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|---|---|
| Site Name (Subject): | TUNGSTEN QUEEN MINE/ATLAS MINE |
| Site ID (Document ID): | NCD082362989 |
| Document Name (DocType): | Correspondence (C) |
| Report Segment: | |
| **Description:** | General Correspondence, 1985 - 2004 |
| Date of Document: | 4/8/2004 |
| Date Received: | |
| Box: *Enter SF and # with no spaces* | SF10,634 |
| Access Level: | PUBLIC |
| Division: | WASTE MANAGEMENT |
| Section: | SUPERFUND |
| Program (Document Group): | SERB (SERB) |
| Document Category: | FACILITY |

**Print Report for Record** | **Go to New Blank Record** | **Go to New Record - (default to last record values)** | **Delete Record**

# TUNGSTEN QUEEN MINE

NCD 082 362 989

### *Folders*

1. General Correspondence file, 1985—

### *Bound Reports*

2. Preliminary Assessment: April 1985
3. Phase II Abbreviated Sampling Plan & Health and Safety Plan: May 1991
4. Phase II Site Screening Inspection References: August 1991
5. Data Validation Package: January 1992
6. Phase II Screening Site Investigation: July 1992

### *Maps*

See Map Cabinet #2

U.S. Environmental Protection Agency

# Superfund Information Systems



CERCLIS Database
Archived Sites
Site Documents
Data Element Dictionary (DED)
Order Superfund Products
Customer Satisfaction Survey

## Archived Sites

### TUNGSTEN QUEEN MINE

### Site Information

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

Site Name: TUNGSTEN QUEEN MINE
Street: 2 MI SE OF TOWNSVILLE
City / State / ZIP: TOWNSVILLE, NC 27584

NPL Status: Not on the NPL
Non-NPL Status: NFRAP

EPA ID: NCD082362989
EPA Region: 04
County: VANCE

Federal Facility Flag: Not a Federal Facility

Return to Search Results Return to Search Archived Sites

DISCLAIMER: Be advised that the data contained in these profiles are intended solely for informational purposes use by employees of the U.S. Environmental Protection Agency for management of the Superfund program. They are not intended for use in calculating Cost Recovery Statutes of Limitations and cannot be relied upon to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. EPA reserves the right to change these data at any time without public notice.

U.S. Environmental Protection Agency

# Superfund Information Systems





## Archived Sites

### TUNGSTEN QUEEN MINE

### Contacts

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

| Title | Name | Phone Number |
|---|---|---|
| Remedial Project Manager (RPM) | GIEZELLE BENNETT | (404) 562-8824 |
| Remedial Project Manager (RPM) | JON BORNHOLM | (404) 562-8820 |
| Remedial Project Manager (RPM) | Luis Flores | (404) 562-8807 |
| Remedial Project Manager (RPM) | BEVERLY HUDSON | (404) 562-8816 |
| Remedial Project Manager (RPM) | KEN LUCAS | (404) 562-8953 |
| Remedial Project Manager (RPM) | KEN MALLARY | (404) 562-8802 |
| Remedial Project Manager (RPM) | MICHAEL TOWNSEND | (404) 562-8813 |
| Remedial Project Manager (RPM) | SAMANTHA URQUHART F | (404) 562-8760 |
| Remedial Project Manager (RPM) | Phil Vorsatz | (404) 562-8789 |
| Site Assessment Manager (SAM) | Jennifer Wendel | (404) 562-8799 |

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DISCLAIMER: Be advised that the data contained in these profiles are intended solely for informational purposes use by employees of the U.S. Environmental Protection Agency for management of the Superfund program. They are not intended for use in calculating Cost Recovery Statutes of Limitations and cannot be relied upon to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. EPA reserves the right to change these data at any time without public notice.

U.S. Environmental Protection Agency

# Superfund Information Systems



CERCLIS Database
Archived Sites
Site Documents
Data Element Dictionary (DED)
Order Superfund Products
Customer Satisfaction Survey

## Archived Sites

### TUNGSTEN QUEEN MINE

### Actions

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

| OU | Action Name | Qualifier | Lead | Actual Start | Actual Completion |
|---|---|---|---|---|---|
| 00 | DISCOVERY | | F | | 08/01/1980 |
| 00 | PRELIMINARY ASSESSMENT | L | S | | 05/31/1985 |
| 00 | SITE INSPECTION | N | S | | 09/25/1992 |
| 00 | ARCHIVE SITE | | EP | | 09/25/1992 |

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file

NCDENR

# North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director
Division of Waste Management
Michael F. Easley, Governor
William G. Ross Jr., Secretary

April 8, 2004

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

Subject: Tungsten Queen Mine
EPA ID: NCD 082 362 989
Townsville, Vance County, North Carolina

Dear Ms. Wendel:

The purpose of this letter is to provide information concerning site activities at the Tungsten Queen Mine site since it was given the designation of "No Further Remedial Action Planned (NFRAP)" by EPA in 1994.

The Tungsten Queen Mine site is a former mine and milling facility located in Townsville, Vance County, North Carolina. The site is bounded to the north by Island Creek and to the east by Little Island Creek. The southern site boundary is roughly delineated by State Route 1348 (Tungsten Mine Road). The surrounding land is primarily wooded and undeveloped properties and rural residential properties.

Tungsten ore was discovered at the site by Joseph Hamme in 1942. Mining and milling operations were conducted intermittently at the site from 1943 to 1971. The Hamme brothers sold the property to Haile Gold Mines, Inc. in 1943. Haile and General Electric Company (GE) formed Tungsten Mining Corporation in 1945. The mine was then closed in 1958. Howe Sound Company (subsequently Howmet) acquired the property in 1959 and operated the mine from 1960 to 1962. The mine was then sold in 1968 to Ranchers Exploration and Development (subsequently merged in Hecla Mining Company). Ranchers conducted mining and milling operations during the early 1970's. Hecla sold the site to Atlas Mine and Mill Supply, Inc. in 1986. These responsible paties (RPs) are listed in Attachment 1. Contact information for each of the RPs is included in Attachment 2.

The site contains two former milling operations areas which are referred to as the Old Mine Area and the New Mine Area. Townsville Timber currently owns the Old

Mine Area. The ownership of the New Mine Area is unclear. The milling operations areas consist of former mill buildings, warehouses, offices and other structures, including mine shafts. The underground mineworks are located in the area extending between the Old Mine Area and the New Mine Area.

Northwest of the Old Mine Area are three tailings ponds. From north to south, the tailings pond are approximately 30, 20, and 2 acres, respectively, in size. The three tailings ponds have been estimated to contain approximately 2,038,000 tons of mine tailings. Also located in the area of the tailings ponds, a portion of the site (approximately 21.5 acres) is owned by the U.S. Army Corps of Engineers (ACOE). The ACOE also maintains a flow easement over an additional portion of the site (up to elevation 320 m.s.l.).

The site was brought to the attention of the North Carolina Inactive Hazardous Sites Branch (IHSB) in December 1995 when the ACOE requested that the IHSB review the existing file. At this time, the ACOE was assessing the current condition of the Island Creek Reservoir pumping station and debating possible shut down of the station. Resultant flooding of Island Creek would have inundated portion of the tailings ponds at the site. Ultimately, based on both environmental and cost concerns, the determination was made to revamp the pump station instead of abandoning it.

Because of high metals concentrations in the tailings ponds as well as in drums remaining at various locations on site, the IHSB requested EPA's Emergency Response and Removal Branch (ERRB) conduct a removal evaluation in 1997. ERRB reviewed the file and ranked the site as a low priority for a removal action. In 1998, the IHSB requested ERRB reevaluate the site. ERRB performed a site visit with IHSB staff and again ranked it as a low priority for removal action. At the same time, ERRB referred it to EPA" North Site Management Branch for review as a potential Non-Time Critical Removal Action.

Since 1998, the IHSB has obtained the cooperation of a number of RPs in both conducting removal actions at the site as well characterizing the site under the NC Voluntary Cleanup Program. All drums, building and lab contents, several tons of pyrite material, scrap metals, discarded trash and wastewater have been removed from the site by the various RPs.

Detailed information about site activities in the past three years can be found in the following reports which are located in the North Carolina Superfund Section Public Records File Room:

1. *Focused Site Assessment Work Plan – February 21, 2002* – Prepared by Environmental Resources Management

2. *Pyrite Drum Removal/Soil Sampling Results Report – July 5, 2002* – Prepared by Environmental Answers of North Carolina LLC

3. *Focused Site Assessment Report – September 27, 2002* – Prepared by Environmental Resources Management

4. *Phase II Focused Site Assessment Report* – April 2, 2003 – Prepared by Environmental Resources Management

5. *Sampling and Analysis Plan – September 19, 2003* – Prepared by Tetra Tech NUS

6. *Phase II Focused Site Assessment Addendum Report – November 10, 2003* -- Prepared by Environmental Resources Management

7. *Final Sampling and Analysis Report – December 2003* – Prepared by Tetra Tech NUS

8. *Cleanup Report – January 16, 2004* – Prepared by MACTEC Engineering and Consulting

9. *Cleanup Report Addendum – February 23, 2004* -- Prepared by MACTEC Engineering and Consulting

According to local residents, there has been increased recreational activity on the site. According to these residents, in the last year or so, hundreds of individuals can be found dirt biking or riding ATVs across the areas of contamination on weekends. This activity creates a trespassing problem at both the site and neighboring residential properties and increases the amount of potentially hazardous dust produced in the area. The IHSB plans to address this issue with the RPs at the next scheduled meeting.

Based on recent sampling results (Reports 3, 4, 6 and 7 from the above-mentioned list) and on complaints from the nearby residents, the site continues to be a threat to human health and the environment. Recent sampling results, however, do not support the need for further CERCLA site assessment. Surface water and sediment samples collected in 2002 by Environmental Resources Management and included in Reports 3, 4, and 6 confirm that there is no significant impact to downstream fishery or wetland targets. Other pathways of concern (air, groundwater, and soil exposure) for Hazard Ranking System (HRS) scoring lack sufficient on-site and nearby residences and workers to be significantly impacted by on-site source, dust, and groundwater contamination. Though "hundreds" of recreational dirt bikers and ATVers use the site for recreational activities on weekends, scoring under HRS does not warrant further action due to the nature of the

individuals (non-residential, non workers). Therefore, we do not recommend any changes to the site's current CERCLIS status at this time.

Attachment 3 contains copies of recent sampling data and maps collected at and near the site for your records. If you have any questions or need for further information, please feel free to contact me at melanie.bryson@ncmail.net or (919) 733-2801 ext. 315.

Sincerely,

Melanie Bryson
Environmental Engineer
NC Superfund Section

Jim Bateson, Head
Site Evaluation and Removal Branch
NC Superfund Section

Attachments

cc: File
Keith Snavely

## Tungsten Queen Mine RP list

1) Howmet Corporation- current company name is Pechiney, Inc.- owned site during 1950's-1960's.

2) Hecla Mining Company, Inc.- Last mining operator. Mine shut down in 1971.

3) Atlas Mine & Mill Supply, Inc.- owned site after Hecla and Ranchers. Ranchers operated the site after Howmet and later went out of business and were bought by Hecla Mining Company, Inc.

4) US Army Corps of Engineers – owns 21 acres of the approximate 50 acres of tailings that exist at the "Old Mine" area of the Site.

5) Townsville Timber, Inc. – current owner of "Old Mine" area; principle's name is Mr. James Bailey, Sr.

**Address and Contact list of RPs for Tungsten Queen Mine Site**

1) Howmet Corporation- Pechiney, inc.

Mr. Theodore L. Garrett, Esq.
Counsel for Howmet and Pechiney
Covington & Burling
1201 Pennsylvania N. W.
Washington, CD 20004-2401
Telephone: (202) 662-5398
Fax: (202) 778-5398
Tgarrett@cov.com

2) Hecla Mining Company, Inc.

Mr. John N. Galbavy, Esq.
Corporate Counsel
Hecla Mining Company
6500 N. Mineral Drive – Suite 200
Coeur d'Alene, Idaho 83815-8788
Telephone: (208) 769-4100
Fax: (208) 769-4159
jgalbavy@hecla-mining.com

3) US Army Corps of Engineers

Ms. Brooke Lamson, Esq.
Counsel for US-ACE
US-ACE
PO Box 1890
Wilmington, NC 28402
Telephone: (910) 251-4499
Fax: (910) 251-4025
Brooke.lamson@usace.army.mil

4) Atlas Mine & Mill Supply , Inc.

Mr. Shawn Szombathy
Atlas Mine & Mill Supply, Inc.
N. 1115 Havana Street
Spokane, WA 99202
Telephone: (509) 535-2039
Fax: (509) 535-2090
Sales@atlasminemillsupply.com
Second ph# (208) 788-4349

Mr. John R. Zeimantz, Esq.
Counsel for Atlas Mine & Mill Supply, Inc.
Feltman, Gebhardt, Greer & Zeimantz, P.S.
1400 Paulsen Center
421 West Riverside Avenue
Spokane, WA 99201-0495
Telephone: (509) 838-6800
Fax: (509) 744-3436
Jrzeimantz@fggzlaw.com

4) Townsville Timber, Inc.

Mr. James A. Bailey, Sr.
Townsville Timber, Inc. (Also James A. Bailey, Inc.)
5201 Beryl Road
Raleigh NC 27606
Telephone: (919) 821-0415

United States Environmental Protection Agency
Region IV
61 Forsyth Street
Atlanta, GA 30303

Facsimile Cover Sheet

# TO: Melanie Bryson-NCDENR

FAX No: 919-733-4811

From: Jennifer Wendel-U.S. EPA

Office phone: (404)-562-8799
FAX: (404)-562-8788

Office code: 11th fl

Date: April 5, 2004

Number of pages, including cover: lots

MESSAGE: Hi Melanie, attached is some HRS work done here on Tungsten. Did IHSB do any PPE/SW pathway sampling? I think we need to use all of this most recent data too. It seems there is some concern over the PPE/SW pathway work done during the original SI. Thanks for your help. Jennifer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUL 16 1999

4WD-NSMB

**CONFIDENTIAL : FOIA EXEMPTION 5**

**MEMORANDUM**

**SUBJECT:** Tungsten Queen Mine Site
Townsville, Vance County, North Carolina
EPA ID: NCD082362989

**FROM:** Loften Carr
NSMB Site Assessment Manager

**TO:** Philip H. Vorsatz, Chief
NC Site Management Section

The purpose of this memo is to provide recommendations regarding the evaluation of this site for further CERCLA remedial action. The following questions were presented in the attached Memorandum dated May 12, 1999 (attached) regarding the above referenced site. The recommendations that follow are based on review of the available EPA file materials (including Hazard Ranking System scores) and my best professional judgement.

**1. Could this Site score and potentially qualify for listing on the NPL?**

The site was designated No Further Remedial Action Planned (NFRAPed) by an October 14, 1994 Memo to File from Cynthia Gurley (attached) regarding HRS scoring of the site. The data collected during the 1991 Site Inspection had only previously been evaluated for HRS purposes using the less thorough Preliminary Assessment (PA) score method. This memo documented the evaluation of the SI data via the more thorough and representative HRS Prescore method. The memo determines that the site did not score 28.5 or greater and therefore was not eligible for further remedial action and inclusion on the NPL. Additionally this memo is attached to a July 29, 1992 letter to Ms. Kathy Amoroso, EPA NC CERCLA Project Officer from Grover Nicholson of the North Carolina Department of Environment, Health, and Natural Resources (NCDEHNR) Division of Solid Waste Management regarding the discussion of the Phase II, Screening Site Investigation, Tungsten Queen Mine and data. This is the same 1991 SI and data referred to in the above memo.

The letter clearly states on page 3 and 4 that the data collected by this SI to evaluate the Surface Water (SW) pathway via the HRS is incomplete at best and may have missed the primary Probable Point of Entry (PPE) into perennial surface water. In the section titled Surface Water, the NC Superfund section requests that the site be moved to the next phase (Expanded Site Inspection, ESI) of the pre-remedial process for the following reasons:

> The nearest well appears to be at a threshold of being contaminated with Cadmium (Cd) and Lead (Pb).
>
> Soil Sample TQSS05, which had a Pb concentration of 20,000 ppm was collected from an area where a drainage ditch leads to Island Creek *downstream* of the TQSED02 and TQSW02. If contamination of surface waters has resulted from this area of contamination; swimming, boating and fishing in Island Creek and the John H. Kerr Reservoir may be affected.

Furthermore, the letter makes the following recommendation:

> The next phase of the pre-remedial process should focus on identifying whether near by drinking water wells are being affected by on site contamination, and whether surface waters and wetlands are being affected by contamination from the new mill area.

The information about the data collected by the SI presented in this letter indicates that the evaluation of SW pathway was incomplete due to errors made at the time of sampling. The high levels of Pb and possibly other heavy metals such as Arsenic (As) in the sources combined with the presence of targets downstream of the site, both fisheries and sensitive environments (wetlands) would indicate that there is a considerable potential for the SW pathway to contribute enough points to the pathway score to cause the overall HRS score to exceed 28.5.

