY PRESERVATIVE AND HUMUS FOUND IN SOME SOILS.

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SS-09
Station No.: NK-SS-09
Co[illegible]cted: 12/14/99 13:20:00 By CS
[illegible]y: 54

Lab Number: 9912159-03B
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	43	12/27/99	JWB	
BENZENE	U	PPB	4.3	12/27/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.3	12/27/99	JWB	
BROMOFORM	U	PPB	4.3	12/27/99	JWB	
BROMOMETHANE	U	PPB	8.6	12/27/99	JWB	
2-BUTANONE (MEK)	U	PPB	43	12/27/99	JWB	
CARBON DISULFIDE	U	PPB	8.6	12/27/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.3	12/27/99	JWB	
VINYL ACETATE	U	PPB	8.6	12/27/99	JWB	
CHLOROBENZENE	U	PPB	4.3	12/27/99	JWB	
CHLOROETHANE	U	PPB	8.6	12/27/99	JWB	
CHLOROFORM	U	PPB	4.3	12/27/99	JWB	
CHLOROMETHANE	U	PPB	8.6	12/27/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.3	12/27/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.3	12/27/99	JWB	
1,2-DICHLOROETHANE	U	PPB	4.3	12/27/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.3	12/27/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.3	12/27/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.3	12/27/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.3	12/27/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.3	12/27/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.3	12/27/99	JWB	
ETHYLBENZENE	X,J 1.2	PPB	4.3	12/27/99	JWB	
METHYLENE CHLORIDE	X 55	PPB	4.3	12/27/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	43	12/27/99	JWB	
STYRENE	U	PPB	4.3	12/27/99	JWB	
2-HEXANONE	U	PPB	8.6	12/27/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.3	12/27/99	JWB	
TETRACHLOROETHENE	U	PPB	4.3	12/27/99	JWB	
TO[illegible]UENE	X 70	PPB	4.3	12/27/99	JWB	
[illegible] TRICHLOROETHANE	U	PPB	4.3	12/27/99	JWB	
[illegible] TRICHLOROETHANE	U	PPB	4.3	12/27/99	JWB	
TRICHLOROETHENE	U	PPB	4.3	12/27/99	JWB	
VINYL CHLORIDE	U	PPB	8.6	12/27/99	JWB	
o-XYLENE	X,J 1.3	PPB	4.3	12/27/99	JWB	
m&p-XYLENE	X 4.8	PPB	4.3	12/27/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SS-10
Station No.: NK-SS-10
Collected: 12/14/99 13:55:00 By CS
ity: 54

Lab Number: 9912159-04B
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	X,A 750	PPB	50	12/29/99	JWB	
BENZENE	X,J 1.8	PPB	5.0	12/29/99	JWB	
BROMODICHLOROMETHANE	U	PPB	5.0	12/29/99	JWB	
BROMOFORM	U	PPB	5.0	12/29/99	JWB	
BROMOMETHANE	U	PPB	10	12/29/99	JWB	
2-BUTANONE (MEK)	X 68	PPB	50	12/29/99	JWB	
CARBON DISULFIDE	U	PPB	10	12/29/99	JWB	
CARBON TETRACHLORIDE	U	PPB	5.0	12/29/99	JWB	
VINYL ACETATE	U	PPB	10	12/29/99	JWB	
CHLOROBENZENE	U	PPB	5.0	12/29/99	JWB	
CHLOROETHANE	U	PPB	10	12/29/99	JWB	
CHLOROFORM	U	PPB	5.0	12/29/99	JWB	
CHLOROMETHANE	U	PPB	10	12/29/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	5.0	12/29/99	JWB	
1,1-DICHLOROETHANE	U	PPB	5.0	12/29/99	JWB	
1,2-DICHLOROETHANE	X 5.9	PPB	5.0	12/29/99	JWB	
1,1-DICHLOROETHENE	U	PPB	5.0	12/29/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	5.0	12/29/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	5.0	12/29/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	5.0	12/29/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	5.0	12/29/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	5.0	12/29/99	JWB	
ETHYLBENZENE	X,J 3.2	PPB	5.0	12/29/99	JWB	
METHYLENE CHLORIDE	X 150	PPB	5.0	12/29/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	50	12/29/99	JWB	
STYRENE	U	PPB	5.0	12/29/99	JWB	
2-HEXANONE	U	PPB	10	12/29/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	5.0	12/29/99	JWB	
TETRACHLOROETHENE	X,J 1.8	PPB	5.0	12/29/99	JWB	
TOLUENE	X 260	PPB	5.0	12/29/99	JWB	
1,1-TRICHLOROETHANE	U	PPB	5.0	12/29/99	JWB	
1,2-TRICHLOROETHANE	U	PPB	5.0	12/29/99	JWB	
TRICHLOROETHENE	U	PPB	5.0	12/29/99	JWB	
TRICHLOROFLUOROMETHANE	X 6.9	PPB	10	12/29/99	JWB	
VINYL CHLORIDE	U	PPB	10	12/29/99	JWB	
o-XYLENE	X,J 3.0	PPB	5.0	12/29/99	JWB	
m&p-XYLENE	X 12	PPB	5.0	12/29/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.
A: POSSIBLE LAB ARTIFACT PRODUCED BY PRESERVATIVE AND HUMUS FOUND IN SOME SOILS.

Project/Site No.: 54514
Project Name: NGK METALS
Site Description: NK-SD-01
Station No.: NK-SD-01
Collected: 12/14/99 14:20:00 By CS
Qty: 54

Lab Number: 9912159-05B
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	X,A 240	PPB	43	12/29/99	JWB	
BENZENE	U	PPB	4.3	12/29/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.3	12/29/99	JWB	
BROMOFORM	U	PPB	4.3	12/29/99	JWB	
BROMOMETHANE	U	PPB	8.6	12/29/99	JWB	
2-BUTANONE (MEK)	U	PPB	43	12/29/99	JWB	
CARBON DISULFIDE	U	PPB	8.6	12/29/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.3	12/29/99	JWB	
VINYL ACETATE	U	PPB	8.6	12/29/99	JWB	
CHLOROBENZENE	U	PPB	4.3	12/29/99	JWB	
CHLOROETHANE	U	PPB	8.6	12/29/99	JWB	
CHLOROFORM	U	PPB	4.3	12/29/99	JWB	
CHLOROMETHANE	U	PPB	8.6	12/29/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.3	12/29/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.3	12/29/99	JWB	
1,2-DICHLOROETHANE	U	PPB	4.3	12/29/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.3	12/29/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.3	12/29/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.3	12/29/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.3	12/29/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.3	12/29/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.3	12/29/99	JWB	
ETHYLBENZENE	X,J 0.9	PPB	4.3	12/29/99	JWB	
METHYLENE CHLORIDE	X 32	PPB	4.3	12/29/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	43	12/29/99	JWB	
STYRENE	U	PPB	4.3	12/29/99	JWB	
2-HEXANONE	U	PPB	8.6	12/29/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.3	12/29/99	JWB	
TETRACHLOROETHENE	U	PPB	4.3	12/29/99	JWB	
TOLUENE	X 59	PPB	4.3	12/29/99	JWB	
TRICHLOROETHANE	U	PPB	4.3	12/29/99	JWB	
TRICHLOROETHANE	U	PPB	4.3	12/29/99	JWB	
CHLOROETHENE	U	PPB	4.3	12/29/99	JWB	
TRICHLOROFLUOROMETHANE	X,J 3.7	PPB	8.6	12/29/99	JWB	
VINYL CHLORIDE	U	PPB	8.6	12/29/99	JWB	
o-XYLENE	X,J 1.0	PPB	4.3	12/29/99	JWB	
m&p-XYLENE	X,J 3.6	PPB	4.3	12/29/99	JWB	

*-Water, uG/L; Sediment, uG/kG

Printed: January 13, 2000

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.
A: POSSIBLE LAB ARTIFACT PRODUCED BY PRESERVATIVE AND HUMUS FOUND IN SOME SOILS.

Project/Site No.:	54514	Lab Number:	9912159-06B
Project Name:	NGK METALS	Matrix:	SOIL
Site Description:	NK-SD-02	Received:	12/15/99 09:00:00 By LJB
Station No.:	NK-SD-02	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 14:45:00 By CS	Priority:	
nty:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
VOLATILES-TAL SEDIMENTS						8260A
ACETONE	U	PPB	40	12/30/99	JWB	
BENZENE	U	PPB	4.0	12/30/99	JWB	
BROMODICHLOROMETHANE	U	PPB	4.0	12/30/99	JWB	
BROMOFORM	U	PPB	4.0	12/30/99	JWB	
BROMOMETHANE	U	PPB	8.0	12/30/99	JWB	
2-BUTANONE (MEK)	U	PPB	40	12/30/99	JWB	
CARBON DISULFIDE	U	PPB	8.0	12/30/99	JWB	
CARBON TETRACHLORIDE	U	PPB	4.0	12/30/99	JWB	
VINYL ACETATE	U	PPB	8.0	12/30/99	JWB	
CHLOROBENZENE	U	PPB	4.0	12/30/99	JWB	
CHLOROETHANE	U	PPB	8.0	12/30/99	JWB	
CHLOROFORM	U	PPB	4.0	12/30/99	JWB	
CHLOROMETHANE	U	PPB	8.0	12/30/99	JWB	
DIBROMOCHLOROMETHANE	U	PPB	4.0	12/30/99	JWB	
1,1-DICHLOROETHANE	U	PPB	4.0	12/30/99	JWB	
1,2-DICHLOROETHANE	U	PPB	4.0	12/30/99	JWB	
1,1-DICHLOROETHENE	U	PPB	4.0	12/30/99	JWB	
CIS-1,2-DICHLOROETHENE	U	PPB	4.0	12/30/99	JWB	
TRANS-1,2-DICHLOROETHENE	U	PPB	4.0	12/30/99	JWB	
1,2-DICHLOROPROPANE	U	PPB	4.0	12/30/99	JWB	
CIS-1,3-DICHLOROPROPENE	U	PPB	4.0	12/30/99	JWB	
TRANS-1,3-DICHLOROPROPENE	U	PPB	4.0	12/30/99	JWB	
ETHYLBENZENE	U	PPB	4.0	12/30/99	JWB	
METHYLENE CHLORIDE	X,J 3.0	PPB	4.0	12/30/99	JWB	
4-METHYL-2-PENTANONE (MIBK)	U	PPB	40	12/30/99	JWB	
STYRENE	U	PPB	4.0	12/30/99	JWB	
2-HEXANONE	U	PPB	8.0	12/30/99	JWB	
1,1,2,2-TETRACHLOROETHANE	U	PPB	4.0	12/30/99	JWB	
TETRACHLOROETHENE	U	PPB	4.0	12/30/99	JWB	
TOLUENE	X 15	PPB	4.0	12/30/99	JWB	
1,1-TRICHLOROETHANE	U	PPB	4.0	12/30/99	JWB	
?-TRICHLOROETHANE	U	PPB	4.0	12/30/99	JWB	
.HLOROETHENE	U	PPB	4.0	12/30/99	JWB	
VINYL CHLORIDE	U	PPB	8.0	12/30/99	JWB	
o-XYLENE	U	PPB	4.0	12/30/99	JWB	
m&p-XYLENE	X,J 2.1	PPB	4.0	12/30/99	JWB	

*-Water, uG/L; Sediment, uG/kG *Printed: January 13, 2000*

X: ESTIMATED RESULTS ONLY DUE TO GC/MS PROBLEMS.

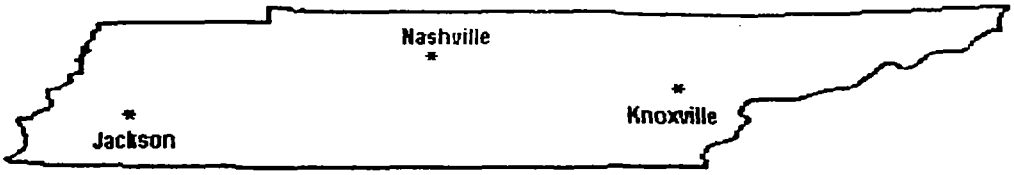
FROM	DATE
CEE	2-12
TO	
ENV ADM	2/14/00

RECEIVED
FEB 16 2000

ENVIRONMENTAL LABORATORIES REPORT ROUTING

PLEASE REVIEW AND ROUTE AS INDICATED:

____Air Pollution Control, 9th floor, L&C Annex, 401 Church St., Nashville, TN 37243-1531, Attn:
____DOE Oversight, 761 Emory Valley Road, Oak Ridge, TN 37830-7072, Attn:
____Groundwater Protection, 10th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1540, Attn:
____Radiological Health, 3rd floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1532, Attn:
____Solid Waste Management, 5th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1535, Attn:
✓___Superfund, 4th floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1538, Attn: Tim Stewart
____Water Pollution Control, 6th floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1534, Attn:
____Water Supply, 6th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1549, Attn:
____Underground Storage Tanks, 4th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1541, Attn:
____Chattanooga Environmental Assistance Center, 540 McCallie Ave., Suite 550, Chattanooga, TN, 37402, Attn:
____Columbia Environmental Assistance Center, 2484 Plus Park Drive, Columbia, TN 38401, Attn:
____Cookeville Environmental Assistance Center, 1221 South Willow Ave., Cookeville, TN 38506, Attn:
____Jackson Environmental Assistance Center, 362 Carriage House Drive, Jackson, TN 38305, Attn:
____Johnson City Environmental Assistance Center, 2305 Silverdale Road, Johnson City, TN 37601, Attn:
____Knoxville Environmental Assistance Center, 2700 Middlebrook Pike, Knoxville, TN 37921, Attn:
____Memphis Environmental Assistance Center, 2510 Mt. Moriah, Suite E-645, Perimeter Park, Memphis, TN 38115-1520, Attn:
____Nashville Environmental Assistance Center, 537 Brick Church Pike, Nashville, TN 37243, Attn:
____Joelton Environmental Assistance Center, 3000 Morgan Road, Joelton, TN 37080, Attn:
____Jackson Branch Laboratory, 295 Summar Avenue, P.O. Box 849, Jackson, TN, 38302-0849, Attn:
____Knoxville Branch Laboratory, 1522 Cherokee Trail, Knoxville, TN 37920, Attn:
____Charlie Mickle, Laboratory Quality Assurance, 630 Hart Lane, Nashville, TN, 37247-0801
____Debbie Arnwine, Aquatic Biology, 630 Hart Lane, Nashville, TN, 37247-0801
____OTHER



STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 HART LANE
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM - PA/SI, CFO**
540 McCALLIE AVE, SUITE 550
CHATTANOOGA, TN 37402

CRAIG STANNARD
(615)634-5758

Lab ID: 9912157
Sampling Agency: HWM_11_CFO

Billing Code: 327.38-11

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Craig Edward

Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calibration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed
O- Received out of holding time

Printed: February 1, 2000

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-01**
Station No.: NK-SS-01
Collected: 12/14/99 09:25:00 By CS
County: 54

Lab Number: **9912157-01**
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/kg	0.25	01/07/00	SAE	9012A
ALUMINUM	20900	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	14	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	193	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.5	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	2070	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	23	mg/kg	0.2	01/06/00	MP	200.7/6010
[illegible]R	20	mg/kg	0.1	01/06/00	MP	200.7/6010
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	23000	mg/kg	2.5	01/14/00	MP	200.7/6010
LEAD	57	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	1170	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	2410	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	0.12	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	19	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	75.3	%		01/04/00	ATB	
POTASSIUM	6110	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	3.3	mg/kg	2.0	01/06/00	MP	200.7/6010
[illegible]R	U	mg/kg	0.1	01/06/00	MP	200.7/6010
SODIUM	B 7	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-01**
Station No.: NK-SS-01
Collected: 12/14/99 09:25:00 By CS
County: 54

Lab Number: **9912157-01**
Matrix: SOIL
Received: 12/15/99 15:00:00 By
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	U	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	33	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	64	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	74	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
ect Name: **NGK METALS**
ription: **NK-SS-02**
Station No.: NK-SS-02
Collected: 12/14/99 10:00:00 By CS
County: 54

Lab Number: **9912157-02**
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	0.30	mg/kg	0.25	01/07/00	SAE	9012A
ALUMINUM	20500	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	11	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	148	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.9	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	8040	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	25	mg/kg	0.2	01/06/00	MP	200.7/6010
COPPER	56	mg/kg	0.1	01/06/00	MP	200.7/6010
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	31100	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	33	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	2170	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	2180	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	0.27	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	22	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	79.2	%		01/04/00	ATB	
POTASSIUM	5440	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	2.8	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/6010
SODIUM	B 18	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
ect Name: **NGK METALS**
cription: **NK-SS-02**
Station No.: NK-SS-02
Collected: 12/14/99 10:00:00 By CS
County: 54

Lab Number: **9912157-02**
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	1	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	26	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	42	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	97	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-03**
Station No.: NK-SS-03
Collected: 12/14/99 10:05:00 By CS
County: 54

Lab Number: **9912157-03**
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	22400	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	15	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	73	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.4	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	3090	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	14	mg/kg	0.2	01/06/00	MP	200.7/6010
COPPER	26	mg/kg	0.1	01/06/00	MP	200.7/6010
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	35700	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	22	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	1990	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	821	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	0.18	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	23	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	74.9	%		01/04/00	ATB	
POTASSIUM	5030	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	3.7	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/6010
SODIUM	B 16	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
ject Name: **NGK METALS**
cription: **NK-SS-03**
Station No.: NK-SS-03
Collected: 12/14/99 10:05:00 By CS
County: 54

Lab Number: **9912157-03**
Matrix: SOIL
Received: 12/15/99 15:00:00 By
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	U	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	30	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	46	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	80	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-04**
Station No.: NK-SS-04
Collected: 12/14/99 10:45:00 By CS
County: 54

Lab Number: **9912157-04**
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	20600	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	11	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	107	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	2.5	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	2990	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	24	mg/kg	0.2	01/06/00	MP	200.7/6010
[illegible]ER	61	mg/kg	0.1	01/06/00	MP	200.7/6010
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	34000	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	49	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	1510	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	1740	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	2.45	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	27	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	81.4	%		01/04/00	ATB	
POTASSIUM	5300	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	2.4	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/6010
SODIUM	B 26	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-04**
Station No.: NK-SS-04
Collected: 12/14/99 10:45:00 By CS
County: 54

Lab Number: **9912157-04**
Matrix: SOIL
Received: 12/15/99 15:00:00 By [illegible]
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	1.1	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	32	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	51	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	86	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-05**
Station No.: NK-SS-05
Collected: 12/14/99 11:15:00 By CS
County: 54

Lab Number: **9912157-05**
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	21000	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	13	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	126	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.7	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	1550	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	29	mg/kg	0.2	01/06/00	MP	200.7/6010
COPPER	28	mg/kg	0.1	01/06/00	MP	200.7/6010
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	36400	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	61	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	1440	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	2260	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	0.69	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	23	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	81.2	%		01/04/00	ATB	
POTASSIUM	6790	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	3.8	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/6010
SODIUM	B 14	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-05**
Station No.: NK-SS-05
Collected: 12/14/99 11:15:00 By CS
County: 54

Lab Number: **9912157-05**
Matrix: SOIL
Received: 12/15/99 15:00:00 By L
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	1.4	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	35	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	54	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	60	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-06**
Station No.: NK-SS-06
Collected: 12/14/99 11:20:00 By CS
County: 54

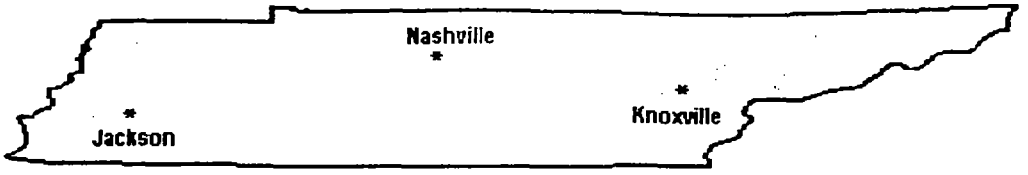
Lab Number: **9912157-06**
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	21800	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	10	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	70	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.8	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	2400	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	18	mg/kg	0.2	01/06/00	MP	200.7/6010
[illegible]R	44	mg/kg	0.1	01/06/00	MP	200.7/6010
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	33200	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	40	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	1750	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	727	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	3.20	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	19	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	78.6	%		01/04/00	ATB	
POTASSIUM	5630	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	2.8	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/6010
SODIUM	B 24	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-06**
Location No.: NK-SS-06
Collected: 12/14/99 11:20:00 By CS
County: 54

Lab Number: **9912157-06**
Matrix: SOIL
Received: 12/15/99 15:00:00 By 1
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	U	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	30	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	45	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	65	mg/kg	0.1	01/06/00	MP	200.7/6010



STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 HART LANE
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM - PA/SI, CFO**
540 McCALLIE AVE, SUITE 550
CHATTANOOGA, TN 37402

CRAIG STANNARD
(615)634-5758

Lab ID: 9912159
Sampling Agency: HWM_11_CFO

Billing Code: 327.38-11

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Craig Edwards
Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calibration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed
^ Received out of holding time

Printed: February 1, 2000

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-07**
Station No.: NK-SS-07
Collected: 12/14/99 13:10:00 By
County: 54

Lab Number: **9912159-01**
Matrix: SOIL
Received: 12/15/99 09:00:00 By I
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	0.25	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	14200	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	12.7	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	236	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.5	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	1410	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	30.8	mg/kg	0.2	01/06/00	MP	200.7/6010
CR	22.3	mg/kg	0.1	01/06/00	MP	200.7/60
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	34900	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	71.1	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	858	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	5160	mg/kg	0.5	01/10/00	MP	200.7/6010
MERCURY	0.20	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	14.5	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	81.5	%		01/04/00	ATB	
POTASSIUM	6600	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	U	mg/kg	2.0	01/06/00	MP	200.7/6010
SR	U	mg/kg	0.1	01/06/00	MP	200.7/601
SODIUM	B 17	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-07**
Station No.: NK-SS-07
Collected: 12/14/99 13:10:00 By
County: 54

Lab Number: **9912159-01**
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	1.4	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	28.5	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	51.8	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	46.9	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-08**
Station No.: NK-SS-08
Collected: 12/14/99 10:50:00 By CS
County: 54

Lab Number: **9912159-02**
Matrix: SOIL
Received: 12/15/99 09:00:00 By
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	18000	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	11	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	84.1	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	2.9	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	3560	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	25	mg/kg	0.2	01/06/00	MP	200.7/6010
COPPER	72.7	mg/kg	0.1	01/06/00	MP	200.7/601
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	34000	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	60.5	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	1380	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	1450	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	2.75	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	25.3	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	83.2	%		01/04/00	ATB	
POTASSIUM	5170	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	2.6	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/601
SODIUM	B 21	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
ect Name: **NGK METALS**
iption: **NK-SS-08**
Station No.: NK-SS-08
Collected: 12/14/99 10:50:00 By CS
County: 54

Lab Number: **9912159-02**
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	1.1	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	29.8	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	47	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	90.6	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
ect Name: **NGK METALS**
ription: **NK-SS-09**
Station No.: NK-SS-09
Collected: 12/14/99 13:20:00 By CS
County: 54

Lab Number: **9912159-03**
Matrix: SOIL
Received: 12/15/99 09:00:00 By
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	0.30	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	13200	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	11.2	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	186	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.4	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	1350	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	23	mg/kg	0.2	01/06/00	MP	200.7/6010
ER	23.1	mg/kg	0.1	01/06/00	MP	200.7/60
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	30600	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	55.9	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	805	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	3600	mg/kg	0.5	01/10/00	MP	200.7/6010
MERCURY	0.23	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	12.8	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	81.5	%		01/04/00	MP	
POTASSIUM	5070	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	U	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/60.
SODIUM	B 23	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-09**
Station No.: NK-SS-09
Collected: 12/14/99 13:20:00 By CS
County: 54

Lab Number: **9912159-03**
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	1.3	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	24.2	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	46.5	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	41.4	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SS-10**
Station No.: NK-SS-10
Collected: 12/14/99 13:55:00 By CS
County: 54

Lab Number: **9912159-04**
Matrix: SOIL
Received: 12/15/99 09:00:00 By
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	0.25	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	15000	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	9	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	117	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.5	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	2340	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	22.3	mg/kg	0.2	01/06/00	MP	200.7/6010
ER	47.8	mg/kg	0.1	01/06/00	MP	200.7/601
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	25800	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	51.7	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	902	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	2010	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	0.18	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	15.8	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	78.2	%		01/04/00	ATB	
POTASSIUM	4160	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	3	mg/kg	2.0	01/06/00	MP	200.7/6010
ER	U	mg/kg	0.1	01/06/00	MP	200.7/601
SODIUM	B 37	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
ct Name: **NGK METALS**
ription: **NK-SS-10**
Station No.: NK-SS-10
Collected: 12/14/99 13:55:00 By CS
County: 54

Lab Number: **9912159-04**
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	U	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	23.8	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	40.8	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	122	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
ject Name: **NGK METALS**
cription: **NK-SD-01**
Station No.: NK-SD-01
Collected: 12/14/99 14:20:00 By CS
County: 54

Lab Number: **9912159-05**
Matrix: SOIL
Received: 12/15/99 09:00:00 By [illegible]
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	21700	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	20.3	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	144	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	1.6	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	2480	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	30	mg/kg	0.2	01/06/00	MP	200.7/6010
[illegible]PER	18.7	mg/kg	0.1	01/10/00	MP	200.7/60[illegible]
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	64600	mg/kg	2.5	01/06/00	MP	200.7/6010
LEAD	74	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	1400	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	1660	mg/kg	0.5	01/06/00	MP	200.7/6010
MERCURY	0.10	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	21.6	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	72.9	%		01/04/00	ATB	
POTASSIUM	6570	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	2.4	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/601[illegible]
SODIUM	B 8	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SD-01**
Location No.: NK-SD-01
Collected: 12/14/99 14:20:00 By CS
County: 54

Lab Number: **9912159-05**
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	1.3	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	42.7	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	68.7	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	72.7	mg/kg	0.1	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SD-02**
Station No.: NK-SD-02
Collected: 12/14/99 14:45:00 By CS
County: 54

Lab Number: **9912159-06**
Matrix: SOIL
Received: 12/15/99 09:00:00 By LGB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
CYANIDE	U	mg/kg	0.25	01/06/00	SAE	9012A
ALUMINUM	20500	mg/kg	10	01/06/00	MP	200.7/6010
ANTIMONY	U	mg/kg	2.0	01/06/00	MP	200.7/6010
ARSENIC	22.7	mg/kg	2.0	01/06/00	MP	200.7/6010
BARIUM	215	mg/kg	10	01/06/00	MP	200.7/6010
BERYLLIUM	2.1	mg/kg	0.1	01/06/00	MP	200.7/6010
CADMIUM	U	mg/kg	0.1	01/06/00	MP	200.7/6010
CALCIUM	8130	mg/kg	200	01/06/00	MP	200.7/6010
COBALT	40.2	mg/kg	0.2	01/06/00	MP	200.7/6010
[illegible]ER	26.1	mg/kg	0.1	01/06/00	MP	200.7/601[illegible]
DIGESTION-METALS	1/05/2000	COMPLETED		01/05/00	ATB	
IRON	69700	mg/kg	2.5	01/10/00	MP	200.7/6010
LEAD	101	mg/kg	0.3	01/06/00	MP	200.7/6010
MAGNESIUM	1450	mg/kg	2	01/06/00	MP	200.7/6010
MANGANESE	3890	mg/kg	0.5	01/10/00	MP	200.7/6010
MERCURY	0.11	mg/kg	0.1	01/18/00	ATB	EPA 245.5
METALS PREP-SOLIDS/WASTES	1/04/2000	COMPLETED		01/04/00	ATB	
NICKEL	24	mg/kg	1	01/06/00	MP	200.7/6010
PERCENT SOLIDS	73.4	%		01/04/00	ATB	
POTASSIUM	9390	mg/kg	30	01/06/00	MP	200.7/6010
SELENIUM	U	mg/kg	2.0	01/06/00	MP	200.7/6010
SILVER	U	mg/kg	0.1	01/06/00	MP	200.7/601[illegible]
SODIUM	B U	mg/kg	10	01/06/00	MP	200.7/6010

Project/Site No.: **54514**
Project Name: **NGK METALS**
Description: **NK-SD-02**
Station No.: NK-SD-02
Collected: 12/14/99 14:45:00 By CS
County: 54

Lab Number: **9912159-06**
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	UNITS	LIMIT	ANALYZED	BY	METHOD
THALLIUM	1.4	mg/kg	1.0	01/06/00	MP	200.7/6010
TOTAL CHROMIUM	42.8	mg/kg	0.1	01/06/00	MP	200.7/6010
VANADIUM	77.9	mg/kg	0.2	01/06/00	MP	200.7/6010
ZINC	152	mg/kg	0.1	01/06/00	MP	200.7/6010

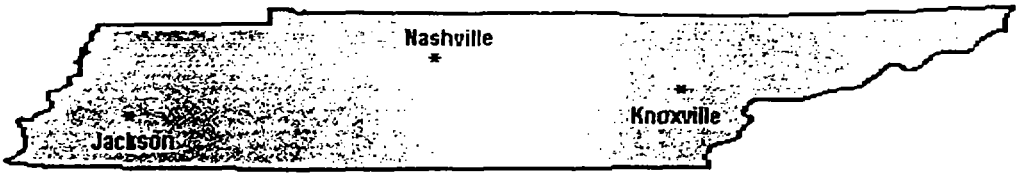
FROM	DATE
Rick	2/9/00
TO	
ENV ADM	2/14/00

ENVIRONMENTAL LABORATORIES
REPORT ROUTING

RECEIVED
FEB 22 2000

PLEASE REVIEW AND ROUTE AS INDICATED:

____Air Pollution Control, 9th floor, L&C Annex, 401 Church St., Nashville, TN 37243-1531, Attn:
____DOE Oversight, 761 Emory Valley Road, Oak Ridge, TN 37830-7072, Attn:
____Groundwater Protection, 10th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1540, Attn:
____Radiological Health, 3rd floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1532, Attn:
____Solid Waste Management, 5th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1535, Attn:
____Superfund, 4th floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1538, Attn:
____Water Pollution Control, 6th floor, L&C Annex, 401 Church St., Nashville, TN, 37243-1534, Attn:
____Water Supply, 6th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1549, Attn:
____Underground Storage Tanks, 4th floor, L&C Tower, 401 Church St., Nashville, TN, 37243-1541, Attn:
_✓_Chattanooga Environmental Assistance Center, 540 McCallie Ave., Suite 550, Chattanooga, TN, 37402, Attn:
____Columbia Environmental Assistance Center, 2484 Plus Park Drive, Columbia, TN 38401, Attn:
____Cookeville Environmental Assistance Center, 1221 South Willow Ave., Cookeville, TN 38506, Attn:
____Jackson Environmental Assistance Center, 362 Carriage House Drive, Jackson, TN 38305, Attn:
____Johnson City Environmental Assistance Center, 2305 Silverdale Road, Johnson City, TN 37601, Attn:
____Knoxville Environmental Assistance Center, 2700 Middlebrook Pike, Knoxville, TN 37921, Attn:
____Memphis Environmental Assistance Center, 2510 Mt. Moriah, Suite E-645, Perimeter Park, Memphis, TN 38115-1520, Attn:
____Nashville Environmental Assistance Center, 537 Brick Church Pike, Nashville, TN 37243, Attn:
____Joelton Environmental Assistance Center, 3000 Morgan Road, Joelton, TN 37080, Attn:
____Jackson Branch Laboratory, 295 Summar Avenue, P.O. Box 849, Jackson, TN, 38302-0849, Attn:
____Knoxville Branch Laboratory, 1522 Cherokee Trail, Knoxville, TN 37920, Attn:
____Charlie Mickle, Laboratory Quality Assurance, 630 Hart Lane, Nashville, TN, 37247-0801
____Debbie Arnwine, Aquatic Biology, 630 Hart Lane, Nashville, TN, 37247-0801
____OTHER



STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 HART LANE
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM - PA/SI, CFO**
540 McCALLIE AVE, SUITE 550
CHATTANOOGA, TN 37402

CRAIG STANNARD
(615)634-5758

Lab ID: **9912157**
Sampling Agency: **HWM_11_CFO**

Billing Code: **327.38-11**

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calibration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed
ceived out of holding time

Printed: February 8, 2000

Project/Site No.:	54514	Lab Number:	9912157-01A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-01	Received:	12/15/99 15:00:00 By LJB
Station No.:	NK-SS-01	Sampling Agency:	HWM_11_CFO
ected:	12/14/99 09:25:00 By CS	Priority:	
ity:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	ppb	210	01/28/00	CRS	
BIS(2-ETHYLHEXYL)PHTHALATE	J 201	ppb	210	01/28/00	CRS	
DI-n-BUTYL PHTHALATE	U	ppb	210	01/28/00	CRS	
DI-n-OCTYL PHTHALATE	U	ppb	420	01/28/00	CRS	
DIETHYL PHTHALATE	U	ppb	110	01/28/00	CRS	
DIMETHYL PHTHALATE	U	ppb	110	01/28/00	CRS	
n-NITROSODIMETHYLAMINE	U	ppb	420	01/28/00	CRS	
n-NITROSODIPHENYLAMINE	U	ppb	210	01/28/00	CRS	
n-NITROSO-di-n-PROPYLAMINE	U	ppb	210	01/28/00	CRS	
ISOPHORONE	U	ppb	110	01/28/00	CRS	
NITROBENZENE	U	ppb	210	01/28/00	CRS	
2,4-DINITROTOLUENE	U	ppb	420	01/28/00	CRS	
2,6-DINITROTOLUENE	U	ppb	420	01/28/00	CRS	
ACENAPHTHENE	U	ppb	110	01/28/00	CRS	
ACENAPHTHYLENE	U	ppb	110	01/28/00	CRS	
ANTHRACENE	U	ppb	110	01/28/00	CRS	
BENZO(a)ANTHRACENE	U	ppb	110	01/28/00	CRS	
BENZO(a)PYRENE	U	ppb	110	01/28/00	CRS	
BENZO(b)FLUORANTHENE	U	ppb	110	01/28/00	CRS	
BENZO(ghi)PERYLENE	U	ppb	420	01/28/00	CRS	
BENZO(k)FLUORANTHENE	U	ppb	110	01/28/00	CRS	
DIBENZO(a,h)ANTHRACENE	U	ppb	420	01/28/00	CRS	
FLUORANTHENE	U	ppb	110	01/28/00	CRS	
FLUORENE	U	ppb	110	01/28/00	CRS	
INDENO(1,2,3-cd)PYRENE	U	ppb	420	01/28/00	CRS	
NAPHTHALENE	U	ppb	110	01/28/00	CRS	
PHENANTHRENE	U	ppb	110	01/28/00	CRS	
PYRENE	U	ppb	110	01/28/00	CRS	
CHRYSENE	U	ppb	110	01/28/00	CRS	
´2-CHLOROETHYL)ETHER	U	ppb	210	01/28/00	CRS	
2-CHLOROETHOXY)METHANE	U	ppb	210	01/28/00	CRS	
(2-CHLOROISOPROPYL)ETHER	U	ppb	210	01/28/00	CRS	
4-BROMOPHENYLPHENYL ETHER	U	ppb	210	01/28/00	CRS	
4-CHLOROPHENYLPHENYL ETHER	U	ppb	110	01/28/00	CRS	
HEXACHLOROCYCLOPENTADIENE	U	ppb	420	01/28/00	CRS	
HEXACHLOROBUTADIENE	U	ppb	210	01/28/00	CRS	
HEXACHLOROBENZENE	U	ppb	210	01/28/00	CRS	
HEXACHLOROETHANE	U	ppb	210	01/28/00	CRS	
1,2,4-TRICHLOROBENZENE	U	ppb	210	01/28/00	CRS	
2-CHLORONAPHTHALENE	U	ppb	110	01/28/00	CRS	
4-CHLORO-3-METHYLPHENOL	U	ppb	210	01/28/00	CRS	
2-CHLOROPHENOL	U	ppb	210	01/28/00	CRS	
2,4-DICHLOROPHENOL	U	ppb	210	01/28/00	CRS	
2,4-DIMETHYLPHENOL	U	ppb	210	01/28/00	CRS	
2,4-DINITROPHENOL	U	ppb	2100	01/28/00	CRS	
2-METHYL-4,6-DINITROPHENOL	U	ppb	1100	01/28/00	CRS	
2-NITROPHENOL	U	ppb	420	01/28/00	CRS	
4-NITROPHENOL	U	ppb	1100	01/28/00	CRS	
PENTACHLOROPHENOL	U	ppb	1100	01/28/00	CRS	
PHENOL	U	ppb	210	01/28/00	CRS	
2,4,6-TRICHLOROPHENOL	U	ppb	420	01/28/00	CRS	
2,4,5-TRICHLOROPHENOL	U	ppb	420	01/28/00	CRS	
O-CRESOL	U	ppb	210	01/28/00	CRS	
M- & P-CRESOL	U	ppb	210	01/28/00	CRS	
2-METHYLNAPHTHALENE	U	ppb	110	01/28/00	CRS	
BENZOIC ACID	U	ppb	1100	01/28/00	CRS	
BENZYL ALCOHOL	U	ppb	210	01/28/00	CRS	
4-CHLOROANILINE	U	ppb	210	01/28/00	CRS	
DIBENZOFURAN	U	ppb	110	01/28/00	CRS	
3,3-DICHLOROBENZIDINE	U	ppb	1100	01/28/00	CRS	
2-NITROANILINE	U	ppb	420	01/28/00	CRS	
3-NITROANILINE	U	ppb	1100	01/28/00	CRS	
4-NITROANILINE	U	ppb	1100	01/28/00	CRS	
ALDRIN	U	ppb	2.1	01/28/00	CRS	
alpha-BHC	U	ppb	2.1	01/28/00	CRS	
-BHC	U	ppb	2.1	01/28/00	CRS	
BHC	U	ppb	2.1	01/28/00	CRS	
ma-BHC (LINDANE)	U	ppb	2.1	01/28/00	CRS	
alpha-CHLORDANE	U	ppb	2.1	01/28/00	CRS	
gamma-CHLORDANE	U	ppb	2.1	01/28/00	CRS	
TECHNICAL CHLORDANE	U	ppb	86	01/28/00	CRS	
p,p-DDD	U	ppb	4.3	01/28/00	CRS	
p,p-DDE	U	ppb	4.3	01/28/00	CRS	

Project/Site No.:	54514	Lab Number:	9912157-01A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-01	Received:	12/15/99 15:00:00 By LJB
Station No.:	NK-SS-01	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 09:25:00 By CS	Priority:	
Quality:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	ppb	4.3	01/28/00	CRS	
DIELDRIN	U	ppb	4.3	01/28/00	CRS	
ENDOSULFAN I	U	ppb	2.1	01/28/00	CRS	
ENDOSULFAN II	U	ppb	4.3	01/28/00	CRS	
ENDOSULFAN SULFATE	U	ppb	4.3	01/28/00	CRS	
ENDRIN	U	ppb	4.3	01/28/00	CRS	
ENDRIN ALDEHYDE	U	ppb	4.3	01/28/00	CRS	
ENDRIN KETONE	U	ppb	4.3	01/28/00	CRS	
HEPTACHLOR	U	ppb	2.1	01/28/00	CRS	
HEPTACHLOR EPOXIDE	U	ppb	2.1	01/28/00	CRS	
TOXAPHENE	U	ppb	210	01/28/00	CRS	
METHOXYCHLOR	U	ppb	21	01/28/00	CRS	
PCB 1016/1242	U	ppb	140	01/28/00	CRS	
PCB 1221	U	ppb	150	01/28/00	CRS	
PCB 1232	U	ppb	160	01/28/00	CRS	
PCB 1248	U	ppb	140	01/28/00	CRS	
PCB 1254	U	ppb	160	01/28/00	CRS	
PCB 1260	U	ppb	160	01/28/00	CRS	
PCB 1262	U	ppb	140	01/28/00	CRS	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-02
Station No.: NK-SS-02
ected: 12/14/99 10:00:00 By CS
ity: 54

Lab Number: 9912157-02A
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	J 397	ppb	470	01/28/00	CRS	
BIS(2-ETHYLHEXYL)PHTHALATE	J 337	ppb	470	01/28/00	CRS	
DI-n-BUTYL PHTHALATE	U	ppb	470	01/28/00	CRS	
DI-n-OCTYL PHTHALATE	U	ppb	940	01/28/00	CRS	
DIETHYL PHTHALATE	U	ppb	230	01/28/00	CRS	
DIMETHYL PHTHALATE	U	ppb	230	01/28/00	CRS	
n-NITROSODIMETHYLAMINE	U	ppb	940	01/28/00	CRS	
n-NITROSODIPHENYLAMINE	U	ppb	470	01/28/00	CRS	
n-NITROSO-di-n-PROPYLAMINE	U	ppb	470	01/28/00	CRS	
ISOPHORONE	U	ppb	230	01/28/00	CRS	
NITROBENZENE	U	ppb	470	01/28/00	CRS	
2,4-DINITROTOLUENE	U	ppb	940	01/28/00	CRS	
2,6-DINITROTOLUENE	U	ppb	940	01/28/00	CRS	
ACENAPHTHENE	U	ppb	230	01/28/00	CRS	
ACENAPHTHYLENE	U	ppb	230	01/28/00	CRS	
ANTHRACENE	U	ppb	230	01/28/00	CRS	
BENZO(a)ANTHRACENE	U	ppb	230	01/28/00	CRS	
BENZO(a)PYRENE	U	ppb	230	01/28/00	CRS	
BENZO(b)FLUORANTHENE	U	ppb	230	01/28/00	CRS	
BENZO(ghi)PERYLENE	U	ppb	940	01/28/00	CRS	
BENZO(k)FLUORANTHENE	U	ppb	230	01/28/00	CRS	
DIBENZO(a,h)ANTHRACENE	U	ppb	940	01/28/00	CRS	
FLUORANTHENE	U	ppb	230	01/28/00	CRS	
FLUORENE	U	ppb	230	01/28/00	CRS	
INDENO(1,2,3-cd)PYRENE	U	ppb	940	01/28/00	CRS	
NAPHTHALENE	U	ppb	230	01/28/00	CRS	
PHENANTHRENE	U	ppb	230	01/28/00	CRS	
PYRENE	U	ppb	230	01/28/00	CRS	
CHRYSENE	U	ppb	230	01/28/00	CRS	
'2-CHLOROETHYL)ETHER	U	ppb	470	01/28/00	CRS	
2-CHLOROETHOXY)METHANE	U	ppb	470	01/28/00	CRS	
ois(2-CHLOROISOPROPYL)ETHER	U	ppb	470	01/28/00	CRS	
4-BROMOPHENYLPHENYL ETHER	U	ppb	470	01/28/00	CRS	
4-CHLOROPHENYLPHENYL ETHER	U	ppb	230	01/28/00	CRS	
HEXACHLOROCYCLOPENTADIENE	U	ppb	940	01/28/00	CRS	
HEXACHLOROBUTADIENE	U	ppb	470	01/28/00	CRS	
HEXACHLOROBENZENE	U	ppb	470	01/28/00	CRS	
HEXACHLOROETHANE	U	ppb	470	01/28/00	CRS	
1,2,4-TRICHLOROBENZENE	U	ppb	470	01/28/00	CRS	
2-CHLORONAPHTHALENE	U	ppb	230	01/28/00	CRS	
4-CHLORO-3-METHYLPHENOL	U	ppb	470	01/28/00	CRS	
2-CHLOROPHENOL	U	ppb	470	01/28/00	CRS	
2,4-DICHLOROPHENOL	U	ppb	470	01/28/00	CRS	
2,4-DIMETHYLPHENOL	U	ppb	470	01/28/00	CRS	
2,4-DINITROPHENOL	U	ppb	4700	01/28/00	CRS	
2-METHYL-4,6-DINITROPHENOL	U	ppb	2300	01/28/00	CRS	
2-NITROPHENOL	U	ppb	940	01/28/00	CRS	
4-NITROPHENOL	U	ppb	2300	01/28/00	CRS	
PENTACHLOROPHENOL	U	ppb	2300	01/28/00	CRS	
PHENOL	U	ppb	470	01/28/00	CRS	
2,4,6-TRICHLOROPHENOL	U	ppb	940	01/28/00	CRS	
2,4,5-TRICHLOROPHENOL	U	ppb	940	01/28/00	CRS	
O-CRESOL	U	ppb	470	01/28/00	CRS	
M- & P-CRESOL	U	ppb	470	01/28/00	CRS	
2-METHYLNAPHTHALENE	U	ppb	230	01/28/00	CRS	
BENZOIC ACID	U	ppb	2300	01/28/00	CRS	
BENZYL ALCOHOL	U	ppb	470	01/28/00	CRS	
4-CHLOROANILINE	U	ppb	470	01/28/00	CRS	
DIBENZOFURAN	U	ppb	230	01/28/00	CRS	
3,3-DICHLOROBENZIDINE	U	ppb	2300	01/28/00	CRS	
2-NITROANILINE	U	ppb	940	01/28/00	CRS	
3-NITROANILINE	U	ppb	2300	01/28/00	CRS	
4-NITROANILINE	U	ppb	2300	01/28/00	CRS	
ALDRIN	U	ppb	4.9	01/28/00	CRS	
alpha-BHC	U	ppb	4.9	01/28/00	CRS	
-BHC	U	ppb	4.9	01/28/00	CRS	
-BHC	U	ppb	4.9	01/28/00	CRS	
gamma-BHC (LINDANE)	U	ppb	4.9	01/28/00	CRS	
alpha-CHLORDANE	U	ppb	4.9	01/28/00	CRS	
gamma-CHLORDANE	U	ppb	4.9	01/28/00	CRS	
TECHNICAL CHLORDANE	U	ppb	200	01/28/00	CRS	
p,p-DDD	U	ppb	9.9	01/28/00	CRS	
p,p-DDE	U	ppb	9.9	01/28/00	CRS	

Project/Site No.:	54514	Lab Number:	9912157-02A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-02	Received:	12/15/99 15:00:00 By LJB
St-'ion No.:	NK-SS-02	Sampling Agency:	HWM_11_CFO
ıcted:	12/14/99 10:00:00 By CS	Priority:	
nty:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	ppb	9.9	01/28/00	CRS	
DIELDRIN	U	ppb	9.9	01/28/00	CRS	
ENDOSULFAN I	U	ppb	4.9	01/28/00	CRS	
ENDOSULFAN II	U	ppb	9.9	01/28/00	CRS	
ENDOSULFAN SULFATE	U	ppb	9.9	01/28/00	CRS	
ENDRIN	U	ppb	9.9	01/28/00	CRS	
ENDRIN ALDEHYDE	U	ppb	9.9	01/28/00	CRS	
ENDRIN KETONE	U	ppb	9.9	01/28/00	CRS	
HEPTACHLOR	U	ppb	4.9	01/28/00	CRS	
HEPTACHLOR EPOXIDE	U	ppb	4.9	01/28/00	CRS	
TOXAPHENE	U	ppb	490	01/28/00	CRS	
METHOXYCHLOR	U	ppb	49	01/28/00	CRS	
PCB 1016/1242	U	ppb	320	01/28/00	CRS	
PCB 1221	U	ppb	350	01/28/00	CRS	
PCB 1232	U	ppb	370	01/28/00	CRS	
PCB 1248	U	ppb	320	01/28/00	CRS	
PCB 1254	U	ppb	370	01/28/00	CRS	
PCB 1260	U	ppb	370	01/28/00	CRS	
PCB 1262	U	ppb	320	01/28/00	CRS	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

Project/Site No.:	54514	Lab Number:	9912157-03A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-03	Received:	12/15/99 15:00:00 By LJB
Station No.:	NK-SS-03	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 10:05:00 By CS	Priority:	
Quantity:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	ppb	480	01/28/00	CRS	
BIS(2-ETHYLHEXYL)PHTHALATE	17800	ppb	-	01/28/00	CRS	
DI-n-BUTYL PHTHALATE	U	ppb	480	01/28/00	CRS	
DI-n-OCTYL PHTHALATE	U	ppb	970	01/28/00	CRS	
DIETHYL PHTHALATE	10900	ppb	-	01/28/00	CRS	
DIMETHYL PHTHALATE	U	ppb	240	01/28/00	CRS	
n-NITROSODIMETHYLAMINE	U	ppb	970	01/28/00	CRS	
n-NITROSODIPHENYLAMINE	U	ppb	480	01/28/00	CRS	
n-NITROSO-di-n-PROPYLAMINE	U	ppb	480	01/28/00	CRS	
ISOPHORONE	U	ppb	240	01/28/00	CRS	
NITROBENZENE	U	ppb	480	01/28/00	CRS	
2,4-DINITROTOLUENE	U	ppb	970	01/28/00	CRS	
2,6-DINITROTOLUENE	U	ppb	970	01/28/00	CRS	
ACENAPHTHENE	U	ppb	240	01/28/00	CRS	
ACENAPHTHYLENE	U	ppb	240	01/28/00	CRS	
ANTHRACENE	U	ppb	240	01/28/00	CRS	
BENZO(a)ANTHRACENE	U	ppb	240	01/28/00	CRS	
BENZO(a)PYRENE	U	ppb	240	01/28/00	CRS	
BENZO(b)FLUORANTHENE	U	ppb	240	01/28/00	CRS	
BENZO(ghi)PERYLENE	U	ppb	970	01/28/00	CRS	
BENZO(k)FLUORANTHENE	U	ppb	240	01/28/00	CRS	
DIBENZO(a,h)ANTHRACENE	U	ppb	970	01/28/00	CRS	
FLUORANTHENE	U	ppb	240	01/28/00	CRS	
FLUORENE	U	ppb	240	01/28/00	CRS	
INDENO(1,2,3-cd)PYRENE	U	ppb	970	01/28/00	CRS	
NAPHTHALENE	U	ppb	240	01/28/00	CRS	
PHENANTHRENE	U	ppb	240	01/28/00	CRS	
PYRENE	U	ppb	240	01/28/00	CRS	
CHRYSENE	U	ppb	240	01/28/00	CRS	
[illegible]/2-CHLOROETHYL)ETHER	U	ppb	480	01/28/00	CRS	
[illegible]-CHLOROETHOXY)METHANE	U	ppb	480	01/28/00	CRS	
[illegible],2-CHLOROISOPROPYL)ETHER	U	ppb	480	01/28/00	CRS	
4-BROMOPHENYLPHENYL ETHER	U	ppb	480	01/28/00	CRS	
4-CHLOROPHENYLPHENYL ETHER	U	ppb	240	01/28/00	CRS	
HEXACHLOROCYCLOPENTADIENE	U	ppb	970	01/28/00	CRS	
HEXACHLOROBUTADIENE	U	ppb	480	01/28/00	CRS	
HEXACHLOROBENZENE	U	ppb	480	01/28/00	CRS	
HEXACHLOROETHANE	U	ppb	480	01/28/00	CRS	
1,2,4-TRICHLOROBENZENE	U	ppb	480	01/28/00	CRS	
2-CHLORONAPHTHALENE	U	ppb	240	01/28/00	CRS	
4-CHLORO-3-METHYLPHENOL	U	ppb	480	01/28/00	CRS	
2-CHLOROPHENOL	U	ppb	480	01/28/00	CRS	
2,4-DICHLOROPHENOL	U	ppb	480	01/28/00	CRS	
2,4-DIMETHYLPHENOL	U	ppb	480	01/28/00	CRS	
2,4-DINITROPHENOL	U	ppb	4800	01/28/00	CRS	
2-METHYL-4,6-DINITROPHENOL	U	ppb	2400	01/28/00	CRS	
2-NITROPHENOL	U	ppb	970	01/28/00	CRS	
4-NITROPHENOL	U	ppb	2400	01/28/00	CRS	
PENTACHLOROPHENOL	U	ppb	2400	01/28/00	CRS	
PHENOL	U	ppb	480	01/28/00	CRS	
2,4,6-TRICHLOROPHENOL	U	ppb	970	01/28/00	CRS	
2,4,5-TRICHLOROPHENOL	U	ppb	970	01/28/00	CRS	
O-CRESOL	U	ppb	480	01/28/00	CRS	
M- & P-CRESOL	U	ppb	480	01/28/00	CRS	
2-METHYLNAPHTHALENE	U	ppb	240	01/28/00	CRS	
BENZOIC ACID	U	ppb	2400	01/28/00	CRS	
BENZYL ALCOHOL	U	ppb	480	01/28/00	CRS	
4-CHLOROANILINE	U	ppb	480	01/28/00	CRS	
DIBENZOFURAN	U	ppb	240	01/28/00	CRS	
3,3-DICHLOROBENZIDINE	U	ppb	2400	01/28/00	CRS	
2-NITROANILINE	U	ppb	970	01/28/00	CRS	
3-NITROANILINE	U	ppb	2400	01/28/00	CRS	
4-NITROANILINE	U	ppb	2400	01/28/00	CRS	
ALDRIN	U	ppb	4.7	01/28/00	CRS	
alpha-BHC	U	ppb	4.7	01/28/00	CRS	
[illegible]-BHC	U	ppb	4.7	01/28/00	CRS	
[illegible] BHC	U	ppb	4.7	01/28/00	CRS	
[illegible]na-BHC (LINDANE)	U	ppb	4.7	01/28/00	CRS	
alpha-CHLORDANE	U	ppb	4.7	01/28/00	CRS	
gamma-CHLORDANE	U	ppb	4.7	01/28/00	CRS	
TECHNICAL CHLORDANE	U	ppb	190	01/28/00	CRS	
p,p-DDD	U	ppb	9.4	01/28/00	CRS	
p,p-DDE	U	ppb	9.4	01/28/00	CRS	

Project/Site No.:	54514	Lab Number:	9912157-03A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-03	Received:	12/15/99 15:00:00 By LJB
St on No.:	NK-SS-03	Sampling Agency:	HWM_11_CFO
ected:	12/14/99 10:05:00 By CS	Priority:	
ity:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	ppb	9.4	01/28/00	CRS	
DIELDRIN	U	ppb	9.4	01/28/00	CRS	
ENDOSULFAN I	U	ppb	4.7	01/28/00	CRS	
ENDOSULFAN II	U	ppb	9.4	01/28/00	CRS	
ENDOSULFAN SULFATE	U	ppb	9.4	01/28/00	CRS	
ENDRIN	U	ppb	9.4	01/28/00	CRS	
ENDRIN ALDEHYDE	U	ppb	9.4	01/28/00	CRS	
ENDRIN KETONE	U	ppb	9.4	01/28/00	CRS	
HEPTACHLOR	U	ppb	4.7	01/28/00	CRS	
HEPTACHLOR EPOXIDE	U	ppb	4.7	01/28/00	CRS	
TOXAPHENE	U	ppb	470	01/28/00	CRS	
METHOXYCHLOR	U	ppb	47	01/28/00	CRS	
PCB 1016/1242	U	ppb	310	01/28/00	CRS	
PCB 1221	U	ppb	330	01/28/00	CRS	
PCB 1232	U	ppb	350	01/28/00	CRS	
PCB 1248	U	ppb	310	01/28/00	CRS	
PCB 1254	U	ppb	350	01/28/00	CRS	
PCB 1260	U	ppb	350	01/28/00	CRS	
PCB 1262	U	ppb	310	01/28/00	CRS	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-04
Station No.: NK-SS-04
C lected: 12/14/99 10:45:00 By CS
ity: 54

Lab Number: 9912157-04A
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	ppb	190	01/28/00	CRS	
BIS(2-ETHYLHEXYL)PHTHALATE	374	ppb	-	01/28/00	CRS	
DI-n-BUTYL PHTHALATE	U	ppb	190	01/28/00	CRS	
DI-n-OCTYL PHTHALATE	U	ppb	380	01/28/00	CRS	
DIETHYL PHTHALATE	123	ppb	-	01/28/00	CRS	
DIMETHYL PHTHALATE	U	ppb	95	01/28/00	CRS	
n-NITROSODIMETHYLAMINE	U	ppb	380	01/28/00	CRS	
n-NITROSODIPHENYLAMINE	U	ppb	190	01/28/00	CRS	
n-NITROSO-di-n-PROPYLAMINE	U	ppb	190	01/28/00	CRS	
ISOPHORONE	U	ppb	95	01/28/00	CRS	
NITROBENZENE	U	ppb	190	01/28/00	CRS	
2,4-DINITROTOLUENE	U	ppb	380	01/28/00	CRS	
2,6-DINITROTOLUENE	U	ppb	380	01/28/00	CRS	
ACENAPHTHENE	U	ppb	95	01/28/00	CRS	
ACENAPHTHYLENE	U	ppb	95	01/28/00	CRS	
ANTHRACENE	U	ppb	95	01/28/00	CRS	
BENZO(a)ANTHRACENE	U	ppb	95	01/28/00	CRS	
BENZO(a)PYRENE	U	ppb	95	01/28/00	CRS	
BENZO(b)FLUORANTHENE	U	ppb	95	01/28/00	CRS	
BENZO(ghi)PERYLENE	U	ppb	380	01/28/00	CRS	
BENZO(k)FLUORANTHENE	U	ppb	95	01/28/00	CRS	
DIBENZO(a,h)ANTHRACENE	U	ppb	380	01/28/00	CRS	
FLUORANTHENE	U	ppb	95	01/28/00	CRS	
FLUORENE	U	ppb	95	01/28/00	CRS	
INDENO(1,2,3-cd)PYRENE	U	ppb	380	01/28/00	CRS	
NAPHTHALENE	U	ppb	95	01/28/00	CRS	
PHENANTHRENE	U	ppb	95	01/28/00	CRS	
PYRENE	U	ppb	95	01/28/00	CRS	
CHRYSENE	U	ppb	95	01/28/00	CRS	
BIS(2-CHLOROETHYL)ETHER	U	ppb	190	01/28/00	CRS	
2-CHLOROETHOXY)METHANE	U	ppb	190	01/28/00	CRS	
,2-CHLOROISOPROPYL)ETHER	U	ppb	190	01/28/00	CRS	
4-BROMOPHENYLPHENYL ETHER	U	ppb	190	01/28/00	CRS	
4-CHLOROPHENYLPHENYL ETHER	U	ppb	95	01/28/00	CRS	
HEXACHLOROCYCLOPENTADIENE	U	ppb	380	01/28/00	CRS	
HEXACHLOROBUTADIENE	U	ppb	190	01/28/00	CRS	
HEXACHLOROBENZENE	U	ppb	190	01/28/00	CRS	
HEXACHLOROETHANE	U	ppb	190	01/28/00	CRS	
1,2,4-TRICHLOROBENZENE	U	ppb	190	01/28/00	CRS	
2-CHLORONAPHTHALENE	U	ppb	95	01/28/00	CRS	
4-CHLORO-3-METHYLPHENOL	U	ppb	190	01/28/00	CRS	
2-CHLOROPHENOL	U	ppb	190	01/28/00	CRS	
2,4-DICHLOROPHENOL	U	ppb	190	01/28/00	CRS	
2,4-DIMETHYLPHENOL	U	ppb	190	01/28/00	CRS	
2,4-DINITROPHENOL	U	ppb	1900	01/28/00	CRS	
2-METHYL-4,6-DINITROPHENOL	U	ppb	950	01/28/00	CRS	
2-NITROPHENOL	U	ppb	380	01/28/00	CRS	
4-NITROPHENOL	U	ppb	950	01/28/00	CRS	
PENTACHLOROPHENOL	U	ppb	950	01/28/00	CRS	
PHENOL	U	ppb	190	01/28/00	CRS	
2,4,6-TRICHLOROPHENOL	U	ppb	380	01/28/00	CRS	
2,4,5-TRICHLOROPHENOL	U	ppb	380	01/28/00	CRS	
O-CRESOL	U	ppb	190	01/28/00	CRS	
M- & P-CRESOL	U	ppb	190	01/28/00	CRS	
2-METHYLNAPHTHALENE	U	ppb	95	01/28/00	CRS	
BENZOIC ACID	U	ppb	950	01/28/00	CRS	
BENZYL ALCOHOL	U	ppb	190	01/28/00	CRS	
4-CHLOROANILINE	U	ppb	190	01/28/00	CRS	
DIBENZOFURAN	U	ppb	95	01/28/00	CRS	
3,3-DICHLOROBENZIDINE	U	ppb	950	01/28/00	CRS	
2-NITROANILINE	U	ppb	380	01/28/00	CRS	
3-NITROANILINE	U	ppb	950	01/28/00	CRS	
4-NITROANILINE	U	ppb	950	01/28/00	CRS	
ALDRIN	U	ppb	2.0	01/28/00	CRS	
alpha-BHC	U	ppb	2.0	01/28/00	CRS	
beta-BHC	U	ppb	2.0	01/28/00	CRS	
-BHC	U	ppb	2.0	01/28/00	CRS	
ma-BHC (LINDANE)	U	ppb	2.0	01/28/00	CRS	
alpha-CHLORDANE	U	ppb	2.0	01/28/00	CRS	
gamma-CHLORDANE	U	ppb	2.0	01/28/00	CRS	
TECHNICAL CHLORDANE	U	ppb	80	01/28/00	CRS	
p,p-DDD	U	ppb	4.0	01/28/00	CRS	
p,p-DDE	U	ppb	4.0	01/28/00	CRS	

Project/Site No.:	54514	Lab Number:	9912157-04A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-04	Received:	12/15/99 15:00:00 By LJB
St ion No.:	NK-SS-04	Sampling Agency:	HWM_11_CFO
acted:	12/14/99 10:45:00 By CS	Priority:	
nty:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	ppb	4.0	01/28/00	CRS	
DIELDRIN	U	ppb	4.0	01/28/00	CRS	
ENDOSULFAN I	U	ppb	2.0	01/28/00	CRS	
ENDOSULFAN II	U	ppb	4.0	01/28/00	CRS	
ENDOSULFAN SULFATE	U	ppb	4.0	01/28/00	CRS	
ENDRIN	U	ppb	4.0	01/28/00	CRS	
ENDRIN ALDEHYDE	U	ppb	4.0	01/28/00	CRS	
ENDRIN KETONE	U	ppb	4.0	01/28/00	CRS	
HEPTACHLOR	U	ppb	2.0	01/28/00	CRS	
HEPTACHLOR EPOXIDE	U	ppb	2.0	01/28/00	CRS	
TOXAPHENE	U	ppb	200	01/28/00	CRS	
METHOXYCHLOR	U	ppb	20	01/28/00	CRS	
PCB 1016/1242	U	ppb	130	01/28/00	CRS	
PCB 1221	U	ppb	140	01/28/00	CRS	
PCB 1232	U	ppb	150	01/28/00	CRS	
PCB 1248	U	ppb	130	01/28/00	CRS	
PCB 1254	U	ppb	150	01/28/00	CRS	
PCB 1260	U	ppb	150	01/28/00	CRS	
PCB 1262	U	ppb	130	01/28/00	CRS	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-05
Station No.: NK-SS-05
Collected: 12/14/99 11:15:00 By CS
Qty: 54

Lab Number: 9912157-05A
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	ppb	180	01/28/00	CRS	
BIS(2-ETHYLHEXYL)PHTHALATE	3710	ppb	-	01/28/00	CRS	
DI-n-BUTYL PHTHALATE	U	ppb	180	01/28/00	CRS	
DI-n-OCTYL PHTHALATE	U	ppb	360	01/28/00	CRS	
DIETHYL PHTHALATE	629	ppb	-	01/28/00	CRS	
DIMETHYL PHTHALATE	U	ppb	90	01/28/00	CRS	
n-NITROSODIMETHYLAMINE	U	ppb	360	01/28/00	CRS	
n-NITROSODIPHENYLAMINE	U	ppb	180	01/28/00	CRS	
n-NITROSO-di-n-PROPYLAMINE	U	ppb	180	01/28/00	CRS	
ISOPHORONE	U	ppb	90	01/28/00	CRS	
NITROBENZENE	U	ppb	180	01/28/00	CRS	
2,4-DINITROTOLUENE	U	ppb	360	01/28/00	CRS	
2,6-DINITROTOLUENE	U	ppb	360	01/28/00	CRS	
ACENAPHTHENE	U	ppb	90	01/28/00	CRS	
ACENAPHTHYLENE	U	ppb	90	01/28/00	CRS	
ANTHRACENE	U	ppb	90	01/28/00	CRS	
BENZO(a)ANTHRACENE	U	ppb	90	01/28/00	CRS	
BENZO(a)PYRENE	U	ppb	90	01/28/00	CRS	
BENZO(b)FLUORANTHENE	U	ppb	90	01/28/00	CRS	
BENZO(ghi)PERYLENE	U	ppb	360	01/28/00	CRS	
BENZO(k)FLUORANTHENE	U	ppb	90	01/28/00	CRS	
DIBENZO(a,h)ANTHRACENE	U	ppb	360	01/28/00	CRS	
FLUORANTHENE	U	ppb	90	01/28/00	CRS	
FLUORENE	U	ppb	90	01/28/00	CRS	
INDENO(1,2,3-cd)PYRENE	U	ppb	360	01/28/00	CRS	
NAPHTHALENE	U	ppb	90	01/28/00	CRS	
PHENANTHRENE	U	ppb	90	01/28/00	CRS	
PYRENE	U	ppb	90	01/28/00	CRS	
CHRYSENE	U	ppb	90	01/28/00	CRS	
BIS(2-CHLOROETHYL)ETHER	U	ppb	180	01/28/00	CRS	
2-CHLOROETHOXY)METHANE	U	ppb	180	01/28/00	CRS	
2-CHLOROISOPROPYL)ETHER	U	ppb	180	01/28/00	CRS	
4-BROMOPHENYLPHENYL ETHER	U	ppb	180	01/28/00	CRS	
4-CHLOROPHENYLPHENYL ETHER	U	ppb	90	01/28/00	CRS	
HEXACHLOROCYCLOPENTADIENE	U	ppb	360	01/28/00	CRS	
HEXACHLOROBUTADIENE	U	ppb	180	01/28/00	CRS	
HEXACHLOROBENZENE	U	ppb	180	01/28/00	CRS	
HEXACHLOROETHANE	U	ppb	180	01/28/00	CRS	
1,2,4-TRICHLOROBENZENE	U	ppb	180	01/28/00	CRS	
2-CHLORONAPHTHALENE	U	ppb	90	01/28/00	CRS	
4-CHLORO-3-METHYLPHENOL	U	ppb	180	01/28/00	CRS	
2-CHLOROPHENOL	U	ppb	180	01/28/00	CRS	
2,4-DICHLOROPHENOL	U	ppb	180	01/28/00	CRS	
2,4-DIMETHYLPHENOL	U	ppb	180	01/28/00	CRS	
2,4-DINITROPHENOL	U	ppb	1900	01/28/00	CRS	
2-METHYL-4,6-DINITROPHENOL	U	ppb	900	01/28/00	CRS	
2-NITROPHENOL	U	ppb	360	01/28/00	CRS	
4-NITROPHENOL	U	ppb	900	01/28/00	CRS	
PENTACHLOROPHENOL	U	ppb	900	01/28/00	CRS	
PHENOL	U	ppb	180	01/28/00	CRS	
2,4,6-TRICHLOROPHENOL	U	ppb	360	01/28/00	CRS	
2,4,5-TRICHLOROPHENOL	U	ppb	360	01/28/00	CRS	
O-CRESOL	U	ppb	180	01/28/00	CRS	
M- & P-CRESOL	U	ppb	180	01/28/00	CRS	
2-METHYLNAPHTHALENE	U	ppb	90	01/28/00	CRS	
BENZOIC ACID	U	ppb	900	01/28/00	CRS	
BENZYL ALCOHOL	U	ppb	180	01/28/00	CRS	
4-CHLOROANILINE	U	ppb	180	01/28/00	CRS	
DIBENZOFURAN	U	ppb	90	01/28/00	CRS	
3,3-DICHLOROBENZIDINE	U	ppb	900	01/28/00	CRS	
2-NITROANILINE	U	ppb	360	01/28/00	CRS	
3-NITROANILINE	U	ppb	900	01/28/00	CRS	
4-NITROANILINE	U	ppb	900	01/28/00	CRS	
ALDRIN	U	ppb	2.0	01/28/00	CRS	
alpha-BHC	U	ppb	2.0	01/28/00	CRS	
beta-BHC	U	ppb	2.0	01/28/00	CRS	
BHC	U	ppb	2.0	01/28/00	CRS	
a-BHC (LINDANE)	U	ppb	2.0	01/28/00	CRS	
alpha-CHLORDANE	U	ppb	2.0	01/28/00	CRS	
gamma-CHLORDANE	U	ppb	2.0	01/28/00	CRS	
TECHNICAL CHLORDANE	U	ppb	78	01/28/00	CRS	
p,p-DDD	U	ppb	4.0	01/28/00	CRS	
p,p-DDE	U	ppb	4.0	01/28/00	CRS	

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-05
Station No.: NK-SS-05
Collected: 12/14/99 11:15:00 By CS
Qty: 54

Lab Number: 9912157-05A
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	ppb	4.0	01/28/00	CRS	
DIELDRIN	U	ppb	4.0	01/28/00	CRS	
ENDOSULFAN I	U	ppb	2.0	01/28/00	CRS	
ENDOSULFAN II	U	ppb	4.0	01/28/00	CRS	
ENDOSULFAN SULFATE	U	ppb	4.0	01/28/00	CRS	
ENDRIN	U	ppb	4.0	01/28/00	CRS	
ENDRIN ALDEHYDE	U	ppb	4.0	01/28/00	CRS	
ENDRIN KETONE	U	ppb	4.0	01/28/00	CRS	
HEPTACHLOR	U	ppb	2.0	01/28/00	CRS	
HEPTACHLOR EPOXIDE	U	ppb	2.0	01/28/00	CRS	
TOXAPHENE	U	ppb	200	01/28/00	CRS	
METHOXYCHLOR	U	ppb	20	01/28/00	CRS	
PCB 1016/1242	U	ppb	130	01/28/00	CRS	
PCB 1221	U	ppb	140	01/28/00	CRS	
PCB 1232	U	ppb	150	01/28/00	CRS	
PCB 1248	U	ppb	130	01/28/00	CRS	
PCB 1254	U	ppb	150	01/28/00	CRS	
PCB 1260	U	ppb	150	01/28/00	CRS	
PCB 1262	U	ppb	130	01/28/00	CRS	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-06
Station No.: NK-SS-06
Collected: 12/14/99 11:20:00 By CS
Quality: 54

Lab Number: 9912157-06A
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	ppb	200	01/28/00	CRS	
BIS(2-ETHYLHEXYL)PHTHALATE	J 158	ppb	200	01/28/00	CRS	
DI-n-BUTYL PHTHALATE	U	ppb	200	01/28/00	CRS	
DI-n-OCTYL PHTHALATE	U	ppb	3960	01/28/00	CRS	
DIETHYL PHTHALATE	1170	ppb	-	01/28/00	CRS	
DIMETHYL PHTHALATE	U	ppb	98	01/28/00	CRS	
n-NITROSODIMETHYLAMINE	U	ppb	390	01/28/00	CRS	
n-NITROSODIPHENYLAMINE	U	ppb	200	01/28/00	CRS	
n-NITROSO-di-n-PROPYLAMINE	U	ppb	200	01/28/00	CRS	
ISOPHORONE	U	ppb	98	01/28/00	CRS	
NITROBENZENE	U	ppb	200	01/28/00	CRS	
2,4-DINITROTOLUENE	U	ppb	400	01/28/00	CRS	
2,6-DINITROTOLUENE	U	ppb	400	01/28/00	CRS	
ACENAPHTHENE	U	ppb	98	01/28/00	CRS	
ACENAPHTHYLENE	U	ppb	98	01/28/00	CRS	
ANTHRACENE	U	ppb	98	01/28/00	CRS	
BENZO(a)ANTHRACENE	U	ppb	98	01/28/00	CRS	
BENZO(a)PYRENE	U	ppb	98	01/28/00	CRS	
BENZO(b)FLUORANTHENE	U	ppb	98	01/28/00	CRS	
BENZO(ghi)PERYLENE	U	ppb	390	01/28/00	CRS	
BENZO(k)FLUORANTHENE	U	ppb	98	01/28/00	CRS	
DIBENZO(a,h)ANTHRACENE	U	ppb	390	01/28/00	CRS	
FLUORANTHENE	U	ppb	98	01/28/00	CRS	
FLUORENE	U	ppb	98	01/28/00	CRS	
INDENO(1,2,3-cd)PYRENE	U	ppb	390	01/28/00	CRS	
NAPHTHALENE	U	ppb	98	01/28/00	CRS	
PHENANTHRENE	U	ppb	98	01/28/00	CRS	
PYRENE	U	ppb	98	01/28/00	CRS	
CHRYSENE	U	ppb	98	01/28/00	CRS	
[illegible](2-CHLOROETHYL)ETHER	U	ppb	200	01/28/00	CRS	
2-CHLOROETHOXY)METHANE	U	ppb	200	01/28/00	CRS	
[illegible](2-CHLOROISOPROPYL)ETHER	U	ppb	200	01/28/00	CRS	
4-BROMOPHENYLPHENYL ETHER	U	ppb	200	01/28/00	CRS	
4-CHLOROPHENYLPHENYL ETHER	U	ppb	98	01/28/00	CRS	
HEXACHLOROCYCLOPENTADIENE	U	ppb	390	01/28/00	CRS	
HEXACHLOROBUTADIENE	U	ppb	200	01/28/00	CRS	
HEXACHLOROBENZENE	U	ppb	200	01/28/00	CRS	
HEXACHLOROETHANE	U	ppb	200	01/28/00	CRS	
1,2,4-TRICHLOROBENZENE	U	ppb	200	01/28/00	CRS	
2-CHLORONAPHTHALENE	U	ppb	98	01/28/00	CRS	
4-CHLORO-3-METHYLPHENOL	U	ppb	200	01/28/00	CRS	
2-CHLOROPHENOL	U	ppb	200	01/28/00	CRS	
2,4-DICHLOROPHENOL	U	ppb	200	01/28/00	CRS	
2,4-DIMETHYLPHENOL	U	ppb	200	01/28/00	CRS	
2,4-DINITROPHENOL	U	ppb	2000	01/28/00	CRS	
2-METHYL-4,6-DINITROPHENOL	U	ppb	980	01/28/00	CRS	
2-NITROPHENOL	U	ppb	390	01/28/00	CRS	
4-NITROPHENOL	U	ppb	980	01/28/00	CRS	
PENTACHLOROPHENOL	U	ppb	980	01/28/00	CRS	
PHENOL	U	ppb	200	01/28/00	CRS	
2,4,6-TRICHLOROPHENOL	U	ppb	390	01/28/00	CRS	
2,4,5-TRICHLOROPHENOL	U	ppb	390	01/28/00	CRS	
O-CRESOL	U	ppb	200	01/28/00	CRS	
M- & P-CRESOL	U	ppb	200	01/28/00	CRS	
2-METHYLNAPHTHALENE	U	ppb	98	01/28/00	CRS	
BENZOIC ACID	U	ppb	980	01/28/00	CRS	
BENZYL ALCOHOL	U	ppb	200	01/28/00	CRS	
4-CHLOROANILINE	U	ppb	200	01/28/00	CRS	
DIBENZOFURAN	U	ppb	98	01/28/00	CRS	
3,3-DICHLOROBENZIDINE	U	ppb	980	01/28/00	CRS	
2-NITROANILINE	U	ppb	390	01/28/00	CRS	
3-NITROANILINE	U	ppb	980	01/28/00	CRS	
4-NITROANILINE	U	ppb	980	01/28/00	CRS	
ALDRIN	U	ppb	2.0	01/28/00	CRS	
alpha-BHC	U	ppb	2.0	01/28/00	CRS	
[illegible]-BHC	U	ppb	2.0	01/28/00	CRS	
[illegible]-BHC	U	ppb	2.0	01/28/00	CRS	
[illegible]ma-BHC (LINDANE)	U	ppb	2.0	01/28/00	CRS	
alpha-CHLORDANE	U	ppb	2.0	01/28/00	CRS	
gamma-CHLORDANE	U	ppb	2.0	01/28/00	CRS	
TECHNICAL CHLORDANE	U	ppb	79	01/28/00	CRS	
p,p-DDD	U	ppb	3.9	01/28/00	CRS	
p,p-DDE	U	ppb	3.9	01/28/00	CRS	

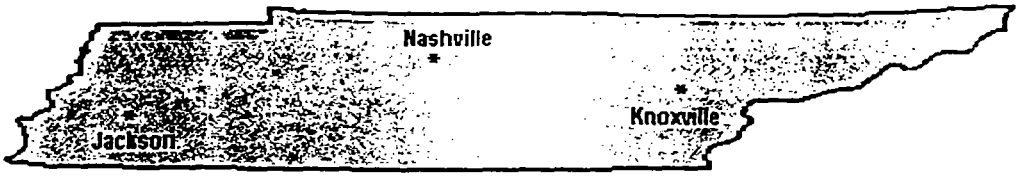
Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-06
Station No.: NK-SS-06
C ected: 12/14/99 11:20:00 By CS
.ty: 54

Lab Number: 9912157-06A
Matrix: SOIL
Received: 12/15/99 15:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	ppb	3.9	01/28/00	CRS	
DIELDRIN	U	ppb	3.9	01/28/00	CRS	
ENDOSULFAN I	U	ppb	2.0	01/28/00	CRS	
ENDOSULFAN II	U	ppb	3.9	01/28/00	CRS	
ENDOSULFAN SULFATE	U	ppb	3.9	01/28/00	CRS	
ENDRIN	U	ppb	3.9	01/28/00	CRS	
ENDRIN ALDEHYDE	U	ppb	3.9	01/28/00	CRS	
ENDRIN KETONE	U	ppb	3.9	01/28/00	CRS	
HEPTACHLOR	U	ppb	2.0	01/28/00	CRS	
HEPTACHLOR EPOXIDE	U	ppb	2.0	01/28/00	CRS	
TOXAPHENE	U	ppb	200	01/28/00	CRS	
METHOXYCHLOR	U	ppb	20	01/28/00	CRS	
PCB 1016/1242	U	ppb	130	01/28/00	CRS	
PCB 1221	U	ppb	140	01/28/00	CRS	
PCB 1232	U	ppb	150	01/28/00	CRS	
PCB 1248	U	ppb	130	01/28/00	CRS	
PCB 1254	U	ppb	150	01/28/00	CRS	
PCB 1260	U	ppb	150	01/28/00	CRS	
PCB 1262	U	ppb	130	01/28/00	CRS	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000



STATE OF TENNESSEE

ENVIRONMENTAL LABORATORIES

JACKSON LABORATORY
295 SUMMAR AVENUE
JACKSON, TN 38302-0849
PH: (901)423-6600

NASHVILLE LABORATORY
630 HART LANE
NASHVILLE, TN 37247-0801
PH: (615)262-6300

KNOXVILLE LABORATORY
1522 CHEROKEE TRAIL
KNOXVILLE, TN 37920
PH: (423)549-5201

SENT TO: **HWM - PA/SI, CFO**
540 McCALLIE AVE, SUITE 550
CHATTANOOGA, TN 37402

CRAIG STANNARD
(615)634-5758

Lab ID: 9912159
Sampling Agency: HWM_11_CFO

Billing Code: 327.38-11

This is to certify that the following results were determined using good laboratory practices and in accordance with federal or state approved methodologies.

Analytical Supervisor

Definition of Data Qualifiers

U- Analyte requested but not detected
J- Estimated value--result is less than sample quantitation limit but greater than zero
B- Analyte in blank as well as sample
E- Analyte concentration exceeds the calibration range of instrument
N- Uncertainty in result other than "J" flag
X,Y,Z- Other flags used to define results as needed
- ceived out of holding time

Printed: February 8, 2000

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-07
Station No.: NK-SS-07
C lected: 12/14/99 13:10:00 By
ity: 54

Lab Number: 9912159-01A
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	190	02/02/00	KDH	
BIS(2-ETHYLHEXYL)PHTHALATE	B J 173	PPB	190	02/02/00	KDH	
DI-n-BUTYL PHTHALATE	U	PPB	190	02/02/00	KDH	
DI-n-OCTYL PHTHALATE	U	PPB	390	02/02/00	KDH	
DIETHYL PHTHALATE	B 1180	PPB	-	02/02/00	KDH	
DIMETHYL PHTHALATE	U	PPB	97	02/02/00	KDH	
n-NITROSODIMETHYLAMINE	U	PPB	390	02/02/00	KDH	
n-NITROSODIPHENYLAMINE	U	PPB	190	02/02/00	KDH	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	190	02/02/00	KDH	
ISOPHORONE	U	PPB	97	02/02/00	KDH	
NITROBENZENE	U	PPB	190	02/02/00	KDH	
2,4-DINITROTOLUENE	U	PPB	390	02/02/00	KDH	
2,6-DINITROTOLUENE	U	PPB	390	02/02/00	KDH	
ACENAPHTHENE	U	PPB	97	02/02/00	KDH	
ACENAPHTHYLENE	U	PPB	97	02/02/00	KDH	
ANTHRACENE	U	PPB	97	02/02/00	KDH	
BENZO(a)ANTHRACENE	U	PPB	97	02/02/00	KDH	
BENZO(a)PYRENE	U	PPB	97	02/02/00	KDH	
BENZO(b)FLUORANTHENE	U	PPB	97	02/02/00	KDH	
BENZO(ghi)PERYLENE	U	PPB	390	02/02/00	KDH	
BENZO(k)FLUORANTHENE	U	PPB	97	02/02/00	KDH	
DIBENZO(a,h)ANTHRACENE	U	PPB	390	02/02/00	KDH	
FLUORANTHENE	U	PPB	97	02/02/00	KDH	
FLUORENE	U	PPB	97	02/02/00	KDH	
INDENO(1,2,3-cd)PYRENE	U	PPB	390	02/02/00	KDH	
NAPHTHALENE	U	PPB	97	02/02/00	KDH	
PHENANTHRENE	U	PPB	97	02/02/00	KDH	
PYRENE	U	PPB	97	02/02/00	KDH	
CHRYSENE	U	PPB	97	02/02/00	KDH	
BIS(2-CHLOROETHYL)ETHER	U	PPB	190	02/02/00	KDH	
2-CHLOROETHOXY)METHANE	U	PPB	190	02/02/00	KDH	
(2-CHLOROISOPROPYL)ETHER	U	PPB	190	02/02/00	KDH	
4-BROMOPHENYLPHENYL ETHER	U	PPB	190	02/02/00	KDH	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	97	02/02/00	KDH	
HEXACHLOROCYCLOPENTADIENE	U	PPB	390	02/02/00	KDH	
HEXACHLOROBUTADIENE	U	PPB	190	02/02/00	KDH	
HEXACHLOROBENZENE	U	PPB	190	02/02/00	KDH	
HEXACHLOROETHANE	U	PPB	190	02/02/00	KDH	
1,2,4-TRICHLOROBENZENE	U	PPB	190	02/02/00	KDH	
2-CHLORONAPHTHALENE	U	PPB	97	02/02/00	KDH	
4-CHLORO-3-METHYLPHENOL	X U	PPB	190	02/02/00	KDH	
2-CHLOROPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DICHLOROPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DIMETHYLPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DINITROPHENOL	X U	PPB	1900	02/02/00	KDH	
2-METHYL-4,6-DINITROPHENOL	X U	PPB	970	02/02/00	KDH	
2-NITROPHENOL	X U	PPB	390	02/02/00	KDH	
4-NITROPHENOL	X U	PPB	970	02/02/00	KDH	
PENTACHLOROPHENOL	X U	PPB	970	02/02/00	KDH	
PHENOL	X U	PPB	190	02/02/00	KDH	
2,4,6-TRICHLOROPHENOL	X U	PPB	390	02/02/00	KDH	
2,4,5-TRICHLOROPHENOL	X U	PPB	390	02/02/00	KDH	
O-CRESOL	X U	PPB	190	02/02/00	KDH	
M- & P-CRESOL	X U	PPB	190	02/02/00	KDH	
2-METHYLNAPHTHALENE	U	PPB	97	02/02/00	KDH	
BENZOIC ACID	X U	PPB	970	02/02/00	KDH	
BENZYL ALCOHOL	U	PPB	190	02/02/00	KDH	
4-CHLOROANILINE	U	PPB	190	02/02/00	KDH	
DIBENZOFURAN	U	PPB	97	02/02/00	KDH	
3,3-DICHLOROBENZIDINE	U	PPB	970	02/02/00	KDH	
2-NITROANILINE	U	PPB	390	02/02/00	KDH	
3-NITROANILINE	U	PPB	970	02/02/00	KDH	
4-NITROANILINE	U	PPB	970	02/02/00	KDH	
ALDRIN	U	PPB	1.9	02/02/00	KDH	
alpha-BHC	U	PPB	1.9	02/02/00	KDH	
beta-BHC	U	PPB	1.9	02/02/00	KDH	
-BHC	U	PPB	1.9	02/02/00	KDH	
ma-BHC (LINDANE)	U	PPB	1.9	02/02/00	KDH	
alpha-CHLORDANE	U	PPB	1.9	02/02/00	KDH	
gamma-CHLORDANE	U	PPB	1.9	02/02/00	KDH	
TECHNICAL CHLORDANE	U	PPB	78	02/02/00	KDH	
p,p-DDD	U	PPB	3.9	02/02/00	KDH	
p,p-DDE	U	PPB	3.9	02/02/00	KDH	

Project/Site No.:	54514	Lab Number:	9912159-01A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-07	Received:	12/15/99 09:00:00 By LJB
Station No.:	NK-SS-07	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 13:10:00 By	Priority:	
Quality:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	3.9	02/02/00	KDH	
DIELDRIN	U	PPB	3.9	02/02/00	KDH	
ENDOSULFAN I	U	PPB	1.9	02/02/00	KDH	
ENDOSULFAN II	U	PPB	3.9	02/02/00	KDH	
ENDOSULFAN SULFATE	U	PPB	3.9	02/02/00	KDH	
ENDRIN	U	PPB	3.9	02/02/00	KDH	
ENDRIN ALDEHYDE	U	PPB	3.9	02/02/00	KDH	
ENDRIN KETONE	U	PPB	3.9	02/02/00	KDH	
HEPTACHLOR	U	PPB	1.9	02/02/00	KDH	
HEPTACHLOR EPOXIDE	U	PPB	1.9	02/02/00	KDH	
TOXAPHENE	U	PPB	190	02/02/00	KDH	
METHOXYCHLOR	U	PPB	19	02/02/00	KDH	
PCB 1016/1242	U	PPB	130	02/02/00	KDH	
PCB 1221	U	PPB	140	02/02/00	KDH	
PCB 1232	U	PPB	150	02/02/00	KDH	
PCB 1248	U	PPB	130	02/02/00	KDH	
PCB 1254	U	PPB	150	02/02/00	KDH	
PCB 1260	U	PPB	150	02/02/00	KDH	
PCB 1262	U	PPB	130	02/02/00	KDH	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

X - RESULTS SUSPECT DUE TO POOR SURROGATE RECOVERY.

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-08
Station No.: NK-SS-08
Collected: 12/14/99 10:50:00 By CS
ity: 54

Lab Number: 9912159-02A
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	190	02/02/00	KDH	
BIS(2-ETHYLHEXYL)PHTHALATE	B 316	PPB	-	02/02/00	KDH	
DI-n-BUTYL PHTHALATE	U	PPB	190	02/02/00	KDH	
DI-n-OCTYL PHTHALATE	U	PPB	370	02/02/00	KDH	
DIETHYL PHTHALATE	U	PPB	94	02/02/00	KDH	
DIMETHYL PHTHALATE	U	PPB	94	02/02/00	KDH	
n-NITROSODIMETHYLAMINE	U	PPB	370	02/02/00	KDH	
n-NITROSODIPHENYLAMINE	U	PPB	190	02/02/00	KDH	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	1490	02/02/00	KDH	
ISOPHORONE	U	PPB	94	02/02/00	KDH	
NITROBENZENE	U	PPB	190	02/02/00	KDH	
2,4-DINITROTOLUENE	U	PPB	370	02/02/00	KDH	
2,6-DINITROTOLUENE	U	PPB	370	02/02/00	KDH	
ACENAPHTHENE	U	PPB	94	02/02/00	KDH	
ACENAPHTHYLENE	U	PPB	94	02/02/00	KDH	
ANTHRACENE	U	PPB	94	02/02/00	KDH	
BENZO(a)ANTHRACENE	U	PPB	94	02/02/00	KDH	
BENZO(a)PYRENE	U	PPB	94	02/02/00	KDH	
BENZO(b)FLUORANTHENE	U	PPB	94	02/02/00	KDH	
BENZO(ghi)PERYLENE	U	PPB	370	02/02/00	KDH	
BENZO(k)FLUORANTHENE	U	PPB	94	02/02/00	KDH	
DIBENZO(a,h)ANTHRACENE	U	PPB	370	02/02/00	KDH	
FLUORANTHENE	U	PPB	94	02/02/00	KDH	
FLUORENE	U	PPB	94	02/02/00	KDH	
INDENO(1,2,3-cd)PYRENE	U	PPB	370	02/02/00	KDH	
NAPHTHALENE	U	PPB	94	02/02/00	KDH	
PHENANTHRENE	U	PPB	94	02/02/00	KDH	
PYRENE	U	PPB	94	02/02/00	KDH	
CHRYSENE	U	PPB	94	02/02/00	KDH	
BIS(2-CHLOROETHYL)ETHER	U	PPB	190	02/02/00	KDH	
2-CHLOROETHOXY)METHANE	U	PPB	190	02/02/00	KDH	
2-CHLOROISOPROPYL)ETHER	U	PPB	190	02/02/00	KDH	
4-BROMOPHENYLPHENYL ETHER	U	PPB	190	02/02/00	KDH	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	94	02/02/00	KDH	
HEXACHLOROCYCLOPENTADIENE	U	PPB	370	02/02/00	KDH	
HEXACHLOROBUTADIENE	U	PPB	190	02/02/00	KDH	
HEXACHLOROBENZENE	U	PPB	190	02/02/00	KDH	
HEXACHLOROETHANE	U	PPB	190	02/02/00	KDH	
1,2,4-TRICHLOROBENZENE	U	PPB	190	02/02/00	KDH	
2-CHLORONAPHTHALENE	U	PPB	94	02/02/00	KDH	
4-CHLORO-3-METHYLPHENOL	X U	PPB	190	02/02/00	KDH	
2-CHLOROPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DICHLOROPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DIMETHYLPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DINITROPHENOL	X U	PPB	1900	02/02/00	KDH	
2-METHYL-4,6-DINITROPHENOL	X U	PPB	940	02/02/00	KDH	
2-NITROPHENOL	X U	PPB	370	02/02/00	KDH	
4-NITROPHENOL	X U	PPB	940	02/02/00	KDH	
PENTACHLOROPHENOL	X U	PPB	940	02/02/00	KDH	
PHENOL	X U	PPB	190	02/02/00	KDH	
2,4,6-TRICHLOROPHENOL	X U	PPB	370	02/02/00	KDH	
2,4,5-TRICHLOROPHENOL	X U	PPB	370	02/02/00	KDH	
O-CRESOL	X U	PPB	190	02/02/00	KDH	
M- & P-CRESOL	X U	PPB	190	02/02/00	KDH	
2-METHYLNAPHTHALENE	U	PPB	94	02/02/00	KDH	
BENZOIC ACID	X U	PPB	940	02/02/00	KDH	
BENZYL ALCOHOL	U	PPB	190	02/02/00	KDH	
4-CHLOROANILINE	U	PPB	190	02/02/00	KDH	
DIBENZOFURAN	U	PPB	94	02/02/00	KDH	
3,3-DICHLOROBENZIDINE	U	PPB	940	02/02/00	KDH	
2-NITROANILINE	U	PPB	370	02/02/00	KDH	
3-NITROANILINE	U	PPB	940	02/02/00	KDH	
4-NITROANILINE	U	PPB	940	02/02/00	KDH	
ALDRIN	U	PPB	1.9	02/02/00	KDH	
alpha-BHC	U	PPB	1.9	02/02/00	KDH	
beta-BHC	U	PPB	1.9	02/02/00	KDH	
-BHC	U	PPB	1.9	02/02/00	KDH	
ma-BHC (LINDANE)	U	PPB	1.9	02/02/00	KDH	
alpha-CHLORDANE	U	PPB	1.9	02/02/00	KDH	
gamma-CHLORDANE	U	PPB	1.9	02/02/00	KDH	
TECHNICAL CHLORDANE	U	PPB	76	02/02/00	KDH	
p,p-DDD	U	PPB	3.8	02/02/00	KDH	
p,p-DDE	U	PPB	3.8	02/02/00	KDH	

Project/Site No.:	54514	Lab Number:	9912159-02A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-08	Received:	12/15/99 09:00:00 By LJB
Station No.:	NK-SS-08	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 10:50:00 By CS	Priority:	
By:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	3.8	02/02/00	KDH	
DIELDRIN	U	PPB	3.8	02/02/00	KDH	
ENDOSULFAN I	U	PPB	1.9	02/02/00	KDH	
ENDOSULFAN II	U	PPB	3.8	02/02/00	KDH	
ENDOSULFAN SULFATE	U	PPB	3.8	02/02/00	KDH	
ENDRIN	U	PPB	3.8	02/02/00	KDH	
ENDRIN ALDEHYDE	U	PPB	3.8	02/02/00	KDH	
ENDRIN KETONE	U	PPB	3.8	02/02/00	KDH	
HEPTACHLOR	U	PPB	1.9	02/02/00	KDH	
HEPTACHLOR EPOXIDE	U	PPB	1.9	02/02/00	KDH	
TOXAPHENE	U	PPB	190	02/02/00	KDH	
METHOXYCHLOR	U	PPB	19	02/02/00	KDH	
PCB 1016/1242	U	PPB	250	02/02/00	KDH	
PCB 1221	U	PPB	270	02/02/00	KDH	
PCB 1232	U	PPB	290	02/02/00	KDH	
PCB 1248	U	PPB	250	02/02/00	KDH	
PCB 1254	U	PPB	290	02/02/00	KDH	
PCB 1260	U	PPB	290	02/02/00	KDH	
PCB 1262	U	PPB	250	02/02/00	KDH	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

X - RESULTS SUSPECT DUE TO POOR SURROGATE RECOVERY.