Additionally, other potential exists for increasing the various pathway scores of the HRS to contribute to an overall HRS score of 28.5 or greater. The nearest groundwater well mentioned above needs to be re-sampled and the Ground Water(GW) pathway and Soil pathway targets need to updated based upon the exposure concerns of trespassing and encroaching residential development. The Waste Quantity (WQ) needs to be re-evaluated based upon Tier 1 Actual Constituent Quantity using the reserve estimate metals percentages presented in the Confidential Business Information (CBI) portion of the file.

Based on this file review and the information presented above, I concur with the recommendations made by NCDEHNR presented in the July 29, 1992 letter.

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

MAY 12 1999

MEMORANDUM

SUBJECT: Tungsten Queen Mine Site

FROM: Philip H. Vorsatz, Chief
NC Site Management Section

TO Lofton Carr
NSMB Site Assessment Manager

Lofton utilizing both your Site Assessment expertise, and your recently acquired knowledge of mining Sites, I need you to review the file materials for the above Site and make a recommendation to me as to the following:

1. **Could this Site score and potentially qualify for listing on the NPL.** If so, recommend which scoring pathways we should look harder at and what additional data or information we should collect.

This Site was SERAPed by EPA in the early 1990s, after the State had utilized a previous scoring system to recommend further action at that time. Exposure concerns that seems to exist now, that may or not have been considered in the past include - trespassers on off road vehicles and mountain bikes (observed by the State); encroaching residential development (including a portion of the Site that was reported under contract for construction of a new residence, until environmental concerns were raised as a part of the real estate transaction); use of the sand-like mine tailings for private beach nourishment (anecdotal, no recent evidence, however this was a big problem in the early 1990s).

2. **Are there any comparisons you can offer relative to other mining Sites and how they are handled,** that would also help us reach an opinion on whether this Site is NPL caliber or at least deserving of further EPA consideration (potentially for non-time-critical removal actions.)

Please contact me with any questions or Samantha Urquhart-Foster. I am attaching a Site review memo that Samantha prepared last year.

Attachments

DATE: June 17, 1998

SUBJECT: Tungsten Queen Mine File Review

FROM: Samantha Urquhart-Foster, RPM
NSMB-NCS

TO: A-Train

I was asked by the A-train to review the Tungsten Queen Mine file to determine if it would be a potential "start" for FY 1999. The site contains approximately 80 drums in two separate areas, three tailing ponds and a gravity separator area. Several drums in one of the areas have been sampled and samples have been obtained from all three tailing ponds, a gravity separator and background sources. The drums in the other area contain similar substances as the ones sampled. The Site is not completely secure and trespassers have been noted.

In 1993, after a Site Investigation the site was marked in CERCLIS as NFRAP. In 1994, Hecla Mining Co. (a prior property owner) removed chemicals from the laboratory in an independent removal action. In 1995, the Site was assigned NFRAP status by the North Carolina Department of Environment and Natural Resources (NC DENR) Superfund Section's PA/SI group. In 1997, NC DENR requested EPA's Emergency Response and Removal Branch (ERRB) conduct a removal action at the Site. ERRB reviewed the file and ranked the Site as a low priority for a removal action. In 1998, NC DENR requested ERRB reevalate the Site. ERRB performed a Site visit with NC DENR staff and again ranked it as a low priority for removal action and at the same time referred it to EPA's North Site Management Branch for review as a potential Non-Time Critical Removal Action.

On June 16, 1998, I reviewed the file material. As ERRB has stated, the Site does meet the criteria for a Removal Action based on elevated levels of metals (particularly lead and arsenic) and unrestricted access. ERRB ranked it as a low-priority based on minimal potential for prolonged direct exposure. Lead concentrations were as high as 18,000 ppm in the drums, 3,100 ppm in the new tailings pond, 20,000 ppm in the former gravity separator area, and 7,000 ppm in the two-acre pond. The Site is several hundred acres in size and may contain vast quantities of contamination. Further sampling is needed to fully characterize the extent of contamination. Non-Time Critical Removal Actions are restricted to removals costing less than $2,000,000. Completely removing the contamination may exceed this dollar amount (unknown until the extent is determined). The threat to human health may be reduced at a lower cost by securing the Site. Another option would be to remove/treat only the areas containing the highest levels of contamination.

Whether the PRPs can or will perform the action is yet to be determined. There are six current owners of the portions comprising the Site. The Old Mine area portion of the Site is currently owned by Louisburg Hardwood, who purchased it from Atlas Mine & Mill. Atlas purchased the property from Hecla Mining Co. who had purchased it from Ranchers Exploration. One portion of the Old Mine area is owned by the US Army Corp. of Engineers. The New Mine area was sub-divided and is owned by four entities: Mr. Daryl Tharrington, Champion International Corporation, Mr. Charles W. Finch, and Mr. Charles E. and Annette Edwards. NC DENR has verbally contacted Louisburg Hardwood regarding removal of the drums, but they were not responsive.

Based on this information, the Site is eligible to be considered for a Non-Time Critical Removal Action with a limited scope of action to keep it within the statutory limits of not exceeding $2,000,000. If you have any questions, contact me at (404) 562-8760.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

OCT 24 1994

4WD-WPB

MEMORANDUM

SUBJECT: Tungsten Queen Mine
Townsville, Vance County, North Carolina
NCD 082 362 989

FROM: Cynthia K. Gurley
North Carolina Project Officer

Cynthia Gurley

TO: File

Currently the status of the Tungsten Queen Mine Site is for a high priority Expanded Site Inspection. The Site Inspection (SI) was approved on September 25, 1994. The site has not been evaluated using the Hazard Ranking System (HRS), however the site had been evaluated using the Preliminary Assessment Scoring program (PAscore). The PAscore recommended further action.

On October 19, 1994, the raw data and information gathered during the SI was applied in the HRS PRESCORE program version 3.0. This site did not score above the 28.5 cut-off value, therefore this site will not be eligible for inclusion on the National Priorities List, and will receive a recommendation of No Further Remedial Action Planned (NFRAP) under Superfund authority.

Printed on Recycled Pa

DATE REPORT ACCEPTED:
DISPOSITION NFRAP on 10/24/9[illegible]
SAM SIGNATURE Cynthia Ginley

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

July 29, 1992

Ms. Kathy Amoroso
EPA NC CERCLA Project Officer
EPA Region IV Waste Division
345 Courtland Street, NE
Atlanta, Georgia 30365

Approved 9/25/92
Cathy Amoroso Sign

RE: Phase II, Screening Site Investigation
Tungston Queen Mine
Townsville, Vance County, North Carolina
NCD 082 362 989 #2910

Dear Ms Amoroso:

Enclosed herewith is the Phase II, Screening Site Investigation (SSI) Report by Greenhorne & O'Mara, Inc. for Tungston Queen Mine (NCD 082 362 989).

Based on the information gathered and presented in this report and on the results of the data validation, it is believed that the site may pose a threat to the public health and/or the environment.

The following discussion of the analytical results from the Phase II, SSI sampling event for the subject site, reflects data validation.

A total of fourteen (14) environmental samples were collected to characterize the site. To characterize whether a release of contaminants has occurred, a limited subsurface and surficial investigation was conducted to obtain ground water, surface water, soil and sediment samples for laboratory analysis. The sampling locations are shown on Appendix A, Figure 2. These samples consisted of one (1) ground water sample, one (1) off-site drinking water well sample, eight (8) composite soil samples, two (2) surface water samples and two (2) sediment samples.

Soils
A background surface soil sample (TQSS01) was collected at the site. No Purgable Organics (VOCs) or Base Neutral Acid Extractable (BNAs) were reported in this sample. See Table 1 for the inorganic results.

A composite soil sample (TQSS02) was collected in the northern tailings pond. No VOCs or BNAs were reported in this sample. See Table 1 for the inorganic results.

A composite soil sample (TQSS03) was collected in the southern tailings pond. No VOCs or BNAs were reported in this sample. See Table 1 for the inorganic results.

A composite soil sample (TQSS04) was collected from the area around the chemical storage building located in the old mill area. No VOCs or BNAs were reported in this sample. See Table 1 for the inorganic results.

A composite soil sample (TQSS05) was collected in the vicinity of the new mill, in an area where separate lead, pyrite and silver tailings were stored and loaded onto trucks. No VOCs or BNAs were reported in this sample. See Table 1 for the inorganic results.

On July 18, 1992, a background sample (TQSS06) was collected on site. No VOCs or BNAs were reported in this sample. See Table 1 for the inorganic results.

On July 18, 1992, a composite soil sample (TQSS07) was collected from the northeast section of the southern tailings pond. No VOCs or BNAs were reported in this sample. See Table 1 for the inorganic results.

On July 18, 1992, a composite soil sample (TQSS08) was collected from the northeast section of the southern tailings pond. No VOCs or BNAs were reported in this sample. See Table 1 for the inorganic results.

An observed release to soils has been documented from the data gathered relative to the soil samples. It appears that there are releases of antimony, arsenic, calcium, cobalt, copper, iron, lead, manganese, nickel, potassium, selenium, silver, sodium and zinc. It is believed that these inorganics, particularily lead, can be attributed to the site.

Sediments
An upstream sediment sample (TQSED01) was collected at the site. No Purgable Organics or BNAs were reported in this sample. Barium (45 ppm) and lead (18 ppm) were the only inorganics reported in this sample. Barium and lead were reported within naturally occurring concentrations for barium and lead in soils in the Eastern United States.

A downstream sediment sample (TQSED02) was collected downstream of the site, along Island Creek. No Purgable Organics or BNAs were reported in this sample. No inorganics were reported in significant concentrations in this sample.

An observed release to surface water has not been documented from the data gathered relative to sediment samples.

Ground Water
An off-site drinking water well (TQDW01) was collected south of the site. This sample is being used as a background groundwater sample. No Purgable Organics or BNAs were detected in this sample. See Table 2 for the inorganic results.

A downgradient ground water sample (TQGW02) was collected from a temporary monitoring well, located in the northern tailings pond. No Purgable Organics or BNAs were reported in this sample. See Table 2 for the inorganic results.

An observed release to groundwater has been documented from the data gathered relative to ground water samples. It appears that significant releases of arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver have occurred in TQGW02. As can seen from Table 2, arsenic, cadmium, chromium, lead and silver are greater than their respective North Carolina Maximum Contaminant Level (NCMCL) and/or Federal Maximum Contaminant Level (MCL). It is believed that these inorganics, particularily lead, can be attributed to the site. Cadmium was reported at a level equal to its' NCMCL and MCL.

Surface Water
An upstream surface water sample (TQSW01) was collected at the site. No Purgable Organics or BNAs were reported in this sample. Barium (40 ppb) was the only inorganic reported in this sample. Barium has no Maximum Permissible Level (MPL) which is deemed protective of aquatic life.

A downstream surface water sample (TQSW02) was collected downstream of the site, along Island Creek. No Purgable Organics or BNAs were reported in this sample. Lead (8 ppb) was the only inorganic reported in this sample and its' concentration is considered significant. Lead has a Maximum Permissible Level (MPL) of 25 ppb which is deemed protective of aquatic life.

Based on the information gathered and presented in this report, it is believed that the site may pose a threat to human health and/or the environment, therefore, the North Carolina Superfund Section is recommending that the site move on to the next phase of the pre-remedial process. The nearest drinking water well appears to be at the threshold of being contaminated with cadmium and possibly lead. Whether or not these contaminants are at natural levels is unknown. Additionally, soil sample (TQSS05),

which had a lead concentration of 20000 ppm, was collected from an area where a drainage ditch leads to Island Creek downstream of the of TQSED02 and TQSW02. If contamination of surface waters has resulted from this area of contamination, swimming, boating and fishing activities on Island Creek and the John H. Kerr Reservoir may be affected. Additionally, freshwater wetlands along the surface water path may be affected. The next phase of the pre-remedial process should focus on identifying whether nearby drinking water wells are being affected by onsite contamination, and whether surface waters and wetlands are being affected by contamination from the new mill area.

If you have any questions, please contact me at 919-733-2801.

Sincerely,

Glover Nicholson, Head
Contracts Management Branch

Enclosures

# TABLE 1
## TUNGSTEN QUEEN MINE
## NCD 082 362 989

| INORGANICS | SOILS NATURAL RANGE (PPM) | TQSS05 (PPM) | TQSS06 (PPM) | TQSS07 (PPM) | TQSS08 (PPM) |
|---|---|---|---|---|---|
| ALUMINUM | 0.7->10% | NA | NA | NA | NA |
| ANTIMONY | <1-[illegible].8 | NA | NA | NA | NA |
| ARSENIC | <0.[illegible]-73 | 310 | U | 33 | 17 |
| BARIUM | 10-1500 | 20 | 32 | U | U |
| BERYLLIUM | <1-[illegible] | NA | NA | NA | NA |
| CADMIUM | 0.01-0.7 | 200 | U | U | U |
| CALCIUM | 0.01-20% | NA | NA | NA | NA |
| CHROMIUM | 1-1000 | U | 30 | U | U |
| COBALT | <0.[illegible]-70 | NA | NA | NA | NA |
| COPPER | <1-700 | NA | NA | NA | NA |
| IRON | 0.01->10% | NA | NA | NA | NA |
| LEAD | <10-300 | 20000 | 20 | 910 | 240 |
| MAGNESIUM | 0.005-5% | NA | NA | NA | NA |
| MANGANESE | <2-7000 | NA | NA | NA | NA |
| MERCURY | 0.01-3.4 | U | U | U | U |
| NICKEL | <3-700 | NA | NA | NA | NA |
| POTASSIUM | 0.005-3.7% | NA | NA | NA | NA |
| SELENIUM | <0.1-3.9 | 13 | U | U | U |
| SILVER | 0.01-5 | 290 | U | U | U |
| SODIUM | 0.05-5% | NA | NA | NA | NA |
| THALLIUM | - | NA | NA | NA | NA |
| VANADIUM | <7-500 | NA | NA | NA | NA |
| ZINC | <5-2900 | NA | NA | NA | NA |
| CYANIDE | - | NA | NA | NA | NA |

NOTES:

1) NA - NOT ANALYZED
2) N - PRESENCE OF CONTAMINANT PRESUMED
3) J - CONCENTRATION ESTIMATED
4) U - NON-DETECT
5) B - CONTAMINANT FOUND IN ASSOCIATED BLANK

TABLE 1
TUNGSTEN QUEEN MINE
NCD 082 362 989

| INORGANICS | SOILS NATURAL RANGE (PPM) | TQSS01 (PPM) | TQSS02 (PPM) | TQSS03 (PPM) | TQSS04 (PPM) |
|---|---|---|---|---|---|
| ALUMINUM | 0.7->10% | 21000 | 1600 | 7300 | 8200 |
| ANTIMONY | <1-8.8 | 20U | 75 | 200 | 240 |
| ARSENIC | <0.1-73 | 4.1J | 30J | 110J | 110J |
| BARIUM | 10-1500 | 35 | 0.51U | 13 | 29 |
| BERYLLIUM | <1-7 | 0.63 | 0.36 | 0.36 | 0.34 |
| CADMIUM | 0.01-0.7 | 10JN | 14 | 71JN | 61JN |
| CALCIUM | 0.01-20% | 70U | 13000 | 4800 | 2200 |
| CHROMIUM | 1-1000 | 48 | 4.7 | 8.1 | 10 |
| COBALT | <0.3-70 | 2.9 | 2.5U | 73 | 33 |
| COPPER | <1-700 | 25 | 360 | 470 | 1200 |
| IRON | 0.01->10% | 59000 | 4700 | 180000 | 110000 |
| LEAD | <1-300 | 22J | 260 | 3100J | 2400J |
| MAGNESIUM | 0.005-5% | 4509 | 620 | 1100 | 760 |
| MANGANESE | <2-7000 | 18J | 350J | 50J | 200J |
| MERCURY | 0.01-3.4 | .26U | 0.25U | 0.25U | 0.26U |
| NICKEL | <3-700 | 2.9U | 4.1 | 87 | 38 |
| POTASSIUM | 0.005-3.7% | 600 | 630 | 530 | 1900 |
| SELENIUM | <0.1-3.9 | 1U | 1U | 3.3J | 2 |
| SILVER | 0.01-5 | 1.3UJ | 8.9 | 56J | 34J |
| SODIUM | 0.05-5% | 140U | 200U | 180 | 310J |
| THALLIUM | - | 0.51U | 0.49U | 0.47U | 0.45U |
| VANADIUM | <7-500 | 120 | 2J | 47 | 34 |
| ZINC | <5-2900 | 13 | 810 | 3000 | 2900 |
| CYANIDE | - | 6.3U | 6.2U | 6U | 5.4U |

NOTES:

1) NA - NOT ANALYZED
2) N -- PRESENCE OF CONTAMINANT PRESUMED
3) J -- CONCENTRATION ESTIMATED
4) U -- NON-DETECT
5) B -- CONTAMINANT FOUND IN ASSOCIATED BLANK