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-09
Station No.: NK-SS-09
Collected: 12/14/99 13:20:00 By CS
Quantity: 54

Lab Number: 9912159-03A
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	190	02/02/00	KDH	
BIS(2-ETHYLHEXYL)PHTHALATE	U	PPB	380	02/02/00	KDH	
DI-n-BUTYL PHTHALATE	U	PPB	190	02/02/00	KDH	
DI-n-OCTYL PHTHALATE	U	PPB	380	02/02/00	KDH	
DIETHYL PHTHALATE	U	PPB	96	02/02/00	KDH	
DIMETHYL PHTHALATE	U	PPB	96	02/02/00	KDH	
n-NITROSODIMETHYLAMINE	U	PPB	380	02/02/00	KDH	
n-NITROSODIPHENYLAMINE	U	PPB	190	02/02/00	KDH	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	190	02/02/00	KDH	
ISOPHORONE	U	PPB	96	02/02/00	KDH	
NITROBENZENE	U	PPB	190	02/02/00	KDH	
2,4-DINITROTOLUENE	U	PPB	380	02/02/00	KDH	
2,6-DINITROTOLUENE	U	PPB	380	02/02/00	KDH	
ACENAPHTHENE	U	PPB	96	02/02/00	KDH	
ACENAPHTHYLENE	U	PPB	96	02/02/00	KDH	
ANTHRACENE	U	PPB	96	02/02/00	KDH	
BENZO(a)ANTHRACENE	U	PPB	96	02/02/00	KDH	
BENZO(a)PYRENE	U	PPB	96	02/02/00	KDH	
BENZO(b)FLUORANTHENE	U	PPB	96	02/02/00	KDH	
BENZO(ghi)PERYLENE	U	PPB	380	02/02/00	KDH	
BENZO(k)FLUORANTHENE	U	PPB	96	02/02/00	KDH	
DIBENZO(a,h)ANTHRACENE	U	PPB	380	02/02/00	KDH	
FLUORANTHENE	U	PPB	96	02/02/00	KDH	
FLUORENE	U	PPB	96	02/02/00	KDH	
INDENO(1,2,3-cd)PYRENE	U	PPB	380	02/02/00	KDH	
NAPHTHALENE	U	PPB	190	02/02/00	KDH	
PHENANTHRENE	U	PPB	96	02/02/00	KDH	
PYRENE	U	PPB	96	02/02/00	KDH	
CHRYSENE	U	PPB	96	02/02/00	KDH	
[illegible](2-CHLOROETHYL)ETHER	U	PPB	190	02/02/00	KDH	
2-CHLOROETHOXY)METHANE	U	PPB	190	02/02/00	KDH	
[illegible](2-CHLOROISOPROPYL)ETHER	U	PPB	190	02/02/00	KDH	
4-BROMOPHENYLPHENYL ETHER	U	PPB	190	02/02/00	KDH	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	96	02/02/00	KDH	
HEXACHLOROCYCLOPENTADIENE	U	PPB	380	02/02/00	KDH	
HEXACHLOROBUTADIENE	U	PPB	190	02/02/00	KDH	
HEXACHLOROBENZENE	U	PPB	190	02/02/00	KDH	
HEXACHLOROETHANE	U	PPB	190	02/02/00	KDH	
1,2,4-TRICHLOROBENZENE	U	PPB	190	02/02/00	KDH	
2-CHLORONAPHTHALENE	U	PPB	96	02/02/00	KDH	
4-CHLORO-3-METHYLPHENOL	X U	PPB	190	02/02/00	KDH	
2-CHLOROPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DICHLOROPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DIMETHYLPHENOL	X U	PPB	190	02/02/00	KDH	
2,4-DINITROPHENOL	X U	PPB	1900	02/02/00	KDH	
2-METHYL-4,6-DINITROPHENOL	X U	PPB	960	02/02/00	KDH	
2-NITROPHENOL	X U	PPB	380	02/02/00	KDH	
4-NITROPHENOL	X U	PPB	960	02/02/00	KDH	
PENTACHLOROPHENOL	X U	PPB	960	02/02/00	KDH	
PHENOL	X U	PPB	190	02/02/00	KDH	
2,4,6-TRICHLOROPHENOL	X U	PPB	380	02/02/00	KDH	
2,4,5-TRICHLOROPHENOL	X U	PPB	380	02/02/00	KDH	
O-CRESOL	X U	PPB	190	02/02/00	KDH	
M- & P-CRESOL	X U	PPB	190	02/02/00	KDH	
2-METHYLNAPHTHALENE	U	PPB	96	02/02/00	KDH	
BENZOIC ACID	X U	PPB	960	02/02/00	KDH	
BENZYL ALCOHOL	U	PPB	190	02/02/00	KDH	
4-CHLOROANILINE	U	PPB	190	02/02/00	KDH	
DIBENZOFURAN	U	PPB	96	02/02/00	KDH	
3,3-DICHLOROBENZIDINE	U	PPB	960	02/02/00	KDH	
2-NITROANILINE	U	PPB	380	02/02/00	KDH	
3-NITROANILINE	U	PPB	960	02/02/00	KDH	
4-NITROANILINE	U	PPB	960	02/02/00	KDH	
ALDRIN	U	PPB	1.9	02/02/00	KDH	
alpha-BHC	U	PPB	1.9	02/02/00	KDH	
[illegible]-BHC	U	PPB	1.9	02/02/00	KDH	
-BHC	U	PPB	1.9	02/02/00	KDH	
[illegible]ma-BHC (LINDANE)	U	PPB	1.9	02/02/00	KDH	
alpha-CHLORDANE	U	PPB	1.9	02/02/00	KDH	
gamma-CHLORDANE	U	PPB	1.9	02/02/00	KDH	
TECHNICAL CHLORDANE	U	PPB	77	02/02/00	KDH	
p,p-DDD	U	PPB	3.8	02/02/00	KDH	
p,p-DDE	U	PPB	3.8	02/02/00	KDH	

Project/Site No.:	54514	Lab Number:	9912159-03A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-09	Received:	12/15/99 09:00:00 By LJB
Station No.:	NK-SS-09	Sampling Agency:	HWM_11_CFO
C[illegible]cted:	12/14/99 13:20:00 By CS	Priority:	
[illegible]cy:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	3.8	02/02/00	KDH	
DIELDRIN	U	PPB	3.8	02/02/00	KDH	
ENDOSULFAN I	U	PPB	1.9	02/02/00	KDH	
ENDOSULFAN II	U	PPB	3.8	02/02/00	KDH	
ENDOSULFAN SULFATE	U	PPB	3.8	02/02/00	KDH	
ENDRIN	U	PPB	3.8	02/02/00	KDH	
ENDRIN ALDEHYDE	U	PPB	3.8	02/02/00	KDH	
ENDRIN KETONE	U	PPB	3.8	02/02/00	KDH	
HEPTACHLOR	U	PPB	1.9	02/02/00	KDH	
HEPTACHLOR EPOXIDE	U	PPB	1.9	02/02/00	KDH	
TOXAPHENE	U	PPB	190	02/02/00	KDH	
METHOXYCHLOR	U	PPB	19	02/02/00	KDH	
PCB 1016/1242	U	PPB	120	02/02/00	KDH	
PCB 1221	U	PPB	130	02/02/00	KDH	
PCB 1232	U	PPB	140	02/02/00	KDH	
PCB 1248	U	PPB	120	02/02/00	KDH	
PCB 1254	U	PPB	140	02/02/00	KDH	
PCB 1260	U	PPB	140	02/02/00	KDH	
PCB 1262	U	PPB	120	02/02/00	KDH	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

X - RESULTS SUSPECT DUE TO POOR SURROGATE RECOVERY.

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SS-10
Station No.: NK-SS-10
Collected: 12/14/99 13:55:00 By CS
Qty: 54

Lab Number: 9912159-04A
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	200	02/02/00	KDH	
BIS(2-ETHYLHEXYL)PHTHALATE	B 2280	PPB	-	02/02/00	KDH	
DI-n-BUTYL PHTHALATE	U	PPB	200	02/02/00	KDH	
DI-n-OCTYL PHTHALATE	U	PPB	400	02/02/00	KDH	
DIETHYL PHTHALATE	7670	PPB	-	02/02/00	KDH	
DIMETHYL PHTHALATE	U	PPB	100	02/02/00	KDH	
n-NITROSODIMETHYLAMINE	U	PPB	400	02/02/00	KDH	
n-NITROSODIPHENYLAMINE	U	PPB	200	02/02/00	KDH	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	200	02/02/00	KDH	
ISOPHORONE	U	PPB	100	02/02/00	KDH	
NITROBENZENE	U	PPB	400	02/02/00	KDH	
2,4-DINITROTOLUENE	U	PPB	400	02/02/00	KDH	
2,6-DINITROTOLUENE	U	PPB	400	02/02/00	KDH	
ACENAPHTHENE	U	PPB	100	02/02/00	KDH	
ACENAPHTHYLENE	U	PPB	100	02/02/00	KDH	
ANTHRACENE	J 26.2	PPB	100	02/02/00	KDH	
BENZO(a)ANTHRACENE	129	PPB	-	02/02/00	KDH	
BENZO(a)PYRENE	133	PPB	-	02/02/00	KDH	
BENZO(b)FLUORANTHENE	204	PPB	-	02/02/00	KDH	
BENZO(ghi)PERYLENE	J 282	PPB	400	02/02/00	KDH	
BENZO(k)FLUORANTHENE	J 36.3	PPB	100	02/02/00	KDH	
DIBENZO(a,h)ANTHRACENE	U	PPB	400	02/02/00	KDH	
FLUORANTHENE	321	PPB	-	02/02/00	KDH	
FLUORENE	J 78.7	PPB	100	02/02/00	KDH	
INDENO(1,2,3-cd)PYRENE	J 321	PPB	400	02/02/00	KDH	
NAPHTHALENE	U	PPB	200	02/02/00	KDH	
PHENANTHRENE	210	PPB	-	02/02/00	KDH	
PYRENE	284	PPB	-	02/02/00	KDH	
CHRYSENE	141	PPB	-	02/02/00	KDH	
BIS(2-CHLOROETHYL)ETHER	U	PPB	200	02/02/00	KDH	
2-CHLOROETHOXY)METHANE	U	PPB	200	02/02/00	KDH	
2-CHLOROISOPROPYL)ETHER	U	PPB	200	02/02/00	KDH	
4-BROMOPHENYLPHENYL ETHER	U	PPB	200	02/02/00	KDH	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	100	02/02/00	KDH	
HEXACHLOROCYCLOPENTADIENE	U	PPB	400	02/02/00	KDH	
HEXACHLOROBUTADIENE	U	PPB	200	02/02/00	KDH	
HEXACHLOROBENZENE	U	PPB	200	02/02/00	KDH	
HEXACHLOROETHANE	U	PPB	200	02/02/00	KDH	
1,2,4-TRICHLOROBENZENE	U	PPB	200	02/02/00	KDH	
2-CHLORONAPHTHALENE	U	PPB	100	02/02/00	KDH	
4-CHLORO-3-METHYLPHENOL	X U	PPB	200	02/02/00	KDH	
2-CHLOROPHENOL	X U	PPB	200	02/02/00	KDH	
2,4-DICHLOROPHENOL	X U	PPB	200	02/02/00	KDH	
2,4-DIMETHYLPHENOL	X U	PPB	200	02/02/00	KDH	
2,4-DINITROPHENOL	X U	PPB	2000	02/02/00	KDH	
2-METHYL-4,6-DINITROPHENOL	X U	PPB	1000	02/02/00	KDH	
2-NITROPHENOL	X U	PPB	400	02/02/00	KDH	
4-NITROPHENOL	X U	PPB	1000	02/02/00	KDH	
PENTACHLOROPHENOL	X U	PPB	1000	02/02/00	KDH	
PHENOL	X U	PPB	200	02/02/00	KDH	
2,4,6-TRICHLOROPHENOL	X U	PPB	400	02/02/00	KDH	
2,4,5-TRICHLOROPHENOL	X U	PPB	400	02/02/00	KDH	
O-CRESOL	X U	PPB	200	02/02/00	KDH	
M- & P-CRESOL	X U	PPB	200	02/02/00	KDH	
2-METHYLNAPHTHALENE	U	PPB	100	02/02/00	KDH	
BENZOIC ACID	X U	PPB	1000	02/02/00	KDH	
BENZYL ALCOHOL	U	PPB	200	02/02/00	KDH	
4-CHLOROANILINE	U	PPB	200	02/02/00	KDH	
DIBENZOFURAN	U	PPB	100	02/02/00	KDH	
3,3-DICHLOROBENZIDINE	U	PPB	1000	02/02/00	KDH	
2-NITROANILINE	U	PPB	400	02/02/00	KDH	
3-NITROANILINE	U	PPB	1000	02/02/00	KDH	
4-NITROANILINE	U	PPB	1000	02/02/00	KDH	
ALDRIN	U	PPB	2.1	02/02/00	KDH	
alpha-BHC	U	PPB	2.1	02/02/00	KDH	
beta-BHC	U	PPB	2.1	02/02/00	KDH	
-BHC	U	PPB	2.1	02/02/00	KDH	
a-BHC (LINDANE)	U	PPB	2.1	02/02/00	KDH	
alpha-CHLORDANE	U	PPB	2.1	02/02/00	KDH	
gamma-CHLORDANE	U	PPB	2.1	02/02/00	KDH	
TECHNICAL CHLORDANE	U	PPB	84	02/02/00	KDH	
p,p-DDD	U	PPB	4.2	02/02/00	KDH	
p,p-DDE	U	PPB	4.2	02/02/00	KDH	

Project/Site No.:	54514	Lab Number:	9912159-04A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SS-10	Received:	12/15/99 09:00:00 By LJB
Station No.:	NK-SS-10	Sampling Agency:	HWM_11_CFO
C[illegible]ected:	12/14/99 13:55:00 By CS	Priority:	
[illegible]ty:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	4.2	02/02/00	KDH	
DIELDRIN	U	PPB	4.2	02/02/00	KDH	
ENDOSULFAN I	U	PPB	2.1	02/02/00	KDH	
ENDOSULFAN II	U	PPB	4.2	02/02/00	KDH	
ENDOSULFAN SULFATE	U	PPB	4.2	02/02/00	KDH	
ENDRIN	U	PPB	4.2	02/02/00	KDH	
ENDRIN ALDEHYDE	U	PPB	4.2	02/02/00	KDH	
ENDRIN KETONE	U	PPB	4.2	02/02/00	KDH	
HEPTACHLOR	U	PPB	2.1	02/02/00	KDH	
HEPTACHLOR EPOXIDE	U	PPB	2.1	02/02/00	KDH	
TOXAPHENE	U	PPB	210	02/02/00	KDH	
METHOXYCHLOR	U	PPB	21	02/02/00	KDH	
PCB 1016/1242	U	PPB	270	02/02/00	KDH	
PCB 1221	U	PPB	290	02/02/00	KDH	
PCB 1232	U	PPB	320	02/02/00	KDH	
PCB 1248	U	PPB	270	02/02/00	KDH	
PCB 1254	U	PPB	320	02/02/00	KDH	
PCB 1260	U	PPB	320	02/02/00	KDH	
PCB 1262	U	PPB	270	02/02/00	KDH	

*-Water, uG/L; Sediment, uG/kG

Printed: February 8, 2000

X - RESULTS SUSPECT DUE TO POOR SURROGATE RECOVERY.

Project/Site No.: 54514
Project Name: NGK METALS
Description: NK-SD-01
Station No.: NK-SD-01
Collected: 12/14/99 14:20:00 By CS
ty: 54

Lab Number: 9912159-05A
Matrix: SOIL
Received: 12/15/99 09:00:00 By LJB
Sampling Agency: HWM_11_CFO
Priority:

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	B J 120	PPB	210	02/02/00	KDH	
BIS(2-ETHYLHEXYL)PHTHALATE	B 697	PPB	-	02/02/00	KDH	
DI-n-BUTYL PHTHALATE	U	PPB	210	02/02/00	KDH	
DI-n-OCTYL PHTHALATE	U	PPB	410	02/02/00	KDH	
DIETHYL PHTHALATE	B 1420	PPB	-	02/02/00	KDH	
DIMETHYL PHTHALATE	U	PPB	100	02/02/00	KDH	
n-NITROSODIMETHYLAMINE	U	PPB	410	02/02/00	KDH	
n-NITROSODIPHENYLAMINE	U	PPB	210	02/02/00	KDH	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	210	02/02/00	KDH	
ISOPHORONE	U	PPB	100	02/02/00	KDH	
NITROBENZENE	U	PPB	210	02/02/00	KDH	
2,4-DINITROTOLUENE	U	PPB	410	02/02/00	KDH	
2,6-DINITROTOLUENE	U	PPB	410	02/02/00	KDH	
ACENAPHTHENE	U	PPB	100	02/02/00	KDH	
ACENAPHTHYLENE	U	PPB	100	02/02/00	KDH	
ANTHRACENE	U	PPB	100	02/02/00	KDH	
BENZO(a)ANTHRACENE	U	PPB	100	02/02/00	KDH	
BENZO(a)PYRENE	U	PPB	100	02/02/00	KDH	
BENZO(b)FLUORANTHENE	U	PPB	100	02/02/00	KDH	
BENZO(ghi)PERYLENE	U	PPB	410	02/02/00	KDH	
BENZO(k)FLUORANTHENE	U	PPB	100	02/02/00	KDH	
DIBENZO(a,h)ANTHRACENE	U	PPB	410	02/02/00	KDH	
FLUORANTHENE	U	PPB	100	02/02/00	KDH	
FLUORENE	U	PPB	100	02/02/00	KDH	
INDENO(1,2,3-cd)PYRENE	U	PPB	410	02/02/00	KDH	
NAPHTHALENE	U	PPB	100	02/02/00	KDH	
PHENANTHRENE	U	PPB	100	02/02/00	KDH	
PYRENE	U	PPB	100	02/02/00	KDH	
CHRYSENE	U	PPB	100	02/02/00	KDH	
BIS(2-CHLOROETHYL)ETHER	U	PPB	210	02/02/00	KDH	
2-CHLOROETHOXY)METHANE	U	PPB	210	02/02/00	KDH	
2-CHLOROISOPROPYL)ETHER	U	PPB	210	02/02/00	KDH	
4-BROMOPHENYLPHENYL ETHER	U	PPB	210	02/02/00	KDH	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	100	02/02/00	KDH	
HEXACHLOROCYCLOPENTADIENE	U	PPB	410	02/02/00	KDH	
HEXACHLOROBUTADIENE	U	PPB	210	02/02/00	KDH	
HEXACHLOROBENZENE	U	PPB	210	02/02/00	KDH	
HEXACHLOROETHANE	U	PPB	210	02/02/00	KDH	
1,2,4-TRICHLOROBENZENE	U	PPB	210	02/02/00	KDH	
2-CHLORONAPHTHALENE	U	PPB	100	02/02/00	KDH	
4-CHLORO-3-METHYLPHENOL	U	PPB	210	02/02/00	KDH	
2-CHLOROPHENOL	U	PPB	210	02/02/00	KDH	
2,4-DICHLOROPHENOL	U	PPB	210	02/02/00	KDH	
2,4-DIMETHYLPHENOL	U	PPB	210	02/02/00	KDH	
2,4-DINITROPHENOL	U	PPB	2100	02/02/00	KDH	
2-METHYL-4,6-DINITROPHENOL	U	PPB	1000	02/02/00	KDH	
2-NITROPHENOL	U	PPB	410	02/02/00	KDH	
4-NITROPHENOL	U	PPB	1000	02/02/00	KDH	
PENTACHLOROPHENOL	U	PPB	1000	02/02/00	KDH	
PHENOL	U	PPB	210	02/02/00	KDH	
2,4,6-TRICHLOROPHENOL	U	PPB	410	02/02/00	KDH	
2,4,5-TRICHLOROPHENOL	U	PPB	410	02/02/00	KDH	
O-CRESOL	U	PPB	210	02/02/00	KDH	
M- & P-CRESOL	U	PPB	210	02/02/00	KDH	
2-METHYLNAPHTHALENE	U	PPB	100	02/02/00	KDH	
BENZOIC ACID	U	PPB	1000	02/02/00	KDH	
BENZYL ALCOHOL	U	PPB	210	02/02/00	KDH	
4-CHLOROANILINE	U	PPB	210	02/02/00	KDH	
DIBENZOFURAN	U	PPB	100	02/02/00	KDH	
3,3-DICHLOROBENZIDINE	U	PPB	1000	02/02/00	KDH	
2-NITROANILINE	U	PPB	410	02/02/00	KDH	
3-NITROANILINE	U	PPB	1000	02/02/00	KDH	
4-NITROANILINE	U	PPB	1000	02/02/00	KDH	
ALDRIN	U	PPB	2.1	02/02/00	KDH	
alpha-BHC	U	PPB	2.1	02/02/00	KDH	
beta-BHC	U	PPB	2.1	02/02/00	KDH	
-BHC	U	PPB	2.1	02/02/00	KDH	
a-BHC (LINDANE)	U	PPB	2.1	02/02/00	KDH	
alpha-CHLORDANE	U	PPB	2.1	02/02/00	KDH	
gamma-CHLORDANE	U	PPB	2.1	02/02/00	KDH	
TECHNICAL CHLORDANE	U	PPB	83	02/02/00	KDH	
p,p-DDD	U	PPB	4.2	02/02/00	KDH	
p,p-DDE	U	PPB	4.2	02/02/00	KDH	

Project/Site No.:	54514	Lab Number:	9912159-05A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SD-01	Received:	12/15/99 09:00:00 By LJB
Station No.:	NK-SD-01	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 14:20:00 By CS	Priority:	
Qty:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	4.2	02/02/00	KDH	
DIELDRIN	U	PPB	4.2	02/02/00	KDH	
ENDOSULFAN I	U	PPB	2.1	02/02/00	KDH	
ENDOSULFAN II	U	PPB	4.2	02/02/00	KDH	
ENDOSULFAN SULFATE	U	PPB	4.2	02/02/00	KDH	
ENDRIN	U	PPB	4.2	02/02/00	KDH	
ENDRIN ALDEHYDE	U	PPB	4.2	02/02/00	KDH	
ENDRIN KETONE	U	PPB	4.2	02/02/00	KDH	
HEPTACHLOR	U	PPB	2.1	02/02/00	KDH	
HEPTACHLOR EPOXIDE	U	PPB	2.1	02/02/00	KDH	
TOXAPHENE	U	PPB	210	02/02/00	KDH	
METHOXYCHLOR	U	PPB	21	02/02/00	KDH	
PCB 1016/1242	U	PPB	140	02/02/00	KDH	
PCB 1221	U	PPB	150	02/02/00	KDH	
PCB 1232	U	PPB	160	02/02/00	KDH	
PCB 1248	U	PPB	140	02/02/00	KDH	
PCB 1254	U	PPB	160	02/02/00	KDH	
PCB 1260	U	PPB	160	02/02/00	KDH	
PCB 1262	U	PPB	140	02/02/00	KDH	

*-Water, uG/L; Sediment, uG/kG

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Project/Site No.:	54514	Lab Number:	9912159-06A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SD-02	Received:	12/15/99 09:00:00 By LJB
Station No.:	NK-SD-02	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 14:45:00 By CS	Priority:	
Qty:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
BUTYL BENZYL PHTHALATE	U	PPB	200	02/02/00	KDH	
BIS(2-ETHYLHEXYL)PHTHALATE	B 2890	PPB	-	02/02/00	KDH	
DI-n-BUTYL PHTHALATE	U	PPB	200	02/02/00	KDH	
DI-n-OCTYL PHTHALATE	U	PPB	400	02/02/00	KDH	
DIETHYL PHTHALATE	B 624	PPB	-	02/02/00	KDH	
DIMETHYL PHTHALATE	U	PPB	100	02/02/00	KDH	
n-NITROSODIMETHYLAMINE	U	PPB	400	02/02/00	KDH	
n-NITROSODIPHENYLAMINE	U	PPB	200	02/02/00	KDH	
n-NITROSO-di-n-PROPYLAMINE	U	PPB	200	02/02/00	KDH	
ISOPHORONE	U	PPB	100	02/02/00	KDH	
NITROBENZENE	U	PPB	200	02/02/00	KDH	
2,4-DINITROTOLUENE	U	PPB	400	02/02/00	KDH	
2,6-DINITROTOLUENE	U	PPB	400	02/02/00	KDH	
ACENAPHTHENE	U	PPB	100	02/02/00	KDH	
ACENAPHTHYLENE	U	PPB	100	02/02/00	KDH	
ANTHRACENE	U	PPB	100	02/02/00	KDH	
BENZO(a)ANTHRACENE	U	PPB	100	02/02/00	KDH	
BENZO(a)PYRENE	U	PPB	100	02/02/00	KDH	
BENZO(b)FLUORANTHENE	U	PPB	100	02/02/00	KDH	
BENZO(ghi)PERYLENE	U	PPB	400	02/02/00	KDH	
BENZO(k)FLUORANTHENE	U	PPB	100	02/02/00	KDH	
DIBENZO(a,h)ANTHRACENE	U	PPB	400	02/02/00	KDH	
FLUORANTHENE	U	PPB	100	02/02/00	KDH	
FLUORENE	U	PPB	100	02/02/00	KDH	
INDENO(1,2,3-cd)PYRENE	U	PPB	400	02/02/00	KDH	
NAPHTHALENE	U	PPB	100	02/02/00	KDH	
PHENANTHRENE	U	PPB	100	02/02/00	KDH	
PYRENE	U	PPB	100	02/02/00	KDH	
CHRYSENE	U	PPB	100	02/02/00	KDH	
BIS(2-CHLOROETHYL)ETHER	U	PPB	200	02/02/00	KDH	
2-CHLOROETHOXY)METHANE	U	PPB	200	02/02/00	KDH	
(2-CHLOROISOPROPYL)ETHER	U	PPB	200	02/02/00	KDH	
4-BROMOPHENYLPHENYL ETHER	U	PPB	200	02/02/00	KDH	
4-CHLOROPHENYLPHENYL ETHER	U	PPB	100	02/02/00	KDH	
HEXACHLOROCYCLOPENTADIENE	U	PPB	400	02/02/00	KDH	
HEXACHLOROBUTADIENE	U	PPB	200	02/02/00	KDH	
HEXACHLOROBENZENE	U	PPB	200	02/02/00	KDH	
HEXACHLOROETHANE	U	PPB	200	02/02/00	KDH	
1,2,4-TRICHLOROBENZENE	U	PPB	200	02/02/00	KDH	
2-CHLORONAPHTHALENE	U	PPB	100	02/02/00	KDH	
4-CHLORO-3-METHYLPHENOL	X U	PPB	200	02/02/00	KDH	
2-CHLOROPHENOL	X U	PPB	200	02/02/00	KDH	
2,4-DICHLOROPHENOL	X U	PPB	200	02/02/00	KDH	
2,4-DIMETHYLPHENOL	X U	PPB	200	02/02/00	KDH	
2,4-DINITROPHENOL	X U	PPB	2000	02/02/00	KDH	
2-METHYL-4,6-DINITROPHENOL	X U	PPB	1000	02/02/00	KDH	
2-NITROPHENOL	X U	PPB	400	02/02/00	KDH	
4-NITROPHENOL	X U	PPB	1000	02/02/00	KDH	
PENTACHLOROPHENOL	X U	PPB	1000	02/02/00	KDH	
PHENOL	X U	PPB	200	02/02/00	KDH	
2,4,6-TRICHLOROPHENOL	X U	PPB	400	02/02/00	KDH	
2,4,5-TRICHLOROPHENOL	X U	PPB	400	02/02/00	KDH	
O-CRESOL	X U	PPB	200	02/02/00	KDH	
M- & P-CRESOL	X U	PPB	200	02/02/00	KDH	
2-METHYLNAPHTHALENE	U	PPB	100	02/02/00	KDH	
BENZOIC ACID	X U	PPB	1000	02/02/00	KDH	
BENZYL ALCOHOL	U	PPB	200	02/02/00	KDH	
4-CHLOROANILINE	U	PPB	200	02/02/00	KDH	
DIBENZOFURAN	U	PPB	100	02/02/00	KDH	
3,3-DICHLOROBENZIDINE	U	PPB	1000	02/02/00	KDH	
2-NITROANILINE	U	PPB	400	02/02/00	KDH	
3-NITROANILINE	U	PPB	1000	02/02/00	KDH	
4-NITROANILINE	U	PPB	1000	02/02/00	KDH	
ALDRIN	U	PPB	2.0	02/02/00	KDH	
alpha-BHC	U	PPB	2.0	02/02/00	KDH	
beta-BHC	U	PPB	2.0	02/02/00	KDH	
-BHC	U	PPB	2.0	02/02/00	KDH	
ma-BHC (LINDANE)	U	PPB	2.0	02/02/00	KDH	
alpha-CHLORDANE	U	PPB	2.0	02/02/00	KDH	
gamma-CHLORDANE	U	PPB	2.0	02/02/00	KDH	
TECHNICAL CHLORDANE	U	PPB	80	02/02/00	KDH	
p,p-DDD	U	PPB	4.0	02/02/00	KDH	
p,p-DDE	U	PPB	4.0	02/02/00	KDH	

Project/Site No.:	54514	Lab Number:	9912159-06A
Project Name:	NGK METALS	Matrix:	SOIL
Description:	NK-SD-02	Received:	12/15/99 09:00:00 By LJB
Station No.:	NK-SD-02	Sampling Agency:	HWM_11_CFO
Collected:	12/14/99 14:45:00 By CS	Priority:	
Qty:	54		

TEST	RESULT	*UNITS	LIMIT	ANALYZED	BY	METHOD
B/N/A EXTR+PESTS,PCBS-SOIL						MS+ECD
p,p-DDT	U	PPB	4.0	02/02/00	KDH	
DIELDRIN	U	PPB	4.0	02/02/00	KDH	
ENDOSULFAN I	U	PPB	2.0	02/02/00	KDH	
ENDOSULFAN II	U	PPB	4.0	02/02/00	KDH	
ENDOSULFAN SULFATE	U	PPB	4.0	02/02/00	KDH	
ENDRIN	U	PPB	4.0	02/02/00	KDH	
ENDRIN ALDEHYDE	U	PPB	4.0	02/02/00	KDH	
ENDRIN KETONE	U	PPB	4.0	02/02/00	KDH	
HEPTACHLOR	U	PPB	2.0	02/02/00	KDH	
HEPTACHLOR EPOXIDE	U	PPB	2.0	02/02/00	KDH	
TOXAPHENE	U	PPB	200	02/02/00	KDH	
METHOXYCHLOR	U	PPB	20	02/02/00	KDH	
PCB 1016/1242	U	PPB	130	02/02/00	KDH	
PCB 1221	U	PPB	140	02/02/00	KDH	
PCB 1232	U	PPB	150	02/02/00	KDH	
PCB 1248	U	PPB	130	02/02/00	KDH	
PCB 1254	U	PPB	150	02/02/00	KDH	
PCB 1260	U	PPB	150	02/02/00	KDH	
PCB 1262	U	PPB	130	02/02/00	KDH	

*-Water, uG/L; Sediment, uG/kG

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X - RESULTS SUSPECT DUE TO POOR SURROGATE RECOVERY.

54 - 514

NGK METALS

2-15-00

arrived @ site 11:30 EST

noticed RR ~~at back of~~ behind site

drainage ditch on side + off to the front

" " goes thru restaurant parking lot (Athens Diner)

UST tank spotted on UPS ~~site~~ facility (caddy corner of site) (labeled gasoline)

Texas Hydraulics + cylinder plant

fence in decent shape around entire site

no schools or day cares near site

nearest resident is between 1/4 - 1/2 mile

drove around

12:30 left site + went to court house + Chamber of commerce to acquire maps

then visited Eric Newberry (AUB) - lot of help provided map w/ all the areas that they supply in a 1-mile radius around site

left Athens around ~~12:30~~ 1:30 EST

Renee Lucchesi 2-15-00

2-15-00

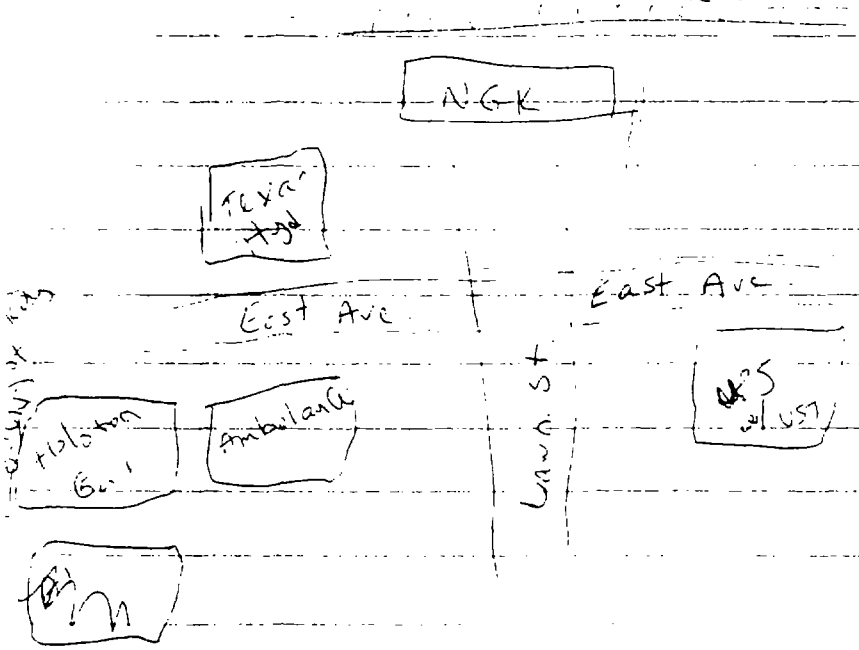
RR on South side (back side)
no drainage ~~up~~ by RR
nothing upgradient

Texas Hydraulics next to site (North side)
UPS corner of Lawn & East any info on this?
has UST (gasoline - BTEX) call UST
~~maint~~
~~service~~

any release?
how old tanks?
any wells?
any gw contam?

ambulance service
may have maintenance shop

Applied Tech. Group Inc
746-8900



various
fleet & maintenance small shops in area
truck

they have containment (respectable decent fence)

2-15-00

drainage ditch runs thru diner parking lot
potential to children

not ~~much~~ many people

If you have sewer lines, you have water lines

fence contains soil contam. but will not contain sw

Ray - Engineering

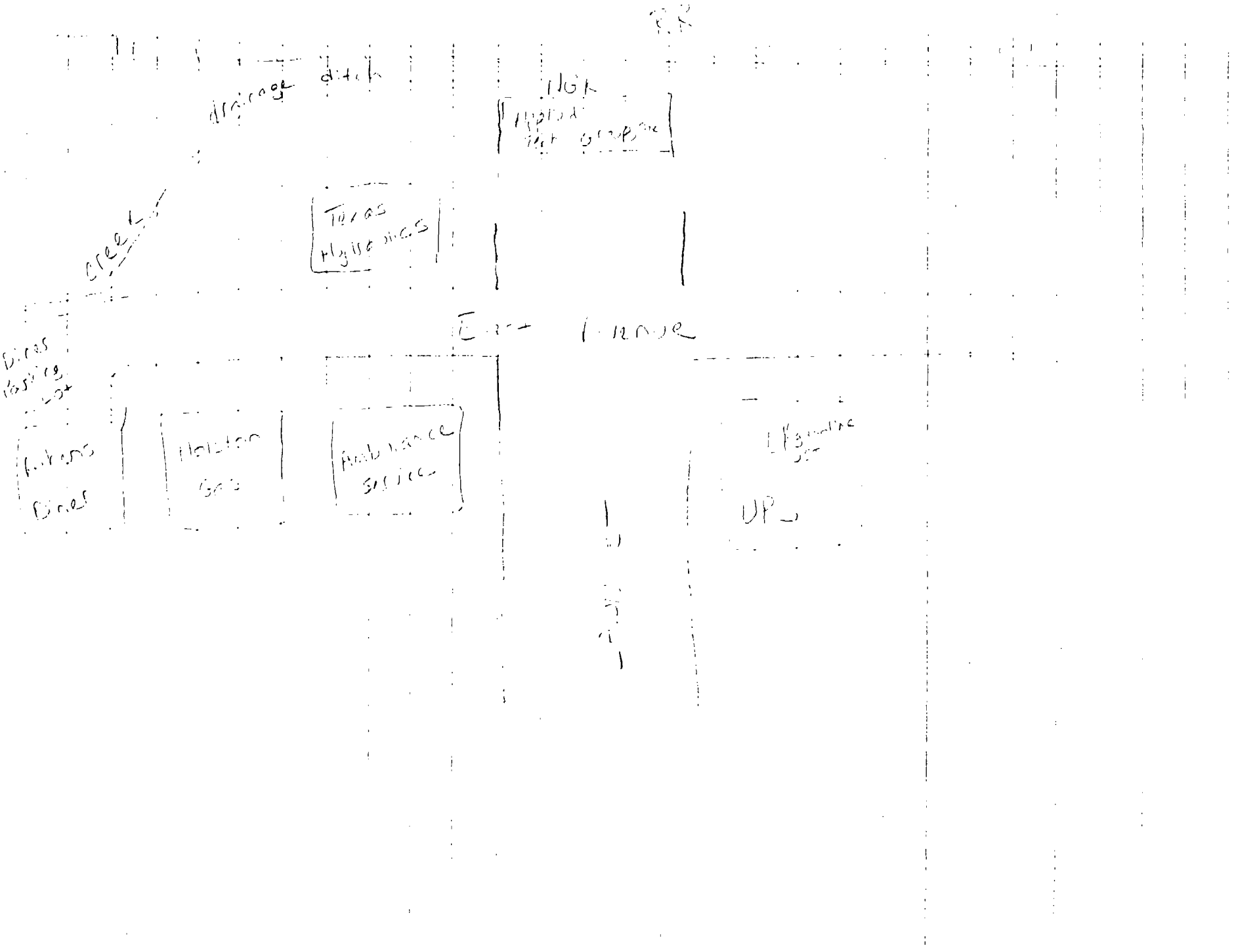
have pressurized lines
won't get any metals

assume Mr Watson uses sw

water intake downstream
closed water intake downstream } Scores high

check where NK-SD-02 was taken

solid blue line on topo = free flowing stream
dash blue line = intermittant stream / drainage ditch
can't be counted as nearest sw


RR
drainage ditch
NGK
Texas Hydraulics
creek
Dines Parking Lot
Holston Gas
Ambulance Service
UP

NGK METALS

SITE INVESTIGATION

APPENDIX D

Paul Bradshaw collecting background surface soil sample
NK-SS-01, 9:25 am, 12/14/99

Paul Bradshaw and Craig Stannard at NK-SS-01
9:25 am, 12/14/99

Paul Bradshaw collecting sample NK-SS-02,
10 am, 12/14/99

Craig Stannard and Paul Bradshaw collecting sample
NK-SS-03, 10:05 am, 12/14/99

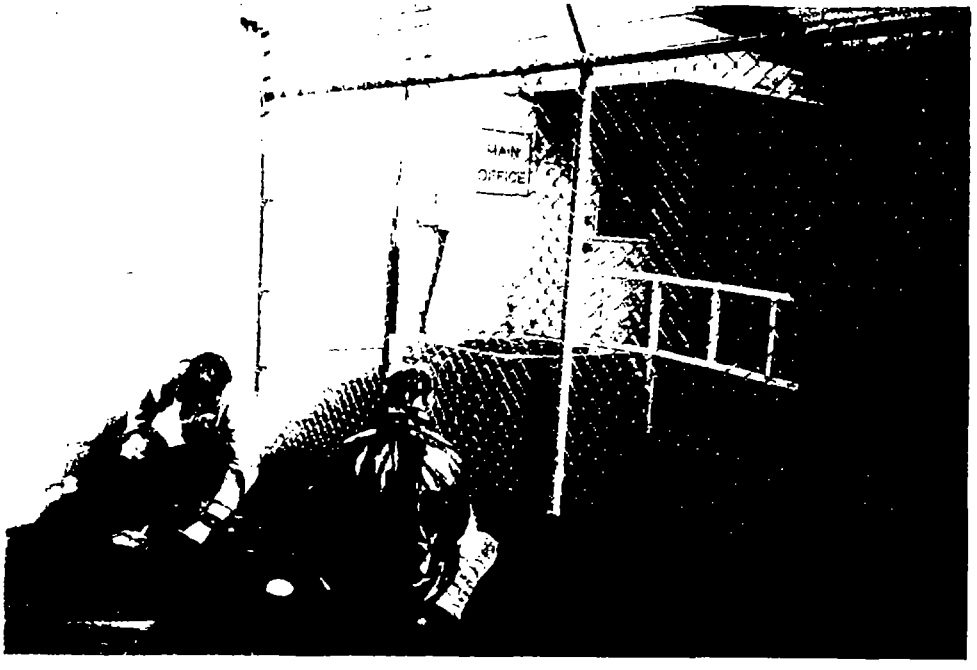
Paul Bradshaw collecting sample NK-SS-04 and
Duplicate sample NK-SS-08,10:45 am, 12/14/99

Craig Stannard at sample NK-SS-05,
11:15 am, 12/14/99

Paul Bradshaw at sampleNK-SS-06,11:20 am, 12/14/99

Craig Stannard and Paul Bradshaw at sample NK-SS-07
And duplicate NK-SS-09, 1:20 pm, 12/14/99

Craig Stannard collecting sample NK-SS-09
1:20 pm, 12/14/99



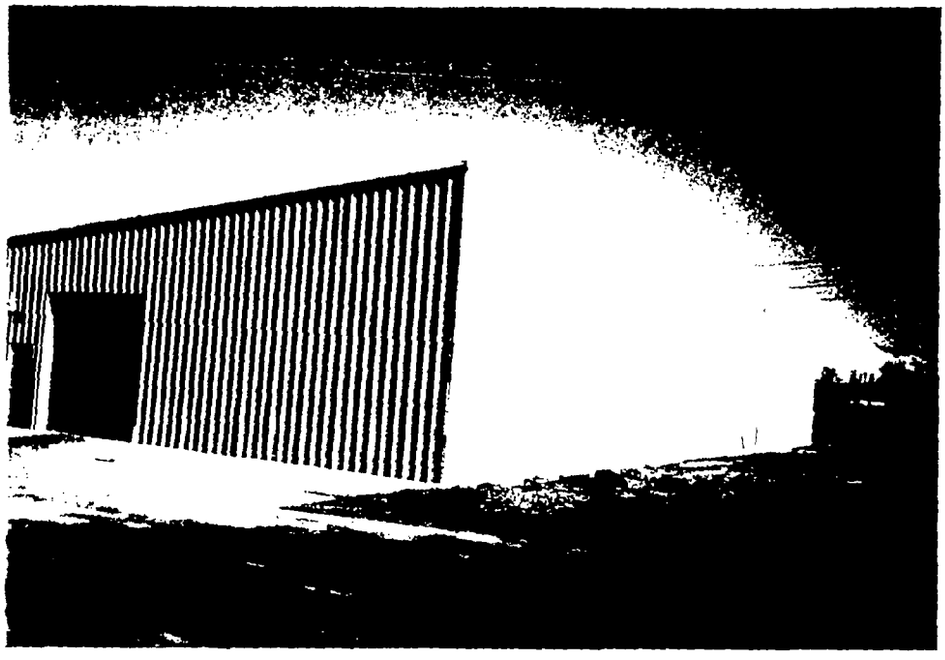
Paul Bradshaw and Craig Stannard collecting sample
NK-SS-10,1:55 pm, 12/14/99

Sample point NK-SD-01,2:20 pm, 12/14/99

Paul Bradshaw collecting sample NK-SD-02,
2:45 pm, 12/14/99

The west side of the NGK Metals bldg. 10:20 am, 12/15/99

The south side of the NGK Metals bldg. 10:25 am, 12/15/99



The warehouse structure on the northeast side of the NGK Metals Bldg., 10:30 am, 12/15/99

The northeast corner of the NGK Metals Property, 10:35 am, 12/15/99

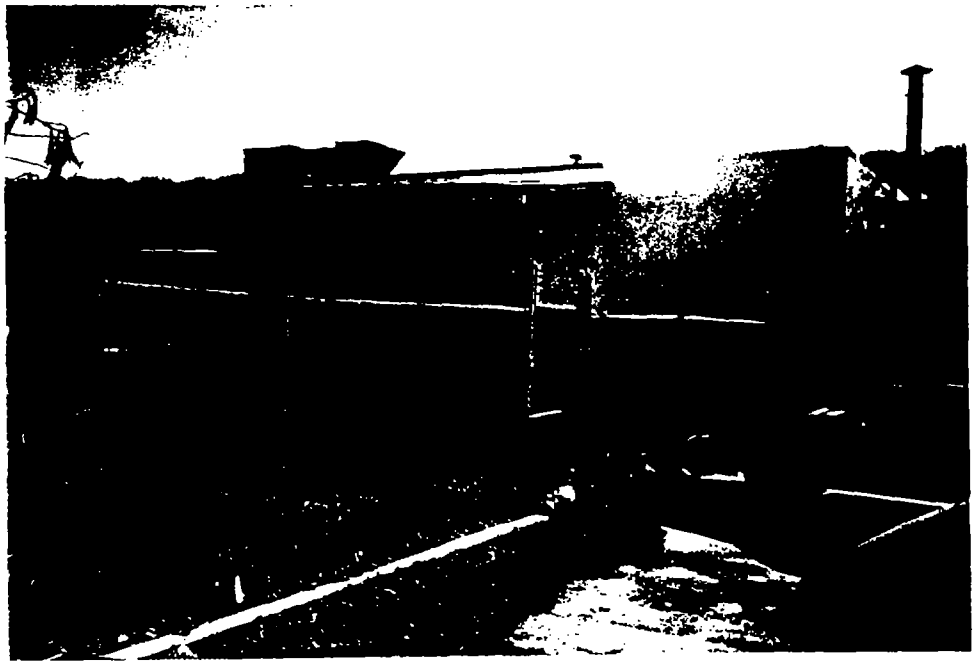
The northeast side of the NGK Metals bldg., 10:40 am, 12/15/99

The north corner of the NGK Metals property, 10:45 am 12/15/99

The south side of the NGK Metals bldg., 10:50 am, 12/15/99

The front or west side of the NGK Metals bldg., 10:55 am, 12/15/99

The front or west side of the NGK Metals bldg., 11:00 am, 12/15/99

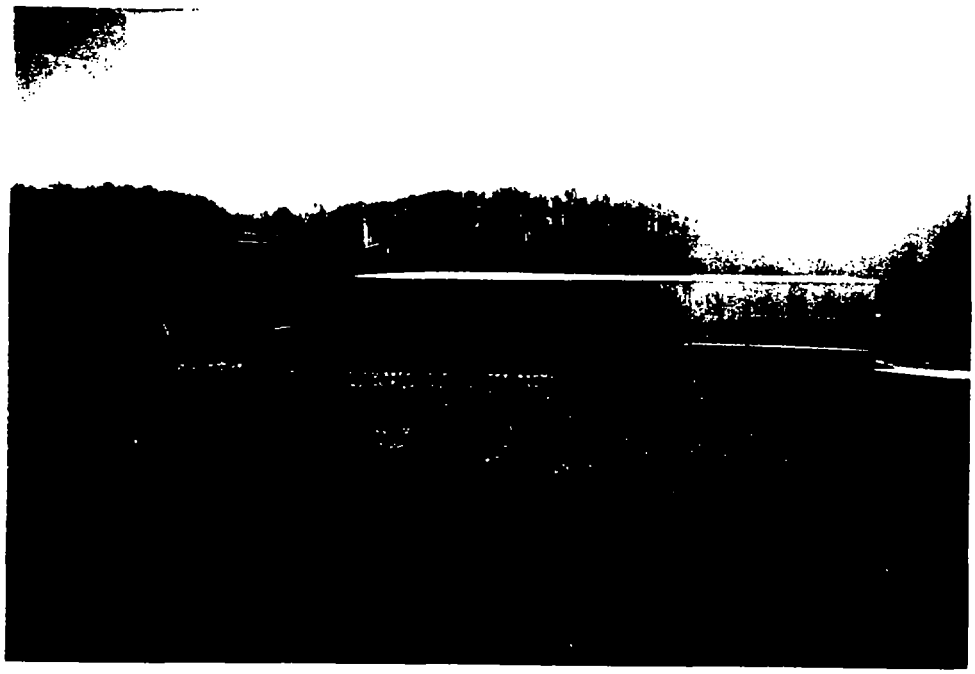


The left front portion of the NGK Metals bldg., 11:00 am, 12/15/99

Little North Mouse Creek, 11:05 am, 12/15/99

Little North Mouse Creek at the north end of the NGK Metals property, 11:10 am, 12/15/99

View of the north end of the NGK Metals bldg. and property, 11:15 am, 12/15/99



View of the warehouse structure at the north end of the NGK property, 11:15 am, 12/15/99

NGK METALS

SITE INVESTIGATION

APPENDIX E

STUDY PLAN
NGK METALS
ATHENS, MCMINN COUNTY, TENNESSEE
TN FILE NO. 54-514
CERCLIS NO. TN980314033

1.0 INTRODUCTION

The Tennessee Division of Superfund, Chattanooga field Office (TDSF-CFO), is conducting a limited sampling event of the NGK Metals site (File #54-514) in Athens, Tennessee. This event will be conducted pursuant to the authority and requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act of 1986 (SARA).

1.1 Objectives

The objective of this limited sampling is to collect information to assist in developing a site-specific preliminary HRS score and to determine if further investigation is required at the site.

Specific elements are:

- Chart the use, history, location, and nature of past hazardous disposal activity on the site;
- Obtain information to prepare a preliminary HRS score of the site;
- Provide EPA the necessary information to make decisions on any other actions warranted at the site.

1.2 Scope of Work

- Obtain and review background materials relevant to HRS of the site;
- Obtain information on local water systems;

  Determine location and distance to the nearest potable well;

  Evaluate target population within a 4-mile radius of the site with regards to groundwater use, surface water use, soil and airborne exposure;

  Collect environmental samples consisting of soil samples, sediment samples, surface water samples and product samples (if warranted).

2.0 SITE DESCRIPTION

2.1 Location

The NGK Metals site is located on East Avenue in Athens, Tennessee. The geographic coordinates of the site are latitude 35° 26' 52" and longitude 84° 36' 43"(See Figure 1).

To reach the site, travel north from Chattanooga on Interstate 75. Then, take exit 49 and travel east on Highway 30 for approximately 3 miles. Turn left (north) onto Congress Parkway (Highway 30) and go 2.4 miles. Then turn right onto Lawn Street. The site is southeast of the intersection of Lawn Road and East Avenue on the eastside of a large gravel parking area.

2.2 Site Description

The NGK METALS site is approximately 5.7 acres in size (See Figure 2). The site is relatively flat and lies at an elevation of approximately 910 feet above sea level, which is above the 100 year flood zone for this area. The site is located in a mixed residential, commercial, and industrial area. The site is bounded on the north by Little North Mouse Creek, a tributary to North Mouse Creek. The NGK Metals building is currently being used by Applied Technologies for the manufacturing of specialized machinery. The rest of the site is vacant and a fence with locked gates surrounds the entire site.

McMinn County, Tennessee is climatologically characterized by moderate, rainy winters and hot, humid summers. The average winter temperature is approximately 41°F, and the average summer temperature is approximately 77°. Rainfall data indicates that this area receives an average annual precipitation of 54 inches and a 1-year 24-hour rainfall event of 3.0 inches. Rainfall distribution is fairly even throughout the year with late summer and early fall being the driest time and winter through mid spring being the wettest.

2.3 Site History

NGK Metals was a manufacturer of beryllium alloyed intrinsic tools at this facility prior to 1995. The site is presently owned by Applied Technologies, Incorporated.

3.0 COLLECTION OF NON-SAMPLING DATA

- In addition to the items mentioned in section 1.2 Scope of Work, non-sampling data collection activities will include;
- Location of runoff pathways not already known;
- Development of an accurate site map;
- Other gaps in the available information identified during the remainder of the Site Investigation will be researched and filled in as needed.

4.0 SAMPLING ACTIVITIES

4.1 Source Sampling

If there is a source of contamination at the site it will most likely be contaminated soil. Source Samples will, therefore, be those surface soil samples taken at the site. A total of at least 10 surface soil samples, to be identified as NK-SS-02 through NK-SS-11, two of which will be duplicates, will be collected from the areas at the sides of the NGK Metals building (See Figure 2). If the samples indicate that soil contamination is present, the pattern and spacing of the sampling should give an indication of the size of the contaminated soil source. A background surface soil sample, NK-SS-01, will be collected from the field immediately southwest of the site.

4.2 Groundwater Sampling

Groundwater sampling will not be conducted. There are no on-site wells, and there is no evidence that contaminants from the site have ever been released to the groundwater. The nearest private drinking water wells are believed to be less than a mile from the site. However, most of the residents in a 4-mile radius of the site are supplied drinking water by the Athens Utility Board which has a municipal well located at Ingleside Spring approximately 1.7 miles southeast of the site. There have been no complaints of any groundwater contamination from the site.

4.3 Surface Water Sampling

Surface water samples will not be collected. There is no evidence to suggest that surface water in the stream (Little North Mouse Creek) that runs by the site just to it's north is currently being impacted by the site or that sample data from such samples would provide significant information on contaminant migration from the site. Sediment samples should provide more useful data and sediment samples NK-SD-01 and NK-SD-02 will be collected upstream and downstream from the NGK Metal facility's outfall respectively (See Figure 1).

4.4 Quality Assurance

Quality assurance and quality control (QA/QC) for this sampling event will be provided by the use of duplicate samples. As stated previously, two duplicate surface soil samples will be taken. All samples collection, preservation, QA/QC preparation of duplicates, and chain-of-custody procedures used during sampling activities will be in accordance with the standard operating guidelines (SOGs) specified in the Engineering and Support Branch Standard Operating Procedures and Quality Assurance Manual, U.S. Environmental Protection Agency, Environmental Services Division, Region IV, Atlanta, Georgia, April 1986.

4.5 Field Activities

Field personnel are scheduled to conduct sampling on or about December 1, 1999. Access to the site property will be requested prior to the sampling date. Sampling is planned to be conducted over two days. The sampling date and time required to complete sampling may change due to available access to sampling points and/or the weather.

A four person sampling team will be utilized (two for each sampling point). For soil samples, one container each for volatile organic, extractable organic and inorganic will be collected at each point for analysis.

4.6 Investigation-Derived Waste Plan

Investigative derived waste in the form of soils will be returned to the boreholes from which they were collected. Any personal

protective equipment (PPE) and sampling equipment that is not reusable will be disposed of in accordance with the manual Management of Investigative Derived Waste During Site Investigation, Environmental Protection Agency, May 1991. All reusable PPE and sampling equipment will be decontaminated before leaving the site.

5.0 Project Management

The project manager for the NGK Metals site, Craig Stannard, will schedule field activities and personnel requirements, obtain site access approval from site owners, direct and oversee all on-site activities associated with the investigation. The project manager will document all samples collected. The project safety officer, while on site is Craig Stannard and the alternate safety officer will be Paul Bradshaw. The project manager will conduct any preparatory safety activities prior to the on-site sampling event.

5.1 Field Equipment/Health and Safety

Conditions on the site should present only a minimal health and safety risk during sampling. For collection of soil and sediment samples, personnel will be dressed out in Level D. Work boots for Level D will have steel toe and shank. Tyvek coveralls will be available to the sampling team. Powderless latex gloves will be worn to prevent sample contamination. Since there is no overhead danger, hard hats will not be required during the sampling. Safety goggles/glasses or a face shield are recommended but are optional, and their use will be left to the discretion of the individual. The safety officer may change PPE requirements, as needed, based on his judgment and conditions at the site on the day of sampling.

Other field equipment that was not mentioned above but which will be used at the site includes; sampling containers and sampling tools, decontamination equipment, and a first aid kit.

The nearest hospital to the site is the Athens Regional Medical Center located at 1114 West Madison Road in Athens (See Figure 1). This is approximately 3 ½ to 4 miles by road from the site.

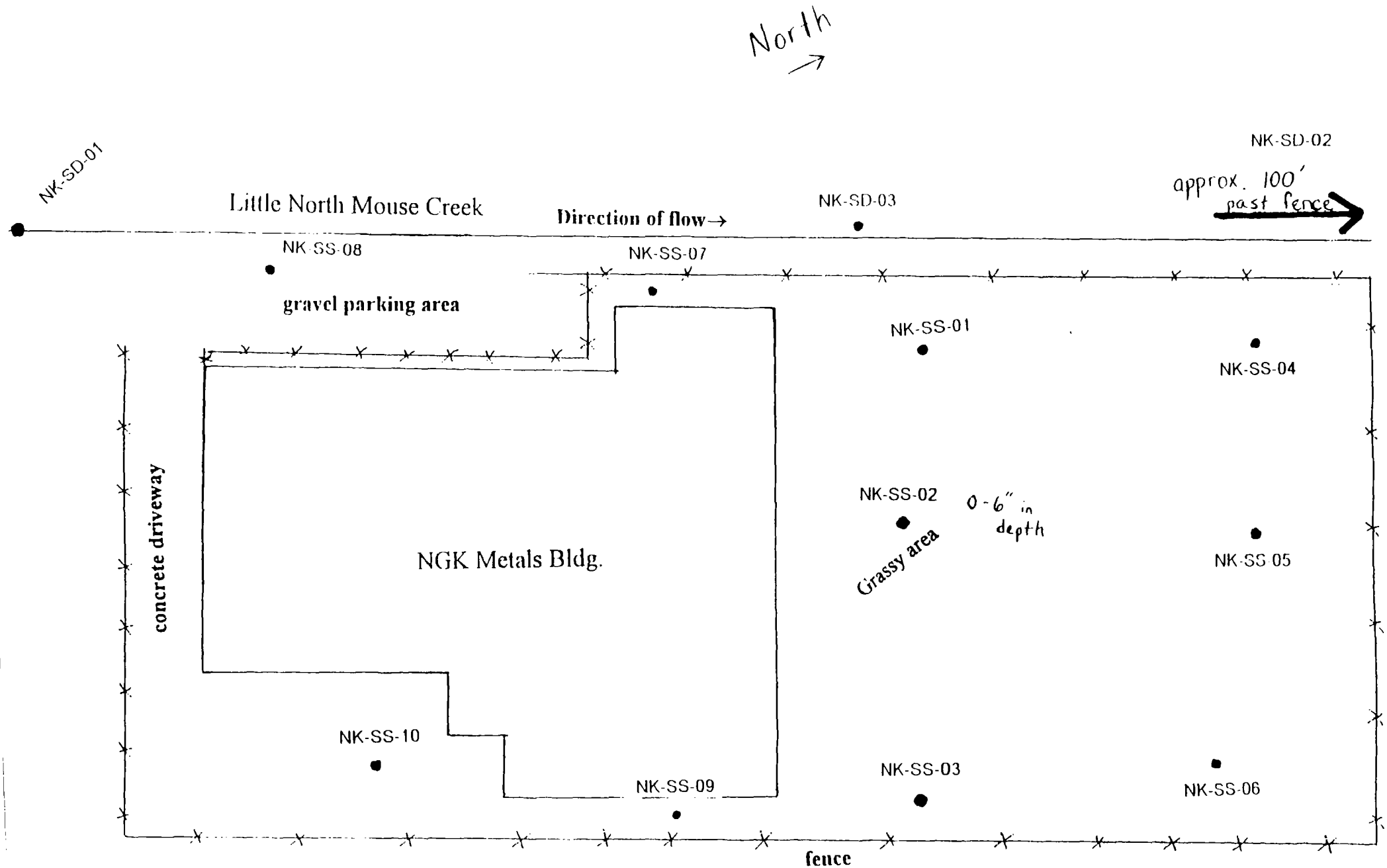


Figure 2
Site Sketch

al • Industrial
d Welding
atment
395
39 E

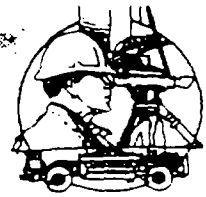
STATE FARM
Auto Life Fire
INSURANCE

518 S. Congress Pkwy.
Athens, TN 37303
615-745-7757

STATE FARM INSURANCE COMPANIES
HOME OFFICES BLOOMINGTON, ILLINOIS

"Like a Good Neighbor, State Farm is There"

WILSON
CONSTRUCTION INC.



Tom Dake
President

615-745-5629 or 745-5272

P.O. Box 623 Athens, TN 37371

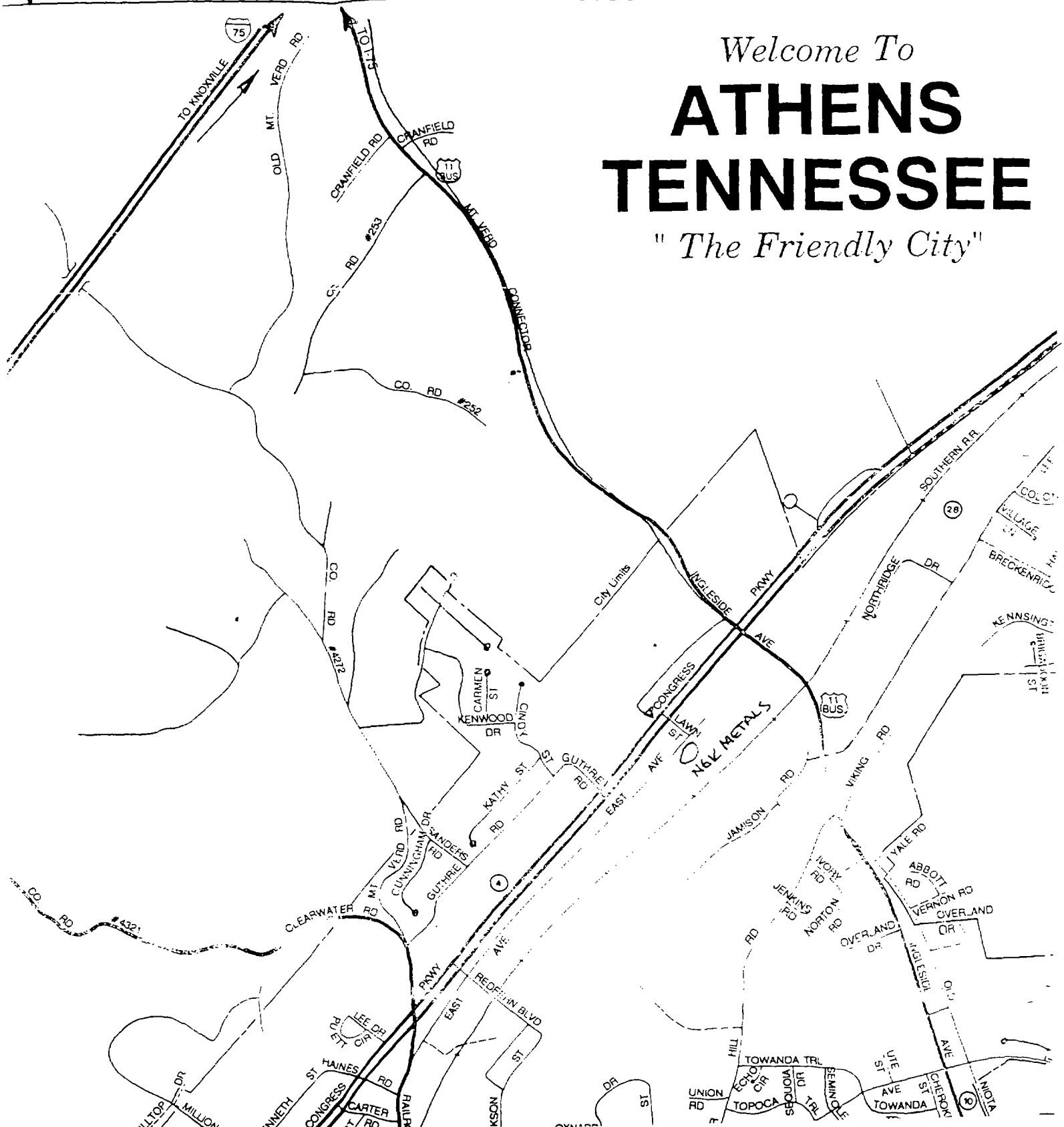
Cosme
200

C D E

Welcome To

ATHENS TENNESSEE

" The Friendly City"



NGK METALS

SITE INVESTIGATION & REMEDIAL ACTION
By
TriAD ENVIRONMENTAL CONSULTANTS

APPENDIX F

RECEIVED
DEC 0 2 1999
ENVIRONMENTAL
CENTER AT CHATTANOOGA

NGK BERYLCO

NGK Metals Corporation
917 Highway 11 South, Sweetwater, TN 37874
phone 423-337-5500 fax 423-337-5540

Memo

To: **Mr. Craig Stannard**

From: **Mark Satterfield**

Date: **11/30/99**

Re: **Former NGK Athens, TN site information**

Please find enclosed information about the former NGK Athens, TN facility which I think will assist you with your EPA site investigation. I have included a report of investigation conducted by TriAD Environmental Consultants, inc., a diagram indicating soil sampling locations (with stormwater discharge outfalls highlighted in yellow), a diagram indicating where excavation of soil was performed, appendix 7 ... laboratory reports for soil samples, a copy of a letter from the TN dept. of Environment and Conservation (Mr. Ronnie Bowers, Program Manager) and a brochure "Introducing - NGK Metals Corporation".

If I can be of further assistance, please do not hesitate to call me at 423-351-0388.

Sincerely,

Mark Satterfield
Safety & Health Coordinator

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Solid Waste Management
Fifth Floor, L & C Tower
401 Church Street
Nashville, Tennessee 37243 - 1535
615-532-0780

December 15, 1998

Ms. Lynne Woodside
Supervisor, Environmental Affairs
NGK Metals Corporation
150 Tuckerton Road
Reading, PA 19612-3367

Re: Closure of Former NGK Metals Facility, Athens, Tennessee

The Division has completed its review of the *Report of Investigation and Remediation of Metal-Impacted Soils* for the subject facility, dated December 14, 1998, which was prepared and submitted to this office by TriAD Environmental Consultants, Inc. Based on the information available, the Division concurs with TriAD's conclusions and agrees that no further actions are necessary at this site in response to the finding of metals-impacted soils. If you have any questions, please feel free to contact me at (615) 532-0853.

Sincerely,

Ronnie Bowers

Ronnie Bowers
Program Manager
State Remediation Program
Division of Solid Waste Management

RLB/ca/wood

cc: Mr. Dwight Hinch, TriAD
SRP Files

REPORT OF INVESTIGATION AND REMEDIATION OF METAL-IMPACTED SOILS FORMER NGK METALS CORPORATION FACILITY 725 EAST AVENUE, ATHENS, TENNESSEE

DECEMBER 14, 1998

Prepared For:

NGK METALS CORPORATION
150 TUCKERTON ROAD
READING, PA 19612-3367

Prepared By:

TriAD Environmental Consultants, Inc.
Suite 200, 207 Donelson Pike
Nashville, Tennessee 37214
Tel: (615) 889-6888
Fax: (615) 889-4004

By and/or under the direction of:

T. Dwight Hinch

T. Dwight Hinch
Senior Project Manager

TriAD Project No. 98-NGK01-01

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Solid Waste Management
Fifth Floor, L & C Tower
401 Church Street
Nashville, Tennessee 37243 - 1535
615-532-0780

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Sincerely,

Ronnie Bowers

Ronnie Bowers
Program Manager
State Remediation Program
Division of Solid Waste Management

RLB/ca/wood

cc: Mr. Dwight Hinch, TriAD
SRP Files

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Appendices (cont'd.)

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REPORT OF INVESTIGATION AND REMEDIATION OF METAL-IMPACTED SOILS FORMER NGK METALS CORPORATION FACILITY 725 EAST AVENUE, ATHENS, TENNESSEE

1.0 INTRODUCTION

This Report has been prepared by TriAD Environmental Consultants, Inc., ("TriAD") on behalf of NGK Metals Corporation ("NGK Metals") for submission to the Tennessee Division of Solid Waste Management ("TDSWM"). It describes the performance and results of investigative and remedial activities that have been performed at the former NGK Metals manufacturing facility in Athens, Tennessee, (the "Site") to clean up certain areas where surface soils had apparently been impacted by gradual and inadvertent releases of certain heavy metal constituents from previous site operations. This Report is intended to demonstrate that the Site has been adequately investigated and remediated, and that no soil contamination remains at levels which might pose a significant threat to human health or the environment.

Section 2 of this Report provides a brief description of the Site and the manufacturing operations formerly conduct there. Section 3 summarizes the investigations performed by others to assess the environmental conditions at the Site and to evaluate higher-risk areas for soil contamination. In Section 4, TriAD's evaluations of the previous data are presented along with descriptions of the additional soil sampling and analysis efforts performed by TriAD in November 1998 to more clearly define the soil contamination situation and plan the remediation efforts. The soil contaminant constituents of potential concern are identified and discussed, including an assessment of the risks posed by their presence at the measured concentrations. It should be noted that Section 4 also presents a revised risk-based target cleanup level for beryllium based on consideration of the updated toxicological status of this constituent. Section 5 of the Report utilizes this revised target cleanup level to present an assessment of the risks posed by the identified soil contamination at the Site. Section 6 describes the soil removal and off-site disposal efforts that NGK Metals and TriAD implemented on December 8 and 9, 1998, to remediate the

two "hot spots" of soil contamination that were identified. Finally, Section 7 presents TriAD's summary and conclusions based on the activities performed.

In this report, the terms "elevated", "contaminated", and "hot spots" are used to identify the presence of constituents in higher concentrations relative to other samples in a set of measurements or relative to the measured or expected background levels. The use of such terms, however, does not necessarily mean that the constituent is present in sufficient concentration in the referenced measurement or area to pose a significant threat to human health or the environment, nor should it imply that further investigative or remedial measures are necessary or appropriate to deal with such measurement or area.

2.0 SITE DESCRIPTION AND BACKGROUND

The Site is an industrial facility located at 725 East Avenue in Athens, Tennessee. It is currently unoccupied, but was operated by NGK Metals from the late 1970s until plant closure in 1997. The facility manufactured aluminum castings, nonferrous castings, and hand and edge tools from aluminum-, beryllium-, and copper-alloy raw materials.

Figure 1 shows a diagram of the layout of the Site and certain adjacent properties. The facility consists of two buildings on approximately 3.79 acres. The majority of the Site is covered by the buildings, gravel, and asphalt or concrete pavement. A small unnamed watercourse is located along the front of the facility. The facility utilized two baghouses to control air pollution from the facility's operations. These baghouses were located on the northeastern side of the main building, and have been removed since the plant's closure. During facility operation, the concrete area between the main building and the aluminum-sided storage building was used as a storage area for drummed baghouse dust. Storm water from the drum storage area and the baghouses flowed to the grassy area northeast of the main plant building and adjacent to the aluminum-sided storage building.

FIGURE 1

In 1997, the facility was closed when NGK Metals moved its manufacturing operations to its current facility in Sweetwater, Tennessee. In preparation for the closure and subsequent sale of the Site, NGK Metals retained Solutions to Environmental Problems, Inc. ("STEP") to perform a Phase I Environmental Audit (a "Phase I") in an effort to identify environmental conditions at the Site. STEP conducted the Phase I in the fall of 1997, and their November 21, 1997, Report of the effort is included as Appendix 1. As part of the Phase I, STEP personnel conducted a comprehensive site walkover and agency file reviews. This site-wide assessment determined that "the property was found to have no potential significant environmental risks." However, the Phase I report did recommend removal and proper disposal of the drums, containers, and their contents (baghouse dust). This recommendation was implemented a short time later by NGK Metals.

3.0 SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS BY OTHERS

In addition to and since STEP's Phase I Environmental Audit investigations, there were three soil sampling and analysis events performed at the Site by others in advance of TriAD's involvement. These investigations are detailed in the following sections.

3.1 January 1998 Investigations by Texas Hydraulics

The soil contamination problems at the Site were first investigated and identified in January 1998 as a result of pre-acquisition investigations performed by Texas Hydraulics (operator of the neighboring facility). On January 5 and 6, 1998, personnel from Texas Hydraulics collected soil, sediment, and/or water samples from 19 locations on and around the Site. Each of these samples was subsequently analyzed for its total concentrations of the eight RCRA metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver) along with the metals Copper and Beryllium which were known to have been used in NGK Metals' manufacturing operations. The results from Texas Hydraulics sampling and analysis efforts are presented in Appendix 3. The sampling diagram included in Appendix 3 shows that the whole Site was addressed in this comprehensive screening of surface soils for the metal constituents most likely to have been released from NGK Metals'

operations. The analytical results show elevated concentrations of copper and beryllium in a few soil samples.

3.2 March 1998 Investigations by STEP

After NGK Metals received the analytical results from the sampling conducted by Texas Hydraulics, NGK Metals hired STEP to conduct limited additional soil investigations to confirm the Texas Hydraulics findings. On March 13, 1998, STEP personnel collected seven soil samples from the three locations where the Texas Hydraulics investigation had found the highest beryllium and copper concentrations. These samples were each analyzed for their total concentrations of beryllium and copper. STEP's March 31, 1998, letter report of this sampling and analysis effort is included as Appendix 4. By far the highest concentrations of both copper and beryllium were found in the soil samples collected from the southeast corner of the grassy area on the northeastern side of the facility. The concrete driveway and the concrete apron of the aluminum-sided storage building join at this point, and it appears that this location receives storm water runoff from both areas. Based on these sampling and analysis results, NGK Metals decided to investigate this "hot spot" area more thoroughly.

3.3 June 1998 Phase II Investigations by STEP

On June 16, 1998, STEP personnel followed up their initial sampling and analysis effort with a more comprehensive Phase II effort to investigate the extent of copper and beryllium contamination in shallow soils in the grassy area northeast of the main plant building. The performance and results of this Phase II effort is described in STEP's July 10, 1998, Report included as Appendix 5. As shown on the figure in Appendix 5, a 20-foot by 20-foot grid was established in the open grassy field and 25 sample locations were established at the grid nodes. Soil samples were then collected from these locations and subsequently analyzed for their total concentrations of beryllium and copper. Nine of these locations (locations 1 through 9) were assumed to be most likely to be impacted, and so samples were collected at two intervals, 0 to 6 inches and 6 to 12 inches below the ground surface

("bgs"). At the other 16 locations, a single sample was composited from soil collected from an interval of 0 to 12 inches bgs. In addition to these sample locations, two background samples were collected from adjacent offsite properties.

The analytical results from this more comprehensive soil investigation confirmed that shallow soil concentrations of beryllium and copper substantially in excess of the apparent soil background concentrations do exist in the study area. However, the study also showed that such elevated concentrations are basically confined to the area of and immediately around the previously identified "hot spot".

4.0 TRIAD DATA EVALUATION AND ADDITIONAL SOIL INVESTIGATIONS

Following receipt and evaluation of the report of STEP's Phase II Sampling Event, NGK Metals retained the services of TriAD to assist them in pursuing further investigation and remediation of the Site under appropriate oversight by the Tennessee Department of Environment and Conservation ("TDEC"). It was determined that the TDSWM's State Remediation Program ("TDSWM-SRP") provided the most appropriate regulatory vehicle for achieving the desired TDEC-approved cleanup of the Site. Acting on this determination, TriAD contacted the TDSWM-SRP program manager, Mr. Ronnie Bowers, and worked with him to plan and implement the additional investigative and remedial activities described in the rest of this report.

4.1 Constituents/Levels of Potential Concern

4.1.1 General

Upon getting involved in the project, TriAD personnel worked with other NGK Metals representatives to evaluate the reported findings from the previous investigations performed by others and to identify the constituents of potential concern and the soil concentrations of such constituents which might be of regulatory concern. TriAD project manager Dwight Hinch and TDSWM-SRP manager Ronnie Bowers also visited the Site on November 5, 1998, to perform an initial site reconnaissance. They were met and

provided access to the Site by NGK Metals long-time employee Mark Satterfield. After Mr. Satterfield had showed and described to them the baghouse area and the performance and results of the previous investigations had been reviewed and discussed, Mr. Bowers and Mr. Hinch determined that the identified soil contamination had likely resulted from storm water dispersion of fugitive dust emissions from the baghouse area.

An evaluation of the operations and materials utilized at the Site - based on information gained from STEP's Phase I Environmental Audit report and from on-site discussions with Mr. Satterfield - indicated that metals were the only constituents of potential concern likely to have been released from the facility to the ground surface - especially in the area of the baghouses. The data from the Texas Hydraulics' investigation (see Appendix 3) was compared to the applicable Remediation Guidance Level ("RGL") values for soil established by the TDSWM-SRP to determine if any soil samples exhibited concentrations of the ten metals for which they were tested that were higher than the RGLs. [Note: These RGLs are conservatively low concentrations of the constituents in soil, based on a residential exposure scenario, below which ingestion of such soil by humans would not be expected to pose a significant threat to human health. They are used by the TDSWM-SRP as a preliminary screen to determine if measured soil concentrations of toxic constituents might be considered a problem warranting further investigation or remediation.] This comparison showed that only the metals arsenic, beryllium, and copper had been measured at such higher concentrations. However, it must be noted that these metals are also naturally occurring in soils, and can sometimes be present at background levels in soil that are higher than the current RGL values.

4.1.2 Beryllium

The current RGL for beryllium is 0.20 mg/kg. A review of the previous soil sampling and analysis data described in Section 3 shows that all of the measured concentrations of beryllium exceeded this very low level, including those in the selected soil background samples. The Texas Hydraulics investigation found beryllium at 0.671 mg/kg in their

background sample collected some 300 yards south of the plant. In their Phase II Sampling Event, STEP collected surface soil background samples at off-site locations northeast and southwest of the Site and found beryllium concentrations of 1.51 and 1.81 mg/kg, respectively. A review of the Texas Hydraulics and STEP data suggests that the soil background levels of beryllium in the area may indeed range up to four or five mg/kg, and it appears that this would not be unlikely. In U.S. Geological Survey Professional Paper 1270 entitled *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States* (1984), Shacklette and Boerngen identified an observed range of beryllium in soils in the Eastern United States of <1 - 7 mg/kg.

In addition to being inappropriate for use in assessment of this Site because of higher background levels, NGK Metals and TriAD believe that the current TDSWM-SRP RGL of 0.20 mg/kg for beryllium must be re-calculated in light of revised toxicological information now used by EPA. Included as Appendix 2 to this Report is a November 24, 1998, letter report from Gradient Corporation which demonstrates that the RGL for beryllium in soil should be at least 160 mg/kg, using the same intake assumptions and mathematical relationships on which the RGLs are based. As explained in the Gradient Corporation letter, this revision to the RGL calculation for beryllium is based on the U.S. EPA's April 1998 determination that insufficient evidence exists for beryllium to be an oral carcinogen. TriAD personnel have confirmed this new position on beryllium toxicity with U.S EPA toxicologist Elmer Akin in Atlanta. This EPA position is further corroborated by the *Risk-Based Concentration Table* maintained and published by EPA Region III. This frequently referenced document also presents a 160 mg/kg value for beryllium in residential soils, based on beryllium as a non-carcinogen.

When the previous soil sampling and analysis data described in Section 3 is compared to this proposed new beryllium RGL of 160 mg/kg, only one sample exhibited beryllium concentrations that exceeded this level. This was the 865 mg/kg concentration found by

the Texas Hydraulics investigation in their sample (#6) of surface soil collected from the identified "hot spot" in the corner of the concrete driveway and the storage building.

[It should be noted that the current TDSWM-SRP RGL of 0.008 µg/L for arsenic in water is also inappropriately based on consideration of the constituent as an oral carcinogen. The current EPA and Tennessee drinking water Maximum Contaminant Level ("MCL") value for beryllium is 0.004 mg/l, which was established based on consideration of beryllium as a systemic toxicant. Thus, in keeping with the policy of defaulting to the MCL values, the RGL for beryllium in water should be revised to 4 µg/l.]

4.1.3 Copper

For the relatively non-toxic metal copper, the current TDSWM-SRP RGL is 2,960 mg/kg. A review of the soil sampling and analysis data presented in Section 3 finds that only three soil samples exhibited copper concentrations in excess of this RGL. These samples were the surface soil samples collected by Texas Hydraulics in January 1998, by STEP in March 1998, and by STEP in June 1998 from the same "hot spot" corner of the concrete driveway and the storage building apron.

4.1.4 Arsenic

The only metal constituent other than beryllium and copper that was identified in the previous investigations at the Site at levels higher than the RGLs was arsenic. The Texas Hydraulics investigation found arsenic at levels a little higher (30.5 mg/kg maximum) that the RGL of 16.00 mg/kg in five samples, but the locations of these higher-arsenic samples did not fit the identified pattern of beryllium and copper contamination. In fact, the higher arsenic concentrations were found in the samples collected in or near the watercourse, including samples both upstream and downstream of the former NGK Metals facility. The data thus indicate that the higher arsenic levels are related to off-site or natural conditions. In the selected "background" sample (sample "B.G.")) of soil collected by Texas Hydraulics some 300 yards south of the plant, arsenic was measured at 12.2 mg/kg. In U.S.

Geological Survey Professional Paper 1270 entitled *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States* (1984), Shacklette and Boerngen identified an observed range of arsenic in soils in the Eastern United States of <0.1 - 73 mg/kg. It thus seems likely that these elevated arsenic levels are found as natural deviations in the background levels in the soil in the area of the Site.

4.2 November 5, 1998, TriAD/TDSWM-SRP Sampling Event

During their November 5, 1998, site reconnaissance visit, TriAD project manager Dwight Hinch and TDSWM-SRP manager Ronnie Bowers decided to collect soil samples for analysis from three locations. These locations are indicated on the figure in Appendix 6.

Sample "S-1" was composited from three selected locations (random systematic pattern) in the bare earth areas surrounding the concrete pad that formerly supported the main baghouse. The objective of this sampling was to check the immediate area around the former baghouse as a potential source area for elevated metals concentrations and to try to confirm if dust releases from the baghouse were the likely source of the elevated metals concentrations found in the previously investigated nearby grassy area. Soil from the soil surface (to about a 2-inch depth) at each location was collected using a decontaminated stainless-steel spoon and placed in a new aluminum pan. The spoon was then used to thoroughly mix the accumulated soil material and then transfer the mixed soil sample into a laboratory-supplied clean 2-oz. glass sample jar. The jar was then tightly closed, marked with the sample number, and placed into an ice-chilled cooler for storage and transport to the laboratory.

Sample "S-2" was collected from the immediate area of STEP's staked Phase II sampling location "1A,B", in the primary "hot spot" identified by both STEP's and Texas Hydraulics' previous soil sampling and analysis efforts. The objective of this sampling was to collect a "worst-case" soil sample from this known "hot spot" location and subject it to special testing to evaluate the environmental mobility of the target metals in the soil. This sample

was collected by using a separate decontaminated stainless-steel spoon to scrape away the surface limestone gravel and remove underlying soil material (to a depth of 2-3") into a separate, new, clean aluminum pan. Again, the soil material was mixed with the spoon and transferred into sample jars which were then closed, marked with the sample number, and placed in the cooler. Two 2-oz. glass jars were filled.

Sample "S-3" was collected from the soil surface within a tiny drainage way just outside the fence that surrounds the facility and before the drainage way enters the watercourse along the facility's western border with the neighboring Texas Hydraulics facility. This tiny drainage way appears to drain surface water from the field into the watercourse. The objective of this sampling was to help evaluate whether the surface soil contamination has significantly migrated from the grassy field into the watercourse. The sample was collected by using a third decontaminated stainless-steel spoon to scrape away the surface vegetative material, loosen the soil surface (to a depth of about 1"), and transfer soil material into a sample jar. One 2-oz. glass jar was filled and again tightly closed, marked, and placed in the cooler.

The collected samples were subsequently delivered for analysis to Specialized Assays, Inc. a commercial analytical laboratory in Nashville, Tennessee. Samples S-1 and S-3 were analyzed for their total concentrations of Beryllium, Copper, and Arsenic, and for their % moisture. Sample S-2 was analyzed for its total concentrations of Beryllium and Copper, and for % moisture. A portion of the S-2 soil sample was also subjected to the Synthetic Precipitation Leaching Procedure for soils (the "SPLP"), and then the resulting leachate was analyzed for its concentrations of Beryllium and Copper. The results from these analyses are presented in Table 1, while the actual laboratory reports are included in Appendix 6.

Table 1 November 5, 1998, Soil Sampling and Analysis Results				
Parameter	Sample Location			TDSWM-SRP RGL
	S-1	S-2	S-3	
Total Beryllium (mg/kg)	147	21.4	2.44	0.20[A], 160[C]
Total Copper (mg/kg)	6110	1030	64.2	2960[A]
Total Arsenic (mg/kg)	4.35	NT	9.96	16.00[A]
SPLP Beryllium (ug/L)	NT	<4.0	NT	0.008[B], 4.0[C]
SPLP Copper (ug/L)	NT	35.0	NT	1300[B]

Notes: NT = Not Tested
[A] - Current TDSWM-SRP RGL for soil
[B] - Current TDSWM-SRP RGL for water
[C] - Proposed new RGLs for beryllium (see Section 4.1.2)

In order to try to verify that arsenic was not a constituent of concern for this investigation, TriAD had the soil samples from the newly sampled S-1 and S-3 areas also analyzed for arsenic in addition to beryllium and copper. As shown on Table 1, these analyses found arsenic only at concentrations much lower than the RGL. It was thus confirmed that beryllium and copper were the only constituents of potential concern for the investigation and possible remediation of the former baghouse area.

The sampling and analysis results in Table 1 for the S-1 sample show that the area around the base of the former main baghouse is another "hot spot" of copper and beryllium contamination. Copper was found at a concentration above the RGL value. The measured beryllium concentration was less than the proposed new RGL value, but it was measured at the second highest concentration that had been found on-site. This seems to confirm the hypothesis that the copper and beryllium contamination in soil on the northeastern side of the facility has resulted from storm water dispersion of fugitive dusts from the baghouses.

The sampling and analysis results in Table 1 for the S-2 sample show that the total beryllium and copper concentrations in this soil sample from this known "hot spot" were not as high as in some of the previous Texas Hydraulics and STEP samples. Copper was found at a concentration much lower than its RGL value, and beryllium was found at a concentration much lower than its proposed new RGL value. Both, however, were found at levels well exceeding background levels. Table 1 also compares the concentrations of the two metals in the SPLP leachate to the RGL values for the metals in water. This provides an indication as to whether the metals are likely to leach from the soils in sufficient concentrations to pose a significant threat to groundwater that might be used as human drinking water. Table 1 shows that for copper the measured SPLP concentration is much less than the RGL value, and for beryllium the measured SPLP concentration is less than the current MCL value (and its proposed new RGL value). These findings demonstrate that the leaching of copper and beryllium is not a significant potential concern.

Table 1 shows that the sampling and analysis results for all three metals tested in the S-3 sample are well below their respective RGL values. This finding corroborates the Texas Hydraulics investigation findings that the copper and beryllium contamination in soils at the Site does not appear to be significantly migrating into the watercourse that parallels the Site's western boundary.

4.3 November 30, 1998, TriAD Investigation

On November 25, 1998, TriAD representatives again met with the TDSWM's Mr. Bowers to more thoroughly evaluate the available data, including that obtained from the November 5, 1998, soil sampling efforts, and to determine the next course of action. In evaluating the data from STEP's July 10, 1998, report of their Phase II Sampling Event (see Appendix 5), Mr. Bowers observed that the soil sample concentrations of copper and beryllium in some of the grid borings seemed to increase with depth and became concerned that the previous investigations had not adequately assessed the vertical extent of the beryllium and copper contamination in the soils. In response to this concern, TriAD planned and implemented

another soil sampling visit to the Site to collect deeper soil samples from and around the identified "hot spot" areas.

This additional deeper soil sampling effort was carried out by TriAD's Jeff Postell on November 30, 1998. A decontaminated stainless-steel hand auger was utilized to obtain soil samples at varying depths at the four sample locations identified on the figure in Attachment 7. Locations "A", "B", and "C" were in the grassy area northeast of the main plant building at and around the "hot spot" identified by the Texas Hydraulics and STEP sampling and analysis efforts. Location "D" was in the new "hot spot" identified by TriAD's November 5, 1998, sampling visit, around the base of the former main baghouse.

Samples were collected at approximately 1.5, 2.0, 2.5, and 3.0 feet below the ground surface at each of the four locations. In general, the soil samples were a brown/tan or gray clayey soil, and had no apparent staining. Soil material was retrieved from each boring using the decontaminated hand auger, and then freshly gloved hands and a decontaminated stainless-steel spoon were used to remove soil from the auger bucket into a new or decontaminated metal pan. The spoon was then used to thoroughly mix the removed soil material and transfer the mixed soil into laboratory-supplied clean 2-oz. glass sample jars. The sample containers were then tightly closed, marked with the sample location number and depth, and placed into an ice-chilled cooler for storage and transport to the laboratory.

In the location "C" soil boring, a layer of apparently unnatural granular material was found at about the 6-inch to 12-inch depth. This material was deep brown in color and of consistent granular size, but had no odor or other remarkable characteristics. A sample of this material was also collected, in the same manner described above, from about the 9-inch depth.

The collected samples were again delivered for analysis to Specialized Assays, Inc., in Nashville. Each of the collected soil samples was analyzed for its total concentration of beryllium and copper. The analytical results are presented in Table 2, while the actual laboratory reports are included in Appendix 7. The sample of apparently foreign material collected from boring C at the 0.75-foot depth was also analyzed for copper and beryllium,

Table 2
November 30, 1998, Soil Sampling and Analysis Results

Sample Location	Depth (feet bgs)	Copper (mg/kg)	Beryllium (mg/kg)
Sample A: Located at the corner of the metal building and the concrete driveway	1.5	2.64	<1.01
	2.0	6.21	<0.97
	2.5	3.81	<0.95
	3.0	<0.95	1.90
Sample B: Located at the center of the 25 foot by 25 foot grid between previous sample locations 1, 2, 4, and 5.	1.5	22.3	<0.98
	2.0	8.03	<1.00
	2.5	1.75	1.17
	3.0	<0.96	1.15
Sample C: Located halfway between the previous sample locations 4 and 5.	0.75*	514	2.38
	1.5	19.7	<0.96
	2.0	5.01	<0.96
	2.5	7.14	<1.02
	3.0	2.17	1.18
Sample D: Located within the grassy area which contained the baghouses.	1.5	139	3.38
	2.0	6.37	<0.97
	2.5	<0.99	1.19
	3.0	2.81	<1.00

* Foreign material

and for the eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). The analytical results for this sample are presented in Table 3, while the actual laboratory reports are again included in Appendix 7.

Table 3
Analytical Results for the Foreign Material (Sample C-0.75)

Parameter	Result (mg/kg)	TDSWM-SRP RGL (mg/kg)
Arsenic	<0.99	16.00
Barium	2.18	4000.00
Beryllium	2.38	160*
Cadmium	<0.99	40.00
Chromium	<0.99	400.00
Copper	514	2960.00
Lead	1.98	250.00
Mercury	<0.99	20.00
Selenium	<0.99	400.00
Silver	<0.99	200.00

* Proposed new RGL

Table 2 shows that the copper and beryllium concentrations in the previously identified "hot spot" areas at depths greater than one foot are much less than the previously measured concentrations in the shallower soils. None of the measured copper concentrations ~~even~~ approached the TDSWM-SRP RGL of 2960 mg/kg, and none of the measured beryllium concentrations approached the proposed new RGL of 160 mg/kg. It should be noted that the results from this deeper soil sampling seem to corroborate the indications from the previous investigations that beryllium is naturally present in the soils at the Site at concentrations up to perhaps 5.0 mg/kg.

In Table 3, the measured metals concentrations in the foreign material found in boring C are compared to their respective RGL values. These comparisons show that this material

does not exhibit concentrations of any of these metals that approach the RGL values. Thus, this material does not seem to contain toxic constituents which might pose a significant threat to human health or the environment.

5.0 ASSESSMENT OF RISKS

As discussed in Sections 3 and 4 of this Report, the only constituents of potential concern at this Site have been determined to be the metals beryllium and copper. These constituents have been found in elevated concentrations in soil samples from certain areas of the Site. In order to determine whether or not remedial action is warranted, these measured concentrations have been compared to the RGLs utilized by the TDSWM-SRP. These RGLs are conservatively low concentrations of the constituents in soil and water, based on a residential exposure scenario, below which ingestion of such soil or water by humans would not be expected to pose a significant threat to human health. At this Site, direct human ingestion of the contaminated soil is the hypothetical exposure pathway with the greatest potential to pose a threat to human health or the environment. The nature of the contaminants and soil matrix involved, the presence generally of a vegetative cover, the relatively small surface areas involved, and other aspects of the site-specific scenario act against the contaminants becoming airborne and thus a potential inhalation hazard. The nature of the contaminants and the soil matrix involved, the relatively small amount of total contaminant mass available, and other aspects of the site-specific scenario similarly act against significant migration of the metal contaminants into groundwater or surface water. This latter expectation was corroborated by the SPLP testing of a targeted "worse case" soil sample (see Section 4.1) which indicated that beryllium and copper are not likely to leach from the soils in significant concentrations, even under the "acid rain" conditions modeled by the SPLP test. Dermal exposure, food-chain contamination, and other more-exotic exposure pathways are not likely to pose significant risk to human health or the environment.

As described in Section 4.1.1, the appropriate RGLs for beryllium and copper in soils is 160 mg/kg and 2,960 mg/kg, respectively. When the soil sampling and analysis data in Section 3 and 4 are compared to these RGL values, only four measurements of copper and one measurement of beryllium exceeded these RGLs. Three of these copper samples were the surface soil samples collected by Texas Hydraulics in January 1998, by STEP in March 1998, and by STEP in June 1998, from the same "hot spot" corner of the concrete driveway and the storage building apron. The January 1998 Texas Hydraulics' surface soil sample from this location is also the only soil sample to show a beryllium concentration higher than the proposed beryllium RGL value. The fourth soil sample that exhibited a copper concentration that exceeded the RGL value was the composite surface soil collected by TriAD on November 5, 1998, from the other "hot spot" area around the concrete pad on which the main baghouse formerly sat. This sample also exhibited the second highest beryllium concentration.

Based on the above evaluations, the only two areas at the Site with copper or beryllium concentrations which might have the potential to pose unacceptable risks to human health or the environment are the two "hot spots". It is also clear that it is only the surface soils at these locations which might contain such significant concentrations.

6.0 REMEDIAL ACTION

Based on the assessment of risks described above, NGK Metals and TriAD determined that the removal and off-site disposal of shallow soils from the two "hot spots" would eliminate any significant threat and effectively remediate the Site. It was thus planned to excavate the soils to a depth of one foot from an approximately 10-foot square area in the corner of the concrete driveway and the storage building apron and from the unpaved areas around the concrete pad on which the main baghouse formerly sat. The areas to be excavated are depicted on the figure in Appendix 8. This plan was presented to TDSWM-SRP manager Ronnie Bowers during his November 25, 1998, meeting with TriAD representatives, and he tentatively approved such as an adequate remedy provided that

(1) the deeper soil sampling ultimately performed on November 30, 1998, by TriAD demonstrated that deeper soil removal was not required, and (2) his agency ultimately concurs with the revised RGL of 160 mg/kg. Mr. Bowers also agreed that no confirmation sampling of the newly excavated soil surfaces would be necessary if - as expected - the deeper soil sampling demonstrated a dramatic reduction with depth of the soil concentrations of beryllium and copper.

Based on the findings of the November 30, 1998, soil sampling and analysis effort and further discussions with Mr. Bowers, NGK Metals and TriAD planned and implemented the soil removal on December 8 and 9, 1998. Under the direction of TriAD's Jeff Postell (and Mr. Mark Satterfield of NGK Metals), on December 8 a backhoe and operator provided by remedial subcontractor Four Seasons Environmental was used to excavate the approximately 29 cubic yards of soil from the two "hot spot" areas. The excavated soils were placed into two rolloff boxes provided by Fox Waste Systems of Chattanooga, Tennessee. These rolloff boxes were covered by a tarp and transported the next day by truck to Waste Management's Pine Bluff Landfill near Ball Ground, Georgia, (a commercial Subtitle D landfill) where they were disposed as non-hazardous solid wastes. No confirmation sampling was performed because TriAD's deeper soil sampling and analysis had demonstrated that there was no need to be concerned with soils below about one foot in depth. The excavated areas were backfilled to grade on December 8 with clean crushed limestone.

Copies of the manifests documenting the off-site disposal of the excavated soils are included in Appendix 9 along with other related documentation. Photographs documenting the soil removal effort were also taken by TriAD and are available upon request.

7.0 SUMMARY AND CONCLUSIONS

As described previously in this Report, a site-wide assessment of the subject Site was performed and identified some concerns regarding possible metals contamination of

surface soils in certain areas of the Site. The nature and the vertical and horizontal extent of such soil contamination was defined through several soil sampling and analysis efforts. The sampling and analysis results revealed elevated levels of the metals beryllium and copper in shallow soils in at least two "hot spots" at the Site. Based on a limited and conservative assessment of the risks posed by such elevated levels, these two "hot spots" were remediated by the removal and off-site disposal of shallow soils. NGK Metals and TriAD have determined that any significant surface or subsurface contamination that might reasonably be considered to exist at this Site has been adequately investigated and remediated, and that no further such actions need to be taken.

End of Text

NGK BERYLCO

NGK Metals Corporation

150 Tuckerton Road P.O. Box 13367 Reading, PA 19612 610 921-5000 Fax 610 921-5358

June 15, 2000

Mr. Tim Stewart
Tennessee Department of Environment and Conservation / Superfund
4th Floor L&C Annex
401 Church Street
Nashville , Tennessee 37243-1538

Re: NGK Metals Corporation
Athens, TN Facility

Dear Mr. Stewart:

Ms. Renee Lucchessi informed NGK Metals that the Department was missing Appendices 1 - 6 of the Report of Investigation and Remediation of Metal Contaminated Soils Former NGK Metals Corporation Facility 725 East Avenue , Athens Tennessee, prepared by TRIAD Environmental Consultants Inc., and submitted by NGK to the Department in December of 1998. Enclosed please find a copy of Appendix 1 through 9 to complete your files. Should you have any questions or require further information, please feel free to contact me at (610) 921-5147.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

cc: Art Becker
Mark Satterfield

STEP

PHASE I ENVIRONMENTAL AUDIT

NGK Metals Corporation
at
725 East Avenue
(McMinn County)
Athens, Tennessee

Submitted to:
Mr. John Manikas
General Manager
NGK Metals Corporation
725 East Avenue
Athens, Tennessee 37303

Submitted by:

Solutions To Environmental Problems, Inc.
1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

November 21, 1997
STEP Project No. 110-078-001

STEP

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APPENDIX A Photos

1.0 INTRODUCTION

Solutions To Environmental Problems, Inc., (STEP) has conducted a Phase I Environmental Audit at NGK Metals Corporation and associated property, 725 East Avenue, Athens, Tennessee (McMinn County). This audit was conducted for NGK Metals Corporation at the request of Mr. John Manikas. The observations and findings of this audit are presented in **Section 4.0** of this report. The audit was conducted during the period September 23, 1997, to October 17, 1997, and was designed to provide NGK Metals Corporation with the information needed to make cost-effective and timely decisions regarding the potential environmental liabilities associated with the aforementioned properties. The audit was conducted according to STEP's environmental auditing and due diligence protocol, the different phases of which are described below.

2.0 LIMITATIONS OF STUDY

The scope of this report is limited to the matters expressly covered; it was conducted using standard engineering and scientific judgment, principles, and practices. The following items, in particular, should be taken into account when using this report to evaluate the environmental risks associated with the parcels.

- The audit is based upon site observations and information provided by third-party individuals and organizations, which is assumed to be correct. Sometimes, information may have been provided by individuals whose knowledge of the history of the site may be incomplete. Except as provided in this report, STEP has made no independent investigations as to the accuracy or completeness of the information provided by these individuals or organizations.

- Descriptions of suspect environmental conditions contained herein have been based on visual observations and information provided by regulatory agencies. No other qualitative or quantitative chemical analysis has been performed.

TEP makes no warranties, expressed or implied, including without limitations, as to the marketability of the sites or their fitness for particular use. Information in this report is not to be onstrued as legal advice. Warranties and liabilities as to the service performed are as described n the contractual terms and conditions.

3.0 ASSESSMENT PROTOCOL

The audit follows the protocol used by STEP on Phase I Audits. Before visiting the property, STEP personnel reviewed topographic maps of the area, property boundary information, environmental databases incorporating federal and state lists of contaminated sites, and local tax maps. Other pre-visit site tasks included calls to the local fire and health departments to obtain information regarding underground storage tanks, spills, health problems at the site or in the area, and visits to the local Soil Conservation Service (SCS) and other agencies to view historic aerial photographs of the site and vicinity, and to obtain soil information, wetlands maps, floodplain maps, etc.

The site visit consisted of a walkover of the NGK Metals Corporation and associated property. STEP conducted the site visit for visual inspection of the property to evaluate the site for evidence of environmental impairment. In addition, STEP examined the interior and perimeter of the property and also adjacent and nearby properties. The inspection was performed to look for evidence of contamination that may have resulted from historic or current use of the properties, adjacent properties, and nearby properties. The observations made during the site inspection are incorporated throughout this report. No samples of environmental media were obtained during the Phase I Audit.

Documentation of the site visits and observations was recorded on a checklist and by taking ographs to document the pertinent observations. Copies of files, documents, and drawings

ıat STEP collected, and the checklist and copies of documents obtained from other agencies, are art of the project file and are available for inspection.

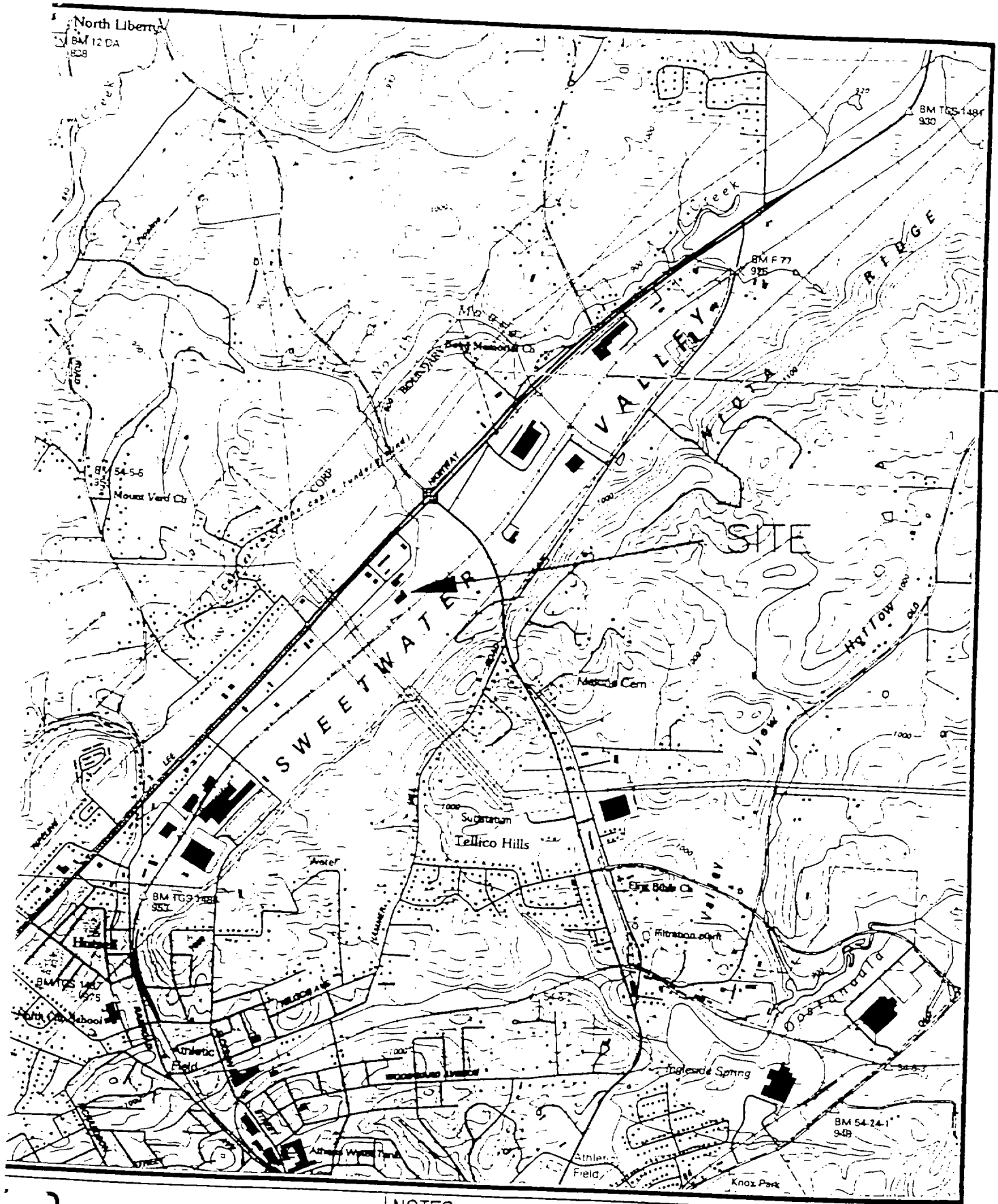
ollowing the site visit, additional calls were made to regulatory agencies to confirm data ollected by STEP during and subsequent to the visual inspection of the property. Additional isits were made to the appropriate regulatory agencies to review and/or obtain copies of pplicable files as needed.

.0 FINDINGS

.1 Business and Property Information

GK Metals Corporation has been at the site in Athens, Tennessee, (McMinn County) since the . 70s. Before NGK Metals Corporation, the building was used by two different companies, recision Cast Products and Pet Creamery, dating back to the 1940s. The property before the 940s was vacant. This site is just south of the intersection of Lawn Street and East Avenue, as own in Figure I-I. Figure I-II is a tax map that also shows the location of the site.

he property is broken up into 3 parcels totaling 9.7 acres. The largest parcel (3.79) acres ontains three structures, a brick building which houses the non-ferris tooling operations and ffice space, a metal building which is used for finished products, and two mobile office trailers sed for additional office space. The remaining 3 parcels (1.88, 2.00, and 2.04 acres) are vacant. ehicular and foot traffic access is only available to the parking area of the 3.79 acre parcel roperty since fencing surrounds this parcel. The other parcels have no vehicular access but is not nced so foot traffic access is available.



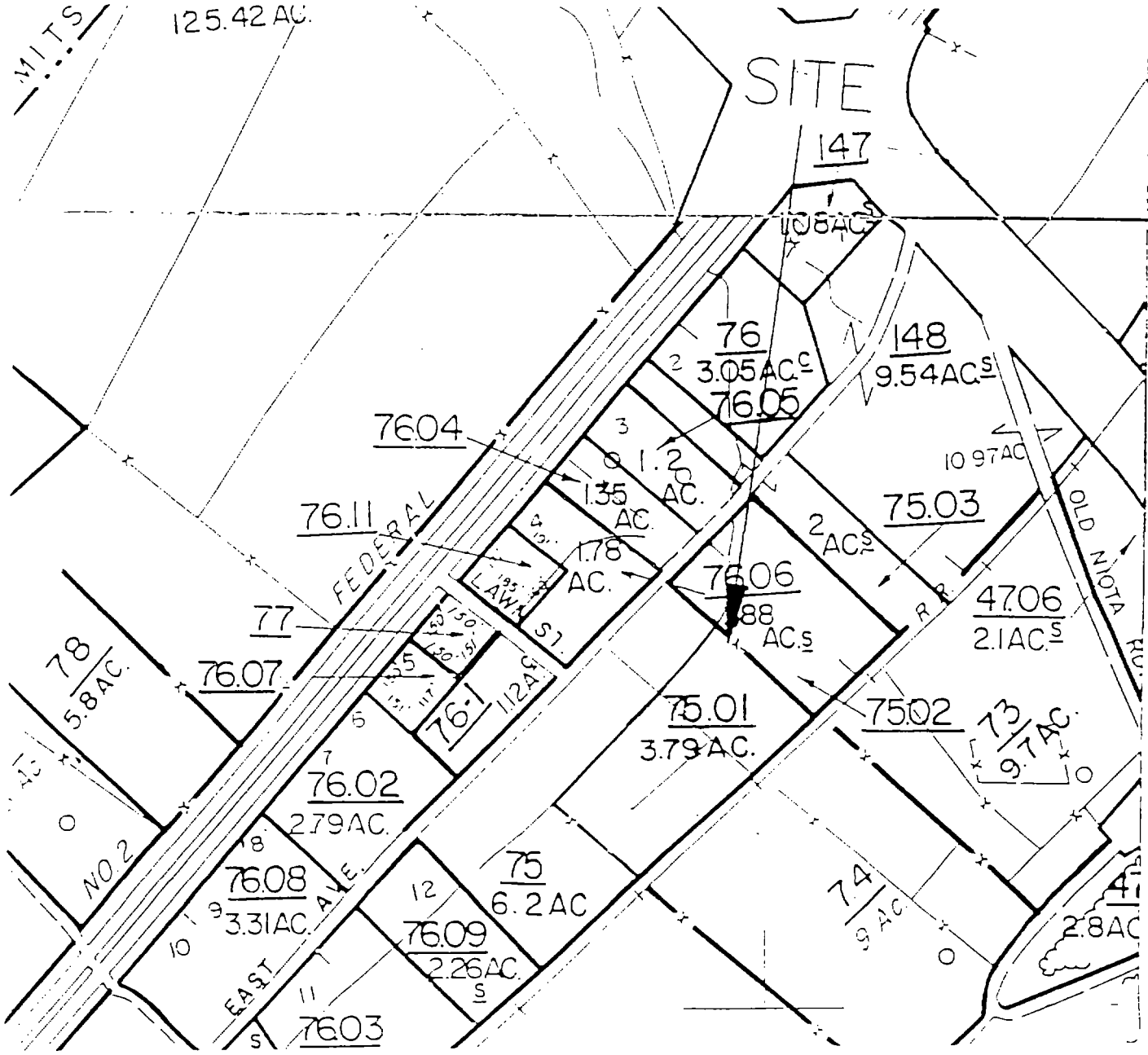
LOCATION MAP

2000'

FIGURE 1.1

NOTES:	ENVIRONMENTAL AUDIT
MAP TAKEN FROM ATHENS,	NGK METALS CORPORATION (ATHENS PLANT)
TN U.S.G.S. QUADRANGLE MAP	
LIMITED UPDATED 1990	
SITE LOCATION:	
725 EAST AVENUE	
ATHENS, TENNESSEE	

STEP
1006 FLOYD CULLER COURT
OAK RIDGE TN. 37830
(423) 481-7837



TAX MAP

FIGURE 1-11

NOTES:	ENVIRONMENTAL AUDIT
MAP PROVIDED BY	NGK METALS CORPORATION (ATHENS PLANT)
McMINN COUNTY PROPERTY ASSESSOR	STEP 1006 FLOYD CULLER COURT OAK RIDGE TN. 37830 (423) 481-7837
SITE LOCATION: 725 EAST AVENUE ATHENS, TENNESSEE	

The 3.79-acre parcel has very limited vegetation with almost the entire parcel being graveled, pavement, or concrete. The remaining parcels have vegetation consisting of grass (which is periodically mowed) and sparsely located eastern red cedar trees.

The drainage of the property is to the south to an unnamed tributary of the Little North Mouse Creek. No Federal Emergency Management Agency Flood Insurance Rate Map for this site was not available at the time of this report.

Information regarding prior ownership of the property was reviewed. (McMinn County Parcel Numbers 75.01, 75.02 and 75.03). The parcels 75.02 and 75.03 are vacant and have been vacant at least since the 1940s and parcel 75.01 has been occupied with a building structure since the late 1940s.

4.2 Regulatory File Review, Historical Data Review, and Prior Use Information

To evaluate the historical use of the site and surrounding property, STEP evaluated readily available historical information including:

1. Aerial photos - United States Department of Agriculture (USDA), 1992 and 1973 at various scales

2. Topographic maps - Tennessee Valley Authority, Athens Quadrangle, 7.5 minute, dated 1964, limited update 1990, 1 inch = 2000 feet

The following personnel were contacted to discuss property information and regulatory status/compliance issues:

commercial or vacant. No commercial or industrial landfills, abandoned industrial facilities, or other suspicious features, which could represent improper disposal of hazardous wastes, were observed on the property in any of the aerial photos.

The U.S. Department of the Interior, Fish and Wildlife Service, National Wetlands Inventory Map (1989) for the Athens Quadrangle was not available for review at SCS.

4.3 Surface and Ground Water Information

There is no ponding of surface water on the property. Surface water run-off, as mentioned before, is collected in an unnamed tributary and flowed northeast to the North Little Mouse Creek.

The property currently has municipally supplied potable water and is connected to sanitary sewer according to Athens Utility Board. No known hydrogeologic studies have been performed for the property.

4.4 PCB Information

One 15-KVA pole-mounted transformer and one 75-KVA pole mounted transformer are located on the northern and southern boundaries of parcel 75.01 and a pad mounted transformer is also located along the southern boundary of parcel 75.01. According to Mr. Larry Monteen of the Athens Utility Board these transformers are considered non-PCB containing. No other potential sources of PCBs were observed on the property. According to Lynne Woodside, NGK Corporate, small motors associated with some of the equipment used in the NGK process had PCB containing fluid. These fluids have been removed and properly disposed of according to NGK personnel.

4.5 Asbestos

Since portions of the main building located on parcel 75.01 were built in the 1940s and other portions added on at various times, the building materials (i.e. sheet rock, floor covering, ceiling tiles, roofing material, wall insulation, etc.) have a potential for containing asbestos. These materials and any other materials that may have the potential to contain asbestos should be tested for asbestos if remodeling or demolition of the facility should take place.

4.6 Radon and Other Health Issues

An EPA publication (EPA's Map of Radon Zones-Tennessee, September 1993) reported that 18 homes have been checked in McMinn County for radon exceeding the EPA-mandated threshold level of 4 picocuries per liter (pCi/L). Of the 18 houses tested in McMinn County, a mean value of 2.7 pCi/L was found with the highest reading being 8.8 pCi/L. However, since no living facilities are present at this site, radon concerns are minimal.

Personnel with the McMinn County Health Department are unaware of any known health problems in the immediate vicinity of the property.

The Athens City Fire Department indicated that NGK Metals had a small fire during a re-modeling phase but was very limited and only cased minor damage. They also had no knowledge of any past spills at the facility.

4.7 Aboveground and Underground Storage Tanks

The property has no above ground storage tanks (ASTs) or underground storage tanks (USTs).

4.8 Adjacent Property Information

A visual inspection of the adjacent properties was conducted during the site visit. There was no indication that adjacent properties were affecting the parcels. The properties bordering the site are listed below:

- **North** -Texas Hydraulics,
- **South** - Southern Railroad Property (tracks),
- **East** - Vacant Property, and
- **West** - Vacant Property.

4.9 Environmental Database Review

To check for contaminated sites and other environmentally regulated sites located within one mile of the subject parcels, STEP checked with various regulatory divisions of the TDEC located in oxville. The following summarizes these findings:

- National Priority List (Superfund) or state promulgated sites - No Superfund site is located within 1.0 mile radius according to the Tennessee Department of Environment & Conservation, Division of Superfund, Promulgated Site List dated December 5, 1995.

- Federal or State CERCLIS (Comprehensive Environmental Response, Cleanup & Liability Information System) sites - No CERCLIS site is located within 1.0 mile radius.

- Landfills - No licensed landfills are located within a 1.0 mile radius of the property.

- Injection Wells - No known injection wells are located within 1.0 mile of the property.

- Leaking USTs - No leaking USTs are known to be located within 1.0 mile of the property.

- Spill/dumping files - No spills or illegal dumping has been documented at the property.

4.10 Orders, Actions, and Legal Liabilities

Based on discussions with local and state officials, there is no evidence that the property is subject to any administrative orders or proceedings, actions by any regulatory authorities, or involved in

any legal proceedings such as civil or criminal cases resulting from environmental impairment, spills, or other common environmental concerns.

4.11 Permit Review

The property currently holds a TDEC Air Quality Permit and a Tennessee General Stormwater Baseline Permit. These permits are in the process of being transferred from the Athens, Tennessee facility to the Sweetwater, Tennessee facility.

4.12 Solid and Hazardous Waste Issues

Solid waste generated at the property is picked up by BFI sanitation department. No hazardous waste is generated on the property at this time. Bag house dust generated at the facility is considered an industrial waste and is shipped to the corporate landfill in Pennsylvania.

4.13 Other Issues of Significance

At the time of the site visit a large number of drums were located at the facility. All drums were sealed that were located on the outside of the building. The visual observation of the drums did not totally reveal the drum contents (i.e., some drums were either not labeled or the label was not visible). According to NGK personnel these drums either contained bag house dust, recyclable material, or were empty. During the file review at the TDEC Chattanooga Field Office, the Texas Hydraulics, Inc., facility which is located across the unnamed tributary to the north of the NGK property indicated some past environmental issues. The Texas Hydraulics, Inc., facility solid waste file indicated violation of The Tennessee Hazardous Waste Management Act and an issue concerning petroleum contaminated soils from compressors located on the south side of the Texas Hydraulics, Inc., facility. No other issues of significance were noted.

5.0 SUMMARY AND CONCLUSIONS

Based upon the work performed to date, the property was found to have no potential significant environmental risks. As mentioned before all drums/containers located outside of the facility were sealed and contents were bag house dust, recyclable material, or were empty according to NGK personnel. STEP suggests before removing the drums/containers and their substance that all drums be checked for proper labeling and if no labels are present, identify the contents and properly label the drum(s). Also, STEP suggests that all drums/containers be removed from the property before a property transaction takes place.

Contamination Issues

Contamination issues concerning the Texas Hydraulics, Inc., facility found during the file search have been resolved with the TDEC Chattanooga Field Office, and their was no indication that these issues affected the NGK property.

Compliance Issues

As stated previously, if demolition or renovation is to take place on the structure, an asbestos survey should be performed prior to demolition or renovation. No other current compliance issues were found concerning the subject property.

PHOTO 1. NGK METALS CORPORATION (ATHENS PLANT)
WHITE IN COLOR, VIEW LOOKING SOUTHWEST

PHOTO 2. UNNAMED TRIBUTARY OF NORTH LITTLE MOUSE CREEK
WHICH FLOWS BETWEEN NGK AND TEXAS HYDRAULICS.

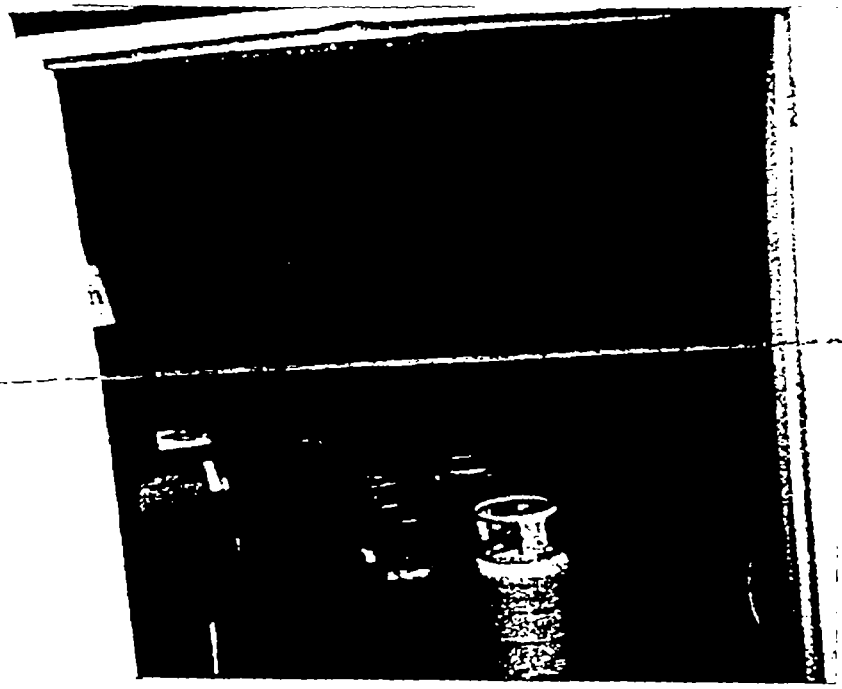


PHOTO 3. INSIDE STORAGE BUILDING OF NGK LOCATED AT THE SOUTHWEST CORNER OF PARCEL 75.01

PHOTO 4 VIEW OF THE WESTERN BOUNDARY OF PARCEL 75.01.

PHOTO 5. BAGHOUSE FACILITIES AT THE EASTERN SITE OF THE PLANT.

PHOTO 3. DRUM STORAGE AREA ALONG THE SOUTHERN BORDER OF PARCEL 73.01

PHOTO 7. VIEW LOOKING NORTHEAST OF VACANT PARCELS.

PHOTO 8. VIEW LOOKING SOUTHEAST OF VACANT PARCELS.

PHOTO 9. VIEW LOOKING SOUTHWEST OF VACANT PROPERTY NEXT TO PARCEL 75.01.

APPENDIX 2

NOVEMBER 24, 1998, GRADIENT CORPORATION LETTER ON BERYLLIUM TOXICITY

Gradient Corporation
AN EA COMPANY

November 24, 1998

James M. Weaver, Esq.
Waller Lansden Dortch and Davis
Nashville City Center
511 Union Street, Suite 2100
Nashville, TN 37219-8966

Dear Mr. Weaver:

NGK Metals owns a parcel of land at 725 East Avenue, Athens, Tennessee. Beryllium has been detected in soil at the site at concentrations up to 38.6 mg/kg, concentrations which exceed the current Tennessee Remediation Guidance Level (RGL) value for beryllium of 0.2 mg/kg.

The U.S. Environmental Protection Agency (EPA) has recently reevaluated beryllium toxicity, including both cancer and non-cancer effects. Based on this recent reassessment, we have derived an updated RGL for beryllium. Using the same approach used by the Tennessee Division of Solid Waste Management to calculate RGLs, but substituting the latest EPA beryllium toxicity value and EPA-recommended soil ingestion rate for children, an updated RGL value of 320 mg/kg was derived for beryllium in soils. The remainder of this letter first explains the basis for the EPA reassessment of beryllium, and then details our derivation of a revised beryllium RGL value.

Basis for the US EPA Reassessment of Beryllium

The primary source of quantitative information on cancer and noncancer effects, for use in risk assessments and developing risk-based screening levels, is the EPA Integrated Risk Information System (IRIS).[1] The IRIS database provides EPA-recommended reference doses (RfDs) to evaluate noncancer health effects from oral exposures, reference concentrations (RfCs) to evaluate noncancer health effects from inhalation exposures, cancer slope factors (CSFs) to evaluate carcinogenicity from oral exposures, and air unit risks (UR) to evaluate carcinogenicity from inhalation exposures. Until 1998, the IRIS file listed an oral RfD, an oral CSF, and an inhalation UR value for beryllium. As a result, risk-based soil screening levels for beryllium developed prior to 1998 were typically based on consideration of the potential for oral carcinogenicity of beryllium (*i.e.*, agency soil screening levels were calculated using the former oral CSF of 4.3 kg-day/mg).

However, in April 1998, the EPA revised the beryllium IRIS file.[2] The IRIS revisions were subject to both internal EPA and external peer review. The most significant change was that the EPA no longer recommends the use of an oral CSF. Based on a comprehensive review of the published literature, the EPA concluded in the revised beryllium IRIS file that "the human carcinogenic potential of ingested beryllium cannot be determined." Specifically, the IRIS file explains that:

> "The chronic oral studies did not report increased incidences of tumors in rodents, but were conducted at doses below the MTD. The oral database, including the Schroeder and

[1] US EPA Integrated Risk Information System (IRIS) system http://www.epa.gov/ngispgm3/iris/subst/0012.htm.
[2] US EPA Integrated Risk Information System (IRIS) file for beryllium http://www.epa.gov/ngispgm3/iris/subst/0012.htm Last revised by EPA 4/3/98. File accessed 10/21/98

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Email: info@gradcorp.com

> Mitchener study previously used in the development of the oral slope factor on IRIS, is considered inadequate for the assessment of carcinogenicity. The basis for not using the Schroeder and Mitchener rat study is that the incidences of gross malignant tumors in the control and beryllium-exposed groups were not significantly different." (EPA, 1998, revised beryllium IRIS file)

In other words, it is no longer scientifically appropriate to consider beryllium to be an oral carcinogen, or to use the old beryllium CSF in risk assessments for deriving risk-based screening levels. (Note that beryllium is still considered to be a "likely" human carcinogen via *inhalation* exposures; the EPA-recommended inhalation UR for beryllium is still 0.0024 $m^3/\mu g$.)

The other change in the beryllium IRIS file relevant to oral exposures is that the oral RfD was revised somewhat, from the previous value of 0.005 mg/kg/day to the current value of 0.002 mg/kg/day. Because the rat study on which the original RfD was based found no adverse effects even at the highest dose tested, EPA derived a new beryllium RfD based on small intestinal lesions observed in a chronic dog study

Derivation of a Revised Beryllium RGL Value

The Tennessee Division of Solid Waste Management's Remediation Guidance Levels (RGLs) are adapted from the "Action Levels" developed by EPA in 1990 for use in the RCRA Corrective Action Program.[3] These action levels for soil were derived considering cancer and noncancer risks associated with incidental ingestion of surface soil. For carcinogens, Action Levels (or RGLs) were calculated as follows:

$$\text{Action Level}_{soil} = \frac{\text{Target Cancer Risk } (10^{-6}) \times \text{Adult Body Weight (70 kg)} \times \text{Averaging Time (70 yrs)}}{\text{CSF} \times \text{Adult Soil Intake Rate (0.1 g/d)} \times \text{Exposure Duration (70 yrs)} \times (1\text{ kg}/1000\text{ g})}$$

Using this equation and the former oral CSF of 4.3 kg-day/mg, a cancer-based RGL of 0.2 mg/kg was set for beryllium.

Since EPA no longer recommends the use of an oral CSF, this RGL based on the former CSF should no longer be utilized. Instead, the RGL should be based on the noncancer effects of beryllium, *i.e.*, calculated using the beryllium RfD. The equation used to calculate Action Levels (or RGLs) for non-carcinogens is:

$$\text{Action Level}_{soil} = \frac{\text{RfD (mg/kg} \cdot \text{day)} \times \text{Child Body Weight (16 kg)}}{\text{Child Soil Intake Rate (g/day)} \times (1\text{ kg}/1000\text{ g})}$$

An updated RGL for beryllium can be calculated using this equation. For the RfD, EPA's revised value of 0.002 mg/kg-day should be used. For the soil intake rate, EPA recently lowered their recommended value for children from the previous value of 0.2 g of soil per day (200 mg/day) to a mean value 0.1 g of soil per day (100 mg/day).[4] Using the equation above, EPA's revised RfD, and EPA's revised child soil intake rate results in an updated non-cancer-based RGL of 320 mg/kg for beryllium.[5] Based on EPA's reassessment of the potential for cancer and non-cancer health effects from beryllium and EPA's reevaluation of soil ingestion

[3] Federal Register, Vol. 55, No. 145, Pg. 30865-30873, Friday July 27.
[4] US EPA, Exposure Factors Handbook, Volume 1, General Factors. EPA/600/P-95/002Fa. August
[5] Note that even use of EPA's previous soil ingestion rate for children (0.2 g/day) would result in a revised RGL value of 160 mg/kg

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studies, this updated value is more scientifically appropriate. Since this value is derived using conservative exposure assumptions for a child residential scenario, it is protective for both residential and industrial site uses.

Since beryllium is still considered to be a "likely" human carcinogen via *inhalation* exposures, it is also appropriate to consider risk-based soil screening levels based on inhalation of wind-blown or fugitive dusts. In their 1996 Soil Screening Guidance, EPA derived a soil screening level of 1,300 mg/kg, considering inhalation of fugitive particulates, and using the beryllium inhalation UR.[6] This value is nearly 10 times greater that the revised RGL calculated above. Thus, the updated RGL of 320 mg/kg is protective of both potential noncancer health effects due to incidental ingestion of soil, as well as potential carcinogenicity due to inhalation of soil particles resuspended into the air as dusts.

In summary, the updated value of 320 mg/kg should be adopted as a remedial guidance level based on the recent EPA reevaluation of beryllium toxicity and carcinogenicity and EPA's revised soil ingestion rates. This updated RGL would be protective of both potential noncancer health effects due to incidental ingestion of soil, as well as potential carcinogenicity due to inhalation of soil particles resuspended into the air as dusts. Since even the maximum concentration (38.6 mg/kg) detected at NGK Metals' site at 725 East Avenue, Athens, Tennessee is well below the updated RGL of 320 mg/kg, the beryllium present at the site *does not* pose a risk to human health, even if the site were to be used as a residential property in the future.

Note that since risk-based RGLs are derived assuming that a receptor is equally exposed to all areas of a site, RGLs represent an acceptable site-wide average concentration and should not be applied on a point-by-point basis. Should any future sampling indicate higher concentrations that cause the site-wide average to exceed the updated RGL value, locations with the highest concentrations could be remediated with focused excavation.

If you have any questions, or if you would like additional information, feel free to call either me or our toxicologist, Tracey Slayton, at 617-576-1555.

Yours truly,

GRADIENT CORPORATION

Neil Shifrin (TMS)

Neil S. Shifrin, Ph.D.
Principal

[6] US EPA, Soil Screening Guidance: Technical Background Document, EPA/540/R-95/12 May

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APPENDIX 3

TEXAS HYDRAULICS' JANUARY 1998
SOIL SAMPLING AND ANALYSIS RESULTS

Athens Soil Sampling

Location	Cu	Be
1	126	3.43
2	99.1	2.22
3	59.9	1.68
4	71.2	1.82
5	114	2.77
6	30000	865
7	31.6	1.24
8	112	3.44
9	64.6(37.4Dup)	2.1(1.23Dup)
10	753	7.64
11	2130	19.2
12	12.8	0.21
13	14.1	0.93 .95
14	52.9	1.94
15	22.9	1.09
16	32.7	1.52
Exc 1	314	7.23
Exc 2	377	11.4
BG	17.1	0.671
US BG*	2 - 250	.1-10

centrations

*Soil Elemental Background Conectrations for United States

TEXAS HYDRAULICS INC.
3410 North Range Road P.O. Box 1067 Terrible Texas 76[illegible] Telephone (254) 774-[illegible] FAX (254) 774-9940
A [illegible] INDUSTRIES COMPANY

TELEFAX TRANSMISSION

Date: 2-9-98

To: NGK Metals Fax #: 423-337-5540

ATTN: John Manikas

From: Jim West

This sheet is number 1 of 13 pages in this transmission.

Our fax number is (254) 774-9940.

Memo

TEXAS HYDRAULICS INC
A DOVER INDUSTRIES COMPANY

To: Reed Vivatson

From: Jim West

CC: Vernon Pontes

Date: January 27, 1998

Re: NGK Metals

Site Assessment on NGK metals, Athens, TN. By David Ford and Jim West. This is only a partial assessment; the extent of contamination needs to be addressed by NGK Metals.

SAMPLE RESULTS (REFER TO MAP)

Samples EXC #1 & #2

Under concrete slab possible septic tank readings are copper (#1 - 314 ppm #2 - 377 ppm)

Samples 1 - 5 North side plant open field

1-2 near fence line heading to creek, possible rain runoff towards creek

#1 - 126 ppm

#2 - 99.1 ppm

3-4 top side of field a little high not bad

#5 - sample taken 1 foot + deep

Results 114 ppm copper (possibly buried)

#6 - sample taken by new storage building

Copper - 30,000 ppm, Beryllium - 865 ppm.

#7-8-9 samples show trace levels of copper; small clean-up.

#10-11 samples taken South side driveway

#10 - 753 ppm copper, 7.64 beryllium

#11 - 2,130 ppm copper, 19.2 beryllium

#12 sample taken parking lot crossover.

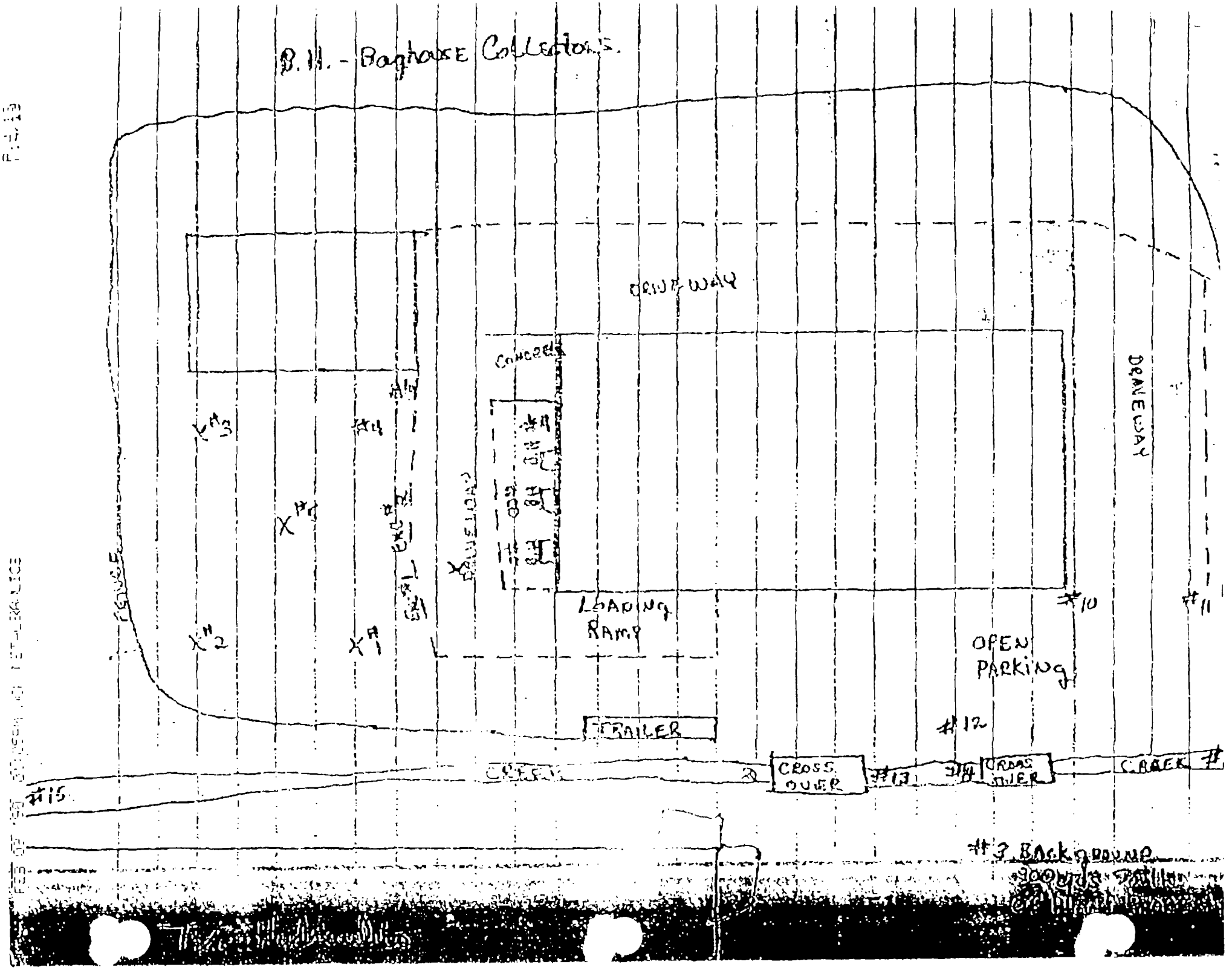
12.8 ppm copper - beryllium 0.21/Refer back to #10, #11 this would probably be a small area to clean-up.

#13 - 16 Creek samples

Samples 13-14 possible rain water runoff-plus barium shows high 639 ppm.

Compared to background 213 ppm

Asbestos survey show that pattern storage room and spray booth contain asbestos (Ceiling Tile)


B.H. - Baghouse Collectors.
DRIVEWAY
CONCRETE
DRIVEWAY
LOADING RAMP
OPEN PARKING
TRAILER
CROSS OVER
CROSS OVER
CREEK
CREEK
FENCE
#1
#2
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12
#13
#14
#15
#3 BACKGROUND

ANALYTICAL

INORGANIC REPORT

PHUBSOIL Grp: 670,1108
CLIENT: Texas Hydraulics
CLIENT PROJECT #: N/A
LOCATION: Texas Hydraulics, Tennessee

EXTRACTION METHOD:	3051	SAMPLE DATE:	1/6/98
ANALYTICAL METHOD:	See Notes Below	SAMPLE REC'D:	1/7/98
MATRIX:	SOIL	SAMPLE CONDITION:	GOOD
ANALYSIS BY:	KF	EXTRACTION DATE:	1/08&1/13/98
REPORT GENERATED BY:	LB	EXTRACT. HOLD TIME (DAYS):	1 & 0
QA REVIEW:	TC	ANALYSIS DATE:	1/9&1/13/98
BATCH NUMBER:	768 & 754	HOLDING TIME (DAYS):	3 & 7

SAMPLE ID:	Silver [1] ppm (mg/Kg)	Arsenic [1] ppm (mg/Kg)	Barium [1] ppm (mg/Kg)	Cadmium [1] ppm (mg/Kg)	Chromium [1] ppm (mg/Kg)	Lead [1] ppm (mg/Kg)	Selenium [1] ppm (mg/Kg)	Mercury [2] ppm (mg/Kg)	Beryllium [1] ppm (mg/Kg)	Copper [1] ppm (mg/Kg)
Method Blank	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sample #1	0.59	16.8	247	0.60	29.2	56.3	ND	0.11	3.45	126
Sample #2	ND	9.75	79.5	0.36	27.6	40.0	7.54	0.71	2.22	99.1
Sample #3	ND	13.1	68.9	0.51	25.4	43.0	ND	1.63	1.98	59.9
Sample #4	ND	11.2	72.5	0.35	27.9	51.9	ND	1.35	1.82	71.2
Sample #5	ND	13.7	80.7	0.40	23.3	95.2	ND	0.67	2.77	114
Sample #6	1.71	4.99	106	0.32	272	34.0	ND	ND	866	30000
Sample #7	ND	14.0	96.4	ND	28.6	40.5	ND	ND	1.24	31.6
Sample #8	0.53	0.00	291	0.49	25.9	80.3	ND	0.09	3.44	112
Sample #9	ND	18.9	81.1	0.66	30.9	57.8	ND	0.10	2.10	84.6
Sample #10	ND	1.92	22.5	0.41	16.2	27.0	ND	0.22	7.64	753
Sample #11	ND	1.39	79.1	0.29	17.3	27.4	ND	ND	19.2	2139
Sample #12	ND	ND	30.3	0.10	6.43	6.39	ND	ND	0.21	12.0
Sample #13	1.42	14.5	6.39	0.46	29.1	69.8	ND	ND	0.95	14.1
Sample #14	ND	16.2	164	0.48	40.0	74.1	ND	0.21	1.94	52.0
Sample #15	ND	30.5	235	1.04	46.1	79.6	ND	0.31	1.09	22.9
Sample #16	ND	23.0	197	0.70	33.1	75.5	ND	0.03	1.52	32.7
PQL (mg/Kg)	0.66	0.66	0.05	0.04	0.44	0.38	1.10	0.02	0.06	0.71
MDL (mg/Kg)	0.21	0.21	0.02	0.01	0.14	0.12	0.34	0.01	0.02	0.22

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7471A - Cold Vapor
ND - Not Detected at listed Practical Quantitation Limit (PQL)

Tien-Yu Chang
QA Review

0601008 / PPMETALS SOIL

DHL ANALYTICAL

QUALITY ASSU E REPORT

METALS

DHL PROJECT #: 9701008
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: Texas Hydraulics, Tennessee
DATE ANALYZED: 1/9/98 & 1/13/98

LABORATORY CONTROL SAMPLE (LCS) - % RECOVERY

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
LCS	95	100	101	98	98	101	104	98	98	110

CONTINUING CALIBRATION VERIFICATION (CCV) - % RECOVERY

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
CCV #1	100	101	100	101	100	102	102	97	101	97
CCV #2	99	103	101	102	100	104	103	99	102	97
CCV #3	100	105	102	102	101	105	105	98	102	97
CCV #4	--	--	103	--	--	--	--	--	107	103

SAMPLE DUPLICATE ANALYSIS - RELATIVE PERCENT DIFFERENCE (RPD)

SAMPLE ID	Silver [1] ppm (mg/Kg)	Arsenic [1] ppm (mg/Kg)	Barium [1] ppm (mg/Kg)	Cadmium [1] ppm (mg/Kg)	Chromium [1] ppm (mg/Kg)	Lead [1] ppm (mg/Kg)	Selenium [1] ppm (mg/Kg)	Mercury [2] ppm (mg/Kg)	Beryllium [1] ppm (mg/Kg)	Copper [1] ppm (mg/Kg)
Sample #9	ND	18.9	81.1	0.66	30.9	57.8	ND	0.18	2.10	64.6
Sample #9 DUP	ND	12.6	83.7	0.44	21.9	52.7	ND	0.19	1.23	37.4
RPD=	0.00	40.0	3.18	40.0	34.1	9.23	0.00	5.41	52.3	53.3

MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD) - % RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
Sample #7 MS	100	100	135	102	96	125	105	95	104	88
Sample #7 MSD	99	94	68	100	99	95	100	94	102	92
RPD=	1.01	6.19	66.0	1.98	3.08	27.3	4.88	1.06	1.91	0.00

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7471A - Cold Vapor
ND - Not Detected at listed Method Detection Limit (MDL)

QA Review

9801008 / PPMETALS_SOIL

DHL ANALYTICAL

METALS REPORT

DHL PROJECT #: 9701008
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: Texas Hydraulics, Tennessee

EXTRACTION METHOD:	3015	SAMPLE DATE:	1/6/98
ANALYTICAL METHOD:	See Notes Below	SAMPLE REC'D:	1/7/98
MATRIX:	WATER	SAMPLE CONDITION:	GOOD
ANALYSIS BY:	KF	EXTRACTION DATE:	1/7 & 1/12
REPORT GENERATED BY:	LB	EXTRACT. HOLD TIME (DAYS):	1 & 0
QA REVIEW:	TC	ANALYSIS DATE:	1/8 &1/12
BATCH NUMBER:	752 & 766	HOLDING TIME (DAYS):	2 & 6

SAMPLE ID:	Silver [1] ppb (ug/L)	Arsenic [1] ppb (ug/L)	Barium [1] ppb (ug/L)	Cadmium [1] ppb (ug/L)	Chromium [1] ppb (ug/L)	Lead [1] ppb (ug/L)	Selenium [1] ppb (ug/L)	Mercury [2] ppb (ug/L)	Beryllium [1] ppb (ug/L)	Copper [1] ppb (ug/L)
Method Blank	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
VP Creek	ND	ND	41.4	ND	ND	ND	ND	ND	ND	ND
E. Creek	ND	ND	41.8	ND	ND	ND	ND	ND	ND	ND
Down Stream	62.3	ND	40.9	ND	ND	ND	ND	ND	ND	ND
W. Creek	ND	ND	85.5	ND	92.2	ND	ND	ND	ND	77.3
PQL (ug/L)	26	27	2.0	1.7	18	15	43	0.07	2.5	28
MDL (ug/L)	8.3	8.4	0.6	0.5	5.5	4.6	13.6	0.02	0.8	6.9

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7470A - Cold Vapor
ND - Not Detected at listed Practical Quantitation Limit (PQL)

QA Review

ANALYTICAL

QUALITY ASSURANCE REPORT

METALS

DHL PROJECT #: 9701069
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: Texas Hydraulics, Tennessee
DATE ANALYZED: 1/9/98 & 1/13/98

LABORATORY CONTROL SAMPLE (LCS) - % RECOVERY

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
LCS	101	101	97	99	100	100	99	97	100	98

CONTINUING CALIBRATION VERIFICATION (CCV) - % RECOVERY

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
CCV #1	99	101	99	101	101	101	101	97	101	97
CCV #2	98	101	99	100	101	105	102	98	101	96
CCV #3	100	104	101	103	103	108	104	N/A	102	97

SAMPLE DUPLICATE ANALYSIS - RELATIVE PERCENT DIFFERENCE (RPD)

SAMPLE ID	Silver [1] ppb (ug/L)	Arsenic [1] ppb (ug/L)	Barium [1] ppb (ug/L)	Cadmium [1] ppb (ug/L)	Chromium [1] ppb (ug/L)	Lead [1] ppb (ug/L)	Selenium [1] ppb (ug/L)	Mercury [2] ppb (ug/L)	Beryllium [1] ppb (ug/L)	Copper [1] ppb (ug/L)
E. Creek	ND	ND	41.8	ND	ND	ND	ND	ND	ND	ND
E. Creek DUP	ND	ND	42.3	ND	ND	ND	ND	ND	ND	ND
RPD=	0.00	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00

MATRIX SPIKE / MATRIX SPIKE DUPLICATE (MS/MSD) - % RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD)

SAMPLE ID	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
Down Stream MS	91	98	95	95	98	98	98	97	98	93
Down Stream MSD	91	101	99	99	100	100	100	99	101	96
RPD=	0.00	3.02	4.12	4.12	2.02	2.02	2.02	2.04	3.02	3.17

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7470A - Cold Vapor
ND - Not Detected at listed Practical Quantitation Limit (PQL).

QA Review

FEB 09 '98 02:28PM FROM TEXAS HYDRAULICS P.03/13

DHL ANALYTICAL

METALS REPORT

DHL PROJECT #: 9801006
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: NGK Metals

EXTRACTION METHOD	3050	SAMPLE DATE:	1/5/98
ANALYTICAL METHOD	See Notes Below	SAMPLE REC'D:	1/6/98
MATRIX:	Soil	SAMPLE CONDITION:	GOOD
ANALYSIS BY:	KF	EXTRACTION DATE:	1/7/98
REPORTED BY:	KF	EXTRACT. HOLD TIME (DAYS):	0
QA REVIEW:	TC	ANALYSIS DATE:	1/7/98
BATCH NUMBER:	750 & 751	HOLDING TIME (DAYS):	2

SAMPLE ID:	Silver [1] ppm (mg/kg)	Arsenic [1] ppm (mg/kg)	Barium [1] ppm (mg/kg)	Cadmium [1] ppm (mg/kg)	Chromium [1] ppm (mg/kg)	Lead [1] ppm (mg/kg)	Selenium [1] ppm (mg/kg)	Mercury [2] ppm (mg/kg)	Beryllium [1] ppm (mg/kg)	Copper [1] ppm (mg/kg)
METHOD BLANK	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EXC #1	ND	12.0	195	ND	28.7	66.7	ND	0.43	7.23	314
EXC #2	ND	11.4	97.2	ND	41.9	29.2	ND	0.14	11.4	377
D. G.	ND	12.2	213	ND	22.6	51.3	ND	ND	0.671	17.1
PQL	0.70	0.73	0.07	0.06	2.30	1.60	2.00	0.02	0.04	0.58
MDL	0.22	0.23	0.02	0.02	0.72	0.58	0.64	0.01	0.01	0.18

Data Review

DHL ANALYTICAL

TOTAL RESIDUE ANALYTICAL RESULTS

DHL PROJECT # : 9601008
CLIENT: Texas Hydraulics
CLIENT PROJECT # : N/A
LOCATION: Texas Hydraulics, Tennessee

ANALYTICAL METHOD:	160.3	SAMPLE DATE:		1/6/98
MATRIX:	Water	SAMPLE REC'D:		1/7/98
ANALYST:	JF/SS	SAMPLE CONDITION:		GOOD
REPORT GENERATED BY:	TC	ANALYSIS DATE:		1/14/98
QA REVIEW:	LB	HOLDING TIME (DAYS):		8
SAMPLE ID:	VP CREEK	E. CREEK	DOWN STREAM	W. CREEK
TS (mg/L)	462	436	443	904
PQL (mg/L)	1	1	1	1

SAMPLE DUPLICATE ANALYSIS-RELATIVE PERCENT DIFFERENCE(RPD)

SAMPLE ID	TS (mg/L)
E. CREEK	436
E. CREEK DUP	443
RPD=	1.59

Lee Bartholl
Data Review

DHL ANALYTICAL

QUALITY ASSURANCE REPORT

DHL Project Number: 9801006
Client: Texas Hydraulics
Soil samples were analyzed on 1/7/98

Laboratory Control Sample (LCS) - % Recovery

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
LCS	92	95	94	95	96	98	97	98	95	97

Continuing Calibration Verification (CCV) - % Recovery

	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
CCV #1	93	99	100	100	98	100	100	101	98	99
CCV #2	98	89	96	101	101	102	100	95	99	100

Matrix Spike & Duplicate (MS/MSD) - % Recovery & Relative Percent Difference (RPD)

Sample ID	Silver [1]	Arsenic [1]	Barium [1]	Cadmium [1]	Chromium [1]	Lead [1]	Selenium [1]	Mercury [2]	Beryllium [1]	Copper [1]
EXC #1 MS	100	94	98	102	92	105	99	104	107	84
EXC #1 MSD	99	87	89	98	87	101	97	93	95	81
RPD=	1.01	7.73	9.63	4.00	5.59	3.88	2.04	11.2	11.9	3.64

Sample Duplicate Analysis - Relative Percent Difference (RPD)

SAMPLE ID	Silver [1] ppm (mg/kg)	Arsenic [1] ppm (mg/kg)	Barium [1] ppm (mg/kg)	Cadmium [1] ppm (mg/kg)	Chromium [1] ppm (mg/kg)	Lead [1] ppm (mg/kg)	Selenium [1] ppm (mg/kg)	Mercury [2] ppm (mg/kg)	Beryllium [1] ppm (mg/kg)	Copper [1] ppm (mg/kg)
B.G.	ND	12.2	213	ND	22.6	51.3	ND	ND	0.671	17.1
B.G. DUP	ND	12.0	223	ND	22.2	50.0	ND	ND	0.717	18.0
RPD=	0.00	1.65	4.59	0.00	1.79	2.57	0.00	0.00	6.63	5.02

NOTES: 1 - EPA Method 6010B - ICP
2 - EPA Method 7471 - Cold Vapor
ND - Not Detected at listed Practical Quantitation Limit (PQL)

Data Review

9801006/RCRA8_SOR

FEB 03 '98 01:32PM ... METHS/HYDRAULICS

APPENDIX 4

STEP'S MARCH 31, 1998, LETTER REPORT OF SAMPLING AND ANALYSIS RESULTS AT THREE SOIL SAMPLING LOCATIONS

SOLUTIONS TO ENVIRONMENTAL PROBLEMS
1006 Floyd Culler Court • Oak Ridge, Tennessee 37830
Telephone 423/481-7837 • Fax 423/481-0290

March 31, 1998

Ms. Lynn Woodside
Environmental Compliance Division
NGK Metals Corporation
Tucker Road
Temple, Pennsylvania 19560

RE: **Results of sampling at three soil sampling locations; NGK Metals Corporation, 725 East Avenue Athens, Tennessee 37303**

Dear Ms. Woodside:

Seven soil samples were collected from three locations at the referenced facility. The locations were selected based on the results of previous sampling that was conducted by Texas Hydraulics (January 1998). The three locations were not marked by Texas Hydraulics in the field. Instead the locations were marked on a map provided to NGK, by Texas Hydraulics (see attached location map).

At the Texas Hydraulics #10 sampling point (STEP's 1A, 1B) and at the Texas Hydraulics #11 sampling point (STEP's 2A, 2B) STEP encountered concrete material at about 4 inches. These samples indicated lower levels of both copper and beryllium than did Texas Hydraulics, but the beryllium is still above the Tennessee Department of Solid Waste Management Remediation Guidance Levels for soil (0.20 parts per million). At Texas Hydraulics #6 sampling location (STEP's 3A, 3B, 3C) STEP took three different samples at depths 0 to 4" (3A), 4"to 8" (3B), and 8" to 12" (3C) again. fill material was encountered to about 6 to 8 inches and after that a very clay-like soil material was encountered. These sample results were again lower than the Texas Hydraulics findings, but copper in sample 3A is still above the Tennessee Department of Solid Waste Management Remediation Guidance Levels for soil (2,960.00 parts per million) and beryllium in all three samples is still above the 0.20 parts per million level.

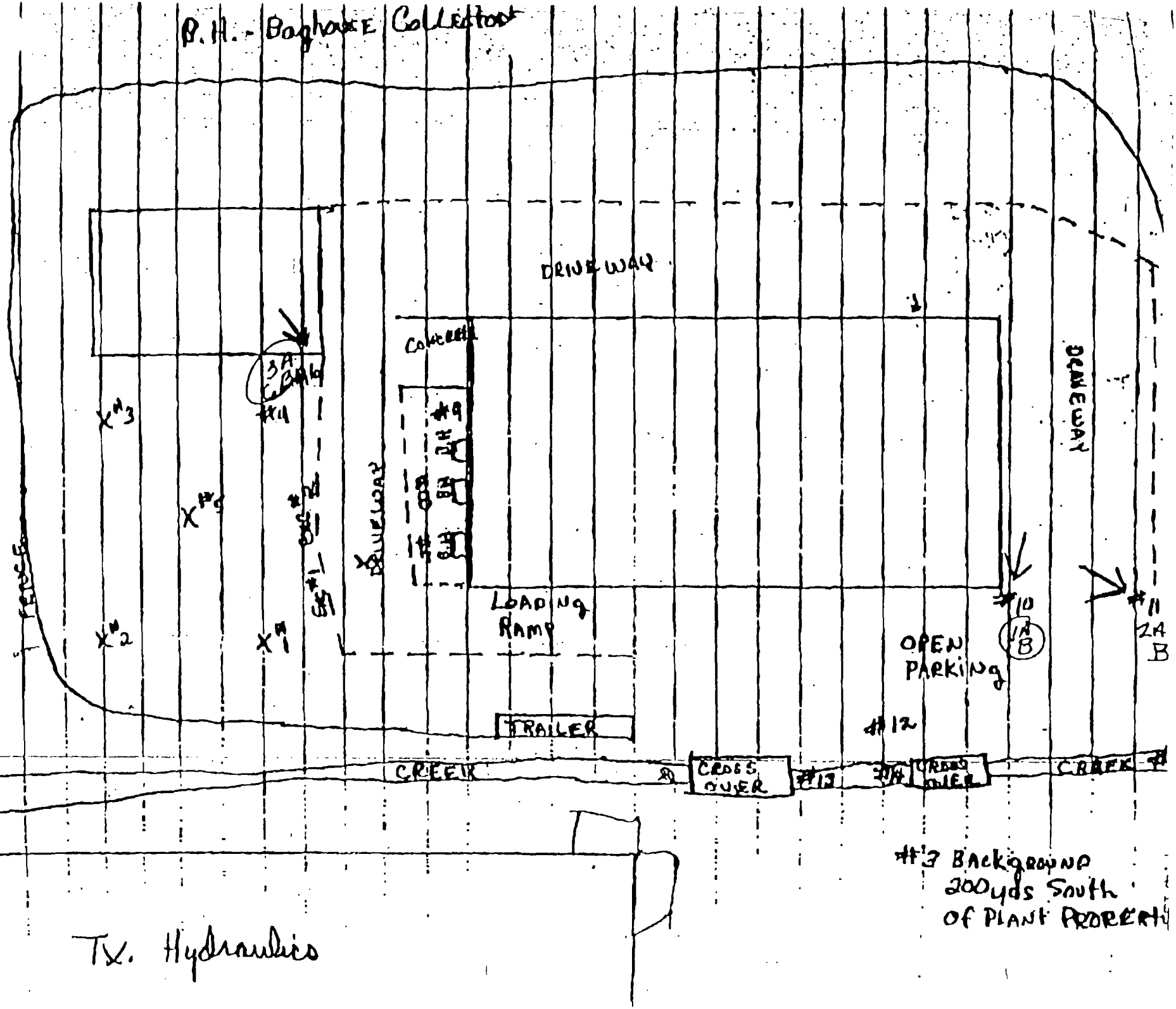
As we discussed by telephone on 3/30/98 these results indicate contamination at this site. Samples 3A, 3B, and 3C show the levels of beryllium and copper declining with depth, which may indicate only surface contamination. Also the blue material that was encountered may be copper sulfide and this was only noticed from 0 to 8" in depth.

We also discussed further options on 3/30/98 concerning this NGK site after your review of the above information please give me a call at 423-481-7837 ext.264 to talk about developing future actions and options at this site.

Sincerely,
Solutions To Environmental Problems, Inc.

Doug Hawn
Project Manager

B.H. - Baghouse Collector



#3 Background 200yds South of Plant Property

Tx. Hydraulics

Microbac Laboratories, Inc.
Knoxvill Division
505 East Broadway Avenue Maryville, TN 37804
423/977-1200 Fax: 423/984-8616

CERTIFICATE OF ANALYSIS # 9803-00104

S.T.E.P., INC.
DOUG HAWN
1093 COMMERCE PARK DR.

OAK RIDGE TN 37831-5479

Date Reported 3/26/98
Date Received 3/13/98
Date Sampled 3/13/98
Invoice No. 000462
Customer No. 8002
Cust P.O.

Subject: NGK; ATHENS, TN

ANALYSIS	RESULT	UNITS	METHOD	DATE	TECH
MPLE: 1 1A; 09:00					
PPER	50.6	MG/KG	SW846 6010	3/25/98	LAM
RYLLIUM	<1.25	MG/KG	SW846 6010	3/26/98	LAM
MPLE: 2 1B; 09:15					
PPER	77.1	MG/KG	SW846 6010	3/25/98	LAM
[illegible]UM	2.20	MG/KG	SW846 6010	3/26/98	LAM
MP[illegible]: 3 2A; 09:30					
PPER	32.6	MG/KG	SW846 6010	3/25/98	LAM
RYLLIUM	<1.25	MG/KG	SW846 6010	3/26/98	LAM
MPLE: 4 2B; 09:45					
PPER	15.0	MG/KG	SW846 6010	3/25/98	LAM
RYLLIUM	<1.25	MG/KG	SW846 6010	3/26/98	LAM
MPLE: 5 3A; 10:00					
PPER	7454	MG/KG	SW846 6010	3/25/98	LAM
RYLLIUM	72.3	MG/KG	SW846 6010	3/26/98	LAM
MPLE: 6 3B; 10:15					
PPER	1200	MG/KG	SW846 6010	3/25/98	LAM
RYLLIUM	9.88	MG/KG	SW846 6010	3/26/98	LAM
MPLE: 7 3C; 10:45					
PPER	509	MG/KG	SW846 6010	3/25/98	LAM
[illegible]LLIUM	6.46	MG/KG	SW846 6010	3/26/98	LAM

CERTIFICATE OF ANALYSIS CONTINUED ON NEXT PAGE.

The data and other information contained on this, and other accompanying documents, represents only the sample(s) analysed and is rendered upon the condition that it is not to be reproduced wholly or in part for advertising or other purposes without written approval from the laboratory.

APPENDIX 5

STEP'S JULY 10, 1998, PHASE II SAMPLING EVENT REPORT

STEP

PHASE II SAMPLING EVENT

Former NGK Metals Corporation Facility
at
725 East Avenue
(McMinn County)
Athens, Tennessee

Submitted to:
Ms. Lynne Woodside
Supervisor Environmental Affairs
NGK Metals Corporation
Tuckerton Road
Reading, Pennsylvania 19612

Submitted by:

Solutions To Environmental Problems, Inc.
1006 Floyd Culler Ct.
Oak Ridge, Tennessee 37830

July 10, 1998
STEP Project No. 110-082-002

STEP

Introduction:

Solutions to Environmental Problems, Inc. (STEP) has completed the soils investigation as requested by NGK Metals Corporation. On June 6, 1998, soil sampling was performed at the former NGK Metals Corporation, Athens, Tennessee facility. The sampling was conducted to determine the approximate vertical and horizontal extent of potential copper and beryllium contamination in an area that is next to the old bag house. As directed, samples were obtained from the ground surface to a depth of twelve inches. The area of concern encompassed an area roughly 100' x 100' next to the old bag house collection area.

The analytical results were compared to the Tennessee Department of Solid Waste Management Remediation Guidance Levels (RGL) to determine if the concentrations exceeded industrial remediation values.

The sampling locations, soil sampling, analytical results, conclusions/findings, and recommendations that NGK may consider for future activities are discussed below.

Sampling Locations:

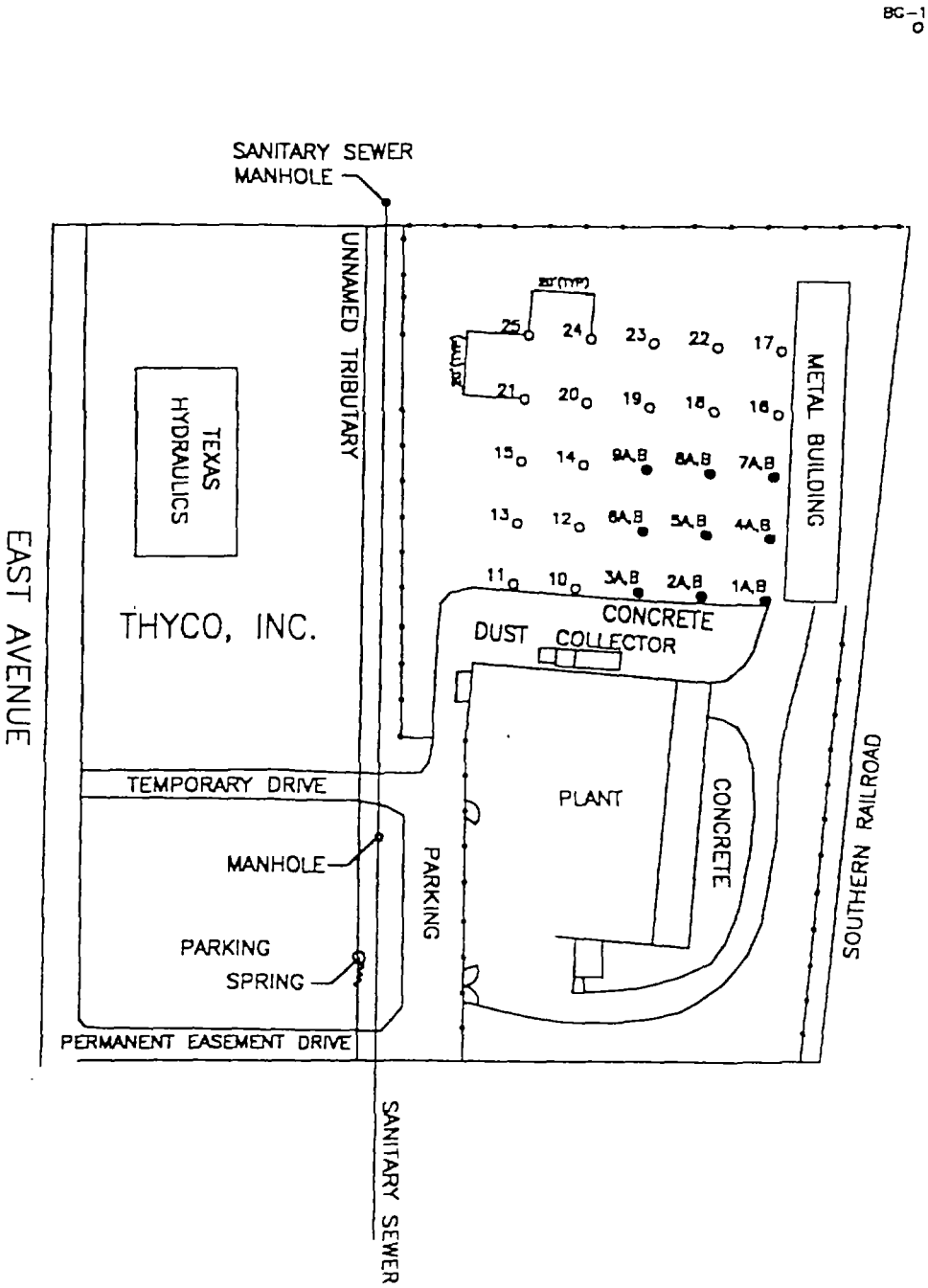
Previous soil investigations conducted at the site (January 1998, March 1998) had identified copper and beryllium concentrations that exceed the RGL (mainly on the east side of the facility). The current sampling effort consisted of obtaining thirty-two soil samples from 27 locations on a rectangular grid pattern. In addition, four samples were taken from potentially non-impacted areas for determining background concentrations.

Prior to sampling, the grid system was established by placing a wooden-stake at each node of a 20' rectangular grid. The stakes were labeled to coincide with the sample number to be obtained. The grid system was based on the previous sample results obtained. The grid was initiated at the corner of the concrete pad area on the north side of the facility (i.e sample 1A, B).

The background sampling locations were chosen at random, with BG-1 being in the northeastern-most corner of NGK the property. Background sample BG-2 was obtained approximately 200 yards southwest of the most southern parking area. The sampling locations are shown on Figure 1.

Soil Sampling:

Samples were collected by using a push and/or hand auger. The sampling equipment was decontaminated with alconox and deionized water, with the sampling tools air-dried before use at each location The samples were collected at appropriate depths, composited, placed in clean sample containers, labeled and placed on ice within a cooler. Once the sampling was completed, the cooler was shipped via Federal Express to the laboratory for analysis. A composite sample was taken from 0"-6"in depth and another composite sample was taken from 6"-12" depth at 9 locations. Samples were also composited from 0"-12" at 18 sampling locations that also included the background samples. The samples that were taken from 0"to 6" were labeled with an "A" designation and the samples taken from 6"to 12" were labeled with a "B."



LEGEND

- ● A & B SAMPLE
  (A 0"– 6")
  (B 6" – 12")
- ○ 0" – 12" SAMPLE

FIGURE 1

NOTES:	SAMPLING LOCATIONS
BASE MAP PROVIDED BY CLIENT	NGK METALS FACILITY
	ATHENS, TENNESSEE
SITE LOCATION:	STER 1008 FLOYD CULLER COURT OAK RIDGE TN. 37830 (423) 481-7837
725 EAST AVENUE	
ATHENS, TENNESSEE	

STEP

Analytical Results:

Each of the thirty-six samples were analyzed for total beryllium and total copper. These analytical results were compared to the RGL's to determine if the results were in excess of the industrial remediation values. All thirty-six samples were above the RGL for beryllium. The beryllium concentrations ranged from 1.14 parts per million (ppm) to 38.6 ppm. The RGL for beryllium is 0.20 parts per million (ppm). Only one of the thirty-six samples was above the RGL for copper. The RGL for copper is 2,960 ppm. The results of the copper samples ranged from 2.12 ppm to 3540 ppm with the mean being 393.07 ppm. A table indicating the results for both beryllium and copper is included in Appendix I. The sample custody documentation and the lab certificates are in Appendix II.

Conclusion/Findings:

The soil encountered during sampling consisted primarily of a thin (0"-2") vegetative-topsoil layer which was over a reddish-brown, hard, clay layer to the bottom of the sampling depth. The two eastern-most grid lines encountered the same topsoil layer overlying a reddish-brown hard clay layer to a depth of apprpoximately 8 inches. The next layer encountered was a dark-brown to black, fine-grained, sandy-silt layer (probably fill) to the bottom of the sampling depth.

As stated previously, the results indicated that all the samples were above the RGL for beryllium, and only one sample was above the RGL for copper. The highest concentration for beryllium and copper came from sample 1A. The highest results for beryllium were at the southeast corner of the grid. It should be noted that in all the "A, B" samples except for two, the copper results indicated a substantial increase in the 6" to 12" sample, as compared to the 0" to 6" sample, but these results were still below the RGL.

Recommendations:

STEP recommends that the vertical and horizontal extent of the berylium contamination be determined. Once the extent of contamination is determined, volume calculations and remediation options can be investigated.

As an additional course of action, to speed up the remediation process, contact the appropriate state agency division by letter or phone concerning our findings and set up a meeting to discuss a course of action. In some instances the contact to the state is best made by company attorneys when potential contamination is at issue.

APPENDIX I

STEP

Sampling Results for NGK Athens Plant

Sample ID	Beryllium Results	Copper Results
NGK-1A	**38.6**	**3540***
NGK-1B	1.21	6.45
NGK-2A	2.72	41.8
NGK-2B	12.1	596
NGK-3A	1.44	5.77
NGK-3B	2.45	29.2
NGK-4A	9.4	780
NGK-4B	28.2	2580
NGK-5A	14.1	1220
NGK-5B	23.4	2380
NGK-6A	4.29	136
NGK-6B	1.19	10.5
NGK-7A	2	77
NGK-7B	9.49	782
NGK-8A	1.96	86.3
NGK-8B	1.75	61
NGK-9A	1.66	22.4
NGK-9B	1.93	49.7
NGK-10	1.71	23.1
NGK-11	1.36	5.73
NGK-12	1.25	12.8
NGK-13	1.14	27.9
NGK-14	1.31	24.8
NGK-15	1.2	8.33
NGK-16	3	398
NGK-17	4.28	352
NGK-18	4.91	344
NGK-19	1.31	30.7
NGK-20	3.17	387
NGK-21	1.24	5.49
NGK-22	2.34	63.7
NGK-23	1.59	36.8
NGK-24	1.2	7.36
NGK-25	1.39	11
NGK-BG-1	1.51	5.63
NGK-BG-2	1.81	2.12

Highest results for both beryllium and copper are in bold. All beryllium samples were above the Tennessee Department of Solid Waste Remediation Guidance Levels (RGLs) for soil. * Indicates the only copper sample above the RGLs.

APPENDIX II

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

CHAIN OF CUSTODY

Project Number: 110-082-110-002 | Sampler: D. HAWN

Project Name: NGK Athens | SAE Quote: 060998A120

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	CU	Be
69537	NGK-1A	6-16-98	0930	soil		X		✓	✓
538	NGK-1B		0930					✓	✓
539	NGK-2A		1034					✓	✓
540	NGK-2B		1034					✓	✓
541	NGK-3A		1042					✓	✓
542	NGK-3B		1042					✓	✓
543	NGK-4A		0945					✓	✓
544	NGK-4B		0945					✓	✓
69545	NGK-5A		1132					✓	✓

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:
Doug Hawn Doug Hawn	6/16/98 1700					
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:
						CRB

Cooler Temperature When Recevied: 4

Laboratory Project Number: 104048

Cooler Seals Intact?

SPECIAL INSTRUCTIONS:

Normal
Turn
Around

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

CHAIN OF CUSTODY

Project Number: 110-082-110-002 | Sampler: D. Hawn

Project Name: NGK Athens | SAE Quote: 060998A120

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Cu	Be
69546	NGK-5B	6-16-98	1132	soil		X		✓	✓
547	NGK-6A		1115					✓	✓
548	NGK-6B		1115					✓	✓
549	NGK-7A		1000					✓	✓
550	NGK-7B		1000					✓	✓
551	NGK-8A		1155					✓	✓
552	NGK-8B		1155					✓	✓
553	NGK-9A		1208					✓	✓
69554	NGK-9B	↓	1208					✓	✓

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	
Doug Hawn Doug Hawn	6/16/98 1700						
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	
						CB	6/17

Cooler Temperature When Received:

Laboratory Project Number:

Cooler Seals Intact?

SPECIAL INSTRUCTIONS:

Normal Turn Around

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

CHAIN OF CUSTODY

Project Number: 110-082-110-002 | Sampler: D. Hawn

Project Name: NGK Athens | SAE Quote: 060998A120

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Cu	Be							
69555	NGK-10	6-16-98	1052	Soil		X		✓	✓							
556	NGK-11		1102					✓	✓							
557	NGK-12		1125					✓	✓							
558	NGK-13		1142					✓	✓							
559	NGK-14		1228					✓	✓							
560	NGK-15		1220					✓	✓							
561	NGK-16		1010					✓	✓							
562	NGK-17		1020					✓	✓							
69563	NGK-18	✓	1149					✓	✓							

Analysis Requested

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
Doug Hawn Doug Hawn	6/16/98 1700						
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
						CBB	6/17

Cooler Temperature When Received:

Laboratory Project Number:

Cooler Seals Intact?

SPECIAL INSTRUCTIONS:

Normal Turn Around

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

CHAIN OF CUSTODY

Project Number: 110-082-110-002 | Sampler: D. Hawn

Project Name: NGK Athens | SAE Quote: 060998A120

Analysis Request

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Cu	Be					
119564	NGK-19	6-16-98	1100	soil		X		✓	✓					
565	NGK-20		1240					✓	✓					
566	NGK-21		1237					✓	✓					
567	NGK-22		1202					✓	✓					
568	NGK-23		1308					✓	✓					
569	NGK-24		1300					✓	✓					
570	NGK-25		1251					✓	✓					
571	NGK-BG1		1314					✓	✓					
119572	NGK-BG-2		1316					✓	✓					

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:
Doug Hawn Doug Hawn	6/16/98 1700					
Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by: CJB

Cooler Temperature When Received:

Laboratory Project Number:

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:

Normal Turn Around

SPECIALIZED ASSAYS, INC.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-003
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69537
Sample ID: NGK-1A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 9:30
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	38.6	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	3540	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director

Laboratory Certification Number: 02008

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69538
Sample ID: NGK-1B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 9:30
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.21	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	6.45	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69539
Sample ID: NGK-2A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:34
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.72	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	41.8	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69540
Sample ID: NGK-2B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:34
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	12.1	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	60100	5966
Copper	595.	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	60100	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69541
Sample ID: NGK-3A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:42
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.44	mg/kg	0.96	0.96	1	6/19/98	6:51	R.Street	6010B	5966
Copper	5.77	mg/kg	0.96	0.96	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69542
Sample ID: NGK-3B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:42
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.45	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	60100	5966
Copper	29.2	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	60100	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69543
Sample ID: NGK-4A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 9:45
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	9.40	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	60100	5966
Copper	780.	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	60100	5966

ND = Not detected at the report limit.

Report Approved By: Danny Hale Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69544
Sample ID: NGK-4B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 9:45
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	28.2	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966
Copper	2580	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966

nD = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69545
Sample ID: NGK-5A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:32
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	14.1	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	1220	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1005 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69546
Sample ID: NGK-5B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:32
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	23.4	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	60100	5966
Copper	2380	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	60100	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69547
Sample ID: NGK-6A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:15
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	4.29	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	136.	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny R. Hale, M.S., Laboratory Director

Laboratory Certification Number: 02008

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69548
Sample ID: NGK-6B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:15
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.19	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	10.5	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69549
Sample ID: NGK-7A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:00
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.00	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	77.0	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69550
Sample ID: NGK-7B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:00
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	9.49	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	782.	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69551
Sample ID: NGK-8A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:55
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.96	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	86.3	mg/kg	1.01	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69552
Sample ID: NGK-8B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:55
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.75	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966
Copper	61.0	mg/kg	1.00	1.00	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69553
Sample ID: NGK-9A
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:08
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.66	mg/kg	0.96	0.96	1	6/19/98	6:51	R.Street	6010B	5966
Copper	22.4	mg/kg	0.96	0.96	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69554
Sample ID: NGK-9B
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:08
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.93	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966
Copper	49.7	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69555
Sample ID: NGK-10
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:52
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.71	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966
Copper	23.1	mg/kg	0.97	0.97	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69556
Sample ID: NGK-11
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:02
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.36	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966
Copper	5.73	mg/kg	0.99	0.99	1	6/19/98	6:51	R.Street	6010B	5966

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69557
Sample ID: NGK-12
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:25
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.25	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	12.8	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69558
Sample ID: NGK-13
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:42
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.14	mg/kg	1.00	1.00	1	6/19/98	7:03	R.Street	60100	5967
Copper	27.9	mg/kg	1.00	1.00	1	6/19/98	7:03	R.Street	60100	5967

ND = Not detected at the report limit.

Report Approved By: Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69559
Sample ID: NGK-14
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:28
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.31	mg/kg	0.96	0.96	1	6/19/98	7:03	R.Street	60100	5967
Copper	24.8	mg/kg	0.96	0.96	1	6/19/98	7:03	R.Street	60100	5967

ND = Not detected at the report limit.

Report Approved By: Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69560
Sample ID: NGK-15
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:20
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.20	mg/kg	1.02	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	8.33	mg/kg	1.02	1.00	1	6/19/98	7:03	R.Street	6010B	5967

<0 = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69561
Sample ID: NGK-16
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:10
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	3.00	mg/kg	1.00	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	398.	mg/kg	1.00	1.00	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69562
Sample ID: NGK-17
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 10:20
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	4.28	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	352.	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69563
Sample ID: NGK-18
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:49
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	4.91	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967
Copper	344.	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

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1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69564
Sample ID: NGK-19
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 11:00
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.31	mg/kg	1.01	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	30.7	mg/kg	1.01	1.00	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69565
Sample ID: NGK-20
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:40
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	3.17	mg/kg	0.99	0.99	1	6/19/98	7:03	R.Street	6010B	5967
Copper	387.	mg/kg	0.99	0.99	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69566
Sample ID: NGK-21
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:37
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.24	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967
Copper	5.49	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69567
Sample ID: NGK-22
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:02
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.34	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967
Copper	63.7	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69568
Sample ID: NGK-23
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 13:06
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.59	mg/kg	1.01	1.00	1	6/19/98	7:03	R.Street	6010B	5967
Copper	36.8	mg/kg	1.01	1.00	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69569
Sample ID: NGK-24
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 13:00
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.20	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	7.36	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69570
Sample ID: NGK-25
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 12:51
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.39	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967
Copper	11.0	mg/kg	0.98	0.98	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

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ANALYTICAL REPORT

STEP, INC. 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-082-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69571
Sample ID: NGK-BG-1
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 13:26
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.51	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	5.63	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 6/19/98

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ANALYTICAL REPORT

STEP, INC 5860

1006 FLOYD CULLER CT
OAK RIDGE, TN 37830

Project: 110-092-110-002
Project Name: NGK ATHENS
Sampler: D. HAWN

Lab Number: 98-A69572
Sample ID: NGK-BG-2
Sample Type: Soil
Site ID:

Date Collected: 6/16/98
Time Collected: 13:16
Date Received: 6/17/98
Time Received: 8:30

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.81	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967
Copper	2.12	mg/kg	0.97	0.97	1	6/19/98	7:03	R.Street	6010B	5967

ND = Not detected at the report limit.

Report Approved By _____ Report Date: 6/19/98

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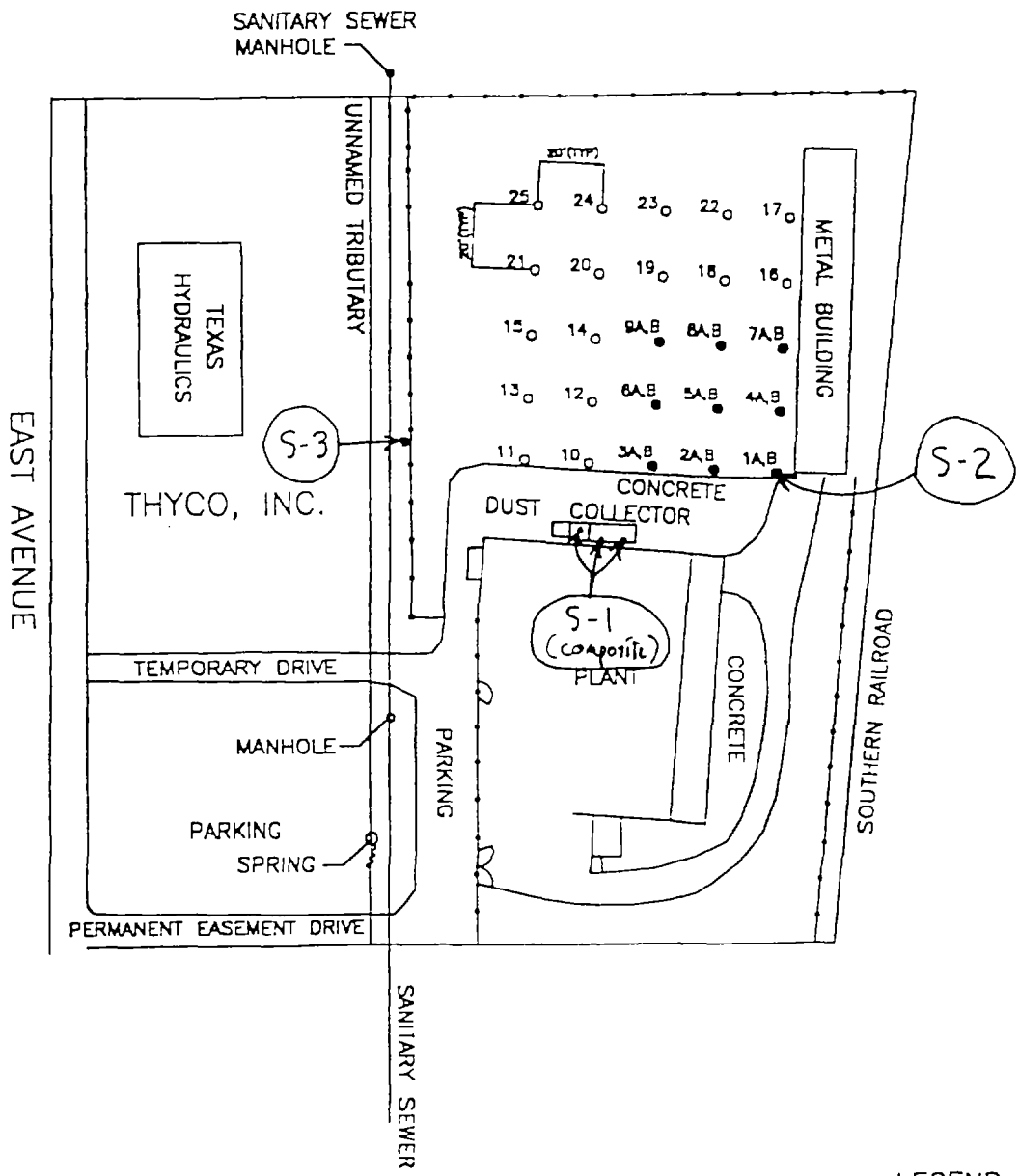
APPENDIX 6

LABORATORY REPORTS FOR SOIL SAMPLES COLLECTED BY TRIAD ON NOVEMBER 5, 1998

11/5/98 SAMPLING LOCATIONS



LEGEND

- ● A & B SAMPLE
  - (A 0" – 6")
  - (B 6" – 12")
- ○ 0" – 12" SAMPLE

FIGURE 1

NOTES:	SAMPLING LOCATIONS
BASE MAP PROVIDED BY CLIENT	NGK METALS FACILITY
	ATHENS, TENNESSEE
SITE LOCATION:	STER — 1006 FLOYD CULLER COURT, OAK RIDGE TN. 37830, (423) 481-7837
725 EAST AVENUE	
ATHENS, TENNESSEE	Solutions To Environmental Problems, Inc.