# TABLE 2
## TUNGSTEN QUEEN MINE
## NCD 082 362 989

| INORGANICS | WATER NCMCL (PPB) | WATER MCL (PPB) | TQDW01 (PPB) | TQGW02 (PPB) |
|---|---|---|---|---|
| ALUMINUM | - | - | NA | 12000J |
| ANTIMONY | - | 10/5 | NA | 1900J |
| ARSENIC | 50 | - | U | 210J |
| BARIUM | 1000 | 5000 | U | 54J |
| BERYLLIUM | - | 1 | NA | 6J |
| CADMIUM | 5 | 5 | 5 | 780J |
| CALCIUM | - | - | NA | 290000J |
| CHROMIUM | 50 | 100 | U | 70J |
| COBALT | - | - | NA | 66J |
| COPPER | 1000 | 1300 | NA | 7100J |
| IRON | 300 | - | NA | 26000J |
| LEAD | 50 | 50 | 8 | 4500 |
| MAGNESIUM | - | - | NA | 52000J |
| MANGANESE | 50 | - | NA | 31000J |
| MERCURY | 1.1 | 2 | U | 0.38J |
| NICKEL | 150 | 100 | NA | 120J |
| POTASSIUM | - | - | NA | 11000J |
| SELENIUM | 10 | 50 | U | 6J |
| SILVER | 50 | - | U | 190J |
| SODIUM | - | - | NA | 16000J |
| THALLIUM | - | 2/1 | NA | 2UJ |
| VANADIUM | - | - | NA | 10J |
| ZINC | 5000 | - | NA | 43000J |
| CYANIDE | 15[illegible] | 200 | NA | 10UJ |

NOTES:

1) NA - NOT ANALYZED
2) N - PRESENCE OF CONTAMINANT PRESUMED
3) J - CONCENTRATION ESTIMATED
4) U - NON-DETECT
5) R - DATA UNUSABLE
6) B - CONTAMINANT FOUND IN THE ASSOCIATED BLANK
7) NCMCL - NORTH CAROLINA MAXIMUM CONTAMINANT LEVEL
8) MCL - FEDERAL MAXIMUM CONTAMINANT LEVEL

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**MEMO**

DATE: May 20, 1997

TO: File

FROM: Keith Snavely, Hydrogeologist RKS
Inactive Hazardous Sites Branch
NC Superfund Section

RE: Tungsten Queen Mine
Tungsten, Vance Co
NCD 082 362 989

John Walch and I from the IHS Branch of NC Superfund arrived at the Tungsten Queen Mine site on May 12, 1997 at 8:45 AM to conduct a site reconnaissance and soil sampling of the New Mine area and extensive sampling of drummed waste and tailings from waste ponds of the Old Mine area of the Tungsten Queen Mine site. We met Mrs. Pearl Farrington, owner of a portion of the property of the New Mine area located west of SR 1348 or Mine Road. This part of the New Mine was locked and enclosed by a chain-linked fence and we had to contact the Farringtons for site access. The other half of the New Mine (or eastern part) of the New Mine is located east of SR 1348 and contains a one-story building and an abandoned mine shaft that has been sealed and enclosed by a fence. Charlotte Jesneck and I conducted a site reconnaissance of the eastern part of the Mine on March 27, 1997. No tailings or drummed material was noted at the eastern part of the New Mine and this part of the mine was not locked although it was surrounded by a fence.

Two composite soil samples (TQMNM C01) and (TQMNM C02) were collected from ground surface to a depth of 6 inches at the New Mine. One was collected from soils adjacent to a razed building (once 3-stories) at the New Mine and the second was collected from an area 50 feet south of the building structure. These composite soil samples were analyzed for arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc (Hazardous substance list metals). The site reconnaissance indicated two on-site drums, one (55-gallon) that contained a mixture of water and petroleum substances and a second (30-gallon) partially filled with water and petroleum. A black stain of petroleum on the concrete floor of the building structure was noted adjacent to the 55-gallon drum. Each composite sample contained sandy soils and gravel fill. Each composite sample consisted of grab samples from 4 different locations composited in 25 foot squares. A GPS location (File # R051213A)was collected at the corner of the building structure at the New Mine. Sampling was completed from the Farrington property by 10:00 pm and John and I left the site and continued to the Old Mine site located approximately 0.5 miles north of the New Mine. Mrs. Pearl Farrington returned home.

John and I arrived at the Old Mine area at around 10:00 AM. It is located approximately 0.5 miles north of the New Mine. We parked along the main road entrance adjacent to the abandoned warehouses and began to sample the cuttings and the pyrite tailings waste stored in numerous 30-gallon drums. We sampled waste material from three of the drums for metals from the warehouse (TQMD01, TQMD02 and TQMD03). One sample was collected from drums that were near complete deterioration (possibly from the drying agents (noted in print on the drums)), a second sample was collected from black metallic powder (possibly iron) and a third was collected from brown soils that were a fine powder. No odors were noted from the sampling of any of the drums, which many were uncovered. The drums in the eastern half of the warehouse were stacked two to three layers high and sealed. A GPS location ( File # R051214A) was recorded at the warehouse. The sampling and GPS location was completed at 11:00 AM. We collected 3 grab background samples (TQMB01, TQMB02 and TGMB03) after the collection of the grab samples from the drums. One of the background samples was collected in the wooded area west of the Office inside the fence of the Old Mine site. The other two were collected outside of the gate east of SR 1348 below the power lines. These samples were 50 to 75 feet apart from each other and collected in clayey sandy soils. There was a GPS location collected for each background sample. We completed the collection of the background samples by 11:30 AM and broke for lunch for one hour.

Sampling was resumed by 12:30 PM in the tailing ponds located northwest of the warehouses and west of the gravity separator. We collected 4 composite samples from 50 foot square grids from each pond (Upper - adjacent to Island creek (TQMU01- TQMU04, and Lower-adjacent to gravity separator (TQMLP01-TQMLP04). Each composite sample consisted of 4 grab aliquots. In addition, two grab samples (TQM G01LP and TQM G01U) were collected from two hand-auger samples, one in each of the tailing ponds to a depth of 1 foot below ground surface. These samples were limited in depth because of groundwater encountered at 1 to 2 feet below ground surface in both tailing ponds. GPS locations (R51216A - 19C) were collected at each composite location (in the middle of the square grid of each set of 4 grabs or aliquots) and at each hand-auger hole. A total of 15 GPS locations and 18 soil samples were collected. John and I completed our sampling of the Old Mine by 3:45 and left both mine areas by 4:00 PM and returned to the Raleigh Office by 5:30 PM.

# INACTIVE HAZARDOUS SITES
## Trip Notification & Authorization

**Prepared by:** Keith Snavely **Today's Date:** 4-28-97

**TO BE COMPLETED BY PROJECT TEAM LEADER *(INK ONLY)***

Date of Trip: May 12 + 13, 1997

**If trip changed or cancelled note below:**
Trip Date Changed To: _____ Cancelled: _____

**NCD#:** 082 362 989 **Site Name:** Tungsten Queen Mine
(If none, State ID)

**City:** Tungsten **County:** Vance

Name of Hotel (Overnight Trip): _____
Hotel Telephone Number: ( ) ____-_____

**Authorized by:** _____
Industrial Hygienist

Project Team Leader: Keith Snavely

Assistants: John Walch, Tom Power, _____

**Project Team Leader: If this is a sampling trip, submit a copy of this form to the QA/QC Chemist**

**To Be Completed by Industrial Hygienist:**

County Health Department Contact: _____

Title: _____

Telephone Number: ( ) ____-_____

Notes: Health Department Official Contacted: _____
Back Up Letter Required: Yes ____ No ____

_____

_____

**Submit this form to the Industrial Hygienist with a copy of the Site Location Map (8½ x 11 paper only)**

**MEMO**

**DATE:** April 4, 1997

**TO:** File

**FROM:** Keith Snavely *Keith Snavely*
Inactive Hazardous Sites Branch
NC Superfund Section

**RE:** Site reconnaissance
Tungsten Queen Mine Site
Tungsten, Vance Co.
NCD #082 362 989

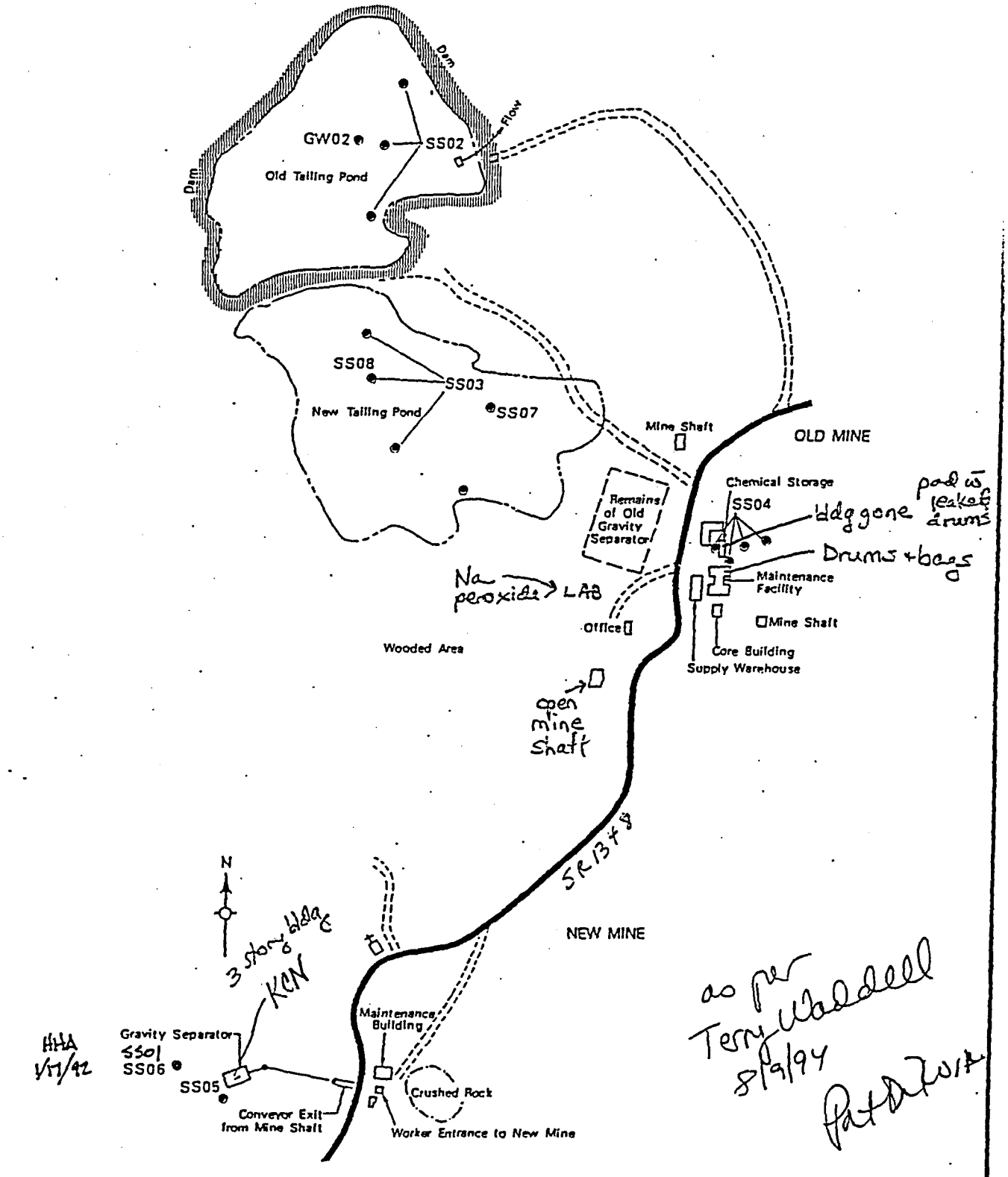
On March 27, 1997, Charlotte Jesneck and I conducted a site reconnaissance at the referenced site. We met Wayne Hudson, an employee of Louisburg Lumber (current owners of the mine site) in Stovall and followed him to the site at about 9:00 AM. The directions from Raleigh office to mine site are as follows. Leave Raleigh by Highway 50 to Creedmoor. Take Highway 50 to Highway 15 North through Oxford. Stay on Highway 15 from Oxford through Stovall to the crossroad at Bullock. Turn right onto State Road 1445 ("Faucette Road"). Take SR 1445 east crossing Island Creek and into Vance County. Come to sign marked Tungsten and turn left off SR 1445 onto SR 1348 or "Mine Road". Take Mine Road approximately 1.25 miles to first of the mine entrances. This entrance is to the new mine area. This entrance is noted by an abandoned building and fenced area on the right and left side of the road. The fenced area is locked west of the road and open on the east side of the road. The east side of the road is noted with an abandoned building and an area of crushed rock. North of this location is a church on SR 1348. Continue on SR 1348 for 1 to 1.5 miles to the main entrance at a sharp curve. The entrance to the main mine (old mine area) is located to the left. Several abandoned buildings and a water tower are evident from the gate entrance.

Charlotte and I initially did not stop at the new mine entrance, but later returned to the new mine area when we left the old mine site. Wayne drove us from the entrance of the old mine area past several buildings to the two tailings ponds. We returned to the main entrance and He left us to continued our site reconnaissance. Charlotte and I surveyed the buildings located at the main entrance. To the left inside the main gate is an office, an abandoned lab and a road running parallel to the gate to the left of the entrance leading to a mine shaft. Other buildings to the right of the entrance road are abandoned warehouses, storage buildings and mine shaft. One of the storage buildings contains drums of what appears to be crushed metal powder. However, several drums are not labeled. A removal of chemicals from on site labs was conducted at the site in August 1994, but NC Superfund Section does not have a copy of this report. It is unclear as to whether the materials in the drums have been tested. I plan to call about this later today or by next week (April 7th to 11th, 1997).

Charlotte and I continued the reconnaissance from the buildings north to the tailings ponds. Left of the road towards the tailings pond the large remains of the old gravity separator are present. This separator overlooks an estimated 15- 20 acres of a lower tailings pond and then another 15 to 20 acres of tailings pond adjacent to Island Creek. The gravity separator area contains several levels of concrete structures. A large UST was noted on-site laying out on the concrete structure. Its location and position of manhole of the UST made it difficult to note if any material was present inside the UST. The sands from tailings pond adjacent to the gravity separator are white and gray with the western end adjacent to a Dam covered by several feet of water. The upper pond area adjacent to Island Creek is partly owned by the US Army Corp of Engineers and noted by a fence line with the Corps symbol. However, the fence line is flat in some areas and easily accessible by foot. While Charlotte and I were walking around the tailings sands, two guys on dirt motor bikes came riding down the dam and across both tailings ponds. According to a previous SSI assessment, the ponds had signs stating "hazardous levels of lead posted", these are no longer posted. In addition, the bikes had no problem driving across the Corps property even though "restricted federal property " signs were noted hanging from the fence. The sands in some areas were gray to green possibly from oxidation of the coppers and sulfides from the Tungsten ore.