DATE: 6/26/98 NOT TO SCALE

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ANALYTICAL REPORT

[illegible]

Lab Number: [illegible]
Sample ID: [illegible]
Sample Type: [illegible]
Site ID

Date Collected: [illegible]
Time Collected: [illegible]
Date Received: [illegible]
Time Received: [illegible]

[illegible]

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ANALYTICAL REPORT

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]										
[illegible]										
[illegible]										
[illegible]										
[illegible]										
[illegible]										

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

COPY 3

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ANALYTICAL REPORT

[illegible]

	Report	Quan	Dil	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

Laboratory Certification Number [illegible]

SPECIALIZED ASSAYS
ENVIRONMENTAL

7A-052964

2960 Foster Creighton Drive
Nashville, TN 37204
615-726-0177, 800-765-0980
FAX 615/726-3404

Specialized Assays: (800) 765-098

REFERRING CLIENT
Account: 6921
Triad Env. Consultants
Eric Lehnohoff
207 Donelson Pike, Ste 200
Nashville, TN 37214
Ph: 615-889-6888 Fax: 615-889-4004

LING CONTROL NUMBER (FOR LAB USE ONLY): 120670

PROJECT #: 98-NGK01-01

P.O. #:

MPLERS (Signature-Please Print): Dwight Hinch (Dwight Hinch)

PROJECT NAME: NGK Metals / Athens Site

FOR LAB USE ONLY ACC#	SAMPLE DESCRIPTION	DATE	TIME	COMP	GRAB	# OF CONT	ANALYSIS REQUESTED
3-A142208	S-1	11/5/98	1158 ~~1145~~ TDH	X		1	Total Be, Cu, As; % Moisture
3-A142210	S-2	11/5/98	1205		X	2	Total Be, Cu; % Moisture ~~[illegible]~~ TDH Be, Cu by SPLP
3-A142209	S-3	11/5/98	1212		X	1	Total Be, Cu, As; % Moisture

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Received for Laboratory by	Date / Time
Dwight Hinch	11/16/98 0834	Denton Hill	[illegible]	11/16/98 11:04
Denton Hill	1100 11/16/98	[illegible]		
[illegible]	11/16/11:00			

Remarks: RUSH ALL ANALYSES

SAI Project #:

For further assistance in completing the chain of custody form please refer to the instructions found on the opposite sid

APPENDIX 7

LABORATORY REPORTS FOR SOIL SAMPLES COLLECTED BY TRIAD ON NOVEMBER 30, 1998

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A149799
Sample ID: C-0.75
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:45
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Arsenic	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Barium	2.18	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Cadmium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
[illegible]onium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
[illegible]d	1.98	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
[illegible]cury	ND	mg/kg	0.10	0.10	1	12/ 2/98	13:02	R. Kelley	7471	7718
Selenium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Silver	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719

ND = Not detected at the report limit.

Report Approved By: JMMitchell Report Date: 12/ 3/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148946
Sample ID: A-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.01	1.00	1	12/ 1/98	15:53	C.Holmes	6010B	7182
Copper	2.64	mg/kg	1.01	1.00	1	12/ 1/98	15:53	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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Nashville, TN 37204-0566
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148947
Sample ID: A-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:30
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	6.21	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148948
Sample ID: A-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:35
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	3.31	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Lab Number: 98-A148949
Sample ID: A-3.0
Sample Type: Soil
Site ID

Date Collected: 11/30/98
Time Collected: 12:40
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.90	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	ND	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182

"ND" = Not detected at the report limit

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148954
Sample ID: B-1 S
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.98	0.98	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	22.3	mg/kg	0.98	0.98	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number 98-A148955
Sample ID: B-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:25
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.00	1.00	1	12/ 1/98	15:55	C Holmes	60100	7182
Copper	8.03	mg/kg	1.00	1.00	1	12/ 1/98	15:55	C.Holmes	60100	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148956
Sample ID: B-2.5
Sample Type: Soil
Site ID

Date Collected: 11/30/98
Time Collected: 10:30
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.17	mg/kg	0.97	0.97	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	1.75	mg/kg	0.97	0.97	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148957
Sample ID: B-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:45
Date Received: 11/30/98
Time Received: 18.19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.15	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	60100	7182
Copper	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	60100	7182

= Not detected at the report limit.

Report Approved By _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148962
Sample ID: C-0.75
Sample Type: Soil
Site ID.

Date Collected: 11/30/98
Time Collected: 13:45
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.38	mg/kg	0.99	0.99	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	514.	mg/kg	0.99	0.99	1	12/ 1/98	15:56	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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P.O. Box 40566
Nashville, TN 37204-0566
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIN LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Lab Number 98-A148958
Sample ID: C-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:10
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7132
Copper	19.7	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7132

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
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P.O. Box 40566
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Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148959
Sample ID: C-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:15
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	5.01	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
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2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148960
Sample ID: C-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.02	1.00	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	7.14	mg/kg	1.02	1.00	1	12/ 1/98	15:56	C.Holmes	6010B	7182

= Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number. 98-A148961
Sample ID. C-3.0
Sample Type. Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:25
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.18	mg/kg	0.98	0.98	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	2.17	mg/kg	0.98	0.98	1	12/ 1/98	15:56	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148950
Sample ID: D-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:08
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	3.38	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	139.	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182

* = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148951
Sample ID: D-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:12
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	60100	7182
Copper	6.37	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	60100	7182

ND = Not detected at the report limit

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148952
Sample ID: D-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:16
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.19	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	ND	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182

' = Not detected at the report limit.

Report Approved By _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A Officer
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148953
Sample ID: D-3.0
Sample Type: Soil
Site ID.

Date Collected: 11/30/98
Time Collected: 13:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.00	1.00	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	2.81	mg/kg	1.00	1.00	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

CHAIN OF CUSTODY

Project Number: 98-NGK 01-01 | Sampler: JEFF POSTELL

Project Name: | SAE Quote:

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Copper	Beryllium	
148946	A-1.5	11/30/98	12:20	SOIL	X		1	X	X	24hr RUSH
47	A-2.0		12:30							
48	A-2.5		12:35							
49	A-3.0		12:40							
50	D-1.5		1:08							
51	D-2.0		1:12							
52	D-2.5		1:16							
148953	D-3.0		1:20							

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
Jeff Postell	11/30/98 PM 5:55	Dwight Hinch	11/30/98 PM 5:55	Dwight Hinch	11/30/98 5:58 PM	[signature]	11/30 5:5[illegible]
[signature]	11/30/98 6:15 PM	[signature]	11/30/98 1819	[signature]		M. Bradley	11/30 18[illegible]

Cooler Temperature When Received: 4°C

Laboratory Project Number: 122164

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
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Phone 1-615-726-0177

TRIAD ENV. CONSULTANTS 6921
ERIN LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

CHAIN OF CUSTODY

Project Number: 98-NGK01-01 | Sampler: JEFF POSTELL

Project Name: | GAE Quote:

Analysis Requested: Copper, Beryllium

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Copper	Beryllium					
148954	B-1.5	11/30/98	10:20	SOIL	X	X	1	X	X	24	hr	RUSH		
55	B-2.0		10:25											
56	B-2.5		10:30											
57	B-3.0		10:45											
58	C-1.5		11:10											
59	C-2.0		11:15											
60	C-2.5		11:20											
61	C-3.0		11:25											
148962	C-0.75		1:45											

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	
Jeff Postell	11/30/98 5:55PM	Dwight Hendr	11/30/98 5:55 PM	Dwight Hendr	11/30/98 5:58 PM	[illegible]	11/30 5:5
[illegible]	11/30/98 6:15PM	[illegible]	[illegible] 1818	Relinquished by:	D/T	Received by: MB	11/30 15

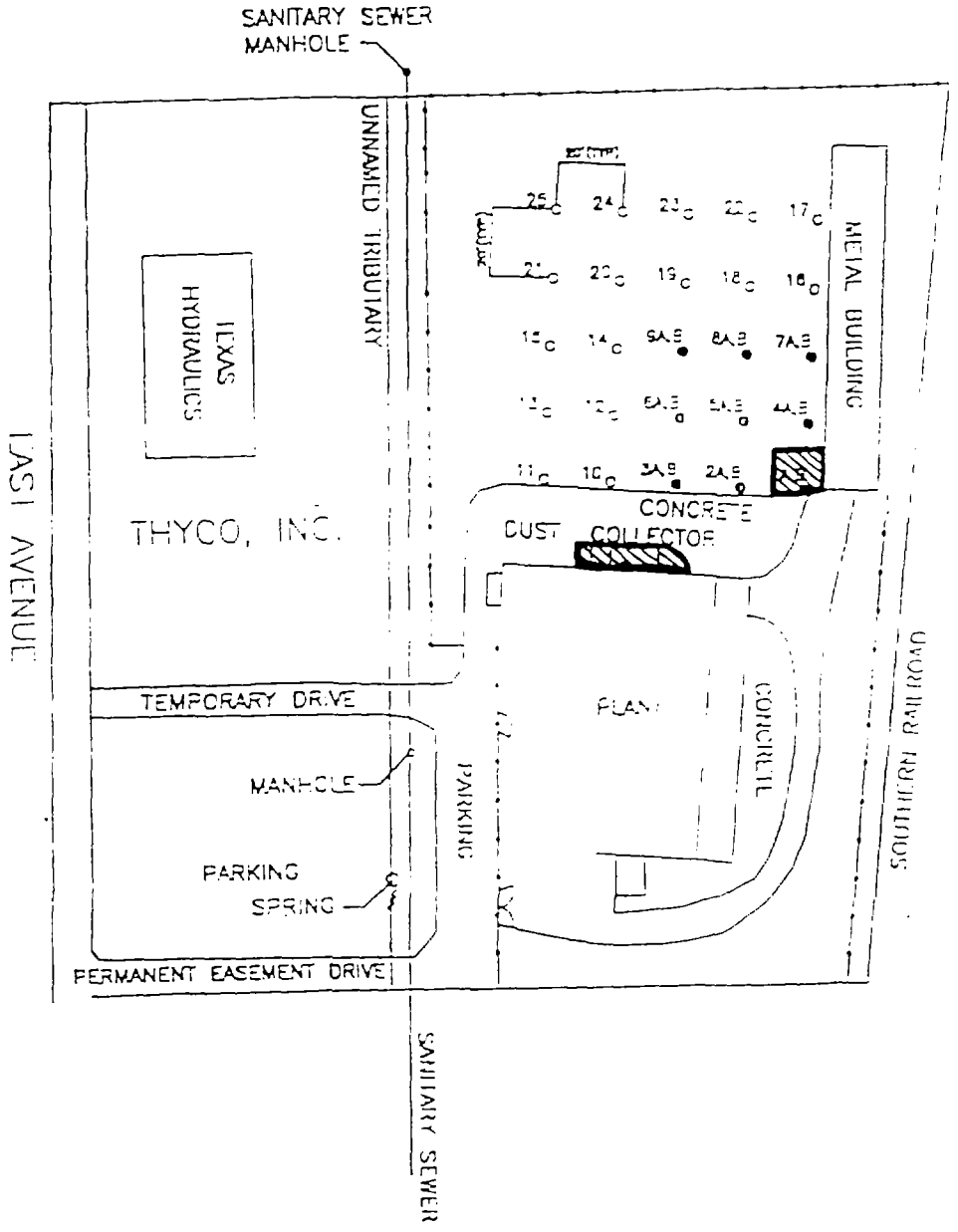
Cooler Temperature When Received:

Laboratory Project Number:

Cooler Seals Intact?

Fed-X Air Bill Number:

SPECIAL INSTRUCTIONS:



Areas where soil was removed and disposed offsite

Notes:
1. Base map provided by client.
2. Approximately one foot of soil was removed from all designated areas.
3. Areas where soil was removed was backfilled with gravel.

PREPARED BY:

TriAD Environmental Consultants, Inc
207 Donelson Pike, Suite 200
Nashville, Tennessee 37214
Phone 615-889-6888 Fax 615-889-4004

FIGURE 1
PROPOSED REMEDIAL ACTION

NGK METALS SITE
ATHENS, TENNESSEE

DWG DATE 12 3/98 SHEET 1 OF 1

APPENDIX 9

SOIL DISPOSAL MANIFESTS AND OTHER DOCUMENTATION

USA WASTE SERVICES, INC.

NON - HAZARDOUS WASTE MANIFEST

FOR OFFICE USE ONLY
Customer Acct. No.
Ticket No.

GENERATOR

NO. 099616

Name: NGR metals Corporation
Generating Location: Same
Address: 725 East Avenue
Athens, TN 37303
Phone No.: 615-889-6888

USA WASTE APPROVAL NUMBER	WASTE DESCRIPTION	QUANTITY	UNITS
PBL-98-12-003	Copper & Beryllium Impacted Soil	9.87	T

UNITS
D - DRUM
B - BAG
C - CARTON
P - POUNDS
Y - YARD
O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Mark Satterfield — AUTHORIZED AGENT'S NAME (PRINT)
12-8-98 — DATE
Mark Satterfield — SIGNATURE

TRANSPORTER

Transporter's Name: Fox Waste
Address: 3331 St Elmo Avenue
Chattanooga, TN 37408
Phone No.: 423-267-0166
Driver's Name: Don Hartley
Vehicle's No.:

I hereby certify that the above named material was picked up at the Generator site listed above and delivered without incident to the disposal facility listed below.

12-10-98 — SHIPMENT DATE
Don Hartley — DRIVER'S SIGNATURE
12-10-98 — DELIVERY DATE
Don Hartley — DRIVER'S SIGNATURE

DISPOSAL FACILITY

Site Name: Pine Bluff Landfill
Address: 13809 E. Cherokee Drive, Ball Ground, Ga 30107
Permit No.: #028-039 D (SC)
Phone No.: 770-479-2936
Time:

I hereby certify that the above material has been accepted and that the information presented on this document are true and accurate.

Jenkins — NAME
12/15/98 — DATE
Stacy Jenkins — SIGNATURE

TRANSPORTER

USA WASTE SERVICES, INC.

NON - HAZARDOUS WASTE MANIFEST

FOR OFFICE USE ONLY
Customer Acct. No.
Ticket No.

GENERATOR

NO. 099617

Name Christy Danny Dothis
Name NGK Metals Corporation
Address 725 East Avenue
Athens TN 37303
Phone No. 615-869-6888

Generating Location Same

USA WASTE APPROVAL NUMBER	WASTE DESCRIPTION	QUANTITY	UNITS
PBC-98-12-003	Copper + Beryllium Impacted Soil	9.65	T

UNITS
D - DRUM
B - BAG
C - CARTON
P - POUNDS
Y - YARD
O - OTHER

I hereby certify that the above listed material(s), is (are) not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law: That each waste has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulation.

Mark Satterfield — AUTHORIZED AGENT'S NAME (PRINT)
12-8-98 — DATE
Mark Satterfield — SIGNATURE

TRANSPORTER

Transporter's Name Fox Waste
Address 3331 St Elmo Avenue
Chattanooga, TN 37408
Phone No. 423-267-0166
Driver's Name Don Hartley
Vehicle's No. 328

I hereby certify that the above named material was picked up at the Generator site listed above and delivered without incident to the disposal facility listed below.

12-15-98 — SHIPMENT DATE
Don Hartley — DRIVER'S SIGNATURE
12-15-98 — DELIVERY DATE
Don Hartley — DRIVER'S SIGNATURE

DISPOSAL FACILITY

Site Name Pine Bluff Landfill
Address 13809 E. Cherokee Drive, Ball Ground Ga 30107
Permit No #028-039 D(SL)
Phone No. 770-479-2936
Time

I hereby certify that the above material has been accepted and that the information presented on this document are true and accurate.

D Cester — NAME
12/15/98 — DATE
SIGNATURE

Dec-10-98 10:00A PINE BLUFF

WASTE MANAGEMENT

PINE BLUFF LANDFILL
13809 E. Cherokee Dr.
Ball Ground, GA 30107
770/479-2936
770/479-3265 Fax

Jeff
4 pages

Date: 12/12/1998 11:20 AM
TIME IN: 11:30 AM Ticket: 00531
306-150 PO #: PBU 9812003
TRIAD ENVIRONMENTAL (NGR
PBU 9812003 (NGR METALS)
207 DONELSON PK SUITE 200
NASHVILLE TN 37214

Driver: Truck: 337
Manifest #: 99617

Description	Quantity	Rate	Amount
SOIL	7.65 TON	22.00	212.30

Source: TNACTH Type: SOIL District: IN
GVW 50220 TW 31580

TOTAL TAXES & SURCHARGES .00

Signature Don Hartley Total $212.30

WASTE MANAGEMENT

PINE BLUFF LANDFILL
13809 E. Cherokee Dr.
Ball Ground, GA 30107
770/479-2936
770/479-3265 Fax

Date: 12/15/1998 [illegible]
TIME IN: [illegible] Ticket: [illegible]
[illegible] PO #: [illegible]
TRIAD ENVIRONMENTAL (NGR)
SOL [illegible] (NGR METALS)
[illegible] DONELSON PL SUITE [illegible]
[illegible]

Driver: Truck: [illegible]
Manifest #: [illegible]

Description	Quantity	Rate	Amount
SOL	9.67 TON	[illegible]	217.14

Source: [illegible] Type: SOL District: [illegible]
[illegible]

TOTAL TAXES & SURCHARGES [illegible]

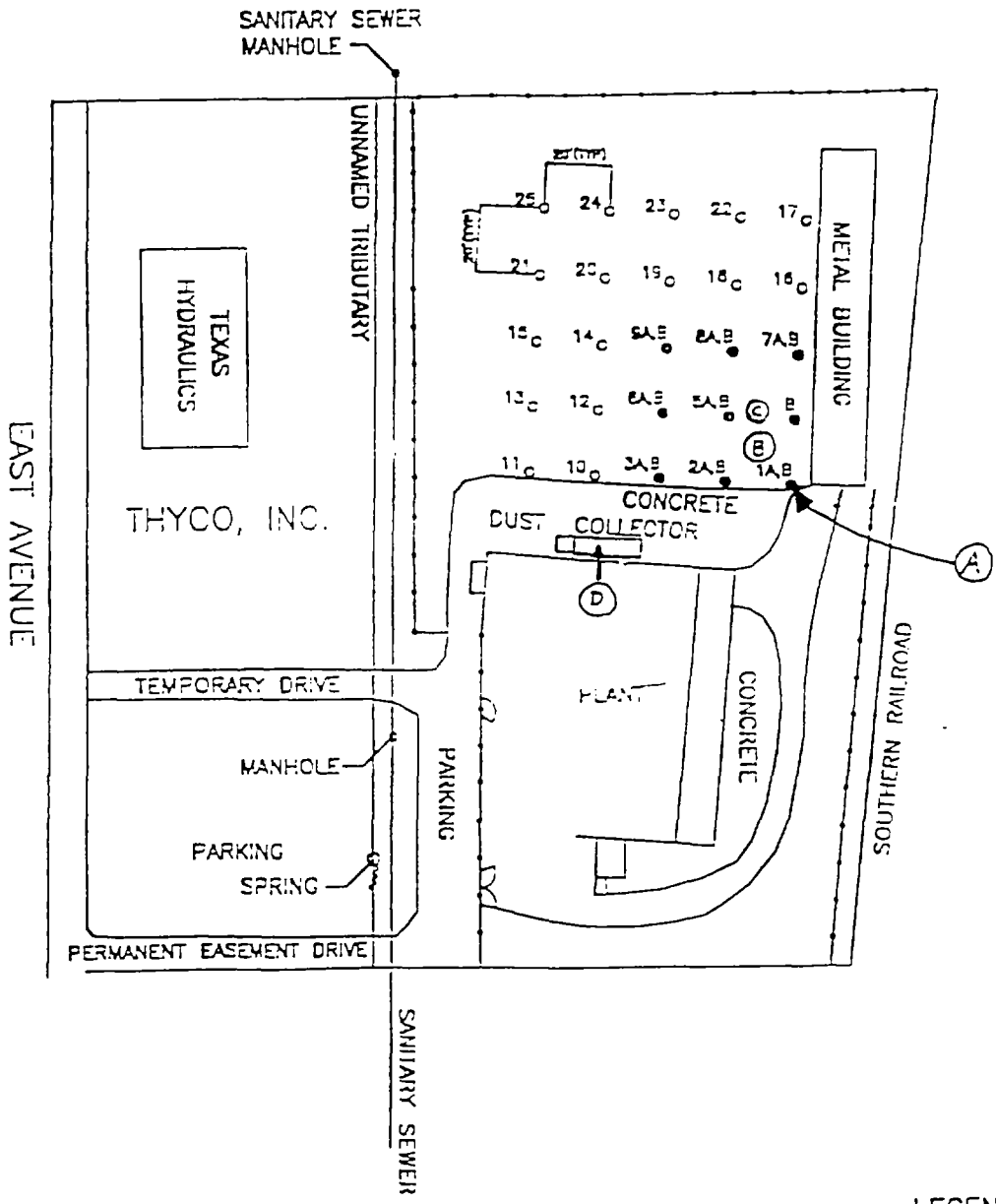
Signature Dan Hartter Total $217.14

APPENDIX 7

LABORATORY REPORTS FOR SOIL SAMPLES COLLECTED BY TRIAD ON NOVEMBER 30, 1998

11/30/98 SAMPLING LOCATIONS

BG-1



BG-2

LEGEND

- ● A & B SAMPLE
  (A 0"– 6")
  (B 6" – 12")
- o 0" – 12" SAMPLE

FIGURE 1	NOTES:	SAMPLING LOCATIONS
	BASE MAP PROVIDED BY CLIENT	NGK METALS FACILITY
		ATHENS, TENNESSEE
	SITE LOCATION:	STEP Solutions To Environmental Problems, Inc.
	725 EAST AVENUE	1009 FLOYD CULLEN COURT OAK RIDGE TN 37830 (423) 481-7637
	ATHENS, TENNESSEE	
DATE: 6/25/98	NOT TO SCALE	

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A149799
Sample ID: C-0.75
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:45
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Arsenic	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Barium	2.18	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Cadmium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Chromium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
d	1.98	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
cury	ND	mg/kg	0.10	0.10	1	12/ 2/98	13:02	R. Kelley	7471	7718
elenium	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719
Silver	ND	mg/kg	0.99	0.99	1	12/ 3/98	8:48	R.Street	6010B	7719

ND = Not detected at the report limit.

Report Approved By: JMMitchell Report Date: 12/ 3/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

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SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148946
Sample ID: A-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.01	1.00	1	12/ 1/98	15:53	C.Holmes	6010B	7182
Copper	2.64	mg/kg	1.01	1.00	1	12/ 1/98	15:53	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148947
Sample ID: A-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:30
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	6.21	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148948
Sample ID: A-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:35
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	3.81	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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Nashville, TN 37204-0566
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Lab Number: 98-A148949
Sample ID: A-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 12:40
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.90	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	ND	mg/kg	0.95	0.95	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Lab Number: 98-A148954
Sample ID: B-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:20
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.98	0.98	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	22.3	mg/kg	0.98	0.98	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A146955
Sample ID: B-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:25
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.00	1.00	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	8.03	mg/kg	1.00	1.00	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148956
Sample ID: B-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:30
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.17	mg/kg	0.97	0.97	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	1.75	mg/kg	0.97	0.97	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6931
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Lab Number: 98-A148957
Sample ID: B-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 10:45
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Ba
METALS										
Beryllium	1.15	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	71
Copper	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	71

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148962
Sample ID: C-0.75
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:45
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	2.38	mg/kg	0.99	0.99	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	514.	mg/kg	0.99	0.99	1	12/ 1/98	15:56	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148958
Sample ID: C-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:10
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF FOSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	19.7	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

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Nashville, TN 37204-0566
Phone 1-615-726-0177

ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148959
Sample ID: C-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:15
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182
Copper	5.01	mg/kg	0.96	0.96	1	12/ 1/98	15:55	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148960
Sample ID: C-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.02	1.00	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	7.14	mg/kg	1.02	1.00	1	12/ 1/98	15:56	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148961
Sample ID: C-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 11:25
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.18	mg/kg	0.98	0.98	1	12/ 1/98	15:56	C.Holmes	6010B	7182
Copper	2.17	mg/kg	0.98	0.98	1	12/ 1/98	15:56	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148950
Sample ID: D-1.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:08
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	3.38	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	139.	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148951
Sample ID: D-2.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:12
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	6.37	mg/kg	0.97	0.97	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Lab Number: 98-A148952
Sample ID: D-2.5
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:16
Date Received: 11/30/98
Time Received: 18:19

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	1.19	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	ND	mg/kg	0.99	0.99	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit.

Report Approved By: _____ Report Date: 12/ 1/98

Theodore J. Duello, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny B. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

Laboratory Certification Number: 02008

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ANALYTICAL REPORT

TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

Lab Number: 98-A148953
Sample ID: D-3.0
Sample Type: Soil
Site ID:

Date Collected: 11/30/98
Time Collected: 13:20
Date Received: 11/30/98
Time Received: 18:19

Project: 98-NGK01-01
Project Name:
Sampler: JEFF POSTELL

Analyte	Result	Units	Report Limit	Quan Limit	Dil Factor	Date	Time	Analyst	Method	Batch
METALS										
Beryllium	ND	mg/kg	1.00	1.00	1	12/ 1/98	15:54	C.Holmes	6010B	7182
Copper	2.81	mg/kg	1.00	1.00	1	12/ 1/98	15:54	C.Holmes	6010B	7182

ND = Not detected at the report limit

Report Approved By: Report Date: 12/ 1/98

Theodore J. Duelic, Ph.D., Q.A. Officer
Michael H. Dunn, M.S., Technical Director
Danny R. Hale, M.S., Laboratory Director
Johnny A. Mitchell, Dir. Technical Services

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TRIAD ENV. CONSULTANTS 6921
ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

CHAIN OF CUSTODY

Project Number: 98-NGK 01-01 | Sampler: JEFF POSTELL

Project Name: | SAE Quote:

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Copper	Beryllium							
148946	A -1.5	11/30/98	12:20	SOIL	X		1	X	X	24hr RUSH						
47	A - 2.0		12:30													
48	A - 2.5		12:35													
49	A - 3.0		12:40													
50	D - 1.5		1:08													
51	D - 2.0		1:12													
52	D - 2.5		1:16													
148953	D - 3.0		1:20													

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
Jeff Postell	11/30/98 PM 5:55	Dwight Hinch	11/30/98 PM 5:55	Dwight Hinch	11/30/98 5:58 PM	[illegible]	4/30 5:[illegible]
[illegible]	11/30/98 6:15 PM	[illegible]	12/30/98 8:19	[illegible]		M. Bailey	11/30 18:[illegible]

Cooler Temperature When Received: 4°

Laboratory Project Number: 122164

ler Seals Intact?

-X Air Bill Number:

SPECIAL INSTRUCTIONS:

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ERIK LEHNHOFF
207 DONELSON PIKE STE 200
NASHVILLE, TN 37214

CHAIN OF CUSTODY

Project Number: 98-NGK01-01 Sampler: JEFF POSTELL

Project Name: SAE Quote:

Analysis Requested

Lab No.	Field Number	Date	Time	Matrix	Grab	Comp	Bottles	Copper	Beryllium					
148954	B-1.5	11/30/98	10:20	SOIL	X	X	1	X	X	24	hr	RUSH		
55	B-2.0		10:25											
56	B-2.5		10:30											
57	B-3.0		10:45											
58	C-1.5		11:10											
59	C-2.0		11:15											
60	C-2.5		11:20											
61	C-3.0		11:25											
148962	C-0.75		1:45											

Relinquished by:	D/T	Received by:	D/T	Relinquished by:	D/T	Received by:	D/T
Jeff Postell	11/30/98 5:55PM	Dwight Hensh	11/30/98 5:55 PM	Dwight Hensh	11/30/98 5:58 PM	[illegible]	11/30 5:[illegible]
[illegible]	11/30/98 6:15PM	[illegible]	[illegible] 1818	Relinquished by:	D/T	Received by: MB	11/30 18[illegible]

Cooler Temperature When Received:

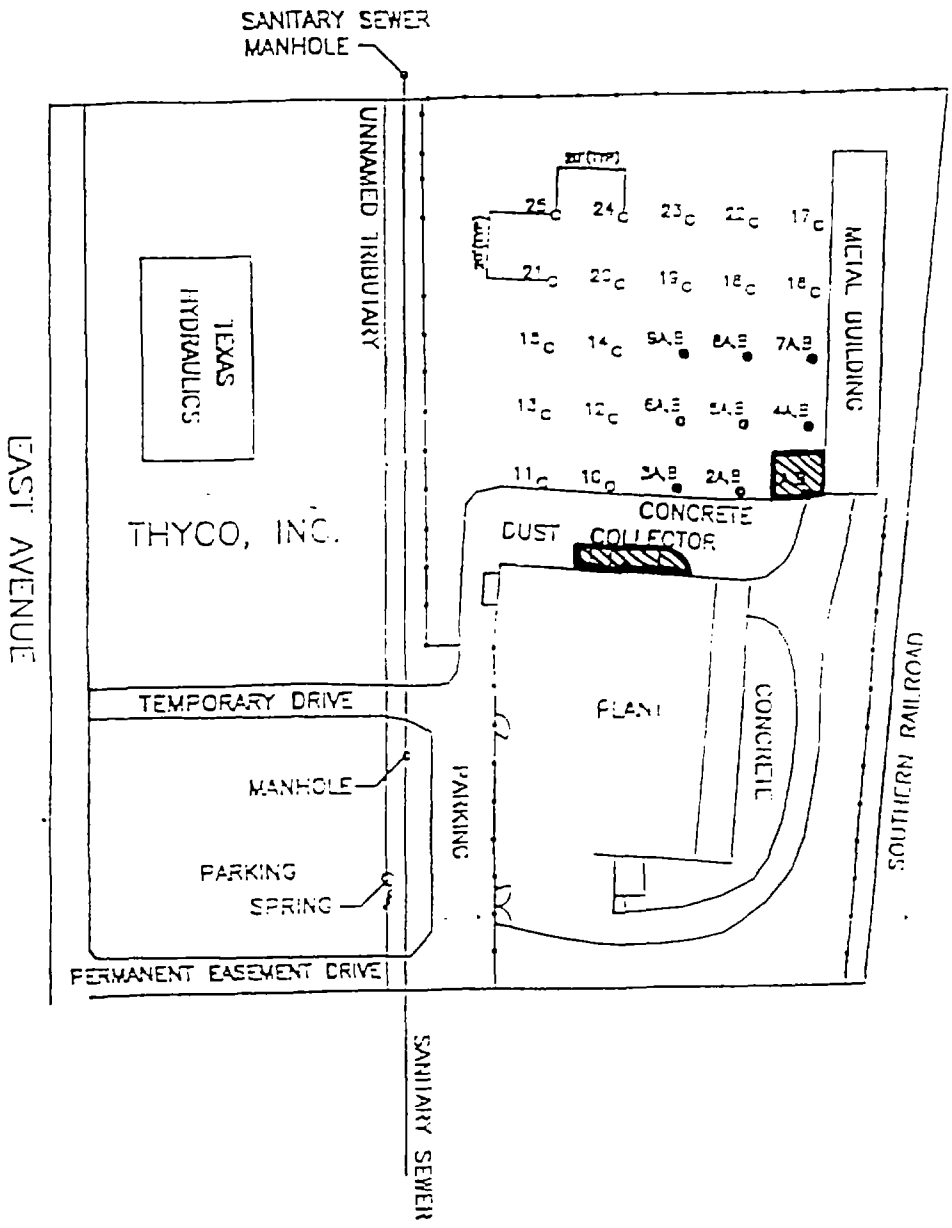
Laboratory Project Number:

[illegible]ler Seals Intact?

[illegible]ed-X Air Bill Number:

SPECIAL INSTRUCTIONS:

COPY 1



Areas where soil was removed and disposed offsite

Notes:
1. Base map provided by client.
2. Approximately one foot of soil was removed from all designated areas.
3. Areas where soil was removed was backfilled with gravel.

PREPARED BY:

TriAD Environmental Consultants, Inc.
207 Donelson Pike, Suite 200
Nashville, Tennessee 37214
Phone: 615-889-6888 Fax: 615-889-4004

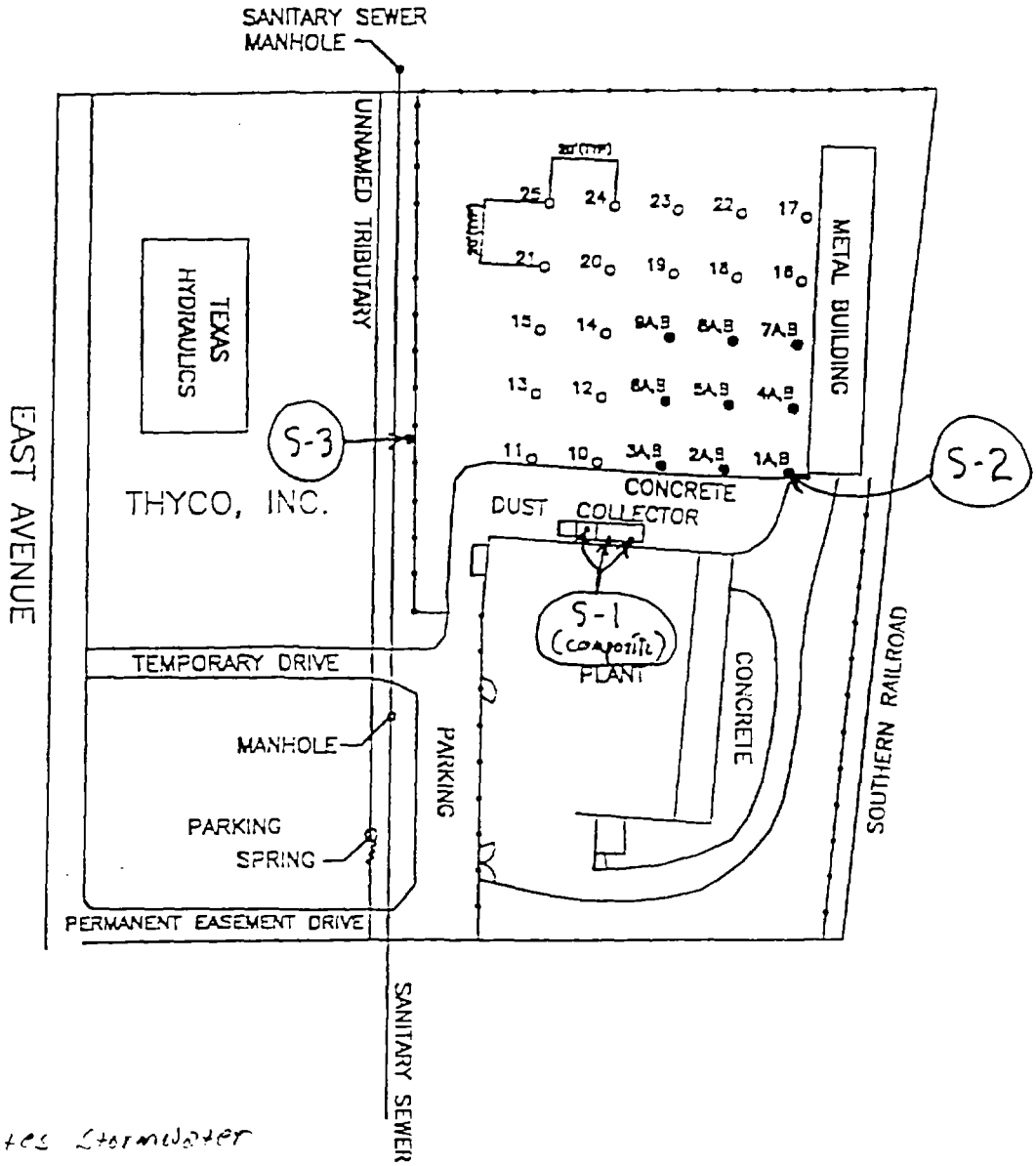
FIGURE 1
PROPOSED REMEDIAL ACTION

NGK METALS SITE
ATHENS, TENNESSEE

DWG DATE: 12/3/98 SHEET 1 OF 1

11/5/98 SAMPLING LOCATIONS

BG-1



Yellow indicates stormwater discharge outfalls.

BG-2

LEGEND

- ● A & B SAMPLE
  (A 0"– 6")
  (B 6" – 12")
- ○ 0" – 12" SAMPLE

FIGURE 1

DATE: 6/26/98

NOT TO SCALE

NOTES:	SAMPLING LOCATIONS
BASE MAP PROVIDED BY CLIENT	NGK METALS FACILITY
	ATHENS, TENNESSEE
SITE LOCATION:	STER
725 EAST AVENUE	1006 FLOYD CULLER COURT OAK RIDGE TN. 37830 (423) 481-7837
ATHENS, TENNESSEE	Solutions To Environmental Problems, Inc.

ENVIRONMENTAL ASSISTANCE CENTER
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
540 McCALLIE AVENUE, SUITE 550
CHATTANOOGA, TENNESSEE 37402
PHONE (423) 634-5745 STATEWIDE 1-888-891-8332 FAX (423) 634-6389

June 18, 1999

Liza I. Montalvo, Remedial Project Manager
Environmental Protection Agency, Region 4
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-8960

Re: NGK Metals
TND980314033
Site # 54-514

Dear Ms. Montalvo:

In response to your May 13, 1999 letter requesting additional information on the NGK Metals Preliminary Assessment (PA) report, I am enclosing the following information: A revised copy of the report, including sections from the Conclusion to the Site History; and, information from NGK Metals web site describing their process and products.

I apologize for the time it has taken to submit this information. If you have any questions, please call me at (423) 634-5755.

Sincerely,

Jill E. Davis, PE
Division of Superfund
Chattanooga Environmental Assistance Center

Jed/awork 1998/ngkmetals.061899.ltr

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

May 13, 1999

4WD-NSMB

Jill Davis
Division of Superfund
TDEC
540 McCallie Street
Suite 550
Chattanooga, TN 37402

SUBJECT: NGK Metals
TND980314033
Site # 54-514

Dear Ms. Davis:

I have reviewed the Preliminary Assessment (PA) report for the NGK Metals site in McMinn County, Tennessee. Overall, the report looks great. However, there needs to be a better description of the type of operation that was conducted at this facility other than just saying intrinsic tools. For example, what are intrinsic tools, what's involved in the beryllium alloy manufacturing, what are the contaminants associated with this type of manufacturing, etc. Also, the first and second paragraphs in Section 6.0 should be included in Section 2.3.

Please provide revised pages only since most of the report is acceptable and the PA scoresheets do not need to be resubmitted. Feel free to contact me at (404)562-8805 should you have any questions concerning this letter.

Sincerely,

Liza I. Montalvo
Remedial Project Manager

cc: Wayne Everett, TDEC
John Weakley, TDEC
Suzanne Wilkes, TDEC

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- Full mechanical and physical testing
- Custom alloy formulations
- Machining and polishing

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[Copper Alloy Wrought Products]
[Casting Alloy

NGK Metals Corporation
P.O. Box 13367, Reading, PA 19612-3367
Tele: 1.800.801.1641 Fax: 1.610.921.5358

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Nonsparking, Nonmagnetic, Corrosion Resistant Safety Tools.

Nonsparking

Berylco Safety Tools will not emit sparks that can ignite volatile materials, chemicals or gasses. Tests have shown that our tools cannot produce a spark to ignite carbon disulfide, which has the lowest ignition point of any substance. Berylco Safety Tools have been certified nonsparking and nonmagnetic by the Factory Mutual and the U.S. Government since 1939.

Strength

Berylco Safety Tools are made of high strength beryllium copper which is a copper-based alloy containing approximately 1.8% beryllium. The alloy can be heat treated to hardness ranges of Rockwell C35-45, with tensile strengths up to 190,000 p.s.i. This allows our tools to be precisely forged, cast, formed, machined and hardened to strength levels that cannot be achieved in tools made from aluminum, bronze or brass.

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- Automotive Plants
- Boating Industry
- Breweries and Distilleries
- Chemical Manufacturing
- Electronics Industry
- Explosives and Pyrotechnics
- Fabricated Metal Products
- Food Product Manufacturing
- Flammable Materials Manufacturing
- Hazardous Materials Handling
- Manufactured Gas Plants
- Medical Diagnostic Equipment
- Mining Industry
- National Defense
- Nuclear Industry
- Oil Industry
- Paint and Varnish Manufacturing
- Paint Spraying and Finishing
- Petrochemicals
- Petroleum Refining
- Pharmaceuticals
- Pipeline Construction
- Public Utilities
- Shipyard and Tankers
- Synthetic Fiber Manufacturing
- Warehouses for Volatile Materials

NGK Metals Corporation
P.O. Box 13367, Reading, PA 19612-3367
Tele: 1.800.801.1641 Fax: 1.610.921.5358

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Rcvd 2/23/99
[illegible]

SI - Low Priority
6/22/1999
[illegible]

Executive Summary
NGK Metals
TND980314033

Attached is the Preliminary Assessment (PA) for the NGK Metals Site. The site is located on East Avenue in the City of Athens in McMinn County, Tennessee. The surrounding area is urban with commercial, industrial and residential development. The site is a former beryllium alloy manufacturing facility.

A small unnamed tributary of Little North Mouse Creek borders the northwest side of the NGK Metals property. Groundwater within the four-mile radius of the site is used for domestic uses. The nearest domestic well is found within one mile of the site. A municipal well for the City of Athens is within two miles of the site. It is not believed that the site impacts any wells.

The nearest school is located approximately 1.8 miles from the site, and residential properties are within one mile of the site.

The address for this facility is:

NGK Metals
725 East Avenue N.E.
Athens, Tennessee 37303

The Tennessee Division of Superfund (TDSF) became aware of the NGK Metals site through a site discovery process of files research. TDSF completed a Preliminary Assessment (PA) of the site on November 15, 1998. The PA score completed in support of the PA yielded a score of 35.

While conducting the PA, the TDSF found conditions which might pose a threat to human health or the environment. The TDSF recommends that t further investigation be conducted at NGK Metals to determine the extent of possible pollution.

Preliminary Assessment
Narrative Report

NGK Metals
Athens, McMinn County, Tennessee

CERCLIS No. TND980314033
Tennessee File No. 54-514

Prepared for the
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF SUPERFUND (TDSF)
in cooperation with
WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

January 1999

Prepared By:	Reviewed By:	Reviewed By:
Jill E. Davis	Wayne Everett	John Weakley

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APPENDIX D	PA Score Sheets

REPORT:	Preliminary Assessment Narrative Report
SITE:	NGK Metals Athens, McMinn County, Tennessee
CERCLIS:	TND980314033
TN FILE NO.:	54-514
PREPARED BY:	Jill E. Davis, Environmental Protection Specialist Tennessee Department of Environment and Conservation Division of Superfund (TDSF)
DATE:	January 1999

1.0 INTRODUCTION

The Tennessee Division of Superfund (TDSF), under cooperative agreement with the United States Environmental Protection Agency (EPA), conducted a Preliminary Assessment (PA) of the former NGK Metals facility in Athens, McMinn County, Tennessee. This investigation was performed under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA).

1.1 Objectives

The purpose of this investigation was to collect information concerning conditions at the site and assess any threat posed to human health and the environment; to identify, if possible, sources which could be attributed to known site contamination; and to determine the need for further investigation under CERCLA/SARA or other authority.

1.2 Scope of Work

The objectives were achieved through the completion of the following tasks:

- Review of available information;
- A comprehensive target survey;
- On-site reconnaissance.

Guidance for this Preliminary Assessment was given through CFR 40, Part 400.

2.0 SITE CHARACTERIZATION

2.1 Location

The former NGK Metals facility is bound by East Avenue on the northern side and railroad tracks on the southern side. The areas to the east and west are open fields with mostly industrial property surrounding. The geographic coordinates of the facility property are Latitude 35°26'52" and Longitude 84°36'43" (Ref. 1). The area is above the 100-year flood plain and has an elevation of 910 feet above sea level (Ref. 2). The site and surrounding areas are situated in Congressional District 2 (Ref. 3).

To reach the site, travel north out of Chattanooga on Interstate Highway 75, take exit 49 (Highway 30). Travel approximately 3 miles and turn east (left) onto Congress Parkway (Hwy. 11). Travel approximately 3 miles and turn right onto East Avenue. The former NGK Metals location is at the end of the road (Ref. 1).

McMinn County, Tennessee is climatologically characterized by moderate, rainy winters and hot, humid summers. The average winter temperature is approximately 41° F, and the average summer temperature is approximately 77° F. Rainfall data indicates an average annual precipitation depth of approximately 54 inches and a 1 year 24 hour rainfall event of 3.0 inches (Ref. 4). Rainfall distribution is fairly even throughout the year with late summer and early fall being the driest time and winter through mid spring being the wettest (Ref. 4).

2.2 Site Description

The total area of the NGK Metals facility is approximately 5.7 acres. Of that, approximately 3.8 acres remain undeveloped (Ref. 5).

The area surrounding the site is urban with commercial, industrial, and residential uses (Ref. 6). A tributary to Little North Mouse Creek is the small stream that flows adjacent the facility property. The tributary originates in an undeveloped area above the site and flows through mostly agriculture/residential areas before draining into Little North Mouse Creek and eventually into North Mouse Creek (Ref. 1).

2.3 Site History

NGK Metals operated a beryllium alloy manufacturing facility at this location from late 1986 until early 1998. The former facility is near the Ingleside community in Athens, Tennessee (McMinn County). Baker Realty Company is currently marketing the site for sale.

The company has been involved with other regulatory agencies in the past including the Tennessee Division of Water Pollution Control and Division of Air Pollution Control.

Their concerns involved NPDES report limit exceedances on storm water discharges and an unpermitted discharge and air pollution record keeping errors. Current Superfund issues at the site include the possibility of soils contamination.

The former NGK Metals facility is presently vacant. NGK Metals formerly manufactured non sparking tools at this facility. The property was purchased in September 1986 from Cabot Corporation (Ref. 7). NGK Metals relocated to a location in Spring City, Tennessee during early 1998.

3.0 GROUND WATER PATHWAY

3.1 Hydrogeologic Setting

The NGK Metals site is located in the Ridge and Valley Province of east Tennessee. Geologically, folded and faulted sedimentary rocks of the Ordovician and Cambrian ages characterize this region. The rock strata of this area are typically tilted up toward the northwest. The Lenoir Limestone underlies the site and is a part of the Ordovician age Chickamauga Group (Ref. 8).

The Lenoir Limestone consists of 25 to 500 feet thick nodular, argillaceous, gray limestone. In places, basal sedimentary breccia, conglomerate, quartz sand are present. Mosheim Limestone Members (dense, light to medium gray limestone) are near the base Ref. 8).

Ground water in McMinn County occurs principally in fractures in the underlying formations. The rocks have little or no primary porosity, but contain fractures caused by folding and faulting. In carbonate rocks, circulating ground water to a depth of about 300 feet frequently enlarges fractures. The siliceous rocks are less soluble and their fractures are rarely enlarged by solution. The fractures in siliceous rocks are usually open for the first few hundred feet, but at greater depth the weight of the overlying material tends to close them (Ref 9).

The yield of wells in area shale seems to be controlled by these lenses of limestone. Stringers of limestone appear to stop the downward percolation of water and concentrate it in solution cavities developed at the contact between shale and limestone. Historical records of industrial wells in McMinn County report well yields less than 100 gallons per minute (Ref. 9).

3.2 Targets

According to the Tennessee Division of Drinking Water Supply, residents in and around McMinn County, Tennessee use groundwater from springs and wells for drinking supplies. Some of these sources are found within 4 miles of the site. The nearest known

private wells believed to be used for supplying drinking water is less than one mile from the site (Ref. 10,11).

The majority of the population within a 4-mile radius of the site relies on municipal water supplied by the Athens Utility Board. A municipal supply well is located approximately 1.7 miles southeast of NGK Metals (Refs. 1,11).

Athens Utilities Board (AUB) has approximately 6,500 connections in Athens and the surrounding area and serves approximately 16500 people. AUB's New Spring and Ingleside Spring each provide approximately 33% of their blended system (Ref. 11).

3.3 Conclusions

It is unlikely that area groundwater supplies have been significantly impacted by contaminant migration from the NGK Metals site. There is no evidence that contamination/hazardous substances had been released to any aquifer or placed so that a release to an aquifer could occur.

4.0 SURFACE WATER PATHWAY

4.1 Hydrologic Setting

A small tributary to Little North Mouse Creek borders the site to the north. The tributary is a perennial stream which flows at approximately 5 cubic feet per second (Ref. 6).

The Federal Emergency Management Agency (FEMA) shows the site does not lie within the 100 year flood zone. The elevation at this point is 910 feet above sea level. (Ref. 2)

Surface water from the site flows directly into the tributary to Little North Mouse Creek (Ref. 1). The tributary and subsequent Little North Mouse Creek flow through an agricultural/residential area and into North Mouse Creek, which is approximately 1.5 miles away.

The remainder of the site's 15 mile surface water pathway flows in North Mouse Creek through a rural agricultural valley. The 15 mile surface water pathway ends just downstream of an active fish hatchery (Refs. 6, 12).

4.2 Targets

There are no drinking water intakes within 15 miles downstream of the site

The low flow in the tributary to Little North Mouse Creek does not support recreational fishing. Fishing occurs near the mouth of Little North Mouse Creek at its crossing with Mt. Verde Road. This area is approximately 1.5 miles from the site. Creel commonly

harvested includes bluegill, bream and small catfish. The classified uses for Little North Mouse Creek are fish and aquatic life, recreation, irrigation, and livestock watering and wildlife (Ref. 13).

There are no known wetlands or critical habitats immediately downstream of the site. The majority of the site's 15 mile surface water pathway is found in a small creek meandering through an agricultural valley. Known U.S. threatened or endangered species in McMinn County, Tennessee include the Hellbender, Tennessee cave salamander, the Swainson's Warbler, the Grasshopper Sparrow and the Flame Chub (Ref. 14).

4.3 Conclusions

Storm water data collected at the site from August 1993 through September 1995 repeatedly showed elevated levels of copper (304 µg/l, 77 µg/l, 272 µg/l, 68 µg/l and 60 µg/l). The levels reported exceeded the Risk Assessment Guidance for Region IV's Preliminary Remediation Goal (PRG) of 6.54 micrograms per liter (chronic screening value). (Ref. 17) This data could possibly imply that surface water had been impacted at the time of sampling. Further data would be required to determine if pollution exists to the point that surface water would be impacted.

The impact of surface water pollution from the site is limited because of the lack of targets. There are no drinking water intakes located within 15 miles downstream of the site, the nearest documented fishery is 1.5 miles downstream, and no sensitive environments have been identified within one mile of the site.

5.0 SOIL EXPOSURE AND AIR PATHWAYS

5.1 Physical Conditions

The soil underlying the site is mapped as the Leadvale silt loam, eroded undulating phase by the Soil Conservation Service. The subsoil may be a firm and friable yellowish brown, weakly mottled from two to eight feet with the parent material consisting of local alluvium originating chiefly from shale. (Ref. 15)

This soil is low to moderate in fertility and low in content of organic matter. It is medium to strongly acidic. The surface layer is permeable to moisture, but the subsoil is firm enough to retard infiltration. The capacity for holding moisture is moderate. (Ref. 15)

There is slight staining from waste foundry sand on concrete areas on the property. Otherwise there are no other visible areas of soil contamination and no evidence that dumping/disposal of hazardous substances occurred on site (Ref. 6).

5.2 Soil and Air Targets

NGK Metals is an inactive facility and therefore there are no employees. The nearest school (Ingleside Elementary School) is approximately 1.8 miles from the site (Ref. 1). Residences can be found within one mile of the site. There are approximately zero residents within 1/4 mile of the site. The total population within a four-mile radius of the site is approximately 2519 (Ref. 16).

5.3 Conclusions

Storm water data collected at the site from August 1993 through September 1995 repeatedly showed elevated levels of copper (304 µg/l, 77 µg/l, 272 µg/l, 68 µg/l and 60 µg/l). The levels reported exceeded the Risk Assessment Guidance for Region IV's Preliminary Remediation Goal (PRG) of 6.54 micrograms per liter (chronic screening value). (Refs. 5, 17) There is no further evidence of soil contamination. Though the site is accessible, a chain link fence limits accessibility (See Appendix B). There are no indications that the site is used by anyone for recreational purposes. Soil and sediment samples should be taken at the site to determine if actual contamination exists.

There are no known reports of complaints or odors being emitted from the site. During site visits there have been no observations of blowing dust.

6.0 SUMMARY AND CONCLUSIONS

NGK Metals operated a beryllium alloy manufacturing facility at this location from late 1986 until early 1998. The former facility is near the Ingleside community in Athens, Tennessee (McMinn County). Baker Realty Company is currently marketing the site for sale.

The company has been involved with other regulatory agencies in the past including the Tennessee Division of Water Pollution Control and Division of Air Pollution Control. Their concerns involved NPDES report limit exceedances on storm water discharges and an unpermitted discharge and air pollution record keeping errors. Current Superfund issues at the site include the possibility of soils contamination.

Other than facility monitored storm water discharge reports and minor staining on concrete areas, there was no other visual evidence of contaminated soil, on-site waste disposal ponds, or open landfilling areas which would impact the soil or air pathways. There was no evidence of direct connections, or indirect connection to the groundwater pathway.

The Preliminary Assessment (PA) indicates that the former NGK Metals facility qualifies for further investigation and Site characterization under CERCLA. The Tennessee Division of Superfund recommends that a Site Investigation (SI) be conducted at NGK Metals.

REFERENCES

1. U.S.G.S. Topographical Map. Quadrants 125 NE.

2. FEMA Flood Insurance Rate Map. revised April 2. 1993.

3. Tennessee Blue Book. "Area Congressional District". 1991-1994.

4. U.S. Department of Commerce. "Normal Annual Total Precipitation for Eastern U.S." June 1968.

5. Tennessee Division of Water Pollution Control. Storm Water Information for NGK Metals.

6. Davis. J.. (TDSF). Memo regarding preliminary site reconnaissance. October 29. 1998.

7. NGK Metals' Quit Claim Deed. page 375 and property tax map

8. Swingle. Tennessee Division of Geology. "Geologic Map of Tennessee. East-Central Sheet". 1966.

9. DeBuchananne and Richardson. Tennessee Division of Geology. Bulletin 58. "Ground Water Resources of East Tennessee" 1956.

10. Tennessee Division of Water Supply. Water Well Program. Well Search for Athens. September 14. 1998.

11. Tennessee Division of Water Supply. Public Water System Data Athens Utility Board. May 17. 1994

12. U.S.G.S. Topographical Maps showing 15-mile surface water pathway.

13. Tennessee Division of Water Pollution Control. State of Tennessee Water Quality Standards. July 1995.

14. Weakley. J. (TDSF). Memo regarding critical habitat and endangered species information for NGK Metals area. September 22. 1998.

15. U.S. Soil Conservation Service. Soil Survey, McMinn County, Tennessee. July 1958.

16. U.S. Department of Commerce. "1990 Census of Population. Tennessee" July 1992

17. EPA Region IV. Waste Management Division. 'OTS Guidance Document'

Preliminary Assessment
For
NGK Metals

Appendix A
References

Preliminary Assessment
For
NGK Metals

Reference 1
USGS Topographic Map Quadrant 125 SE

U.S. EPA REGION IV

SDMS

Unscannable Material Target Sheet

DocID: 10079539 Site ID: TND 980314033

Site Name: NGK METALS

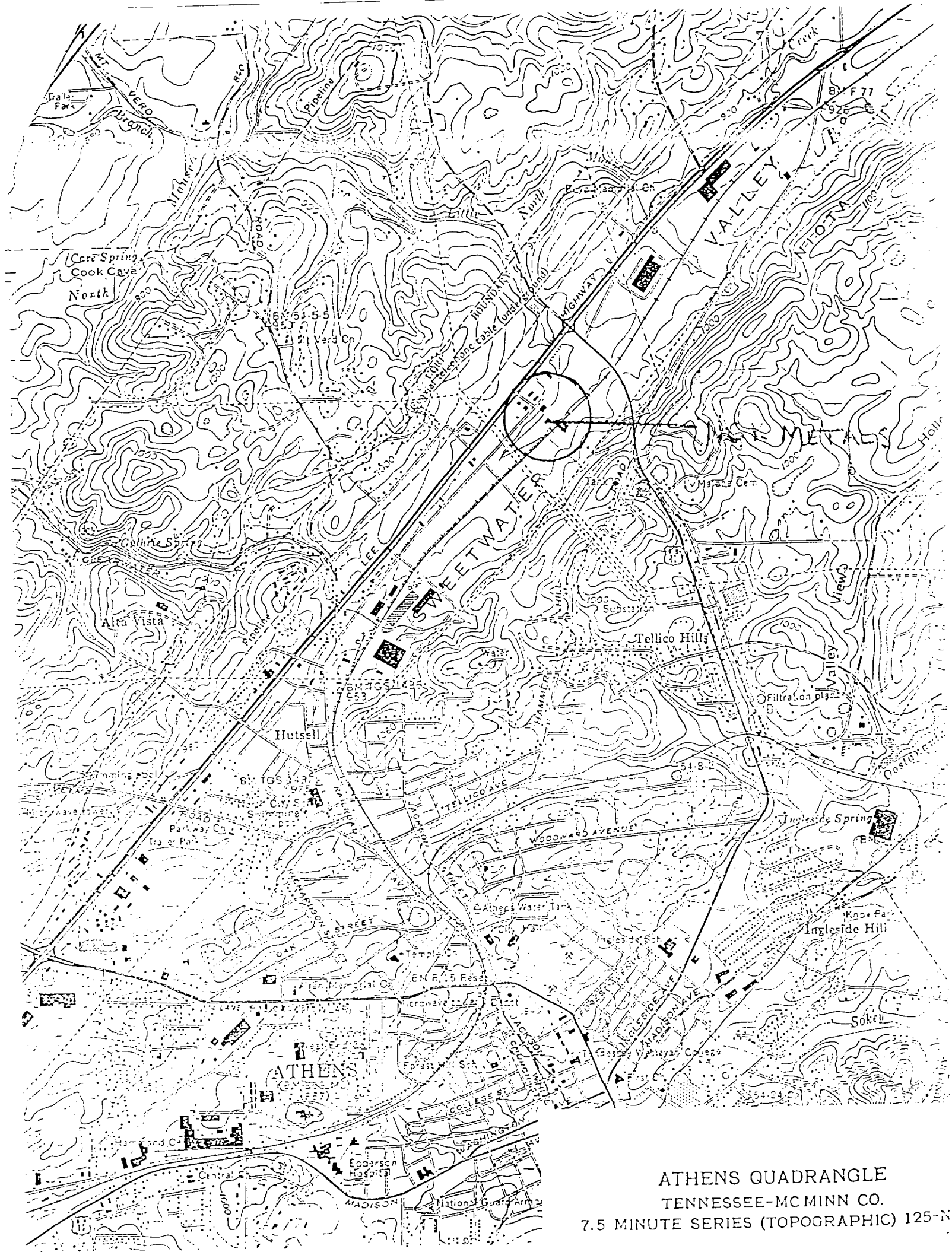
Nature of Material:

Map:		Computer Disks:	
Photos:		CD-ROM:	
Blueprints:		Oversized Report:	
Slides:		Log Book:	

Other (describe): _____

Amount of material: _____

Please contact the appropriate Records Center to view the material.



ATHENS QUADRANGLE
TENNESSEE-MC MINN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC) 125-N

Preliminary Assessment
For
NGK Metals

Reference 2
FEMA Flood Insurance Map

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF ATHENS, TENNESSEE

McMINN COUNTY

PANEL 3 OF 5

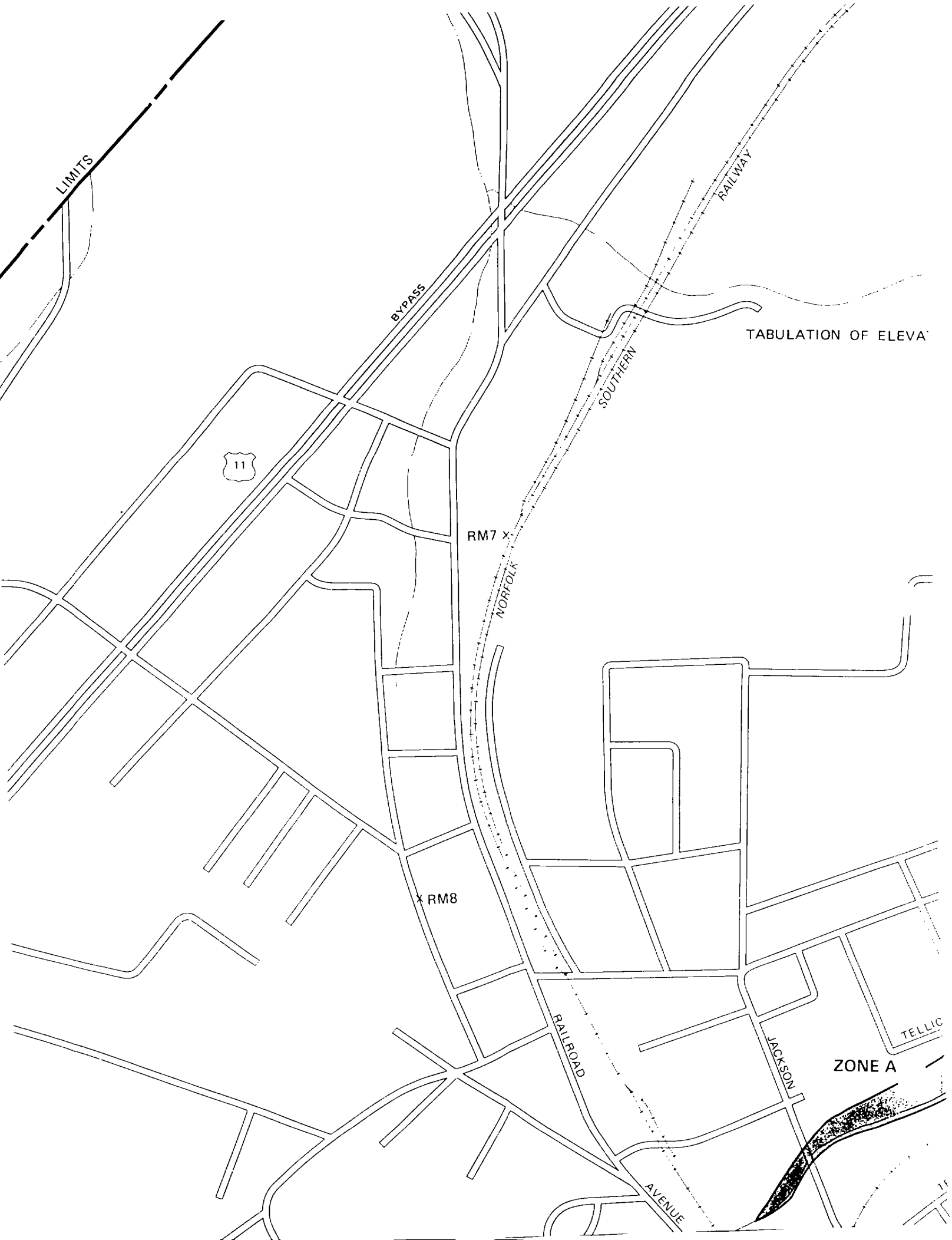
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER

470211 0003 C

MAP REVISED:

DECEMBER 4, 1986


LIMITS
BYPASS
11
RM7
RM8
NORFOLK
SOUTHERN
RAILWAY
TABULATION OF ELEVA
RAILROAD
JACKSON
AVENUE
TELLIC
ZONE A

Preliminary Assessment
For
NGK Metals

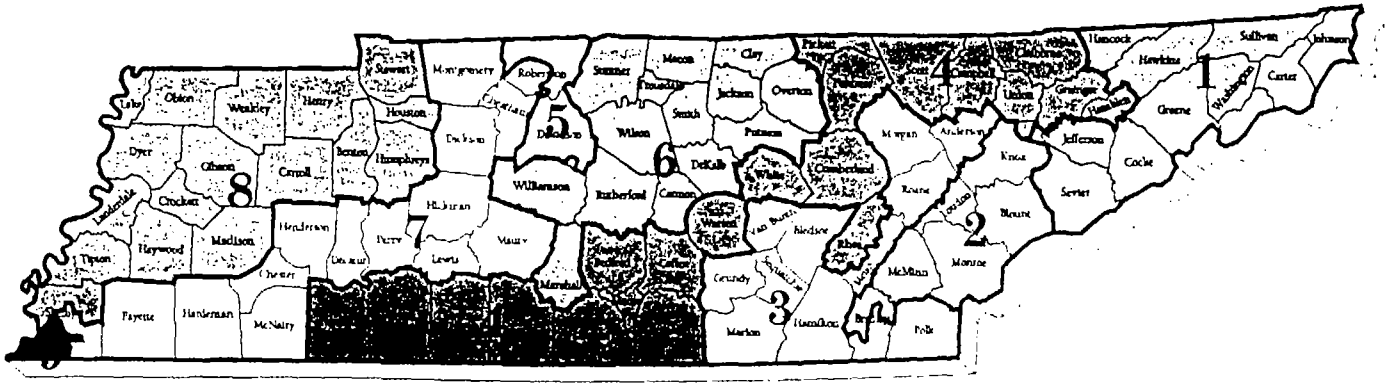
Reference 3
'Tennessee Blue Book' excerpts

TENNESSEE BLUE BOOK 1995-1996

BICENTENNIAL EDITION (1796-1996)

RILEY C. DARNELL
Secretary of State

*U.S. House of Representative Districts



1st Carter, Cocke, Greene, Hancock, Hawkins, Jefferson, Johnson, Knox in part, Sevier, Sullivan, Unicoi, Washington

2nd Blount, Bradley in part, Knox in part, Loudon, McMinn, Monroe

3rd – Anderson, Bledsoe, Bradley in part, Grundy, Hamilton, Marion, Meigs, Morgan, Polk, Roane, Sequatchie, Van Buren

4th – Bedford, Campbell, Claiborne, Coffee,

4th – Cumberland, Fentress, Franklin, Giles, Grainger, Hamblen, Hardin, Knox in part, Lawrence, Lincoln, Moore, Pickett, Rhea, Scott, Union, Warren, Wayne, White

5th – Davidson in part, Robertson in part

6th – Cannon, Clay, Davidson in part, DeKalb, Jackson, Macon, Marshall, Overton, Putnam, Rutherford, Smith, Sumner, Trousdale, Williamson, Wilson

7th Cheatham, Chester, Decatur, Dickson, Fayette, Hardeman, Henderson, Hickman, Lewis, McNairy, Maury, Montgomery, Perry, Robertson in part, Shelby in part

8th – Benton, Carroll, Crockett, Dyer, Gibson, Haywood, Henry, Houston, Humphreys, Lake, Lauderdale, Madison, Obion, Shelby in part, Stewart, Tipton, Weakley

9th Shelby in part

*Map shows approximate area served. Narrative describes counties in each district.

Preliminary Assessment
For
NGK Metals

Reference 4
U.S. Department of Commerce
"Normal Annual Total Precipitation for Eastern U.S."

Reference No. 8

U.S. DEPARTMENT OF COMMERCE
C. R. Smith, Secretary

ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
Robert M. White, Administrator

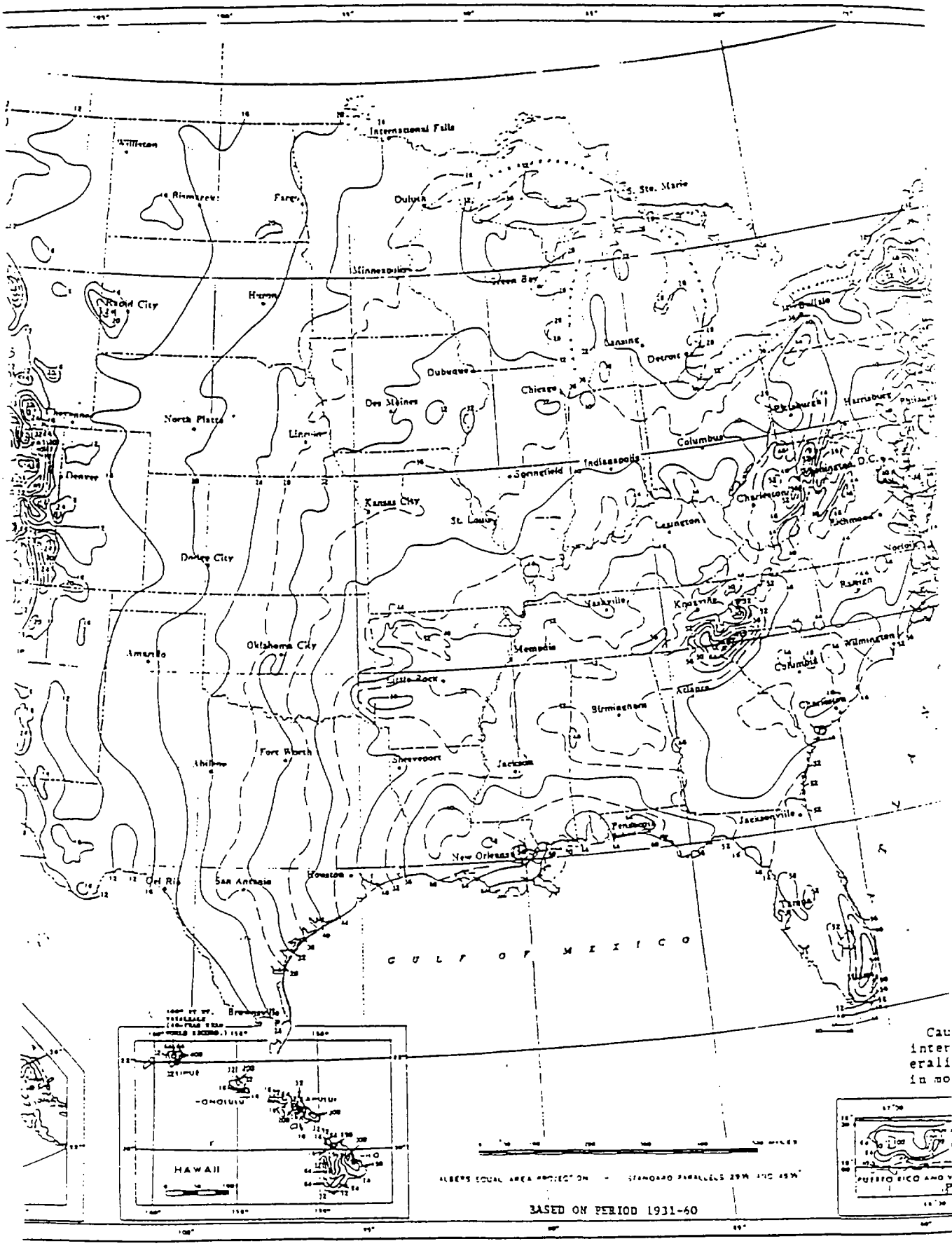
ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

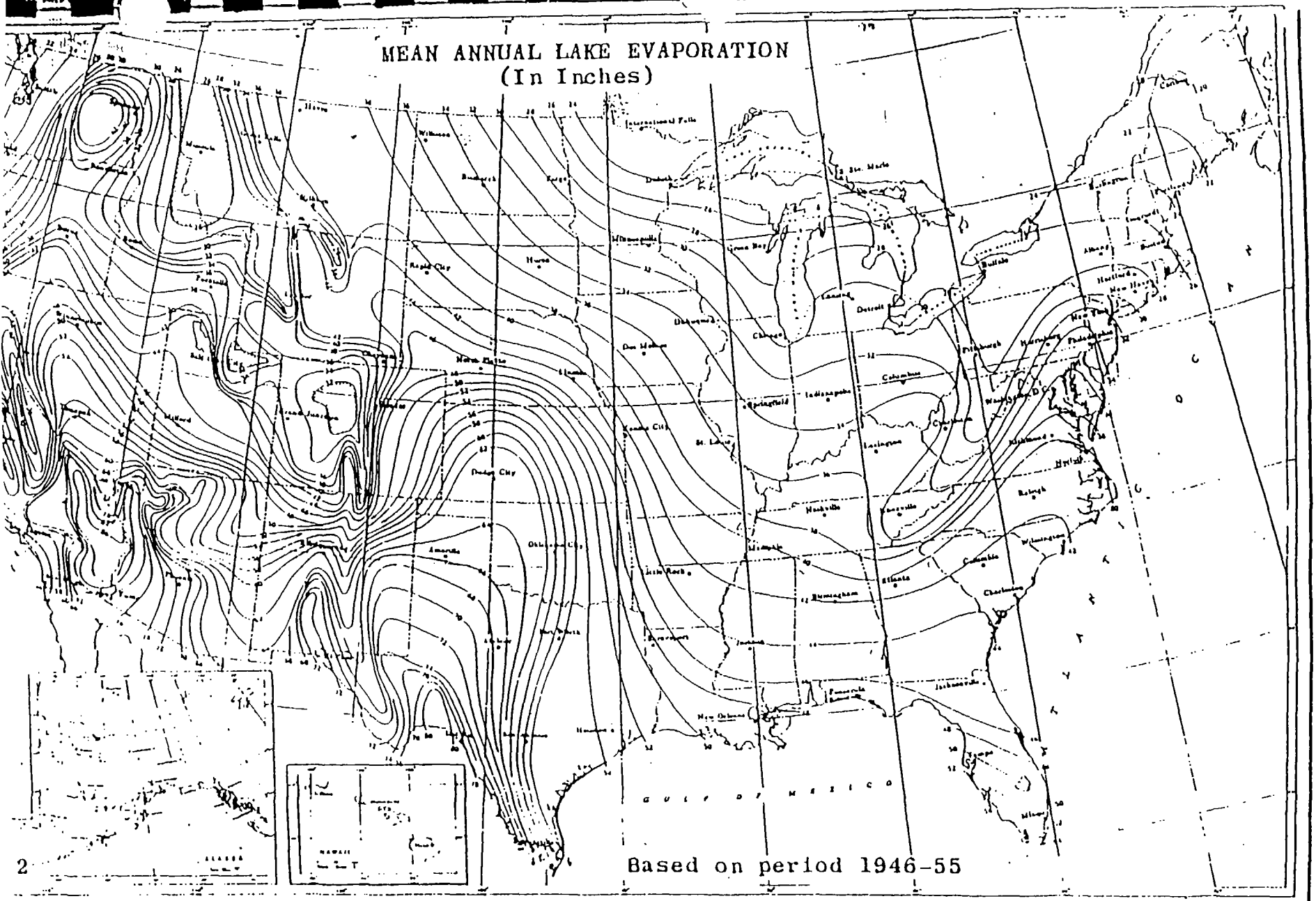
JUNE 1968

REPRINTED BY THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
1983

For sale through the National Climatic Data Center, Federal Building, Asheville, N.C. 28801 Attn: Publications.

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)





MEAN MAY-OCTOBER EVAPORATION IN PERCENT OF ANNUAL

Preliminary Assessment
For
NGK Metals

Reference 5
TN Division of Water Pollution Control's
Storm Water information for NGK Metals

JUN 07 1993 RECEIVED MAY 12 1993

spoke with Woodside and explain in full, no offical extension, etc.

NGK BERYLCO

NGK Metals Corporation

P.O. Box 13367 Reading, PA 19612-3367 215 921-5000 Fax 215 921-5358

PLS 6/9
TPW 6/11
[redacted]
JDH 6/17
[redacted]
AGI 6/22
[redacted]
VMJ 6/28
[redacted]

RECEIVED
MAY 12 1993

CERTIFIED/RETURN RECEIPT
May 3, 1993

Division of Water Pollution Control
6th Floor, L & C Annex
401 Church Street
Tennessee Department of
Environment & Conservation
Nashville, TN 37243-1534

file: Industrial Stormwater 1993 (McMinn)

Re: NGK Metals Corporation
725 East Avenue, NE
Athens, TN 37303
NPDES Permit No.: TNR000544

Gentlemen:

On April 26, 1993, NGK received a Tennessee Baseline General 1 Permit for Storm Water Discharges Associated with Industrial Activity. The general permit requires a Storm Water Pollution Prevention Plan be prepared within 180 days of permit coverage, with the date of coverage being 11/1/92 - 9/26/97. NGK is requesting an extension of this deadline to allow for 180 days from the date NGK received the permit. NGK has taken steps to minimize the potential for materials to come in contact with storm water by performing such tasks as installing a roof over storage areas. Should you have any questions on the request for an extension, please contact me at 215-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor,
Environmental Affairs

nc
0018N

cc: M. Satterfield

McMinn Co.
CFO

NOV 03 1993

NGK Metals Corporation

P.O. Box 13367 Reading, PA 19612-3367 215 921-5000 Fax 215 921-5358

PLS 11-8
TPW
[redacted]
JDH 11/29
[redacted]
MTD 12-3
[redacted]
VMJ 11/22
[redacted]
JEO 12-3

October 29, 1993

look up permit & assure proper county filing
copy of a monitoring report was sent to NCO

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
540 McCallie Avenue, Suite 550
Chattanooga, TN 37406-3399

file
Industrial S/W
McMinn Co.
S/W - 1993

Re: NPDES TNR00-0544
Storm Water Data

Dear Sir/Madam:

This letter serves as notification to the Department that the copper concentration (0.304 mg/l) in the August 2, 1993 storm water sample exceeded the report level of 0.018 mg/l (total) listed on the back of the reporting form. The concentration of all other parameters which we are required to monitor were below report levels.

NGK is presently investigating potential sources of the copper. Through the implementation of the Storm Water Pollution Prevention Plan, NGK expects to reduce the potential for contaminates to enter the storm sewer. Material handling and housekeeping practices shall be further addressed in order to reduce the risk of storm water contamination.

Should you have any questions regarding this information, please contact me at 215-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor
Environmental Affairs

nc
0018N

MAR 10 1994

NGK BERYLCO

NGK Metals Corporation

P.O. Box 13367 Reading, PA 19612-3367 215 921-5000 Fax 215 921-5358

March 9, 1994

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
540 McCallie Avenue, Suite 550
Chattanooga, TN 37406-3399

Re: NPDES TNR00-0544
Storm Water Data

Dear Sir/Madam:

On December 28, 1993, NGK Metals Corporation collected a storm water sample from outfall S02 in compliance with the requirements of NPDES permit number TNR00-0544.

In the event analytical sampling results exceed report levels, NGK is required to submit a copy of the results to your office. As you will note from the attached analysis the copper concentration of 0.077 mg/l and the suspended solids concentration of 344 mg/l exceed the report levels of 0.018 and 200 mg/l respectively.

The results from this sampling event will be included in the once per year report submitted to the Church Street office prior to its November 1 due date.

Should you have any questions regarding this information, please contact me at 610-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

nc
Enc.
0018N

cc: M. Satterfield - Athens
S. Link - SAK

M.J. Reider Associates, Inc.
LICENSED ANALYTICAL LABORATORIES

CERTIFICATE OF ANALYSIS

Attention: Mark Satterfield
Reported to: NGK Metals Corp.
725 East Ave. NE
Athens TN 37303

Identification: Shipping NW Stormwater

Date of Report: 01/10/94

Lab ID.: 698 12/29/93 A
Acct Rep: Richard Wolfe
Date Received: 12/29/93
Date Collected: 12/28/93
Time Collected: 16:30
Collected by: CST

CHEMISTRY	Result	Unit	Date	Procedure	Analyst
pH	6.91	su	12/29	EPA 150.1	WHC
Nitrogen,Ammonia	0.11	mg/l	12/30	EPA 350.3	MEB
Biochemical Oxygen Demand	5	mg/l	12/29	EPA 405.1	MEB
Chemical Oxygen Demand	98	mg/l	01/07	EPA 410.4	CMB
Solids, Total Suspended	344	mg/l	01/06	EPA 160.2	JLP
Oil and Grease	4.9	mg/l	01/03	EPA 413.1	LMB

INORGANIC					
Arsenic, Total	0.001	mg/l	01/03	EPA 206.2	HIM
Beryllium, Total	0.004	mg/l	01/03	EPA 200.7	MES
Cadmium, Total	<0.001	mg/l	12/30	EPA 200.7	MES
Chromium, Total	<0.004	mg/l	01/03	EPA 200.7	MES
Copper, Total	0.077	mg/l	12/30	EPA 200.7	MES
Lead, Total	<0.05	mg/l	12/30	EPA 200.7	MES
Nickel, Total	0.010	mg/l	12/30	EPA 200.7	MES

M.J. Reider Associates, Inc.

Distribution of Report:
NGK-Athens

Per: Richard A Wolfe
Technical Director

PENNSYLVANIA DER / U.S. ENVIRONMENTAL PROTECTION AGENCY #06-003 □ NEW JERSEY DEP #77903 □ FDA #42146
107 ANGELICA STREET □ READING, PENNSYLVANIA 19611-1999 □ (215) 374-5129 FAX (215) 374-7234

MJRA-#20

NOV 04 1994

NGK BERYLCO

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 Fax 610 921-5358

October 31, 1994

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
540 McCallie Avenue, Suite 550
Chattanooga, TN 37406-3399

file
McKinney Co.
S/W - 1994

Re: NPDES TNR00-0544
Storm Water Data

Dear Sir/Madam:

On October 12, 1994, NGK Metals Corporation collected a storm water sample from outfall S01 in compliance with the requirements of NPDES permit number TNR00-0544.

In the event analytical sampling results exceed report levels, NGK is required to submit a copy of the results to your office. As you will note from the attached analysis the copper concentration of 0.272 mg/l exceeds the report levels of 0.018 mg/l.

The results from this sampling event have been included in the once per year report submitted to the Church Street office.

Should you have any questions regarding this information, please contact me at 610-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

nc
Enc.
0018N

cc: M. Satterfield - Athens

EN 29002/ISO 9002
ANSI/ASQC Q92
APPROVED BY BVQI (NA)

Certified ISO 9002

EN 29002 ISO 9002 BS 5750
APPROVED BY BVQI

M. J. Reider Associates, Inc.
LICENSED ANALYTICAL LABORATORIES

CERTIFICATE OF ANALYSIS

Attention: Mark Satterfield
Reported to: NGK Metals Corp.
725 East Ave. NE
Athens TN 37303

Date of Report: 10/26/94
Project Number: 9414450
Lab ID: 0698-94-0026660
Account Rep: Richard Wolfe
Date Received: 10/14/94
Date Collected: 10/12/94
Time Collected: 14:25
Collected By: CLIENT

Sample Description: South Outfall

	Results	Unit	Date	Procedure	Analyst
CHEMISTRY					
NITROGENS					
Nitrogen,Ammonia	0.09	mg/l	10/20	EPA 350.3	JLP
OTHER					
Biochemical Oxygen Demand	3	mg/l	10/14	EPA 405.1	CMB
Chemical Oxygen Demand	19	mg/l	10/20	EPA 410.1	CMB
Oil and Grease	1.2	mg/l	10/17	EPA 413.1	LS
PHYSICAL					
pH	7.85	su	10/14	EPA 150.1	CMB
RESIDUES					
Solids, Total Suspended	20	mg/l	10/17	EPA 160.2	JLP
INORGANIC					
TOTAL					
Arsenic, Total	<0.001	mg/l	10/24	EPA 206.2	HIM
Beryllium, Total	0.006	mg/l	10/18	EPA 200.7	MES
Cadmium, Total	<0.001	mg/l	10/18	EPA 200.7	MES
Chromium, Total	<0.004	mg/l	10/18	EPA 200.7	MES
Copper, Total	0.272	mg/l	10/18	EPA 200.7	MES
Lead, Total	<0.02	mg/l	10/21	EPA 200.7	MES
Nickel, Total	0.014	mg/l	10/18	EPA 200.7	MES

Distribution of Report:
Mark Satterfield - NGK Metals Corp.
Lynn Woodside - NGK Metals Corp.

M. J. Reider Associates, Inc.
Reviewed and Approved by:

Richard Wolfe
Technical Director

PENNSYLVANIA DER / U.S. ENVIRONMENTAL PROTECTION AGENCY #06-003 □ NEW JERSEY DEP #77903 □ FDA #42146
107 ANGELICA STREET □ READING, PENNSYLVANIA 19611-1999 □ (610) 374-5129 FAX (610) 374-7234

MAR 28 1995

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 Fax 610 921-5358

FLS 4/3
TPW 4/4
4-5
4-18
4-6
4/19

RECEIVED
NOV 4 1994
ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

November 1, 1994

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
Attn: Compliance and Enforcement
6th Floor L & C Annex
401 Church Street
Nashville, TN 37243-1534

Re: NPDES TNR00-0544
Storm Water Monitoring Report

Dear Sir/Madam:

Enclosed please find 2 copies of the storm water report for the monitoring year 11/01/93 to 10/31/94. There are two outfalls at the Athens facility. Outfall S01 was sampled October 12, 1994, outfall S02, which receives runoff primarily from gravel driveways, was sampled on December 28, 1993.

Analysis of the storm water samples revealed copper concentrations of 0.272 and 0.077 mg/l, exceeding the report value of 0.018 mg/l. NGK is presently investigating potential sources of the copper. In addition, the total suspended solids result for S02 had a level of 344 mg/l. Through the implementation of the Storm Water Pollution Prevention Plan, NGK expects to reduce the potential for contaminates to enter the storm sewer. Material handling and housekeeping practices shall be further addressed in order to minimize the risk of storm water contamination. The results of these sampling events have been submitted to the local Water Pollution Control Field Office.

As noted in last years submission investigation of the storm water outfalls for non-storm water discharges, revealed one such discharge. There is a cooling tower on site which blows down to the storm sewer. This water is used for non-contact cooling and is not chemically treated. An estimated 575 gallons per day is discharged. NGK has requested guidance from the Department on what if any action is needed to comply with applicable regulations for this discharge.

EN 29002/ISO 9002
ANSI/ASQC Q92
APPROVED BY BVQI (NA)

Certified ISO 9002

EN 29002/ISO 9002 BS 5750
APPROVED BY BVQI

Please direct any phone calls or correspondence to myself at the location identified above.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

nc
Enc.
0018N

cc: M. Satterfield

RECEIVED

NOV 4 1994

ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/01/93 TO 10/31/94

FACILITY NAME NGK Metals Corporation

ADDRESS 725 East Avenue, NE

CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544

CONTACT PERSON Lynne Woodside

PHONE NUMBER (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY": 2

TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR: 2

TOTAL NUMBER OF STORM EVENTS SAMPLED: 2

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR.

A ...DRAINAGE AREA OF OUTFALL
B .... PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C .....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D ....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E. ....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F ...RAINFALL AMOUNT OF THE STORM EVENT SAMPLED; IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT.

OUTFALL NO. S01 A 34,000 [X] SQ FEET [ ] ACRES

B 100 % C 95 % D 5 % E 0 % F 0.10 INCHES

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
BOD, 5-DAY (00310)			3	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			20	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.09	4	mg/l	1	COMP.
OIL AND GREASE (00550)			1.2	15	mg/l	1	GRAB
pH (00400)			7.85	4.0 - 9.0	stand.	1	GRAB
COD			19	100	mg/l	1	Comp
Arsenic Total			< 0.001	0.36	mg/l	1	Comp
Beryllium Total			0.006	1.0	mg/l	1	Comp
Cadmium Total			< 0.001	0.004	mg/l	1	Comp

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? [X] YES [ ] NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? [ ] YES [X] NO

*PE not certified in TN.

HAS THE PLAN BEEN IMPLEMENTED? [X] YES [ ] NO

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? [X] YES [ ] NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? [X] YES [ ] NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION. See cover letter.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Vice President	Yasuhito Niwa	94	11	01
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RECEIVED NOV 4 1994 ENFORCEMENT & COMPLIANCE TN DEPT. WPC

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/01/93 TO 10/31/94

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CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544

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PHONE NUMBER (610) 921-5303

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OUTFALL NO. S 0 1 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Chromium Total			< 0.004	1.0	mg/l	1	Comp
Copper Total			0.272	0.018	mg/l	1	Comp
Lead Total			< 0.02	0.082	mg/l	1	Comp
Nickel Total			0.014	1.4	mg/l	1	Comp

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STORM WATER MONITORING REPORT

MONITORING YEAR 11/01/93 TO __/__/__ NOV 4 1994

ENFORCEMENT & COMPLIANCE
TN DEPT WPC

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue, NE
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TRN00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5303

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OUTFALL NO. S 0 2 A 2,500 [X] SQ FEET [ ] ACRES
B 70 % C 12 % D 58 % E 30 % F Not Recorded INCHES

PARAMETER	QUALITY OR CONCENTRATION MINIMUM	AVERAGE	MAXIMUM	REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
BOD, 5-DAY (00310)			5	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			344	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.11	4	mg/l	1	COMP.
OIL AND GREASE (00550)			4.9	15	mg/l	1	GRAB
pH (00400)			6.91	4.0 - 9.0	stand.	1	GRAB
COD			98	100	mg/l	1	Comp
Arsenic Total			0.001	0.36	mg/l	1	Comp
Beryllium Total			0.004	1.0	mg/l	1	Comp
Cadmium Total			< 0.001	0.004	mg/l	1	Comp

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? [X] YES [ ] NO

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CN-0997

RDA 1663

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

RECEIVED NOV 4 1994 ENFORCEMENT & COMPLIANCE IN DEPT. WPC

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/01/93 TO 10/31/94

FACILITY NAME NGK Metals Corporation

ADDRESS 725 East Avenue, NE

CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544

CONTACT PERSON Lynne Woodside

PHONE NUMBER (610) 921-5303

Note: Read instructions on back before completing this form.

OUTFALL NO. S 0 2 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Chromium Total			< 0.004	1.0	mg/l	1	Comp
Copper Total			0.077	0.018	mg/l	1	Comp
Lead Total			< 0.05	0.082	mg/l	1	Comp
Nickel Total			0.010	1.4	mg/l	1	Comp

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NOV 09 1994

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 Fax 610 921-5358

November 1, 1994

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NOV 4 1994

ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

file: McMinn Co. 4W-1994 Industrial

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
Attn: Compliance and Enforcement
6th Floor L & C Annex
401 Church Street
Nashville, TN 37243-1534

Re: NPDES TNR00-0544
Storm Water Monitoring Report

Dear Sir/Madam:

Enclosed please find 2 copies of the storm water report for the monitoring year 11/01/93 to 10/31/94. There are two outfalls at the Athens facility. Outfall S01 was sampled October 12, 1994, outfall S02, which receives runoff primarily from gravel driveways, was sampled on December 28, 1993.

Analysis of the storm water samples revealed copper concentrations of 0.272 and 0.077 mg/l, exceeding the report value of 0.018 mg/l. NGK is presently investigating potential sources of the copper. In addition, the total suspended solids result for S02 had a level of 344 mg/l. Through the implementation of the Storm Water Pollution Prevention Plan, NGK expects to reduce the potential for contaminates to enter the storm sewer. Material handling and housekeeping practices shall be further addressed in order to minimize the risk of storm water contamination. The results of these sampling events have been submitted to the local Water Pollution Control Field Office.

As noted in last years submission investigation of the storm water outfalls for non-storm water discharges, revealed one such discharge. There is a cooling tower on site which blows down to the storm sewer. This water is used for non-contact cooling and is not chemically treated. An estimated 575 gallons per day is discharged. NGK has requested guidance from the Department on what if any action is needed to comply with applicable regulations for this discharge.

EN 29002/ISO 9002
ANSI/ASQC Q92
APPROVED BY BVQI (NA)

Certified ISO 9002

EN 29002 ISO 9002 BS 5750

Please direct any phone calls or correspondence to myself at the location identified above.

Sincerely,

Lynne Woodside 5303 EXTENSION

Lynne Woodside
Supervisor, Environmental Affairs

nc
Enc.
0018N

cc: M. Satterfield

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NOV 4 1994

ENFORCEMENT & COMPLIANCE
TN DEPT. WPC

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

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MONITORING YEAR 11/01/93 TO 10/31/94

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OUTFALL NO. S.0.1 A 34,000 [X] SQ FEET [ ] ACRES

B 100 % C 95 % D 5 % E 0 % F 0.10 INCHES

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OUTFALL NO. S 0 2 A 2,500 [X] SQ FEET [ ] ACRES

B 70 % C 12 % D 58 % E 30 % F Not Recorded INCHES

PARAMETER	QUALITY OR CONCENTRATION MINIMUM	AVERAGE	MAXIMUM	REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
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12/30
1/5
1/6
2-27
1-19
1-27
2-1
2-2
2-7

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
CHATTANOOGA ENVIRONMENTAL FIELD OFFICE
540 McCALLIE AVE., SUITE 550
CHATTANOOGA, TENNESSEE 37402-2013
(615) 634-5745 FAX (615) 634-6389

due date APH 1-1

file

McMinn Co
S/W Industrial
1994

December 29, 1994

Certified Mail

Mr. John Manikas, General Manager
NGK Metals Corporation
725 East Avenue
Athens, Tennessee 37303

Re: *Notice of Violation*
Unpermitted Discharge
McMinn County

Dear Mr. Manikas:

On December 16, 1994, Jill Davis of this office conducted an inspection of NGK Metals after receiving a storm water monitoring report (NPDES Storm Water Permit No. TNR000544) which stated that there was a dry weather discharge which consisted of non-contact cooling water. Although there was no discharge during the inspection, the discharge pipe was observed. Mr. Satterfield, the facility representative stated that the discharge primarily occurred during the summer. Also noted near a roll-off box was a slight amount of waste foundry sand spillage. This spillage could possibly account for the storm water report level exceedence for copper in this past year's monitoring report.

Please be informed that the discharge of the non-contact cooling water without a valid waste water discharge permit is a violation of the Water Quality Control Act, Tennessee Code Annotated, 69-3-101, et. seq. Enforcement actions which can result for violations of the Act include a civil penalty of up to ten thousand dollars ($10,000) per day for each day a violation occurs. Until a permit is obtained, no discharging can be allowed.

due date → Please respond in writing by January 31, 1995, with a detailed description of what steps have been taken to prevent a recurrence of the non-contact cooling water discharge. If you desire to obtain a permit for the discharge, please complete and submit the enclosed

application. Also include in your response what steps have been taken to reduce the amount of spillage around the roll-off box. If you feel that the roll-off box may not be the cause of the high copper levels in the storm water, then please discuss what steps you plan to take to identify the source and reduce the copper contamination in the storm water.

Thank you for the cooperation extended during the inspection. If you have any questions, please contact Jill Davis at (615)634-5705.

Sincerely,

Philip L. Stewart, P.E.
Manager, Chattanooga Field Office
Division of Water Pollution Control

05/jed/ngk
Enclosure
cc: Division of Water Pollution Control, Industrial Facilities Section, Nashville
cc: Division of Water Pollution Control, Enforcement and Compliance Section, Nashville
cc: Lynne Woodside, NGK Metals Corporation, Tuckerton Road, P.O. Box 13367, Reading, PA 19612-5000

NOV Response

Review

NGK BERYLCO

NGK Metals Corporation

725 East Avenue Athens, TN 37303 615 745-6871 Fax 615 745-6874

January 3, 1995

Certified Mail

Mr. Philip L. Stewart, P.E.
Manager, Chattanooga Field Office
Division of Water Pollution Control
540 McCallie Ave., Suite. 550
Chattanooga, TN 37402

file:
Industrial S.
S/W - 1995
McMinn
cc: E&CS

Re: Unpermitted Discharge

Dear Mr. Stewart:

I am in receipt of your letter dated December 29, 1994 regarding the notice of violation of unpermitted discharge.

On December 17, 1994 NGK, Athens, TN contacted Tri City Plumbing to install a sump pump with reservoir to dump discharge from our cooling tower, non contact cooling water, to the city sewer system. This should be complete by January 10, 1995 (it is currently approximately 75% complete).

As for the waste foundry sand spillage, plans have been made to relocate the 20 yard roll-off to accommodate a dry storage area. Richard Harrill and Sons, General Contractors, should complete this project by February 17, 1995.

If you have any questions, please call me at (615) 745-6871.

Sincerely,

John J. Manikas

John J. Manikas
General Manager

JJM/ced

cc: Jill Davis, E.I.T. Division of Water Pollution Control, Chattanooga Field Office, Chattanooga

cc: Lynne Woodside, NGK Metals Corporation, Tuckerton Road, P.O. Box 13367, Reading, Pa 19612-5000

NOV 06 1995

PLS 11/8
TPW 11/9
JDH
JED 11-20
MFB
VMJ 11-14
CVH
GDR
BSE
AGI 11-15
JFP
CLB

NGK BERYLCO

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 FAX 610 921-5358

logged

October 25, 1995

Tennessee Department of Environment
& Conservation
Division of Water Pollution Control
Attn: Compliance and Enforcement
6th Floor L & C Annex
401 Church Street
Nashville, TN 37243-1534

file: McMinn Co
S/W - 1995
Industrial

Re: NPDES TNR00-054
Storm Water Monitoring Report

Dear Sir/Madam:

Enclosed please find 2 copies of the storm water report for the monitoring year 11/01/94 to 10/31/95. There are two outfalls at the Athens facility. Samples were collected September 13, 1995 and immediately placed in appropriately preserved bottles. Samples were analyzed by M. J. Reider Associates in Reading, Pennsylvania.

Analysis of the storm water samples revealed copper concentrations of 0.068 and 0.060 mg/l, exceeding the report value of 0.018 mg/l. NGK is presently investigating potential sources of the copper.

Should you have any questions on this report, please feel free to contact me at 610-921-5303.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor,
Environmental Affairs

nc
Enc.
0257N

cc: TN Dept. of Env. & Conservation, Chattanooga
M. Satterfield - NGK

EN 29002/ISO 9002
ANSI/ASQC Q92
APPROVED BY BVQI (NA)

Certified ISO 9002

EN 29002 ISO 9002 BS 5750
APPROVED BY BVQI

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/1/94 TO 10/31/95

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue, NE
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY": 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR: 2
TOTAL NUMBER OF STORM EVENTS SAMPLED: 1

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR:

A ....DRAINAGE AREA OF OUTFALL
B .....PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C .....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D .....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E.....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F .....RAINFALL AMOUNT OF THE STORM EVENT SAMPLED; IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT

OUTFALL NO. S 0 1 A 34,000 ☒ SQ FEET ☐ ACRES

B 100 % C 95 % D 5 % E 0 % F 0.6 INCHES

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
BOD, 5-DAY (00310)			6	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			24	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.32	4	mg/l	1	COMP.
OIL AND GREASE (00550)			< 1	15	mg/l	1	GRAB
pH (00400)			6.80	4.0 - 9.0	stand.	1	GRAB
COD			31	100	mg/l	1	Comp.
Arsenic Total			0.003	0.36	mg/l	1	Comp.
Cadmium Total			< 0.001	0.004	mg/l	1	Comp.
Chromium Total			0.006	1.0	mg/l	1	Comp.

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? ☒ YES ☐ NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? ☐ YES ☒ NO*

*PE not certified in TN

HAS THE PLAN BEEN IMPLEMENTED? ☒ YES ☐ NO

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? ☒ YES ☐ NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? ☐ YES ☒ NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	95	10	31
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/1/94 TO 10/31/95

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue, NE
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5303

Note: Read instructions on back before completing this form.

OUTFALL NO. S01 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Copper Total			0.068	0.018	mg/l	1	Comp.
Lead Total			< 0.02	0.082	mg/l	1	Comp.
Nickel Total			0.019	1.4	mg/l	1	Comp.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	95	10	31
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/1/94 TO 10/31/95

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue, NE
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TRN00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5303

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY": 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR: 2
TOTAL NUMBER OF STORM EVENTS SAMPLED: 2

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR.

A .....DRAINAGE AREA OF OUTFALL
B .....PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C .....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D .....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E.....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F.....RAINFALL AMOUNT OF THE STORM EVENT SAMPLED; IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT.

OUTFALL NO. S02 A 2,500 ☒ SQ FEET ☐ ACRES

B 70 % C 12 % D 58 % E 30 % F 0.6 INCHES

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
BOD, 5-DAY (00310)			5	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			110	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.17	4	mg/l	1	COMP.
OIL AND GREASE (00550)			< 1	15	mg/l	1	GRAB
pH (00400)			6.80	4.0 - 9.0	stand.	1	GRAB
COD			27	100	mg/l	1	Comp.
Arsenic Total			< 0.001	0.36	mg/l	1	Comp.
Cadmium Total			< 0.001	0.004	mg/l	1	Comp.
Chromium Total			0.006	1.0	mg/l	1	Comp.

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? ☒ YES ☐ NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? ☐ YES ☒ NO *

HAS THE PLAN BEEN IMPLEMENTED? ☒ YES ☐ NO

*PE not certified in TN

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? ☒ YES ☐ NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? ☐ YES ☒ NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	95	10	31
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/1/94 TO 10/31/95

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue, NE
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5303

Note: Read instructions on back before completing this form.

OUTFALL NO. S 0 2 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Copper Total			< 0.060	0.018	mg/l	1	Comp.
Lead Total			< 0.02	0.082	mg/l	1	Comp.
Nickel Total			0.020	1.4	mg/l	1	Comp.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	95	10	31
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

DEC 1 6 1996

NGK Metals Corporation

Tuckerton Road P.O. Box 13367 Reading, PA 19612-3367 610 921-5000 Fax 610 921-5358

December 12, 1996

PLS 12/20
TPW 12/23
JED 1/14
VMJ 1/7
OK logged

Tennessee Department of Environment & Conservation
Division of Water Pollution Control
Attn: Compliance and Enforcement
6th Floor L&C Annex
401 Church Street
Nashville, TN 37243-1534

Re: NPDES TNR00-054
Storm Water Monitoring Report

file McMinn Co. 5/11 Industrial 1996

Dear Sir/Madam:

Enclosed please find 2 copies of the storm water report for the monitoring year 11/01/95 to 10/31/96. There are two outfalls at the Athens facility. Samples were collected November 1, 1996 and immediately placed in appropriately preserved bottles. Samples were analyzed by M. J. Reider Associates in Reading, Pennsylvania.

Analysis of the storm water samples revealed copper concentrations of 0.049 and 0.156 mg/l, at S01 and S02 respectively exceeding the report value of 0.018 mg/l. In addition, the chemical oxygen demand level at S01 was 101 mg/l slightly exceeding the report level of 100 mg/l. NGK is presently investigating potential sources of the copper and COD.

Should you have any questions on this report, please feel free to contact me at 610-921-5147.

Sincerely,

Lynne Woodside

Lynne Woodside
Supervisor, Environmental Affairs

nc

cc: TN Dept. of Env. & Conservation, Chattanooga
M. Satterfield - NGK

EN 29002/ISO 9002
ANSI/ASQC Q92
APPROVED BY BVQI (NA)

Certified ISO 9002

EN 29002/ISO 9002/BS 5750
APPROVED BY BVQI

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/1/95 TO 10/31/96

FACILITY NAME: NGK Metals Corporation
ADDRESS: 725 East Avenue
CITY: Athens COUNTY: McMinn

NPDES PERMIT NUMBER: TNR00-0544
CONTACT PERSON: Lynne Woodside
PHONE NUMBER: (610) 921-5147

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY": 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR: 2
TOTAL NUMBER OF STORM EVENTS SAMPLED: 1

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR:

A.....DRAINAGE AREA OF OUTFALL
B.....PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C.....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D.....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E.....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F.....RAINFALL AMOUNT OF THE STORM EVENT SAMPLED; IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT.

OUTFALL NO. S01 A 34,000 ☒ SQ FEET ☐ ACRES

B 100 % C 95 % D 5 % E 0 % F 0.5 INCHES

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
BOD, 5-DAY (00310)			8	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			32	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.23	4	mg/l	1	COMP.
OIL AND GREASE (00550)			< 1	15	mg/l	1	GRAB
pH (00400)			6.90	4.0 - 9.0	stand.	1	GRAB
COD			101	100	mg/l	1	Comp
Arsenic Total			< 0.001	0.36	mg/l	1	Comp
Cadmium Total			< 0.001	0.004	mg/l	1	Comp
Chromium Total			< 0.004	1.0	mg/l	1	Comp

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? ☒ YES ☐ NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? ☐ YES ☒ NO *
*PE not certified in TN.

HAS THE PLAN BEEN IMPLEMENTED? ☒ YES ☐ NO

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? ☒ YES ☐ NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? ☐ YES ☒ NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	96	12	12
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

CN-0997

RDA 1663

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/1/95 TO 10/31/96

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610)921-5147

Note: Read instructions on back before completing this form.

OUTFALL NO. S 0 1 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Copper Total			0.049	0.018	mg/l	1	Comp
Lead Total			0.006	0.082	mg/l	1	Comp
Nickel Total			0.009	1.4	mg/l	1	Comp

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	96	12	12
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT

MONITORING YEAR 11/1/95 TO 10/31/96

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5147

TOTAL NUMBER OF FACILITY OUTFALLS THAT CONVEY "STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY": 2
TOTAL NUMBER OF ABOVE OUTFALLS SAMPLED DURING THE MONITORING YEAR: 2
TOTAL NUMBER OF STORM EVENTS SAMPLED: 1

Note: Read instructions on back before completing this form.

PROVIDE THE FOLLOWING INFORMATION FOR EACH OUTFALL SAMPLED THIS YEAR:

A.....DRAINAGE AREA OF OUTFALL
B.....PERCENTAGE OF DRAINAGE AREA DEFINED AS INDUSTRIAL ACTIVITY
C.....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF IMPERVIOUS SURFACES (CONCRETE, PAVEMENT, ROOF, PONDS)
D.....PERCENTAGE OF DRAINAGE AREA ON YOUR PROPERTY CONSISTING OF VEGETATION (FOREST, LAWN, FIELD)
E.....PERCENTAGE OF DRAINAGE AREA CONSISTING OF GRAVEL OR OTHER SURFACES
F.....RAINFALL AMOUNT OF THE STORM EVENT SAMPLED; IF TWO OR MORE EVENTS WERE SAMPLED, REPORT THE HIGHER OR HIGHEST AMOUNT.

OUTFALL NO. S,0,2 A 2,500 [X] SQ FEET [ ] ACRES

B 70 % C 12 % D 58 % E 30 % F 0.5 INCHES

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
BOD, 5-DAY (00310)			2	50	mg/l	1	COMP.
TOTAL S. SOLIDS (00530)			180	200	mg/l	1	COMP.
NITROGEN, AMMONIA (00610)			0.14	4	mg/l	1	COMP.
OIL AND GREASE (00550)			1.7	15	mg/l	1	GRAB
pH (00400)			7.90	4.0 - 9.0	stand.	1	GRAB
COD			58	100	mg/l	1	Comp
Arsenic Total			< 0.001	0.36	mg/l	1	Comp
Cadmium Total			< 0.001	0.004	mg/l	1	Comp
Chromium Total			0.037	1.0	mg/l	1	Comp

HAS A STORM WATER POLLUTION PREVENTION PLAN BEEN PREPARED FOR THIS FACILITY? [X] YES [ ] NO

HAS THE PLAN BEEN SIGNED BY A PERSON WHO MEETS THE SIGNATORY REQUIREMENTS OF THE PERMIT? [ ] YES [X] NO *

*PE not certified in TN.

HAS THE PLAN BEEN IMPLEMENTED? [X] YES [ ] NO

HAVE YOUR STORM WATER OUTFALLS BEEN TESTED FOR UNPERMITTED, NON-STORM WATER DISCHARGES? [X] YES [ ] NO

ARE THERE ANY UNPERMITTED, NON-STORM WATER DISCHARGES PRESENT? [ ] YES [X] NO
IF SO, ATTACH RESULTS OF YOUR INVESTIGATION.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	96	12	12
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

STORM WATER MONITORING REPORT - ADDENDUM FOR ADDITIONAL PARAMETERS

MONITORING YEAR 11/1/95 TO 10/31/96

FACILITY NAME NGK Metals Corporation
ADDRESS 725 East Avenue
CITY Athens COUNTY McMinn

NPDES PERMIT NUMBER TNR00-0544
CONTACT PERSON Lynne Woodside
PHONE NUMBER (610) 921-5147

Note: Read instructions on back before completing this form.

OUTFALL NO. S 0 2 MONITORING RESULTS FOR ADDITIONAL PARAMETERS

PARAMETER	QUALITY OR CONCENTRATION			REPORT LEVEL	UNITS	NO. OF SAMPLES	SAMPLE TYPE
	MINIMUM	AVERAGE	MAXIMUM				
Copper Total			0.156	0.018	mg/l	1	Comp
Lead Total			0.018	0.082	mg/l	1	Comp
Nickel Total			0.227	1.4	mg/l	1	Comp

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN, AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER		DATE		
Y. Niwa, Sr. Vice President	Yasuhito Niwa	'96	12	12
TYPED OR PRINTED	SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	YEAR	MONTH	DAY

State of Tennessee
Department of Environment & Conservation
Division of Water Pollution Control

NOTICE OF INTENT
for
Baseline General Permit to Discharge
Storm Water Associated with Industrial Activity

RECEIVED
OCT - 1 1992

I. OWNER/OPERATOR

Name: NGK Metals Corporation	A. Owner/Operator Type: (Check one) 01.☐ Federal 02.☐ State 03.☐ City 04.☐ County 05.☐ Management Group 06.☒ Private 99.☐ Other
Mailing Address: P. O. Box 13367	
City: Reading	State: PA Zip: 19612-3367 Phone: (215) 921-5303
Contact Person: Lynne Woodside	B. 1.☐ Owner 2.☐ Operator 3.☒ Owner/Operator

II. FACILITY IDENTIFICATION

Facility Name: NGK Metals Corporation	County: McMinn
Street Address: 725 East Avenue,N.E.	Contact Person: John J. Manikas
City: Athens	State: TN Zip: 37303 Phone: (615)745-6871

III. SITE DETAILS

Enter facility location: 35° 34' 05" Latitude: 35 deg. 26 min. 52 sec. 84° 35' 37" Longitude: 84 deg. 36 min. 43 sec.	Area of facility property: 5.67 ☐ sq.ft. ☒ acres
	Area of undeveloped land: 3.77 ☐ sq.ft. ☒ acres
	Area of impervious surfaces: 30,000 ☒ sq.ft. ☐ acres
☐ Check box to indicate required map (8.5"x11") with facility and receiving streams highlighted and identified is attached.	Area of pavement: 0 ☐ sq.ft. ☐ acres

WRONG

THIS IS NEAR ALLEN MEM. CHURCH

IV. INDUSTRIAL INFORMATION

A. SIC Code(s): List primary SIC code first, etc. These are 4-digit numbers.

1. 3366 2. _____ 3. _____ 4. _____

B. Nature of business (keywords):

Manufacturing of beryllium alloys.

C. Activities at facility: (Check all that apply)

01.☒ Manufacturing 02.☐ Storage/Distribution
03.☐ Vehicle Storage 04.☐ Trucking Terminal
05.☐ Vehicle Maintenance 06.☐ Hazardous Waste TSD
07.☐ Outside Waste Disposal 08.☐ Recycling
09.☐ Wastewater Treatment 10.☐ Land Application
11.☐ Landfill 12.☐ Solid Waste Mgt. Unit
99.☐ Other _____

STATE USE ONLY

Date NOI Received: 10-01-92	Field Office JAN 1993 CFO	☐ Individual Permit Rationale
Date of Coverage: 11-01-92	NPDES General Permit No.: TNR00 0544	Reviewer: 4/5/93

CN-0941

V. MATERIAL HANDLING

A. Types of material stored and/or handled outside: (Check all that apply)

01. ☐ Stone, clay, sand
02. ☒ Raw supply/finished metal
03. ☐ Scrap metal
04. ☐ Solvents
05. ☐ Paints
06. ☐ Petroleum products
07. ☐ Wood treating products
08. ☐ Pesticides
09. ☐ Hazardous wastes
10. ☐ Coal
11. ☐ Salt or other deicing chemicals
12. ☐ Plastics
99. ☐ Other (Please list.)

B. Existing practices used to prevent exposure to storm water of material storage, handling or material handling equipment, or to minimize contaminated runoff. (Check all that apply.)

01. ☐ Oil/water separator
02. ☐ Containment
03. ☐ Berms (pervious, impervious)
04. ☐ Storm water detention
05. ☐ Leachate collection
06. ☒ Overhead coverage
07. ☐ Covering with tarpaulins, etc.
08. ☐ Chemical treatment
99. ☐ Other (Please list.)

VI. DISCHARGE POINTS & WATERS RECEIVING THE DISCHARGES

A. Does your facility's storm water discharge directly to: (Check one)

1. ☐ Storm drain system — Owner of system: (Name) _____
2. ☒ Waters of the State (e.g., stream, river, lake) either directly or via ditch, etc.

Approximate distance to receiving stream or sinkhole: 220 ~~miles~~ feet

Number of storm water discharge points: 1 ☒ exact or ☐ estimate

B. Name(s) of Waters of the State: Tributary to Little North Mouse Creek.

VII. EXISTING PERMITS

A. ☐ NPDES Permit	B. ☐ RCRA Permit	C. Air Pollution Control Permit(s)
TN N/A	No. N/A	☒ yes ☐ no
D. Facility on SARA 313 list	E. Dun and Bradstreet No.	
☒ yes ☐ no	N/A	

VIII. ADDITIONAL INFORMATION

A. ☐ Existing storm water sampling data is submitted. Please indicate methods of sampling.

B. Comments or additional information to describe facility

IX. CERTIFICATION AND SIGNATURE (MUST BE SIGNED BY PRESIDENT, V.P. OR EQUIVALENT, OR RANKING ELECTED OFFICIAL)

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in the attached document; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Printed Name: Yasuhito Niwa — Title: Vice President, Administration

Signature: Yasuhito Niwa — Date: 9/24/92

Please submit form to the following address:

Stormwater NOI Processing
Division of Water Pollution Control
401 Church Street
Department of Environment & Conservation
Nashville, Tennessee 37243-1534

State of Tennessee
Department of Environment & Conservation
Division of Water Pollution Control

NOTICE OF INTENT
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Storm Water Associated with Industrial Activity

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STATE USE ONLY

Date NOI Received: 10-01-92	Field Office JAN 1993 CFO	☐ Individual Permit Rationale
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CN-0941

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09. ☐ Hazardous wastes
10. ☐ Coal
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A. ☐ NPDES Permit	B. ☐ RCRA Permit	C. Air Pollution Control Permit(s)
TN N/A	No. N/A	☒ yes ☐ no
D. Facility on SARA 313 list	E. Dun and Bradstreet No.	
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A. ☐ Existing storm water sampling data is submitted. Please indicate methods of sampling.

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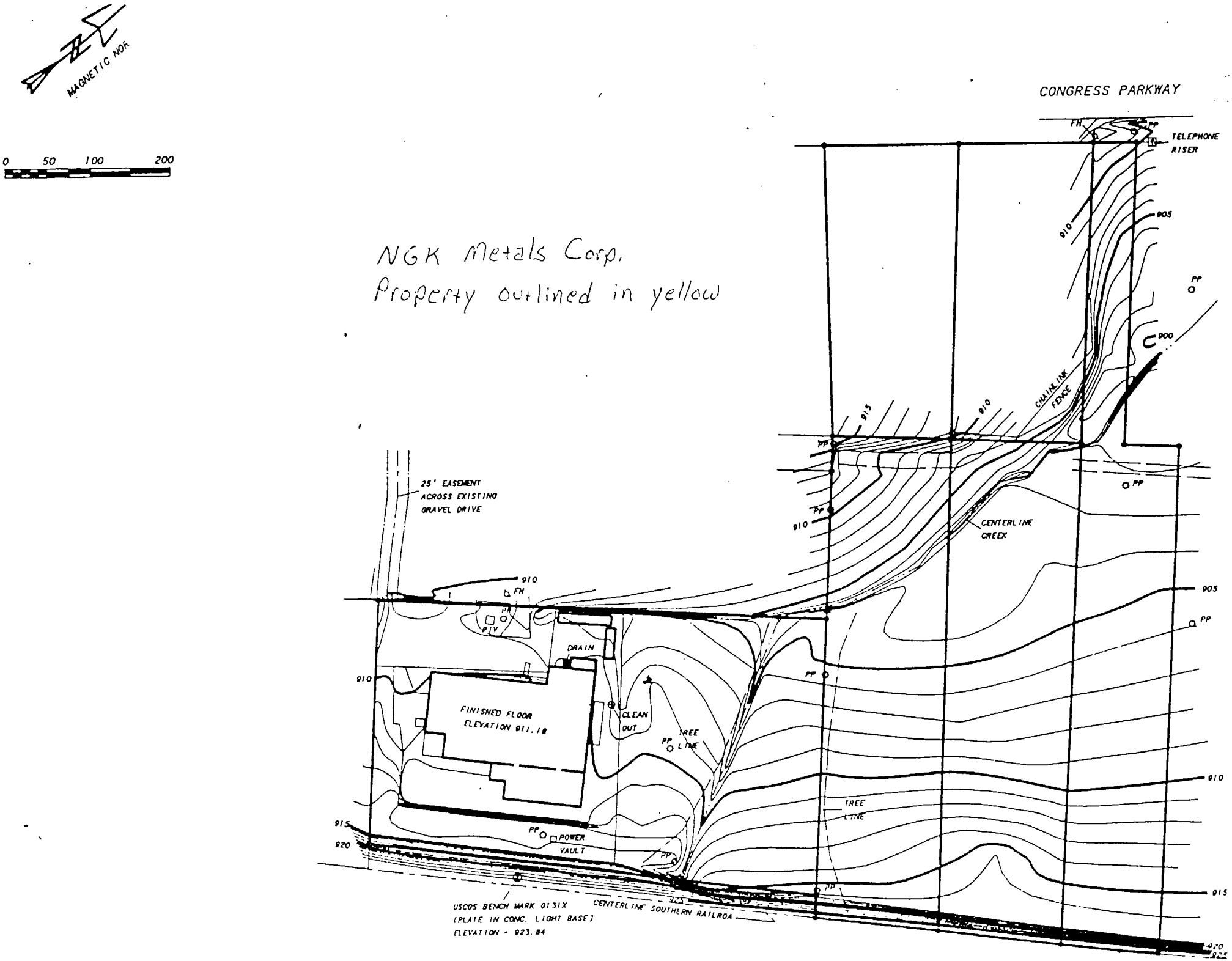
Printed Name: Yasuhito Niwa Title: Vice President, Administration

Signature: Yasuhito Niwa Date: 9/24/92

Please submit form to the following address:

Stormwater NOI Processing
Division of Water Pollution Control
401 Church Street
Department of Environment & Conservation
Nashville, Tennessee 37243-1534


MAGNETIC NOR
0 50 100 200
NGK Metals Corp.
Property outlined in yellow
CONGRESS PARKWAY
TELEPHONE RISER
FH
PP
905
910
900
915
CHAIN LINK FENCE
CENTERLINE CREEK
25' EASEMENT ACROSS EXISTING GRAVEL DRIVE
PIV
DRAIN
FINISHED FLOOR ELEVATION 911.18
CLEAN OUT
TREE LINE
POWER VAULT
920
925
USCGS BENCH MARK 0131X
(PLATE IN CONC. LIGHT BASE)
ELEVATION = 923.84
CENTERLINE SOUTHERN RAILROA

Preliminary Assessment
For
NGK Metals

Reference 6
Memo from Jill Davis
October 29, 1998 Trip Report

TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF SUPERFUND
OFFICE CORRESPONDENCE

DATE: October 29, 1998

TO: Division of Superfund File 54-514

FROM: Jill Davis

SUBJECT: NGK Metals
McMinn County

On October 29, 1998, I conducted a visual inspection of the former NGK Metals facility on East Avenue. The facility was closed and locked with a 'for sale' sign attached to the fence.

From the entrance, there was only a small amount of staining on a concrete driveway. This area was near a previous storage area of waste foundry sand. I did not access the back of the building. There were no signs of staining in the drainage-way upstream or downstream of the facility.

A small perennial stream crosses in front of the facility. Waste foundry sand or other dark colored waste was not apparent in the stream.

FROM	DATE

TO

Preliminary Assessment
For
NGK Metals

Reference 7
NGK Metals Deed Information

THIS INSTRUMENT PREPARED BY
HIGGINS, BIDDLE & CHESTER, ATTORNEYS
ATHENS, TENNESSEE 37303

ADDRESS OF PROPERTY OWNER AND TO WHICH TAX STATEMENT SHALL BE MAILED: NGK Metals Corporation
P.O. Box 13367
Reading, Pa. 19612-3367

375

QUIT CLAIM DEED

THIS INSTRUMENT made and entered into on this the 30th day of September, 1986, by and between CABOT CORPORATION, a Delaware Corporation with properties located in Athens, McMinn County, Tennessee, hereinafter referred to as party of the first part; and NGK Metals Corporation, Delaware Corporation with an office at Tuckerton Rd., Temple, Pa., hereinafter referred to as party of the second part.

WITNESSETH:

THAT for and in consideration of the sum of One Dollar ($1.00) cash in hand paid, the receipt of which is hereby acknowledged, the party of the first part conveys and quitclaims unto the party of the second part, all its right, title and interest in and to the following described real estate, to-wit:

TRACT 1.
LYING AND BEING SITUATED in the First Civil District of McMinn County, Tennessee, and within the Corporate Limits of the City of Athens, the same being a lot or tract lying on the North side of the Southern Railroad and being bounded on the Northwest, Northeast and Southwest by East Tennessee Machine Tool Works, Inc., and also on the Northwest by the center line of a spring branch and containing 1.99 acres, more or less, according to the survey of Morgan Watkins, Engineer, bearing date of April 10, 1973, said lot being more particularly described as follows, to-wit:

BEGINNING at the Northwest corner of the within described property at the point where the West line of the Western most roadway leading from East Avenue into the Old Pet Milk Plant building crosses said branch; thence along the center line of said branch, North 43 deg. 31' East, 294 feet along the center line of said branch and with the meanderings thereof down stream to a point; thence South 47 deg. 00' East, 5 feet to a stake which is 243 feet Southwest of the Sherman Concrete Pipe Co. line marked by a fence which separates the Sherman Concrete Pipe Co. from East Tennessee Machine Tool Works, Inc.; thence South 47 deg. 00' East, 307.5 feet to the fence line running along the North line of the Southern Railroad; thence South 48 deg. 12' West, 295.4 feet along said fence line to an iron pin; thence North 47 deg. 00' West, 288.6 feet along a severance line with East Tennessee Machine Tool Works, Inc. to the center of said creek at the point of BEGINNING.

THERE is also conveyed an easement 25 feet in width for

This property is conveyed subject to the easement rights of Southern Railway Company, Inc.

By Release of Right of Way and Restrictions, Basil W. Turbyfill, as successor to East Tennessee Machine Tool Works, Inc., released all interest of East Tennessee Machine Tool Works, Inc. in said Right of Way and Restrictions which instrument is of record in Deed Book 9-H, Pages 497-498 in the Register's Office for McMinn County, Tennessee, to which reference is hereby made.

BEING THE SAME PROPERTY conveyed unto Kawecki Berylco Industries, Inc. by Trustee's Deed dated March 24, 1975, of record in Deed Book 7-O, Page 753-755 in the Register's Office for McMinn County, Tennessee, to which reference is hereby made. Kawecki Berylco Industries, Inc. changed its name to Cabot Berylco, Inc. on October 15, 1980, and on October 1, 1982, Cabot Berylco, Inc. was merged into the Cabot Corporation, the party of the first part herein.

TRACT 2.
LYING AND BEING in the First Civil District of McMinn County, Tennessee, and in the City of Athens, being more particularly described as follows:, to-wit:

BEGINNING in the West line of Sherman Concrete Pipe Co. at the Northernmost corner of the property described and at an iron pin 177.1 feet from East Avenue, thence with Sherman Concrete South 47 deg. 11 min. East 326 feet to the fence along Southern Railroad, thence with the Railroad South 46 deg. 39 min. West 243.2 feet to an iron pin, thence leaving the Railroad, North 47 deg. 00 min. West 312.5 feet to an iron pin in a ditch, thence North 43 deg. 31 min. East 241.9 feet to the beginning, containing 1.8 acres, according to a survey prepared by Morgan Watkins Engineering Co., Inc. dated July 10, 1978, Drawing No. 78189.

BEING THE same property conveyed to Kawecki Berylco Industries, Inc. by Warranty Deed of East Tennessee Machine Tool Works, Inc. dated August 21, 1978, recorded in Deed Book 8-K, pages 563-564, in the Register's Office for McMinn County, Tennessee, to which reference is hereby made. Kawecki Berylco Industries, Inc. changed its name to Cabot Berylco, Inc. on October 15, 1980, and on October 1, 1982, Cabot Berylco, Inc. was merged into the Cabot Corporation, the party of the first part herein.

IN TESTIMONY WHEREOF, the party of the first part has hereunto set its signature, this the day and date first above written.

CABOT CORPORATION

By: [signature]
Its: Executive Vice President

377

STATE OF Pennsylvania)
)
COUNTY OF Philadelphia)

PERSONALLY APPEARED before me, Sharon G. Davis, a Notary Public, in and for Philadelphia County, Norton Q. Sloan with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged himself to be Executive Vice President of CABOT CORPORATION, the within named bargainor, a corporation, and that he as such Executive Vice President being authorized so to do, executed the foregoing instrument by signing the name of the corporation by himself as such Executive Vice President.

WITNESS MY HAND and seal at office, this 30th day of September, 1986.

Sharon G. Davis
Notary Public

My Commission Expires: _____.

SHARON A. DAVIS
Notary Public, Phila., Phila. Co.
My Commission Expires Feb. 6, 1989

AFFIDAVIT

THE UNDERSIGNED Norton Q. Sloan, hereby makes oath that $ 147,500.00 is the greater of the actual consideration or value of the property hereinabove described as of the date of this instrument.

AFFIANT

Sworn to and subscribed to before me, this 30th day of September, 1986.

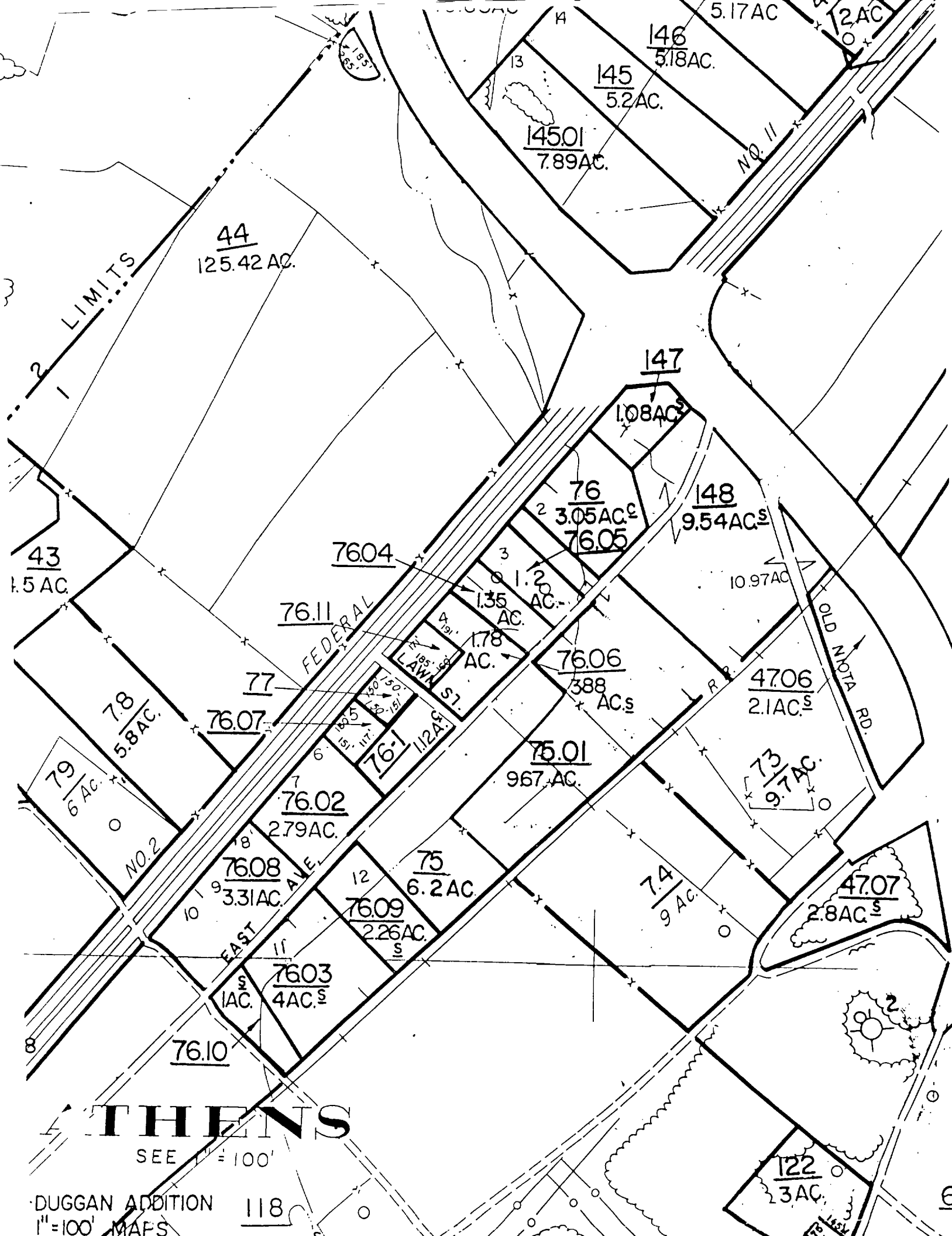
Sharon G. Davis
NOTARY PUBLIC OR REGISTER OF DEEDS

My Commission Expires: _____.

SHARON A. DAVIS
Notary Public, Phila., Phila. Co.
My Commission Expires Feb. 6, 1989

I Certify that State Tax is Paid
State Tax $ 413.00
Certificate Fee .50
Total Paid $ 413.50

STATE OF TENNESSEE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2AC
146
5.18AC.
145
5.2AC.
145.01
7.89AC.
NO. 11
44
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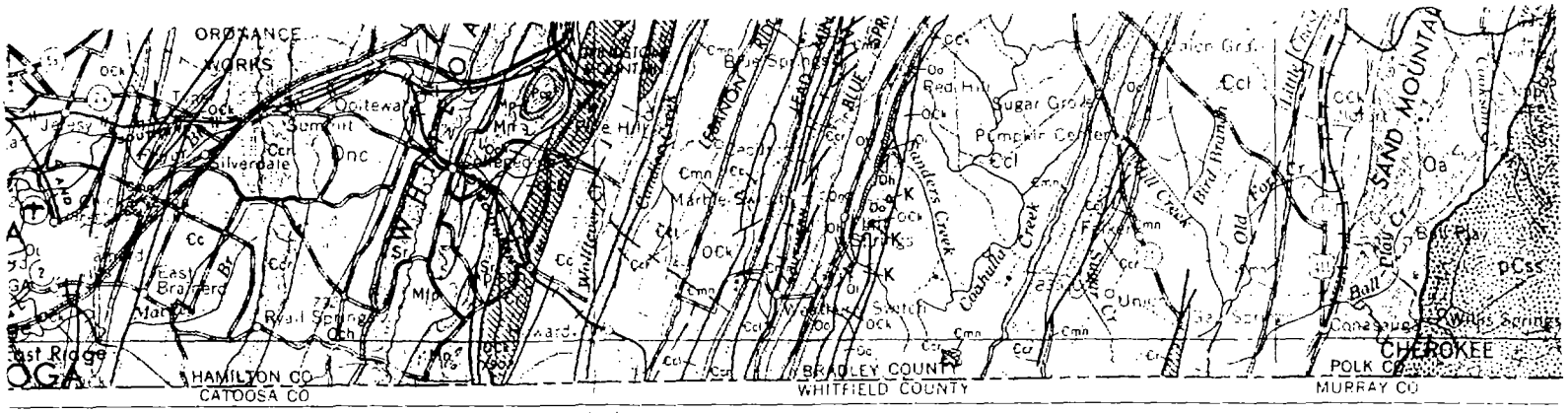
LIMITS
147
1.08AC.
76
3.05AC.
76.05
148
9.54AC.
43
1.5 AC.
76.04
1.2 AC.
1.35 AC.
10.97AC
76.11
FEDERAL
1.78 AC.
LAWN ST.
76.06
388 AC.
OLD NOTA RD.
47.06
2.1AC.
77
7.8
5.8AC.
76.07
76-1
1.12AC.
75.01
9.67 AC.
73
9.7AC.
79
6 AC.
76.02
2.79AC.
NO. 2
76.08
3.31AC.
75
6.2AC.
7.4
9 AC.
47.07
2.8AC.
EAST AVE.
76.09
2.26AC.
76.03
4AC.
1AC.
76.10
ATHENS
SEE 1" = 100'
122
3AC.
DUGGAN ADDITION
1" = 100' MAPS
118

Preliminary Assessment
For
NGK Metals

Reference 8
Geologic Map of Tennessee, East-Central Sheet



EAST-CENTRAL SHEET

GEOLOGIC MAP OF TENNESSEE

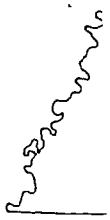
1966

WILLIAM D. HARDEMAN
STATE GEOLOGIST

Scale 1:250,000

5 0 5 10 Statute Miles

CONTOUR INTERVAL 100 FEET WITH SUPPLEMENTARY CONTOURS AT 50-FOOT INTERVALS



EXPLANATION

CUMBERLAND PLATEAU AND VALLEY AND RIDGE

MDSO

rian, Devonian, and
mations

rea containing all or portions
ayne, Chattanooga, Rockwood,
ne.

Mp — Pennington Formation

Highly variegated clay shale distinctive, contains siltstone and locally gray, fine-grained sandstone. Thickness 200 to 700 feet.

Mn — Newman Limestone

Gray limestone sequence near Cumberland Plateau and on Whiteoak Mountain. Shaly limestone, shale, siltstone, and sandstone on Chilhowee Mountain. Thickness about 700 feet.

Mfp — Fort Payne Formation

Bedded chert, calcareous and dolomitic, somewhat crinoidal, and minor shale. Thin green shale (Maury) at base. Average thickness about 300 feet.

Mg — Grainger Formation

Gray to green shale with siltstone and fine-grained glauconitic sandstone; in some areas quartz-pebble conglomerate. Thickness about 1,200 feet.

Greasy Cove Formation

Gray argillaceous limestone, calcareous shale, siltstone, and fine-grained sandstone. Equivalent to Newman Limestone. Maximum preserved thickness about 300 feet.

Mgg (Grainger + Greasy Cove)

MDc — Chattanooga Shale

Black carbonaceous shale, fissile. Thickness 20 to 30 feet in most areas, thickens abruptly to about 100 feet near east edge of sheet.

Sr — Rockwood Formation

Brown to maroon shale, thin gray siltstone and sandstone, and thin lenticular layers of oolitic and fossiliferous red hematite. Thickness 200 to 800 feet.

Clinch Sandstone

Clean, white, well-sorted sandstone; locally gray siltstone and shale. Combined Rockwood and Clinch thicknesses about 700 feet.

Src (Rockwood + Clinch)

Sequatchie Formation

MISSISSIPPIAN

Mbn — **Bangor Limestone**
Dark brownish gray limestone, thick bedded. Thickness 70 to [illegible] feet

Hartselle Formation
Thin bedded, fine grained sandstone interbedded with gray shale, with oolitic and coarse grained limestone beds locally. Thickness [illegible] feet

Mm — **Monteagle Limestone**
Mainly fragmental and oolitic, light gray limestone, blocky brownish chert weathers from base. Thickness [illegible] to [illegible] feet

St. Louis Limestone
Fine grained, brownish gray limestone, dolomitic and cherty. Thickness [illegible] feet

Msw — **Warsaw Limestone**
Mainly medium to coarse grained, gray limestone, crossbedded. Includes much calcareous sandstone and shale to the north. Thickness [illegible] to [illegible] feet

DEVONIAN

Mfp — **Fort Payne Formation**
Calcareous and dolomitic siltstone, contains bedded chert, cherty limestone and shale, scattered crinoidal limestone lenses. Thin green shale. Mainly at base. Thickness [illegible] to [illegible] feet

Chattanooga Shale
Black carbonaceous shale, fissile. Thickness [illegible] to [illegible] feet in most areas. Mapped as MDc in Flynn Creek [illegible] where it is [illegible] feet thick

SILURIAN

Laurel Limestone
Dolomitic limestone, mottled yellowish gray to yellowish green, fine grained. Thickness [illegible] feet. Present only in Madison County

Osgood Formation
Gray to green shale. Thickness [illegible] feet. Present only in Madison County

Brassfield Formation
Gray, fine grained, cherty limestone to the north merging into coarse gray calcareous shale to the south. Thickness [illegible] feet. Present only in Sequatchie Valley

ORDOVICIAN

Sequatchie Formation
Greenish gray calcareous shale, mudstone and argillaceous limestone, dolomitic, laminated, and sandy. Thickness [illegible] feet

Leipers Formation
Nodular, shaly limestone and fine to coarse grained limestone. Thickness [illegible] feet

Inman Formation
Thin bedded to laminated, fine grained, greenish gray limestone interbedded with red and green calcareous shale beds. Thickness [illegible] feet. Present only in Sequatchie Valley

Catheys Formation
Nodular, shaly, thin to medium bedded limestone and fine to coarse grained limestone. Thickness [illegible] to [illegible] feet

Bigby-Cannon Limestone
Dark to light gray dense to medium grained, medium and even bedded limestone. Thickness [illegible] to [illegible] feet

Hermitage Formation
Gray, fine grained, thin bedded to laminated, sandy and argillaceous limestone, shale weathers greenish brown and [illegible] shaly limestone. Thickness [illegible] to [illegible] feet

Carters Limestone
Fine grained, yellowish brown limestone, thin bedded in upper part, thick bedded and very slightly cherty in [illegible] limestone in lower part [illegible] Thickness [illegible] feet

Lebanon Limestone
Thin bedded limestone, gray to yellowish brown [illegible] Thickness [illegible] feet

Ridley Limestone
Medium to very thick bedded, fine to medium grained [illegible] Thickness [illegible] feet

Pierce and Murfreesboro Limestone
Medium to very thick bedded, fine grained, gray limestone [illegible] Thickness [illegible] feet

Wells Creek Formation
Gray [illegible] Present only in Sequatchie Valley

Knox Group (above Copper Ridge Dolomite)
Gray cherty dolomite and limestone, fine to medium grained. Maximum exposed thickness in Sequatchie Valley [illegible] feet

MDSD — **Mississippian, Silurian, Devonian, and Ordovician Formations**
Structurally complex area containing all or portions of the Newman, Fort Payne, Chattanooga, Rockwood, and Sequatchie formations

MISSISSIPPIAN

Mp — **Pennington Formation**
Pale [illegible] gray shale distinctive, contains [illegible] and locally gray, fine grained sandstone. Thickness [illegible] feet

Mn — **Newman Limestone**
Gray limestone sequence near Cumberland Plateau and on Whitwell Mountain. Shaly limestone, shale, siltstone and sandstone on Chickamauga Mountain. Thickness about [illegible] feet

Mfp — **Fort Payne Formation**
Bedded chert, calcareous and dolomitic, somewhat [illegible] and minor shale. Thin green shale. Mainly [illegible] Average thickness about [illegible] feet

Greasy Cove Formation
Gray argillaceous limestone, calcareous shale, siltstone and fine grained sandstone. Equivalent to Newman Limestone. Maximum preserved thickness about [illegible] feet

Mg — **Grainger Formation**
Gray to green shale with siltstone and fine-grained glauconitic sandstone in some areas quartz pebble conglomerate. Thickness about 1,200 feet

Mgg

MISS. AND DEV.

MDc — **Chattanooga Shale**
Black carbonaceous shale, fissile. Thickness [illegible] to [illegible] feet in most areas. Thickness [illegible] to about [illegible] feet near east edge of sheet

SILURIAN

Sr — **Rockwood Formation**
Green to marron shale, thin gray siltstone and sandstone and thin lenticular layers of oolitic and fossiliferous hematite. Thickness [illegible] to [illegible] feet

Clinch Sandstone
Gray to white sandstone, locally gray siltstone and shale. Combined Rockwood and Clinch thicknesses [illegible] feet

Src

Os — **Sequatchie Formation**
Marron and gray shaly limestone, mottled greenish [illegible] Thickness about [illegible] feet

ORDOVICIAN

Ccn — **Chickamauga Group**
In the northwest part of the Valley and Ridge [illegible] Thickness [illegible] feet

Upper Part of Chickamauga Group

Omic — **Middle and Lower Part of Chickamauga Group**
A sequence of about [illegible] feet [illegible] in the northwest part of Valley and Ridge [illegible] Thickness about [illegible] feet

Knox Group
Siliceous dolomite and magnesian limestone sequence. Thickness [illegible] feet

Reedsville Shale
Green to gray calcareous shale. Thickness [illegible] feet

Unnamed Limestone Unit
Medium grained fossiliferous gray limestone, shaly in part. Thickness as much as [illegible] feet

Moccasin Formation
Maroon calcareous shale, siltstone, and limestone thin mesabentonite layers in upper part, mud cracks, ripple marks common. Thickness [illegible] to [illegible] feet

Ob — **Bays Formation**
Maroon, well rounded claystone and siltstone commonly mottled greenish, evenly bedded, light gray sandstone beds and mesabentonite in upper part. Maximum thickness [illegible] feet

Oc — **Ottosee Shale**
Bluish gray calcareous shale, weathers yellow with red lenses of coarsely crystalline reddish fossiliferous limestone "marble". Thickness about [illegible] feet

Oh — **Holston Formation**
Pink, gray, and red coarsely crystalline limestone (Holston Marble) in many areas upper part is sandy, crossbedded ferruginous limestone and brownish greenish calcareous shale. Thickness [illegible] to [illegible] feet

Ol — **Lenoir Limestone**
Nodular argillaceous, gray limestone in places bind sedimentary breccia conglomerate, quartz sand, Mosheim Limestone Member (dense light to medium gray limestone near base. Thickness [illegible] to [illegible] feet

Ot — **Athens Shale**
Medium to dark gray calcareous, argillaceous shale calcareous gray sandstone, siltstone, and locally fine pebble quartz conglomerate, nodules of shaly limestone near base. Maximum thickness [illegible] feet

Ow — **Sevier Shale**
Calcareous bluish gray shale weathers yellow, with thin, gray limestone layers, sandstone and locally conglomerate in the east. Thickness [illegible] feet

Oma — **Mascot Dolomite**
Light-gray, fine-grained, well bedded cherty dolomite mottled red and green dolomite characteristic interbeds of bluish gray limestone in upper part, chert [illegible] quartz sandstone at base. Erosional unconformity at top. Thickness [illegible] to [illegible] feet

Ok — **Kingsport Formation**
Gray, fine grained sparingly cherty dolomite with fossil dense, gray limestone sequence. Thickness about [illegible] feet

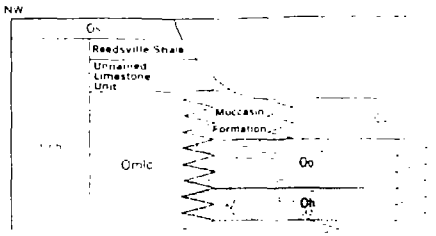
On — **Newala Formation**

Ol — **Longview Dolomite**
Siliceous, gray, fine grained, medium bedded dolomite interbeds of gray limestone in upper part. Thickness about [illegible] feet

Oc — **Chepultepec Dolomite**
Light gray, fine grained, well bedded dolomite, moderately cherty, fine grained limestone locally in upper part, quartz sandstone beds at base. Average thickness about [illegible] feet

Oh

Ocr — **Copper Ridge Dolomite**
Coarse, dark gray, knotty dolomite, asphaltic in places, with much gray, medium grained, well bedded dolomite, abundant chert, cryptozoons typical. Thickness about [illegible] feet



Millstone
South Harriman
Rockwood
Kingston
HALEY MOUNTAIN
BLACK MOUNTAIN
DRY MOUNTAIN
CUMBERLAND CO
Coal Creek
Laurel Creek
Stinging Fork
Bumbee Creek
COALING GROUNDS RIDGE
PHILLIPS RIDGE
LAKE
BAR
WATTS
ROANE
R I D G E
TENNESSEE
RIVER
RED HILLS
SPRING CREEK RIDGE
Athens
Sweetwater
TEXAS KNOBS
MOUNTAIN

Preliminary Assessment
For
NGK Metals

Reference 9
Bulletin 58, "Ground Water Resources of East Tennessee"

State of Tennessee

DEPARTMENT OF CONSERVATION

DIVISION OF GEOLOGY

BULLETIN 58

PART II

GROUND-WATER RESOURCES OF EAST TENNESSEE

by

G. D. DeBUCHANANNE

and

R. M. RICHARDSON

Prepared in cooperation with the U. S. Geological Survey

NASHVILLE, TENNESSEE

1956

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth of water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
141	2 mi. NE.	Swafford	.....	Valley	710	18	.....	48	Dolomite	Oma	12	.....	B	.....	.....	D	Well reported never dry in 60 years.
	RICEVILLE																
142	1½ mi. S.	Perkinson	.....	do.	755	50	50	6	Shale	Ꞓc	20	6/49	J	.....	.....	D,S	
143	2½ mi. SW.	Charles Buckner	.....	Slope	740	80	.....	6	Dolomite	Ꞓcr	.....	.....	L	.....	.....	D	
	CALHOUN																
144	3 mi. N.	O. G. Ramsey	.....	Valley	800	.....	.....	.....	do.	On	.....	.....	J	.....	.....	D,S	Water always muddy.
145	4 mi. E.	Swafford	.....	do.	810	20	.....	36	Limestone	Oo	10	6/49	B	.....	.....	D	
	RICEVILLE																
146-S	5½ mi. SE.	H. L. Shamblin	.....	Slope	760	.....	.....	.....	Dolomite	O Ꞓk	.....	.....	.....	65	60	D	
147	4 mi. SE.	Virgil Key	.....	do.	860	54	3	6	Limestone	Oo	45	.....	B	.....	.....	D	
148	3 mi. SE.	Lloyd Gibson	J. Dodson	Valley	780	.....	6	6	do.	On	13	.....	B	.....	.....	D	
149	2 mi. SE.	McKamey	.....	do.	780	50	40	8	Dolomite	Oma	42	6/49	J	.....	.....	D	
	CALHOUN																
150	2 mi. NW.	J. F. Moore	.....	do.	850	30	.....	36	Shale	Ꞓc	15	7/49	J	.....	.....	D	
151-S	4 mi. NW.	Andrew	.....	do.	700	.....	.....	.....	Dolomite	O Ꞓk	.....	.....	.....	35	60	D	
152-S	4½ mi. N.	J. A. Bacon	.....	do.	720	.....	.....	.....	Shale	Ꞓc	.....	.....	.....	85	60	D	
153	4½ mi. NW.	O. F. Michaels	.....	Slope	800	29	.....	36	Dolomite	O Ꞓk	19	.....	B	.....	.....	D	
	BIG SPRING																
154-S	5½ mi. E.	.....	.....	do.	730	.....	.....	.....	Shale	Ꞓc	.....	.....	.....	175	58	D	
155	5 mi. SE.	Bradford	.....	Valley	710	30	.....	3	do.	Ꞓc	10	6/49	...	.....	.....	D	Well reported to go dry every year.
156	3½ mi. E.	Hill	.....	Slope	880	31	.....	48	Dolomite	O Ꞓk	17	.....	B	.....	.....	D	
157	5½ mi. E.	Hills View School	Biegler	Valley	710	90	90	.....	Shale	Ꞓc	60	6/49	J	.....	.....	P	
	RICEVILLE																
158-S	4 mi. W.	James O'Wright	.....	do.	600	.....	.....	.....	Dolomite	O Ꞓk	.....	.....	.....	2	60	D	
159-S	5½ mi. W.	G. Swafford	.....	do.	735	.....	.....	.....	Sandstone	Ꞓrs	.....	.....	...	8	60	D	
160	4½ mi. NW.	P. E. McKinney	.....	do.	745	19	.....	48	Shale	Ꞓc	13	.....	P	.....	.....	D	
161-S	6½ mi. NW.	C. A. Vaughn	.....	do.	840	.....	.....	.....	Dolomite	O Ꞓk	.....	.....	...	8	60	D	
	TEN MILE																
162-S	4 mi. S.	P. J. Steeper	.....	Slope	855	.....	.....	.....	Limestone	Ꞓlme	.....	.....	.....	2	60	D	
163-S	5½ mi. S.	Mrs. N. J. Kennedy	.....	do.	790	.....	.....	.....	Shale	Ꞓr	.....	.....	.....	4	65	D	
164-S	6 mi. S.	Ed Elliott	.....	do.	790	.....	.....	.....	Dolomite	O Ꞓk	.....	.....	.....	7	61	D	
	DECATUR																
165-S	4 mi. E.	W. C. Arnold	.....	Valley	860	.....	.....	.....	Shale	Ꞓr	.....	.....	..	4	60	D	
166-S	5 mi. E.	Ollie H. Goins	.....	Slope	1,000	.....	.....	.....	do.	Ꞓr	.....	.....	...	2	60	D	
167	6½ mi. E.	T. P. McKinney	.....	do.	880	23	.....	60	do.	Ꞓc	15	.....	B	.....	.....	D	
168	7 mi. E.	Clyde Hutsell	.....	do.	920	80	.....	6	do.	Ꞓr	75	.....	J	.....	..	D	
	NIOTA																
169	6 mi. NW.	W. A. Brown	Jim Hairrell	do.	925	40	8	6	Dolomite	Oc	45	6/49	J	.....	...	D	
170	6 mi. W.	Earl Simpson	.....	do.	975	40	.....	48	do.	O Ꞓk	20	6/49	J	.....	.....	D	
171	5½ mi. W.	R. H. Linzefelt	.....	Valley	990	24	.....	36	Shale	Ꞓc	20	.....	J	.....	.....	D,S	
	DECATUR																
172	6 mi. E.	E. B. Bohanon	Jim Hairrell	do.	815	68	.....	6	do.	Ꞓc	50	6/49	B	.....	.....	D	
173	3 mi. E.	Ray Womac	.....	Ridge	955	26	.....	.....	Dolomite	O Ꞓk	54	.....	B	.....	.....	D	
	ERIE																
174	2 mi. SW.	Albert Clower	.....	Slope	860	14	.....	10	Shale	Ꞓr	7	.....	P	.....	.....	D	
175	1½ mi. SE.	R. C. Wilkes	.....	do.	1,060	40	.....	.....	Dolomite	Oc	25	.....	J	.....	.....	D	
	MT. VERNON																
176	3 mi. SW.	Sherman Lowe	.....	do.	1,020	18	.....	.....	Shale	Oa	12	.....	B	.....	.....	D,S	

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
104	3 mi. NW.	Mt. Lebanon School		Slope	870	75	51	6	Shale	Ꞓc	50		L		59	P	
105	1½ mi. NW.	W. L. Davis		Hilltop	900	27		36	do.	Ꞓc	15		L		60	D,S	
	ATHENS																
106	2½ mi. W.	Sam Elder		Valley	810	100		6	do.	Ꞓc			J			D,S	
107	2½ mi. NW.	The Russell School		do.	830	75		6	do.	Ꞓc	40		L		59	P	
108	4 mi. NW.	Glen Allen	Godsey	Ridge	1,000	179	60	6	Dolomite	Oc	70		L			D	
109-S	5½ mi. W.	A. C. Stanford		Valley	840				do.	O-Ꞓk				250	57	D	Water slightly turbid.
110-S	do.	Dallas Vincent		do.	820				Shale	Ꞓc				250	52	D	
	DECATUR																
111	3 mi. SE.	J. C. Vincent		Slope	900	60		36	Dolomite	O-Ꞓk	48		L			D	
	RICEVILLE																
112-S	4 mi. N.	Luther Lewis		do.	550				Shale	Ꞓc				175	58	D	
113	5½ mi. NW.	Pine Hill School		Hilltop	800	42			do.	Ꞓc			L			P	
114	2 mi. E.	M. C. Melton		Valley	800	47		6	Dolomite	Oma	17		T			D,S	
115-S	do.	Bill Davis		do.	800				do.	Oma				500	58	D	Spring occasionally flooded by stream.
116-S	do.	do.		do.	790				do.	Oma				1,800	58		
117-S	2½ mi. S.	Fred and Charles Parkinson		do.	750				do.	Ok				500	58	D	
118-S	do.	H. F. Parkinson		do.	750				do.	Oma				500	58	S	
119	4 mi. E.	O. M. Ray		Ridge	1,020	90		6	Limestone	Ob	50		J		60	D,S	Water sample analyzed.
120	do.	Gus Thompson		do.	1,010	112		6	do.	Oh	40		B			D	Water becomes muddy in rainy weather.
121	do.	Poplar Hill School		Valley	880	115		6	Shale	Oa			L			P	
	ATHENS																
122-S	2½ mi. SW.	Cedar Springs		do.	830				Dolomite	Oma				200	60	D	
123	1½ mi. S.	Jesse H. Gunn	Godsey	Slope	900	129		6	Limestone	Oo	60		L			D	
124	3 mi. S.	G. Underdown		do.	96			4	do.	Oo	40		L			D	
	ENGLEWOOD																
125	3 mi. SW.	Zion Hill School		Valley	840	54		6	Shale	Ꞓc	18		L		59	P	
126-S	1 mi. W.	John Payne		Slope	810				do.	Ꞓc				175	59	D	
127	3½ mi. W.	Fred Peel		do.	810	25		36	do.	Ꞓc	15		L		59	D	
128	2½ mi. W.	Robert Ritson		do.		36		36	do.	Ꞓc	29		J			D	
129	3 mi. W.	R. M. Harrel	Jim Hairrell	do.		107	20	6	Dolomite	Oc	45		T			D	
	BIG SPRING																
130-S	5½ mi. E.	Whiteside Spring		Valley	780				do.	O-Ꞓk				500	59	S	Water sample analyzed.
	DECATUR																
131-S	4 mi. S.	McCorkle Spring		do.	830				Limestone	Olnic				1,000	59		Water slightly milky.
	ATHENS																
132	In town	Mayfield Creamery		Slope	880	120		6	Dolomite	Oma			T	100		In	
	NIOTA																
133-S	1½ mi. SW.	Glenn Spring		Valley	910				Limestone	Ol				300	59	D	
	CALHOUN																
134	½ mi. E.	Mrs. Lewis		Slope	745	75		24	Dolomite	Oc	50		B			D	
	CHARLESTON																
135	2 mi. SE.	Ralph Green		Hilltop	745	49		24	Shale	Oa	28		B			D	
	CALHOUN																
136-S	3 mi. E.	R. A. McBrian		Valley	800				Limestone	Oh				4	60	D	
137	4½ mi. SE.	Harrison		Slope	805	31		36	Dolomite	O-Ꞓk	15		B			D	
138	5 mi. E.	Fred Clark		Valley	795	31		36	do.	O-Ꞓk	17		B			D	
139	6 mi. E.	G. W. Burris		Ridge	785	50		6	Shale	Ꞓc	18	6/49	J			D	
140-S	3½ mi. E.	Lem Burch		Valley	740				Limestone	Oo				2	60	D	

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	ATHENS																
77	In town	Mayfield Creamery	Herb Hairrell	Slope	860	91	30	6	Shale	Oa	10		T	135	60	In	
78-S	3½ mi. SE.	J. Clayton		do.	800				do.	Ce				25	60		
	NIOTA																
79	3 mi. SE.	Mt. Harmony School		Hilltop	1,010	60		6	do.	Oa	30		J			P	
80-S	do.	A. Jackson		Valley	970				do.	Oa				20	60	S	
	ATHENS																
81	3 mi. NE.	J. R. Hicks		Slope	980	60		6	do.	Oa	30		L		60	D	
	ENGLEWOOD																
82	In town	City of Englewood	Herb Hairrell	Valley	860	159	100	8	do.	Ce	30		T	90	59	P	Well tested at 90 gpm for 24 hours. Water sample analyzed.
	ATHENS																
83	2 mi. NE.	R. T. Chambers		Hilltop	1,020	70		36	Dolomite	Oe	65		J			D	
	NIOTA																
84	2½ mi. S.	Geo. L. Thomas	Gosney	Valley	1,000	127		6	do.	Oe	50		J		59	D,S	
	ATHENS																
85	3½ mi. N.	N. Liberty School		do.	840	70		6	Shale	Ce			L		59	P	
	NIOTA																
86	3½ mi. SE.	W. H. Torbett		do.	980	68		6	do.	Oa	28		J		59	D,S	Water sample analyzed.
	ENGLEWOOD																
87	2 mi. NW.	Oak Grove School		Slope	850	50		36	do.	Ce			P		60	Ah	
88-S	do.	Cooper's Cave Spring		Valley	860				Dolomite	Ccr				900	59	S	
89-1	do.	Mart Shoemaker		Hilltop	890	259		6	do.	Ccr	90		L		58	S	
	ATHENS																
89-2	4½ mi. E.	do.	Jim Hairrell	do.	880	130	35	3	do.	Ccr	38		L		59	S	
	RICEVILLE																
90	In town	Riceville School		Valley	800	60		6	do.	Ocn	20		T		60	P	Well supplies 300 students. Water sample analyzed.
	DECATUR																
91	5 mi. SE.	Idlewild School		do.	800	22	22	24	Shale	Ce	5		L			P	
	RICEVILLE																
92-S	1 mi. NW.	Thompson Spring		do.	760				do.	Ce				1,800	58	D	
93-S	2 mi. W.	Peck Spring		do.	820				do.	Ce				250	58	D,S	Water sample analyzed.
94-S	5 mi. N.	Ward Spring		do.	780				Dolomite	O-Ck				500	57	D,S	
	DECATUR																
95	4½ mi. SE.	Sam Wade		Hilltop	820	75	24	6	Shale	Ce	20					D	
	RICEVILLE																
96-S	3½ mi. NE.	Cate Spring		Slope	780				do.	Ce				1,000	57	D,S	
97-S	3½ mi. N.	Underwood Heirs		do.	820	18		6	do.	Ce	15		P			D	
98-S	5 mi. N.	Jess Norwood		Valley	800				do.	Ce				200	58	D	
	ATHENS																
99	4 mi. W.	Mouse Creek School		Slope	900	50			do.	Ce			L		60	P	
100-S	3 mi. W.	Arnett Cave		Valley	880				do.	Ce				1,000		D	
	RICEVILLE																
101	4 mi. N.	Albert King		Slope	870	54	65	12	Dolomite	O-Ck	25	3/49	B		60	D,S	
102-S	3½ mi. N.	W. T. Roberts		Valley	820				Shale	Ce				100	59	D,S	
103-S	do.	L. J. King		do.	830				do.	Ce				150	58	D	

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY—Continued

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth to water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
38-S	2 mi. NW.	Denton Spring		Valley	900				Shale	Ꞓc				300	58	D,S	
39	2½ mi. W.	Harry Evans	Jim Hairrell	Hilltop	870	36	30	6	do.	Ꞓc	29		J			D	
40-S	3½ mi. W.	Armstrong Spring		Valley	900				Dolomite	Oc				400	58	D	
41	do.	Cus Henderson	Jim Hairrell	do.	940	111	96	6	do.	Oc	0		J			D,S	Flowing well.
42	4 mi. NW.	H. J. Warner		do.	1,020	31			do.	Ꞓcr	2		L			D,S	
43	2½ mi. NW.	J. B. Smith		Hilltop	960	25			Shale	Ꞓc	22		B			D	
	ERIN																
44	2½ mi. SW.	J. B. Terry	Jim Hairrell	Slope	920	51	30	6	Dolomite	Ꞓcr			J			D	
45	3½ mi. SW	Mac Heckell	do.	do.	940	124		6	Shale	Ꞓc	4		J			D	
	ETOWAH																
46-1	In town	City of Etowah		Valley	840	250		8	do.	Oa			T	150		P	Well reported to flow when not being pumped.
46-2	do.	do.		do.	840	250		8	do.	Oa			T	35		P	Do.
46-3	do.	do.		do.	820	250		8	do.	Oa			T	40		P	Do.
46-4	do.	do.		do.	840	401		8	do.	Oa	11		T	150		P	
47-S	1½ mi. S.	Fowler Spring		do.	760				do.	Ꞓc				250	60	P	
48	do.	Chilhowee Motor Court		do.	800	92		6	Dolomite	O Ꞓk	77		J	5	60	In	
49-S	2½ mi. N.	Crockett Spring		do.	870				do.	On				500	60	S	
50	do.	W. F. Moses		Slope	900	36		6	Shale	Oa	15		L		60	D	
51-S	2 mi. SE.	Turgle Spring		Valley	780				do.	Ꞓc				500	57	D,S	
52-S	do.	Mosquitoes Spring		do.	840				do.	Ꞓc				500	57	D,S	
53-S	3 mi. S.	Cave Spring		do.	860				Dolomite	O Ꞓk				1,000	55	D,S	
	DELANO																
54-S	3 mi. W.	Dodd Spring		do.	750				do.	O Ꞓk				1,000	59	D,S	
55-S	do.	J. H. Trow		do.	760				do.	O Ꞓk				200	59	D	
	ETOWAH																
56-S	4½ mi. W.	Ford Elrod		Hilltop	800				Shale	Ꞓc				8	57	D	
57	3 mi. E.	Conasauga School		do.		50			do.	Oa	30		L		59	P	
58	4 mi. E.	W. L. Tallant		Slope	840	26		6	do.	Oa	12	12/48	B		62	D	Water sample analyzed.
	MT. VERNON																
59-S	6 mi. S.	White Cliff		Valley	1,900				do.	ocss				20			
	ETOWAH																
60	1½ mi. N.	J. L. Bain		Slope	850	50		6	do.	Oa	6	1/49	P			D	
61	2½ mi. N.	L. S. Blair	Herb Hairrell	do.	900	100	78	6	Dolomite	Oc	60		J			D	
62-S	3 mi. N.	Chestnut Spring		Valley	800				do.	Ꞓcr				1,000	57		
63	3½ mi. NW.	Wesleyana School		Slope	800	60		6	Shale	Ꞓc			L		56	P	
64	do.	Alec Humphries		Valley	760	17		36	do.	Ꞓc	3	1/49	B			D	
65	3½ mi. W.	Gravel Hill School		do.	860	75		6	do.	Ꞓc			L			P	
66	3 mi. W.	J. E. Ross		do.	780	34	35	24	Dolomite	Ꞓcr	29	1/49	B			D	
67-S	3 mi. W.	G. E. Ross		do.	770				do.	O Ꞓk				100	5	S	
68-S	2 mi. W.	Good Spring		do.	960				Limestone	Oh				50	57	D	
	DELANO																
69	4½ mi. NW.	C. F. Rowland		do.	770	13	12	24	Shale	Ꞓc	0	1/49	B			D	
70	4 mi. NW.	J. E. Rowland		Hilltop	790	26	27	24	do.	Ꞓc	15	1/49				D	
71	2 mi. N.	Carlock School		Slope	780	100		6	Dolomite	O Ꞓk			J		61	P	
	ATHENS																
72-S-1	In town	Ingleside Spring		Valley	880				do.	Ok				1,500	58	P	Owned by Commissioners Athens Board of Water Works. Water sample analyzed.
72-S-2	do.	do.		do.	880				do.	Ok				350	59	P	Do.
73	do.	Athens Table Co.	Bayliss	Slope	980	420		6	do.	Oc	50		L	25	59	In	
74	do.	Athens Hosiery Mill		Valley	980	125	125	6	do.	Ꞓcr	95		T	25	60	In	
75-S	2 mi. NW.	Guthrie Spring		do.	840				do.	Ꞓcr				1,000	58	D	
	ETOWAH																
76	4 mi. N.	F. P. Cantrell		Hilltop	860	46	40	6	Shale	Ꞓc	23		L			D	

TABLE 55.—TYPICAL WELLS AND SPRINGS IN McMINN COUNTY
Shown on Plates 7, 8, 13, and 14

Method of lift: A, air lift; B, bucket; C, centrifugal; J, jet pump; L, lift pump; P, pitcher pump; T, turbine pump.
Use of water: Ab, abandoned; D, domestic; In, industrial; Ir, irrigation; P, public supply; S, stock

Well or spring No.	Location with reference to nearest post office	Owner or name	Driller	Topographic situation	Altitude (feet)	Depth of well (feet)	Length of casing (feet)	Diameter (inches)	Probable water-bearing beds: Character of material	Probable water-bearing beds: Geologic horizon	Depth of water level (feet)	Date of measurement	Method of lift	Yield (gallons per minute)	Temperature (°F.)	Use of water	Remarks
	NIOTA																
1-S	4 mi. NE.	Ball Spring	.....	Valley	990	.....	.....	.....	Dolomite	Ꞓcr	.....	.....	...	150	58	D	Spring subject to flooding by stream.
2	3½ mi. E.	Ford Miller	.....	Hilltop	1,160	36	.....	.....	Graywacke	ocl	26	8/48	B	.....	...	D	
3	3 mi. E.	Mrs. H. J. Dougherty	Hugh Armstrong	Slope	1,020	40	.....	5	Limestone	Ol	.....	.....	J	.....	...	D	
4	4 mi. E.	J. L. Barker	Bob Harold	do.	1,030	38	.....	6	do.	Ol	20	.....	L	6	...	D	
	ERIE																
5	3 mi. SE.	.....	.....	Valley	990	.....	.....	6	Dolomite	Olv	.....	.....	...	10	58	Ab	Flowing well. Water sample analyzed.
6	4 mi. S.	Clyde Foster	J. M. Godsey	Slope	1,020	62	60	6	Shale	Ꞓc	30	.....	J	.....	...	D,S	Water occasionally muddy.
7-S	2½ mi. E.	Malone Spring	.....	Valley	.....	.....	.....	.....	Dolomite	Oma	.....	.....	...	500	59	D,S	
	ENGLEWOOD																
8-S	1½ mi. N.	Jim Barnett	.....	Slope	.....	.....	.....	.....	do.	Oc	.....	9/45	...	288	...	...	
9	4 mi. N.	Newt Hicks	Jim Hairrell	do.	940	30	2	6	do.	Ꞓcr	6	.....	J	.....	...	D,S	
10	2 mi. N.	Gordon Kinser	J. M. Godsey	do.	900	47	25	6	Shale	Ꞓc	23	.....	J	10	...	D,S	Water becomes muddy after prolonged pumping.
11	In town	Mack Reynolds	.....	Valley	880	160	.....	8	do.	Ꞓc	.....	.....	L	25	...	In	
12-S	2 mi. N.	Hicks-Brown	.....	do.	810	.....	.....	.....	do.	Ꞓc	.....	.....	...	486	60	D,S	
13-1	In town	Mack Reynolds	.....	do.	880	183	.....	8	do.	Ꞓc	163	.....	J	25	...	P	
13-2	do.	do.	.....	do.	860	140	.....	6	do.	Ꞓc	25	.....	T	50	...	D,In	
13-3	do.	Englewood Water Works	.....	do.	880	300	.....	8	do.	Ꞓc	.....	.....	T	.....	...	In, P	
13-4	do.	do.	.....	do.	880	200	.....	8	do.	Ꞓc	.....	.....	T	.....	...	P	
14	3 mi. NE.	Ida McClung	.....	do.	900	54	40	6	do.	Ꞓc	25	.....	J	.....	...	D,S	
15	1½ mi. E.	J. F. Hamilton	.....	Hilltop	860	20	.....	.....	do.	Ꞓc	16	.....	P	3	61	D	
16	1 mi. S.	E. W. Bryant	Jim Hairrell	Valley	.....	34	.....	6	Dolomite	Ꞓcr	23	.....	J	4	...	D	
17-S	3 mi. E.	Arthur Hamilton	.....	do.	850	.....	.....	.....	do.	Ꞓcr	.....	9/45	...	171	60	S	
18	2 mi. SE.	John R. Miller	Jim Hairrell	Hilltop	.....	56	18	...	do.	On	47	.....	L	3	...	D	Water occasionally muddy.
19	1 mi. SE.	W. H. Lee	Mackelroy a	do.	.....	90	18	6	do.	Ꞓcr	84	.....	B	...	...	D	
20	3 mi. N.	James Howell	Jim Hairrell	Slope	...	125	...	6	do.	Ꞓcr	.....	.....	J	.....	...	D,S	
	ERIE																
21	3½ mi. SE.	E. C. Anderson	.....	Valley	980	45	.....	..	do.	Ok	30	.....	J	.....	...	D,S	
22	2½ mi. S.	Joe McClure	J. M. Godsey	Slope	970	45	30	6	Shale	Ꞓc	25	.....	J	10	...	D,S	
23	4 mi. S.	Iris Haun	.....	Valley	1,060	23	.....	.....	Dolomite	Oc	12	.....	J	.....	...	D,S	
24	do	J. M. Godsey	J. M. Godsey	do.	1,020	110	100	6	do.	Oma	...	.....	J	.....	...	D,S	
	SWEETWATER																
25	3½ mi. SW.	John Thomas	.....	Hilltop	970	54	.....	6	do.	Oma	29	4/48	J	5	...	D	Well can be pumped dry in 30 minutes.
26	4½ mi. SW.	Ralph A. Sutherland	Jim Hairrell	do.	1,020	57	40	6	Shale	Ꞓc	29	.....	J	5	...	D,S	
	NIOTA																
27	3½ mi. N.	Sanford Anderson	J. M. Godsey	Slope	960	130	.....	6	Dolomite	Oma	51	.....	L	4	61	D,S	
28	2 mi. N.	R. L. Thomas	Walt Clemons	Valley	970	120	.....	6	do.	Ꞓcr	30	8/48	.....	.....	...	D,S	
29	½ mi. E.	Town of Niota	.....	Hilltop	1,000	318	.....	6	Limestone	Ꞓmn	17	.....	T	25	...	P	
30	In town	Crescent Hosiery	J. M. Godsey	Valley	970	75	65	6	Shale	Ꞓc	20	...	T	55	...	In,P	Well tested at 53 gpm for 30 hours.
31	1 mi. SE.	Neel Knox	do.	Slope	1,040	72	.....	6	Dolomite	Ꞓcr	20	.....	J	.....	...	D,S	
32-S	1 mi. W.	John Cates	.....	Valley	940	.....	.....	.....	do.	Oma	.....	.....	...	500	...	D	
33	3 mi. NE.	J. L. Burn	J. M. Godsey	Slope	970	100	.....	6	Limestone	Ol	15	.....	L	40	...	D,S	
34-S	3½ mi. NE.	Lee Gregory	.....	Valley	1,000	.....	.....	.....	Dolomite	Olv	.....	.....	...	150	59	D,S	
35	2½ mi. N.	Gus Roberts	Herb Hairrell	do.	1,080	198	100	5	do.	Oc	110	.....	B	.....	...	D	
36	2 mi. NE.	J. B. Wilson	Hugh Armstrong	Hilltop	1,010	86	20	6	Limestone	Ꞓcm	25	.....	J	.....	...	D,S	
37	1½ mi. E.	Alfred Stevens	.....	Slope	1,100	60	.....	.....	Dolomite	Ꞓcr	22	8/48	B	.....	...	D	

TABLE 54.—DISCHARGE MEASUREMENTS OF SELECTED SPRINGS IN McMINN COUNTY

Spring	Location	Date of measurement	Discharge (gpm)	Temperature (°F.)		Remarks
				Air	Water	
Thompson (no. 92-S)	1 mile northwest of Riceville	3/28/31	1,210	54	57	Clear
		7/ 1/31	a2,000	91	59	Do.
		10/12/31	615	78	59	Do.
		6/19/50	1,221	86	60	Do.
		7/17/50	997	78	59	Do.
		8/14/50	1,004	81	59	Do.
		9/14/50	1,236	73	59	Do.
		10/23/50	1,034	68	59	.....
		11/16/50	1,012	58	58	.....
		12/19/50	1,181	38	58	.....
		1/18/51	1,497	53	58	.....
		2/14/51	1,372	47	57	.....
		3/12/51	1,738	48	57	.....
		4/16/51	1,700	51	59	.....
		5/15/51	1,232	70	59	.....
		6/19/51	1,145	85	59	.....
Big	1 mile south of Niota	3/30/31	1,050	50	56	Cloudy
		7/ 2/31	754	86	60	Murky
		10/12/31	287	83	60	Clear
Kennedy	4 miles east of Decatur	4/ 3/31	970	61	56	Clear
		7/15/31	90	83	59	Do.
		11/ 2/31	31	57	57	Do.
Clear	8 miles north of Riceville	4/ 3/31	1,050	61	56	Clear
		7/15/31	534	89	59	Milky
		11/ 2/31	108	60	58	Clear
Ingleside (no. 72-S-1)	Athens	4/16/31	1,850	74	58	Clear
		7/ 1/31	1,270	78	59	Murky
		10/12/31	1,180	82	59	Clear
Fowler (no. 47-S)	1½ miles south of Etowah	4/16/31	1,340	74	59	Clear
		7/ 1/31	368	94	60	Do.
		10/29/31	375	55	59	Do.
Hicks-Brown (no. 12-S)	2 miles north of Englewood	4/17/31	934	75	54	Clear
		7/ 1/31	620	90	60	Murky
		10/29/31	458	59	59	Muddy
		6/19/50	924	92	62	Clear
		7/17/50	829	88	63	Do.
		8/14/50	802	88	61	Do.
		9/14/50	786	78	61	Do.
		10/23/50	717	70	60	.....
		11/16/50	677	59	59	.....
		12/19/50	1,142	27	58	.....
		1/18/51	1,103	53	59	.....
		2/14/51	1,617	70	59	.....
		3/12/51	1,472	52	59	.....
		4/16/51	2,021	57	59	.....
		5/15/51	1,507	83	60	.....
		6/19/51	987	87	60	.....

a Rain raised lake level. Discharge too great.

TABLE 54.—DISCHARGE MEASUREMENTS OF SELECTED SPRINGS IN McMINN COUNTY—Continued

Spring	Location	Date of measurement	Discharge (gpm)	Temperature (°F.)		Remarks
				Air	Water	
Arnwine (no. 40-S)	3½ miles west of Niota	4/16/31	2,300	68	59	Clear
		7/ 1/31	1,290	88	59	Do.
		10/12/31	543	84	59	Do.
		6/19/50	1,823	87	63	Do.
		7/17/50	2,035	85	62	Do.
		8/14/50	1,648	85	62	Do.
		9/14/50	3,069	87	62	Do.
		10/23/50	1,715	75	61	.....
		11/16/50	1,459	67	59	.....
		12/19/50	2,246	40	56	.....
		1/18/51	2,840	55	57	.....
		2/14/51	3,182	61	58	.....
		3/12/51	3,504	49	57	.....
		4/16/51	3,543	60	58	.....
		5/15/51	2,460	80	61	.....
		6/19/51	1,944	86	61	.....
Crockett (no. 49-S)	2½ miles north of Etowah	6/19/50	535	92	60	Clear
		7/17/50	362	88	60	Do.
		8/14/50	261	84	60	Do.
		9/14/50	567	83	60	Do.
		10/23/50	305	72	60	.....
		11/16/50	190	63	60	.....
		12/19/50	590	35	58	.....
		1/18/51	540	57	58	.....
		2/14/51	789	66	59	.....
		3/12/51	979	51	59	.....
		4/16/51	986	68	59	.....
		5/15/51	501	83	60	.....
		6/19/51	321	86	59	.....
Dodd (no. 54-S)	3 mile west of Delano	6/19/50	1,324	88	60	Clear
		7/17/50	1,050	88	60	Do.
		8/14/50	1,109	83	60	Do.
		9/14/50	1,409	79	60	Do.
		10/23/50	1,052	71	60	.....
		11/16/50	956	68	59	.....
		12/19/50	1,180	30	58	.....
		1/18/51	1,193	55	59	.....
		2/14/51	1,229	69	59	.....
		3/12/51	1,487	49	59	.....
		4/16/51	1,431	68	59	.....
		5/15/51	1,045	85	60	.....
		6/19/51	957	89	60	.....
Glenn (no. 133-S)	1½ miles southwest of Niota	6/19/50	1,843	86	61	Clear
		7/17/50	2,315	86	60	Do.
		8/14/50	1,978	83	59	Do.
		9/14/50	3,287	79	60	Do.
		10/23/50	1,855	69	59	.....
		11/16/50	1,823	59	59	.....
		12/19/50	2,604	25	58	.....
		1/18/51	2,998	51	59	.....
		2/14/51	3,661	61	59	.....
		3/12/51	3,753	49	58	.....
		4/16/51	3,844	56	58	.....
		5/15/51	2,828	82	60	.....
		6/19/51	2,163	83	60	.....

Analyses of representative samples of ground water from McMinn County are given in table 56.

McMinn County

(Area 435 square miles, population 32,024)

General Features

McMinn County lies in the south-central part of the region covered by this report. It is somewhat triangular in outline and is bounded by Meigs, Bradley, Polk, Monroe, and Loudon Counties.

Athens, the county seat, is about 60 miles southwest of Knoxville and 55 miles northeast of Chattanooga; it has a population of 8,618. Englewood, Etowah, Niota, Calhoun, and Riceville are smaller towns and communities.

The county has excellent facilities for transportation. A main line of the Southern Railway System runs through the middle of the county, and a main line of the Louisville & Nashville Railroad runs through the eastern part. A branch line of the Louisville & Nashville Railroad from Englewood connects with the Southern Railway System at Athens. In addition to the excellent railroad facilities, paved U. S. Highway 11 crosses the middle of the county and U. S. Highway 411 runs through its eastern part. Paved State Highways 30 and 39 and all-weather county roads cross the county from east to west.

The county is about equally divided between industry and agriculture. Industries include hosiery mills, stove works, roller mills, and others at Athens. Etowah, a division point on the Louisville & Nashville Railroad, is the home of hosiery mills and textile plants. Englewood has several hosiery mills and clothing manufacturing plants.

Geology

Most of McMinn County lies in the Valley and Ridge physiographic province, and the surface forms of alternating ridges and valleys are characteristic of this province. Part of Stone Mountain, in the extreme southeastern corner of the county, is in the Blue Ridge province.

The oldest rocks exposed are east of the Great Smoky fault. These rocks are of Early Cambrian or pre-Cambrian age and include the Sandsuck shale, the Cochran conglomerate and the Nichols shale. The rocks are predominantly clastic. Those lying above the Sandsuck shale are Early Cambrian in age.

The youngest consolidated rocks exposed in McMinn County are those of the Ottosee shale of Middle Ordovician age. The oldest rocks exposed in the portion of the county lying within the Valley and Ridge province are the sandstones and shales of the Rome formation of Early Cambrian age.

Ground Water

Ground water in McMinn County occurs principally in fractures in the underlying formations. The rocks have little or no primary porosity, but contain fractures caused by folding and faulting. In carbonate rocks, fractures are frequently enlarged by circulating ground water to a depth of about 300 feet. The siliceous rocks are less soluble and their fractures are rarely enlarged by solution. The fractures in siliceous rocks are usually open for the first few hundred feet, but at greater depth the weight of the overlying material tends to close them.

Five towns in McMinn County have public water supplies. Calhoun, Niota, and Englewood are supplied by wells; Etowah uses 4 wells and 1 spring, and Athens uses 2 springs.

Wells and springs are used by many of the industries. Most of the wells yield less than 100 gpm, but a few have higher yields. In rural areas, domestic supplies are obtained from wells and springs, many of which are equipped with electric pumps.

Preliminary Assessment
For
NGK Metals

Reference 10
Tennessee Division of Water Supply
Well Search for Athens, September, 1998

TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
OFFICE CORRESPONDENCE

DATE: August 31, 1998

TO: Jennifer Schroll, DWS

FROM: Jill Davis, CFO

SUBJECT: NGK Metals
Water Wells
Site No. TN 54-514
McMinn County

The Division of Superfund is conducting a Preliminary Assessment (PA) of the former NGK Metals facility in McMinn County, Tennessee. In order to complete the PA, any known water supply wells must be documented in a 4-mile radius of the site. The quad maps which include this radius are given below. Would you please assist us by determining the registered wells which are in these quads. Thank you for your help.

The 4-mile radius around NGK Metals encompasses an area which is included on the following USGS quad maps: 125 NE, 125 NW and 124 SE. The Manufacturing facility is located on quad 125 NE.

FROM	DATE

TO	

jed/wells.mem

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS IN SELECTED AREAS OF TENNESSEE

RECEIVED
SEP 14 1998
ENVIRONMENTAL ASSISTANCE
CENTER AT CHATTANOOGA

EXPLANATION OF COLUMN HEADINGS

QUAD/NTH = Designation by number, Quadrant and ninth of the 2.5 - minute quadrangle area in which the well is located. The leading numbers identify the 15-minute quadrangle, the next two letters identify the 7.5-minute quadrant and the last digit identifies the one-ninth subdivision of the latter.

COUNTY = County in which the well is located.

WELL NUM = Identification number assigned to the well by the State.

TAG NUM = An inspection number assigned to the well at the time of inspection by the State.

OWNER'S NAME = Name of person or organization for whom the well was drilled.

LOCATION ROAD = Name of street or road from which to access the well. Blank if unknown.

COMP DATE = Month, day and year the well was completed.

INSPT DATE = Month, day and year the well was inspected by TDHE. Blank if well has not been inspected.

TOT DEPTH = Total depth of the well in feet.

AQ DEPTH = Depth, in feet, below land surface to the top of the shallowest aquifer or water-bearing zone tapped by the well.

TOT YIELD = Total yield of the well in gallons per minute (gpm). Yields less than one-half gpm reported as zero.

STAT LEVEL = Static water-level: depth, in feet, from the land surface to the surface of the water standing in an idle well.

CSE DEPTH = Casing depth: depth, in feet, to the bottom of the water tight casing installed in the well.

CSE TYPE = Casing type: PLAST = Plastic; STEEL = Steel; OTHER = any other material such as concrete, fiberglass or tile.

WELL FINISH = Construction of the well in the interval supplying water to the well: OPEN = Uncased or open hole; SLOT = Hand perforated or slotted pipe; SCREEN = Manufactured device designed to maintain the wall of the borehole and allow ground water to enter the well.

INTERVAL = The depth, in feet, from the top to the bottom of the interval that is open to the well.

WAT QUAL = Water Quality: a word to describe the relative quality of the well water such as GOOD, FAIR, BAD, LIME, IRON, SULFUR, SALT, OIL, GAS, OTHER.

GEO FORM = Name of the geologic formation tapped by the well (not generally reported).

LATITUDE = Latitude of well site in degrees, minutes, and seconds.

LONGITUDE = Longitude of well site in degrees, minutes, and seconds.

A/C = Accuracy Code [illegible] latitude and longitude: S [illegible] second; [illegible] nearest [illegible] seconds; T = [illegible] 30 [illegible]; M = nearest minute; Blank [illegible] nearest 2.5 minute

LOG = Refers to availability of drillers log: Y = yes; N = no.

DRILLER = License number of driller who supervised construction of the well. Names provided upon request.