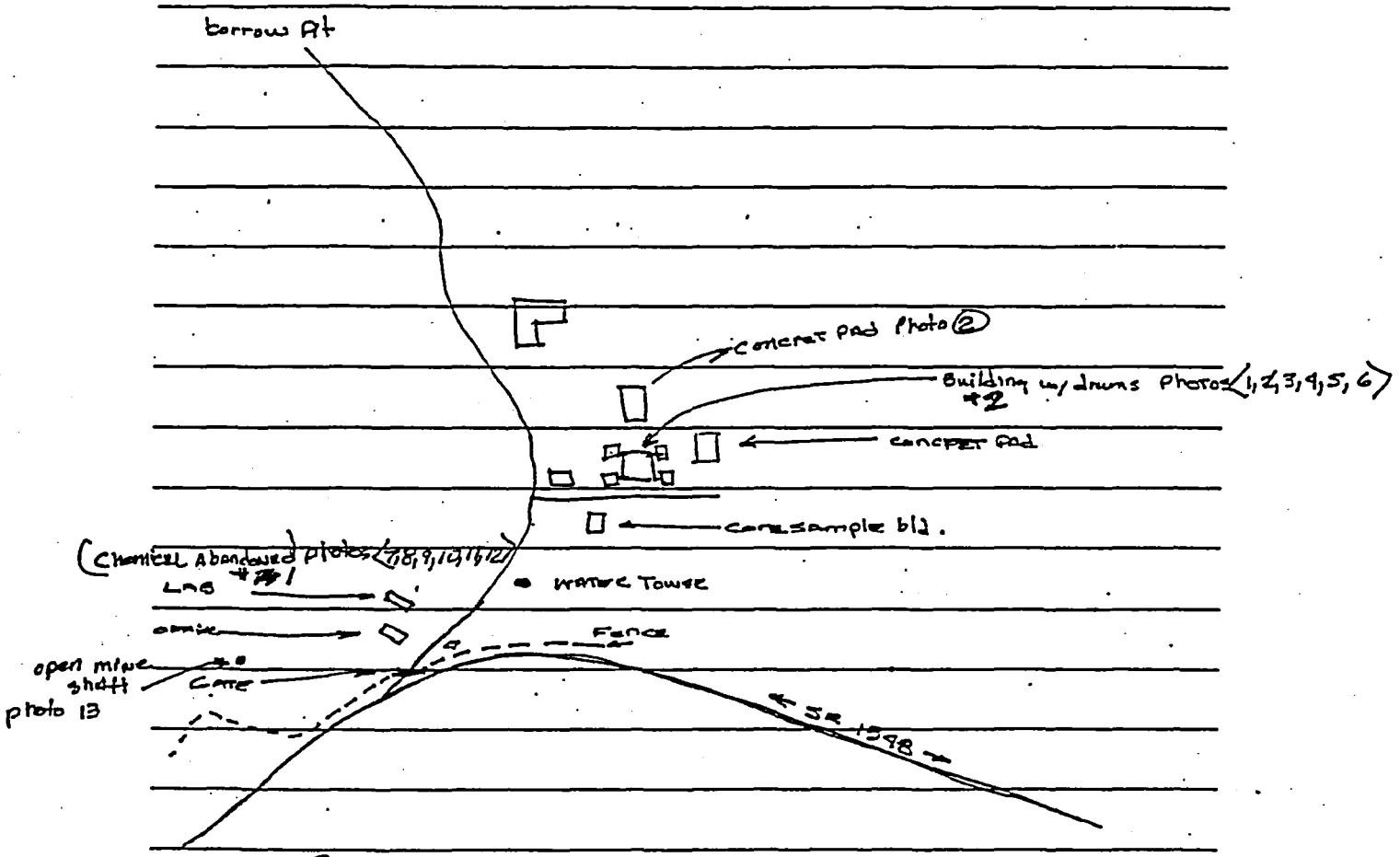
Prior to observing the tailings ponds and storage areas, a large drainage ditch and dump area is located east of the storage buildings near the gate entrance to the old mine area. This drainage area flows towards several residents located east of the mine. The drainage area contained paper, bottles, machinery from appliances and various other trash material. We did not note any hazardous materials or drummed waste in this ditch. We left the site about 1:00 PM. Upon leaving the old mine area we observed a map prepared by Green Horne and O'mara during the SSI conducted at the site. It was a little confusing as to the location of the new mine area. After leaving the site we drove down SR 1348 and noted the new mine area. This location made the map more understandable as to the locations of both mine areas. We stopped at the new mine area, however the location of the gravity separator at the new mine was fenced and locked. The maintenance building located east of the SR 1348 was accessible. We briefly walked this site and noted the abandoned building and mine shaft secured. We left the mine site at about 1:30 PM. After stopping for lunch in Oxford we returned to Raleigh by 3:30PM.

A sketch of the site was completed by Charlotte and I added some text about our site recon. In addition to our reconnaissance, there was an inspection of the facility conducted by Terry Waddell completed prior to the chemical removal conducted in August 1994. See attachments for site locations. The one building Charlotte and I were not able to inspect was a three story building at the new mine area. There was supposed to have been a cleanup conducted at this building during the August 1994 cleanup.




# TUNGSTEN QUEEN MINE

| NOT TO SCALE | FIGURE 2B |
|---|---|
| ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS<br>GREENHORNE & O'MARA, INC.<br>9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770<br>(301) 982-2800 | SITE LAYOUT<br>SAMPLING POINTS<br>NCD 082 362 989 |




Building #2 <Photos 1, 3, 4, 5, 6,> houses several drums of and unknown material. It appears to be some type of metallic powder. Most of the drums are in good shape, but some have completely rusted out. Concrete Pad (was a building) <photo #2> held a few drums, most empty. (There was a heavy sulfur smell at that location.)

Building #1 <photos 7,8,9,10,11,12> WAS A LAB. Inside there is several containers of chemicals, some of the chemical are; <Photo 7> mini drums of sulfuric acid; <Photo 8·B> Table top numerous containers (note empty container of perchloric acid); Bench bottom shelf <photo 9> Numerous containers (note broken bottles); Bench Top <photo 10> several containers, one of which is Arsenic Trioxide.

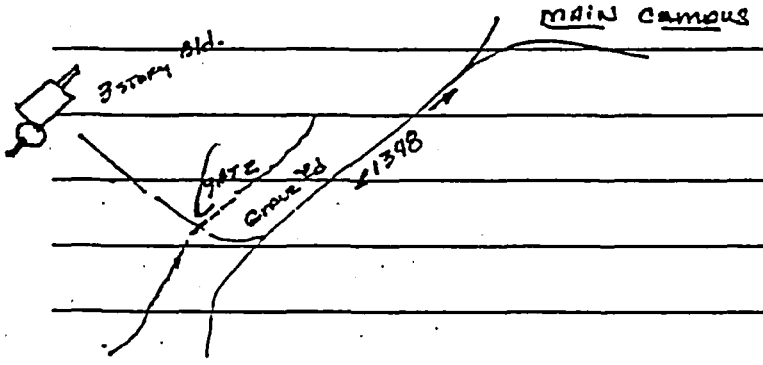
(LAB CONT.)

Bench Top <photo 11> broken box with containers of Sodium Peroxide (Note white crystal from leaking container)

Bench Top <photo 12> Numerous containers of Chemicals.

This building is NOT secure an is accessable by any curious person.

The other Mines site location of Concern is down SE 1348 approx. 1/2 mile from MAIN Campus.




ON Second floor of this location is A LAB with various small container of chemical & reagents. One container in particular is Potassium cyanide.

- Most of the sites consist of large mining equip bld & machinery. There is obvious signs of intruder damage from fire arms and vandalism.
- Near entrance to MAIN CAMPUS, there exist AN OPEN mine shaft unsecured photo <13>
- In conclusion I believe emergency or immnnant hazard exist. (Owner are Atlas Mine, Spokane WA.) Recommend is owner is NOT ABLE to remediate the immnnant hazard, the state should do so.

a FAX message from:

# Special Studies

Planning and Engineering Division Wilmington District

Doug Greene / CESAW-EP-PS
Corps of Engineers
PO Box 1890
Wilmington, NC 28402
(910) 251 - 4553 voice
(910) 251 - 4744 fax

Date: 9 April 1996 Number of Pages 4

## To: Keith Snavely

*Office Symbol: NC Division of Solid Waste, NC Superfund*
*Fax : 919-733-4811*

Remarks: Hi Keith.

The following 3 pages is our scoping letter. This letter relates to Island Creek except for paragraph 2, page 2 which indicates our expansion of the study. Since this letter went out we completed an Initial Appraisal Report recommending that we proceed with an expansion to the reconnaissance study. This report is under review at our Division HQ in Atlanta.

D.W.G.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

REPLY TO ATTENTION OF

January 2, 1996

Special Studies and Flood
Plain Services Section

Dear Madam or Sir:

We are conducting studies related to the operation of John H. Kerr Dam and Reservoir, North Carolina and Virginia. The study is being conducted under the authority of Section 216 of the 1970 Flood Control Act. Section 216 is for reevaluation of purposes and operations of existing Federal projects. The focus of the studies is on the Island Creek Dam and Pumping Station. The location of the Island Creek facility is on the North Carolina - Virginia state boundary in the southwestern part of Kerr Reservoir. The exact location is shown on the enclosed map.

In the 1950's it was feared that creation of the Kerr Reservoir would interfere with mining operations in the Hamme Tungsten District. The Government agreed to build Island Creek Dam and Pumping Station to minimize the impact of Kerr Reservoir on the mining operations. The mining company in turn agreed to compensate the Government for costs of operating and maintaining the facility.

The agreement made during the construction of the Kerr and Island Creek facilities remained in effect until 1983 when the mining company notified the Government that it had no further interest in the site. The mining interests have discontinued financial support for Island Creek and have released the Government from the obligation to operate and maintain the pumping station. There has been no other known interest in the mining operations, and no compensation is being made for operation of the facility. Although the Island Creek facility no longer serves its authorized purpose, it still requires substantial expenditures and energy to maintain and operate. Furthermore, the facility has now been operating for over 40 years and the Government cannot expect the pumping station to continue to operate dependably indefinitely. As a result, the need for continuation of the pumping station is being evaluated.

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In this study we are examining the consequences of the facility's declining reliability and developing alternative solutions. Two preliminary plans for modification of the Island Creek facility will be developed - cessation or continuation of the pumping operation. Kerr Reservoir on the opposing side of Island Creek Dam has a normal pool elevation of 300 feet m.s.l. (above mean sea level) and a maximum flood storage pool elevation of 320 feet m.s.l. The pumping station draws down the Island Creek Reservoir to maintain a pool elevation of 258 feet m.s.l. In the Island Creek basin the Government holds flowage easements only up to elevation 290 feet m.s.l. Cessation of pumping would require relocation of any infrastructure and property between elevation 255 and 320 feet m.s.l., mitigation for loss of habitats, and removal of any environmental threats from mine tailings. Continuation of pumping, the other main alternative, would require improved dependability by replacement or rehabilitation of the pumping station and justification and sponsorship for its operation.

The North Carolina Power Company is currently involved in studies of the Roanoke River system as part of its Roanoke Rapids and Gaston Hydropower Relicensing project. We will consider expanding the scope of our Section 216 study downstream of John H. Kerr Reservoir to parallel those being conducted by the North Carolina Power Company.

We are requesting comments from agencies, interest groups, and the public to identify and discuss significant issues of concern and recommendations for additional studies, if needed. Comments received in response to this scoping letter will be considered as we conduct our studies. Significant resources (including historic resources, recreational and esthetic resources, endangered and threatened species, fish and wildlife resources, wetlands, water quality, and freshwater and upland habitats) will be addressed, as appropriate, in the Section 216 reconnaissance report.

We request that you provide written comments on any of these matters within 30 days from the date of this letter. Comments should be addressed to the District Engineer; (Attention: Mr. Doug Greene); U.S. Army Corps of Engineers, Wilmington District; Post Office Box 1890; Wilmington, North Carolina 28402-1890. No formal scoping meetings are planned at this time, but based on the responses received, scoping meetings may be held with specific agencies or individuals as required. If you need additional information, please call Mr. Greene at (910) 251-4553.

Sincerely,

Robert J. Sperberg
Colonel, U.S. Army
District Engineer

Enclosure

CESAW-EP-PS/Greene/br/4553
CESAW-EP-PS/Griffin
CESAW-EP-P/Saunders
CESAW-EP/Dawson
CESAW-DX/Burch
CESAW-DP/Shuford
CESAW-DD/MAJ Bowling
CESAW-DE/COL Sperberg/s/
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# UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

## FACSIMILE TRANSMITTAL COVER SHEET

Date: 12-5-95 Time: 8:06 ☒ a.m. ☐ p.m.

TO: Grover Nicholson

Company/Organization: NC Superfund

Phone Number: 733-2801 Fax Number: 733-4811

Number of Pages Sent *(Including This Cover Sheet)*: 3

FROM: Cindy Gurley
North Superfund Remedial Branch
Waste Management Division

Site: "Tungsten Queen Mine"

Phone Number: (404) 347-7791 Fax Number: (404) 347-1695

NOTES: Grover, the following sheets is a printout from Wantden. The first sheet is the Event Qualifier = "N" = NFRAP and the second sheets are Comments.

Cindy Gurley

VIEW EVENT SUMMARY SCREEN 1 OF 1

REF NO.: 02910 EPA ID: NCD082362989
OPUNIT: 00 SITE NAME: TUNGSTEN QUEEN MINE
EVENT: SI1 EVENT NAME: SCREENING SITE INSPECT

EVENT DATA

EVENT LEAD: S PLANNING STATUS:
SCAP NOTE: HRS SCORE--NFRAP EVENT QUALIFIER: N

| | START | COMPLETE | |
|---|---|---|---|
| PLANNED: | / / | / / | CAG/TDD NO.: |
| ACTUAL: | / / | 09/25/1992 | CAG AMND NO.: |
| | | | PROJECT NO.: |

FIRST START INDICATOR: A FIRST COMPLETE INDICATOR: A

CONTACT NAME: CATHY AMOROSO CONTACT NO.: (404) 347-5065

Menu options Edit Leave Quit [M]

VIEW EVENT SUMMARY SCREEN 1 OF 1

REF NO.: 02910 EPA ID: NCD082362989
OPUNIT: 00 SITE NAME: TUNGSTEN QUEEN MINE
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EVENT DATA

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| | START | COMPLETE | |
|---|---|---|---|
| PLANNED: | / / | / / | CAG/TDD NO.: |
| ACTUAL: | / / | 09/25/1992 | CAG AMND NO.: |
| | | | PROJECT NO.: |

FIRST START INDICATOR: A FIRST COMPLETE INDICATOR: A

CONTACT NAME: CATHY AMOROSO CONTACT NO.: (404) 347-5065

Menu options Edit Leave Quit [M]

VIEW EVENT SUMMARY SCREEN 1 OF 1

REF NO.: 02910 EPA ID: NCD082362989
OPUNIT: 00 SITE NAME: TUNGSTEN QUEEN MINE
EVENT: SI1 EVENT NAME: SCREENING SITE INSPECT

```
003   06  RECOMMENDED FURTHER ACTION.  ON 10/19/94, THE RAW DATA AND
003   07  INFORMATION GATHERED DURING THE SI WAS APPLIED IN THE HRS

Add new comment    Select comment ID    View screen    Leave    [ ]

VIEW          EVENT COMMENTS

REF NO.: 02910                    EPA ID: NCD082362989
OPUNIT: 00                        SITE NAME: TUNGSTEN QUEEN MINE
EVENT: SI1                        EVENT NAME: SCREENING SITE INSPECT

COMM  LINE
ID    NO.                         COMMENTS                          TYPE
001   01  GW AND SW CONCERNS, ALSO ECO CONCERNS DUE TO NEARBY
001   02  WETLANDS AND KERR RESIVOIR.  OLD TUNGSTEN MINE WITH TAILING
001   03  PITS INTO THE SHALLOW AQUIFER.  CR, AS, PB, ZN IN TAILINGS.
001   04   E. BOZEMAN  2/20/91.
002   01  HIGH PRIORITY FOR PHASE II SSI.  E. BOZEMAN 2/20/91.
003   01  10/24/94:::  THE STATUS FOR THIS SITE WAS FOR A HIGH
003   02  PRIORITY ESI.  THE SI WAS APPROVED ON 9/25/94.  THE SITE
003   03  HAS NOT BEEN EVALUATED USING THE HAZARD RANKING SYSTEM,
003   04  HOWEVER THE SITE HAD BEEN EVALUATED USING THE PRELIMINARY
003   05  ASSESSMENT SCORING PROGRAM (PASCORE).  THE PASCORE
003   06  RECOMMENDED FURTHER ACTION.  ON 10/19/94, THE RAW DATA AND
003   07  INFORMATION GATHERED DURING THE SI WAS APPLIED IN THE HRS

Add new comment    Select comment ID    View screen    Leave    [ ]

VIEW          EVENT COMMENTS

REF NO.: 02910                    EPA ID: NCD082362989
OPUNIT: 00                        SITE NAME: TUNGSTEN QUEEN MINE
EVENT: SI1                        EVENT NAME: SCREENING SITE INSPECT

COMM  LINE
ID    NO.                         COMMENTS                          TYPE
003   08  PRESCORE PROGRAM VERSION 3.0.  THIS SITE DID NOT SCORE
003   09  ABOVE THE 28.5 CUT-OFF VALUE, THEREFORE THIS SITE WILL NOT
003   10  BE ELIGIBLE FOR INCLUSION ON THE NPL, AND WILL RECEIVE A
003   11  RECOMMENDATION OF NFRAP UNDER SUPERFUND AUTHORITY.
003   12  10/24/94.

Back    Leave    [ ]

VIEW          EVENT COMMENTS
```

DATE: August 22, 1995

SUBJECT: REMOVAL FROM EPA'S CERCLIS INVENTORY

FROM: Matthew J. Robbins, Brownfields Coordinator
Waste Management Division, Region IV

TO: TUNGSTEN QUEEN MINE
2 MI SE OF TOWNSVILLE
TOWNSVILLE
NC 27584

EPA has identified the Brownfields Initiative as one of the Agency's top priorities. The term "brownfields" refers to previously used properties that may lie vacant because potential contamination makes them unmarketable to the private sector. EPA has recently announced a comprehensive Brownfields strategy, including Pilot grants to municipalities, to stimulate economic revitalization.

One part of the strategy has been for EPA to review its complete inventory of Superfund sites. These sites have been screened and determined to require no remedial action under the Federal Superfund Program based on information available as well as on conditions and policies that currently exist. This is to notify you that EPA has removed your facility from EPA's computer inventory known as CERCLIS. THIS DOES NOT INDICATE THAT THE STATE HAS MADE A SIMILAR DETERMINATION.

If you have any questions, please call me at 404/347-5059 ext. 6214.

cc: State Agency

August 12, 1994

TO: File

FROM: Pat DeRosa, CERCLA Branch Head
NC Superfund Section

SUBJECT: Tungsten Queen Mine
NCD082362989
Townsville, Vance County, NC

On August 10, 1994, I spoke by telephone with Ken Deeder, Sales Manager, Atlas Mine and Mill (509) 535-2039 about the subject site. He told me that he did not know anything about the site and that I needed to talk to Shawn Szombathy, the company president, about the site. He said that Mr. Szombathy was out of the country and could not be reached and that he would not be back until Monday (August 15, 1994). He said that he had received a call from EPA and that he was sure the company would take care of the problem. I asked him if they had any plans for visiting the site in the near future and he said no.