[illegible] = [illegible] which [illegible] [illegible] = [illegible]

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 1 MCMINN	10700782	SHERLIN T SUNSET DR	04/15/1977 / /	100 85	0 --	43 STEEL	-- - --		- - - -		00344
0125NE 1 MCMINN	10700829	TATE H	10/02/1977 / /	80 65	10 25	22 STEEL	-- - --	GOOD	- - - -		00344 HOME
0125NE 1 MCMINN	10701165	KENNEDY_____DEBB MT VERD	07/17/1983 02/06/1985	205 160	5 67	42 STEEL	OPEN 42 - 205	GOOD	35-29-58 84-37-18	F Y	00598 HOME
0125NE 1 MCMINN	10701234	SEATON_____RAY	08/21/1984 / /	107 95	5 65	104 PLAST	SCREEN 104 - 107	GOOD	- - - -	Y	00528 MON
0125NE 1 MCMINN	10701319	ROBINSON_____RAY_ MT VERD RD	10/20/1985 / /	105 80	3 30	105 STEEL	SLOT 95 - 100	OTHR	- - - -	Y	00630 HOME
0125NE 1 MCMINN	10701344	EASTER_____EARL FAIRVIEW RD	09/25/1986 / /	185 80	20 --	21 STEEL	OPEN 21 - 185	GOOD	- - - -	Y	00598 HOME
0125NE 1 MCMINN	10701426	WALDEN_____DARR OLD MT VERD RD	11/17/1986 / /	95 90	7 30	83 STEEL	OPEN 83 - 95	OTHR	- - - -	Y	00630 HOME
0125NE 1 MCMINN	10701521	WATSON_____RONN MT VERD RD	03/07/1987 / /	555 555	50 100	109 STEEL	OPEN 109 - 555	GOOD	- - - -	Y	00598 HOME
0125NE 1 MCMINN	10701540	PALMER_____JOE_ HAYWOOD DR (OFF	07/29/1987 / /	280 --	1 30	41 STEEL	OPEN 41 - 280	GOOD	- - - -	Y	00598 HOME
0125NE 1 MCMINN	10701547	LUNSFORD_____HARV MT VERD RD	09/22/1987 04/26/1988	100 80	8 10	38 STEEL	OPEN 38 - 100	OTHR	35-29-24 84-37-02	S Y	00630 HOME
0125NE 1 MCMINN	10701731	LEWIS_____ROBE CONGRESS PARKWA	01/06/1989 / /	580 200	4 30	41 STEEL	OPEN -- - --	OTHR	- - - -	Y	00598 HOME
0125NE 1 MCMINN	10701759	MIRACLE_HOMES__ MT VERD	04/17/1989 / /	465 465	5 120	76 STEEL	OPEN 76 - 465	OTHR	- - - -	Y	00608 HOME
0125NE 1 MCMINN	92003436	MILLER_____RON_ CO RD 252	07/13/1992 / /	135 135	20 60	62 STEEL	OPEN 62 - 135	UNK	- - - -	Y	00598 HOME
0125NE 1 MCMINN	95005244 P0016539	RAMSEY_____JOHN HWY	10/17/1995 / /	225 210	30 30	146 STEEL	OPEN 146 - 225	UNK	- - -	Y	00598 HOME
0125NE 1 MCMINN	96 03713 D0020975	ALLMON_____MICH HENRY RD	07/25/1996 / /	565 480	3 120	105 STEEL	OPEN 105 - 565	OTHR	- - - -	Y	00608 HOME
0125NE 2 MCMINN	10701475	JOHNSON_____DANN SLAGER RD	07/31/1986 / /	72 52	10 --	35 STEEL	OPEN 35 - 72	GOOD	- - - -	Y	00693 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 2 MCMINN	10701513	REYNOLDS_____BOYD OLD NOTIA RD	12/20/1986 / /	145 80	3 40	49 STEEL	OPEN 49 - 145	OTHR	- - - -	Y	00598 HOME
0125NE 2 MCMINN	91002107	MORGAN_SR_____ WILL UPPER RIVER	12/12/1990 / /	305 285	12 100	125 STEEL	OPEN 125 - 305	UNK	- - - -	Y	00598 HOME
0125NE 2 MCMINN	92000656	LYLES_____DANN FAIRVIEW	01/19/1992 / /	185 170	10 60	41 STEEL	OPEN 41 - 185	UNK	- - - -	Y	00598 HOME
0125NE 2 MCMINN	92000659	NEIL_____SAMU OLD KINGSTON	08/02/1991 / /	165 120	10 60	104 STEEL	OPEN 104 - 165	UNK	- - - -	Y	00598 HOME
0125NE 2 MCMINN	93000988	MILLER_____MARV FLAUN RD	01/16/1993 / /	325 160	1 60	83 STEEL	OPEN 83 - 325	OTHR	- - - -	Y	00598 HOME
0125NE 2 MCMINN	93003375	HYDE_____RALP KINGSTON HILL	08/17/1993 / /	305 290	40 90	126 STEEL	OPEN 126 - 305	UNK	- - - -	Y	00598 HOME
0125NE 2 MCMINN	96003424 D0019200	ATHENS UTILITY DIST TELLICO AVE	08/15/1996 9/ 9/1996	322 34	15 12	98 STEEL	OPEN 98 - 322	UNK 016571	35-27-42 84-34-15	F Y	00571 TEST
0125NE 2 MCMINN	96003425 D0021701	ATHENS UTILITY DIST OFF HWY 305	08/16/1996 9/ 9/1996	183 51	-- 20	77 STEEL	OPEN 77 - 183	OTHR 016573	35-27-32 84-34-24	F Y	00571 TEST
0125NE 2 MCMINN	96003426 D0021702	ATHENS UTILITY DIST TELLICO AVE	08/20/1996 9/ 9/1996	204 71	800 15	20 STEEL	OPEN 20 - 204	UNK 016548	35-27-48 84-34-10	F Y	00571 TEST
0125NE 2 MCMINN	96003427 D0021703	ATHENS UTILITY DIST TELLICO AVE	08/21/1996 9/ 9/1996	163 63	800 15	83 STEEL	OPEN 83 - 163	UNK 016549	35-27-50 84-34-05	F Y	00571 TEST
0125NE 2 MCMINN	96003428 D0021704	ATHENS UTILITY DIST TELLICO AVE	08/22/1996 9/ 9/1996	182 30	15 15	20 STEEL	OPEN 20 - 182	UNK 016550	35-27-43 84-34-12	F Y	00571 TEST
0125NE 2 MCMINN	97000022 D0021656	CITY OF ATHENS TELLICO AVE	12/09/1996 7/10/1997	143 123	1400 17	83 STEEL	OPEN 83 - 143	GOOD 019009	35-27-51 84-34-09	F Y	00571 MUN ~ 1.7mi FROM NGK
0125NE 2 MCMINN	97000026 D0021702	ATHENS UTILITY DIST TELLICO AVE	12/02/1996 7/10/1997	204 71	800 15	20 STEEL	SLOT 20 - 130	GOOD 016548	35-27-48 84-34-10	F N	00571 TEST
0125NE 2 MCMINN	97004743 D0024777	CARTER_____TERE FAIRVIEW	09/22/1997 / /	265 250	20 80	104 STEEL	OPEN 104 - 265	UNK	- - - -	Y	00598 HOME
0125NE 3 MCMINN	91000760	[illegible]ANK_____MIKE OLD MADISONVILL	[illegible]/25/1990 / /	125 52	50 38	41 OTHER	-- - --	[illegible]	- - - -	Y	00598 HOME
0125NE 3 MCMINN	92000434	LETHCO_____JOHN	08/21/1991 / /	345 330	5 40	138 PLAST	OPEN 138 - 345	OTHR	- - - -	Y	00608 HOME

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RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAD TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 3 MCMINN	96000117 D0015562	JENKINS_____MART GAMBLE RD	12/29/1995 / /	345 165	4 60	99 STEEL	OPEN 99 - 345	UNK	- - - -	Y	00598 HOME
0125NE 3 MCMINN	96000886 D0015571	GONZALEZ ROSA CO RD 420 154	02/29/1996 4/ 8/1997	125 55	40 20	59 STEEL	OPEN 59 - 125	UNK 019095	35-28-52 84-30-23	F Y	00598 HOME
0125NE 3 MCMINN	96003879 D0021158	BARBER_____BILL CO RD 420 150	08/16/1996 4/ 8/1997	165 125	6 60	83 STEEL	OPEN 83 - 165	OTHR 019094	35-28-50 84-30-23	F Y	00598 HOME
0125NE 3 MCMINN	96004475 D0022226	SPURLIN_____DEWA CO RD 422 290	09/13/1996 10/21/1996	385 210	3 30	146 STEEL	OPEN 146 - 385	UNK 017976	35-28-15 84-31-00	F Y	00598 HOME
0125NE 3 MCMINN	96004477 D0022234	PEELER_____ WILL CO RD 420 162	09/27/1996 4/ 8/1997	205 84	5 20	62 STEEL	OPEN 62 - 205	UNK 019096	35-28-50 84-30-22	F Y	00598 HOME
0125NE 3 MCMINN	96005444 D0022263	LOW_____STAC CO RD 420	11/21/1996 4/ 8/1997	285 135	40 20	41 STEEL	OPEN 41 - 285	UNK 019093	35-28-57 84-30-30	F Y	00598 HOME
0125NE 3 MCMINN	97000436 D0022277	JOHNSTON_____CHUC GAMBLE	02/04/1997 4/ 8/1997	145 130	20 40	84 STEEL	OPEN 84 - 145	UNK 019092	35-29-00 84-30-22	F Y	00598 HOME
0125NE 3 MCMINN	98000991 D0032836	JOHNSON_____GARY 444 CO RD	03/31/1998 / /	265 170	10 20	41 STEEL	OPEN 41 - 265	UNK	- - - -	Y	00598 HOME
0125NE 4 MCMINN	10700785	STEVENS J SHERWOOD DR	06/08/1977 / /	70 62	0 --	40 STEEL	-- - --		- - - -		00344
0125NE 4 MCMINN	10701110	CITY OF ATHENS	08/26/1982 / /	185 170	103 35	110 STEEL	-- - --	GOOD	35-25-34 84-35-24	C	00598 MUN
0125NE 4 MCMINN	10701219	SEWELL_____EDNA CONGRESS PKWY R	04/15/1984 03/19/1985	126 80	5 --	40 STEEL	OPEN 40 - 126	GOOD	35-29-10 84-35-13	F Y	00598 HOME
0125NE 4 MCMINN	10701222	MELTON_____DON_ HI NO 11 OLD RD	06/06/1984 01/17/1985	366 340	15 500	243 STEEL	OPEN 243 - 366	OTHR	35-25-08 84-39-12	F Y	00598 HOME
0125NE 4 MCMINN	10701317	PARKER_____ROBE SPRING CREEK	01/06/1986 / /	250 210	25 40	124 STEEL	OPEN 124 - 250	GOOD	- - - -	Y	00637 HOME
0125NE 4 MCMINN	10701391	ADAMS_____JIM PENN AVE	05/21/1986 / /	505 210	5 --	82 STEEL	OPEN 82 - 505	GOOD	- - - -		00598 HOME
0125NE 4 MCMINN	10701428	WOODS_____DALE CO ROAD 309	09/23/19[illegible] / /	630 570	3 140	80 STEEL	OPEN 145 - 630	GOOD	- - - -	Y	00637 HOME
0125NE 4 MCMINN	10701429	WOODEN_____GENA MT VERD	10/24/1986 / /	510 215	8 60	87 STEEL	OPEN 87 - 510	GOOD	- - - -		00637 HOME

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QUAD / COUNTY	NTH	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE MCMINN	4	10701432	WALKER_____PAT_ OFF MT VERD	09/25/1986 / /	390 222	6 60	82 STEEL	OPEN 82 - 390	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701433	VAUGHN_____A_R_ CEDAR SPRINGS	06/30/1986 / /	250 160	12 38	42 STEEL	OPEN 42 - 250	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701435	TEAGUE_____CLAY LONG MILL RD	07/30/1986 / /	125 105	25 40	71 STEEL	OPEN 71 - 125	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701437	SLOAN_HOMES____ SUBURBAN HILLS	08/20/1986 / /	435 430	25 90	130 STEEL	OPEN 130 - 435	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701442	NORWOOD_____RAY_ ROCKY MT	07/30/1986 / /	165 130	8 8	21 STEEL	OPEN 21 - 165	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701452	HARRIS_____DON_ ROGERS CREEK	04/11/1986 / /	210 90	6 18	38 STEEL	38 - 210	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701453	FORREST_____AMY_ CO ROAD 709	12/08/1986 / /	450 230	6 80	100 STEEL	OPEN 100 - 450	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701457	DOBB_____RONA MT VERD RD	01/21/1986 / /	310 285	15 78	98 STEEL	OPEN 98 - 310	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701469	ARMOUR_____DOT_ HWY 30	07/19/1986 / /	150 148	14 70	145 STEEL	OPEN 145 - 150	GOOD	- - - -	Y	00637 HOME
0125NE MCMINN	4	10701512	DUGGAN_____LAMA CRESTWOOD DR	04/11/1987 / /	505 425	2 100	119 STEEL	OPEN 119 - 505	GOOD	- - - -	Y	00598 HOME
0125NE MCMINN	4	10701570	BLACK_____KENN ELLIS RD	11/06/1987 / /	180 175	50 40	29 STEEL	OPEN 29 - 180	OTHR	- - - -	Y	00598 HOME
0125NE MCMINN	4	10701571	GILBERT_____GEOR NEW ENGLEWOOD R	10/09/1987 / /	200 190	20 40	87 STEEL	OPEN 87 - 200	OTHR	- - - -	Y	00598 HOME
0125NE MCMINN	4	10701729	CHURCH_OF_JESUS 	12/29/1988 / /	225 48	7 --	42 STEEL	OPEN 42 - 225	GOOD	- - - -	Y	00001 IRR
0125NE MCMINN	4	91002348	CRUISE ... _____DILM LANDFI L	05/13/1991 / /	175 160	15 80	157 STEEL	OPEN [illegible] - 175	OTHR	- - - -	[illegible]	00603 HOME
0125NE MCMINN	4	92002202	CLARK_____ __GEO INGESIDE AVE	06/03/1992 / /	800 400	2 100	[illegible] STEEL	OPEN 87 - 800	UNK	- - - -	[illegible]	00598 HOME
0125NE MCMINN	4	94000561 D0004607	ANDERSON_____ __CARL 139 CO RD 675	02/24/1994 6/27/1994	145 130	40 60	83 STEEL	OPEN 83 - 145	UNK 008101	35-24-45 1-37-10	[illegible] Y	00598 HOME

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RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

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0125NE 4 MCMINN	96003423 D0019199	CITY OF ATHENS HWY 305	08/13/1996 9/ 9/1996	322 27	-- 20	41 STEEL	OPEN 41 - 322	OTHR 016572	35-27-08 84-34-46	F Y	00571 TEST
0125NE 5 MCMINN	10701017	SHELTON	07/02/1981 / /	390 --	-- --	42 STEEL	-- - --	GOOD	35-27-12 84-33-32	S	00254 HOME
0125NE 5 MCMINN	10701181	PATTERSON_____JOHN FAIRVIEW	11/14/1983 03/27/1985	215 210	10 50	42 OTHER	OPEN 42 - 215	GOOD	35-27-12 33-52-00	S Y	00006 OTHR
0125NE 5 MCMINN	10701184	HAUN_____GENE MT CUMBERLAND M	11/28/1983 11/19/1984	452 434	20 88	95 OTHER	OPEN 95 - 452	GOOD	35-30-00 84-35-00	S Y	00006 HOME
0125NE 5 MCMINN	10701240	JOHNSON_____DOUG SLACK RD.	07/20/1984 / /	90 55	15 20	35 STEEL	OPEN 35 - 90	OTHR	- - - -	Y	00528 HOME
0125NE 5 MCMINN	10701249	SHEPPARD_____KELL OLD ENGLEWOOD R	09/19/1984 / /	406 200	1 --	105 STEEL	OPEN 105 - 406	GOOD	- - - -	Y	00598 HOME
0125NE 5 MCMINN	10701250	CARDEN_____WAYN OLD ENGLEWOOD R	09/14/1984 / /	226 215	10 --	169 STEEL	OPEN 169 - 226	OTHR	- - - -	Y	00598 HOME
0125NE 5 MCMINN	10701255	CHAMBERS_____DAVI HWY 11	08/16/1984 / /	505 300	3 --	163 STEEL	OPEN 163 - 505	GOOD	- - - -	Y	00598 HOME
0125NE 5 MCMINN	10701284	FUGATE_____JACK FAIRVIEW RD	04/30/1985 / /	185 170	15 --	83 STEEL	OPEN 83 - 185	OTHR	- - - -	Y	00598 HOME
0125NE 5 MCMINN	10701364	MAJORS_____JIM_ OLD MADISONVILL	08/05/1985 / /	405 375	20 --	63 STEEL	OPEN 63 - 405	BAD	- - - -	Y	HOME
0125NE 5 MCMINN	10701479	MAJORS_____JAME OLD MADISONVILL	08/16/1985 / /	405 380	12 40	41 STEEL	OPEN 41 - 405	GOOD	- - - -	Y	00598 HOME
0125NE 5 MCMINN	10701480	SMITH_____MIKE SLACK ROAD	06/30/1986 / /	105 80	40 30	74 STEEL	OPEN 74 - 105	GOOD	- - - -	Y	00598 HOME
0125NE 5 MCMINN	10701635	GIBSON_____DARR	06/28/1988 / /	305 265	8 50	105 STEEL	OPEN 105 - 305	GOOD	- - - -	Y	00608 HOME
0125NE 5 MCMINN	10701682	GALYON_____ALLE MADISONVILLE	05/23/1988 / /	195 [illegible]	30	61 STEEL	[illegible] - 195	OTHR	- - - -	Y	00598 HOME
0125NE 5 MCMINN	1070161[illegible]	PILKEY_____GR[illegible] SLACK ROAD	09/29/1983 / /	160 155	40 60	[illegible] STEEL	OPEN 126 - 160	OTHR	- - - -	Y	00598 HOME
0125NE 5 MCMINN	10701742	MCCASLYN_____STEV BETWEEN MACHEUR	04/29/1989 / /	420 34[illegible]	6 170	210 STEEL	OPEN [illegible] - 420	OTHR	- - - -	Y	00593 HOME

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0125NE 5 MCMINN	10701743	PATTERSON_____LARR FAIRVIEW ROAD	05/02/1989 / /	140 100	15 40	84 STEEL	OPEN 0 - 140	OTHR	- - - -	Y	00598 HOME
0125NE 5 MCMINN	91000753	SELF_____DAVI ENGLEWOOD NOTIA	12/05/1990 / /	165 125	6 50	62 STEEL	OPEN -- - --	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	91002127	GRAVES_____TEDD SLACK RD	06/13/1991 / /	305 220	3 100	146 STEEL	OPEN 146 - 305	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	92000425	TALLENT_____STEV	09/11/1991 / /	365 350	5 100	159 STEEL	OPEN 159 - 365	OTHR	- - - -	Y	00608 HOME
0125NE 5 MCMINN	92000661	COPPINGER_____TOM_ WILDWOOD	02/05/1992 / /	125 100	30 30	83 STEEL	OPEN 83 - 125	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	92003430	CAVRULL_____JERR SLACK RD	09/17/1992 / /	245 235	10 30	62 STEEL	OPEN 62 - 245	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	93000763	MOORE_____EVEL CUMBERLAND CHUR	11/21/1992 / /	125 110	10 40	105 STEEL	OPEN 105 - 125	OTHR	- - - -	Y	00608 HOME
0125NE 5 MCMINN	93001766	WILEY_____JOHN KELLY HILL	01/29/1993 / /	165 140	10 70	105 STEEL	OPEN 105 - 165	OTHR	- - - -	Y	00608 HOME
0125NE 5 MCMINN	93003369	BARNETT_____STEV OLD ETOWAH	08/12/1993 / /	105 90	21 30	62 STEEL	OPEN 62 - 105	GOOD	- - - -	Y	00598 HOME
0125NE 5 MCMINN	94000095 D0004595	PRYOR_____ED_ SLACK	12/16/1993 / /	185 165	10 40	83 STEEL	OPEN 83 - 185	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	94000566 D0004605	MCCAY_____BOB_ 583 CO RD 110	02/22/1994 8/ 3/1994	345 160	4 83	125 STEEL	OPEN 125 - 345	UNK 010163	35-24-55 84-33-10	F Y	00598 HOME
0125NE 5 MCMINN	94001353 D0004634	JONES_____LIND 578	04/16/1994 8/ 9/1994	285 270	40 78	188 STEEL	OPEN 188 - 285	UNK 010162	35-25-25 84-32-50	F Y	00598 HOME
0125NE 5 MCMINN	94002042 D0008184	WADE_____ TRAC CO ROAD 574	06/06/1994 / /	205 180	5 60	104 STEEL	OPEN 104 - 205	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	95002858 D001[illegible]68	TILEY_____ KENN CO RD 430 335	06/15/1995 9/[illegible]/1995	205 185	15 [illegible]	104 STEEL	OPEN 104 - [illegible]	UNK 015353	35-27-[illegible] 84-3[illegible]	F Y	00598 [illegible]
0125NE 5 MCMINN	95003159 D0012690	HUTH _____TOM_ CO RD 576 153	07/14/1995 9/25/1995	365 162	[illegible] 67	125 STEEL	OPEN 125 - 365	UNK 015354	35-25-18 84-33-00	Y Y	00[illegible] HOME
0125NE 5 MCMINN	95003950 D0014[illegible]1	COLEMAN_____GARY SLACK	08/02/1995 / /	145 130	15 50	62 STEEL	OPEN 62 - 1[illegible]	UNK	- - - -	Y	00598 HOME

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RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

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0125NE 5 MCMINN	96001697 D0015592	SONGER_____STEV HWY 39 EAST	04/17/1996 / /	305 290	15 60	119 STEEL	OPEN 119 - 305	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	97001488 D0024801	CARROLL_____DAVI CO RD SLACK RD	04/10/1997 / /	505 280	1 100	104 STEEL	OPEN 104 - 505	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	97001490 D0024807	COLEMAN_____HERM CO RD 435 201	04/24/1997 / /	165 150	10 70	104 STEEL	OPEN 104 - 165	UNK	- - - -	Y	00598 HOME
0125NE 5 MCMINN	97002802 D0026193	WEBB_____JOEL RD 444	07/10/1997 / /	385 360	20 80	179 STEEL	OPEN 179 - 385	OTHR	- - - -	Y	00608 HOME
0125NE 5 MCMINN	98001548 D0032842	JACKSON_____CLAY SLACK	04/24/1998 / /	225 140	6 60	124 STEEL	OPEN 124 - 225	UNK	- - - -	Y	00598 HOME
0125NE 6 MCMINN	10701214	FAIRMAN_____MANC OLD ENGLEWOOD N	05/05/1984 03/21/1985	166 160	25 499	60 STEEL	OPEN 60 - 160	GOOD	35-28-30 84-30-55	S Y	00598 HOME
0125NE 6 MCMINN	10701310	MCCASLIN_____DAVI CUNNINGHAM	09/15/1985 / /	390 340	25 70	210 STEEL	OPEN -- - --	GOOD	- - - -	Y	00637 HOME
0125NE 6 MCMINN	10701446	MORROW_____BILL MASHBORN	05/09/1986 / /	290 260	3 60	80 STEEL	OPEN 80 - 290	GOOD	- - - -	Y	00637 HOME
0125NE 6 MCMINN	10701447	MOSES_____GLEN SLACK	09/30/1986 / /	105 86	18 22	41 STEEL	OPEN 41 - 105	GOOD	- - - -	Y	00637 HOME
0125NE 6 MCMINN	10701451	JOHNSON_REAL_ES HOUSER HILL	08/11/1986 / /	210 193	15 80	185 STEEL	OPEN 185 - 210	GOOD	- - - -	Y	00637 HOME
0125NE 6 MCMINN	10701460	CURTIS_____JAME SLACK	08/13/1986 / /	210 180	15 42	90 STEEL	OPEN 90 - 210	GOOD	- - - -	Y	00637 HOME
0125NE 6 MCMINN	10701464	BAXTER_____GEOR NIOTA RD	06/03/1986 / /	410 330	4 22	62 STEEL	OPEN 62 - 410	GOOD	- - - -	Y	00637 HOME
0125NE 6 MCMINN	10701470	AITSLATT_____BOB_ OLD ENGLEWOOD	11/03/1986 / /	105 98	40 16	69 STEEL	OPEN 69 - 105	GOOD	- - - -	Y	00637 HOME
0125NE 6 MCMINN	10701516	BULL_____DAVI ENGLEWOOD NOTTA	01/10/1987 / /	145 [illegible]	15 100	104 [illegible]	OPEN 104 - [illegible]	OTHR	- - -	Y	00593 FAR[illegible]
0125NE 6 MCMINN	10701517	BULL_____DAVI MANILLA	01/12/1987 / /	300 289	15 170	167 STEEL	OPEN 167 - 200	OTHR	- - - -	Y	0059[illegible] HOME
0125NE 6 MCMINN	10701545	DOCKERY_____LARR ZOIN HILL	08/15/1987 / /	180 160	20 70	62 STEEL	OPEN 62 - 180	GOOD	- - - -	Y	00593 HOME

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RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 6	10701628	KNOX_____ BILL	03/12/1988	285	15	168	OPEN	OTHR	- -		00608
MCMINN			/ /	265	150	STEEL	168 - 285		- -	Y	HOME
0125NE 6	10701658	BELCHER_____GEOR	11/22/1987	230	10	103	OPEN	GOOD	- -		00630
MCMINN		BLACK CHAPEL RD	/ /	200	110	STEEL	103 - 230		- -	Y	HOME
0125NE 6	10701785	RUESSLL_____JEFF	06/30/1989	125	2	32	OPEN	OTHR	- -		00598
MCMINN		ROCKY MT	/ /	70	25	STEEL	32 - 125		- -	Y	HOME
0125NE 6	90000951	HALE_____JOHN	01/08/1990	100	15	41	OPEN	UNK	- -		00598
MCMINN		WILDWOOD EASTES	/ /	80	4	STEEL	41 - 100		- -	Y	HOME
0125NE 6	91002077	MILLER_____JOHN	05/24/1991	185	10	83	OPEN	UNK	- -		00598
MCMINN		ZION HILL	/ /	175	20	STEEL	83 - 185		- -	Y	HOME
0125NE 6	91002121	SYVESTER_____CLAU	07/10/1991	205	10	104	OPEN	UNK	- -		00598
MCMINN		ZION HILL	/ /	150	60	STEEL	104 - 205		- -	Y	HOME
0125NE 6	93001911	KINCAID_____JACK	02/04/1993	148	30	49	OPEN	OTHR	- -		00006
MCMINN		#436 MASHBURN	/ /	125	60	STEEL	49 - 148		- -	Y	HOME
0125NE 6	93002477	ENTREKIN_____MERR	05/24/1993	405	2	185	OPEN	UNK	- -		00598
MCMINN		MASHBURN RD	/ /	190	60	STEEL	185 - 405		- -	Y	HOME
0125NE 6	93005215	NATTER_____ANN_	11/29/1993	245	15	125		UNK	- -		00598
MCMINN	D0004627	430	/ /	235	100	STEEL	125 - 245		- -	Y	HOME
0125NE 6	94000235	HALL_____HOME	09/05/1993	125	50	100	OPEN	UNK	- -		00528
MCMINN		CO RD 575	/ /	120	60	STEEL	100 - 125		- -	Y	HOME
0125NE 6	94002484	BLEDSOE_____ROBE	06/26/1994	405	10	106	OPEN	UNK	35-25-50	T	00598
MCMINN	D0008190	COUNTY #431 RD	10/ 5/1994	280	81	STEEL	106 - 405	010239	84-30-25	Y	HOME
0125NE 6	94003702	REED_____LARR	09/05/1994	230	50	79	OPEN	UNK	35-25-08	F	00598
MCMINN	D0008160	CO RD 520 105	9/25/1995	225	44	STEEL	79 - 230	015355	84-30-06	Y	HOME
0125NE 6	94003711	BATES_____KIN_	09/23/1994	145	15	104	OPEN	UNK	35-26-10	F	00598
MCMINN	D0008169	MASHBURN CTY RD	12/20/1994	130	30	STEEL	104 - 145	010334	84-31-43	Y	HOME
0125NE 6	94004880	KING_____HARO	11/01/1994	189	12	42	OPEN	OTHR	- -		00006
MCMINN	D0011303	ROAD 435	/ /	60	[illegible]	STEEL	42 - [illegible]		-	Y	[illegible]
0125NE 6	95000314	CANTRELL_____ AME	01/03/1995	[illegible]	15	83	OPEN	UNK	35-25-[illegible]	F	00598
MCMINN	D0012702	435	3/21/1995	110	60	STEEL	83 - [illegible]	010456	84-31-[illegible]	Y	HOME
0125NE 6	95002537	SCHULTZ_____GEOR	06/01/1995	145	10	62	OPEN	UNK	35-25-06	F	00598
MCMINN	D0011060	CO RD 568 185	9/25/1995	34	[illegible]	STEEL	62 - 145	015353	84-32-00	Y	HOME

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RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 6	95003160	POGGI_____GEOR	07/07/1995	165	8	62	OPEN	UNK	35-26-24	F	00598
MCMINN	D0012682	CO RD 436 522	9/25/1995	89	41	STEEL	62 - 165	015358	84-30-38	Y	HOME
0125NE 6	95003702	BROCK_____JAME	06/14/1995	125	20	83	OPEN	OTHR	35-25-04	F	00608
MCMINN	D0009030	CO RD 520 143	9/25/1995	100	50	STEEL	83 - 125	015356	84-30-05	Y	HOME
0125NE 6	95005439	PRESSWOOD_____MIKE	11/19/1995	145	40	125	OPEN	UNK	- -		00598
MCMINN	D0015553	MASHBURN RD	/ /	135	80	STEEL	125 - 145		- -	Y	HOME
0125NE 6	96000121	DAVIS_____D_GE	11/29/1995	305	25	125	OPEN	UNK	35-25-45	F	00598
MCMINN	D0015546	MASHBURN RD	4/ 9/1996	250	80	STEEL	125 - 305	016717	84-32-30	Y	HOME
0125NE 6	96000123	THOMAS_____ROBE	12/12/1995	125	20	19	OPEN	UNK	35-24-50	F	00598
MCMINN	D0015557	TOM MARTIN RD	4/ 9/1996	60	4	STEEL	19 - 125	016716	84-30-02	Y	HOME
0125NE 6	96001694	UNDERDOWN_____DANA	05/07/1996	505	1	125	OPEN	UNK	- -		00598
MCMINN	D0015603	CO ROAD 437	/ /	480	70	STEEL	125 - 505		- -	Y	HOME
0125NE 6	97005563	BROWN TONY	10/20/1997	145	20	62	OPEN	FAIR	35-25-48	F	00598
MCMINN	D0024790	145 CO. RD 433	1/28/1998	70	40	STEEL	62 - 145	020519	84-31-17	Y	
0125NE 6	97005569	SMITH_____CHAD	11/05/1997	205	15	125	OPEN	UNK	35-25-48	F	00598
MCMINN	D0024796	150 CO. RD 438	1/28/1998	140	70	STEEL	125 - 205	020518	84-32-14	Y	HOME
0125NE 6	98002251	HALLOWAY_____HERB	05/29/1998	205	10	41	OPEN	UNK	- -		00598
MCMINN	D0032855	JORDON RD	/ /	170	20	STEEL	41 - 205		- -	Y	HOME
0125NE 7	10701011	KNOY H.L.	08/30/1981	290	--	21		GOOD	35-23-23	S	00254
MCMINN			/ /	--	--	STEEL	-- - --		84-36-39		HOME
0125NE 7	10701212	DERRICK_____DAVI	06/26/1984	245	3	84	OPEN	OTHR	- -		00598
MCMINN		PINEY GROVE	/ /	220	--	STEEL	84 - 245		- -	Y	HOME
0125NE 7	10701241	RADSHAW_____HERB	07/10/1984	280	8	158	OPEN	GOOD	- -		00528
MCMINN		CLAY HILL RD	/ /	251	90	STEEL	158 - 280		- -	Y	HOME
0125NE 7	10701252	THOMPSON_____BUDD	08/20/1984	206	30	63	OPEN	GOOD	- -		00598
MCMINN		CLAY HILL RD	/ /	185	--	STEEL	63 - 206		- -	Y	HOME
0125NE 7	10701270	WATSON_____R_G_	11/17/1984	100	5	23	OPEN	OTHR	- -		00630
MCMINN		ROAD [illegible]	/ /	85	[illegible]	STEEL	23 - [illegible]		-	Y	[illegible]
0125NE 7	10701[illegible]	CARMLEY_____[illegible]	05/19/1985	[illegible]	15	83	OPEN	OTHR	- -		00598
MCMINN		UNION HILL RD	/ /	108	--	STEEL	83 - 14[illegible]		- -	Y	HOME
0125NE 7	10701285	BARKER_____LARR	00/00/1900	326	10	83	OPEN	OTHR	- -		00599
MCMINN		OFF PINEY GROVE	/ /	205	--	STEEL	83 - 326		- -	Y	HOME

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 7	10701477	HACKER_____DAVI	06/10/1986	125	4	62	OPEN	GOOD	- -		00598
MCMINN		CLAY HILL RD	/ /	80	60	STEEL	62 - 125		- -	Y	HOME
0125NE 7	10701482	BROWN_____GARY	08/05/1986	105	30	62	OPEN	OTHR	- -		00598
MCMINN		LAYMAN ROAD	/ /	75	40	STEEL	62 - 105		- -	Y	HOME
0125NE 7	10701529	HUCKABY_____RAY_	07/08/1987	103	15	41	OPEN	GOOD	- -		00598
MCMINN		LAYMAN RD	/ /	65	40	STEEL	41 - 103		- -	Y	HOME
0125NE 7	10701530	BURNS_____ERIC	06/20/1987	125	15	41	OPEN	GOOD	- -		00598
MCMINN		LAYMAN RD	/ /	60	40	STEEL	41 - 125		- -	Y	HOME
0125NE 7	10701607	PASLEY_____BILL	10/02/1987	250	30	91	OPEN	FAIR	35-23-54	S	00637
MCMINN		PINEY GROVE	/ /	180	48	STEEL	91 - 250		84-35-08	Y	HOME
0125NE 7	10701714	WOMAC_____CECI	04/30/1988	130	15	20	OPEN	OTHR	- -		00630
MCMINN		CEDAR SPRINGS R	/ /	120	40	STEEL	20 - 130		- -	Y	HOME
0125NE 7	10701764	POWERS_____BRET	06/07/1989	280	50	146	OPEN	GOOD	- -		00598
MCMINN		PINEY GROVE	/ /	260	100	STEEL	-- - --		- -	Y	HOME
0125NE 7	91002072	POWERS_____RICK	06/07/1991	485	1	41		H2S	- -		00598
MCMINN		CLAY HILL	/ /	440	--	STEEL	41 - 485		- -	Y	HOME
0125NE 7	91002103	WILLIAMS_____PAUL	05/10/1991	270	6	84	OPEN	OTHR	- -		00006
MCMINN		657	/ /	140	50	OTHER	84 - 270		- -	Y	HOME
0125NE 7	92000627	COLEMAN_____E_H_	09/05/1991	305	20	41	OPEN	UNK	- -		00598
MCMINN		UNDER DOWN	/ /	280	20	STEEL	41 - 305		- -	Y	HOME
0125NE 7	92000628	LASHER_SR_____GEOR	09/16/1991	145	8	26	OPEN	OTHR	- -		00598
MCMINN		UNION HILL	/ /	--	20	STEEL	26 - 145		- -	N	HOME
0125NE 7	92000631	ANDERSON_____CHRI	09/16/1991	245	10	20	OPEN	UNK	- -		00598
MCMINN		UNION HILL	/ /	230	30	STEEL	20 - 245		- -	Y	HOME
0125NE 7	92000632	HORNWOOD_____BESS	11/20/1991	165	40	104	OPEN	GOOD	- -		00598
MCMINN		LARRY ELLIS	/ /	150	49	STEEL	104 - 165		- -	Y	HOME
0125NE 7	92002243	MOFFIT_____VADO	05/02/1992	305	10	155	OPEN	UNK	- -		00608
MCMINN		CEADER SPRINGS	/ /	290	30	STEEL	155 - 305		- -	N	HOME
0125NE 7	92003431	ROBERTS_____L_R_	09/03/1992	145	6	8	OPEN	UNK	- -		00598
MCMINN		PINE GROVE	/ /	130	50	STEEL	83 - 145		- -	Y	HOME
0125NE 7	93001530	BOWAN_____TERR	04/29/1993	165	10	62	OPEN	UNK	- -		00598
MCMINN		CO RD 657	/ /	150	60	STEEL	62 - 145		-	Y	HOME

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0125NE 7 MCMINN	93003373	BREEDEN_____LOUI CO RD 669	09/02/1993 / /	145 98	10 10	20 STEEL	OPEN 20 - 145	GOOD	- - - -	 Y	00598 HOME
0125NE 7 MCMINN	94000562 D0004608	BENSON_____JOHN CO RD 675	02/25/1994 / /	205 55	5 20	41 STEEL	OPEN 41 - 205	UNK	- - - -	 Y	00598 HOME
0125NE 7 MCMINN	94001354 D0004644	TEAGUE_____GARL 658	04/30/1994 / /	105 85	20 30	62 STEEL	OPEN 62 - 105	UNK	- - - -	 Y	00598 HOME
0125NE 7 MCMINN	94002491 D0008203	HUCKABEY_____MIKE LAYMAN RD	07/07/1994 10/ 5/1994	105 70	10 20	60 STEEL	OPEN 60 - 105	UNK 010238	35-23-05 84-36-35	T Y	00598 HOME
0125NE 7 MCMINN	94003113 D0008216	TORBETT_____DARR UNION HILL RD	08/01/1994 / /	365 190	2 40	59 STEEL	OPEN 59 - 365	UNK	- - - -	 Y	00598 HOME
0125NE 7 MCMINN	94003703 D0008158	MOSE_____JEFF LONGMILL RD	09/10/1994 / /	365 185	2 40	79 STEEL	OPEN 79 - 365	UNK	- - - -	 Y	00598 HOME
0125NE 7 MCMINN	94004179 D0008170	HYATT_____MICH CLAY HILL RD	09/28/1994 12/20/1994	405 220	4 185	124 STEEL	OPEN 124 - 405	UNK 010330	35-24-28 84-37-16	F Y	00598 HOME
0125NE 7 MCMINN	95001135 D0012670	SULLIVAN_____JOHN CEDAR SPRINGS	03/14/1995 / /	105 75	20 15	41 STEEL	OPEN 41 - 105	UNK	- - - -	 Y	00598 HOME
0125NE 7 MCMINN	95003947 D0014038	BURNS_____ERIC RALPH LAYMAN	08/15/1995 / /	245 90	4 20	41 STEEL	OPEN 41 - 245	UNK	- - - -	 Y	00598 HOME
0125NE 7 MCMINN	96005439 D0022267	THOMPSON_____KEVI CO RD 675 500	12/10/1996 2/ 4/1997	145 120	15 10	41 STEEL	OPEN 41 - 145	UNK 019190	35-23-26 84-37-16	F Y	00598 HOME
0125NE 7 MCMINN	98000654 D0032821	WEST_____HERB CLAY HILL	02/02/1998 / /	145 120	15 20	62 STEEL	OPEN 62 - 145	UNK	- - - -	 Y	00598 HOME
0125NE 7 MCMINN	98001357 D0032484	BEASHEARS_____WILL CO RD 729	03/02/1998 / /	205 47	9 48	42 STEEL	OPEN 42 - 205	OTHR	- - - -	 Y	00006 HOME
0125NE 6 MCMINN	10700436	STRICKLAND R	06/23/1970 / /	228 207	12 70	71 STEEL	-- - --	GOOD	35-22-45 84-33-30	S	00006 HOME
0125NE 8 MCMINN	10700674	STRICKLAND L R	11/26/1974 / /	124 --	9 -	71	-- - --		35-23-45 84-33-30	S	00006 HOME
0125NE MCMINN	10700842	MOSES [illegible]	05/06/1978 / /	228 210	25 60	90 STEEL	-- - --	GOOD	35-23-50 84-33-30	S	00006
0125NE 8 MCMINN	10701089	BLANKENSHIP LARRY	06/22/1982 / /	105 95	10 30	60 STEEL	-- - -	GOOD	35-23-29 84-34-20	S	00598 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 8 MCMINN	10701097	BENSON RALPH	06/19/1982 / /	265 240	25 100	105 STEEL	-- - --	GOOD	35-24-49 84-34-23	S	00598 HOME
0125NE 8 MCMINN	10701111	STEPHENS HUB	08/27/1982 / /	145 135	10 50	110 STEEL	-- - --	GOOD	35-24-57 84-34-09	S	00598 HOME
0125NE 8 MCMINN	10701153	AKINS_____STEV SHOWBARN	05/10/1983 03/26/1985	425 --	-- 950	257 STEEL	OPEN 257 - 425	GOOD	35-24-27 84-34-11	S N	00598 HOME
0125NE 8 MCMINN	10701164	RUDD_____GENE OLD ETOWAH & AT	04/29/1983 11/19/1984	105 80	30 56	63 STEEL	OPEN 63 - 105	GOOD	35-20-00 84-30-00	S Y	00596 HOME
0125NE 8 MCMINN	10701248	BOGGESS_____ROBE MT CUMBERLAND R	09/12/1984 / /	266 140	4 --	126 STEEL	OPEN 126 - 266	GOOD	- - - -	Y	00598 HOME
0125NE 8 MCMINN	10701331	ALLMAN_____WAYN SHOWBARN	02/08/1986 / /	465 385	2 --	185 STEEL	OPEN 185 - 465	GOOD	- - - -	Y	00598 HOME
0125NE 8 MCMINN	10701339	NORWOOD_____FRAN ZION HILL RD	10/09/1985 / /	285 105	10 --	95 STEEL	OPEN 95 - 285	GOOD	- - - -	Y	00598 HOME
0125NE 8 MCMINN	10701410	GARREN_____JAME OFF HWY 30	08/19/1986 / /	107 68	50 30	53 OTHER	OPEN 53 - 107	OTHR	- - - -	Y	00006 HOME
0125NE 8 MCMINN	10701483	HANEY_____BRUC BIVENS ROAD	10/20/1986 / /	150 90	2 30	83 STEEL	OPEN 83 - 150	OTHR	- - - -	Y	00598 HOME
0125NE 8 MCMINN	10701486	BIVENS_____NATH GOODSPRINGS ROA	05/22/1986 / /	165 160	20 40	63 STEEL	OPEN 63 - 165	OTHR	- - - -	Y	00598 FARM
0125NE 8 MCMINN	10701487	TALLENT_____MIKE CASEY GAP	08/15/1986 / /	300 145	21 80	104 STEEL	OPEN 104 - 300	OTHR	- - - -	Y	00598 HOME
0125NE 8 MCMINN	10701499	POATS_____GERA SHOWBARN RD	05/12/1987 / /	445 320	4 60	50 STEEL	OPEN 50 - 445	GOOD	- - - -	Y	00598 HOME
0125NE 8 MCMINN	10701519	HOLMES_____ROBE OLD ETOWAH RD	11/05/1984 11/19/1984	105 95	10 50	62 STEEL	OPEN 62 - 105	OTHR	35-24-35 84-33-08	S Y	00598 HOME
0125NE 8 MCMINN	10701532	MILLER_____LARR BULL RD	04/27/1987 / /	205 160	7 60	99 STEEL	OPEN [illegible] 205	GOOD	- - - -	[illegible]	00598 HOME
0125NE 8 MCMINN	10701555	MOSES_____CHES HWY 30	10/20/1986 / /	500 140	2 120	125 STEEL	OPEN 125 - 500	OTHR	- - - -	Y	00598 HOME
0125NE 8 MCMINN	10701556	MOSES_____CHES HWY 30	05/15/1987 / /	325 0	12 85	147 STEEL	OPEN 147 - 325	OTHR	- - - -	Y	00598 HOME

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0125NE 8	10701561	ROWLAND_____GLEN	09/20/1987	260	3	29	OPEN	OTHR	- -		00598
MCMINN		WILDWOOD RD	/ /	180	20	STEEL	29 - 260		- -	Y	HOME
0125NE 8	10701564	LOUTHAN_____WALT	11/05/1987	143	3	79	OPEN	OTHR	- -		00598
MCMINN		BULL	/ /	120	60	STEEL	79 - 143		- -	Y	HOME
0125NE 8	10701585	STANDRIDGE_____JERR	08/12/1987	250	12	137	OPEN	GOOD	35-22-37	S	00637
MCMINN		HWY 30	/ /	185	70	STEEL	138 - 250		84-33-37	Y	HOME
0125NE 8	10701645	HAYDOCK_____PHIL	04/18/1988	145	30	105	OPEN	GOOD	- -		00598
MCMINN		SHOWBARN RD	/ /	128	90	STEEL	105 - 145		- -	Y	FARM
0125NE 8	10701672	BELL_____DAN_	06/21/1988	800	3	209	OPEN	GOOD	- -		00598
MCMINN		HWY 30#	/ /	120	150	STEEL	209 - 800		- -	Y	HOME
0125NE 8	10701683	BROWN_____SAMU	07/28/1988	200	8	73	OPEN	OTHR	- -		00598
MCMINN		MOORE MILL	/ /	160	50	STEEL	73 - 200		- -	Y	HOME
0125NE 8	10701700	RIDEN_____JAME	12/04/1988	130	--	63	OPEN	GOOD	- -		00609
MCMINN		GOLF COURSE RD	/ /	--	--	STEEL	63 - 130		- -	Y	HOME
0125NE 8	10701702	RIBEN_____JAME	12/04/1988	157	100	105	OPEN	GOOD	35-22-50	F	00609
MCMINN		WESLEY ANN RD	4/19/1989	50	40	STEEL	105 - 157	002292	84-34-00	Y	HOME
0125NE 8	10701739	AUSTIN_____GREG	03/18/1989	84	30	63	OPEN	OTHR	- -		00598
MCMINN		OLD ETOWAH	/ /	80	20	STEEL	0 - 84		- -	Y	HOME
0125NE 8	10701740	ELLIS_____JIM_	03/15/1989	226	20	105	OPEN	OTHR	- -		00598
MCMINN		ELKINS ROAD	/ /	180	60	STEEL	0 - 225		- -	Y	HOME
0125NE 8	90002564	WARD_____MIKE	06/13/1990	405	30	83		OTHR	- -		00598
MCMINN			/ /	120	8	STEEL	-- - --		- -	Y	HOME
0125NE 8	91000195	KENNDY_____JAME	10/15/1990	445	4	127	OPEN	GOOD	- -		00598
MCMINN		MT CUMBERLAND	/ /	200	--	STEEL	0 - 445		- -	Y	HOME
0125NE 8	91002116	STRICKLAND_____WAYN	01/21/1991	220	39	146	OPEN	UNK	- -		00598
MCMINN		WESLYANA	/ /	190	20	STEEL	146 - 220		- -	Y	HOME
0125NE 8	91002117	BLANKSHIP_____RALP	05/01/1991	305	4	167	OPEN	UNK	- -		00598
MCMINN		OLD ETOWAH	/ /	1[illegible]	40	STEEL	167 - 3[illegible]		- -	Y	HOME
0125NE 8	91003791	WEBB_____DANN	10/09/19[illegible]	125	20	20	OPEN	UNK	- -		00598
MCMINN		OLD ETOWAH RD	/ /	100	15	STEEL	20 - 125		- -	Y	HOME
0125NE 8	93000987	SMITH_____APRI	01/27/1993	305	2	62	OPEN	UNK	- -		00598
MCMINN		WESLEYANNA GOOD	/ /	168	30	STEEL	-- - --		- -		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 8	93001528	JOHNSON_____J_W_	04/23/1993	170	8	104	OPEN	OTHR	- -		00598
MCMINN		WESLEYANNA GOOD	/ /	150	40	STEEL	104 - 170		- -	Y	HOME
0125NE 8	93004230	KELLY_____JIM_	09/16/1993	125	20	83	OPEN	UNK	- -		00598
MCMINN		WESLEYANNA GOOD	/ /	115	60	STEEL	83 - 125		- -	Y	HOME
0125NE 8	94000965	BRANNON_____CLEL	04/05/1994	245	15	62	OPEN	UNK	35-24-25	F	00598
MCMINN	D0004623	WOLD WOOD	8/ 9/1994	185	33	STEEL	62 - 245	010165	84-32-35	Y	HOME
0125NE 8	94001352	PRESS_KITT_____MARK	04/19/1994	145	15	41	OPEN	UNK	35-24-33	F	00598
MCMINN	D0004636	585	8/ 9/1994	65	10	STEEL	41 - 145	010164	84-32-55	Y	HOME
0125NE 8	94001356	CULBERSON_____DAVI	05/06/1994	145	10	104	OPEN	UNK	- -		00598
MCMINN	D0004648	OLD ETOWAH	/ /	120	50	STEEL	104 - 145		- -	Y	HOME
0125NE 8	94002482	SHADDEN_____VIRG	07/01/1994	225	10	146	OPEN	UNK	35-23-15	F	00598
MCMINN	D0008199	CORNER 550 &561	10/ 5/1994	155	90	STEEL	146 - 225	010236	84-32-42	Y	HOME
0125NE 8	95001411	MELTON_____DARR	03/27/1995	365	3	60	OPEN	OTHR	35-24-30	F	00608
MCMINN	D0009073	ATHENS ETOWAH R	5/24/1995	340	80	STEEL	60 - 365	010530	84-33-46	Y	HOME
0125NE 8	95002541	BIVENS_____BENN	05/23/1995	105	7	62	OPEN	UNK	35-22-35	F	00598
MCMINN	D0014056	BIVENS RD	7/24/1995	68	27	STEEL	62 - 105	015426	84-32-54	Y	HOME
0125NE 8	95002542	COOK_____WILL	05/22/1995	245	4	62	OPEN	UNK	35-23-06	F	00598
MCMINN	D0014055	WATSON RD	7/24/1995	120	17	STEEL	62 - 245	015425	84-36-33	Y	HOME
0125NE 8	95002857	LEATHERWOOD____CHER	06/15/1995	145	7	83	OPEN	UNK	35-23-17	F	00598
MCMINN	D0014067	CO RD 609 129	9/ 6/1995	118	60	STEEL	83 - 145	015364	84-33-08	Y	HOME
0125NE 8	95003655	SMITH_____STEV	07/29/1995	165	30	62	OPEN	UNK	35-23-34	F	00598
MCMINN	D0012700	CO RD 561 1950	9/25/1995	145	40	STEEL	62 - 165	015352	84-33-25	Y	HOME
0125NE 8	95005631	COPPINGER_____LYNN	11/21/1995	125	10	21	OPEN	OTHR	- -		00608
MCMINN	D0014972	WILD RD	/ /	95	30	STEEL	21 - 125		- -	Y	HOME
0125NE 8	95005639	MASHBURN_____WIND	10/17/1995	145	18	42	OPEN	OTHR	- -		00608
MCMINN	D0014957	GOOD SPRINGS	/ /	110	40	STEEL	42 - 145		- -	Y	HOME
0125NE 8	96001288	THOMAS BUILDERS INC	04/08/1996	505	2	39	OPEN	UNK	35-24-28	F	00598
MCMINN	D0015585	WILDWOOD RD	7/31/1996	70	45	STEEL	39 - 50	016634	84-33-06	Y	HOME
0125NE 8	96003[illegible]	SLACK_____JAME	07/23/1996	205	6	85	OPEN	UNK	- -		00598
MCMINN	D0021140	MT CUMBERLAND R	/ /	130	20	STEEL	85 - 205		- -	Y	HOME
0125NE 8	96003884	LARSON_____MONT	08/21/1996	225	30	83	OPEN	UNK	- -		00598
MCMINN	D0021159	BIVENS CIRCLE R	/ /	205	60	STEEL	83 - 225		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 8 MCMINN	97000594 D0023090	BURTON_____DARR OLD ATHENS	02/07/1997 / /	225 195	3 50	21 STEEL	OPEN 21 - 225	OTHR	- - - -	 Y	00608 HOME
0125NE 8 MCMINN	97001491 D0024806	HADDOCK_____J_M_ ZION HILL RD	04/17/1997 / /	165 135	8 40	62 STEEL	OPEN 62 - 165	UNK	- - - -	 Y	00598 HOME
0125NE 8 MCMINN	97002692 D0024830	LANDIS_____ALLE HWY 30 1622	06/05/1997 / /	225 160	8 50	125 STEEL	OPEN 125 - 225	UNK	- - - -	 Y	00598 HOME
0125NE 8 MCMINN	97003367 D0024848	COX_____ CHAR ROSS ELKINS RD	07/28/1997 / /	145 110	40 40	83 STEEL	OPEN 83 - 145	UNK	- - - -	 Y	00598 FARM
0125NE 8 MCMINN	97005568 D0024795	SHAW_____MARS 295 CO. RD #550	11/04/1997 1/28/1998	365 160	3 70	106 STEEL	OPEN 106 - 365	UNK 020508	35-23-01 84-32-55	F Y	00598 HOME
0125NE 9 MCMINN	10700774	BOWERY J L	06/25/1977 / /	210 --	10 70	65 STEEL	 -- - --	GOOD	35-23-56 84-30-25	S	00527 HOME
0125NE 9 MCMINN	10700880	WAGGONER I	05/10/1979 / /	106 62	20 40	42 STEEL	 -- - --		35-24-10 84-31-05	S	00006 HOME
0125NE 9 MCMINN	10701044	DEVILLE P.	00/00/1982 / /	205 --	10 --	184 STEEL	 -- - --		35-24-30 84-31-10	S	00598 HOME
0125NE 9 MCMINN	10701091	WITT PETE	04/28/1982 / /	220 190	5 150	126 STEEL	 -- - --	GOOD	35-22-47 84-34-08	S	00598 HOME
0125NE 9 MCMINN	10701162	REED_____P.J. ZION HI	06/29/1983 03/26/1985	305 140	8 --	84 STEEL	OPEN 84 - 305	OTHR	35-24-17 84-31-08	F N	00598 HOME
0125NE 9 MCMINN	10701211	PRICE_____CHAR OLD ETOWAH RD	03/09/1984 03/26/1985	226 160	3 693	84 STEEL	OPEN 84 - 226	GOOD	35-24-54 84-34-00	S Y	00598 HOME
0125NE 9 MCMINN	10701223	SMITH_____FLOY ZION HILL	07/01/1984 03/26/1985	125 110	5 --	42 STEEL	OPEN 42 - 125	GOOD	35-23-51 84-31-10	S Y	00598 HOME
0125NE 9 MCMINN	10701245	LETHAM_____LARR OLD FEDERAL RD	11/05/1984 / /	105 90	20 --	83 STEEL	OPEN 83 - 105	GOOD	- - - -	 Y	00598 HOME
0125NE 9 MCMINN	10701253	CANTRELL_____ STEV WILDWOOD RD	09/12/1984 / /	246 180	5	147 STEEL	OPEN 147 - [illegible]	GOOD	- - -	 Y	00598 HOME
0125NE 9 MCMINN	10701350	CALVIN _____DUFF ZION HILL -NEAR	04/0[illegible]1986 / /	305 305	[illegible] --	63 STEEL	OPEN 68 - 305	GOOD	- - - -	 Y	00[illegible] HOME
0125NE 9 MCMINN	10701390	WATSON_____ERNI ZION HILL RD	10/21/1985 / /	3051 180	0 --	63 STEEL	OPEN 63 - 3[illegible]	GOOD	- - - -	 Y	00598 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 9	10701421	ENGLEWOOD_CHURC	07/15/1986	230	7	84	OPEN	OTHR	- -		00609
MCMINN		ENGLEWOOD SUBDI	/ /	170	90	STEEL	84 - 230		- -	Y	HOME
0125NE 9	10701500	ELIKINS_____ROSS	07/22/1986	345	7	180	OPEN	OTHR	- -		00598
MCMINN		CASEY	/ /	235	150	STEEL	180 - 345		- -	Y	HOME
0125NE 9	10701509	DOCKERY_____TERR	01/06/1987	105	25	33	OPEN	GOOD	- -		00598
MCMINN		ZOIN HILL	/ /	60	30	STEEL	33 - 105		- -	Y	HOME
0125NE 9	90002566	MARTIN_____CLAU	06/04/1990	150	20	62	OPEN	OTHR	- -		00598
MCMINN		ZION HILL	/ /	80	7	STEEL	-- - --		- -	Y	HOME
0125NE 9	90003036	RUSSEL_____JIM_	09/06/1990	265	4	74	OPEN	OTHR	- -		00608
MCMINN		HWY 411	/ /	185	60	STEEL	-- - 265		- -	Y	HOME
0125NE 9	91002079	GARDNER_____HELE	05/22/1991	185	20	159	OPEN	UNK	- -		00598
MCMINN		WATSON	/ /	180	30	STEEL	159 - 185		- -	Y	HOME
0125NE 9	91002114	COLTHARP_____LYNN	03/20/1991	225	30	62	OPEN	UNK	- -		00598
MCMINN		ELKINS	/ /	210	40	STEEL	62 - 225		- -	Y	HOME
0125NE 9	91002636	HALL_____HOME	06/17/1991	210	6	63	OPEN	UNK	- -		00528
MCMINN		OFF HWY 39	/ /	180	60	STEEL	63 - 210		- -	Y	FARM
0125NE 9	92001966	GARDNER JOE_	04/03/1992	390	10	105	OPEN	UNK	- -		00528
MCMINN		ELKINS RD	/ /	380	100	STEEL	105 - 360		- -	Y	HOME
0125NE 9	92003429	COVINGTON_____WAYN	09/19/1992	205	5	125	OPEN	UNK	- -		00598
MCMINN		ZION HILL	/ /	170	--	STEEL	125 - 205		- -	Y	HOME
0125NE 9	92003433	ALDRIDGE_____I_E_	09/10/1992	185	7	82	OPEN	OTHR	- -		00598
MCMINN		KIRLAND SUBDIVI	/ /	100	20	STEEL	82 - 185		- -	Y	HOME
0125NE 9	92003434	ARMSTRONG_____GARY	09/11/1992	145	15	41	OPEN	UNK	- -		00598
MCMINN		TOM MARTIN	/ /	80	20	STEEL	41 - 145		- -	Y	OTHR
0125NE 9	92004208	SMITH_____FLOY	11/16/1992	185	40	41	OPEN	UNK	- -		00598
MCMINN		ZOIN HILL RD	/ /	170	20	STEEL	41 - 185		- -	Y	HOME
0125NE 9	93000447	THOMAS SHIR	01/07/1993	305	2	104	OPEN	OTHR	- -		00598
MCMINN		COUNTY RD 415	/ /	290	80	STEEL	104 - 305		- -	Y	HOME
0125NE 9	93000449	[illegible] X TIM_	01/04/1993	405	2	62	OPEN	UNK	- -		00598
MCMINN		KIRLAND CORD 51	/ /	180	40	STEEL	62 - 405		- -	Y	HOME
0125NE 9	93005213	FRAZIER_____BILL	12/08/1993	185	10	83	OPEN	UNK	- -		00598
MCMINN	D0004586	OLD ETOWAH	/ /	150	40	STEEL	83 - 185		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 9	94000941	ANDERSON_____BIVI	03/18/1994	165	20	125	OPEN	UNK	- -		00598
MCMINN	D0004609	ZOIN HILL RD	/ /	155	80	STEEL	125 - 165		- -	Y	HOME
0125NE 9	94004393	CHURCH OF CASTEEL	10/20/1994	305	4	62	OPEN	CTHR	- -		00598
MCMINN	D0008132	517	/ /	145	30	STEEL	62 - 305		- -	Y	HOME
0125NE 9	94004597	MORGAN_____TONY	11/06/1994	205	8	20	OPEN	UNK	35-23-36	F	00598
MCMINN	D0008138	ZION HILL LT 1	2/14/1995	60	31	STEEL	20 - 205	010412	84-31-10	Y	HOME
0125NE 9	95002259	MARTIN_____ CARL	05/10/1995	165	6	42	OPEN	UNK	35-23-53	F	00598
MCMINN	D0014029	CO RD 516 # 331	7/24/1995	130	37	STEEL	42 - 165	015427	84-30-53	Y	HOME
0125NE 9	95002532	BIGGAM_____FLOR	06/16/1995	145	14	41	OPEN	UNK	35-24-08	F	00598
MCMINN	D0014070	ZION HILL SPUR	7/24/1995	0	36	STEEL	41 - 145	015429	84-31-50	Y	HOME
0125NE 9	95002856	PRESLEY_____AFFA	06/16/1995	105	10	41	OPEN	UNK	35-24-07	F	00598
MCMINN	D0014069	ZION HILL SPUR	7/24/1995	45	20	STEEL	41 - 105	015428	84-31-50	Y	HOME
0125NE 9	95003021	BEARFIELD_____GEOR	06/18/1995	285	50	62	OPEN	UNK	35-24-18	F	00598
MCMINN	D0014071	CO RD 516	7/24/1995	275	40	STEEL	62 - 285	015430	84-31-52	Y	HOME
0125NE 9	95003162	LEE_____RAND	07/03/1995	285	30	125	OPEN	UNK	- -		00598
MCMINN	D0012679	OLD ENGLEWOOD	/ /	215	60	STEEL	125 - 285		- -	Y	HOME
0125NE 9	95005433	ROGERS BRIA	11/10/1995	165	15	41	OPEN	UNK	35-23-40	F	00598
MCMINN	D0015549	CO RD 550	4/ 9/1996	115	20	STEEL	41 - 165	016718	84-31-24	Y	HOME
0125NE 9	96000118	DAUGHERTY_____ANDY	12/12/1995	145	30	60	OPEN	UNK	35-24-15	F	00598
MCMINN	D0015558	KIRKLAND ESTATE	4/ 9/1996	105	30	STEEL	60 - 145	016740	84-30-04	Y	HOME
0125NE 9	96001284	MORGAN/GUINN TONY	03/18/1996	145	15	39	OPEN	UNK	35-23-42	F	00598
MCMINN	D0015578	ZION HILL RD	4/ 9/1996	65	20	STEEL	39 - 145	016719	84-31-29	Y	HOME
0125NE 9	96001699	DUNCAN_____SAMM	04/17/1996	145	20	59	OPEN	UNK	- -		00598
MCMINN	D0015591	ZION HILL RD	/ /	110	40	STEEL	59 - 145		- -	Y	HOME
0125NE 9	96002724	GUINN_JR_____JESS	06/16/1996	105	30	41	OPEN	UNK	35-23-36	F	00598
MCMINN	D0015617	ZION HILL RD	9/ 3/1996	55	10	STEEL	41 - 105	016541	84-31-26	Y	HOME
0125NE 9	96002910	BAREFIELD_____BUD	07/12/1996	285	6	129	OPEN	UNK	35-24-24	F	00598
MCMINN	D0021136	ZION HILL RD	9/ 3/1996	[illegible]	80	[illegible]	129 - 285	016542	84-30-37	Y	HOME
0125NE 9	96003887	LEMONS_____LARR	08/30/1996	105	25	41	OPEN	UNK	- -		00598
MCMINN	D0021169	ZION HILL RD	/ /	80	20	STEEL	41 - 105		- -	Y	HOME
0125NE 9	96003889	MORGAN_____TONY	08/31/1996	105	20	41	OPEN	UNK	35-23-30	F	00598
MCMINN	D0021173	ZION HILL ROAD	9/ 3/1996	60	15	STEEL	41 - 105	016640	84-31-32	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE ATHENS QUADRANGLE (0125NE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NE 9 MCMINN	96005073 D0022252	STANDRIDGE_____JERR ZION HILL RD	10/28/1996 / /	145 80	8 10	20 STEEL	OPEN 20 - 145	UNK	- - - -	 Y	00598 HOME
0125NE 9 MCMINN	97002093 D0024821	CLOWER_____DONA CO RD 545	05/16/1997 / /	105 55	30 20	41 STEEL	OPEN 41 - 105	UNK	- - - -	 Y	00598 HOME
0125NE 9 MCMINN	97002095 D0024818	EVANS_____GREG CO RD 550 596	05/16/1997 / /	125 60	8 20	41 STEEL	OPEN 41 - 125	UNK	- - - -	 Y	00598 HOME
0125NE 9 MCMINN	97004439 D0024870	MORGAN_____JOHN COUNTY RD 565	09/08/1997 / /	145 115	7 40	62 STEEL	OPEN 62 - 145	OTHR	- - - -	 Y	00598 HOME
0125NE 9 MCMINN	97005564 D0024791	ROGERS_JR_____TED_ 250 CO. RD 520	10/20/1997 1/28/1998	125 104	40 40	41 STEEL	OPEN 41 - 125	UNK 020520	35-24-34 84-30-19	F Y	00598 HOME
0125NE 9 MCMINN	98001544 D0032838	PRESSWOOD_____MIKE ZION HILL 550	04/13/1998 / /	125 60	20 20	41 STEEL	OPEN 41 - 125	UNK	- - - -	 Y	00598 HOME
0125NE 9 MCMINN	98001553 D0032847	MASSENGILL_____ANGE CO RD 564	05/12/1998 / /	125 60	20 20	41 STEEL	OPEN 41 - 125	UNK	- - - -	 Y	00598 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS IN SELECTED AREAS OF TENNESSEE

EXPLANATION OF COLUMN HEADINGS

QUAD/NTH = Designation by number, Quadrant and ninth of the 2.5 - minute quadrangle area in which the well is located. The leading numbers identify the 15-minute quadrangle, the next two letters identify the 7.5-minute quadrant and the last digit identifies the one-ninth subdivision of the latter.

COUNTY = County in which the well is located.

WELL NUM = Identification number assigned to the well by the State.

TAG NUM = An inspection number assigned to the well at the time of inspection by the State.

OWNER'S NAME = Name of person or organization for whom the well was drilled.

LOCATION ROAD = Name of street or road from which to access the well. Blank if unknown.

COMP DATE = Month, day and year the well was completed.

INSPT DATE = Month, day and year the well was inspected by TDHE. Blank if well has not been inspected.

TOT DEPTH = Total depth of the well in feet.

AQ DEPTH = Depth, in feet, below land surface to the top of the shallowest aquifer or water-bearing zone tapped by the well.

TOT YIELD = Total yield of the well in gallons per minute (gpm). Yields less than one-half gpm reported as zero.

STAT LEVEL = Static water-level: depth, in feet, from the land surface to the surface of the water standing in an idle well.

CSE DEPTH = Casing depth: depth, in feet, to the bottom of the water tight casing installed in the well.

CSE TYPE = Casing type: PLAST = Plastic; STEEL = Steel; OTHER = any other material such as concrete, fiberglass or tile.

WELL FINISH = Construction of the well in the interval supplying water to the well: OPEN = Uncased or open hole; SLOT = Hand perforated or slotted pipe; SCREEN = Manufactured device designed to maintain the wall of the borehole and allow ground water to enter the well.

INTERVAL = The depth, in feet, from the top to the bottom of the interval that is open to the well.

WAT QUAL = Water Quality: a word to describe the relative quality of the well water such as GOOD, FAIR, BAD, LIME, IRON, SULFUR, SALT, OIL, GAS, OTHER.

GEO FORM = Name of the geologic formation tapped by the well (not generally reported).

LATITUDE = Latitude of well site in degrees, minutes, and seconds.

LONGITUDE = Longitude of well site in degrees, minutes, and seconds.

ACC = Accuracy Code for latitude and longitude: [illegible] = Nearest second; [illegible] = nearest 15 seconds; T = nearest 30 seconds; M = nearest minute; Blank = nearest 2.5 minutes.

LOG = Refers to availability of driller's log: Y = yes; N = no.

DRILLER = License number of driller who supervised construction of the well. Names provided upon request.

U = Purpose for which the well was constructed: [illegible] = residential; [illegible] = commercial; [illegible].

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ENVIRONMENTAL ASSISTANCE CENTER AT CHATTANOOGA

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE NIOTA QUADRANGLE (0124SE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0124SE 1 MCMINN	10701213	CAMBELL_____J_B MT VERD	05/26/1984 03/19/1985	205 185	12 198	100 STEEL	OPEN 100 - 205	GOOD	35-35-33 84-36-10	S Y	00598 FARM
0124SE 1 MCMINN	10701236	DENNIS_____RUTH HWY 68	09/19/1983 / /	125 82	15 35	73 STEEL	OPEN 73 - 125	GOOD	- - - -	Y	00383 HOME
0124SE 1 MCMINN	10701641	MATHENS_____GLEN 	05/17/1988 / /	300 0	1 20	20 STEEL	OPEN 20 - 300	GOOD	- - - -	Y	00598 HOME
0124SE 1 MCMINN	10701677	MAY_____J_ MT VERD	03/15/1988 / /	265 160	1 40	41 STEEL	OPEN 41 - 265	OTHR	- - - -	Y	00598 HOME
0124SE 1 MCMINN	90003049	MOSS_____MIKE UNION GROVE RD	08/15/1990 / /	485 460	5 80	42 STEEL	OPEN -- - 485	OTHR	- - - -	Y	00608 HOME
0124SE 1 MCMINN	91002120	MILLSAPS_____ALVI MT VERD	06/11/1991 / /	205 185	10 30	133 STEEL	OPEN 133 - 205	H2S	- - - -	Y	00598 HOME
0124SE 1 MCMINN	92001408	FINGER_____JOE_ 	03/11/1992 / /	185 165	25 20	63 STEEL	OPEN 63 - 185	OTHR	- - - -	Y	00608 HOME
0124SE 1 MCMINN	92004197	FLEMING_____STEV HICKEY	11/15/1992 / /	405 140	3 80	101 STEEL	OPEN 101 - 405	GOOD	- - - -	Y	00598 HOME
0124SE 1 MCMINN	92004206	ED BROWN MT VERD	11/25/1992 / /	145 130	20 15	41 STEEL	OPEN 4 - 145	H2S	- - - -	Y	00598 HOME
0124SE 1 MCMINN	94000083 D0000081	DAWSON_____BILL CAMPBELL RD OFF	12/02/1993 / /	168 95	30 40	55 STEEL	OPEN 55 - 168	OTHR	- - - -	Y	00006 HOME
0124SE 1 MCMINN	94003590 D0000136	WATSON_____DAVI CC RD 250 #1683	08/31/1994 12/14/1994	208 67	10 10	21 STEEL	OPEN 21 - 208	OTHR 010326	35-36-36 84-37-15	F Y	00006 HOME
0124SE 1 MCMINN	94003591 D0000135	DAWSON_____RON_ CO RD 282	08/30/1994 12/14/1994	148 112	50 --	105 STEEL	OPEN 105 - 148	OTHR 010327	35-36-40 84-35-37	F Y	00006 HOME
0124SE 1 MCMINN	95000850 D0011321	WATSON_____DARR COUNTY RD 250	02/16/1995 / /	353 50	2 30	21 STEEL	OPEN 21 - 353	OTHR	- - - -	Y	00006 HOME
0124SE 1 MCMINN	95003019 D0014073	MOSS_____RAND [illegible]	06/30/1995 / /	425 300	1 [illegible]	41 STEEL	OPEN 41 - 425	UNK	- - -	Y	00598 HOME
0124SE 1 MCMINN	96000796 D0017159	MASHBURN_____WIND ROCKVILLE CHURC	02/25/1996 / /	305 290	15 120	168 STEEL	OPEN 168 - 305	OTHR	- - -	Y	00608 HOME
0124SE 1 MCMINN	96001701 D0015604	JOHNSON_____MIKE ROCKVIEW CHURCH	05/10/1996 8/15/1996	425 280	20 10	83 STEEL	OPEN 83 - 425	UNK 016560	35-35-42 84-34-43	F Y	00598 FARM

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE NIOTA QUADRANGLE (0124SE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0124SE 1	96005076	TRENTHAM_____ROBE	10/11/1996	225	5	20	OPEN	UNK	35-35-36	F	00598
MCMINN	D0022242	J B CAMPBELL RD	2/ 6/1997	100	10	STEEL	20 - 225	019180	84-36-00	Y	HOME
0124SE 1	97000152	LEWIS_____JOEL	12/02/1996	225	2	42	OPEN	OTHR	- -		00608
MCMINN	D0021023	FLEMING	/ /	180	60	STEEL	42 - 225		- -	Y	HOME
0124SE 1	97002800	ROBERTS_____STEV	07/03/1997	345	6	118	OPEN	OTHR	- -		00608
MCMINN	D0026191	ROCK VIEW CHURC	/ /	320	60	STEEL	118 - 345		- -	Y	HOME
0124SE 2	10700801	INGRAM J	12/28/1977	230	2	21		GOOD	35-36-36	S	00527
MCMINN			/ /	--	--	STEEL	-- - --		84-33-05		HOME
0124SE 2	10701201	AKENS_____GENE	11/20/1983	246	30	210	OPEN	GOOD	35-36-45	F	00598
MCMINN		HWY 68	01/11/1985	235	--	STEEL	210 - 246		84-33-11	Y	HOME
0124SE 2	10701300	MYERS_____MARY	11/20/1985	188	40	108	OPEN	OTHR	- -		00006
MCMINN		BLUE SPRING PIN	/ /	168	40	OTHER	108 - 188		- -	Y	HOME
0124SE 2	10701387	TILLEY_____MAUR	05/30/1986	455	12	75	OPEN	OTHR	- -		00006
MCMINN		UNION GROVE RD	/ /	270	70	OTHER	75 - 455		- -	Y	HOME
0124SE 2	10701388	VANCE_____DONN	05/28/1986	290	15	152	OPEN	OTHR	- -		00006
MCMINN		UNION GROVE	/ /	172	100	OTHER	152 - 290		- -	Y	HOME
0124SE 2	10701407	JENKINS_____ED_	05/08/1986	100	12	63	OPEN	OTHR	- -		00383
MCMINN		68	/ /	92	20	STEEL	63 - 100		- -	Y	HOME
0124SE 2	10701425	STEPHENS_____LEMU	11/26/1986	468	2	131	OPEN	OTHR	- -		00006
MCMINN		HWY 68	/ /	187	80	OTHER	131 - 468		- -	Y	HOME
0124SE 2	10701526	LEWIS_____JAME	03/26/1987	310	15	137	OPEN	OTHR	- -		00383
MCMINN		UNION GRAVE	/ /	290	100	STEEL	137 - 310		- -	Y	HOME
0124SE 2	10701631	WHITE_____CHAR	04/07/1988	185	5	158	OPEN	OTHR	- -		00608
MCMINN			/ /	160	90	STEEL	158 - 185		- -	Y	HOME
0124SE 2	10701634	STEPHENS_____LEMU	05/25/1988	220	50	210	OPEN	GOOD	- -		00608
MCMINN		HWY 68	/ /	220	130	STEEL	210 - 220		- -	Y	HOME
0124SE 2	10701689	AKENS_____[illegible]	07/14/1988	640	8	150	OPEN	OTHR	- -		00598
MCMINN		AKENS ROAD 297	/ /	[illegible]	140	STEEL	150 - 640		- -	Y	FARM
0124SE 2	12301500	PARSON_ ____HELE	11/18/1[illegible]3	230	20	96	OPEN	OTHR	- -		00521
MONROE		HWY 68	/ /	215	80	STEEL	96 - 230		- -	Y	HOME
0124SE 2	12301570	LONG_____EARL	03/28/1985	115	40	100	OPEN	OTHR	- -		00383
MONROE			/ /	110	70	STEEL	100 - 115		- -	Y	HOME

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0124SE 2	12301961	MOORE_____ALIN	05/29/1989	330	1	20	OPEN	OTHR	- -		00630
MONROE		HWY 68	/ /	80	18	STEEL	20 - 330		- -	Y	HOME
0124SE 2	90000268	WICKER_____TOM_	11/24/1989	505	3	40	OPEN	OTHR	- -		00608
MCMINN		TROUT FARM RD	/ /	450	3	STEEL	40 - 505		- -	Y	HOME
0124SE 2	90000269	WEBB_____JOHN	11/10/1989	225	10	138	OPEN	OTHR	- -		00608
MCMINN		TROUT FARM RD	/ /	200	8	STEEL	138 - 225		- -	Y	HOME
0124SE 2	90000963	STAR_____TIM_	11/30/1989	440	4	125	OPEN	UNK	- -		00598
MCMINN		UNION HILL	/ /	430	8	PLAST	125 - 440		- -	Y	HOME
0124SE 2	90001649	RICHARDSON_____SHAW	06/01/1990	145	20	104	OPEN	GOOD	- -		00622
MCMINN		UNION GROVE RD	/ /	130	4	STEEL	104 - 145		- -	Y	HOME
0124SE 2	90002559	CLOVER_____KATH	07/15/1990	185	20	146		OTHR	- -		00598
MCMINN		HWY 68	/ /	165	10	OTHER	-- - --		- -	Y	OTHR
0124SE 2	90003056	BRYANT_____JIM_	07/23/1990	85	20	42	OPEN	OTHR	- -		00608
MCMINN		HWY 68	/ /	50	30	STEEL	0 - 85		- -	Y	HOME
0124SE 2	90003058	HICKEY_____GRAN	07/18/1990	150	20	120	OPEN	OTHR	- -		00608
MCMINN			/ /	135	80	STEEL	0 - 150		- -	Y	HOME
0124SE 2	92001646	DAWSON_____ARRA	02/26/1992	270	50	126	OPEN	OTHR	- -		00006
MCMINN		RIDDLE	/ /	252	100	STEEL	126 - 270		- -	Y	HOME
0124SE 2	92004210	ROGERS_____JAME	11/08/1992	325	3	83	OPEN	UNK	- -		00598
MCMINN		HAUN RD	/ /	280	60	STEEL	83 - 325		- -	Y	HOME
0124SE 2	93004506	MELTON_____TOMM	10/05/1993	265	8	41	OPEN	UNK	- -		00598
MCMINN		HAUN RD	/ /	230	30	STEEL	41 - 265		- -	Y	HOME
0124SE 2	93004597	DAWSON_____EDWA	10/05/1993	505	1	125	OPEN	OTHR	- -		00608
MCMINN			/ /	400	100	STEEL	125 - 505		- -	Y	HOME
0124SE 2	93005163	MAURER_____DON_	12/03/1993	105	20	42	OPEN	OTHR	- -		00608
MONROE	D0004785	MURRAYS CHAPEL	/ /	100	40	STEEL	42 - 105		- -	Y	HOME
0124SE 2	94002489	SHORLY___ ____JOHN	07/07/1994	145	10	39	OPEN	UNK	- -		00598
MCMINN	[illegible]	HWY 68 RD	/ /	50	10	STEEL	39 - 145		- -	Y	HOME
0124SE 2	[illegible]000236	DAVIS____ ___GRAD	12/20/199[illegible]	425	2	20	OPEN	GOOD	-		00622
MCMINN	[illegible]0010141	COUNTY RD [illegible]96	/ /	50	37	STEEL	20 - 425		- -	Y	HOME
0124SE 2	95000619	RON MORELAND BUILDE	01/26/1995	65	20	35	OPEN	OTHR	35-36-38	T	00608
MCMINN	[illegible]0009057	HWY 68	4/ 5/199[illegible]	50	6	STEEL	35 - 65	010473	84-34-22	Y	HOME

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0124SE 2	95001861	ATKINS_____DEBB	04/16/1995	185	10	20	OPEN	UNK	- -		00598
MCMINN	D0012716	68	/ /	168	20	STEEL	20 - 185		- -	Y	HOME
0124SE 2	95001892	BASS_____JARR	04/18/1995	225	8	62	OPEN	UNK	- -		00598
MCMINN	D0012717	HAUN RD	/ /	205	40	STEEL	62 - 225		- -	Y	HOME
0124SE 2	95002050	PETTIT_____KENN	04/18/1995	425	10	160	OPEN	OTHR	- -		00608
MCMINN	D0009084	RIDDLE RD	/ /	405	100	STEEL	160 - 425		- -	Y	HOME
0124SE 2	95002531	WATTERS_____SCOT	06/08/1995	365	5	125	OPEN	UNK	- -		00598
MCMINN	D0014062	DAWSON RD	/ /	342	100	STEEL	125 - 365		- -	Y	HOME
0124SE 2	95004180	CRAFT_____HARO	08/30/1995	205	5	67	OPEN	UNK	35-36-40	F	00598
MCMINN	D0014047	HWY 68	8/13/1996	145	30	STEEL	67 - 205	016611	84-34-20	Y	HOME
0124SE 2	95004188	UNION GROVE CHURCH	08/22/1995	165	20	146	OPEN	UNK	35-35-50	F	00598
MCMINN	D0014042	CO RD 316	4/11/1996	155	50	STEEL	146 - 165	016696	84-33-14	Y	HOME
0124SE 2	95004930	GOFORTH_____RAND	10/02/1995	125	30	93	OPEN	GOOD	- -		00622
MCMINN	D0011973	LYNN ROAD	/ /	99	54	STEEL	93 - 125		- -	Y	HOME
0124SE 2	96005150	MASHBURN_____WIND	10/01/1996	205	15	166	OPEN	OTHR	35-36-30	F	00608
MCMINN	D0021001	RIDDLE	2/ 6/1997	180	90	STEEL	166 - 205	019162	84-32-41	Y	HOME
0124SE 2	97003547	MOSER_____TRAV	08/01/1997	265	5	84	OPEN	OTHR	35-37-00	F	00608
MCMINN	D0026202	ATKINS RD	10/10/1997	250	100	STEEL	84 - 265	019633	84-32-56	Y	HOME
0124SE 2	97003548	MCKEEHAN_____ERNE	08/02/1997	205	12	128	OPEN	OTHR	35-35-53	F	00608
MCMINN	D0026203		10/10/1997	180	80	STEEL	128 - 205	019632	84-32-38	Y	HOME
0124SE 2	97003549	MCKEEKAN_____ERNE	08/04/1997	185	15	78	OPEN	OTHR	- -		00608
MCMINN	D0026204	RICHARDSON RD	/ /	150	50	STEEL	78 - 185		- -	Y	HOME
0124SE 2	97004746	CARDIN_____JERR	10/09/1997	505	3	126	OPEN	UNK	- -		00598
MCMINN	D0024786	HAUN	/ /	120	100	STEEL	126 - 505		- -	Y	HOME
0124SE 2	97005286	EDMONSON_____THOM	11/02/1997	265	20	84	OPEN	OTHR	- -		00608
MCMINN	D0026237	ROCKVIEW CHURCH	/ /	--	60	STEEL	84 - 265		- -	Y	HOME
0124SE 2	97005305	MCCAMMON_____HARO	11/13/1997	330	4	42	OPEN	OTHR	- -		00383
MCMINN	D00[illegible]70	HWY [illegible]	/ /	[illegible]	[illegible]	STEEL	42 - [illegible]		- -	Y	HOME
0124SE [illegible]	98001549	MACON_____CATH	04/29/1998	130	40	125	OPEN	UNK	- -		00[illegible]3
MCMINN	D0032843	316 UNION GROVE	/ /	126	1	STEEL	125 - 129		- -	Y	HOME
0124SE 2	98002102	MATTHEWS_____TERR	05/26/1998	165	15	147	OPEN	OTHR	- -		00608
MCMINN	D0032[illegible]4	MOODY RD	/ /	1[illegible]	40	STEEL	147 - 1[illegible]		- -	Y	HOME

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0124SE 2 MCMINN	TN008601	PETIT KEN CC RD 312 172	/ / 1/10/1995				-		35-35-54 84-33-51	S	
0124SE 3 LOUDON	10500856	MONTOOTH_ENTERP GREASY CREEK	01/03/1987 / /	172 170	100 79	89 STEEL	OPEN 89 - 172	GOOD	- - - -	Y	00622 HOME
0124SE 3 MCMINN	10700958	OGLE B	12/21/1979 / /	126 103	100 20	72 STEEL	-- - --	GOOD	35-36-24 84-32-04	S	00006 HOME
0124SE 3 MCMINN	10701081	SHOFFNER BERRY	04/21/1982 / /	460 455	6 20	20 STEEL	-- - --	GOOD	35-36-13 84-31-56	S	00006 COMM
0124SE 3 MONROE	12301517	PHILLIPS_____J_D 	04/14/1984 / /	125 95	30 20	52 STEEL	OPEN 52 - 125	GOOD	- - - -	Y	00383 HOME
0124SE 3 MONROE	12301724	MILLER_____BILL CHAPEL	01/05/1987 / /	105 87	75 56	83 STEEL	OPEN 83 - 105	GOOD	- - - -	Y	00622 FARM
0124SE 3 MONROE	12301762	ANDERSON_____WILL UNION GROVE	11/11/1986 / /	330 240	8 60	150 STEEL	OPEN 150 - 330	GOOD	- - - -	Y	00637 HOME
0124SE 3 MONROE	12301948	BILDERBACK_____MART BILDERBACK RD	12/07/1988 / /	365 305	5 80	40 STEEL	OPEN 40 - 365	OTHR	- - - -	Y	00608 HOME
0124SE 3 MCMINN	91002081	HAUN_____J_C_ HWY 68	04/01/1991 / /	209 25	10 12	21 OTHER	OPEN 21 - 209	OTHR	- - - -	Y	00006 HOME
0124SE 3 MCMINN	92000410	HICKEY_____GRAN 	10/10/1991 / /	405 365	5 100	76 STEEL	OPEN 76 - 405	OTHR	- - - -	Y	00608 HOME
0124SE 3 MCMINN	92001467	SZLABORYI_____SAND ROAD #313	04/03/1992 / /	125 108	25 42	104 STEEL	OPEN 104 - 125	GOOD	- - - -	Y	00622 HOME
0124SE 3 MCMINN	92003856	NIPPER_____COLL 	08/10/1992 / /	365 340	3 80	118 STEEL	OPEN 118 - 365	OTHR	- - - -	Y	00608 HOME
0124SE 3 MCMINN	92004234	GASS_____FERR 313	08/27/1992 / /	394 140	4 --	106 PLAST	OPEN 106 - 394	OTHR	- - - -	Y	00006 HOME
0124SE 3 MONROE	93005217 D0081[illegible]	HUGE_____LARR PLEASANT GROV[illegible]	11/19/1993 / /	365 [illegible]	3 100	126 STEEL	OPEN 126 - [illegible]	UNK	- - - -	Y	00598 HOME
0124SE [illegible] MCMINN	94001505 D0005130	HARRIS_____JAME ROAD #313	05/13/1994 / /	100 82	60 32	69 STEEL	OPEN 69 - 100	GOOD	- - - -	Y	006[illegible]2 HOME
0124SE 3 MCMINN	96001690 D0015[illegible]	RICHESIN_____CARL HWY 68	05/03/1996 3/13/1996	165 170	15 60	104 STEEL	OPEN 104 - 165	OTHR 016612	35-36-34 84-32-38	F Y	00598 HOME

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0124SE 3	96001700	RICHESIN_____SAM_	05/14/1996	305	3	83	OPEN	UNK	35-36-56	F	00598
MCMINN	D0015607	PINEY ROAD	8/13/1996	170	60	STEEL	83 - 305	016613	84-32-43	Y	HOME
0124SE 3	96003478	TILLEY_____FRED	07/31/1996	245	30	105	OPEN	OTHR	- -		00006
MCMINN	D0018171	HANDSARD HILL R	/ /	125	60	OTHER	105 - 245		- -	Y	HOME
0124SE 3	96005084	COLTHARP_____GEOR	10/30/1996	225	20	146	OPEN	UNK	- -		00598
MCMINN	D0022253	MOSES RD	/ /	200	60	STEEL	146 - 225		- -	Y	HOME
0124SE 3	97000160	MCKEENAN_____ERNI	12/23/1996	225	10	147	OPEN	OTHR	- -		00608
MCMINN	D0023081	RIDDLE SPUR RD	/ /	200	80	STEEL	147 - 225		- -	Y	HOME
0124SE 3	97000493	BAINIS_____SAMU	01/28/1997	175	20	160	OPEN	OTHR	35-36-38	F	00383
MCMINN	D0022462		4/18/1997	--	100	STEEL	160 - 175	019088	84-32-53	Y	HOME
0124SE 3	97004527	WORTHY_____JEFF	09/09/1997	510	2	137	OPEN	OTHR	- -		00383
MCMINN	D0025962	HWY 11	/ /	360	60	STEEL	137 - 510		- -	Y	HOME
0124SE 4	10700826	BLEDSOE J	04/04/1978	92	30	38		GOOD	- -		00344
MCMINN		POND HILL RD	/ /	70	70	STEEL	-- - --		- -		FARM
0124SE 4	10701228	POND HILL BAPTIST C	03/23/1984	350	15	100	OPEN	GOOD	35-33-02	S	00528
MCMINN		POND HILL RD	01/17/1985	240	480	STEEL	100 - 350		84-37-00	Y	OTHR
0124SE 4	10701266	JACKSON_____CHAR	08/22/1984	190	10	34	OPEN	OTHR	- -		00609
MCMINN		POND HILL	/ /	150	40	STEEL	34 - 190		- -	Y	HOME
0124SE 4	10701296	CLARK_____HAZE	10/17/1985	210	10	200	OPEN	OTHR	- -		00609
MCMINN		POND HILL RD	/ /	210	160	STEEL	200 - 210		- -	Y	HOME
0124SE 4	10701297	WILLIS_____BILL	10/12/1985	270	1	87	OPEN	OTHR	- -		00609
MCMINN		POND HILL RD	/ /	120	80	STEEL	87 - 270		- -	Y	HOME
0124SE 4	10701485	RIDEN_____ROBE	09/02/1986	500	1	41	OPEN	OTHR	- -		00598
MCMINN		MT VERD ROAD	/ /	200	30	STEEL	41 - 500		- -	Y	HOME
0124SE 4	10701544	RICHERSON_____STEV	08/03/1987	225	35	199	OPEN	GOOD	- -		00598
MCMINN		MT VERD RD (OFF	/ /	200	160	STEEL	199 - 225		- -	Y	HOME
0124SE 4	10701713	BORGO _____ _OGLE	09/28/1988	130	10	20	OPEN	OTHR	- -		00630
MCMINN		POND HILL RD	/ /	110	8	STEEL	20 - 130		-	Y	HOME
0124SE 4	10701757	ALLMON_____ _AME	04/23/1989	365	10	158	OPEN	OTHR	- -		00608
MCMINN			/ /	340	120	STEEL	158 - 365		- -	Y	HOME
0124SE 4	10701772	CARDIN _____ _FRAN	05/01/1989	565	1	21	OPEN	OTHR	- -		00608
MCMINN		POND HILL	/ /	330	20	STEEL	21 - 565		- -	Y	HOME

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0124SE 4	92002200	FARR_____DON_	04/12/1992	405	6	129	OPEN	UNK	- -		00598
MCMINN		POND HILL RD	/ /	180	100	STEEL	129 - 405		- -	Y	HOME
0124SE 4	93003713	DERRICK_____RICK	08/18/1993	125	20	113	OPEN	OTHR	- -		00608
MCMINN		CLEARWATER	/ /	120	60	STEEL	113 - 125		- -	Y	HOME
0124SE 4	93004598	HOLBERT_____LARR	10/07/1993	365	5	197	OPEN	OTHR	- -		00608
MCMINN			/ /	340	100	STEEL	197 - 365		- -	Y	HOME
0124SE 4	94000939	WHITE_____JAME	03/29/1994	145	20	104	OPEN	UNK	35-33-15	F	00598
MCMINN	D0004622	MILL RD DON PRI	6/22/1994	130	72	STEEL	104 - 145	008100	84-35-00	Y	HOME
0124SE 4	94000940	MURANI_____MARC	03/28/1994	325	3	149	OPEN	UNK	35-33-15	F	00598
MCMINN	D0004621	MILL RD	6/22/1994	280	88	STEEL	149 - 325	008098	84-35-00	Y	HOME
0124SE 4	94001530	COOK_____DALE	04/24/1994	105	20	83	OPEN	UNK	35-38-15	F	00598
MCMINN	D0004639	MILL RD	6/22/1994	90	78	STEEL	83 - 105		84-35-00	Y	HOME
0124SE 4	95002538	MURPHY_____JIM_	06/02/1995	265	5	146	OPEN	UNK	- -		00598
MCMINN	D0014061	HYDE RD	/ /	150	80	STEEL	146 - 265		- -	Y	HOME
0124SE 4	95004663	WHITE_____JAME	09/14/1995	405	4	--	OPEN	UNK	- -		00598
MCMINN	D0004622	MILL RD	/ /	130	70	STEEL	-- - 405		- -	N	HOME
0124SE 4	96001292	MCCASH_____LAY_	04/12/1996	365	2	159	OPEN	UNK	35-34-15	T	00598
MCMINN	D0015588	FOSTER VALLEY R	6/10/1996	280	100	STEEL	159 - 365	016663	84-35-35	Y	HOME
0124SE 4	96002141	ROBERTSON_____CHRI	06/07/1996	385	15	247	OPEN	UNK	- -		00598
MCMINN	D0015616	ACE MILL RD	/ /	285	100	STEEL	247 - 385		- -	Y	HOME
0124SE 4	96002719	SEHRAGE_____JUDY	06/24/1996	165	15	149	OPEN	UNK	35-33-19	F	00598
MCMINN	D0015623	CO RD 271 284	8/13/1996	150	100	STEEL	149 - 165	016566	84-34-56	Y	HOME
0124SE 4	96004480	AKENS_____DAVE	10/10/1996	365	6	146	OPEN	UNK	35-34-00	F	00598
MCMINN	D0022241	FOSTER VALLEY R	2/ 6/1997	335	100	STEEL	146 - 365	019179	84-35-38	Y	HOME
0124SE 4	96004482	HYDE_____DANN	10/09/1996	345	3	125	OPEN	UNK	35-33-18	F	00598
MCMINN	D0022240	DON PIERCE RD	2/ 6/1997	180	100	STEEL	125 - 345	019178	84-35-29	Y	HOME
0124SE 4	97000590	YOUNG_____THER	02/24/1997	240	20	210	OPEN	OTHR	- -		00608
MCMINN	D0023[illegible]	MILL RD	/ /	230	100	STEEL	210 - 210		-	Y	HOME
0124SE 4	97001483	MCCOSL___ ____CHRI	05/06/19[illegible]	165	15	146	OPEN	UNK	- -		00598
MCMINN	D0024812	FOSTER VALLEY C	/ /	150	80	STEEL	146 - 165		- -	Y	HOME
0124SE 4	97002693	GIBSON_____SHAN	06/10/1997	325	4	125	OPEN	UNK	35-33-08	F	00598
MCMINN	D0024831	CO RD 295	6/10/1997	180	80	STEEL	125 - 325	019685	84-35-41	Y	HOME