On August 11, 1994, I spoke again by telephone with Mr. Deeder. He said that the previous owners, Hecla Mining Company, were working on removing the chemicals and that I should contact Dave Holland at (208) 769-4100.

I then spoke with Terry Waddell who was at the site earlier that day. He said that Shawn Szombathy was at the site and that he had spoken with him. Mr. Szombathy had been in Canada. Mr. Szombathy confirmed that Hecla Mining Company, a previous owner of the site, was planning to remove the chemicals and that we should contact them about the status. He thought that the removal contractor was AETC and that Harvey Allen with Allen and Associates was the oversight contractor for Hecla.

On August 12, 1994, I spoke by telephone with Harvey Allen (910) 485-3413 who confirmed that he had been contracted by Hecla to oversee the removal. He said the removal was scheduled to begin on August 22, 1994 and that he would contact Gary Gamble with Hecla and ask him to contact me to confirm the date.

I then received a call from Gary Gamble Environmental Supervisor, Hecla Mining Company in Idaho (208) 769-4154. Mr. Gamble confirmed that the removal contract had been awarded to Advanced Environmental Technology Corporation (AETC) in Creedmore,

NC (919) 528-3996 and the contact there was Ms. Stacy Goodwin. He said they were scheduled to begin work on August 22, 1994 and that AETC was responsible for obtaining all the necessary permits. I told him I would relay this information to Terry Waddell and EPA. I mentioned to him that the site was not secure and that there was a hole in the fence and evidence of children getting in there and also evidence of vandalism. He said that Atlas, the current owner, was responsible for site security.

I then spoke by telephone again with Terry Waddell and informed him that the removal was scheduled to begin on August 22, 1994 as per Mr. Gamble. Terry said that during his discussion with Mr. Howard Compton and Mr. Szombathy he suggested that they put up hazard tape at all entrances or holes in the fence where children could enter. He also pointed out areas where mine shafts were accessible. Terry said that Mr. Compton said he would put up the tape and Mr. Szombathy said he would take care of securing the mine shafts.

cc: Bill Steiner, US EPA
Terry Waddell, Hazardous Waste Section
Bruce Nicholson
Jack Butler

August 9, 1994

TO: File

FROM: Pat DeRosa, CERCLA Branch Head
NC Superfund Section

SUBJECT: Tungsten Queen Mine
NCD082362989
Townsville, Vance County, NC

On August 9, 1994, I spoke with Terry Waddell, Hazardous Waste Section, Raleigh Regional Office (919) 571-4700 regarding his discovery of drums, bags, and assorted bottles of discarded chemicals in and around buildings at the subject site. A copy of his report is attached. Based on the apparent presence of at least some reactive and non-compatible species in the buildings on site, the accessibility of materials and evidence of children playing and possibly vagrants living on site, Terry requested that we contact the US EPA Emergency Response and Removal Branch (ERRB) to request emergency action.

I then called Bill Steiner, US EPA ERRB, (404) 347-3931 ext. 6124, to request that EPA evaluate this site for an emergency removal. I told him of our concerns regarding the chemicals present and accessiblity of the site as well as the presence of open mine shafts. I told him that company representatives were supposed to be visiting the site on August 11, 1994 and that that might be a good opportunity for an OSC to meet with the company contacts since they were based in Spokane, Washington. I gave him the following contacts names:

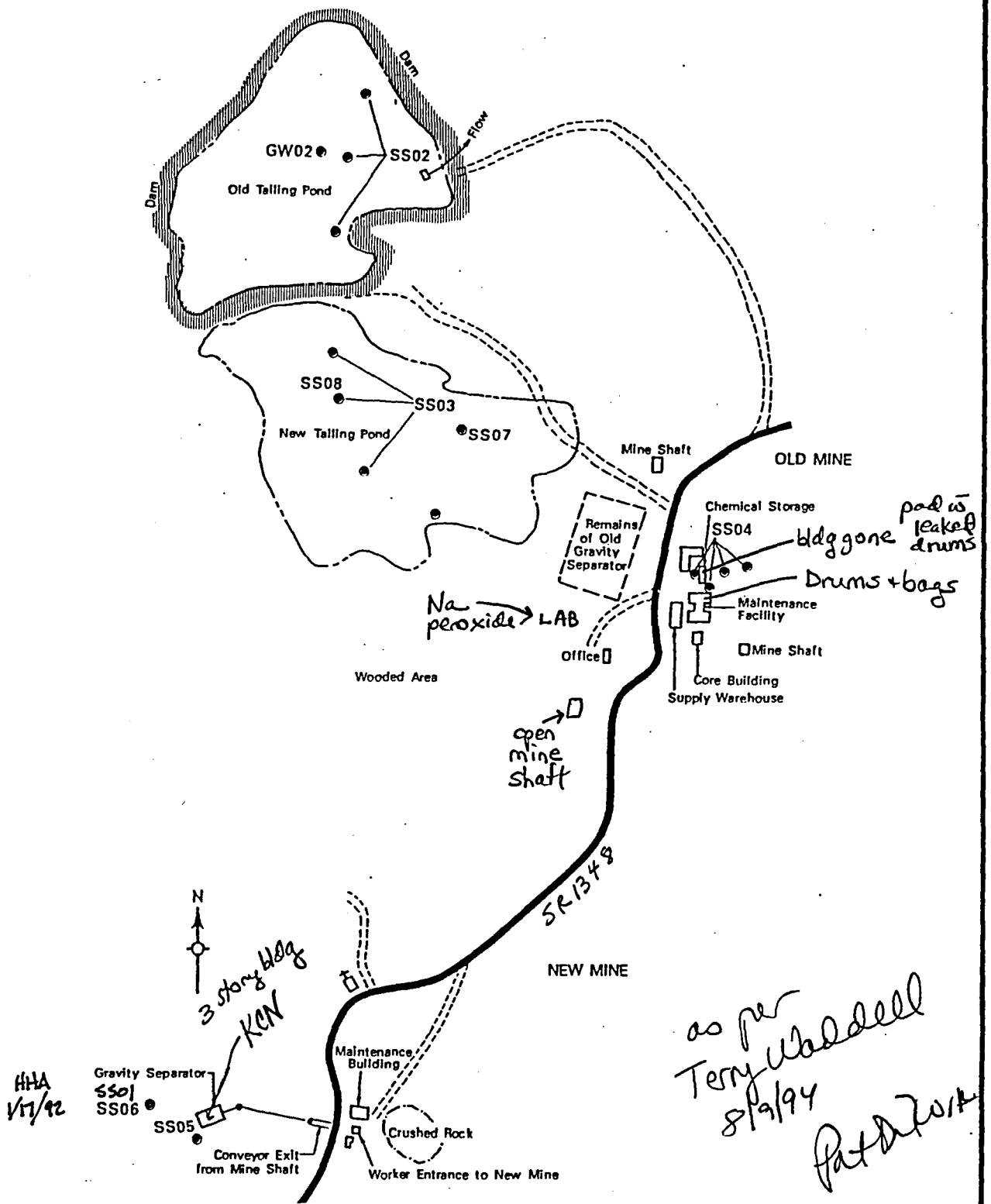
Owner: Atlas Mines (aka Mine Supply, Inc.)
Contact Shan Szombathy or Ken Deeder, (509) 535-2039

Key available with Howard Compton locally at (919) 492-5531

I also told him that if US EPA was going to visit the site, they should contact Terry Waddell by pager 1-800-412-9660 since Terry was most familiar with site conditions. Bill Steiner said that he needed to discuss this site with Shane Hitchcock and others in ERRB and that he would get back to me this afternoon or tomorrow with a response.

attachments

cc: Bruce Nicholson (with attachments)
Jack Butler




## TUNGSTEN QUEEN MINE

| NOT TO SCALE | FIGURE 2B |
|---|---|
| ENGINEERS • ARCHITECTS • PLANNERS • SCIENTISTS • SURVEYORS • PHOTOGRAMMETRISTS<br>**GREENHORNE & O'MARA, INC.**<br>9001 EDMONSTON ROAD, GREENBELT, MARYLAND 20770<br>(301) 982-2800<br>ANNAPOLIS MD • ATLANTA GA • AURORA CO • BALTIMORE MD • CULPEPER VA • DULUTH GA<br>EXPORT PA • FAIRFAX VA • MANASSAS VA • RALEIGH NC • ROCKVILLE MD • TAMPA FL | **SITE LAYOUT**<br>**SAMPLING POINTS**<br>NCD 082 362 989 |

DEPARTMENT OF ENVIRONMENT, HEALTH and NATURAL RESOURCES
DIVISION OF SOLID WASTE MANAGEMENT
HAZARDOUS WASTE SECTION
ACTIVITY REPORT

Subject: Investigation of Report of Abandoned Chemicals

Location: Tungsten Mines  Date: 8-1-94

Address: SR 1348  Time spent: 8 hr.

City: Tungsten  State: N.C.  Zip:

By whom: Terry W. Waddell - HWS, Ben Barns - SWM.

Persons contacted: Eugene Jaynes - High School Student.
(Owner, agent, tenant, manager, other)

Reason for visit: reported abandoned chemicals

Copies to:

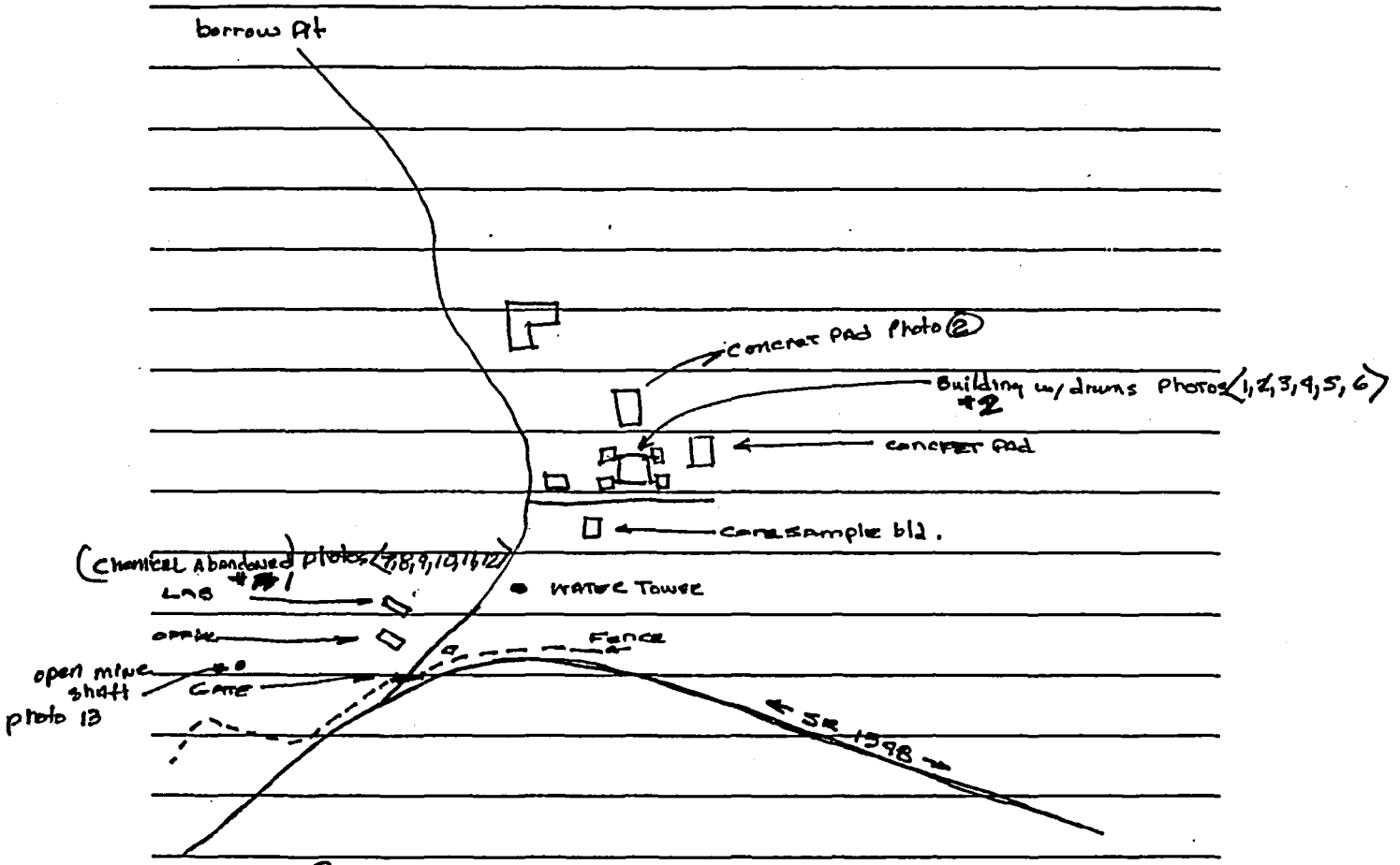
REPORT: 8-1-94, Site visit to the Tungsten Mine property on SR 1348, Tungsten N.C in Northern Vance Co. revealed the following information.

- Site is secured by a chain link fence but areas of accessability are available. While entering the facility a high school student, Eugene Jaynes, drove by and asked what we were doing. After we ID. ourselves & our purpose, he (Eugene) offered to show us the facility. Eugene said that he has explored the site all of his life, including hunting + swimming. Eugene, when asked, said he knew of drums of material and chemicals in 2 different labs.

- The facility (main campus) was closed in mid 1970's due to cheaper Chinese imports of Tungsten. Other locations exist down the road. Site consist of several abandon buildings, conveyers, crushers, ~~[illegible]~~ borrow pit, water towers & mine shaft.

Activity Type: Check Most Appropriate

| | | | | | |
|---|---|---|---|---|---|
| 1. | Complaint | X | 5. | Presentation | |
| 2. | Emergency Response | | 6. | Training | |
| 3. | Technical Assistance | | 7. | Meeting | |
| 4. | Remedial Action (other than WPCA) | | 8. | Other | |




Building #2 <Photos 1, 3, 4, 5, 6,> houses several drums of and unknown material. It appears to be some type of metallic power. Most of the drums are in good shape, but some have completely rusted out. Concret Pad (was a building) <photo #2> held a few drums, most empty. (There was a heavy sulfur smell at that Location.)

Building #1 <photos 7,8,9,10,11,12> WAS A LAB. Inside there is several containers of chemicals, some of the chemical are; <Photo 7> mini drum of sulfuric acid; <Photo 8> Table top numerous containers (note empty container of perchloric acid); Bench bottom shelf <photo 9> Numerous containers (note broken bottles); Bench Top <photo 10> several Containers, one of which is Arsenic Trioxide.

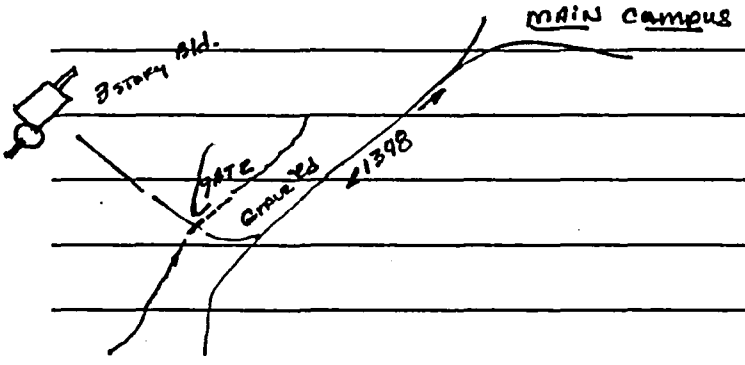
(LAB CONT.)

Bench Top <photo 11> broken box with containers of Sodium Peroxide (Note white crystal from leaking container)

Bench Top <photo 12> Numerous containers of Chemicals.

This building is NOT secure an is accessable by any curious person.

The other Mines site location of Concern is down SE 1398 approx 1/2 mile from MAIN Campus.




ON Second floor of this location is A LAB with various small container of chemical reagents. One container in particular is Potassium cyanide.