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QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0124SE 4 MCMINN	97002810 D0026184	DUNCAN_____CRAI MT VERD RD	06/11/1997 / /	465 325	4 60	42 STEEL	OPEN 42 - 465	OTHR	- - - -	 Y	00608 HOME
0124SE 4 MCMINN	98002245 D0032849	FARR_____JAME MT VERD	05/20/1998 / /	425 190	2 20	83 STEEL	OPEN 83 - 425	UNK	- - - -	 Y	00598 HOME
0124SE 4 MCMINN	98002248 D0032852	FRYE_____JACK CO RD 267	05/26/1998 / /	305 225	3 80	104 STEEL	OPEN 104 - 305	UNK	- - - -	 Y	00598 HOME
0124SE 4 MCMINN	98002252 D0032856	BOGGESS_____HANN CO RD 267	06/02/1998 / /	165 132	40 40	125 STEEL	OPEN 125 - 165	UNK	- - - -	 Y	00598 HOME
0124SE 5 MCMINN	10701036	FOX C. 	10/20/1981 / /	494 400	3 120	158 STEEL	 -- - --	GOOD	35-33-16 84-34-53	S 	00006 HOME
0124SE 5 MCMINN	10701207	SMALLEN_____CLEO UNION GROVE	02/29/1984 01/11/1985	286 120	1 220	63 STEEL	OPEN 63 - 286	GOOD	35-33-34 84-33-44	S Y	00598 HOME
0124SE 5 MCMINN	10701209	SAYNE_____CLAR UNION GROVE	03/03/1984 01/11/1985	306 16	2 159	42 STEEL	OPEN 42 - 306	OTHR	35-34-01 84-33-10	S Y	00598 HOME
0124SE 5 MCMINN	10701215	BURRIS_____BILL UNION GROVE	05/04/1984 01/11/1985	246 185	7 385	60 STEEL	OPEN 60 - 246	GOOD	35-33-52 84-33-47	S Y	00598 HOME
0124SE 5 MCMINN	10701298	COOK_____PEGG 271	12/17/1985 / /	188 107	3 25	32 OTHER	OPEN 32 - 188	OTHR	- - - -	 Y	00006 OTHR
0124SE 5 MCMINN	10701535	BURRIS_____BILL WEBB	06/10/1987 / /	85 60	15 40	53 STEEL	OPEN 53 - 85	GOOD	- - - -	 Y	00598 HOME
0124SE 5 MCMINN	10701633	WILLIS_____KENN 	05/24/1988 / /	285 245	5 20	84 STEEL	OPEN 84 - 285	GOOD	- - - -	 Y	00608 HOME
0124SE 5 MCMINN	10701691	FAIN_____LARR DOTSON	09/24/1988 / /	420 340	5 150	187 STEEL	OPEN 187 - 420	OTHR	- - - -	 Y	00598 HOME
0124SE 5 MCMINN	10701760	WATTS_____WILL 	04/14/1989 / /	190 165	15 90	126 STEEL	OPEN 126 - 190	OTHR	- - - -	 Y	00608 HOME
0124SE 5 MCMINN	10701774	COOK _____DALE 	07/18/1989 / /	345 330	15 [illegible]	21 STEEL	OPEN 21 - 345	OTHR	- - - -	 Y	00608 HOME
0124SE 5 MCMINN	910029[illegible] 	REEDY_____BILL 	04/23/1991 / /	28[illegible] 275	15 120	98 STEEL	OPEN 98 - 285	OTHR	- - - -	 Y	00608 HOME
0124SE 5 MCMINN	93002655	MASON_____VIRG WATTENBARGER	07/13/1993 / /	365 330	10 100	125 STEEL	OPEN 125 - 365	GOOD	- - - -	 Y	00598 HOME

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0124SE 5	93003157	ROBERTS_____ED_	05/17/1993	125	10	63	OPEN	OTHR	- -		00608
MCMINN		DOTSON	/ /	105	40	STEEL	63 - 125		- -	Y	HOME
0124SE 5	93003168	JENKINS_____DAVI	04/13/1993	185	20	174	OPEN	OTHR	- -		00608
MCMINN			/ /	180	60	STEEL	174 - 185		- -	Y	HOME
0124SE 5	93004081	RITTENBERRY____DON_	09/16/1993	105	40	20	OPEN	UNK	- -		00598
MCMINN		CORD 276	/ /	97	10	STEEL	20 - 105		- -	Y	HOME
0124SE 5	94000259	EATON_____RAND	01/24/1994	150	20	1	OPEN	UNK	- -		00598
MCMINN	D0004601	COUNTY RD 225	/ /	145	80	STEEL	1 - 150		- -	Y	HOME
0124SE 5	94000261	HUGGINS_____GREG	12/30/1993	400	3	125	OPEN	UNK	- -		00598
MCMINN	D0004599	BOBBY CLARK	/ /	260	100	STEEL	125 - 400		- -	Y	HOME
0124SE 5	94001358	THOMAS_____ WILL	04/21/1994	225	5	62	OPEN	UNK	- -		00598
MCMINN	D0004640	271	/ /	120	30	STEEL	62 - 225		- -	Y	HOME
0124SE 5	94001740	PHIPPS_____BOB_	05/27/1994	225	8	104	OPEN	UNK	- -		00598
MCMINN	D0008179	MT TABOR RD	/ /	190	80	STEEL	104 - 225		- -	Y	HOME
0124SE 5	94004595	WILSON_____GERA	10/28/1994	545	2	146	OPEN	UNK	- -		00598
MCMINN	D0008135	MILL	/ /	230	100	STEEL	146 - 545		- -	Y	HOME
0124SE 5	95003658	SANDERS_____DAN_	07/29/1995	105	15	62	OPEN	UNK	35-33-18	F	00598
MCMINN	D0014030	CO RD 319	9/25/1995	70	9	STEEL	62 - 105	015348	84-33-22	Y	HOME
0124SE 5	95004190	THOMPSON_____THOM	08/29/1995	405	1	83	OPEN	UNK	- -		00598
MCMINN	D0014046	UNION GROVE RD	/ /	340	50	STEEL	83 - 405		- -	Y	HOME
0124SE 5	95005435	LOCKE_____CHAR	11/10/1995	145	15	41	OPEN	UNK	- -		00598
MCMINN	D0015548	CO RD 316 RD	/ /	50	20	STEEL	41 - 145		- -	Y	HOME
0124SE 5	96002250	FRISBIE_____HOME	05/22/1996	165	10	63	OPEN	OTHR	- -		00608
MCMINN	D0020951	UNION GROVE RD	/ /	130	40	STEEL	63 - 165		- -	Y	HOME
0124SE 5	96002715	JENKINS_____DAVI	07/01/1996	265	12	87	OPEN	UNK	- -		00598
MCMINN	D0021126	CO RD 319 RD	/ /	110	72	STEEL	87 - 265		- -	Y	HOME
0124SE 5	96003287	SANDERS_____DAN_	07/16/1996	125	15	41	OPEN	UNK	35-33-12	F	00598
MCMINN	D0021137	CO RD 319 770	[illegible]/1996	65	15	STEEL	41 - 125	016567	84-33-29	Y	HOME
0124SE 5	9600[illegible]82	PARSONS_____RED	08/15/1996	[illegible]25	8	104	OPEN	OTHR	- -		00598
MCMINN	D0021157	COUNTY RD 276	/ /	140	60	STEEL	104 - 635		- -	Y	HOME
0124SE 5	97000779	MASON_____JEFF	02/20/1997	365	3	210	OPEN	UNK	- -		00598
MCMINN	D0023279	CO RD 319 643	/ /	220	140	STEEL	210 - 365		- -	Y	HOME

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0124SE 5	97000790	FILLYAW_____DONA	03/20/1997	105	10	41	OPEN	UNK	- -		00598
MCMINN	D0022290	PROFFITT RD	/ /	46	20	STEEL	41 - 105		- -	Y	HOME
0124SE 5	97002907	WEIR_____CHAR	06/19/1997	340	4	118	OPEN	OTHR	- -		00006
MCMINN	D0023746	263	/ /	--	80	OTHER	118 - 340		- -	Y	HOME
0124SE 5	97003366	BURRIS_____BILL	07/24/1997	105	30	41	OPEN	UNK	35-33-06	F	00598
MCMINN	D0024847	CO RD 319	10/10/1997	55	20	STEEL	41 - 105	019637	84-33-43	Y	HOME
0124SE 5	97004749	WEBB_____JOHN	10/13/1997	230	40	229	OPEN	UNK	- -		00598
MCMINN	D0024787	275	/ /	230	40	STEEL	229 - 230		- -	Y	HOME
0124SE 5	98000656	METER_____VAN_	02/17/1998	265	20	146	OPEN	UNK	- -		00598
MCMINN	D0032823	UNION GROVE	/ /	160	60	STEEL	146 - 265		- -	Y	HOME
0124SE 5	98000841	CONAR_____WESL	02/24/1998	410	1	42	OPEN	OTHR	- -		00383
MCMINN	D0026007	COUNTY RD 439	/ /	200	40	STEEL	42 - 410		- -	Y	HOME
0124SE 5	98001382	MASINGALE_____MICH	04/01/1998	400	1	105	OPEN	OTHR	- -		00006
MCMINN	D0032489	263	/ /	300	100	OTHER	105 - 400		- -	Y	HOME
0124SE 6	10701033	CLEVELAND A.	05/26/1981	515	20	126		GOOD	35-34-20	S	00006
MCMINN			/ /	512	--	STEEL	-- - --		84-30-08		HOME
0124SE 6	10701238	QUEEN_____WILL	04/20/1984	180	20	140	OPEN	GOOD	- -		00383
MCMINN		SWEETWATER CREE	/ /	165	--	STEEL	140 - 180		- -	Y	HOME
0124SE 6	10701301	BOGGESS_____FRAN	11/14/1985	110	15	28	OPEN	OTHR	- -		00630
MCMINN		POND HILL RD	/ /	70	40	STEEL	28 - 110		- -	Y	HOME
0124SE 6	10701351	MILLER_____HELE	04/16/1986	205	30	120	OPEN	GOOD	- -		00598
MCMINN		LEFT OFF HWY 11	/ /	205	--	STEEL	120 - 205		- -	Y	HOME
0124SE 6	10701369	CAGLE_____GLEN	04/14/1986	165	20	137	OPEN	OTHR	- -		00598
MCMINN		OFF HIGHWAY 11	/ /	165	--	STEEL	137 - 165		- -	Y	HOME
0124SE 6	10701413	HENRY_____JAME	00/00/1900	650	--	--		OTHR	35-34-18	F	
MCMINN		OFF PLEASANT GR	08/28/1986	--	1250	STEEL	-- - --		84-31-46	N	FARM
0124SE 6	10701636	WIDENER_____ERNE	07/05/1988	365	2	95	OPEN	GOOD	- -		00603
MCMINN		HWY 11	/ /	325	30	STEEL	95 - 365		- -	Y	HOME
0124SE 6	10701674	QUIRE_____CHAR	/08/1988	555	30	147	OPEN	GOOD	- -		00598
MCMINN		COUNTY ROAD 325	/ /	320	100	STEEL	147 - 155		- -	Y	HOME
0124SE 6	10701703	YOUNG_____O.R.	10/25/1988	225	8	84	OPEN	GOOD	- -		00608
MCMINN		HWY 11	/ /	225	60	STEEL	84 - 325		- -	Y	HOME

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0124SE 6	10701726	MASHBURN_____WIND	03/11/1989	230	20	188	OPEN	GOOD	35-30-00	-	00354
MCMINN		COBB NOBB RD	/ /	200	60	STEEL	0 - 188		84-30-00	Y	HOME
0124SE 6	10701756	SLOAN_HOMES____	04/05/1989	285	4	84	OPEN	OTHR	- -		00688
MCMINN			/ /	260	80	STEEL	84 - 285		- -	Y	HOME
0124SE 6	91000754	EVANS_____BILL	12/28/1990	145	6	41	OPEN	UNK	- -		00598
MCMINN		BROWDER	/ /	95	5	STEEL	0 - 41		- -	Y	HOME
0124SE 6	91002328	OLD FASHION BAPTIST	04/20/1991	325	4	84	OPEN	OTHR	- -		00608
MCMINN			/ /	285	--	STEEL	84 - 325		- -	Y	HOME
0124SE 6	92000422	JOHNSON_____GEOR	09/16/1991	185	15	92	OPEN	OTHR	- -		00608
MCMINN			/ /	155	50	STEEL	92 - 185		- -	Y	HOME
0124SE 6	93001526	THOMAS_____TERR	04/06/1993	145	15	83	OPEN	OTHR	- -		00598
MCMINN		COUNTY LINE	/ /	130	60	STEEL	83 - 145		- -	Y	HOME
0124SE 6	93004594	NOKES_____JIMM	09/25/1993	285	5	63	OPEN	OTHR	- -		00608
MCMINN			/ /	260	90	STEEL	63 - 285		- -	Y	HOME
0124SE 6	94002044	BACK_____MARV	06/02/1994	445	4	125	OPEN	UNK	- -		00598
MCMINN	D0008182	OLD ENGLEWOOD R	/ /	230	90	STEEL	125 - 445		- -	Y	HOME
0124SE 6	94002488	BROWN_____JACK	06/30/1994	205	15	83	OPEN	UNK	- -		00598
MCMINN	D0008198	HEAD OF CRK RD	/ /	165	50	STEEL	83 - 205		- -	Y	HOME
0124SE 6	95001908	STEPHENS_____STEV	05/09/1995	300	6	172	OPEN	GOOD	- -		00622
MCMINN	D0010112	CTY RD 326	/ /	174	73	STEEL	172 - 300		- -	Y	HOME
0124SE 6	95003403	BOGGS_____RICH	07/19/1995	145	6	35	OPEN	OTHR	35-33-00	F	00006
MCMINN	D0011369	CO RD 350	9/25/1995	106	25	STEEL	35 - 145	015346	84-30-48	Y	HOME
0124SE 6	96003299	WALDEN_____GARY	07/17/1996	225	40	207	OPEN	UNK	- -		00598
MCMINN	D0021138	CO RD 336 RD	/ /	210	90	STEEL	207 - 225		- -	Y	HOME
0124SE 6	96003878	KILE_____ROBE	08/26/1996	305	20	146	OPEN	UNK	- -		00598
MCMINN	D0021165	322	/ /	270	80	STEEL	146 - 305		- -	Y	HOME
0124SE 6	96003092	LANDCASTER___ JEFF	09/11/1996	165	40	62	OPEN	UNK	- -		00598
MCMINN	[illegible]	HEAD OF THE CRK	/ /	[illegible]	40	STEEL	[illegible] - 165		- -	Y	HOME
0124SE 6	96005088	WISEMAN ____ DEWE	10/14/1996	189	20	188	OPEN	UNK	- -		00598
MCMINN	D0022243	OLD FASHION CHU	/ /	189	80	STEEL	188 - 189		- -	Y	HOME
0124SE 6	97003523	EAST_____WAYN	07/22/1997	265	6	90	OPEN	OTHR	35-33-50	F	00006
MCMINN	D0023759	155 CO RD 326	10/10/1997	90	80	OTHER	90 - 265	019638	84-30-43	Y	HOME

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0124SE 6	97003533	EAST_____WAYN	07/22/1997	185	25	105	OPEN	OTHR	35-33-50	F	00006
MCMINN	D0023756	155 CO RD 326	10/10/1997	110	80	OTHER	105 - 185	019634	84-30-45	Y	HOME
0124SE 6	98000652	BURKHART_____AARO	01/30/1998	225	20	146	OPEN	UNK	- -		00598
MCMINN	D0032819	326 COUNTY 265	/ /	150	80	STEEL	146 - 225		- -	Y	HOME
0124SE 7	10701112	PLEMMON RAY	08/30/1982	325	2	71		GOOD	35-30-02	S	00598
MCMINN			/ /	105	50	STEEL	-- - --		84-37-15		HOME
0124SE 7	10701150	SMITH_____QUIN	06/00/1982	230	5	65	OPEN	GOOD	35-30-13	F	00383
MCMINN		INTERSTATE 40	03/19/1985	105	--	STEEL	65 - 230		84-36-30	Y	COMM
0124SE 7	10701315	JACKSON_____CLAY	12/09/1985	195	30	170	OPEN	GOOD	- -		00637
MCMINN		CLEARWATER	/ /	180	60	STEEL	170 - 185		- -	Y	HOME
0124SE 7	10701431	WHEATON_SR_____DOUG	06/10/1986	410	4	21	OPEN	GOOD	- -		00637
MCMINN		SEWEE	/ /	290	18	STEEL	21 - 410		- -	Y	HOME
0124SE 7	10701444	MCAMIS_____JOHN	08/23/1986	490	6	58	OPEN	GOOD	- -		00637
MCMINN		SHOEMAKER	/ /	260	60	STEEL	58 - 490		- -	Y	HOME
0124SE 7	10701449	KYKER_____JOHN	07/03/1986	310	6	64	OPEN	GOOD	- -		00637
MCMINN		MT VERD	/ /	140	22	STEEL	64 - 310		- -	Y	HOME
0124SE 7	10701463	COLLINS_____H_M_	07/24/1986	210	12	36	OPEN	GOOD	- -		00637
MCMINN		CLEARWATER	/ /	168	18	STEEL	36 - 210		- -	Y	HOME
0124SE 7	10701465	BROCK_____LEON	08/18/1986	710	18	209	OPEN	FAIR	- -		00637
MCMINN		OLD NIOTA RD	/ /	685	20	STEEL	209 - 710		- -	Y	HOME
0124SE 7	10701466	BROWN_____DOUG	10/17/1986	310	8	62	OPEN	GOOD	- -		00637
MCMINN		MT VERD	/ /	105	40	OTHER	62 - 310		- -	Y	HOME
0124SE 7	10701467	BENSON_____MRS_	07/07/1986	430	15	88	OPEN	GOOD	- -		00637
MCMINN		COUNTY RD 116	/ /	390	70	STEEL	88 - 430		- -	Y	HOME
0124SE 7	10701495	HYDE_____ MRS_	04/26/1987	365	--	141	OPEN	OTHR	- -		00598
MCMINN		MT VERD	/ /	180	100	STEEL	141 - 365		- -	Y	HOME
0124SE 7	10701558	CARROLL_____JAKE	11/12/1987	160	25	149	SLOT	OTHR	35-30-45	S	00598
MCMINN		LIBERTY 207	04/26/1988	140	80	STEEL	129 - 149		84-37-24	Y	HOME
0124SE 7	10701559	CARROLL_____EARL	04/20/1987	245	15	--	OPEN	OTHR	35-30-50	S	00598
MCMINN		LIBERTY BR	04/26/1988	240	105	STEEL	-- - --		84-37-20	Y	HOME
0124SE 7	10701620	COFFEE_____HARO	03/17/1988	370	2	95	OPEN	OTHR	- -		00608
MCMINN		POND HILL RD	/ /	340	110	STEEL	95 - 370		- -	Y	HOME

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0124SE 7	90000950	FEE_____RICH	01/03/1990	300	2	41	OPEN	UNK	- -		00598
MCMINN		SHOEMAKER	/ /	200	2	STEEL	41 - 300		- -	Y	HOME
0124SE 7	91000151	DILBECK_____DAVI	09/08/1990	105	12	41		UNK	- -		00598
MCMINN		OLD MARSHELL HI	/ /	80	--	STEEL	-- - --		- -	Y	HOME
0124SE 7	91000155	TYDOR_____CHAR	09/14/1990	225	5	134		UNK	- -		00598
MCMINN		HYDE RD	/ /	145	--	STEEL	-- - --		- -	Y	HOME
0124SE 7	91003788	SCHWIGER_____PAUL	10/06/1991	425	3	34	OPEN	UNK	- -		00598
MCMINN		MT VERD	/ /	385	20	STEEL	34 - 425		- -	Y	HOME
0124SE 7	92000625	PHILLIPS_____LEVI	12/15/1991	205	6	41	OPEN	UNK	- -		00598
MCMINN		WALDER	/ /	120	30	STEEL	41 - 205		- -	Y	HOME
0124SE 7	93005144	YARBOUGH_____BART	11/15/1993	205	10	42		OTHR	- -		00598
MCMINN	D0004582	WALDENS	/ /	160	30	OTHER	42 - 205		- -	Y	HOME
0124SE 7	94002049	KILPATRICK_____T_H_	06/05/1994	150	20	136		OTHR	- -		00598
MCMINN	D0004647	333	/ /	147	30	STEEL	136 - 150		- -	Y	HOME
0124SE 7	95004664	LINDNER_____MOZE	09/26/1995	305	5	209	OPEN	UNK	- -		00598
MCMINN	D0015533	SHADY VALLEY RD	/ /	255	100	STEEL	209 - 305		- -	Y	HOME
0124SE 7	96002140	LENOIR_____JOE_	05/22/1996	365	2	104	OPEN	UNK	35-32-32	F	00598
MCMINN	D0015611	CO RD 162	8/13/1996	165	70	STEEL	104 - 365	016565	84-36-08	Y	HOME
0124SE 7	97003376	LUCAS_____RICH	08/12/1997	505	1	41	OPEN	UNK	35-32-17	F	00598
MCMINN	D0024858	BROCK RD	10/10/1997	112	40	STEEL	41 - 505	019636	84-35-28	Y	HOME
0124SE 7	97004442	KILPATRICK_____HARO	10/01/1997	365	3	104	OPEN	H2S	- -		00598
MCMINN	D0024790	WELL HOLLOW	/ /	240	80	STEEL	104 - 365		- -	Y	HOME
0124SE 7	97004443	KERLEY_____WARR	09/16/1997	405	2	41	OPEN	UNK	- -		00598
MCMINN	D0024873	WELL HOLLOW	/ /	140	40	STEEL	41 - 405		- -	Y	HOME
0124SE 7	98000647	KILPATRICK_____HARO	01/02/1998	605	1	41	OPEN	UNK	- -		00598
MCMINN	D0032813	WELL HOL RD	/ /	280	60	STEEL	41 - 605		- -	Y	HOME
0124SE 7	98000648	MCCOSH_____JAME	01/12/1998	185	40	62	OPEN	UNK	- -		00598
MCMINN	D0032814	WELL HOL RD	/ /	170	15	STEEL	62 170		-	Y	HOME
0124SE 8	10701263	HILL_____BOBB	07/18/1983	505	1	101	OPEN	OTHR	-		00598
MCMINN		OLD NIOTA RD	/ /	335	--	STEEL	101 - 505		- -	Y	HOME
0124SE 8	10701340	FARMER_____MELV	12/12/1986	425	3	147	OPEN	OTHR	- -		00598
MCMINN		HACKMAN MILL	/ /	235	--	STEEL	147 - 425		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE NIOTA QUADRANGLE (0124SE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0124SE 8	10701358	NORWOOD_____LOYD	01/10/1986	374	40	222	OPEN	OTHR	- -		00006
MCMINN		OLD NOTA-ATHENS	/ /	370	100	OTHER	222 - 374		- -	Y	HOME
0124SE 8	10701669	NIOTA_GOLF_COUR	07/10/1988	600	12	21	OPEN	GOOD	- -		00598
MCMINN		NIOTA HWY 11	/ /	180	10	STEEL	21 - 600		- -	Y	IRR
0124SE 8	10701692	WALDOW_____CLIF	09/25/1988	200	40	126	OPEN	OTHR	- -		00598
MCMINN		NIOTA ELEMENTAR	/ /	195	80	STEEL	126 - 195		- -	Y	HOME
0124SE 8	10701696	BRYANT_____JIM_	09/21/1988	125	20	73	OPEN	OTHR	- -		00608
MCMINN		HWY 68	/ /	100	40	STEEL	73 - 125		- -	Y	HOME
0124SE 8	10701697	BORDEN_____LOUI	09/22/1988	170	15	153	OPEN	OTHR	35-36-31	S	00608
MCMINN		HWY 68	04/05/1989	165	90	STEEL	153 - 170	001788	84-33-17	Y	OTHR
0124SE 8	90002558	MOBLEY_____MAYN	05/03/1990	265	2	53	OPEN	OTHR	- -		00598
MCMINN		HWY 11 N	/ /	95	--	STEEL	-- - 0		- -	Y	HOME
0124SE 8	92002204	WILSON_____PAUL	03/02/1992	500	3	146	OPEN	UNK	- -		00598
MCMINN		OLD NIOTA LEGIO	/ /	380	120	STEEL	146 - 500		- -	Y	HOME
0124SE 8	94002043	BARTER_____MICH	06/13/1994	225	10	188	OPEN	UNK	- -		00598
MCMINN	D0008186	ROAD 309	/ /	190	120	STEEL	188 - 225		- -	Y	HOME
0124SE 8	94003701	BARTOR_____ MIKE	09/20/1994	525	2	267	OPEN	UNK	- -		00598
MCMINN	D0009167	ROAD 309	/ /	355	200	STEEL	267 - 525		- -	Y	COMM
0124SE 8	95000491	BRACKETT_____VICK	01/05/1995	365	2	62	OPEN	UNK	35-31-55	T	00598
MCMINN	D0012704	HYDE 897	2/12/1996	295	60	STEEL	62 - 365	011631	84-33-50	Y	HOME
0124SE 8	95005437	SHIPLEY_____TERE	11/16/1995	365	5	83	OPEN	UNK	35-32-04	F	00598
MCMINN	D0015551	CO RD 267 #266	2/12/1996	285	40	STEEL	83 - 365	011620	84-34-16	Y	HOME
0124SE 8	97000231	MONROE_____CHAR	07/05/1996	185	15	152	OPEN	UNK	33-30-00	F	00598
MCMINN	D0021128	OLD KINGSTON RD	9/13/1996	152	90	STEEL	152 - 185	016547	84-34-30	Y	HOME
0124SE 8	97000232	MONORE_____CHAR	11/30/1996	505	6	152	OPEN	UNK	- -		00598
MCMINN	D0021128	OLD KINGSTON RD	/ /	150	150	STEEL	152 - 365		- -	Y	HOME
0124SE 8	97002696	SHERMAN_____SHAN	06/26/1997	190	20	188	OPEN	UNK	- -		00598
MCMINN	D0024835	[illegible] WELL HOL RD	/ /	189	100	STEEL	188 - 189		- -	Y	HOME
0124SE 8	97003360	MCCOSH_____JAME	07/18/1997	505	1	125	OPEN	UNK	-		00598
MCMINN	L0024841	WELL HOL RD	/ /	280	60	STEEL	125 505		- -	Y	HOME
0124SE 9	10701104	TORBETT R.J.	08/05/1982	205	12	190		GOOD	35-31-27	S	00598
MCMINN			/ /	198	120	STEEL	-- --		84-30-12		HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE NIOTA QUADRANGLE (0124SE) TN.

QUAD / COUNTY	NTH	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ	DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0124SE MCMINN	9	10701274	FOX_____CARL OFF NIOTA MT H	11/02/1984 / /	202 155	5 140	130 STEEL	OPEN 130 - 202		OTHR	- - - -	Y	00006 COMM
0124SE MCMINN	9	10701304	PENDLETON_____ROBE SAW MILL RD	01/21/1986 / /	220 200	5 140	119 STEEL	OPEN 119 - 220		OTHR	- - - -	Y	00630 HOME
0124SE MCMINN	9	10701306	JONES_____RON_ SABUTAN HILLS	12/26/1985 / /	410 360	5 42	210 STEEL	OPEN -- - --		GOOD	- - - -	Y	00637 HOME
0124SE MCMINN	9	10701316	STEPHENS_____R.L. GRANTHILL RD #3	10/26/1985 / /	560 340	8 --	209 STEEL	OPEN 209 - 560		GOOD	- - - -	Y	00637 HOME
0124SE MCMINN	9	10701324	FOX_____CARL MT HARMONY RD	03/26/1986 / /	270 198	3 150	158 STEEL	OPEN -- - --		OTHR	- - - -	Y	00006 HOME
0124SE MCMINN	9	10701348	STEVENS_____ROSS UPPER RIDGE	11/14/1985 / /	305 235	25 --	168 STEEL	OPEN 168 - 305		GOOD	- - - -	Y	00598 HOME
0124SE MCMINN	9	10701384	GIVENS_____RAYM HEAD OF CREEK R	03/10/1986 / /	175 160	15 120	141 STEEL	OPEN 141 - 175		OTHR	- - - -	Y	00630 HOME
0124SE MCMINN	9	10701441	RATLEDGE_____DAVI STEVENSON	10/30/1986 / /	570 360	10 98	265 STEEL	OPEN 265 - 570		GOOD	- - - -	Y	00637 HOME
0124SE MCMINN	9	10701448	MATTHEWS_____LLOY SHOEMAKER	04/18/1986 / /	310 280	14 60	62 STEEL	OPEN 62 - 310		GOOD	- - - -	Y	00637 HOME
0124SE MCMINN	9	10701468	ALLMON_____OSCA MAYFIELD VALLEY	10/02/1986 / /	290 270	25 48	247 STEEL	OPEN 247 - 290		OTHR	- - - -	Y	00637 HOME
0124SE MCMINN	9	10701527	CRESCENT_HOSIER HWY 11	07/03/1987 / /	80 --	200 30	34 OTHER	OPEN 34 - 80		OTHR	- - - -	Y	00598 COMM
0124SE MCMINN	9	10701528	CRESCENT_HOSIER HWY 11	07/10/1987 / /	165 135	100 40	89 STEEL	OPEN 89 - 165		GOOD	- - - -	Y	00598 COMM
0124SE MCMINN	9	10701534	GRAHAM_____JERR COBBLE RIDGE	06/07/1987 / /	500 280	1 90	146 STEEL	OPEN 146 - 500		GOOD	- - - -	Y	00598 HOME
0124SE MCMINN	9	10701542	DYCHO_____ HWY 11	07/12/1987 / /	300 112	50 40	110 STEEL	OPEN -- - --		GOOD	- - - -	Y	00598 HOME
0124SE MCMINN	9	10701673	HILL_____EDDI SAWMILL RD	5/16/1988 / /	128 120	30 60	128 STEEL	OPEN 128 - 128		GOOD	- - - -	Y	00598 HOME
0124SE MCMINN	9	10701766	HOLT_____DEAN SAWMILL RD	06/13/1989 / /	145 85	20 70	144 STEEL	SLOT 120 - 125		OTHR	- - - -	Y	00598 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE NIOTA QUADRANGLE (0124SE) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ	DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0124SE 9	90002548	GWINN_JR_____ELMO	07/05/1990	270		3	95	OPEN	OTHR	- -		00006
MCMINN		MT HARMONY	/ /	107		60	OTHER	-- - --		- -	Y	HOME
0124SE 9	91001641	FOX_____CARL	02/27/1991	271		7	127	OPEN	OTHR	- -		00006
MCMINN		CHRISTINBURG	/ /	205		100	OTHER	127 - 271		- -	Y	HOME
0124SE 9	92000626	CAIN_____JACK	11/11/1991	265		8	251	OPEN	UNK	- -		00598
MCMINN		COBBLERS NOB RD	/ /	265		100	STEEL	251 - 265		- -	Y	HOME
0124SE 9	92002199	BENSON_____WAYN	04/04/1992	325		4	108	OPEN	GOOD	- -		00598
MCMINN		COBLE RD MASON	/ /	220		80	STEEL	108 - 325		- -	Y	HOME
0124SE 9	93001534	MANOW_____JEFF	02/10/1993	215		10	184	OPEN	UNK	- -		00598
MCMINN		COBLES NOBB	/ /	215		140	STEEL	184 - 215		- -	Y	HOME
0124SE 9	93002476	WATTENBAUGH____DONN	06/23/1993	400		8	36	OPEN	OTHR	- -		00598
MCMINN		COBBLE RIDGE	/ /	400		20	STEEL	36 - 400		- -	Y	HOME
0124SE 9	94002046	COOPER_____ELI_	06/09/1994	505		2	146	OPEN	UNK	35-31-50	F	00598
MCMINN	D0008185	CTY ROAD 357	10/ 5/1994	380		127	STEEL	146 - 505	010240	84-30-00	Y	HOME
0124SE 9	94002047	ROBINSON_____ERNE	06/13/1994	145		20	41	OPEN	H2S	- -		00598
MCMINN	D0008187	HWY 11	/ /	130		20	STEEL	41 - 145		- -	Y	HOME
0124SE 9	95001146	KEY_____J_A_	10/15/1994	235		8	63		OTHR	- -		00667
MCMINN		COUNTY RD 750	/ /	--		50	OTHER	63 - 235		- -	Y	HOME
0124SE 9	97001132	VALLIANSL_____ANNE	03/25/1997	150		8	62	OPEN	OTHR	- -		00569
MCMINN	D0024633	COUNTY RD 510	/ /	105		--	STEEL	62 - 150		- -	Y	HOME

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TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS IN SELECTED AREAS OF TENNESSEE

EXPLANATION OF COLUMN HEADINGS

QUAD/NTH = Designation by number, Quadrant and ninth of the 2.5 - minute quadrangle area in which the well is located. The leading numbers identify the 15-minute quadrangle, the next two letters identify the 7.5-minute quadrant and the last digit identifies the one-ninth subdivision of the latter.

COUNTY = County in which the well is located.

WELL NUM = Identification number assigned to the well by the State.

TAG NUM = An inspection number assigned to the well at the time of inspection by the State.

OWNER'S NAME = Name of person or organization for whom the well was drilled.

LOCATION ROAD = Name of street or road from which to access the well. Blank if unknown.

COMP DATE = Month, day and year the well was completed.

INSPT DATE = Month, day and year the well was inspected by TDHE. Blank if well has not been inspected.

TOT DEPTH = Total depth of the well in feet.

AQ DEPTH = Depth, in feet, below land surface to the top of the shallowest aquifer or water-bearing zone tapped by the well.

TOT YIELD = Total yield of the well in gallons per minute (gpm). Yields less than one-half gpm reported as zero.

STAT LEVEL = Static water-level: depth, in feet, from the land surface to the surface of the water standing in an idle well.

CSE DEPTH = Casing depth: depth, in feet, to the bottom of the water tight casing installed in the well.

CSE TYPE = Casing type: PLAST = Plastic; STEEL = Steel; OTHER = any other material such as concrete, fiberglass or tile.

WELL FINISH = Construction of the well in the interval supplying water to the well: OPEN = Uncased or open hole; SLOT = Hand perforated or slotted pipe; SCREEN = Manufactured device designed to maintain the wall of the borehole and allow ground water to enter the well.

INTERVAL = The depth, in feet, from the top to the bottom of the interval that is open to the well.

WAT QUAL = Water Quality: a word to describe the relative quality of the well water such as GOOD, FAIR, BAD, LIME, IRON, SULFUR, SALT, OIL, GAS, OTHER.

GEO FORM = Name of the geologic formation tapped by the well (not generally reported).

LATITUDE = Latitude of well site in degrees, minutes, and seconds.

LONGITUDE = Longitude of well site in degrees, minutes, and seconds.

A/C = Accuracy Code for latitude and longitude: S = nearest second; F = nearest 15 seconds; T = nearest 30 seconds; M = nearest minute. Blank = nearest 2. minutes.

LOG = Refers to availability of drillers log: Y = yes; N = no.

DRILLER = License number of driller who supervised construction of the well. Names provided upon request.

USE = Purpose [illegible] which the well [illegible] constructed: HO[illegible] [illegible]ential; CO[illegible] [illegible]cial; et

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 1 MCMINN	10701353	MORGAN_____LAKE RICEVILLE-DECAT	04/18/1986 / /	265 265	10 --	40 STEEL	OPEN 40 - 265	GOOD	- - - -	Y	00598 HOME
0125NW 1 MCMINN	10701356	MCMINN_CO_BR_ED HIGHWAY 39 DECA	04/29/1986 / /	305 45	7 --	42 STEEL	OPEN 42 - 305	GOOD	- - - -	Y	00598 COMM
0125NW 1 MCMINN	10701514	KUYKENDALL_____A_J_ INDLEWILD ST	02/24/1987 / /	220 200	1 50	149 STEEL	OPEN 149 - 220	OTHR	- - - -	Y	00598 HOME
0125NW 1 MCMINN	10701523	YORK_____HARO ROCK CREEK RD	06/22/1987 / /	155 90	3 --	21 STEEL	OPEN 21 - 155	GOOD	- - - -	Y	00623 HOME
0125NW 1 MCMINN	10701524	NEWMAN_____JERR BLEVINS RD	06/01/1987 / /	100 80	15 --	42 STEEL	OPEN 42 - 100	GOOD	- - - -	Y	00623 HOME
0125NW 1 MCMINN	10701525	SMITH_____VIOL ROCK CREEK RD	06/08/1987 / /	80 60	15 --	28 STEEL	OPEN 28 - 80	GOOD	- - - -	Y	00623 HOME
0125NW 1 MCMINN	10701750	CRABTREE_____NANC ROCK CREEK RT	03/16/1989 / /	230 70	4 45	20 STEEL	OPEN 20 - 230	GOOD	- - - -	Y	00354 HOME
0125NW 1 MCMINN	90001311	WHITE_____JERR DECATUR ATHENS	04/13/1990 / /	290 185	2 2	25 STEEL	OPEN 25 - 290	GOOD	- - - -	Y	00528 HOME
0125NW 1 MCMINN	90002556	THURMAN_____ WILL BLEVIN RD	05/10/1990 / /	345 170	1 16	71 STEEL	OPEN -- - --	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	90003707	SHELTON_JR_____HOME HW 30	11/11/1990 / /	310 200	3 40	21 STEEL	OPEN 21 - 310	UNK	- - - -	Y	00528 HOME
0125NW 1 MCMINN	92000660	FARRIS_____RAND SMALL	11/15/1991 / /	225 200	8 60	146 STEEL	OPEN 146 - 225	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	94000467 D0004602	HOPE_____TOMM 121 CORD 184	01/31/1994 / /	205 65	10 20	41 STEEL	OPEN 46 - 205	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	94000564 D0004610	CLARK_____JOHN 181 CO RD	03/04/1994 / /	185 115	100 40	62 STEEL	OPEN 62 - 185	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	94000565 D0004611	CLARK_____CASE 181	03/04/1994 / /	185 170	100 80	104 STEEL	OPEN 104 - 185	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	9500172[illegible] D0012712	KNEZEVIC_____ NICH HWY 30 W 1382	04/13/1995 5/30/1995	325 305	20 36	41 STEEL	OPEN 41 - 325	UNK 010534	35-29-06 84-42-06	[illegible] Y	00598 HOME
0125NW 1 MCMINN	95002422 D0014053	HENRY_____LEE_ 181	05/18/1995 / /	405 260	1 40	227 STEEL	OPEN 227 - 405	OTHR	- - - -	Y	00598 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 1 MCMINN	95003713 D0009040	PATTERSON_____MICK CO RD 184	06/26/1995 9/27/1995	305 260	3 100	65 STEEL	OPEN 65 - 305	OTHR 015345	35-29-46 84-43-22	F Y	00608 HOME
0125NW 1 MCMINN	95005778 D0014377	HOLLAND ED_ CO RD 181 BX127	11/17/1995 2/12/1996	285 228	6 20	179 STEEL	OPEN 179 - 285	OTHR 011616	35-29-12 84-44-40	F Y	00006 HOME
0125NW 1 MCMINN	96001289 D0015581	WALKER_____VICK CROSS CREEK RD	04/02/1996 / /	265 240	6 20	39 STEEL	OPEN 39 - 265	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	96001678 D0014399	ANDREW_____BRYA CO RD 179	04/12/1996 / /	145 105	40 50	84 STEEL	OPEN 84 - 145	OTHR	- - - -	Y	00006 HOME
0125NW 1 MCMINN	96002142 D0015609	SHOPE_____JAME HWY 30	05/20/1996 / /	365 205	5 20	62 STEEL	OPEN 62 - 365	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	96002717 D0015619	MONROE_____JERR DUCKET HOLLOW R	06/20/1996 / /	365 290	7 100	272 STEEL	OPEN 272 - 365	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	96003881 D0021174	CRISP_____LARR 100 RICEVILLE	09/10/1996 / /	745 310	1 100	83 STEEL	OPEN 83 - 745	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	98000655 D0032822	COOPER_____LISA COSSCREEK SUB	02/14/1998 / /	505 290	1 40	125 STEEL	OPEN 125 - 505	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	98001540 D0032829	ROGERS_____JOHN SMALL CAVE RD	03/04/1998 / /	145 135	20 60	83 STEEL	OPEN 83 - 145	UNK	- - - -	Y	00598 HOME
0125NW 1 MCMINN	98001550 D0032844	MCDOWELL_____TERE 184 DUCKETT HOL	05/01/1998 / /	305 180	5 100	146 STEEL	OPEN 146 - 305	UNK	- - - -	Y	00598 HOME
0125NW 2 MCMINN	10701216	UNDERWOOD_____FRED HWY 30 W	04/22/1984 11/20/1984	147 140	60 11	80 STEEL	OPEN 80 - 147	GOOD	35-27-30 84-40-00	S Y	00598 HOME
0125NW 2 MCMINN	10701712	CARBETT_____JOHN LEAD MINE RD	11/03/1988 / /	150 140	20 60	109 STEEL	OPEN 109 - 150	OTHR	- - - -	Y	00630 HOME
0125NW 2 MCMINN	10701748	DIVERSIFIED_SYS MINE RD	04/20/1989 9/ 7/1989	90 69	12 50	90 PLAST	SCREEN 0 - 90	GOOD 002286	35-29-18 84-40-46	S Y	00354 TEST
0125NW 2 MCMINN	91000191	THORNTON_____DARR HWY 30	11/01/1990 / /	185 165	5 50	62 STEEL	OPEN 1 - 62	UNK	- - - -	Y	00598 HOME
0125NW 2 MCMINN	91000407	LEE'S CHAPEL	11/24/1990 / /	225 165	20 40	40 STEEL	OPEN 0 - 225	OTHR	- - - -	Y	00608 HOME
0125NW 2 MCMINN	91002119	LONG_____JUDY OFF HWY 30	11/29/1990 / /	235 220	20 80	209 STEEL	SCREEN 209 - 235	UNK	- - -	Y	00598 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 2 MCMINN	92002226	UNDERWOOD_____DAVI SPRING CREEK	04/15/1992 / /	205 190	5 30	117 STEEL	OPEN 117 - 205	UNK	- - - -	N	00608 HOME
0125NW 2 MCMINN	92004191	BENTON_____HARV CO RD 126	11/19/1992 / /	545 200	0 100	104 STEEL	OPEN 104 - 545	OTHR	- - - -	Y	00598 HOME
0125NW 2 MCMINN	93000786	PACK_____ WILM MING RD	02/01/1993 / /	226 97	4 120	96 STEEL	SCREEN 145 - 187	OTHR	- - - -	Y	00572 HOME
0125NW 2 MCMINN	93003370	VINCENT_____OWEN SPRING CK RIDGE	08/12/1993 / /	405 350	22 --	125 STEEL	OPEN 125 - 405	GOOD	- - - -	Y	00598 HOME
0125NW 2 MCMINN	93004233	SHERLIN_____GIL_ NEW HOPE WELL	09/28/1993 / /	225 220	20 100	167 STEEL	OPEN 167 - 225	UNK	- - - -	Y	00598 HOME
0125NW 2 MCMINN	94001351 D0004633	THORNTON_____SCOT CO RD 165	04/19/1994 6/20/1995	405 365	2 60	125 STEEL	OPEN 125 - 405	UNK 015279	35-29-45 84-41-08	F Y	00598 HOME
0125NW 2 MCMINN	95002535 D0012676	MONROE_____CARO HWY 30 W 880	05/29/1995 9/12/1995	365 222	1 60	83 STEEL	OPEN 83 - 365	UNK 015365	35-28-34 84-40-24	F Y	00598 HOME
0125NW 2 MCMINN	95005246 D0015541	ROGERS_____JASO MINE	10/22/1995 / /	145 135	15 80	125 STEEL	OPEN 125 - 145	UNK	- - - -	Y	00598 HOME
0125NW 2 MCMINN	97004283 D0024863	HICKS_____HEAT 127	08/20/1997 / /	545 200	3 100	146 STEEL	OPEN 146 - 545	UNK	- - - -	Y	00598 HOME
0125NW 2 MCMINN	98000259 D0032802	BURNS_____DALL 125	11/26/1997 / /	425 180	15 100	107 STEEL	OPEN 107 - 425	UNK	- - - -	Y	00598 HOME
0125NW 2 MCMINN	98001202 D0027700	CROWER_____JAME POSSUM CREEK RD	04/22/1998 / /	302 290	4 20	157 STEEL	OPEN 157 - 302	GOOD	- - - -	Y	00571 HOME
0125NW 3 MCMINN	10701254	BRANNON_____DWIG OFF DECATUR PIK	08/26/1984 / /	406 275	3 --	100 STEEL	OPEN 100 - 406	GOOD	- - - -	Y	00598 HOME
0125NW 3 MCMINN	10701265	WATSON_____JOHN JUST OF DECATUR	11/00/1984 / /	185 175	12 --	132 STEEL	SCREEN 132 - 185	OTHR	- - - -	Y	00598 HOME
0125NW 3 MCMINN	10701272	WILSON_____CLIN CRESTWAY CIRCL	04/27/1985 / /	240 50	2 30	47 STEEL	OPEN 47 - 240	OTHR	- - - -	Y	00630 HOME
0125NW 3 MCMINN	10701342	KENNEDY_____CECI MT VERD	11/23/1985 / /	385 280	2[illegible] --	63 STEEL	OPEN 63 - 385	GOOD	- - - -	Y	00[illegible]8 HOME
0125NW 3 MCMINN	10701347	CARTER_____BILL CLEARWATER RD	12/19/1985 / /	525 [illegible]	6 --	84 STEEL	84 - 525	OTHR	- - - -	Y	00598 HOME

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RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 3	10701396	HAMPTON_____CLIF	06/09/1986	245	1	63	OPEN	OTHR	- -		00598
MCMINN		CLEARWATER RD	/ /	100	--	STEEL	63 - 245		- -	Y	COMM
0125NW 3	10701494	YORK_____JIM_	08/15/1986	345	3	129	OPEN	GOOD	- -		00598
MCMINN		CLEARWATER RD	/ /	160	90	STEEL	129 - 345		- -	Y	HOME
0125NW 3	10701548	MALONE_____MARK	08/16/1987	130	30	40	OPEN	OTHR	35-29-52	F	00630
MCMINN		HEATHER DR	04/27/1988	100	4	STEEL	40 - 130		84-37-27	Y	HOME
0125NW 3	10701637	MONTGOMERY_____RAND	07/05/1988	225	40	96	OPEN	GOOD	- -		00608
MCMINN			/ /	220	90	STEEL	96 - 225		- -	Y	HOME
0125NW 3	10701638	SILVEY_____DAVI	07/06/1988	465	2	63	OPEN	GOOD	- -		00608
MCMINN			/ /	400	70	STEEL	63 - 465		- -	Y	HOME
0125NW 3	10701650	WELCH_____BOB_	05/30/1988	310	15	120	OPEN	GOOD	- -		00630
MCMINN		CLEARWATER	/ /	300	80	STEEL	120 - 310		- -	Y	HOME
0125NW 3	10701661	WILSON_____JOHN	11/10/1987	150	3	26	OPEN	GOOD	- -		00630
MCMINN		CLEAR WATER RD	/ /	130	15	STEEL	25 - 150		- -	Y	HOME
0125NW 3	10701695	COFFEY_____RONN	09/12/1988	525	1	105	OPEN	OTHR	- -		00608
MCMINN			/ /	500	100	STEEL	105 - 525		- -	Y	HOME
0125NW 3	10701709	MCCROCKEN_____MICK	09/21/1988	190	10	34	OPEN	OTHR	- -		00630
MCMINN		BRUSH CREEK RD	/ /	130	40	STEEL	34 - 190		- -	Y	HOME
0125NW 3	10701710	MCKINNEY_____CARL	09/20/1988	150	5	20	OPEN	OTHR	- -		00630
MCMINN		BRUSH CREEK RD	/ /	130	20	STEEL	20 - 150		- -	Y	HOME
0125NW 3	90002563	INGRAM_____ANDR	06/26/1990	225	7	125		OTHR	- -		00598
MCMINN		CLEAR WATER RT	/ /	145	10	STEEL	-- - --		- -	Y	HOME
0125NW 3	91000187	KINCAID_____CHAD	08/14/1990	85	20	75	OPEN	GOOD	- -		00598
MCMINN		CLEARWATER	/ /	81	--	STEEL	-- - --		- -	Y	HOME
0125NW 3	93000448	UNDERDOWN CHAR	12/30/1992	505	2	146	OPEN	UNK	- -		00598
MCMINN		TOM STEWART	/ /	240	80	STEEL	146 - 505		- -	Y	HOME
0125NW 3	93002380	REED_____DANN	06/21/1993	550	1	167	OPEN	GOOD	- -		00622
MCMINN			/ /	208	138	STEEL	167 - 550		- -	Y	HOME
0125NW 3	93005145	RUSSELL_____MARG	11/10/1993	365	3	41	OPEN	UNK	-		00598
MCMINN	D0004579	CLEARWATER RD	/ /	210	20	STEEL	41 - 365		-	Y	HOME
0125NW 3	93005214	HENDERSON _____LARR	11/24/1993	500	2	41	OPEN	UNK	- -		00598
MCMINN	D0004592	CLEAR WATER	/ /	185	10	STEEL	41 - 500		- -	Y	HOME

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0125NW 3 MCMINN	94001357 D0004645	SHELL_____MEDA 126	05/02/1994 / /	325 260	10 60	83 STEEL	OPEN 83 - 325	UNK	- - - -	 Y	00598 HOME
0125NW 3 MCMINN	94002039 D0008180	STRIKER_____STAN BLUE SPRINGS RD	05/30/1994 / /	325 310	8 20	62 STEEL	OPEN 62 - 325	UNK	- - - -	 Y	00598 HOME
0125NW 3 MCMINN	95000273 D0004809	HOWARD_____BILL CLEARWATER ROAD	11/07/1994 / /	305 250	5 80	189 STEEL	OPEN 189 - 305	OTHR	- - - -	 Y	00608 HOME
0125NW 3 MCMINN	95000281 D0004820	MCCREGRY HARO COMMUNITY CHURC	11/30/1994 / /	185 170	5 70	75 STEEL	OPEN 75 - 185	OTHR	- - - -	 Y	00608 HOME
0125NW 3 MCMINN	96005089 D0022248	DONEGAN_____TOM_ ANDERSON RD	10/23/1996 2/ 6/1997	645 605	30 100	188 STEEL	OPEN 188 - 645	UNK 019176	35-28-24 84-39-46	F Y	00598 HOME
0125NW 3 MCMINN	98002037 D0032499	NORWOOD_____LONN CO RD 124	04/30/1998 / /	365 310	12 --	166 OTHER	OPEN 166 - 365	OTHR	- - - -	 Y	00006 HOME
0125NW 4 MCMINN	10701557	THOMAS_____GEOR COUNTY RD 110	08/14/1987 / /	105 100	7 20	21 STEEL	OPEN 21 - 105	OTHR	- - - -	 Y	00528 HOME
0125NW 4 MCMINN	10701568	BLEVINS_____DANN SPRING CK	10/05/1987 / /	140 138	20 80	129 STEEL	OPEN 129 - 140	OTHR	- - - -	 Y	00598 HOME
0125NW 4 MCMINN	10701777	HENNESSEE_____RONN CLEAR WATER ROG	07/22/1989 / /	271 182	9 30	42 OTHER	OPEN 42 - 271	OTHR	- - - -	 Y	00006 HOME
0125NW 4 MCMINN	90000949	WATTENBARGER___DON_ SPRING CK	01/02/1990 / /	210 200	50 12	210 STEEL	OPEN -- - --	UNK	- - - -	 Y	00598 HOME
0125NW 4 MCMINN	90000956	BURNS_____BILL RICEVILLE DECAT	02/02/1990 / /	90 60	15 4	62 OTHER	OPEN 62 - 90	UNK	- - - -	 Y	00598 HOME
0125NW 4 MCMINN	90000959	LEE_____DANN OFF ROCKY MT	01/30/1990 / /	580 305	2 10	125 OTHER	OPEN 125 - 580	OTHR	- - - -	 Y	00598 HOME
0125NW 4 MCMINN	91000758	NEWBERRY_____BREN 116 RD	08/23/1990 / /	305 170	1 --	146 STEEL	OPEN -- - --	UNK	- - - -	 Y	00598 HOME
0125NW 4 MCMINN	91003718	FAYE_____FRAN COGUE RD	10/29/1991 / /	185 172	20 100	167 STEEL	OPEN 167 - 185	OTHR	- - - -	 Y	00598 HOME
0125NW 4 MCMINN	93004505 D0004577	HENRY_____RAYM ROGER CK	10/27/1993 / /	245 140	4 20	84 STEEL	OPEN 84 - 245	UNK	- - - -	 Y	00598 HOME
0125NW 4 MCMINN	93005143 D0004587	WILISON_____DON_ ROGER CK	11/12/1993 / /	205 100	8 30	41 OTHER	OPEN 41 - 205	UNK	- - - -	 Y	00598 FARM

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0125NW 4	94003535	LOWE_____MARL	09/13/1994	450	4	128	OPEN	UNK	35-26-12	F	00528
MCMINN	D0003488	CORD 110	12/14/1994	230	78	STEEL	128 - 410	010322	84-43-37	Y	HOME
0125NW 4	95001860	HENRY_____HARV	04/16/1995	105	10	41	OPEN	UNK	35-25-54	F	00598
MCMINN	D0012715	CO 82 #289	4/18/1995	82	21	STEEL	41 - 105	010496	84-44-45	Y	HOME
0125NW 4	95002059	HOLMES_____JACK	04/28/1995	305	8	104	OPEN	UNK	35-26-00	F	00598
MCMINN	D0012721	CO RD 116 857	4/28/1995	245	60	STEEL	104 - 305	015342	84-42-41	Y	HOME
0125NW 4	95002423	KYLE_____JANE	05/15/1995	505	1	167	OPEN	UNK	- -		00598
MCMINN	D0014051	110	/ /	245	100	STEEL	167 - 505		- -	Y	HOME
0125NW 4	96002175	PAUL_____TIM_	06/01/1996	308	5	63	OPEN	OTHR	- -		00383
MCMINN	D0020046	MOORE RD	/ /	290	70	STEEL	63 - 308		- -	Y	HOME
0125NW 4	96002913	EVANS_____DAN_	07/08/1996	145	15	83	OPEN	UNK	- -		00598
MCMINN	D0021130	116 RD	/ /	110	60	STEEL	83 - 145		- -	Y	HOME
0125NW 4	96004023	JESTRAB_____GREG	08/21/1996	245	20	209	OPEN	UNK	- -		00598
MCMINN	D0021162	CO RD 116	/ /	218	100	STEEL	209 - 245		- -	Y	HOME
0125NW 4	97000778	PUCKETT_____JAME	03/20/1997	205	10	41	OPEN	UNK	- -		00598
MCMINN	D0015542	CO RD 179 143	/ /	155	30	STEEL	41 - 205		- -	Y	HOME
0125NW 4	97004441	DAVIS_____DOUG	09/01/1997	185	40	146	OPEN	OTHR	- -		00598
MCMINN	D0024868	COUNTY RD 117	/ /	175	80	STEEL	146 - 185		- -	Y	HOME
0125NW 4	98001501	VOY_____DON_	04/17/1998	450	1	155	OPEN	UNK	- -		00528
MCMINN	D0027783	CO RD 116	/ /	300	140	STEEL	155 - 450		- -	Y	HOME
0125NW 4	98001763	ROLEN_____KARE	05/29/1998	342	1	106	OPEN	GOOD	- -		00571
MCMINN	D0027707	CO RD 179	/ /	108	90	STEEL	106 - 342		- -	Y	HOME
0125NW 5	10701259	GIBBS_____JACK	07/03/1984	125	3	63	OPEN	GOOD	- -		00598
MCMINN		MOUSE CREEK RD	/ /	100	--	STEEL	63 - 125		- -	Y	HOME
0125NW 5	10701262	SERRENA_____FRAN	03/28/1984	446	6	126	OPEN	GOOD	- -		00598
MCMINN		COLE RD	/ /	440	--	STEEL	126 - 446		- -	Y	HOME
0125NW 5	10701307	LUXMOORE_____LARR	12/31/1985	230	--	165	OPEN	GOOD	- -		00637
MCMINN		SPRING CREEK RD	/ /	180	60	STEEL	165 230			Y	HOME
0125NW 5	10701314	BENTON_____	11/11/1985	510	3	190	OPEN	GOOD	- -		00637
MCMINN		OLD DECATUR RD	/ /	350	60	STEEL	-- - --		- -	Y	HOME
0125NW 5	10701365	MASON_____JACK	05/02/1986	305	4	127	OPEN	OTHR	- -		00598
MCMINN		612	/ /	260	--	STEEL	127 - 305		- -	Y	HOME

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0125NW 5 MCMINN	10701430	WILSON_____CHER DUCKETT RD	07/11/1986 / /	210 90	5 18	38 STEEL	OPEN 38 - 210	GOOD	- - - -	 Y	00637 HOME
0125NW 5 MCMINN	10701436	SNEEDE_____ROBE MT VERD	05/20/1986 / /	270 260	18 60	88 STEEL	OPEN 88 - 270	GOOD	- - - -	 Y	00637 HOME
0125NW 5 MCMINN	10701439	RUSSELL_____SAM_ MT VERD	07/22/1986 / /	107 80	30 18	107 STEEL	SLOT 107 - 107	GOOD	- - - -	 Y	00637 HOME
0125NW 5 MCMINN	10701450	HOWARD_____WHIT OLD RICEVILLE D	10/08/1986 / /	350 320	8 80	82 STEEL	OPEN 82 - 350	GOOD	- - - -	 Y	00637 HOME
0125NW 5 MCMINN	10701531	BOOTH_____DAVE SPRINK CK VALLE	06/17/1987 / /	143 85	13 40	62 STEEL	OPEN 62 - 143	GOOD	- - - -	 Y	00598 HOME
0125NW 5 MCMINN	10701717	HAWKINS_____JIM_ ROGERS RD	06/08/1988 / /	130 80	5 40	33 STEEL	OPEN 33 - 130	OTHR	- - - -	 Y	00630 HOME
0125NW 5 MCMINN	10701728	LAYMAN_____RAY_ NEW HOPEWELL RD	03/07/1989 9/ 7/1989	940 60	15 30	41 STEEL	OPEN 0 - 940	GOOD 002287	35-26-45 84-40-35	S Y	00354 OTHR
0125NW 5 MCMINN	10701782	COOLEY_____TOM_ COOLEY	11/02/1989 / /	320 260	3 90	225 STEEL	OPEN 225 - 320	OTHR	- - - -	 Y	00598 HOME
0125NW 5 MCMINN	90000962	RAMEY_____BILL ROCKY MT RD	12/14/1989 / /	180 165	100 8	-- STEEL	OPEN -- - --	UNK	- - - -	 Y	00598 HOME
0125NW 5 MCMINN	91000189	MARTIN_____HERB ROCKY MTN RD	07/24/1990 / /	185 165	20 --	146 OTHER	 -- - --	UNK	- - - -	 Y	00598 HOME
0125NW 5 MCMINN	91000634	COLBOCH_____ROBE HWY 136	12/13/1990 / /	291 284	6 80	105 OTHER	OPEN -- - --	OTHR	- - - -	 Y	00006 HOME
0125NW 5 MCMINN	91001642	SHAW_____DAVI 113	03/08/1991 / /	270 2	6 30	36 OTHER	OPEN 36 - 270	OTHR	- - - -	 Y	00006 HOME
0125NW 5 MCMINN	91002332	GOINES_____MIKE 	04/25/1991 / /	145 125	25 60	118 STEEL	OPEN 118 - 145	OTHR	- - - -	 Y	00608 HOME
0125NW 5 MCMINN	91003794	PLANK_____BILL COLIE RD	09/23/1991 / /	87 80	20 20	87 STEEL	OPEN 87 - 87	UNK	- - - -	 Y	00598 HOME
0125NW 5 MCMINN	92000432	[illegible]EE_____DANN 	08/14/1991 / /	145 130	20 25	20 STEEL	OPEN 20 - 145	OTHR	- - - -	 Y	00608 HOME
0125NW 5 MCMINN	92004204	COLBOCH_____DONA GEORGETOWN	09/01/1992 / /	135 135	10 70	135 STEEL	OPEN 135 - 135	UNK	- - - -	 Y	00598 HOME

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0125NW 5	93002652	HESTER_____G_V_	07/21/1993	185	4	41	OPEN	UNK	- -		00598
MCMINN		WARD	/ /	170	20	STEEL	41 - 185		- -	Y	HOME
0125NW 5	94001359	GENTRY_____STEV	04/26/1994	105	40	41	OPEN	UNK	- -		00598
MCMINN	D0004638	130	/ /	60	18	STEEL	41 - 105		- -	Y	HOME
0125NW 5	94002486	AINSWORTH_____RALP	06/30/1994	465	1	125	OPEN	UNK	35-26-00	F	00598
MCMINN	D0008197	ROCKY MOUNT RD	9/16/1994	355	94	STEEL	125 - 465	012218	84-41-50	Y	HOME
0125NW 5	94003706	NORWOOD_____SUSA	09/10/1994	585	1	159	OPEN	UNK	35-27-28	F	00598
MCMINN	D0008164	NEW HOPEWELL RD	12/14/1994	380	138	STEEL	159 - 585	010323	84-40-12	Y	HOME
0125NW 5	94004592	EDGEMON_____RICH	11/04/1994	345	2	146	OPEN	UNK	- -		00598
MCMINN	D0008137	CRUSHER	/ /	265	100	STEEL	146 - 345		- -	Y	HOME
0125NW 5	95001138	TOPNER_____JIM_	03/15/1995	145	20	62	OPEN	UNK	- -		00598
MCMINN	D0012671	ROCKY MOUNT	/ /	130	40	STEEL	62 - 145		- -	Y	HOME
0125NW 5	95003432	HOLLIDAY_____VIVI	07/12/1995	425	3	146	OPEN	UNK	35-25-58	F	00598
MCMINN	D0012688	CO RD 116	9/26/1995	405	100	STEEL	146 - 426	015343	84-42-10	Y	HOME
0125NW 5	95003659	REYNOLDS_____EUGE	07/20/1995	485	1	125	OPEN	UNK	- -		00598
MCMINN	D0012695	ROCKY MOUNT UNI	/ /	385	80	STEEL	125 - 485		- -	Y	HOME
0125NW 5	95003660	STROUD_____KEIT	07/19/1995	210	10	209	OPEN	UNK	35-26-26	F	00598
MCMINN	D0012694	CO RD 130 764	9/28/1995	200	83	STEEL	209 - 210	015323	84-41-14	Y	HOME
0125NW 5	95003949	HUEY_____IMOG	08/15/1995	285	4	43	OPEN	UNK	- -		00598
MCMINN	D0014037	181	/ /	160	15	STEEL	43 - 285		- -	Y	HOME
0125NW 5	96001658	FEE_____RICH	04/20/1996	225	40	84	OPEN	OTHR	- -		00608
MCMINN	D0017187	ROCKY MOUNT RD	/ /	220	100	STEEL	84 - 225		- -	Y	HOME
0125NW 5	96002912	KING_____TIM_	07/06/1996	345	15	146	OPEN	UNK	- -		00598
MCMINN	D0021129	CO RD 110	/ /	330	100	STEEL	146 - 345		- -	Y	HOME
0125NW 5	97000236	PACKET_____FRED	01/06/1997	285	80	146	OPEN	UNK	35-26-00	F	00598
MCMINN	D0022272	ROCKEY MOUNT RD	5/13/1997	170	20	STEEL	146 - 285	019692	84-41-41	Y	HOME
0125NW 5	97001436	GARLAND_____CONN	05/02/1997	305	3	41	OPEN	UNK	- -		00598
MCMINN	D0024811	CO RD 116 335	/ /	275	40	STEEL	41 - 305		- -	Y	HOME
0125NW 5	970[illegible]2094	NIPPER_____ ROBE	05/18/1997	325	2	41	OPEN	UNK	-		00598
MCMINN	D0024820	COLIE RD 515	/ /	210	20	STEEL	41 - 325		-	Y	HOME
0125NW 5	97003364	BLEVINS_____DANN	07/22/1997	565	--	62	OPEN	UNK	- -		00598
MCMINN	D0024845	ROCK CRUSHER	/ /	300	40	STEEL	2 - 565		- -	Y	HOME

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0125NW	5	97004752	BLEVINS_____DANN	10/10/1997	505	15	41	OPEN	UNK	- -		00598
MCMINN		D0024785	ROCK CRUSH	/ /	490	20	STEEL	41 - 505		- -	Y	HOME
0125NW	6	10700786	WARE D	08/03/1977	105	0	52			- -		00344
MCMINN				/ /	51	--	STEEL	-- - --		- -		
0125NW	6	10701161	SHEPHERD_____KELL	06/13/1983	225	15	130	OPEN	OTHR	35-27-14	S	00598
MCMINN			NEW HOPE	03/27/1985	205	542	STEEL	130 - 225		84-39-59	N	HOME
0125NW	6	10701217	MCNUTT_____JOE	04/22/1984	406	1	140	OPEN	GOOD	- -		00598
MCMINN			ROCKY MT RD	/ /	380	--	STEEL	140 - 406		- -	Y	HOME
0125NW	6	10701305	MILLER_____DAVI	12/02/1985	250	2	105	OPEN	OTHR	- -		00630
MCMINN			SWEETFIELD VALL	/ /	195	110	STEEL	105 - 250		- -	Y	HOME
0125NW	6	10701422	OVERSTREET_____RONN	03/24/1986	393	60	120	OPEN	OTHR	- -		00609
MCMINN			ROCKY MT RD	/ /	375	150	STEEL	120 - 393		- -	Y	HOME
0125NW	6	10701484	STEVENS_____DANN	08/27/1986	325	4	89	OPEN	OTHR	- -		00598
MCMINN			COILE ROAD	/ /	260	80	STEEL	89 - 325		- -	Y	HOME
0125NW	6	10701518	JOHNSON_TRAILER	08/02/1986	205	7	29	OPEN	OTHR	- -		00598
MCMINN			MT VERD RD	/ /	110	25	STEEL	29 - 205		- -	Y	COMM
0125NW	6	10701572	BOYLESTON_____BART	10/08/1987	105	30	83	OPEN	OTHR	- -		00598
MCMINN			ROCKY MT	/ /	94	50	STEEL	83 - 105		- -	Y	HOME
0125NW	6	10701599	JOHNSON_____EMMI	06/20/1987	390	5	63	OPEN	GOOD	35-25-38	S	00637
MCMINN			OLD RICEVILLE	/ /	348	40	STEEL	63 - 390		84-38-36	Y	HOME
0125NW	6	10701600	KERLEY_____KEIT	05/25/1987	690	8	84	OPEN	GOOD	35-25-45	S	00637
MCMINN			OLD HWY 11	/ /	290	40	STEEL	84 - 690		84-38-36	Y	HOME
0125NW	6	90000955	NEWMAN_____GARY	01/23/1990	185	30	99	OPEN	UNK	- -		00598
MCMINN			HWY 11	/ /	170	8	STEEL	99 - 185		- -	Y	HOME
0125NW	6	90001300	ALLEN_____JOHN	01/19/1990	230	20	100	OPEN	UNK	- -		00528
MCMINN			RICEVILLE-DECAT	/ /	165	8	STEEL	100 - 230		- -	Y	HOME
0125NW	6	90001310	BINGHAM_____STEV	04/12/1990	189	30	189		GOOD	- -		00528
MCMINN			NEW HOPEWELL	/ /	180	8	STEEL	-- - --		-	Y	HOME
0125NW	6	91000757	GENTRY_____PAUL	08/17/1990	245	10	83		UNK	- -		00598
MCMINN			COIL RD	/ /	168	--	STEEL	-- - --		- -	Y	HOME
0125NW	6	92000663	SETLOCK_____EUGE	01/31/1992	305	10	125	OPEN	UNK	- -		00598
MCMINN			STERLING RD	/ /	275	50	STEEL	125 - 305		- -	Y	HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 6 MCMINN	93002474	WALDEN_____JAME HWY 11	07/01/1993 / /	505 430	2 100	186 STEEL	OPEN 186 - 505	UNK	- - - -	 Y	00598 HOME
0125NW 6 MCMINN	94000093 D0004593	WYRICK_____MARK LAYMAN RD	12/13/1993 5/12/1994	265 250	50 88	62 STEEL	OPEN 62 - 265	UNK 008042	35-27-00 84-38-45	S Y	00598 HOME
0125NW 6 MCMINN	97001489 D0024809	BLANKENSHIP____WARR CO RD 129	04/30/1997 / /	445 180	3 60	83 STEEL	OPEN 83 - 445	UNK	- - - -	 Y	00598 HOME
0125NW 6 MCMINN	98000267 D0032810	SEWELL_____EDNA 134 CO RD	12/17/1997 / /	365 320	2 80	104 STEEL	OPEN 104 - 365	UNK	- - - -	 Y	00598 HOME
0125NW 7 MCMINN	10700681	FEE H.C.	02/01/1975 11/19/1984	310 --	30 21	79 STEEL	 -- - --	GOOD	35-23-24 84-42-58	S	00006 HOME
0125NW 7 MCMINN	10700783	MORROW R	04/22/1977 / /	100 --	0 --	41 STEEL	 -- - --		- - - -		00344
0125NW 7 MCMINN	10700784	WRIGHT C RICEVILLE RD	05/11/1977 / /	-- --	0 --	63 STEEL	 -- - --		- - - -		00344
0125NW 7 MCMINN	10700846	JONES T BOWATER	07/04/1978 / /	228 --	0 --	0	 -- - --		- - - -		00550 HOME
0125NW 7 MCMINN	10701198	CATES_____DELB RICEVILLE & DEC	10/20/1983 01/03/1985	146 130	10 262	63 STEEL	OPEN 63 - 146	GOOD	35-24-34 84-44-00	S Y	00598 HOME
0125NW 7 MCMINN	10701325	WATSON_____JIMM SPRING CREED RI	03/24/1986 / /	127 64	15 30	21 OTHER	OPEN -- - --	OTHR	- - - -	 Y	00006 HOME
0125NW 7 MCMINN	10701326	BOWATERS_____ OFF HIGHWAY 11	03/31/1986 / /	145 145	1 --	120 PLAST	SLOT 120 - 145	OTHR	- - - -	 Y	00598 MON
0125NW 7 MCMINN	10701327	BOWATERS_____ OFF HIGHWAY 11	04/01/1986 / /	85 85	1 --	60 STEEL	SLOT 60 - 85	OTHR	- - - -	 Y	00598 MON
0125NW 7 MCMINN	10701328	BOWATER_____ OFF HIGHWAY 11	04/01/1986 / /	73 73	20 --	73 STEEL	SLOT -- - 73	OTHR	- - - -	 Y	00598 MON
0125NW 7 MCMINN	10701337	KYLE_____BARR RICEVILLE & DEC	07/01/1985 / /	385 385	-- --	105 STEEL	OPEN 105 - 385	GOOD	- - - -	 Y	00598 HOME
0125NW 7 MCMINN	10701511	FEE_____RICH RICEVILLE/DECAT	04/23/19[illegible] / /	245 --	-- 30	20 STEEL	OPEN 20 - 245	OTHR	- - - -	 Y	00598 HOME
0125NW 7 MCMINN	10701515	HYSELL_____RAY_ MOUSE CK	03/20/1987 / /	205 80	5 30	41 STEEL	OPEN 41 - 205	OTHR	- - - -	 Y	00598 HOME

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RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

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0125NW 7 MCMINN	10701520	FEE_____H_C_ RICEVILLE DECAT	03/24/1987 / /	125 105	3 30	28 STEEL	OPEN -- - --	OTHR	- - - -	Y	00598 COMM
0125NW 7 MCMINN	10701718	LORD_____STEV GEORGETOWN RD	07/15/1988 / /	188 110	30 110	187 STEEL	OPEN -- - --	OTHR	- - - -	Y	00630 HOME
0125NW 7 MCMINN	10701747	WINDER_&_MASHBU MOUSE CREEK	05/13/1989 / /	210 190	8 8	20 STEEL	OPEN 20 - 210	GOOD	- - - -	Y	00354 HOME
0125NW 7 MCMINN	10701749	HARDY_____EDWA MOUSE CREEK	05/05/1989 / /	310 180	10 30	41 STEEL	OPEN 41 - 310	GOOD	- - - -	Y	00354 HOME
0125NW 7 MCMINN	10701754	RELAY_INN_____ 175 EXIT AT RIC	04/18/1989 / /	400 300	5 20	40 OTHER	OPEN 40 - 400	OTHR	- - - -	N	00528 COMM
0125NW 7 MCMINN	90000952	WALKER_____DARY SPRING CK	01/15/1990 / /	205 170	10 6	125 STEEL	OPEN 125 - 205	UNK	- - - -	Y	00598 HOME
0125NW 7 MCMINN	91000304	MORROW_____ROSS MCMINN CO RD #6	09/15/1990 / /	188 70	10 30	21 STEEL	OPEN 21 - 188	UNK	- - - -	Y	00550 FARM
0125NW 7 MCMINN	91002546	HAHN_____JOHN OLD RICEVILLE R	09/24/1990 / /	505 340	2 --	265 STEEL	265 - 505	UNK	- - - -	Y	00598 HOME
0125NW 7 MCMINN	91003719	VINCENT_____ANGE BUSH CK	10/28/1991 / /	145 120	10 60	83 STEEL	OPEN 83 - 145	OTHR	- - - -	Y	00598 HOME
0125NW 7 MCMINN	92003870	JOHNSON_____AVER RICEVILLE	07/27/1992 / /	125 100	10 40	84 STEEL	OPEN 84 - 125	OTHR	- - - -	Y	00608 HOME
0125NW 7 MCMINN	93003166	MILTON_____RAND HI	04/23/1993 / /	125 110	10 50	84 STEEL	OPEN 84 - 125	OTHR	- - - -	Y	00608 HOME
0125NW 7 MCMINN	93003352	MARTIN_____DANN 159 CORD 63	08/05/1993 / /	405 80	2 20	20 STEEL	OPEN 20 - 405	GOOD	- - - -	Y	00598 HOME
0125NW 7 MCMINN	93004510	KENSLOW_____JANI SPRING CK	10/04/1993 / /	165 140	15 40	83 STEEL	OPEN 83 - 165	UNK	- - - -	Y	00598 HOME
0125NW 7 MCMINN	94000474 D0004788	HOWARD_____DON_ SHARP RD	01/15/1994 / /	265 240	10 60	126 STEEL	OPEN 126 - 265	OTHR	- - - -	Y	00608 HOME
0125NW 7 MCMINN	94001531 D0004643	BAUMGARDNER____LARR BELLSPRINGS	04/27/1994 / /	365 100	2 30	83 STEEL	OPEN 83 - 365	UNK	- - - -	Y	00598 HOME
0125NW 7 MCMINN	94003709 D0008163	JONES_____PAUL ROCKY MT RD	09/08/1994 12/14/1994	305 180	3 . 17	39 STEEL	OPEN 39 - 305	UNK 010331	35-24-50 84-42-41	F Y	00598 HOME

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RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 7 MCMINN	95002257 D0012725	SHARPE_____TAMM 130	05/05/1995 / /	425 80	1 20	20 STEEL	OPEN 20 - 305	UNK	- - - -	Y	00598 HOME
0125NW 7 MCMINN	97001205 D0022295	PALMER_____BILL DENSMORE ROAD	03/31/1997 5/13/1997	305 190	3 80	167 STEEL	OPEN 167 - 305	UNK 019689	35-24-50 84-42-10	F Y	00598 HOME
0125NW 7 MCMINN	97001484 D0024808	GIBSON_____FLOY 61 IRA HOWARD R	04/25/1997 / /	225 205	20 40	62 STEEL	OPEN 62 - 225	UNK	- - - -	Y	00598 HOME
0125NW 7 MCMINN	97003351 D0024901	WATSON_____ANGE CO RD 71 193	07/21/1997 9/ 5/1997	200 180	50 40	200 STEEL	200 - 200	UNK 019020	35-22-52 84-42-28	F Y	00528 HOME
0125NW 7 MCMINN	97004436 D0024874	CATE_____RAND 61 CO RD	09/18/1997 / /	665 340	1 120	167 STEEL	OPEN 117 - 665	UNK	- - - -	Y	00598 HOME
0125NW 7 MCMINN	98001976 D0027789	BINGHAM_____STEV HWY 39	05/16/1998 / /	120 110	40 40	90 STEEL	OPEN 90 - 120	UNK	- - - -	Y	00528 HOME
0125NW 8 MCMINN	10700777	HUGHES J OLD HWY 11	06/30/1977 / /	150 --	10 --	98 STEEL	-- - --	GOOD	- - - -		00527 HOME
0125NW 8 MCMINN	10700827	BRIGHT C RICEVILLE RD	01/05/1978 / /	90 65	30 25	26 STEEL	-- - --	GOOD	- - - -		00344 HOME
0125NW 8 MCMINN	10701276	KING_____ALIC BELL SPRING	11/01/1984 / /	188 100	8 40	82 OTHER	OPEN 82 - 188	OTHR	- - - -	Y	00006 HOME
0125NW 8 MCMINN	10701290	TURNER_____HUBE CLEAR SPRINGS	07/12/1985 / /	334 334	2 40	47 OTHER	OPEN 47 - 334	OTHR	- - - -	Y	00006 HOME
0125NW 8 MCMINN	10701330	WYATT_JR._____JAME SUBURBAN HILLS	04/05/1986 / /	445 445	5 --	91 STEEL	OPEN 91 - 445	GOOD	- - - -	Y	00598 HOME
0125NW 8 MCMINN	10701397	PRITCHETT_____GEOR OLD HWY 11 RD	06/11/1986 / /	505 175	1 --	126 STEEL	OPEN 126 - 505	GOOD	- - - -	Y	00598 HOME
0125NW 8 MCMINN	10701489	KING_____JEFF DEAD END	04/29/1987 / /	350 277	3 --	127 STEEL	OPEN 127 - 350	OTHR	- - - -	Y	00354 HOME
0125NW 8 MCMINN	10701496	KING_____SCOT HWY 11 BY PASS	05/09/1987 / /	365 220	2 130	146 STEEL	OPEN 146 - 365	OTHR	- - - -	Y	00598 HOME
0125NW 8 MCMINN	10701508	HESTER_____RIC GEORGE TOWN RD	04/17/1987 / /	165 165	30 130	159 STEEL	OPEN 159 - 165	OTHR	- - - -	Y	00598 HOME
0125NW 8 MCMINN	10701541	AIKENS_____MIKE FANNING AVE	07/15/1987 / /	600 500	2 140	209 STEEL	OPEN 209 - 600	GOOD	- - - -	Y	00598 HOME

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0125NW 8 MCMINN	10701569	GARREN_____JOE_ HORSIER HILL	11/10/1987 04/27/1988	600 300	2 150	199 STEEL	OPEN 199 - 600	OTHR	35-23-35 84-39-57	F Y	00598 HOME
0125NW 8 MCMINN	10701678	WILSON_____SAM_ HWY 11 TOWARD C	06/28/1988 / /	520 380	2 80	105 STEEL	OPEN 105 - 520	OTHR	- - - -	Y	00598 FARM
0125NW 8 MCMINN	10701694	BRADY_____KELV	08/22/1988 / /	250 240	15 80	220 STEEL	OPEN 220 - 250	OTHR	- - - -	Y	00608 HOME
0125NW 8 MCMINN	10701722	PLEMONS_____LEWI HWY 11	12/13/1988 / /	148 133	50 70	127 STEEL	OPEN -- - --	OTHR	- - - -	Y	00006 HOME
0125NW 8 MCMINN	10701744	NICHOLS_____TAMM MOUSE CREEK ROA	05/08/1989 / /	200 70	5 35	63 STEEL	OPEN 0 - 200	OTHR	- - - -	Y	00598 HOME
0125NW 8 MCMINN	10701762	BROWN_____CHAR COUNTY 156	07/23/1988 / /	270 240	5 80	126 STEEL	OPEN 126 - 270	GOOD	- - - -	Y	00550 HOME
0125NW 8 MCMINN	90000266	PRICE_RITE_____ HWY 11	07/20/1989 / /	414 346	2 10	153 STEEL	OPEN 153 - 414	OTHR	- - - -	Y	00006 HOME
0125NW 8 MCMINN	90002568	BOSTON_____RAND RICEVILLE DEACU	05/01/1990 / /	125 85	8 4	62 STEEL	OPEN -- - --	OTHR	- - - -	Y	00598 HOME
0125NW 8 MCMINN	92002203	ANDERSON_____BOBB PROFFITS ROCK Q	04/27/1992 / /	460 400	2 25	21 STEEL	OPEN 21 - 460	UNK	- - - -	Y	00598 HOME
0125NW 8 MCMINN	93000802	VAUGHN_____DAN_ CO RD 713	08/10/1992 / /	290 250	20 90	99 STEEL	OPEN 99 - 290	UNK	- - - -	Y	00550 HOME
0125NW 8 MCMINN	93000803	WEST_____LIND CO RD 713	08/05/1992 / /	125 107	30 30	106 STEEL	OPEN 106 - 125	UNK	- - - -	Y	00550 HOME
0125NW 8 MCMINN	93003353	HAYNIE_____JIMM CO RD 73	06/23/1993 / /	150 115	15 50	114 STEEL	OPEN 114 - 150	UNK	- - - -	Y	00598 HOME
0125NW 8 MCMINN	94001157 D0003453	HUBER_____A_C_ HW 11	04/21/1994 / /	370 350	6 35	42 STEEL	OPEN 42 - 370	UNK	- - - -	Y	00528 HOME
0125NW 8 MCMINN	94002481 D0005136	HALE_____KEN_ BOBBY CLARK RD	06/27/1994 9/15/1994	205 180	20 115	146 STEEL	OPEN 146 - 205	UNK 010215	35-23-00 84-42-10	F Y	00598 HOME
0125NW 8 MCMINN	94003708 D0008162	IRONS_____GARY RICEVILLE RD	09/07/1994 12/ 7/1994	145 125	10 33	119 STEEL	OPEN 119 - 145	UNK 010306	35-22-35 84-40-30	F Y	0059[illegible] HOME
0125NW 8 MCMINN	95003427 D0012686	JOHNSON_____LEON WILEY WOMAC	07/11/1995 10/ 6/1995	245 230	15 100	125 STEEL	OPEN 125 - 245	UNK 015327	35-22-57 84-40-46	F Y	00598 HOME

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RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 8	95003430	PRYOR_____DANN	07/10/1995	305	2	125	OPEN	UNK	35-22-58	F	00598
MCMINN	D0012685	WILEY WOMAC	10/ 6/1995	165	75	STEEL	125 - 305	015328	84-40-46	Y	HOME
0125NW 8	95003431	GOINS_____ARVI	07/07/1995	75	50	20	OPEN	UNK	- -		00598
MCMINN	D0012683	BASSINGER RD	/ /	35	10	STEEL	20 - 75		- -	Y	HOME
0125NW 8	95004654	ETIE_____SCOT	09/18/1995	425	6	146	OPEN	UNK	35-22-38	F	00598
MCMINN	D0015526	RICEVILLE RD	2/ 9/1996	415	100	STEEL	146 - 425	011613	84-40-05	Y	HOME
0125NW 8	96005442	HARRIS_____TODD	11/22/1996	305	30	104	OPEN	UNK	35-22-46	F	00598
MCMINN	D0022264	RICEVILLE RD	2/ 4/1997	295	60	STEEL	104 - 305	019187	84-40-05	Y	HOME
0125NW 8	98001551	HENDERSON_____KEIT	05/04/1998	125	15	104	OPEN	UNK	- -		00598
MCMINN	D0032845	HWY 11 3786	/ /	118	60	STEEL	104 - 125		- -	Y	HOME
0125NW 9	10700828	SNYDER F	12/26/1977	100	20	27		GOOD	- -		00344
MCMINN		CEDAR SPRINGS RD	/ /	80	30	STEEL	-- - --		- -		HOME
0125NW 9	10701019	STACY C.	04/21/1981	230	--	--		GOOD	35-23-44	S	00254
MCMINN			/ /	--	--	STEEL	-- - --		84-38-47		HOME
0125NW 9	10701185	BIVENS_____SCOT	12/09/1983	187	40	152	OPEN	GOOD	- -		00006
MCMINN		HWY 709	/ /	161	100	OTHER	152 - 187		- -	Y	HOME
0125NW 9	10701187	MASION_____RICK	08/20/1983	165	24	42	OPEN	GOOD	35-22-35	S	00598
MCMINN		CLAY HILL RD	12/17/1984	50	50	STEEL	42 - 165		84-37-57	Y	HOME
0125NW 9	10701203	JEWELL_____TOMM	02/06/1984	206	17	105	OPEN	OTHR	35-23-16	S	00598
MCMINN		CEDAR SPRINGS R	12/19/1984	160	540	STEEL	105 - 206		84-38-29	Y	HOME
0125NW 9	10701206	HICKS_____JACK	02/17/1984	266	8	66	OPEN	GOOD	35-24-05	S	00598
MCMINN		SHADY SPRING	12/17/1984	140	715	STEEL	66 - 266		84-36-13	Y	HOME
0125NW 9	10701208	THOMPSON_____LEON	03/02/1984	186	4	63	OPEN	GOOD	35-20-00	S	00598
MCMINN		CEDAR SPRINGS	12/17/1984	80	25	STEEL	63 - 186		84-35-00	Y	HOME
0125NW 9	10701221	VINCENT_____LOCK	06/08/1984	246	4	48	OPEN	GOOD	- -		00598
MCMINN		CEDAR SPRING	/ /	220	--	STEEL	48 - 246		- -	Y	HOME
0125NW 9	10701279	PEELER_____GILB	03/20/1985	106	10	41	OPEN	OTHR	- -		00598
MCMINN		CEDAR SPRINGS R	/ /	60	40	STEEL	41 - 106		- -	Y	HOME
0125NW 9	10701352	LANKFORD_____DAVI	04/17/1986	305	5	60	OPEN	GOOD	- -		00598
MCMINN		HILLSVIEW RD	/ /	305	--	STEEL	60 - 305		- -	Y	HOME
0125NW 9	10701354	WEINGARTNER____J._	04/23/1986	235	30	235	OPEN	GOOD	- -		00598
MCMINN		IN HOUSER HILLS	/ /	235	--	STEEL	235 - 235		- -	Y	HOME

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0125NW 9 MCMINN	10701355	PARTAIN_____LEWI OFF CEDAR SPR	04/24/1986 / /	205 205	8 --	92 STEEL	OPEN 92 - 205	GOOD	- - - -	Y	00598 HOME
0125NW 9 MCMINN	10701652	WOMAC_____J_W_ NO PONE RD	04/26/1988 / /	130 90	5 30	20 STEEL	OPEN 20 - 130	GOOD	- - - -	Y	00630 HOME
0125NW 9 MCMINN	10701686	ROBINSON_____EDDI CLAY HILL	07/20/1988 / /	285 125	4 40	80 STEEL	OPEN 80 - 285	BAD	- - - -	Y	00598 HOME
0125NW 9 MCMINN	10701716	JONES_____GARY GEO BRANCH RD	12/04/1988 / /	270 250	5 110	129 STEEL	OPEN 129 - 270	OTHR	- - - -	Y	00630 HOME
0125NW 9 MCMINN	10701737	WOMAC_____EDNA OFF RICEVILLE	03/26/1989 / /	140 140	30 40	126 STEEL	OPEN 0 - 140	OTHR	- - - -	Y	00598 OTHR
0125NW 9 MCMINN	10701776	WOMACK_____JIMM SEDAR SPRINGS	08/29/1989 / /	230 100	30 50	63 STEEL	OPEN 63 - 230	OTHR	- - - -	Y	00528 HOME
0125NW 9 MCMINN	91000152	CURTIS_____GARY 709 RD	09/07/1990 / /	505 160	1 --	104 STEEL	 -- - --	UNK	- - - -	Y	00598 HOME
0125NW 9 MCMINN	91000755	COLEMAN_____STEV HOUSIER HILLS	11/05/1990 / /	265 200	3 --	83 STEEL	OPEN 0 - 84	UNK	- - - -	Y	00598 HOME
0125NW 9 MCMINN	91002071	CASE_____JOHN COLIE RD	06/24/1991 / /	425 240	2 100	122 STEEL	OPEN 122 - 425	UNK	- - - -	Y	00598 HOME
0125NW 9 MCMINN	91002074	YOUNG_____ROBE HOUSIER HILLS	06/05/1991 / /	185 165	30 30	104 STEEL	OPEN 104 - 185	UNK	- - - -	Y	00598 HOME
0125NW 9 MCMINN	91003722	CRITTENDEN_____EGBE CEDAR SPRINGS	08/19/1991 / /	305 285	4 40	62 STEEL	OPEN 62 - 305	UNK	- - - -	Y	00598 HOME
0125NW 9 MCMINN	92000404	WALKER_____STEV CEDAR SPRINGS	10/25/1991 / /	285 265	5 60	21 STEEL	OPEN 21 - 285	OTHR	- - - -	Y	00608 HOME
0125NW 9 MCMINN	92001427	FERRIS_____BOBB 	01/11/1992 / /	145 85	10 50	21 STEEL	OPEN 21 - 145	OTHR	- - - -	Y	00608 HOME
0125NW 9 MCMINN	93003160	GUNGLE_____FLOY 	05/12/1993 / /	105 100	10 60	97 STEEL	OPEN 97 - 105	OTHR	- - - -	Y	00608 HOME
0125NW 9 MCMINN	93005155 D0004734	EDWARDS_____FRAT 	11/24/1993 / /	405 345	2 60	62 STEEL	OPEN 162 - 405	OTHR	- - - -	Y	00608 OTHR
0125NW 9 MCMINN	94000475 D0004798	LEE_____RICH CEDAR SPRING RD	01/31/1994 4/18/1995	130 115	20 . 25	42 STEEL	OPEN 42 - 130	OTHR 010551	35-22-56 84-39-34	F Y	00608 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 9 MCMINN	94001355 D0004646	MCDONALD_____JASO CCO RD 702 #114	05/04/1994 6/27/1994	405 390	8 70	104 STEEL	OPEN 104 - 405	UNK 008102	35-24-28 84-39-15	F Y	00598 HOME
0125NW 9 MCMINN	94003111 D0008215	MULKEY_____JOHN 708 WOMAC RD	07/30/1994 12/ 7/1994	185 180	25 77	119 STEEL	OPEN 119 - 185	UNK 010307	35-24-01 84-39-26	F Y	00598 HOME
0125NW 9 MCMINN	94003182 D0008156	VINCENT_JR_____LOCK CEDAR SPRINGS R	08/23/1994 4/18/1995	165 150	6 18	24 STEEL	OPEN 24 - 165	UNK 010500	35-22-54 84-39-35	F Y	00598 HOME
0125NW 9 MCMINN	94004395 D0008174	MAHONEY_____GARR CO RD 709 #478	10/13/1994 12/20/1994	225 140	10 73	83 STEEL	OPEN 83 - 225	UNK 010329	35-23-14 84-39-26	F Y	00598 HOME
0125NW 9 MCMINN	95000770 D0012656	TEAGUE_____CHRI COUNTY RD709 209	02/12/1995 4/18/1995	505 480	2 34	83 STEEL	 83 - 505	OTHR 010499	35-23-02 84-39-25	F Y	00598 HOME
0125NW 9 MCMINN	95000992 D0012662	MOSIER_____RONN SWEETFIELD VALL	02/22/1995 / /	205 140	8 40	83 STEEL	OPEN 83 - 205	UNK 	- - - -	 Y	00598 HOME
0125NW 9 MCMINN	95000996 D0012663	MOORE_____PATR CEDAR SPRINGS	02/23/1995 / /	325 235	6 80	125 STEEL	OPEN 125 - 325	UNK 	- - - -	 Y	00598 HOME
0125NW 9 MCMINN	95001893 D0012720	TAYLOR_____ LILL CEDAR SPRINGS	04/25/1995 7/25/1995	225 180	15 95	167 STEEL	OPEN 167 - 225	UNK 015433	35-23-04 84-39-47	F Y	00598 HOME
0125NW 9 MCMINN	95002054 D0009089	SOUTH_____MERL CEDAR SPRINGS R	04/26/1995 7/25/1995	205 185	4 19	42 STEEL	OPEN 42 - 205	OTHR 015434	35-22-45 84-39-38	F Y	00608 HOME
0125NW 9 MCMINN	95002536 D0014059	COLLINS_____JERR CEDAR SPRING RD	06/01/1995 / /	325 190	4 60	146 STEEL	OPEN 146 - 325	UNK 	- - - -	 Y	00598 HOME
0125NW 9 MCMINN	96000882 D0015567	HUFF_____CHER 702 RD	02/14/1996 / /	165 150	25 60	139 STEEL	OPEN 139 - 165	UNK 	- - - -	 Y	00598 HOME
0125NW 9 MCMINN	96003285 D0021146	BRANNON_____ALLI CEDAR SPRINGS R	07/29/1996 / /	485 230	2 30	41 STEEL	OPEN 41 - 485	UNK 	- - - -	 Y	00598 HOME
0125NW 9 MCMINN	96005436 D0022262	HOLT_____DEAN CEDAR SPRINGS R	11/12/1996 2/ 4/1997	145 75	40 20	62 STEEL	OPEN 62 - 145	UNK 019188	35-23-19 84-39-11	F Y	00598 HOME
0125NW 9 MCMINN	97000080 D0023188	ALLEN_____JOHN CO RD 674 [illegible]	12/10/1996 2/ 4/1997	230 225	50 40	126 STEEL	OPEN 126 - 230	UNK 019189	35-23-23 84-[illegible]-34	F Y	00528 HOME
0125NW 9 MCMINN	97002096 D0024819	BUNDY_____NORM WILLARD THOMPSO	05/[illegible]/1997 / /	205 85	1 40	62 STEEL	OPEN 62 - 205	UNK 	- - - -	 Y	00598 HOME
0125NW 9 MCMINN	97002809 D0026183	WILSON_____RICH RICEVILLE RD	06/06/1997 9/ 5/1997	345 300	3 80	152 STEEL	OPEN 152 - 345	OTHR 019683	35-22-42 84-40-[illegible]	F Y	00608 HOME

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION - DIVISION OF WATER SUPPLY
RECORDS OF WATER WELLS ON THE RICEVILLE QUADRANGLE (0125NW) TN.