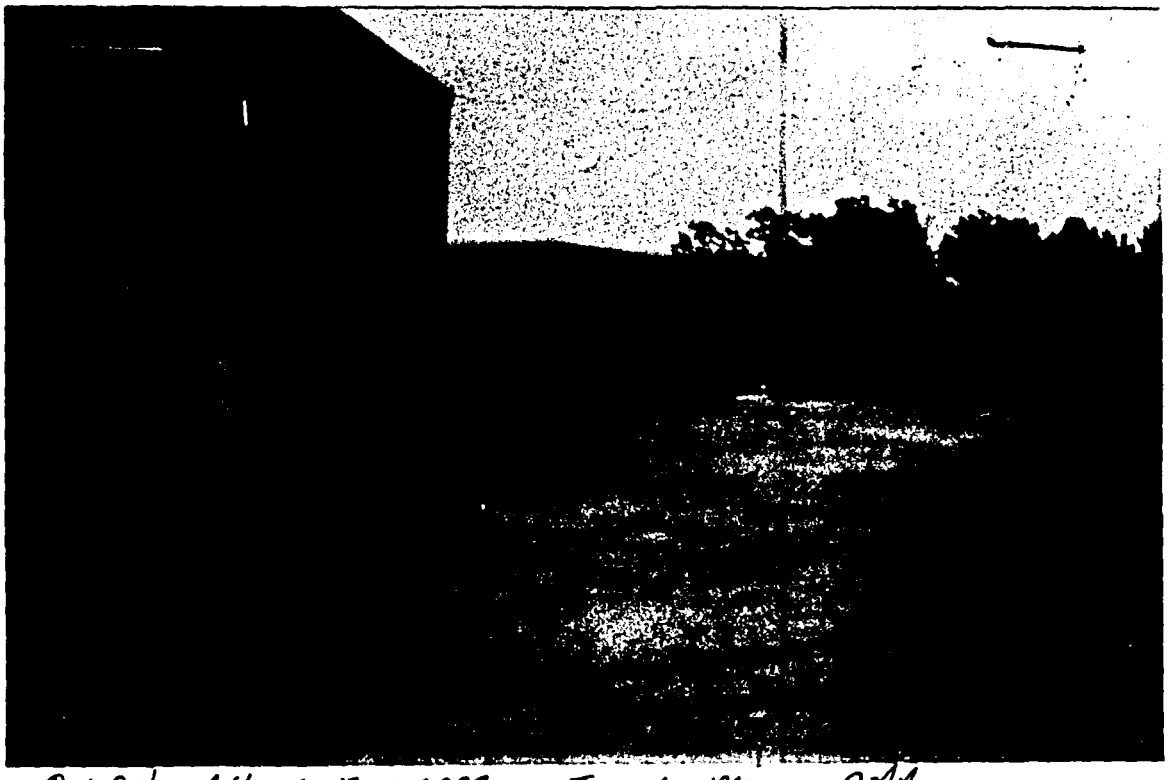
- Most of the sites consist of Large mining equip bld & machinery. There is obvious signs of intruder damage from fire arms and vandalism.
- Near entrance to MAIN CAMPUS, there exist AN OPEN mine shaft unsecured photo <13>.
- Inconclusion I believe emergency or imminant hazard exist. (Owner are Atlas Mine, Spokane WA.) Recommend is owner is NOT ABLE to remediate the imminant hazard, the STATE should do so.

Owners of the site.; Mine Supply Inc. (Atlas Mines)
P.O. Box 11703
Spokane, WA 99211
Contact Howard Compton (919) 492 5531

Contacted Atlas Mine @ (509)-535-2039 on 8-4-94 11:0m EST alerted receptionist of problem and ask responsible person to call or page me ASAP. She indicate that Shan Szombathy would have knowledge of site. Attempt to call @ 2:18 EST - Mr. Szombathy was not in. Attempted to call 8-5-94, Receptionist told me to speak to Ken Deeder.

I explained situation to Deeder & asked when a rep from his company planned to be at the site. Mr. Deeder did not know. Mr. Deeder indicated I needed to speak to Shan Szombathy.

①



8-1-94 Bld #2 Entrance Tungsten Mine

②

Pad Behind Bld #2 Tungsten Mine

8-1-94

①

8-1-94 Bld #C Entrance Tungsten Mine

②

Pad Behind Bld #2 Tungsten Mine

8-1-94

8-1-94
Adm
Tungsten Mine
Bld #2
barrels of ?

(3)

(4)

8-1-94
Adm
Bld #2
Barrels of ?

5

6

(7)

8-1-11 LAB #1 JMH Tungsten Mine re: Sulfuric Acid

(8)

8-1-11 LAB #1 JMH Tungsten Mine re: empty Cont. of Perchloric Acid

(9)

8-1-94
JMK
Lab #1
Tungsten Mine
Abandoned Chem.

(10)

8-1-94
JMK
LAB #1
Tungsten Mine
Abandoned Chem

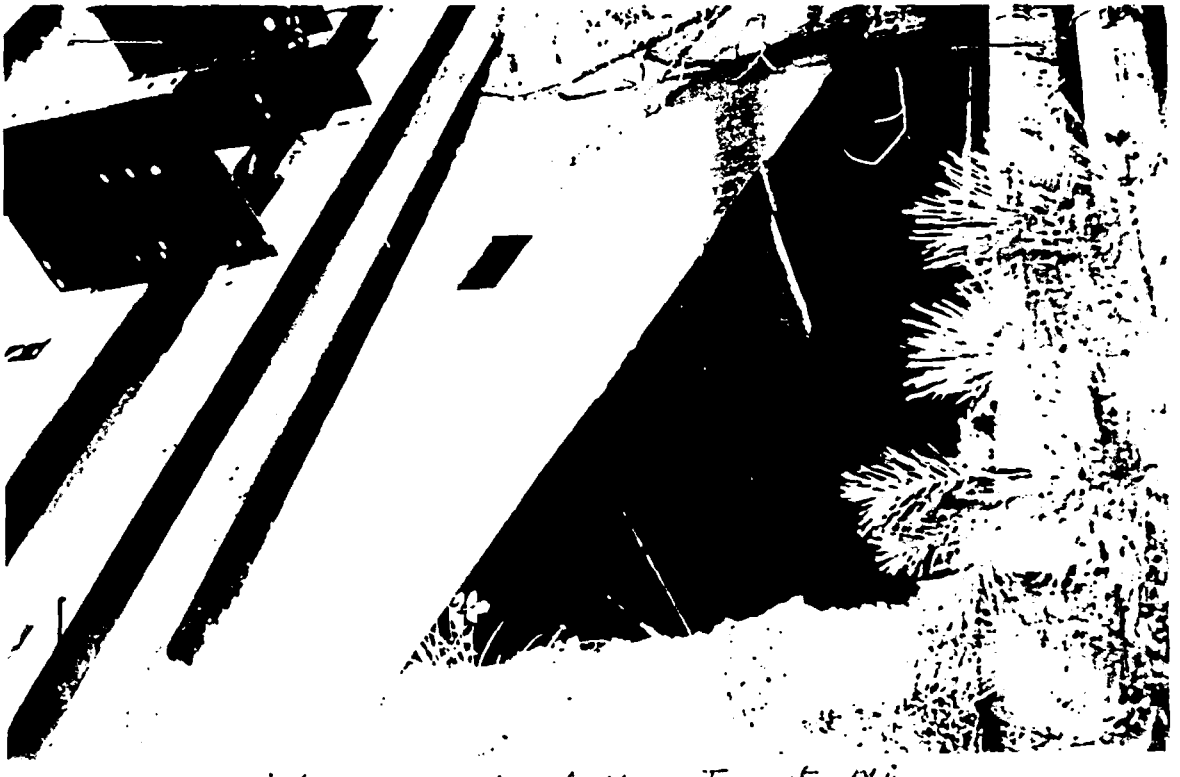
(11)

8-1-94 Lab # 1 Idaho Tungsten Mine [illegible] containers of Sodium Arsenide.

(12)

8-1-94 Lab # 1 Idaho Tungsten Mine [illegible]

(13)



8-1-94 [illegible] open mine shaft @ Tungsten Mine

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

FAX TRANSMITTAL RECORD

DATE: Nov. 9, 1992

FROM: _____, Solid Waste Management Division

_____, Solid Waste Section

_____, Hazardous Waste Section

GROVER NICHOLSON, Superfund Section

TO: JEFF REID

RE: TUNGSTEN QUEEN MINE

Number of pages (including cover) 3

Confirm receipt of document(s):

| | | |
|---|---|---|
| ____ | Division of Solid Waste Management | (919)733-4996 |
| ____ | Solid Waste Section | (919)733-0692 |
| ____ | Hazardous Waste Section | (919)733-2178 |
| ✓ | Superfund Section | (919)733-2801 |

North Carolina Department
of Environment, Health, and
Natural Resources

JEFFREY C. REID, PH.D.
Chief Geologist
North Carolina Geological Survey

P. O. Box 27687
512 N. Salisbury Street
Raleigh, N. C. 27611-7687

(919) 733-2423

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# State of North Carolina
# Department of Environment, Health, and Natural Resources
# Division of Solid Waste Management

James G. Martin, Governor
William W. Cobey, Jr., Secretary

9 November 1992

William L. Meyer
Director

To: Jeff Reid
Chief Geologist
NC Geological Survey

From: Grover Nicholson
Environmental Engineer
NC Superfund Section

Re: Tungsten Queen Mine

I am finally replying to your 18 September 1992 memo concerning the Tungsten Queen Mine in Vance County. I apologize for the long delay. September is our end-of-year and many deadlines must be met.

Basically, your memo accurately describes our conversation that we had on 10 August 1992. However, I have made some notations that further define the Superfund Section's involvement in the site. Let me state again that the reason we are investigating the site is because of the metals content of the tailing ponds. These tailing are a waste product of the mining and show extractable levels of lead. The galena in the mineralized zone is not a waste product and is not part of the investigation.

Listed below are my comments on the points of your memo. My suggested changes and additions are included in brackets, and deletions are lined through.

1. The preliminary inspection ~~and desktop assessment was~~ done by ~~yourself~~ [you] in 1985 ~~which~~ assigned the site a low priority for inspection.

2. ~~The site was inspected for phase II~~ [A site investigation was conducted] by Greenhorne and O'Mara, Inc. in 1991 with the report ~~just~~ published July 29, 1992.

3. ~~Under EPA's hazard ranking system, further work is required under the National Contingency Plan.~~ [Based on the results of the site investigation, the NC Superfund Section recommended an Expanded Site Inspection (ESI) of the site.]

4. We agreed that the information which I provided Dr. Carl in my memorandum of August 8, 1991 [would] be included in the ~~report~~ [site file and in the ESI when completed.] ~~to be produced from the forthcoming work.~~ If lead values are still "high" the relative insolubility of galena provides strong evidence that it ~~is neither~~ [may not be] practical ~~nor~~ [or] necessary to remove the tailing [s].

5. ~~Your new report will acknowledge the~~ [The ESI, when completed, will include my memorandum showing the] mineralized zone whose strike extent of several miles has been prospected along its length. In short, a large area is mineralized. It is impractical to remove galena from the entire length of the mineralized zone.

I hope these comments are helpful. The idea, of course, is to insert practical geological advice into the investigation of the site at the proper stage. Please call me at 3-2801 if you have any questions.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO

April 9, 1992

RECEIVED
APR 1 / 1992
NC DIVISION OF SOLID WASTE MANAGEMENT

Planning Division

Mr. Abraham Ferdas, Director
Superfund Office
Hazardous Waste Management Division
U.S. Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Dear Mr. Ferdas:

The purpose of this letter is to follow up my letter of February 12, 1992, to you regarding the tungsten mine tailings issue related to recreation areas at John H. Kerr Reservoir, North Carolina and Virginia. The removal of the mine tailings from the U.S. Army Corps of Engineers owned and operated recreation areas commenced February 3, 1992, and was completed on February 7, 1992. These tailings were returned to the source, the mine in Vance County, North Carolina. The renourishment of these recreation areas with clean sand was commenced on February 10, 1992, and was completed on February 12, 1992. These actions were described in detail in our January 16, 1992, Public Notice and the Environmental Assessment and Finding of No Significant Impact enclosed with that Public Notice. The areas were cleaned up to eliminate public concerns regarding potential health risks and to encourage full utilization of the recreation areas by the public.

Also, as indicated in my letter to you on February 12, 1992, we began a comprehensive survey of the non-Corps owned/operated tailings beaches on February 19, 1992. Both Mr. Terry Stilman and Ms. Nancy Cichowicz, Environmental Protection Agency (EPA), Region III, were present during the initial day of this survey. The total survey took 2 days and was completed March 9, 1992. During the survey, the reservoir was at or below normal summer pool, which facilitated location of beaches where tailings were placed. The results of this survey are summarized in table 1 and figure 1.

During the initial day of the survey, Mr. Frank Yelverton of my Environmental Resources Branch collected mine tailings samples from three of the survey sites (see enclosure 1 for results). The purpose of these samples was to confirm results from sampling efforts previously conducted by EPA, Region III, or the State of North Carolina at the same three locations. These sites were chosen for additional sampling because the total lead concentrations were the three highest (940, 580, and 445 mg/kg) of all the

values reported by EPA, Region III, or State of North Carolina (the highest total lead concentration previously reported by the Corps at the mine or our owned and operated recreation areas was 422 mg/kg). Our confirmation sampling results and associated quality assurance/quality control data clearly indicate that these three sample sites have total lead concentrations <500 mg/kg. Both the State of North Carolina and Commonwealth of Virginia indicate that no adverse human health effects would be expected in areas where total lead concentrations are <500 mg/kg (enclosure 2). The only quasi-public beaches found during the survey (Stateline Baptist Camp and UNC Recreation Area) have total lead concentrations much less than 500 mg/kg (130 and <20 mg/kg, respectively).

Table 1 also summaries all the total lead results from the sampling efforts by the Corps; EPA, III; and State of North Carolina. The 26 sampling locations are 46 percent (26/56) of the total known mine tailings sites along the reservoir shoreline and include samples taken at the mine and in undisturbed tailings stockpiles (worst case areas).

In addition, the Commonwealth of Virginia conducted groundwater, surface water (reservoir is a source of raw water for water supply), and fish tissue analyses for lead in the vicinity of the Corps owned and operated recreation areas prior to cleanup operations (enclosure 3). No concentrations of concern related to mine tailings were detected.

Several of the areas sampled have toxicity characteristic leaching procedure results that are greater than the Resource Conservation and Recovery Act (RCRA) regulatory threshold for lead of 5.0 mg/l (40 CFR 261.24). However, mine tailings are excluded under Federal law as a hazardous waste regulated by RCRA (40 CFR 261.4(b)(7), enclosure 4). In addition, based on the data referenced above and the circumneutral pH of the reservoir, the probability of lead leaching from the tailings is minimal.

Most of the mine tailings sites identified during the comprehensive survey were small, associated with transient single family residences, and owned in fee by others on which the United States merely holds a flowage easement. The District strongly disagrees with EPA's position that such lands constitute a Federal facility. This is an extremely important issue with the Corps, which the District has coordinated with higher authority. Staff with our South Atlantic Division concur with our position that the United States does not exert sufficient control over these areas for them to be considered a Federal facility. In addition, the District had no participation in the placement of mine tailings on this private property, and we do not believe we are responsible for these areas.

Based on the above, we conclude that (1) a representative number of mine tailings sites have been sampled, (2) worst case sites have been sampled, (3) none of the tailings sites along the reservoir represent a potential health risk, (4) water resources have not been contaminated, (5) fisheries resources are not being impacted, and (6) most of the sites do not constitute a Federal facility. Therefore, removal action by the Corps for the remaining tailings sites along the reservoir shoreline is not necessary.

Sincerely,

Lawrence W. Saunders
Chief, Planning Division

Enclosures

Copies Furnished (with enclosures):

Mr. John Lank
Waste Management Division
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, NE.
Atlanta, Georgia 30365-2401

Mr. M. Doug Lair, Chief
Emergency Response and Removal Branch
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, NE.
Atlanta, Georgia 30365-2401

Mr. Shane Hitchcock
Emergency Response and Removal Branch
Waste Management Division
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, NE.
Atlanta, Georgia 30365-2401

Mr. William Meyer, Director
Solid Waste Management Division
North Carolina Department of Environment,
Health, and Natural Resources
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Mr. Jerry Rhodes, Chief
Hazardous Waste Section
Solid Waste Management Division
North Carolina Department of Environment,
Health, and Natural Resources
Post Office Box 27687
Raleigh, North Carolina 27611-7687

Mr. William F. Gilley, P.E.
Director, Division of Regulation
Department of Waste Management
101 North 14th Street
Richmond, Virginia 23219

Mr. Terry Stilman
Superfund Removal Branch
Hazardous Waste Management Division
U.S. Environmental Protection Agency
Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107

Table 1. Total lead concentration (mg/kg), Tungsten mine tailings sites, John H. Kerr Reservoir.

| Site # | Dock # | Sample #/Sample Date EPA III 5/25/91 | NCDSWM 7/24/91 | CORPS 2/19/92 | Party | Location | Total Conc. |
|---|---|---|---|---|---|---|---|
| 1 * | 193 | B007 | | | Wynne | Island Creek, | 580 |
| ** | | | | KERR-S1 | " | Gomas Br. | 478 |
| 2-5 | | | | | unknown | " (four spots) | |
| 6 * | 105 | | 008380 | | Moore | Island Creek | 85 |
| 7 | 78 | | | | Rodds | Gomas Br. | |
| 8 | 657 | | | | Parker | " | |
| 9 * | 130 | | 008381 | | Atkins | " | 27 |
| 10 * | 627 | B006 | | | Markum/Weaver | Island Creek, Cherokee Hills | 160 |
| 11 | 110 | | | | Paloni | " | |
| 12 | 571 | | | | Miller | Island Creek Sunset Cove | |
| 13 * | 1022 | B005 | | | O'Briant | " | 61 |
| 14 * | 1515 | | 008375 | | Juett | Carter Cove/ | 940 |
| ** | | | | KERR-S2 | " | Carter Branch | 337 |
| ** | | | | KERR-S3 | " | " | 373 |
| 15 * | 845 | B002 | | | Walker | " | 267 |
| | | | 008376 | | " | " | 220 |
| 16 * | 791 | | 008377 | | Dickerson | " | 300 |
| 17 * | 425 | | 008378 | | Bailey | " | 130 |
| 18 * | 388/1655 | B004 | | | Tulloch/Knott | " | 445 |
| | | | 008379 | | " | " | 300 |
| ** | | | | KERR-S4 | " | " | 309 |
| 19 | 855 | | | | Latta | " | |
| 20 | 338 | | | | Walker | " | |
| 21 * | 311/343 | B001 | | | Wilson/Freeman | " | <50 |
| 22-26 | 540 | | | | Andrade | " (Five spots) | |
| 27 | 154 | | | | Norris | Carter Cove/ Carter Branch | |
| 28 | H-103 | | | | Yates | " | |
| 29 | 353 | | | | Bennett | " | |
| 30 | 67 | | | | Stephens | " | |
| 31 | | | | | unknown | " | |
| 32 | 711 | | | | Jordan | " | |
| 33 | 417 | | | | Brackett | " | |
| 34 | 428 | | | | Shaw | " | |
| 35 | 412 | | | | Reveley | Main Channel, Merifield Acres | |
| 36 * | | B010 | | | unknown | Grassy Creek, Merifield Acres | <50 |
| 37 | 44 | | | | Thompson | " | |
| 38 | 604 | | | | Recon, Inc. | Grassy Creek Recon Subdivision | |
| 39 | 649 | | | | Dunson | " | |
| 40 * | | B008 | | | Recon, Inc. | Recon Beach | <50 |
| 41 * | 781 | B003 | | | Williamson | Grassy Creek, head-waters | 325 |
| 42 * | | B009 | | | Corps/State-line Baptist | Grassy Creek at US 15 | 130 |

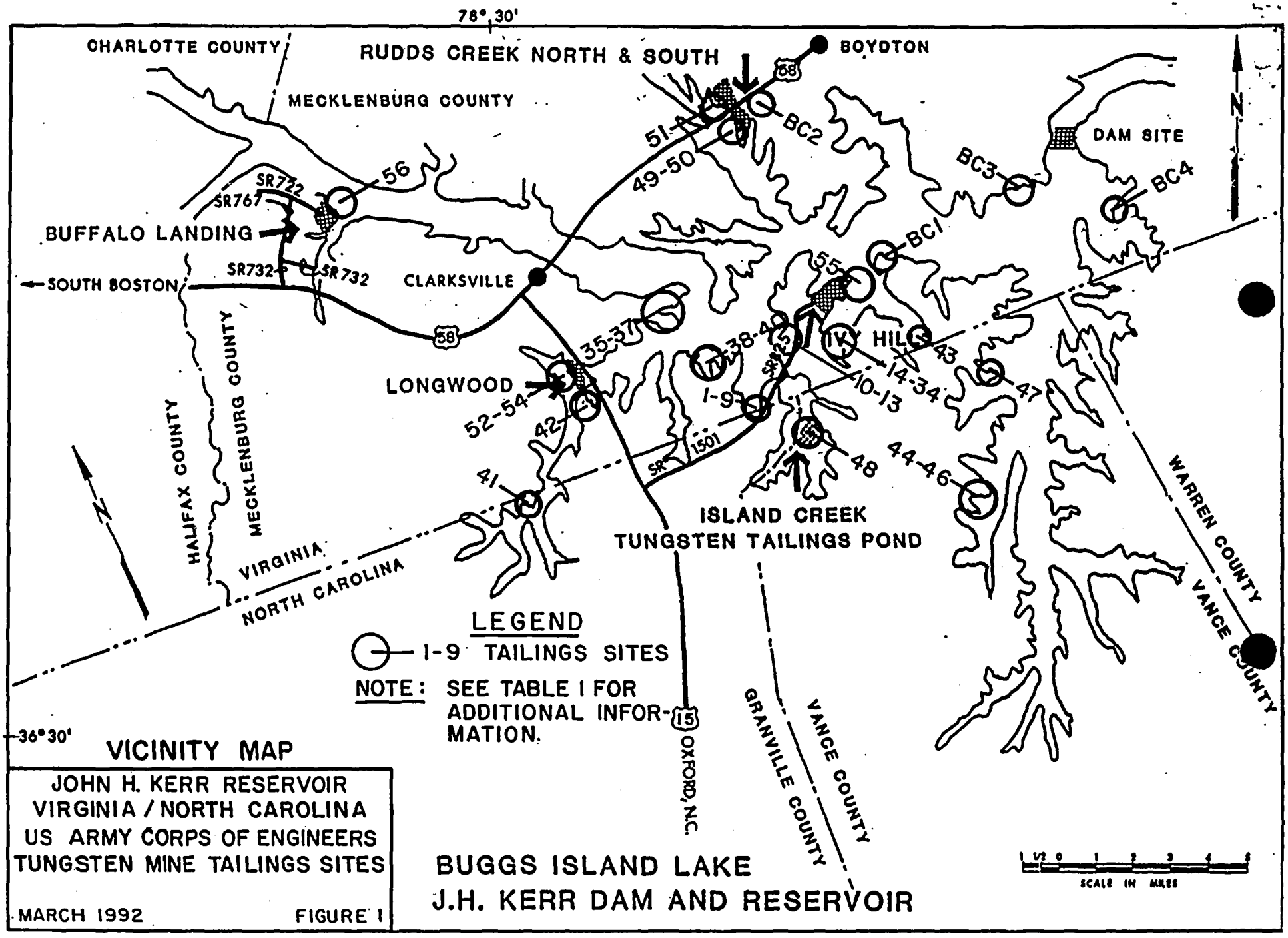
Table 1. Continued.

| Site # | Dock # | Sample #/Sample Date EPA III 5/25/91 | NCDSWM 7/24/91 | CORPS 2/19/92 | Party | Location | Total Conc. |
|---|---|---|---|---|---|---|---|
| 43 | | | | | Odom Farm | Mill Creek | |
| 44 | | | | | unknown | Little Nutbush Creek | |
| 45 | | | | | Unknown | " | |
| 46 * | 88-22 | | 008373 | | Riley | " | 180 |
| 47 * | | | 008374 | | Corps/UNC Rec. Area | Nutbush Creek at Dodson Creek | <20 |

| Site # | Dock # | Sample #/Sample Date EPA III 5/25/91 | NCDSWM 5/21/91 | CORPS 4/9/91 & 5/24/91 | Party | Location | Total Conc. |
|---|---|---|---|---|---|---|---|
| 48 * | | B012 | | | Corps | Tailings Area at | 440 |
| | | | TQSS02 | | " | Mine | 263 |
| | | | | JHK-S2 | " | " | 399 |
| 49 * | | S001 | | | " | Rudds Creek South | <50 |
| | | | | KERR/S26 | " | Beach | 354 |
| 50 * | | S002 | | | " | Rudds Creek South | 183 |
| | | | | JHK-S18 | " | Tot Lot | 363 |
| 51 * | | S003 | | | " | Rudds Creek North | 54 |
| | | | | KERR/S21 | " | Beach | 272 |
| 52 * | | S004 | | | " | Longwood Rec. | <50 |
| | | | | JHK-S31 | " | Area Tot Lot | 419 |
| 53 * | | S005 | | | " | Longwood Rec. | <50 |
| | | | | KERR/S35 | " | Area Beach | 325 |
| 54 * | | | | KERR/S36 | " | Longwood Rec. | 422 |
| | | | | | " | Area Stockpile | |
| 55 * | | S006 | | | " | Ivy Hill Beach | 51 |
| | | | | KERR/S56 | " | " | 293 |
| 56 * | | S007 | | | " | Buffalo Landing | <50 |
| | | | | KERR/S46 | " | Beach | 206 |
| BC1 | | B011 | | | Corps/BSA | Tuscarora BSA (background) | 240 # |
| BC2 | | | | JHK-S8 | Corps | Rudds Creek (background) | 21 |
| BC3 | | B013 | | | " | Mays Chapel Beach | <50 |
| | | | | KERR/S14 | " | (control beach) | <10 |
| BC4 | | | | JHK-S23 | " | Palmer Point | <10 |
| | | | | KERR/S7 | " | (control beach) | <10 |

NCDSWM NC Division of Solid Waste Management.
H-103 Boat House number.
88-22 Clearing permit.
BC1-4 Background or control samples.
# This elevated value is apparently due to sampling/analytical contamination.
* 26 mine tailings sites sampled of the 56 total mine tailings sites (i.e. 46% (26/56) of the sites were sampled).
** Confirmation samples taken by the Corps, see enclosure 1.

Note: The total lead concentrations listed by site are the single values reported by the indicated agency or the maximum of several values reported by the indicated agency. Sites 48-56 have been cleaned up to eliminate public concerns regarding perceived health risks and to encourage full utilization of the recreation areas by the public.


78° 30'
CHARLOTTE COUNTY
RUDDS CREEK NORTH & SOUTH
BOYDTON
MECKLENBURG COUNTY
58
BC2
51-
49-50
DAM SITE
BC3
BC4
56
SR722
SR767
BUFFALO LANDING
SR732
SR732
CLARKSVILLE
BC1
55
SOUTH BOSTON
58
35-37
38-40
IV
HILL
43
14-34
10-13
47
LONGWOOD
52-54
42
1-9
1501
SR
48
44-46
41
HALIFAX COUNTY
MECKLENBURG COUNTY
ISLAND CREEK
TUNGSTEN TAILINGS POND
WARREN COUNTY
VANCE COUNTY
VIRGINIA
NORTH CAROLINA
LEGEND
1-9 TAILINGS SITES
NOTE: SEE TABLE I FOR ADDITIONAL INFORMATION.
15
OXFORD, N.C.
GRANVILLE COUNTY
VANCE COUNTY
36° 30'
VICINITY MAP
JOHN H. KERR RESERVOIR
VIRGINIA / NORTH CAROLINA
US ARMY CORPS OF ENGINEERS
TUNGSTEN MINE TAILINGS SITES
MARCH 1992
FIGURE 1
BUGGS ISLAND LAKE
J.H. KERR DAM AND RESERVOIR
SCALE IN MILES

SOUTH ATLANTIC DIVISION LABORATORY
U.S. ARMY CORPS OF ENGINEERS
611 SOUTH COBB DRIVE
MARIETTA, GA 30060

# CHEMICAL TEST REPORT FOR JOHN H. KERR RESERVOIR

Parameter: Total Lead — Analyst: Keith Bates

| Table 1 Site # | SAD Lab No. | Field ID | Result | Units | Test Date | Duplicate |
|---|---|---|---|---|---|---|
| 1 | 13026 | Kerr-S1 | 390 | mg/kg | 920227 | 478 |
| 14 | 13027 | Kerr-S2 | 330 | mg/kg | 920227 | 337 |
| 14 | 13028 | Kerr-S3 | 373 | mg/kg | 920305 | 341 |
| 18 | 13029 | Kerr-S4 | 297 | mg/kg | 920227 | 309 |
| 14 | 13030 | Kerr-W1 | <200 | ug/L | 920227 | --- |

QA/QC

| | | | | |
|---|---|---|---|---|
| Method Blank | <200 | ug/L | 920227 | |
| Calibration Blank #1 | <200 | ug/L | 920227 | |
| Calibration Blank #2 | <200 | ug/L | 920227 | |
| Calibration Blank #3 | <200 | ug/L | 920305 | |
| Calibration Blank #4 | <200 | ug/L | 920305 | |
| Reference Sample ERA Lot 210 | 100 | mg/kg | 920227 | Actual 90 mg/kg 111% Recovery |
| Reference Sample ERA 9938 | 169 | ug/L | 920227 | Actual 170 ug/L 99% Recovery |
| Reference Sample ERA 9938 | 174 | ug/L | 920305 | Actual 170 ug/L 102% Recovery |

| Spikes | Field ID | Sample Result | Spike+ Sample | Spike Amt. | Units | % Recovery |
|---|---|---|---|---|---|---|
| Prespike | Kerr-S1 | 390 | 1416 | 980 | mg/kg | 105 |
| Postspike | Kerr-S1 | 390 | 1357 | 980 | mg/kg | 99 |

Checked by: BW

Signed by:

Blaise Willis

Blaise Willis
Chemist

Sheet 1 of 1

Enclosure 1. Corps Confirmation Samples.

# PUBLIC HEALTH NEWS

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

109 Governor Street Suite 515
Richmond, Virginia 23219
(804) 786-3551
(804) 371-6152 FAX

May 17, 1991

For immediate release

Contact: Barbara Mitchell
Information Officer
(804) 786-3551

## VDH officials review health effects from lead in sand

The Virginia Department of Health has been assessing the health risk of lead exposure among citizens who visited beaches around the Kerr Dam Reservoir recently closed by the Corps of Engineers. Though the sand does have increased levels of lead, VDH officials do not anticipate the levels causing a health hazard to those who have visited the beach. The VDH is working with other state agencies to further assess the situation by collecting and analyzing water and fish samples.

"Based on our calculations and current test results, whether you used the beaches or play areas frequently or infrequently, there is little possibility of developing any lead toxicity from the sand," said Dr. Carl Armstrong, director of the VDH Division of Health Hazards Control. "The main possibility of exposure in this case would be from ingestion of sand by children less than six years old. At the lead levels reported in the sand, we do not feel this would cause elevated lead levels in any children."

Because the weight of the sand would not tend to create dust, VDH officials believe there would be little risk of inhaling lead-contaminated particles from the sand. Exposure from lying on the beach or swimming in the water would be slight.

"Though exposure to lead in this situation is slight, citizens should be aware that lead can accumulate in the body," said Dr. Armstrong. "Because lead does build up in the body, it is important to be aware of the sources of lead and avoid them. This is especially true for young children because they are more sensitive to the effects of lead."

MORE

Encl. 2

In Virginia, one of the most common forms of exposure is from paint containing lead. Paint containing lead was banned in the 1970s, but was frequently used in homes prior to 1970. Lead plumbing, usually found in older buildings, and lead-based solders are other frequent sources of lead exposure. Some occupations and hobbies that use lead in soldering or welding are sources of lead exposure. Soil may also contain lead naturally or as a result of other sources of contamination such as exhaust fumes from automobiles using leaded gasoline.

Initial testing for lead exposure is done by a finger-stick and analysis of the blood sample. Tests can be done by a physician or the local health department by appointment.

The VDH has tested the public drinking water supplies for the town of Clarksville, which draws water from the reservoir. Tests run in December 1990 and May 11, 1991 show no detectable levels of lead.

The Department of Health will closely monitor other test data as it is received. The U.S. Corps of Engineers is currently awaiting results of tests for other contaminants that might be present in the sand. Area citizens will be notified if any of these results indicate a health risk.

**END**

James G. Martin, Governor

William W. Cobey, Jr., Secretary

North Carolina
Department of Environment, Health, and Natural Resources

Release: #EPI 5/17/91a IMMEDIATE
Contact: W.C. "Bill" Furney (919) 733-4984

Date: 17 MAY 91
Distribution: STATEWIDE

KERR BEACHES DEEMED SAFE

RALEIGH -- Based upon test results received from the Army Corps of Engineers, health officials with the state Division of Epidemiology have determined that beaches around the Kerr Dam Reservoir are safe for public use.

According to Dr. John I. Freeman, chief of the division's Environmental Epidemiology Section, "no adverse health effects would be expected, even among young children, as a result of exposure to the contaminated sand."

Freeman said that the lead content of the sand was such that only an unusually lengthy and repeated exposure caused by ingesting the sand would be cause for immediate concern. Skin contact with the sand containing lead does not constitute risk as lead is not absorbed through the skin.

Sampling data received from the Army Corps of Engineers indicate that lead levels in the sand are less than 500 parts per million. Under North Carolina's lead abatement law, no restrictions are recommended for lead levels below this limit. This standard is based upon guidelines issued by the Centers for Disease Control to reduce environmental lead exposures to young children.

In general, the CDC recommends that all children between the ages of nine months and six years of age be screened annually for lead toxicity. This is because there are many sources of lead in the environment and children are subject to greater exposure to lead and are more easily effected.

Local health department staff members are collecting soil and sand samples from one school in Vance County and one school in Granville County where the sand was used. These samples will be analyzed by the state laboratory for analyses.