QUAD / NTH COUNTY	WELL NUM REG NUM	OWNER'S NAME LOCATION ROAD	COMP DATE INSPT DATE	TOT DEPTH AQ DEPTH	TOT YIELD STAT LEVEL	CSE DEPTH CSE TYPE	WELL FINISH INTERVAL	WAT QUAL TAG NUM	LATITUDE LONGITUDE	A/C LOG	DRILLER USE
0125NW 9	97003379	UNDERDOWN_____TERR	08/14/1997	185	10	62	OPEN	UNK	- -		00598
MCMINN	D0024861	678	/ /	75	40	STEEL	2 - 185		- -	Y	HOME

Preliminary Assessment
For
NGK Metals

Reference 11
Tennessee Division of Water Supply
Public Water System Data for Athens Utility Board

PUBLIC WATER SYSTEM DATA

Key Identification Number: 0000024

Name of Water System: ATHENS UTILITIES BOARD
Mailing Address: 100 ENGLEWOOD ROAD
City: ATHENS County: MCMINN
Zip Code: 37303 Office Phone: 745-4501 Plant Phone: 745-6273

Title of Person	Name	Certification	Interviewed	Correspondence
GEN. MANAGER	GEORGE USRY			✓
SUPERINTENDENT	RICHARD YARBROUGH			✓
REG. COMPLIANCE COORD.	MIKE STONE		✓	✓
CHIEF OPERATOR	KENNETH J. FERGUSON		✓	✓
OPERATORS	DON COLEMAN, RONNIE WOOD		✓	

Source No.		Name	INTAKE LOCATION USGS Map LATITUDE LONGITUDE River Mile DEG	MIN	SEC	MARK (ONE ONLY) Surface	Ground	Purchased	TREATMENT Aeration	Prechlorination	Coagulation	Sedimentation	Filtration	Corrosion Control	Softening	Taste & Odor Control	Iron Removal	Fluoride Adjustment	Disinfection
1	R	OOSTANAULA CREEK - (BACK-UP)	35	27	32	X													
	A		84	34	29														
2	R	INGLESIDE SPRING	35	27	24		X												
	A		84	34	49														
3	R	PLANT (SINGLE ENTRY PT. FOR ALL SOURCES)	35	27	44					X	X	X	X	X		X		X	X
	A		84	34	50														
4	R	NEW SPRING	35	27	23		X												
	A		84	34	51														

Name of Systems Served By This System	Other Systems Connected To This System
NIOTA WATER SYSTEM	CALHOUN CHARLESTON U.D.
	RICEVILLE U.D.
	HIWASSEE UTILITIES COMMISSION

Plant Classification: WT4
Distribution Classification: DS2 Date Laboratory Certified: 1-14-99
Design Capacity: 2880 (gpm) Filter Area: 1440 (sq ft) Filter Rate: 2.0 (gpm/ft²)
Raw Water Pump Capacity: 2@1440, 1@2880 (gpm) Finished Water Pump Capacity: 2@1440, 1@2880 (gpm)
Distribution Storage, Gravity Flow: 4X1.0 = 4.0 (million gallons) Emergency Power Only: NONE (gal/day)
Clearwell Capacity: 1.0 (million gallons) Date Cross Connection Control Program Approved: 3-30-87
Date of Last Inorganic Chemical Analysis: 3-5-97 Date of Last Organic Chemical Analysis: 6-22-98-(ATRAZINE FINT RAW)
Date of Last Radionuclide Analysis: 6-22-98 Date Emergency Plan Approved: EXPIRED 12-31-96. NEEDS TO BE UPDATED Last Rating: 100
Number of Wholesale Customers: 1 Number of Meters: 6,445 Date of Last Survey: 3-6-96
Remarks:

Date of Survey	Number of Connections	Household Factor	Population Served	Average Daily Pumpage (million gallons)	Maximum Daily Pumpage (million gallons)	Engineer	Rating	Year
1-14-99	6,445	2.55	16,435	2.36	3.31	MHF	90	1999
3-6-96	6,063	2.55	15,461	2.24	3.28	CLB	100	1996
10-13-94	5,768	2.55	14,708	2.24	3.33	CLB	98	1994

PUBLIC WATER SYSTEM DATA

Key Identification Number

Name of Water System _____

Mailing Address _____

City _____ County _____

Zip Code _____ Office Phone _____ Plant Phone _____

Title of Person	Name	Certification	Interviewed	Correspondence

Source			INTAKE LOCATION				MARK (ONE ONLY)			TREATMENT										
			USGS Map LATITUDE LONGITUDE River Mile																	
No.		Name	DEG	MIN	SEC		Surface	Ground	Purchased	Aeration	Prechlorination	Coagulation	Sedimentation	Filtration	Corrosion Control	Softening	Taste & Odor Control	Iron Removal	Fluoride Adjustment	Disinfection
1	R	WELL NO. 4	35	27	41			X												
	A		84	34	20															
2	R	WELL NO. 7	35	27	43			X												
	A		84	34	19															
3	R																			
	A																			
4	R																			
	A																			

Name of Systems Served By This System	Other Systems Connected To This System

Plant Classification _____

Distribution Classification _____ Date Laboratory Certified _____

Design Capacity _____ (gpm) Filter Area _____ (sq ft) Filter Rate _____ (gpm/ft^2)

Raw Water Pump Capacity _____ (gpm) Finished Water Pump Capacity _____ (gpm)

Distribution Storage, Gravity Flow _____ (million gallons) Emergency Power Only _____ (gal/day)

Clearwell Capacity _____ (million gallons) Date Cross Connection Control Program Approved _____

Date of Last Inorganic Chemical Analysis _____ Date of Last Organic Chemical Analysis _____

Date of Last Radionuclide Analysis _____ Date Emergency Plan Approved _____ Last Rating _____

Number of Wholesale Customers _____ Number of Meters _____ Date of Last Survey _____

Remarks: _____

Date of Survey	Number of Connections	Household Factor	Population Served	Average Daily Pumpage (million gallons)	Maximum Daily Pumpage (million gallons)	Engineer	Rating	Year

WATER FIELD SHEET
Division of Water Supply

SYSTEM ATHENS UTILITIES BOARD DATE JAN. 14, 1999

COUNTY McMINN PWSID 0000024

SAMPLES REQUIRED PER MONTH 15 REPORTS SUBMITTED (12/12) NONE LAT.

MONTH	NOV 97	DEC	JAN 98	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
SAMPLES RUN	20	20	20	20	20	20	20	20	20	20	20	20
ORGANISM/100 ML	0	0	0	0	0	0	0	0	0	0	0	0

REMARKS

1. The turbidity laboratory was recertified.
2. The chlorine residual was satisfactory (1.8 PPM).
3. Emergency Operation Plan Expired (12-31-96).
4. Chlorine residual must be reported on flushing records.
5. The Bacteriological Sampling Plan is inadequate; a map is needed.

PH-0343
DWS (Rev 3 391)

Sanitary Survey Rating

System: ATHENS UTILITIES BOARD

Date: JAN. 14, 1999

I. SOURCE AND FACILITY (25)

Points in this section may be assessed progressively. For the second survey in which no substantial progress is made the point penalty for each item may be multiplied by 2.0 For the third survey in which no substantial progress is made the point penalty for each item may be multiplied by 3.0.

	Deficiency	Points	Deduction	Comments
A.	Adequate Supply 1200-5-1-.02, .16 and .17(13)	(4-8)		✓
B.	Duplicate Pumps 1200-5-1-.17(13)	(2-4)		✓
C.	Protection Against Contamination 1200-5-1-.02(1), .05(12), .16 and .17(3) and (16)	(1-3)		✓
D.	Wellhead Protection Provisions (If applicable) 1200-5-1-.34	(1-3)		✓
E.	Intake 1200-5-1-.02 and .16	(1-2)		✓
F.	Aerator 1200-5-1-.02	(2-4)		✓
G.	Chemical Feeders 1200-5-1-.05 (8) and .17 (36)	(2-4)		✓
H.	Mixing 1200-5-1-.02	(2-4)		✓
I.	Flocculation 1200-5-1-.02	(1-4)		✓
J.	Sedimentation 1200-5-1-.02	(2-4)		✓
K.	Filtration 1200-5-1-.17(12) and (27)	(1-4)		✓
L.	Re-Wash (i.e. Filter-to-Waste) 1200-5-1-.17(35)	(3)		✓
M.	Turbidimeters 1200-5-1-.05(11) and .17(1) including alarm and automatic shut-off capability	(2-5)		✓
N.	Disinfection 1200-5-1-.02, .17(4), (11) and (28)	(1-10)		✓
O.	Contact Time - Disinfection 1200-5-1-.02, .17(28), and (29)	(1-3)		✓
P.	Master Meter 1200-5-1-.02, .17(2) and (3)	(2)		✓
Q.	Pumping Equipment 1200-5-1-.02 and .17(13)	(2-3)		✓
R.	Maintenance and Security of Equipment, Buildings and Grounds 1200-5-1-.17(17)*	(1-6)		✓
S.	Laboratory Facilities 1200-5-1-.02, .14, .17(3), (17), and (26)	(2-5)		✓
T.	Safety 1200-5-1-.02	(1-2)		✓
U.	Sludge Handling Unit 1200-5-1-.02	(2-5)		✓

V.	Unsanitary Conditions 1200-5-1-.02, .17(17)	(1-5)		✓
W.	Fluoridation Techniques 1200-5-1-.17(20)	(0-3)		✓
X.	Design Capacity 1200-5-1-.05(10)	(1-3)		✓

Deficiency Subtotal 0

* Note: 1200-5-1-.17(3), (17) and (19) are more specific rule cites per equipment and facility condition; 1200-5-1-.18(2) may also apply.

II. Operation (25)

A.	Certified Operator - Plant 1200-5-1-.17(1) and Distribution 1200-5-3-.04(2)	(11-15)		✓
B.	Laboratory-Process Monitoring (excluding Turbidity and Chlorine Residual Monitoring) 1200-5-1-.17(3)	(2-11)		✓
C.	Public Notification 1200-5-1-.18(4) and .19	(2-5)		✓
D.	Submission of Operation Reports (MORs) 1200-5-1-.17(2)	(1-4)		✓
E.	Recordkeeping 1200-5-1-.20 and 1200-5-1-.17(2), (10), (32) and (33)	(2-5, 2 ea)		✓
F.	Emergency Plan 1200-5-1-.17(7)	(1-4)	4	NEEDS UPDATE
G.	Submission of Plans and Specifications 1200-5-1-.05	(2-7)		✓
H.	Construction Projects 1200-5-1-.05(4)-(6) and .17(8) and (19)	(2-5)		✓
I.	Reporting Requirements 1200-5-1-.18	(2-5)		✓
J.	Enforcement 68-221-712(a)	(2-5)		✓
K.	Customer Complaints 1200-5-1-.17(24)	(1-3)		✓

Deficiency Subtotal 4

III. Water Quality and Water Quality Monitoring (25)*

A.	Turbidity Monitoring			
	a. Daily sample 1200-5-1-.08(1), .17(26), .31(4) and .31(5)(c)	(1-5)		✓
	b. Repeat sample 1200-5-1-.08(2)	(6)		✓
B.	Continuous Chlorine Residual Monitoring 1200-5-1-.17(4),17(30), .31(5)(b) 5 and (c)2.	(1-3)		✓
C.	Primary Chemicals Compliance Monitoring			
	a. Inorganic sample 1200-5-1-.09(1)	(3)		✓
	b. Inorganic samples Confirmation 1200-5-1-.09(2)	(3)		✓
	c. Synthetic Organic sample 1200-5-1-.10(1)	(3)		

	d. Synthetic Organic sample Confirmation 1200-5-1-.10(2)	(3)		✓
	e. Radionuclides 1200-5-1-.11	(3)		✓
	f. Sodium 1200-5-1-.24	(3)		✓
	g. Trihalomethane 1200-5-1-.23	(3)		✓
	h. Volatile Organic Chemicals 1200-5-1-.26	(3)		✓
	i. Confirmation Samples	(3)		✓
D.	Secondary Chemicals Monitoring 1200-5-1-.12	(3)		✓
E.	Microbiological			
	a. Regular sample 1200-5-1-.07	(1-11)		✓
	b. Repeat samples 1200-5-1-.07(1)	(6-11)		✓
	c. Bacteriological Sampling Plan 1200-5-1-.07(1)(c)	(2-3)	-2	✓
F.	Lead and Copper Monitoring			
	a. Regular sampling 1200-5-1-.33	(5)		✓
	b. Documentation 1200-5-1-.33	(1-3)		✓
	c. Corrosivity 1200-5-1-.21	(3-4)		✓
G.	Turbidity Compliance			
	a. Monthly average 1200-5-1-.06(3)(a)	(5-9)		✓
	b. Two day average 1200-5-1-.06(3)(b)	(5-9)		✓
	c. 95% of samples not <.5 NTU	(5-9)		✓
H.	Primary Chemicals, Compliance with MCLs			
	a. Inorganic chemicals 1200-5-1-.06(1)(b)	(6-11)		✓
	b. Organic chemicals 1200-5-1-.06(2)	(6-11)		✓
	c. Radionuclides 1200-5-1-.06(5)	(6-11)		✓
	d. Trihalomethane 1200-5-1-.22(3)	(6-11)		✓
	e. Volatile Organic Chemicals (Regulated) 1200-5-1-.25	(6-11)		✓
I.	Secondary Chemicals 1200-5-1-.12	(3)		✓
J.	Microbiological Compliance Monthly average 1200-5-1-.06(4)(a)	(3-11)		✓
K.	Lead and Copper Action Level 1200-5-1-.21	(2-4)		✓
	Deficiency Subtotal		2	

* Refer also to 1200-5-1-.05(11) and (12), .08(2), and .17(3) and (25)

IV. DISTRIBUTION AND CROSS CONNECTION (25)

Points in this section may be assessed progressively. For the second survey in which no substantial progress is made the point penalty may be multiplied by 2.0. For the third survey in which no substantial progress is made the point penalty may be multiplied by 3.0 .

A.	Chlorine Residual 1200-5-1-.17(4)	(4-6)		✓
B.	Adequate Storage 1200-5-1-.17(14)	(4-6)		✓
C.	Notification, Inspection and Disinfection of New or Existing Facilities 1200-5-1-.17(8), (19) and .20(1)	(5)		✓
D.	Maintenance of Reservoirs and Tanks 1200-5-1-.17(16), (17), (33) and (34)	(1-4)		NEED TO REPORT CL2 RESIDUAL
E.	Flushing Program 1200-5-1-.17(10) and (23)	(3-6)	3	
F.	Fire Hydrants 1200-5-1-.17(18)	(2-6)		✓
G.	Adequate Pressure 1200-5-1-.17(9)	(3-5)		✓
H.	Valves and Blow-offs 1200-5-1-.17(10) and (23)	(1-3)		✓
I.	Map of Distribution System 1200-5-1-.17(15)	(1-3)	1	A MAP IS NEEDED
J.	Pump Stations 1200-5-1-.02(1) and .17(9) and (13)	(2-3)		✓
K.	Approved Cross Connection Policy or Ordinance 1200-5-1-.17(6)	(7)		✓
L.	Working Program 1200-5-1-17(6)	(1-5)		✓

Deficiency Subtotal 4
Total Deficiency Points 10
Overall Rating 90

Inspector's Signature Mohammed H. Falck

Additional Comments/Explanation:

ENVIRONMENTAL ASSISTANCE CENTER
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
540 McCALLIE AVENUE, SUITE 550
CHATTANOOGA, TENNESSEE 37402
PHONE (423) 634-5745 STATEWIDE 1-888-891-8332 FAX (423) 634-6389

DRINKING WATER MONITORING PROGRAM

Athens Utilities Board
January 1999

1. Raw Water

   a. Collect a representative sample--7 days per week
   b. Amount of raw water treated
   c. Analyses and Frequency
      1. Temperature - daily
      2. Turbidity - daily
      3. Alkalinity (total) - daily
      4. pH - daily
      5. Hardness - daily
      6. Free CO2 - daily
      7. Iron - daily
      8. Manganese - daily
      9. Fluoride - daily
      10. Bacteriological - daily
      11. Jar Tests as needed, at least once per week

2. Settled Water

   a. Collect a representative sample before filteration
   b. Analyses and Frequency--7 days per week

3. Finished Water

   a. Collect a representative sample--7 days per week
   b. Analyses and Frequency
      1. Turbidity - every four hours
      2. Chlorine Residual (free) - continuously
      3. Alkalinity (total) - daily
      4. pH - daily
      5. Hardness - daily
      6. Free CO2 - daily
      7. Iron - daily
      8. Manganese - daily
      9. Fluoride - daily
      10. Bacteriological - daily
   c. Chlorine, pounds or gallons used
   d. Fluoride, pounds or gallons used

4. Distribution System

a. Collect representative samples from distribution system--5 days per week
b. Amount of water pumped to system
c. Frequency and Analyses
    1. Chlorine Residual (free) - 5 days per week
    2. Fluoride - 5 days per week
    3. Iron - 5 days per week
    4. Manganese - 5 days per week
    5. Bacteriological: Total of fifteen (15) per month to be tested by the System.

Preliminary Assessment
For
NGK Metals

Reference 12
15-Mile Surface Water Pathway

Webb Lake
McMahan Ch.
Quarry
Mouse
Creek
Rocky Mt.
Branch
Rest Area
Bowater Azimuth
Bowater Road
Mooney Azimuth
Cole Spring
Creek
RIDGE
Mouse
CREEK
Fish Hatchery
Suburban Hills
Coastal Telephone Catchline
Georgetown
PIPELINE
MOUSE
HIGHWAY
DRY
Buzzard
Hilltop Ch.
PIPELINE

Preliminary Assessment
For
NGK Metals

Reference 13
State of Tennessee Water Quality Standards

(Rule 1200—4—3—.03, continued)

(h) Taste or Odor - The waters shall not contain substances which will result in taste or odor that would prevent the use of the water for industrial processing.

(i) Toxic Substances - The waters shall not contain toxic substances whether alone or in combination with other substances, which will adversely affect industrial processing.

(j) Other Pollutants - The waters shall not contain other pollutants in quantities that may adversely affect the water for industrial processing.

(3) *Fish and Aquatic Life.*

(a) Dissolved Oxygen - The dissolved oxygen shall be a minimum of 5.0 mg/l except in limited sections of streams where it can be clearly demonstrated that (i) the existing quality of the water due to irretrievable man-induced conditions cannot be restored to the desired minimum of 5.0 mg/l dissolved oxygen; or (ii) the natural background quality of the water is less than the desired minimum of 5.0 mg/l. Such exceptions shall be determined on an individual basis, but in no instance shall the dissolved oxygen concentration be less than 3.0 mg/l. The dissolved oxygen concentrations shall be measured at mid-depth in waters having a total depth of ten (10) feet or less, and at a depth of five (5) feet in waters having a total depth of greater than ten (10) feet. The dissolved oxygen concentration of recognized trout waters shall not be less than 6.0 mg/l. The above criteria are applicable to tailwaters. The dissolved oxygen concentration of trout waters which have been designated as supporting a naturally reproducing population shall not be less than 8.0 mg/l.

(b) pH - The pH value shall lie within the range of 6.5 to 8.5 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.

(c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life.

(d) Turbidity or Color - There shall be no turbidity or color in such amounts or of such character that will materially affect fish and aquatic life.

(e) Temperature - The maximum water temperature change shall not exceed 3°C relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2°C per hour. The temperature of recognized trout waters shall not exceed 20°C. There shall be no abnormal temperature changes that may affect aquatic life unless caused by natural conditions. The temperature of impoundments where stratification occurs will be measured at mid-depth in the epilimnion for warm water fisheries and mid-depth in the hypolimnion for cold water fisheries. In the case of large impoundments (100 acres or larger) subject to stratification and recognized as trout waters, the temperature of the hypolimnion shall not exceed 20°C. The temperature in flowing streams shall be measured at mid-depth.

(f) Taste or Odor - The waters shall not contain substances that will impart unpalatable flavor to fish or result in noticeable offensive odors in the vicinity of the water or otherwise interfere with fish or aquatic life. References include, but are not limited to: Quality Criteria for Water (section 304(a) of Public Law 92-500 as amended).

(g) Toxic Substances - The waters shall not contain substances or a combination of substances including disease - causing agents which, by way of either direct exposure or indirect exposure through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), physical deformations, or restrict or impair growth in fish or aquatic life or their offspring. References on this subject include, but are not limited to: Quality Criteria for Water (Section 304(a) of Public Law 92-500 as amended), Federal Regulations under Section 307 of Public Law 92-500 as amended. The following criteria are for the protection of fish and aquatic life:

(Rule 1200—4—3—.03, continued)

(g)

Compound	Criterion Maximum Concentration ug/l (CMC)	Criterion Continuous Concentration ug/l (CCC)
Arsenic (III)	360	190
Cadmium*, dissolved	1.8/3.9/8.6	0.7/1.1/2.0
Chromium, total	—	100
Chromium, VI	16	11
Copper*, dissolved	9.2/17.7/34.1	6.5/11.8/21.4
Lead*, dissolved	33.8/81.7/197	1.3/3.2/7.7
Mercury	2.4	0.012
Nickel*, dissolved	789/1418/2549	87.7/158/283
Selenium	20	5
Silver*, dissolved	1.23/4.1/13.4	—
Zinc*, dissolved	65.0/117/211	58.9/106/191
Cyanide	22	5.2
Chlorine (TRC)	19	11
Pentachlorophenol**	20	13
Aldrin	3	—
g-BHC - Lindane	2	0.08
Chlordane	2.4	0.0043
4-4'-DDT	1.1	0.001
Dieldrin	2.5	0.0019
a-Endosulfan	0.22	0.056
b-Endosulfan	0.22	0.056
Endrin	0.18	0.0023
Heptachlor	0.52	0.0038
Heptachlor epoxide	0.52	0.0038
PCB, each aloclor	—	0.014
Toxaphene	0.73	0.0002

*Criteria for these metals are expressed as a function of total hardness (mg/L), as follows (values displayed above correspond to a total hardness of 50, 100 and 200 mg/L, respectively):

$$CMC = \exp\{m_A[\ln(\text{hardness})] + b_A\} \qquad CCC = \exp\{m_C[\ln(\text{hardness})] + b_C\}$$

	m_A	b_A	m_C	b_C
Cadmium	1.128	-3.828	0.7852	-3.490
Copper	0.9422	-1.464	0.8545	-1.465
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	3.3612	0.8460	1.1645
Silver	1.72	-6.52		
Zinc	0.8473	0.8604	0.8473	0.7614

**Criteria for pentachlorophenol are expressed as a function of pH. Values displayed above correspond to a pH of 7.8 and are calculated as follows:

$$CMC = \exp(1.005(pH) - 4.830) \qquad CCC = \exp(1.005(pH) - 5.290)$$

(7) Lower Tennessee River Basin (Including Conasauga Basin) (Cont.)

STREAM	DESCRIPTION	DOMESTIC WATER SUPPLY	INDUST WATER SUPPLY	FISH & AQUATIC LIFE	RECRE-ATION	IRRIG-ATION	LIVESTOCK WATERING & WILDLIFE	NAVIG-ATION	TROUT STREAM	NATURALLY REPRODUCING TROUT STREAM
North Potato Creek	Mile 0.0 to North Carolina-Tenn State Line)			X	X	X	X			
Burra Burra Creek	Mile 0.0 to 1.5			X	X	X	X			
Brush Creek	Mile 0.0 to Origin		X	X	X	X	X			
Belcher Creek	Mile 0.0 to Origin			X	X	X	X			
Deweese Creek	Mile 0.0 to Origin	X		X	X	X	X			
Conasauga Creek	Mile 0.0 to Cog Hill Mill Dam			X	X	X	X		X	
Conasauga Creek	Cog Hill Mill Dam to Ruralville Mill			X	X	X	X			
Cane Creek	Mile 0.0 to 3.2			X	X	X	X			
Cane Creek	Mile 3.2 to Origin			X	X	X	X			
Unnamed Branch	Mile 0.0 to Origin			X	X	X	X			
Crockett Spring Cr	Mile 0.0 to Origin			X	X	X	X			
Conasauga Creek	Ruralville Mill to Origin			X	X	X	X		X	
Gee Creek	Mile 0.0 to Origin			X	X	X	X		X	
Spring Creek	Mile 0.0 to Origin			X	X	X	X			
Yellow Creek	Mile 0.0 to Origin			X	X	X	X		X	
Big Lost Creek	Mile 0.0 to Origin			X	X	X	X		X	
Little Lost Creek	Mile 0.0 to Origin			X	X	X	X		X	
Smith Creek	Mile 0.0 to Origin			X	X	X	X		X	
Wolf Creek	Mile 0.0 to Origin			X	X	X	X		X	
Turtletown Creek	Mile 0.0 to N. Carolina Line			X	X	X	X		X	
Brushy Creek	Mile 0.0 to N. Carolina Line			X	X	X	X		X	
Coker Creek	Joe Brown Highway to Origin			X	X	X	X		X	
Hiwassee River	Mile 23.9 to 34.4	X	X	X	X	X	X	X		
North Mouse Creek	Mile 0.0 to 10.0	X	X	X	X	X	X			
Spring Creek	Mile 0.0 to 18.7		X	X	X	X	X			
Spring Creek	Mile 18.7 to Origin			X	X	X	X			
Dry Valley Creek	Mile 0.0 to 7.0			X	X	X	X			
Dry Valley Creek	Mile 7.0 to 9.5			X	X	X	X			
Dry Valley Creek	Mile 9.5 to Origin			X	X	X	X			
North Mouse Creek	Mile 10.0 to 30.1		X	X	X	X	X			
Little North Mouse Cr	Mile 0.0 to 4.1			X	X	X	X			
Little North Mouse Cr	Mile 4.1 to Origin			X	X	X	X			
North Mouse Creek	Mile 30.1 to Origin			X	X	X	X			
Oostanaula Creek	Mile 0.0 to 26.0	X	X	X	X	X	X			
Oostanaula Creek	Mile 26.0 to 28.0		X	X	X	X	X			
Oostanaula Creek	Mile 28.0 to 33.8		X	X	X	X	X			
Oostanaula Creek	Mile 33.8 to 37.5	X	X	X	X	X	X			
Oostanaula Creek	Mile 37.5 to Origin			X	X	X	X			

(7) Lower Tennessee River Basin (Including Conasauga Basin)

Hiwassee River	Mile 34.4 to 64.9 (North Carolina Line)	X	X	X	X	X	X		X	
All other surface waters named and unnamed in the Lower Tennessee River Basin, with the exception of wet weather conveyances, which have not been specifically noted shall be classified				X	X	X	X			

Preliminary Assessment
For
NGK Metals

Reference 14
Memo from John Weakley
Critical Habitat and Endangered Species

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION

September 22, 1998

MEMORANDUM

RECEIVED
SEP 28 1998
ENVIRONMENTAL ASSISTANCE CENTER AT CHATTANOOGA

To: Mr. Frank Grubbs, Deputy Director
Division of Superfund, TDEC

From: Andrew N. Barrass, Ph. D.,
Environmental Review Coordinator
Division of Natural Heritage, TDEC

Subject: Project review information for endangered species and critical or sensitive habitat

Please be advised that a review of our Division's Biological Conservation Data System, BCD, indicates **no** recorded threatened and/or endangered species within the proposed project sites nor an approximate one mile radius of the proposed project. Our records do indicate additional species occurrence records within an approximate four mile radius of the proposed project site(s) and the described fifteen mile surface water pathway. The review is for the proposed **NGK Metals, Inc. preliminary site review [TDSF #54-514], along unnamed tributary to Little North Mouse Creek to North Mouse Creek, near Athens, McMinn County, TN** project site(s). The species occurrence record information, critical or sensitive habitats, and managed areas are listed by quad map and are attached.

The results of our review do not mean that a comprehensive biological survey has been completed. We would suggest that a survey of the project sites be conducted prior to project implementation. Please notify our office of your findings.

Please be advised, however, that this information is sensitive to the protection of rare habitat, threatened or endangered species, and natural areas which our Department has the responsibility to protect. Therefore, we would request that this information **only** be used as a research tool by your professional staff and not be made available to the public or anyone outside of your Division.

We recognize the importance of stream bank habitat to improving water quality and preventing soil erosion. We would suggest that stream bank, stream side and riparian zones be restored to habitat that is representative of eco-specific communities found within the project area. Any restoration activities should include the use of native plant species.

In order to comply with the National Environmental Policy Act consideration should be given to the comprehensive and *cumulative* impacts associated with the project actions. Based upon the information provided, it is probable that any proposed stream crossing will impact instream, aquatic, habitat and riparian habitat as part of the construction. Techniques for streamside reconstruction and sediment retention are outlined in the following documents prepared by our Department:

1. **Tennessee Erosion Control Handbook, July 1992.**

2. **Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites, March 1992.**

3. **Riparian Restoration and Streamside Erosion Control Handbook, November 1994.**

Please refer to the documents when planning measures to lessen the construction impacts.

In addition to our standard project review and data search of the **Biological Conservation Data System,** we typically include information from the **Rivers and Wetlands Assessment Program** data base. This project has compiled a comprehensive database of State and Federal agency evaluated (jurisdictional) wetland sites. These programs are currently without staff. In order to continue to provide needed wetlands data, I will include wetlands data as part of the GIS formatted review. Should any of the agency evaluated wetland sites occur within the fifteen mile **PPE** search corridor or the one mile radius search area, these will be listed within Tables as part of the GIS information sheet attached

We appreciate the opportunity to assist you with your pre-project planning. If we can be of further assistance with your project or by interpreting data elements please contact our office in Nashville, telephone **615/532-0431**.

Please find attached the listings of the various data occurrences or elements from our Biological Conservation Data System, BCD, that have been retrieved from our computer data bases. The information provided is current for this quarter of the calendar year. Our information is continuously being updated and future searches may result in expanded data listings for this specific project investigation.

Definitions of BCD Data Elements:

COUNTYNAME = Tennessee County Name

MANAME = Managed Area Name

QUADNAME = Quad Map Name

SCOMNAME = State Listed, Species Common Name

SITENAME = Site Name for Natural Area, Critical or Sensitive Habitat

SNAME = Species Name

Attachments: (4)

Habitat Information for State and/or Federally Listed Species and Critical or Sensitive Habitat For Locations Within a One Mile Radius of the Project Site and a Fifteen Mile Stream Segment Downstream of the Project

The following habitat description(s) has been retrieved from our national data base for the purpose of scientific field review and population determinations. The following species occurrence record(s) are associated with primarily the **PPE** for the proposed project along upper *North Mouse Creek* and associated watershed.

One mile radius search:

[There are no records within this search area]

Fifteen mile stream segment search:

Flame Chub: *[1993]*
HEMITREMIA FLAMMEA *Springs and spring-fed streams, usually over gravel (Page and Burr 1991).**

_____
[species occurrence or record date and file or survey information]

Because the habitat for the animal species listed is very specific, you may wish to request further information from Mr. Smoot Major, in our office in Nashville. He may be reached by telephone at **615/741-9141**.

Note: **Should the project require further environmental program permits from our Department, please attach a complete copy of this review or assessment to the permit application.**

QUADNAME:..... SITENAME..... SNAME.....

ZERO Records Listed

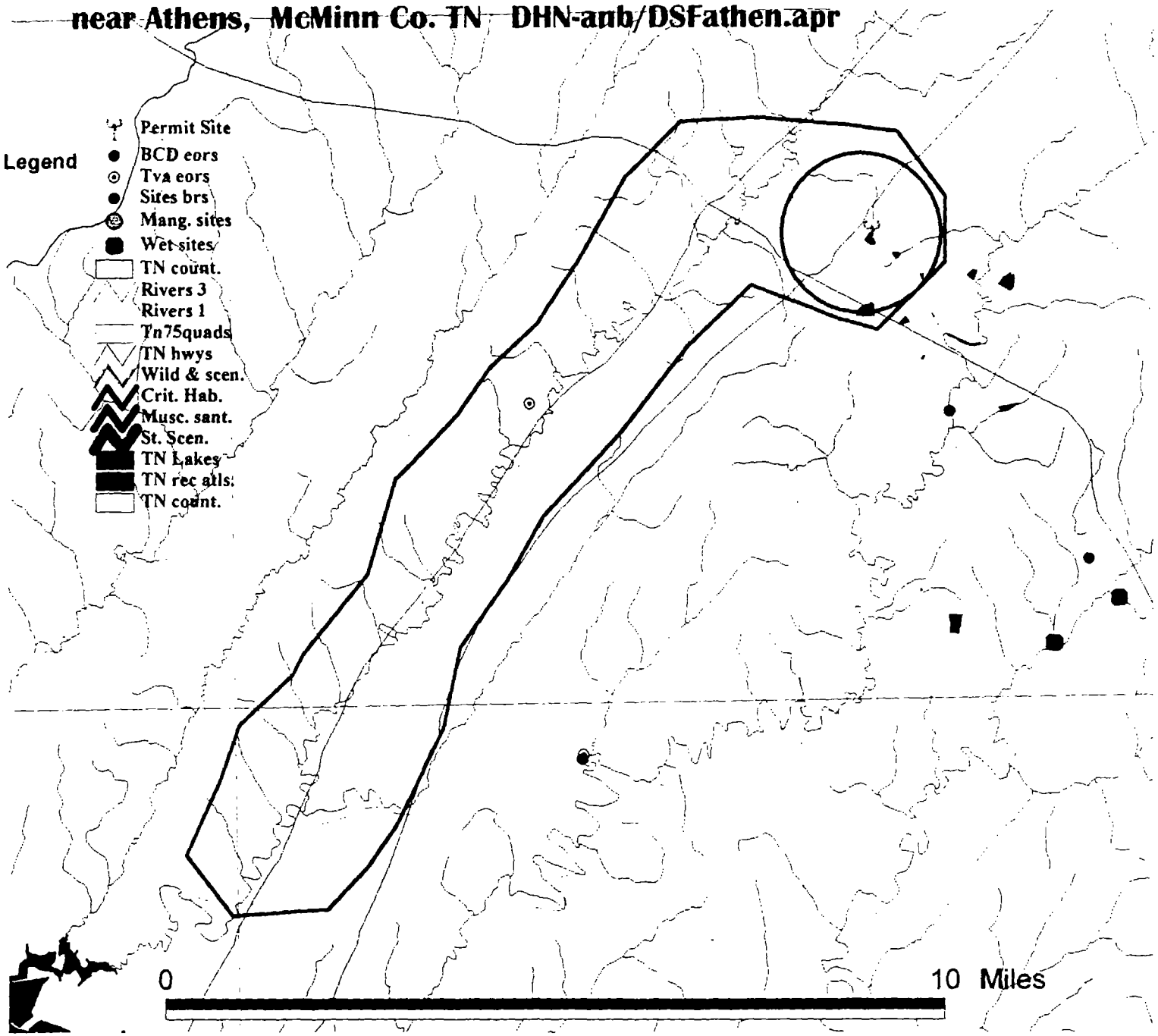
QUADNAME:..... **MANAME**.....

ZERO Records Listed

QUADNAME:.....	SCOMNAME:.....	SNAME:.....	FEDERAL	STATE	SRANK:.....
CALHOUN	HELLBENDER	CRYPTOBRANCHUS ALLEGANIENSIS	D		S3
ATHENS	TENNESSEE CAVE SALAMANDER	GYRINOPHILUS PALLEUCUS	T		S2
ATHENS	SWAINSON'S WARBLER	LIMNOTHLYPIS SWAINSONII	D		S3
[illegible]NS	GRASSHOPPER SPARROW	AMMODRAMUS SAVANNARUM	D		S4
[illegible]A	GRASSHOPPER SPARROW	AMMODRAMUS SAVANNARUM	D		S4
NIOTA	FLAME CHUB	HEMITREMIA FLAMMEA	D		S4
NIOTA	FLAME CHUB	HEMITREMIA FLAMMEA	D		S4

7 Records Processed

along tributary to Little North Mouse Creek to North Mouse Creek,
near Athens, McMinn Co. TN DHN-anb/DSFathen.apr



Preliminary Assessment
For
NGK Metals

Reference 15
Soil Survey, McMinn County

ries 1948, No. 4 Issued October 1957

SOIL SURVEY

McMinn County Tennessee

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
TENNESSEE AGRICULTURAL EXPERIMENT STATION
TENNESSEE VALLEY AUTHORITY

nd Apison soils. A small acreage occurs along the base of Starr Mountain.

The surface layer to a depth of about 10 inches is yellowish-gray or grayish-yellow loam. The sublayers are similar to those of the undulating phase. Bedrock shale is at depths ranging from 2 to about 8 feet. A few sandstone and quartzite cobbles or fragments occur in those areas along the base of Starr Mountain.

The fertility is low, and there is not much organic matter in the surface layer. The soil is medium to strongly acid. It is permeable to moisture and plant roots, but the firm subsoil retards infiltration somewhat and increases the erosion hazard.

Use suitability.—Practically all of this soil is under cutover deciduous forest. It is well suited to tilled crops, but fairly long rotations are needed because of its low fertility and moderately strong slopes. Practically all of the crops commonly grown produce well where proper management that includes adequate fertilization is used. Stands of the more exacting legumes and grasses are more difficult to maintain than on some of the more productive soils. For further discussion of use and management, see group 15 in the section, Use and Management of Soils.

Jefferson loam, eroded rolling phase (5 to 12 percent slopes) (Jb).—This phase consists of rolling areas of Jefferson loam that have been eroded to the extent that the plow layer now consists of remnants of the original surface soil mixed with subsoil. Most areas occur on gentle foot slopes in association with Lehew, Montevallo, and Apison soils.

The plow layer to a depth of about 5 inches is grayish-yellow loam. This material is underlain by the more yellowish firm but friable clay loam similar to that in the subsoil of the undulating phase of Jefferson loam. Bedrock shale is at depths of 2 to 8 feet.

In some patches on the stronger slopes the subsoil is exposed and the plow layer is yellow or yellowish-brown firm but friable clay loam. A small acreage that has slopes as steep as 25 percent is included with this phase.

This soil is not high in fertility and is low in organic matter. It is medium to strongly acid. It is fairly permeable to moisture, but because of the rolling surface and the firm subsoil that retards infiltration, erosion is a hazard where the soil is cultivated. The capacity for holding moisture for plants is fair to moderate. The soil responds well if properly fertilized.

Use suitability.—Practically all of this soil has been cleared and cultivated. About 50 percent is used for crops, and about 30 percent for pasture, much of which is unimproved. A small part is idle. Corn, tobacco, cotton, small grains, and lespedeza are the chief crops. Most of the soil is not highly fertilized, and yields are moderate.

Because of the rather strong slopes and somewhat retarded infiltration of moisture, this soil is not suited to intensive use for row crops. Where good management is practiced, productivity probably can be maintained under a 4-year rotation in which a cultivated crop is grown only for 1 year. However, on much of the acreage a cropping system consisting chiefly of small grains and hay and pasture crops is preferable. The more exacting legumes and grasses can be grown where fertility is increased to a high level, but stands are more difficult to maintain than on some of the more fertile soils of the county. For further discussion of use and management, see group 15 in the section, Use and Management of Soils.

Leadvale silt loam, undulating phase (2 to 5 percent slopes) (Lb).—This moderately well drained soil consists of local alluvium washed chiefly from Litz and Sequoia soils, which originate from predominantly acid shale in which there are occasional lenses of limestone or other calcareous material. This soil lies as very gentle foot slopes along drainageways and is associated with Litz and Sequoia soils. Practically all of it is in the Litz-Cotaco and Sequoia-Litz-Cotaco soil associations. A few areas are in the Needmore-Dandridge soil association.

Profile description:

0 to 7 inches, light yellowish-brown to pale-yellow friable silt loam.
7 to 16 inches, yellowish-brown moderately firm but friable silty clay loam.
16 to 24 inches, yellowish-brown, somewhat mottled with gray, moderately compact silty clay.
24 to 60 inches, mottled gray, yellow, and brown firm or compact silty clay; platy structure of parent shale in much of material; bedrock shale at depths of 3 to 10 feet.

The surface layer in some places, especially on the smoother parts, is darker and is brown when moist.

This soil is low to moderate in fertility and low in content of organic matter. It is medium to strongly acid. The surface layer is permeable to moisture, but the subsoil is firm enough to retard infiltration. The capacity for holding moisture is moderate. Since the lower subsoil is not very permeable to roots, this soil is somewhat less well suited to alfalfa and other deep-rooted legumes than the Decatur, Dewey, and Hermitage soils.

Use suitability.—Practically all of this soil has been cleared and is now used for crops or pasture. Rotations consisting chiefly of corn, small grains, and hay crops are used. In some sections tobacco responds well to fertilization and is of high quality. Most of the acreage receives some fertilizer, and a great part has been limed. Crop yields are moderate.

This soil is well suited to most crops commonly grown because of the smooth surface, fairly good permeability, and favorable response to fertilization. However, its retarded internal drainage and low fertility make it poorly suited to alfalfa. The more permeable open soils are better suited to truck crops.

If adequately fertilized, this soil is productive of most of the grasses and legumes used for pasture or hay. Where fertility is kept high, the soil can be used in a fairly short rotation, but the more sloping parts need erosion control. For a further discussion of use and management, see group 5 in the section, Use and Management of Soils.

Leadvale silt loam, eroded rolling phase (5 to 12 percent slopes) (La).—This phase consists of rolling areas of Leadvale silt loam that have been so eroded that the plow layer now consists of a mixture of surface soil and subsoil materials. The areas are widely distributed on foot slopes in association with Litz and Sequoia soils. A great part of the acreage is in the Litz-Cotaco and Sequoia-Litz-Cotaco soil associations.

The plow layer is grayish-yellow silt loam, and the sublayers are similar to those of Leadvale silt loam, undulating phase. The more exposed parts in many places have lost all of the surface layer and now have a plow layer of yellowish-brown firm but friable silty clay loam.

are especially needed for legume-and-grass hay and pasture crops. The response to potassium can be expected to be good. Boron also is needed for alfalfa. Where row crops are grown continuously, nitrogen fertilizer will be beneficial. Where short rotations that include the more desirable legumes are used, nitrogen fertilizer may not be required. Good tilth is easily maintained. Special practices to control erosion are necessary in very few places.

Because good stands of high-quality grazing vegetation are not difficult to maintain, these soils are especially desirable for pasture. Their good moisture supply makes them favorable for midsummer grazing, as vegetation thrives during the dry periods longer than on most of the upland soils.

Management Group 4

Management group 4 consists of very gently sloping soils derived from local alluvium. They occur along drainageways and are permeable and deep to bedrock. Greendale cherty silt loam has enough chert to interfere somewhat with cultivation. The soils of this group differ from those of group 3 chiefly in having a lower natural fertility. They differ also in parent material. The soils of group 4 consist of material derived from shale, sandy rock, and cherty limestone; whereas the soils of group 3 consist of material derived predominantly from high-grade limestone.

All the soils of group 4 are medium to strongly acid. On the whole they have good tilth; and when they are properly fertilized, their productivity is not difficult to maintain.

The soils of management group 4 and the yields of principal crops that can be expected from each under two levels of management are shown in table 9.

Present use and management.—A great part of the acreage of these soils has been cleared and is now used for crops and pasture. Corn is the chief crop, and bluegrass and whiteclover make up most of the pasture vegetation. Alfalfa, small grains, and tobacco are also grown. Some areas of these soils are used almost continuously for corn. In some places corn is rotated with small grains; in others, pasture is allowed to remain for considerable periods. Fertilization is not heavy.

Use suitability and suggested management.—Because of their smooth surface, favorable tilth, good permeability, and relatively great depth to bedrock, the soils of management group 4 are well suited to intensive use. Corn and legume-and-grass mixtures for hay and pasture are well suited. The better drained soils, as the Barbourville and Greendale, are suited to many kinds of crops, including tobacco, alfalfa, and certain truck crops.

High yields require heavy fertilization. Although continuous row crops may be grown, it is considered good management to use a short rotation that includes the more desirable legumes. Tilth is easily maintained, and special practices for controlling runoff water normally are not required.

All of these soils are productive of pasture where adequately fertilized. Lime, potassium, and phosphorus are all generally deficient. Like the soils of management groups 1 and 3, the moisture relations of these soils are more favorable for midsummer grazing than those of most of the upland soils. Slow internal drainage shortens their winter grazing season, but good stands of fall-sown grains and legumes are more easily obtained than on many of the soils of the uplands.

Management Group 5

The soils of management group 5 are friable and permeable in the upper 1½ to 2 feet, but below this the material is much firmer and has impaired internal drainage. Bedrock is at depths of 3 to 10 feet or more. Fertility is moderate to low, and the content of organic matter is low. These soils are medium to strongly acid. Their capacity for holding moisture available to plants is moderately high. Tilth is good, but field operations on the Monongahela and Leadvale soils are delayed by wetness following prolonged rains. Runoff is difficult to control only where it comes directly onto areas of the Pace and Leadvale soils from adjoining higher lying slopes.

The soils of management group 5 and the yields of principal crops that can be expected from each under two levels of management are given in table 10.

TABLE 9.—*Soils of management group 4: Expected average acre yields of the principal crops under two levels of management*

[Yields in columns A are to be expected under present management; those in columns B are to be expected under the suggested management. Blank spaces indicate either crop is not grown under the management specified or soil is unsuited to its production]

Soil	Corn		Wheat		Lespedeza		Alfalfa		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Barbourville loam	28	50	13	20	0.8	1.6	2.3	2.9	1,200	1,700	75	120
Cotaco loam [2]	25	48	10	18	.7	1.5					75	120
Cotaco silt loam [2]	30	50	13	20	.8	1.6					85	150
Greendale cherty silt loam	25	48	11	20	.9	1.7	2.2	2.9	1,100	1,500	75	105
Greendale silt loam	32	55	15	24	1.1	1.9	2.5	3.2	1,600	2,100	95	145
Whitesburg silt loam	35	55	14	21	1.1	1.9					110	150

[1] Cow-acre-days is the number of days 1 acre will graze a mature animal (cow, horse, or steer) without injury to the pasture.

[2] Yields in columns A can be expected without artificial drainage; those in columns B can be expected under adequate drainage.

TABLE 10.—*Soils of management group 5: Expected average acre yields of the principal crops under two levels of management*

[Yiel ı columns A are to be expected under present management; those in Columns B are to be expected under the suggested manage- ıt. Blank spaces indicate either crop is not grown under the management specified or soil is unsuited to its production]

Soil	Corn		Wheat		Lespedeza		Alfalfa		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
,eadvale silt loam, undulating phase	22	44	11	18	0. 8	1. 5	------	------	1, 000	1, 400	65	120
Ionongahela silt loam [2]	20	35	11	18	. 8	1. 5	------	------	------	------	65	120
'ace silt loam, undulating phase	25	52	13	23	1. 0	1. 6	2. 4	3. 0	1. 300	1, 700	80	120

[1] Cow-acre-days is the number of days 1 acre will graze a mature ıimal (cow, horse, or steer) without injury to the pasture.

[2] Yields in columns A can be expected without artificial drainage; those in columns B can be expected under adequate drainage.

Present use and management.—A great part of the ·reage is used mainly for corn, small grains, hay, and asture. Lespedeza is the most common hay crop. Fer- lization is not heavy, but lime has been used on much of ıe acreage.

Use suitability and suggested management.—The smooth ırface, ability to respond to proper fertilization, fairly gh water-supplying capacity, and ease of tillage and ıservation make these soils well suited to intensive use. 'hey are suited to most general farm crops except alfalfa. ecause of slow internal drainage, the Monongahela soil ı general is not well suited to such crops as potatoes. A ·year rotation of corn, a small grain, and red clover is ell suited. Because of low fertility, these soils require ·av ·rtilization with all plant nutrients, lime, and ·gan... matter if they are to produce high yields. Good ıth is easily maintained on the Pace soils, but tillage of ost areas of the Monongahela and Leadvale soils when ·o wet will cause clodding.

These soils require fertilization, especially with phos- ıorus and lime, for successful production of pasture. ·operly seeded and fertilized, bluegrass, fescue, and ıdino clover or white clover make good permanent ısture. The more slowly drained parts are not well suited to winter pasture crops. They are colder and hold excess moisture longer than some soils of the uplands.

Management Group 6

Brown well-drained soils on old local alluvial slopes and stream terraces are in management group 6. Most of them have firm but permeable subsoils. Among the soils of this group, the Cumberland have the firmest subsoils and the Sequatchie the most permeable. All of them have at least a moderate depth to bedrock, in most places a depth greater than 5 or 6 feet. The surface of the soils is smooth, the gradient in but few places exceeding 5 percent. The surface layers are friable and have good tilth. The natural fertility is, on the whole, moderate to high. The content of organic matter is moderate. All of the soils of this group are medium to strongly acid. Their capacity for holding moisture available to plants is moderate to high, and runoff is not difficult to control.

The soils of management group 6 and the yields of principal crops that can be expected from each under two levels of management are given in table 11.

ABLE 11.—*Soils of management group 6: Expected average acre yields of the principal crops under two levels of management*

ields in columns A are to be expected under present management; those in columns B are to be expected under the suggested management]

Soil	Corn		Wheat		Lespedeza		Alfalfa		Tobacco		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Lb.*	*Lb.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
·oa loam, eroded undulating phase	36	60	15	25	1. 0	1. 7	2. 6	3. 6	1, 500	1, 900	85	125
mberland silt loam, undulating phase	40	65	18	27	1. 2	1. 8	2. 9	3. 6	1, 600	2, 000	95	140
mberland silty clay loam, eroded undulating ıhase	38	60	16	26	1. 1	1. 7	2. 8	3. 5	1, 500	1, 900	90	130
·owah silt loam, undulating phase	35	55	15	24	1. 0	1. 6	2. 6	3. 4	1, 400	1, 800	85	130
·yter loam, undulating phase	36	58	15	23	1. 1	1. 7	2. 7	3. 4	1, 400	1, 800	85	125
rmitage silt loam, undulating phase	38	60	16	25	1. 1	1. 7	2. 8	3. 5	1, 500	1, 900	90	130
quatchie fine sandy loam, undulating phase	34	55	14	23	1. 0	1. 6	2. 6	3. 4	1, 400	1, 800	65	105
ıynesboro loam, eroded undulating phase	35	55	14	23	. 9	1. 6	2. 5	3. 4	1, 400	1, 800	80	125

[1] acre-days is the number of days 1 acre will graze a mature animal (cow, horse, or steer) without injury to the pasture.

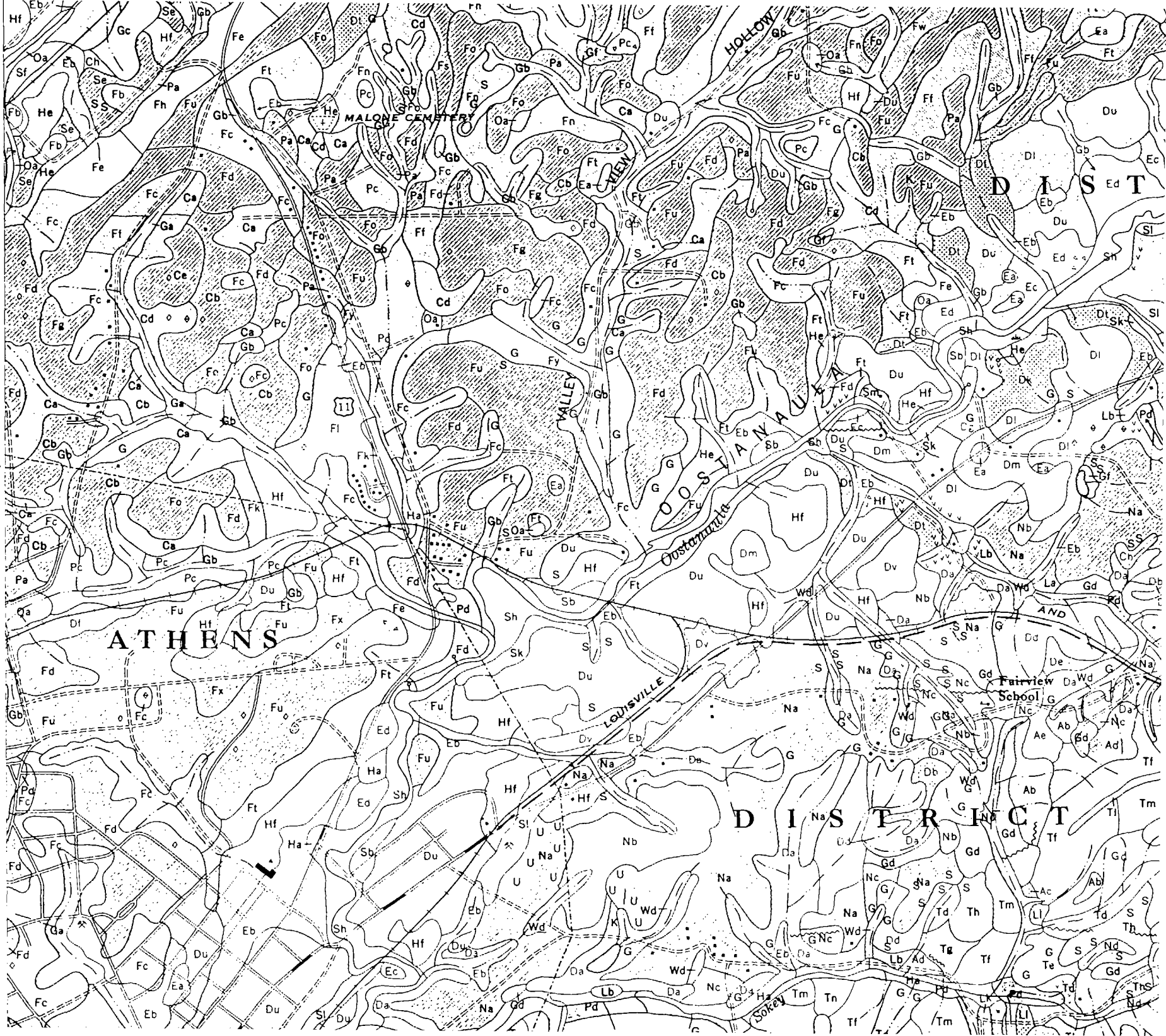
OF IMPORTANT CHARACTERISTICS—Continued

Subsoil		Depth of profile [3]	Parent rock or parent material	General drainage
Color [2]	Consistence			
		Feet		
Yellowish brown	Firm, friable	5–15	Mixed general alluvium originating from sandstone and shale; some limestone in places.	Moderately well drained.
Yellowish brown	Firm, friable	2–12	Mixed general alluvium originating from sandstone and shale; some limestone in places.	Somewhat excessively drained.
Yellow	Friable	2–12	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow	Friable	2–12	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow	Friable	2–10	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow grading to mottled	Firm, friable	2–10	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow grading to mottled	Firm, friable	2–8	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellow grading to mottled	Firm, friable	2–8	Local alluvium originating from quartzite and sandstone; some slaty material.	Well drained.
Yellowish brown, weakly mottled.	Firm, friable	3–10	Local alluvium originating chiefly from shale	Moderately well drained.
Rowish brown, weakly mottled.	Firm, friable	2–8	Local alluvium originating chiefly from shale	Somewhat excessively drained.
Reddish brown and brownish yellow.	Friable	1–2	Acid sandy and fine-grained shale	Somewhat excessively drained.
Reddish brown and brownish yellow.	Friable	1–2	Acid sandy and fine-grained shale	Somewhat excessively drained.
Reddish brown and brownish yellow.	Friable	½–1½	Acid sandy and fine-grained shale	Excessively drained.
Reddish brown and brownish yellow.	Friable	½–1½	Acid sandy and fine-grained shale	Excessively drained.
Reddish brown and brownish yellow.	Friable	1–2	Acid sandy and fine-grained shale	Somewhat excessively drained.
Reddish brown and brownish yellow.	Friable	1–2	Acid sandy and fine-grained shale	Somewhat excessively drained.
Brownish yellow	Friable	1–2	Acid fissile shale with limestone lenses	Somewhat excessively drained.
Brownish yellow	Friable	½–1½	Acid fissile shale with limestone lenses	Somewhat excessively drained.
Brownish yellow	Friable	1–2	Acid fissile shale with limestone lenses	Well drained.
Brownish yellow	Friable	½–1½	Acid fissile shale with limestone lenses	Somewhat excessively drained.
Brownish yellow	Friable	½–1	Acid fissile shale with limestone lenses	Excessively drained.
Brownish yellow	Friable	½–1	Acid fissile shale with limestone lenses	Excessively drained.
Brownish yellow	Friable	½–1	Acid fissile shale with limestone lenses	Excessively drained.

SOILS OF McMINN COUNTY, TENNESSEE: SUMMARY

Map symbol	Soil	Management group [1]	Slope range	Surface soil color [2]
	Holston loam—Continued		*Percent*	
Hh	Eroded undulating phase	10	2–5	Light yellowish brown
Hg	Eroded rolling phase	15	5–12	Light yellowish brown
Ja	Jefferson fine sandy loam, rolling phase	15	3–12	Yellowish gray
	Jefferson stony fine sandy loam:			
Jf	Rolling phase	15	3–12	Yellowish gray
Je	Hilly phase	18	12–25	Yellowish gray
	Jefferson loam:			
Jd	Undulating phase	10	2–5	Yellowish gray
Jc	Rolling phase	15	5–12	Yellowish gray
Jb	Eroded rolling phase	15	5–12	Grayish yellow
	Leadvale silt loam:			
L	Undulating phase	5	2–5	Light yellowish brown
La	Eroded rolling phase	15	5–12	Grayish yellow
Lc	Lehew-Montevallo loams, hilly phases	23	12–25	Light reddish brown and grayish yellow.
	Lehew-Montevallo shaly loams:			
Le	Eroded hilly phases	23	12–25	Light reddish brown and brownish yellow.
Lh	Steep phases	23	25–60	Light reddish brown and grayish yellow.
Lg	Eroded steep phases	23	25–60	Light reddish brown and brownish yellow.
Ld	Lehew-Montevallo loams, rolling phases	11	5–12	Light reddish brown and grayish yellow.
Lf	Lehew-Montevallo shaly loams, eroded rolling phases	11	5–12	Light reddish brown and brownish yellow.
Lv	Litz silt loam, rolling phase	11	5–12	Light yellowish brown
	Litz shaly silt loam:			
Lr	Eroded rolling phase	21	5–12	Brownish yellow
Lt	Eroded undulating phase	11	2–5	Brownish yellow
Lu	Litz silt loam, hilly phase	21	12–25	Light yellowish brown
Lp	Litz shaly silt loam, eroded hilly phase	21	12–25	Brownish yellow
Lw	Litz silt loam, steep phase	23	25–60	Light yellowish brown
s	Litz shaly silt loam, eroded steep phase	23	25–60	Brownish yellow

See footnotes at end of table.


MALONE CEMETERY
HOLLOW
VIEW
VALLEY
OOSTANAULA
Oostanaula
ATHENS
DISTRICT
LOUISVILLE
AND
Fairview School
Sokey
11

(Sheet 20)

Preliminary Assessment
For
NGK Metals

Reference 16
1990 Census of Population, Tennessee

1990 CENSUS POPULATION FACTOR

CODE	COUNTY	FACTOR
001	ANDERSON	2.47
003	BEDFORD	2.59
005	BENTON	2.46
007	BLEDSOE	2.64
009	BLOUNT	2.51
011	BRADLEY	2.61
013	CAMPBELL	2.65
015	CANNON	2.60
017	CARROLL	2.50
019	CARTER	2.49
021	CHEATHAM	2.82
023	CHESTER	2.59
025	CLAIBORNE	2.65
027	CLAY	2.51
029	COCKE	2.58
031	COFFEE	2.57
033	CROCKETT	2.53
035	CUMBERLAND	2.55
037	DAVIDSON	2.36
039	DECATUR	2.45
041	DE KALB	2.50
043	DICKSON	2.65
045	DYER	2.52
047	FAYETTE	2.97
049	FENTRESS	2.64
051	FRANKLIN	2.64
053	GIBSON	2.48
055	GILES	2.58
057	GRAINGER	2.64
059	GREENE	2.52
061	GRUNDY	2.75
063	HAMBLEN	2.56
065	HAMILTON	2.50
067	HANCOCK	2.65
069	HARDEMAN	2.73
071	HARDIN	2.56
073	HAWKINS	2.58
075	HAYWOOD	2.74
077	HENDERSON	2.54
079	HENRY	2.42
081	HICKMAN	2.63
083	HOUSTON	2.55
085	HUMPHREYS	2.56
087	JACKSON	2.52
089	JEFFERSON	2.55
091	JOHNSON	2.52
093	KNOX	2.42
095	LAKE	2.50
097	LAUDERDALE	2.68
099	LAWRENCE	2.62
101	LEWIS	2.58
103	LINCOLN	2.57
105	LOUDON	2.54
107	MCMINN	2.55
109	MCNAIRY	2.51
111	MACON	2.57
13	MADISON	2.55
115	MARION	2.67
117	MARSHALL	2.57
119	MAURY	2.62
121	MEIGS	2.64
123	MONROE	2.63
125	MONTGOMERY	2.72
127	MOORE	2.72
129	MORGAN	2.74
131	OBION	2.53
133	OVERTON	2.59
135	PERRY	2.57
137	PICKETT	2.52
139	POLK	2.66
141	PUTNAM	2.45
143	RHEA	2.57
145	ROANE	2.53
147	ROBERTSON	2.77
149	RUTHERFORD	2.69
151	SCOTT	2.78
153	SEQUATCHIE	2.67
155	SEVIER	2.58
157	SHELBY	2.65
159	SMITH	2.61
161	STEWART	2.53
163	SULLIVAN	2.49
165	SUMNER	2.77
167	TIPTON	2.86
169	TROUSDALE	2.56
171	UNICOI	2.46
173	UNION	2.75
175	VAN BUREN	2.69
177	WARREN	2.57
179	WASHINGTON	2.45
181	WAYNE	2.65
183	WEAKLEY	2.47
185	WHITE	2.57
187	WILLIAMSON	2.88
189	WILSON	2.79

NGK Metals

1990 Census Data - Block Group Level
LAT: 0353411 LONG: 0843523

miles	0-.25	.25-.5	.5-1	1-2	2-3	3-4	
KM	0.00- 0.4	0.4- 0.8	0.8- 1.6	1.6- 3.2	3.2- 4.8	4.8- 6.4	TOTAL
RING TOTALS	0	0	0	1598	258	663	2519

1990 Census Data - Block Level
LAT: 0353411 LONG: 0843523

KM	0.00- 0.4	0.4- 0.8	0.8- 1.6	1.6- 3.2	3.2- 4.8	4.8- 6.4	TOTAL
RING TOTALS	0	0	134	471	549	1038	2192

TENNESSEE DEPARTMENT OF ENVIRONMENT & CONSERVATION
DIVISION OF SUPERFUND

RECEIVED
JAN 20 1999
ENVIRONMENTAL ASSISTANCE
CENTER AT CHATTANOOGA

OFFICE CORRESPONDENCE

January 14, 1999

TO: Jill Davis, EAC-CH

FROM: John T. Weakley JTW

SUBJECT: PC-GEMS Data

Attached is the PC-GEMS information for latitude 35° 34′ 05″ longitude 84° 35′ 37″

NGK Metals

1990 Census Data - Block Group Level
LAT: 0353411 LONG: 0843523

miles	0-.25	.25-.5	.5-1	1-2	2-3	3-4	
KM	0.00- 0.4	0.4- 0.8	0.8- 1.6	1.6- 3.2	3.2- 4.8	4.8- 6.4	TOTAL
RING	0	0	0	1598	258	663	2519
TOTALS							

1990 Census Data - Block Level
LAT: 0353411 LONG: 0843523

KM	0.00- 0.4	0.4- 0.8	0.8- 1.6	1.6- 3.2	3.2- 4.8	4.8- 6.4	TOTAL
RING	0	0	134	471	549	1038	2192
TOTALS							

Preliminary Assessment
For
NGK Metals

Reference 17
U.S. EPA Region IV 'OTS Guidance'

Office of Technical Services Supplemental Guidance to RAGS: Region 4 Bulletins **(October, 1996)**

United States Environmental Protection Agency, Region 4

Waste Management Division

61 Forsyth St.

Atlanta, GA 30303

Phone: 404-562-9714

Fax: 404-562-8628

For best quality hard-copy save and print this document as a PostScript file.
Click on any HYPETREXT link in this color to move around the document.

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Ecological

1. Ecological Introduction
2. Preliminary Risk Evaluation
3. Ecological Screening Values
   - Table 1 Freshwater Surface Water Screening Values
   - Table 2 Saltwater Screening Values
   - Table 3 Sediment Screening Values
4. Endpoint Selection
5. Natural Resource Trustees

Index
Human Health

1. Human HealthIntroduction
2. Data collection and Evaluation
3. Toxicity

Program. NOAA Technical Memorandum NOS OMA 52.
4. Long, ER, DD MacDonald, SL Smith, and FD Calder. 1995. "Incidence of Adverse Biological Effects with Ranges of Chemical Concentrations in Marine and Estuarine Sediments." Environmental Management 19(1): 81-97.

Table 1 Table 2|Table 3|TOP|

Table 1. Region 4 Waste Management Division Freshwater Surface Water Screening Values for Hazardous Waste Sites[1]

Priority Pollutants

Compound	Acute Screening Values (ug/L)	Chronic Screening Values (ug/L)
Antimony	1300 (2s)	160 (2s)
Arsenic III	360*	90*
Beryllium	16 (6s)	0.53 (1s)
Cadmium2	1.79*	0.66*
Chromium (III)2	984.32*	117.32*
Chromium (VI)	16*	11*
Copper2	9.22*	6.54*
Lead2	33.78*	1.32*
Mercury	2.40*	0.012*3
Nickel2	789.00*	87.71*
Selenium	20.00*	5.00*
Silver2	1.23*	0.012(1s)
Thallium	140.00(3s)	4.00 (2s)
Zinc2	65.04*	58.91*
Cyanide	22*	5.2*
2,3,7,8-TCDD-Dioxin	0.1	0.00001[3

Acrolein	6.8(3s)	2.1 (1s)
Acrylonitrile	755 (4s)	75.5
Benzene	530 (7s)	53
Bromoform	2930 (2s)	293
Carbon Tetrachloride	3520 (3s)	352
Chlorobenzene	1950 (5s)	195
2-Chloroethylvinyl Etheru	35400 (1s)	3540
Chloroform	2890 (3s)	289
1,2-Dichloroethane	11800 (3s)	2000 (1s)
1,1-Dichloroethylene	3030 (3s)	303
1,2-Dichloropropane	5250 (3s)	525
1,3-Dichloropropylene (cis and trans)	606 (2s)	24.4 (1s)
Ethylbenzene	4530 (5s)	453
Methyl Bromide	1100 (1s)	110
Methyl Chloride	55000 (1s)	5500
Methylene Chloride	19300 (3s)	1930
1,1,2,2-Tetrachloroethane	932 (3s)	240 (1s)
Tetrachloroethylene	528 (5s)	84 (1s)
Toluene	1750 (5s)	175
1,2-Trans-Dichloroethylene	13500 (1s)	1350
1,1,1-Trichloroethane	5280 (2s)	528
1,1,2-Trichloroethane	3600(3s)	940(1s)
2-Chlorophenol	438 (5s)	43.8
2,4-Dichlorophenol	202 (3s)	36.5 (1s)
2,4-Dimethylphenol	212 (3s)	21.2
2-Methyl-4,6-Dinitrophenol (4,6-Dinitro-O-Cresol)	23 (4s)	2.3
2,4-Dinitrophenol	62 (3s)	6.2
2-Nitrophenol	-	3500
4-Nitrophenol	828 (3s)	82.8
3-Methyl-4-Chlorophenol(P-Chloro-M-Cersol)	3 (1s)	0.3
Pentachlorophenol[4] (pH 7.8)	20 *	13*

Preliminary Assessment
For
NGK Metals

Appendix B
Photodocumentation

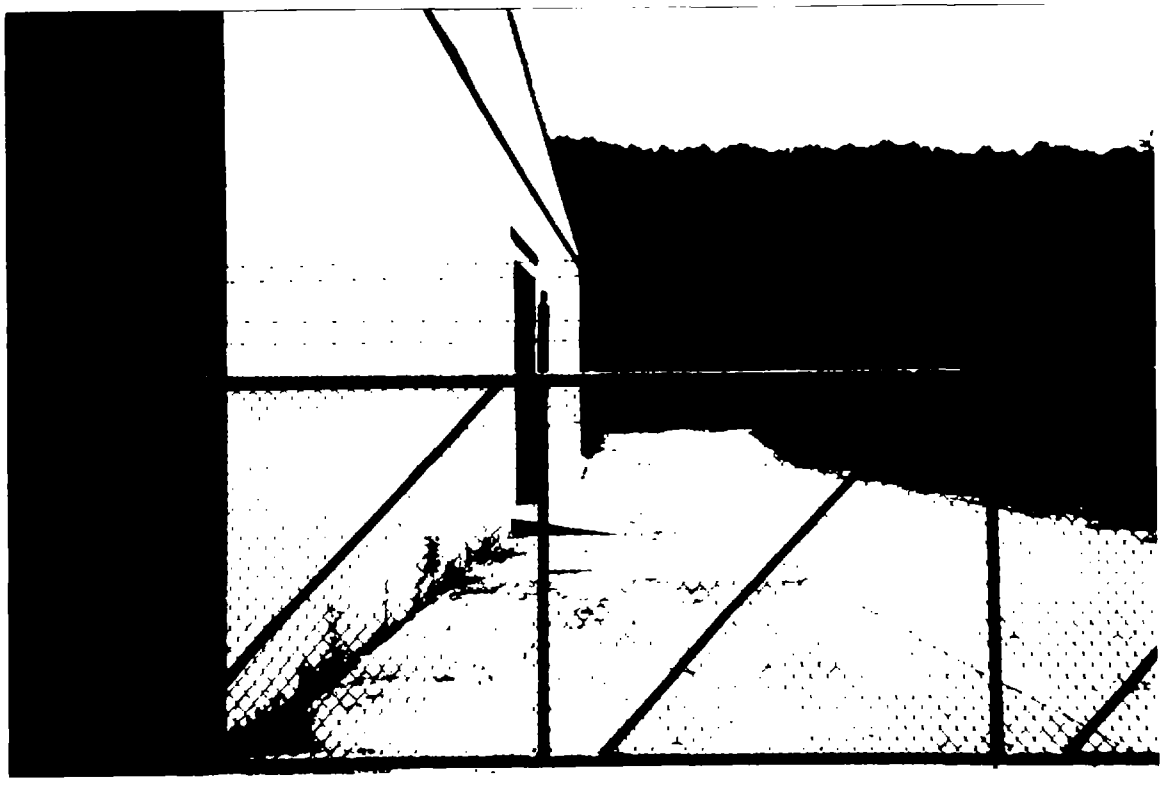
Photographs
NGK Metals

Facility Sign
October 29, 1998

For Sale Sign
October 29, 1998

Photographs
NGK Metals

Western Front of Facility
October 29, 1998



East Side of Facility
October 29, 1998

Preliminary Assessment
For
NGK Metals

Appendix C
4-Mile Radius USGS Topographical Map

Preliminary Assessment
For
NGK Metals

Appendix D
PA Scoresheets

OMB Approval Number: 2050-0095
Approved for Use Through: 4/95

PA SITE SHEET

Site Name: NGK Metals
CERCLIS ID No.: TND980314033
Street Address: 725 East Avenue
City/State/Zip: Athens, TN 37303

Investigator: Jill Davis
Agency/Organization: TDEC/DS
Street Address: 540 McCallie Avenue
City/State: Chattanooga, TN

Date: 1/99

FOIA EXEMPTION #5
6/22/1999

ASTE CHARACTERISTICS

Waste Characteristics (WC) Calculations:

1 Waste Foundry Sand	Contaminated soil	WQ value	maximum
Volume	5.00E+00 cu ft	7.41E-05	
Area	1.00E+03 sq ft	2.94E-02	2.94E-02

** Only First WC Page Is Printed ** | Waste Characteristics Score: WC = 18

Ground Water Pathway Criteria List
Suspected Release

Are sources poorly contained? (y/n/u)	N
Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)? (y/n/u)	N
Is waste quantity particularly large? (y/n/u)	N
Is precipitation heavy? (y/n/u)	N
Is the infiltration rate high? (y/n/u)	N
Is the site located in an area of karst terrain? (y/n)	Y
Is the subsurface highly permeable or conductive? (y/n/u)	N
Is drinking water drawn from a shallow aquifer? (y/n/u)	N
Are suspected contaminants highly mobile in ground water? (y/n/u)	N
Does analytical or circumstantial evidence suggest ground water contamination? (y/n/u)	N

Other criteria? (y/n) N

SUSPECTED RELEASE? (y/n) N

Summarize the rationale for Suspected Release:

Ground Water Pathway Criteria List
Primary Targets

Is any drinking water well nearby? (y/n/u)

Has any nearby drinking water well been closed? (y/n/u)

Has any nearby drinking water well user reported foul-testing or foul-smelling water? (y/n/u)

Does any nearby well have a large drawdown/high production rate? (y/n/u)

Is any drinking water well located between the site and other wells that are suspected to be exposed to a hazardous substance? (y/n/u)

Does analytical or circumstantial evidence suggest contamination at a drinking water well? (y/n/u)

Does any drinking water well warrant sampling? (y/n/u)

Other criteria? (y/n)

PRIMARY TARGET(S) IDENTIFIED? (y/n)

Summarize the rationale for Primary Targets:

GROUND WATER PATHWAY SCORESHEETS

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	No	
Is the site located in karst terrain? (y/n)	Yes	
Depth to aquifer (feet):	100	
Distance to the nearest drinking water well (feet):	2700	

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	0		
2. NO SUSPECTED RELEASE		340	
LR =	0	340	

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION Are any wells part of a blended system? (y/n) Y	0	819	
5. NEAREST WELL	0	20	
6. WELLHEAD PROTECTION AREA Underlies Site	0	20	
7. RESOURCES	0	5	
T =	0	864	

WASTE CHARACTERISTICS WC =	0	18

GROUND WATER PATHWAY SCORE:	64

:ound Water Target Populations

Primary Target Population Drinking Water Well ID	Dist. (miles)	Population Served	Reference	Value
None				
*** Note : Maximum of 5 Wells Are Printed ***			Total	

Secondary Target Population Distance Categories	Population Served	Reference	Value
0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	10		1
Greater than 1 to 2 miles	12000		816
Greater than 2 to 3 miles	20		1
Greater than 3 to 4 miles	26		1
		Total	819

pportionment Documentation for a Blended System

Surface Water Pathway Criteria List
Suspected Release

Is surface water nearby? (y/n/u)	Y
Is waste quantity particularly large? (y/n/u)	N
Is the drainage area large? (y/n/u)	N
Is rainfall heavy? (y/n/u)	N
Is the infiltration rate low? (y/n/u)	Y
Are sources poorly contained or prone to runoff or flooding? (y/n/u)	Y
Is a runoff route well defined(e.g.ditch/channel to surf.water)? (y/n/u)	Y
Is vegetation stressed along the probable runoff path? (y/n/u)	N
Are sediments or water unnaturally discolored? (y/n/u)	N
Is wildlife unnaturally absent? (y/n/u)	N
Has deposition of waste into surface water been observed? (y/n/u)	N
Is ground water discharge to surface water likely? (y/n/u)	N
Does analytical/circumstantial evidence suggest S.W. contam? (y/n/u)	Y

Other criteria? (y/n) Y

SUSPECTED RELEASE? (y/n) Y

Summarize the rationale for Suspected Release:

storm water data from the Division of Water Pollution Control showed levels of copper exceeded storm water report levels. An inspection of the site during operation revealed small amounts of spillage from the mfg. building (of waste foundry sand) and from an outside roll off box (large dumpster). Results reported for total copper were 304, 77, 68 and 60 micrograms per liter. Results shown were from August 1993 to September 1995

Surface Water Pathway Criteria List
Primary Targets

Is any target nearby? (y/n/u) If yes: Y
N Drinking water intake
Y Fishery
N Sensitive environment

Has any intake, fishery, or recreational area been closed? (y/n/u) N

Does analytical or circumstantial evidence suggest surface water contamination at or downstream of a target? (y/n/u) N

Does any target warrant sampling? (y/n/u) If yes: N
N Drinking water intake
N Fishery
N Sensitive environment

Other criteria? (y/n) N

PRIMARY INTAKE(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Intakes:

continued -------

continued -------

Other criteria? (y/n) N

PRIMARY FISHERY(IES) IDENTIFIED? (y/n) Y

Summarize the rationale for Primary Fisheries:

storm water sampling conducted by the facility during active periods revealed exceedences in report levels of copper.

Other criteria? (y/n) N

PRIMARY SENSITIVE ENVIRONMENT(S) IDENTIFIED? (y/n) N

Summarize the rationale for Primary Sensitive Environments:

SURFACE WATER PATHWAY SCORESHEETS

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	Yes	
Distance to surface water (feet):	0	
Flood frequency (years):	1-10	
What is the downstream distance (miles) to:		
a. the nearest drinking water intake?	0.0	
b. the nearest fishery?	0.0	
c. the nearest sensitive environment?	0.0	

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	550		
2. NO SUSPECTED RELEASE		0	
LR =	550	0	

:inking Water Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
3. Determine the water body type, flow (if applicable), and number of people served by each drinking water intake.			
4. PRIMARY TARGET POPULATION 0 person(s)	0		
5. SECONDARY TARGET POPULATION Are any intakes part of a blended system? (y/n): N	0	0	
6. NEAREST INTAKE	0	0	
7. RESOURCES	5	0	
T =	5	0	

Drinking Water Threat Target Populations

Intake Name	Primary (y/n)	Water Body Type/Flow	Population Served	Ref.	Value
None					

Total Primary Target Population Value	0
Total Secondary Target Population Value	0

*** Note : Maximum of 6 Intakes Are Printed ***

ɔportionment Documentation for a Blended System

uman Food Chain Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
8. Determine the water body type and flow for each fishery within the target limit.			
9. PRIMARY FISHERIES	0		
10. SECONDARY FISHERIES	210	0	
T =	210	0	

Human Food Chain Threat Targets

Fishery Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
1 Little North Mouse Creek	N	<10 cfs		210
2 North Mouse Creek	N	<10 cfs		210
None				

Total Primary Fisheries Value	0
Total Secondary Fisheries Value	210

*** Note : Maximum of 6 Fisheries Are Printed ***

ıvironmental Threat Targets

TARGETS	Suspected Release	No Suspected Release	References
11. Determine the water body type and flow (if applicable) for each sensitive environment.			
12. PRIMARY SENSITIVE ENVIRONMENTS	0		
13. SECONDARY SENSITIVE ENVIRONS.	0	0	
T =	0	0	

Environmental Threat Targets

Sensitive Environment Name	Primary (y/n)	Water Body Type/Flow	Ref.	Value
1 Flame Chub	N	<10 cfs		0
None				

Total Primary Sensitive Environments Value	0
Total Secondary Sensitive Environments Value	0

*** Note: Maximum of 6 Sensitive Environments Are Printed ***

ırface Water Pathway Threat Scores

Threat	Likelihood of Release(LR) Score	Targets(T) Score	Pathway Waste Characteristics (WC) Score	Threat Score LR x T x WC / 82,500
Drinking Water	550	5	18	1
Human Food Chain	550	210	18	25
Environmental	550	0	18	0

SURFACE WATER PATHWAY SCORE: 26

Soil Exposure Pathway Criteria List
Resident Population

Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination? (y/n/u)	Y
Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator? (y/n/u)	N
Is there a migration route that might spread hazardous substances near residences, schools, or daycare facilities? (y/n/u)	Y
Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems? (y/n/u)	N
Does any neighboring property warrant sampling? (y/n/u)	N

Other criteria? (y/n) N

RESIDENT POPULATION IDENTIFIED? (y/n) N

Summarize the rationale for Resident Population:

SOIL EXPOSURE PATHWAY SCORESHEETS

Pathway Characteristics		Ref.
Do any people live on or within 200 ft of areas of suspected contamination? (y/n)	No	
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination? (y/n)	No	
Is the facility active? (y/n):	No	

LIKELIHOOD OF EXPOSURE	Suspected Contamination	References
1. SUSPECTED CONTAMINATION LE =	550	

Targets

2. RESIDENT POPULATION 0 resident(s) 0 school/daycare student(s)	0	
3. RESIDENT INDIVIDUAL	0	
4. WORKERS None	0	
5. TERRES. SENSITIVE ENVIRONMENTS	0	
6. RESOURCES	0	
T =	0	

WASTE CHARACTERISTICS

WC = 18

RESIDENT POPULATION THREAT SCORE: 0

NEARBY POPULATION THREAT SCORE: 1

Population Within 1 Mile: 1 - 10,000

SOIL EXPOSURE PATHWAY SCORE: 1

oil Exposure Pathway Terrestrial Sensitive Environments

Terrestrial Sensitive Environment Name	Reference	Value
None		
Total Terrestrial Sensitive Environments Value		

*** Note : Maximum of 7 Sensitive Environments Are Printed ***

Air Pathway Criteria List
Suspected Release

Are odors currently reported? (y/n/u)	N
Has release of a hazardous substance to the air been directly observed? (y/n/u)	N
Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air? (y/n/u)	N
Does analytical/circumstantial evidence suggest release to air? (y/n/u)	N
Other criteria? (y/n) N	
SUSPECTED RELEASE? (y/n)	N

Summarize the rationale for Suspected Release:

AIR PATHWAY SCORESHEETS

Pathway Characteristics		Ref.
Do you suspect a release? (y/n)	No	
Distance to the nearest individual (feet):	0	

LIKELIHOOD OF RELEASE	Suspected Release	No Suspected Release	References
1. SUSPECTED RELEASE	0		
2. NO SUSPECTED RELEASE		500	
LR =	0	500	

Targets

TARGETS	Suspected Release	No Suspected Release	References
3. PRIMARY TARGET POPULATION 0 person(s)	0		
4. SECONDARY TARGET POPULATION	0	1	
5. NEAREST INDIVIDUAL	0	0	
6. PRIMARY SENSITIVE ENVIRONS.	0		
7. SECONDARY SENSITIVE ENVIRONS.	0	0	
8. RESOURCES	0	5	
T =	0	6	

WASTE CHARACTERISTICS		
WC =	0	18

AIR PATHWAY SCORE:	1

ir Pathway Secondary Target Populations

Distance Categories	Population	References	Value
Onsite	0		0
Greater than 0 to 1/4 mile	0		0
Greater than 1/4 to 1/2 mile	0		0
Greater than 1/2 to 1 mile	0		0
Greater than 1 to 2 miles	1598		1
Greater than 2 to 3 miles	258		0
Greater than 3 to 4 miles	663		0
	Total Secondary Population Value		1

ir Pathway Primary Sensitive Environments

Sensitive Environment Name	Reference	Value
None		
Total Primary Sensitive Environments Value		

*** Note : Maximum of 7 Sensitive Environments Are Printed***

Air Pathway Secondary Sensitive Environments

Sensitive Environment Name	Distance	Reference	Value
None			
Total Secondary Sensitive Environments Value			

SITE SCORE CALCULATION	SCORE
GROUND WATER PATHWAY SCORE:	64
SURFACE WATER PATHWAY SCORE:	26
SOIL EXPOSURE PATHWAY SCORE:	1
AIR PATHWAY SCORE:	1
SITE SCORE:	35

SUMMARY

1. Is there a high possibility of a threat to any nearby drinking water well(s) by migration of a hazardous substance in ground water? No

   If yes, identify the well(s).

   If yes, how many people are served by the threatened well(s)? 0

2. Is there a high possibility of a threat to any of the following by hazardous substance migration in surface water?
   A. Drinking water intake No
   B. Fishery No
   C. Sensitive environment (wetland, critical habitat, others) No

   If yes, identity the target(s).

3. Is there a high possibility of an area of surficial contamination within 200 feet of any residence, school, or daycare facility? No

   If yes, identify the properties and estimate the associated population(s)

4. Are there public health concerns at this site that are not addressed by PA scoring considerations? No

   If yes, explain:

REFERENCE L

Removal/Ass. Referral 9/15/98 (D.S.C. 9/24/98)

POTENTIAL HAZARDOUS WASTE SITE
SITE IDENTIFICATION ("DISCOVERY")

I. IDENTIFICATION

TND 980314033

01 ST	02 SITE NUMBER
TN	54-514

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NUMBER, OR SPECIFIC LOCATION IDENTIFIER				
NGK Metals	725 East Avenue				
03 CITY	04 ST	05 ZIP CODE	06 COUNTY	07 CO CODE	08 CONG DIST
Athens	TN	37303	McMinn	54	02

09 DIRECTIONS TO SITE (Starting from nearest public road, enter up to 4 lines of text)

From I-75, take the Athens/Decatur exit #49 south. Travel approximately 3 miles and turn east (left) onto Congress Parkway (Hwy. 11). Travel approximately 3 miles and turn right onto East Avenue. The former NGK Metals location is at the end of the road. Latitude: 35°26'52" Longitude: 84°36'43"

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, residential, mailing)			
Lynne Woodside	Post Office Box 13367			
03 CITY	04 ST	05 ZIP CODE	06 TELEPHONE NUMBER	
Reading	PA	19612	(215)921-5303	
07 OPERATOR (If known and different from owner)	08 STREET (Business, residential, mailing)			
John Manikas				
09 CITY	10 ST	11 ZIP CODE	12 TELEPHONE NUMBER	
Sweetwater	TN	37874	(423)337-5500	

13 TYPE OF OWNERSHIP (Mark one, use "insert" mode)

X A. PRIVATE _ B. FEDERAL (Agency name): _____ _ C. STATE _ D. COUNTY
_ E. MUNICIPAL _ F. OTHER (Specify): _____ _ G. UNKNOWN

IV. HOW IDENTIFIED

01 DATE IDENTIFIED: 1/28/98 (Month/Day/Year)

02 IDENTIFIED BY (Mark all that apply; use "insert" mode)

_ A. CITIZEN COMPLAINT _ B. INDUSTRY X C. STATE/LOCAL GOVERNMENT
_ D. AERIAL RECONNAISSANCE _ E. RCRA INSPECTION _ F. SURFACE IMPOUNDMENT ASSESSMENT
_ G. OTHER EPA IDENTIFICATION X H. OTHER (Specify): Files Search

V. SITE CHARACTERIZATION

01 TYPE OF SITE (Mark all that apply, use "insert" mode)

_ A. STORAGE _ B. TREATMENT _ C. DISPOSAL _ D. UNAUTHORIZED DUMPING X E. OTHER (Specify): manufacturing

02 SUMMARY OF KNOWN PROBLEMS (Provide narrative description, enter up to 6 lines of text)

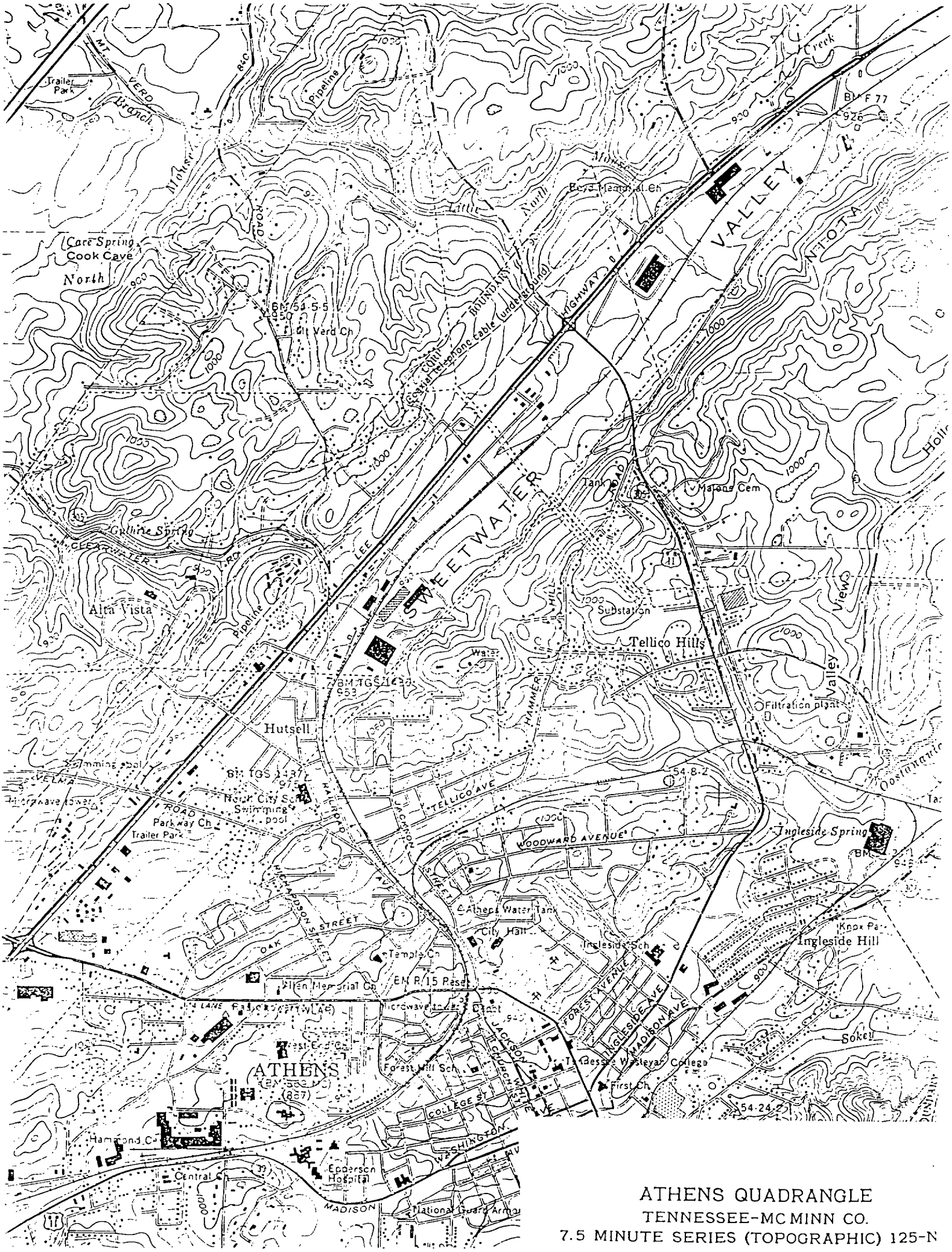
History of Division of Air Pollution violations (i.e. documentation) and Division of Water Pollution Control violations (i.e. storm water). Storm water permit exceedances included total suspended solids (fugitive dust problems noted in past inspections from DWPC).

03 SUMMARY OF ALLEGED OR POTENTIAL PROBLEMS (Provide narrative description, enter up to 5 lines of text)

Improper housekeeping techniques. Possible surface soil contamination where waste were released and pooled. Possible release to surface water. Contaminants would include but not be limited to beryllium, arsenic, cadmium, copper, lead and nickel.

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
Jill E. Davis	TN. Division of Superfund			(423) 634-5755
04 PREPARED BY	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE (Month/Day/Year)
Jill E. Davis	TNDSF	TNDEC	(423) 634-5755	8/25/98



ATHENS QUADRANGLE
TENNESSEE-MC MINN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC) 125-N

DATE: 1-OCT-98

SUBJECT: Findings of Removal Assessment at NGK Metals Site in Athens, TN

FROM: Don Rigger, OSC

TO: Removal Assessment File

On 28-SEP-98 I conducted a windshield assessment of this "Potential Hazardous Waste Site" which was referred to ERRB by the North Site Management Branch. I did not see anything which indicates that a removal action is warranted. The site is secured with a chain link fence, it is mostly paved, there are no wastes or containers visible (I did not look inside the building), the site is very tidy, and there are no indications (no stressed vegetation or stained soil) of contamination. No data was made available to me indicating the presence of contaminants at the site. Therefore, based on the fact that the site does not meet the NCP criteria for a removal action, I recommend a "No Further Action" classification for this site.