--30--

Public Affairs Office
P.O. Box 27687, Raleigh, N.C. 27611
(919) 733-4984 - FAX # (919) 733-0513

Don Follmer
Director, Office of Public Affairs

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# COMMONWEALTH of VIRGINIA

C. M. G BUTTERY, M.D., M.P.H.
STATE HEALTH COMMISSIONER

Department of Health
P. O. BOX 2448
RICHMOND, VA 23218

September 25, 1991

John I. Freeman, D.V.M., M.P.H., Chief
Environmental Epidemiology Section

C. Gregory Smith, M.D., M.P.H.
Medical Epidemiologist
Environmental Epidemiology Section
Division of Epidemiology
Department of Environment, Health,
and Natural Resources
P.O. Box 27687
Raleigh, North Carolina 27611-7687

Dear John and Greg:

Thanks for your letter of September 9, 1991 regarding the risks associated with lead-contaminated mine tailings at the John H. Kerr Reservoir. I have shared your letter with Grayson B. Miller, Jr., M.D., State Epidemiologist, and with our toxicologists. All agree with your assessment that using the action level of 250 parts per million (ppm) proposed by the Agency for Toxic Substances and Disease Registry (ATSDR) in place of the generally accepted action level of 500 ppm would add considerably to cleanup costs, have a marginal—if any—public health benefit, and may cause undue alarm among residents and visitors in the area. Our position is supported by the following:

- No resources are being allocated to deal with similar or higher levels of contamination in urban residential soils and playgrounds, many of which are unvegetated. EPA measured soil lead concentrations in 17 U.S. cities and found the range to be from <100 ppm to >10,000 ppm.[1] The concentrations in a study of city parks were 194 ppm (Balboa Park, San Diego), 560 ppm (Golden Gate Park, San Francisco), and 3,357 ppm (MacArthur Park, Los Angeles).[2] An expert committee of the National Research Council has used 500 ppm for risk assessment purposes as a level "typical of outdoor soils in urban areas."[3]

- The Centers for Disease Control (CDC) has stated that "In general, lead in soil and dust appears to be responsible for blood lead levels in children increasing above background levels when the concentration in the soil or dust exceeds 500-1000 ppm."[4]

- ATSDR has stated that a 2 ug/dL rise in blood lead per 1,000 ppm in soil is a reasonable median estimate of the relationship of soil lead levels to blood lead levels.[5] Assuming a linear relationship, the marginal benefit of reducing soil lead levels from 500 ppm to 250 ppm would be a lowering of blood levels by only 0.5 ug/dL.

- Even in urban environments where soil lead concentrations are elevated, the most important source of exposure for children with a history of pica and an accessible source of lead-based paint is the paint itself. For children without pica and without accessible paint, the most important source is not lead-contaminated soil, but food.[3]

Thanks again for sharing your concerns with me and I hope the information provided above is useful to you.

Sincerely,

Carl

Carl W. Armstrong, M.D., F.A.C.P.
Director
Division of Health Hazards Control

pc: Robert B. Stroube, M.D., M.P.H.
Acting State Health Commissioner

ps: I have enclosed some copies of letters sent by EPA to residents of North Carolina. I believe these should have been sent to you.

References

1. U.S. Environmental Protection Agency. Air Quality Criteria for Lead. Office of Research and Development. EPA-600/8-77-017. Washington, D.C.: U.S. Environmental Protection Agency, 1977.

2. National Research Council. Lead: Airborne Lead in Perspective. Committee on Biological Effects of Atmospheric Pollutants, Division of Medical Sciences. Washington, D.C.: National Academy of Sciences, 1972.

3. National Research Council. Lead in the Human Environment. Committee on Lead in the Human Environment, Environmental Studies Board, Commission on Natural Resources. Washington, D.C.: National Academy of Sciences, 1980.

4. Centers for Disease Control. Preventing Lead Poisoning in Young Children. Atlanta, Ga.: CDC, Department of Health and Human Services, Public Health Service, Center for Environmental Health, Chronic Diseases Division. Publ No 99-2230, 1985: p 7.

5. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Lead. Atlanta, Ga.: ATSDR, Department of Health and Human Services, Public Health Service. Publ No ATSDR/TP-88/17, 1990: p 34.

Cur, John M. Glen
Frank
Centerwatch

State of North Carolina
Department of Environment, Health, and Natural Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

September 25, 1991

Dr. William L. Roper
Director
Centers for Disease Control
1600 Clifton Road
Atlanta, Georgia 30333

Dear Bill:

I recently returned from a visit overseas to find my epidemiologists extremely agitated over a situation facing both us and Virginia and with which we urgently request your personal intervention and assistance.

Briefly put, lead contamination traceable to the deposition of tungsten mine tailings has been identified on beaches and certain other areas of the Kerr Lake Reservoir. Although the concentration of the lead in the beach sand is below the 500 ppm level commonly used as an action level (See CDC publication 99-2230, "Preventing Lead Poisoning in Young Children," 1985, p. 7.) for lead abatement, ATSDR, citing "site-specific circumstances," has advised Virginia, North Carolina, EPA and the Army Corps of Engineers to consider "preventing young children from playing on unvegetated recreational areas exceeding 250 mg lead/Kg sand-like material."

An intensive study of the literature on this subject, as well as consultations with such experts as Dr. Renate Kimbrough, reveals that, if anything, the "site-specific circumstances" in this case render less rather than more likely any possibility of adverse consequences from exposure to this material.

1. Several epidemiologic studies (Telluride, Colorado; Skagway; Atlanta; Park City, Utah; Australia; Wales; and England) have evaluated the risk posed to children by lead in mining tailings. Blood lead levels have not been found to be elevated even in areas where PbS in soil approaches 12,000 ppm. [See also "Assessing the Contributions from Lead in Mining Wastes to Blood Lead"--Martha Steele et al. --Regulatory Toxicology and Pharmacology 11-158-190 (1990).]

2. The predominant form of lead in these tungsten tailings is lead sulfide (PbS). The bioavailability/uptake of lead sulfide is much less than that for other forms of lead typically found in contaminated residential soil.

3. There is less opportunity for cumulative exposure compared to residential areas because this is a vacation/recreation area primarily used on weekends and vacations.

4. CDC does not differentiate vegetated vs. unvegetated in its recommendation related to soil contamination abatement. Most of our residential site investigations are "dustbowls."

5. The sand granules are large and therefore less dust is generated, and there is less chance for significant cumulative exposure compared to most residential soils which are contaminated with lead.

The suggestion that this situation is potentially dangerous to kids has significant implications for ongoing and future lead abatement activities carried out by our two states as well as other governmental bodies across the country.

We would be most appreciative if you would seek a review by your Center for Environmental Health And Injury Control of this risk assessment. We have a great deal of respect for the knowledge and experience possessed by your staff and if they say we're off base, so be it. We strongly suspect, however, that ATSDR has either misinterpreted the available literature on this subject or is, with the best of intentions, calling for an excessive margin of safety beyond accepted standards without a full understanding of the implications of such a posture.

Thank you for your consideration of this request which I make in the name of both of our states.

With warmest personal regards.

Sincerely,

Ronald H. Levine, M.D., M.P.H.

RHL/11

bc: Dr. MacCormack

# COMMONWEALTH of VIRGINIA

C. M. G. BUTTERY, M.D.
COMMISSIONER

*Department of Health*
*Office of Water Programs*
*1347 Piney Forest Road*
*Danville, Virginia 24540*

Phone: Area Code 804-791-5222
FAX: 804 791-5727

4 June 1991

SUBJECT: Mecklenburg County
Water - Buffalo Landing
PWSID No. 5117938
Longwood Park Utility
PWSID No. 5117947
Longwood Park Handpump
PWSID No. 5117948
Rudds Creek Northside Ramp
PWSID No. 5117955
Rudds Creek Southside Handpump
PWSID No. 5117956
Rudds Creek Utility No. 1
PWSID No. 5117957
Rudds Creek Utility No. 2
PWSID No. 5117960
Rudds Creek Comfort Station
PWSID No. 5117961

Mr. John R. Feild, Resource Manager
John H. Kerr Reservoir
Route 1, Box 76
Boydton, Virginia 23917

Dear Mr. Feild:

Enclosed are copies of the analysis for lead completed on water samples collected on 21 May 1991 from the subject water systems. These samples were collected to determine if lead contaminated sand placed on beaches of the nearby recreational areas affected quality of the well water in these areas.

Please note the results indicate the lead concentration in the water from these systems is below the Primary Maximum Contaminant Level of 0.05 mg/L established for <u>community</u> public water supplies. These systems are classified as noncommunity public water supplies. The lead concentration was determined to be less than the detectable limit of 0.01 mg/L in all but four (4) of the water systems.

VDH VIRGINIA DEPARTMENT OF HEALTH
*Protecting You and Your Environment*

Encl. 3

CESAW-PD-E



SUBJECT: Mecklenburg County
Water - Buffalo Landing
PWSID No. 5117938
Longwood Park Utility
PWSID No. 5117947
Longwood Park Handpump
PWSID No. 5117948
Rudds Creek Northside Ramp
PWSID No. 5117955
Rudds Creek Southside Handpump
PWSID No. 5117956
Rudds Creek Utility No. 1
PWSID No. 5117957
Rudds Creek Utility No. 2
PWSID No. 5117960
Rudds Creek Comfort Station
PWSID No. 5117961

The four (4) systems in which lead concentrations were detected are as follows:

| PWSID No. | Waterworks | Lead, mg/L |
|---|---|---|
| 5117938 | Buffalo Landing | 0.040 |
| 5117956 | Rudds Creek Southside HP | 0.012 |
| 5117957 | Rudds Creek Utility No. 1 | 0.010 |
| 5117960 | Rudds Creek Utility No. 2 | 0.010 |

Arrangements have been made for three (3) samples for lead to be collected at weekly intervals from each of the four (4) waterworks in which lead was detected.

Should you have any questions concerning these analyses, please feel free to contact me.

Sincerely,

Ralph E. Sweeney
District Engineer

RES:kcw
cc: VDH-Central
Mecklenburg County Health Department

10 Jun 91

See attached historical data
Hemsley

Date 6-10-91

Subject: Water Sample Analyses John H. Kerr Reservior

Comparative Analysis of Drinking Water Samples taken at recreation areas adjacent to areas next to beaches containing Tungsten mine sand at John H. Kerr Reservior.

The four (4) systems in which lead concentrations were detected are as follows:

Location: Buffalo Landing PWS ID 5117938

| Lead Level: | | | |
|---|---|---|---|
| (faucet) less than | 0.020 | mg/L | Date collected: 8-3-76 |
| (faucet) less than | 0.002 | mg/L | Date collected: 7-21-77 |
| | 0.0009 | mg/L | Date collected: 6-23-81 |
| | 0.040 | mg/L | Date collected: 5-21-91 |

Location: Rudd's Creek Southside H.P. PWS ID 5117956

| Lead Level: | | | |
|---|---|---|---|
| (Hand pump) less than | 0.02 | mg/L | Date collected: 8-2-76 |
| | 0.0056 | mg/L | Date collected: 6-23-81 |
| | 0.012 | mg/L | Date collected: 5-21-91 |

Location: Rudd's Creek Utility #1 PWS ID 5117957

| Lead Level: | | | |
|---|---|---|---|
| (faucet) less than | 0.020 | mg/L | Date collected: 8-2-76 |
| (faucet) less than | ~~0.01~~ | ~~mg/L~~ 0.004 | Date collected: 7-21-77 |
| | 0.0017 | mg/L | Date collected: 6-23-81 |
| | 0.010 | mg/L | Date collected: 5-21-91 |

Location: Rudd's Creek Utility #2 PWS ID 5117960

| Lead Level: | | | |
|---|---|---|---|
| | 0.0059 | mg/L | Date collected: 4-1-80 |
| | 0.0013 | mg/L | Date collected: 6-23-81 |
| | 0.010 | mg/L | Date collected: 5-21-91 |

# COMMONWEALTH of VIRGINIA

C. M. G. BUTTERY, M.D.
COMMISSIONER

*Department of Health*
*Office of Water Programs*
*1347 Piney Forest Road*
*Danville, Virginia 24540*

Phone: Area Code 804-791-5222
FAX: 804-791-5227

31 October 1991

SUBJECT: Mecklenburg County
Water - J.H. Kerr Reservoir

Mr. John H. Feild, Resource Manager
John H. Kerr Dam and Reservoir
Route 1, Box 76
Boydton, Virginia 23917-9801

Dear Mr. Feild:

Enclosed are copies of the results of chemical analyses for nitrate nitrogen completed on the water samples collected on 19 June 1991 from the John H. Kerr Reservoir noncommunity water systems. These samples were collected in accordance with the Safe Drinking Water Act and the Commonwealth of Virginia Waterworks Regulations.

Please note the results indicate the water meets State and Federal standards for drinking water for nitrate nitrogen.

To determine the quality of the water, samples were collected for inorganics and metals analyses and copies of these results are also enclosed. The results of these analyses are summarized in a table that follows. The Primary Maximum Contaminant Levels (PMCL) or Secondary Maximum Contaminant Levels (SMCL) and the identification symbols used in the summary are as follows:

Nitrate Nitrogen, ($NO_3$) - PMCL 10.0 mg/L
Iron, (Fe) - SMCL 0.30 mg/L
Manganese, (Mn) - SMCL 0.05 mg/L
Lead, ($P_b$) - PMCL 0.05 mg/L
Hydrogen Sulfide, ($H_2S$) - 0.05 mg/L

Please note, the PMCLs and SMCLs except for nitrate nitrogen are applicable only to community water supplies and are given here for informational purposes only.

VDH

SUBJECT: Mecklenburg County
Water - J.H. Kerr Reservoir

| WATER SYSTEM | Contaminant, mg/L $NO_3$ | Fe | Mn | Pb | $H_2S$ |
|---|---|---|---|---|---|
| 5117937 Bluestone Landing, HP | <0.10 | 18.0 | 0.50 | | |
| 5117938 Buffalo Landing | 2.70 | | | | |
| 5117939 Buffalo Springs | <0.10 | | 0.06 | | |
| 5117940 Clarksville Outpost | 4.95 | 4.70 | | 0.027 | |
| 5117941 Eagle Point Camp, HP | <0.10 | 1.75 | 0.12 | 0.020 | 0.06 |
| 5117942 Eastland Creek Public Use Area, HP | <0.10 | 36.0 | 2.7 | | |
| 5117943 Eastland Creek PUA #2 | <0.10 | 0.99 | 0.32 | | |
| 5117944 Island Creek, HP | <0.10 | 16.0 | | | 0.14 |
| 5117945 Ivy Hill Camp | 1.12 | | | | |
| 5117946 Ivy Hill Handpump | <0.10 | 14.7 | 0.22 | | |
| 5117947 Longwood Park Utility | <0.10 | | | | |
| 5117948 Longwood Park Handpump | <0.10 | 2.03 | 0.39 | | 0.14 |
| 5117951 North Bend Park Area B Utility | 0.46 | 1.29 | | | |
| 5117952 North Bend Park Area B, Bldg. 77 | 3.61 | 2.39 | | | |
| 5117953 North Bend Park Area D | 0.10 | 0.44 | | | |
| 5117954 Palmer Point | 4.44 | | | | |
| 5117955 Rudds Creek, Northside Ramp | 0.46 | | | | |
| 5117956 Rudds Creek, Southside HP | <0.10 | 0.89 | | | |
| 5117957 Rudds Creek Utility #1 | 0.28 | | | | |
| 5117958 Staunton View, HP | 0.69 | 0.45 | | | |
| 5117959 North Bend Park Area B HP | 0.35 | 16.0 | 0.22 | | |
| 5117960 Rudds Creek Utility #2 | <0.10 | | | | |
| 5117961 Rudds Creek Comfort Station | <0.10 | | | | |
| 5117962 Grassy Creek Comfort Station | 0.12 | 4.23 | | | |

The iron content of the water from 5 handpump systems ranged from 14.6 to 36 mg/L. The rusty or muddy color of the water from these systems will discourage anyone from drinking this water. The taste of the water may be affected in those systems having iron and manganese above the SMCL.

Lead, which exceeded the Environmental Protection Agency's action limit of 0.015 mg/L, was detected in the Clarksville Outpost and Eagle Point Camp water systems, however, the concentrations did not exceed the PMCL for lead of 0.05 mg/L. It is recommended that an additional sample be collected from each of these systems for further evaluation.

SUBJECT: Mecklenburg County
Water - J.H. Kerr Reservoir

Three of the systems may have an objectionable odor in the water resulting from hydrogen sulfide a concentration in excess of 0.05 mg/L.

Should you have any questions on these analyses, please feel free to contact me.

Sincerely,

Ralph E. Sweeney
District Engineer

RES:kcw
Enclosures
cc: VDH-Central
Mecklenburg County Health Department

91 JUN 31 AM 9:17 08 137507

LAB #: 1-6

NAME OF WATER SYSTEM: NBP "B" Bldg #77

SOURCE: Groundwater

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT: VDH

Name: Danville Field Office

Address:

City: Zip Code:

# Water Quality Report

## INORGANIC

WSES0

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#

SAMPLING LOCATION: Bldg #77 Well Head

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L

pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 3 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 27 Yr 91 (19-24)

TIME: 1330 (25-28)

COLLECTED BY: L. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Well Head (29)

DATE REC: 7-1-91

DATE REP: JUN 30 1991

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 7.27 | ± | 07 01 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 176.4 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 176.4 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 00 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 550 | ± | 07 02 91 | JTC |
| 1932 | Acidity | 157 | | | ± | | |
| 1910 | Corrosion Index | 136 | | 10.52 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0.14 | ± | 07 02 91 | JG |
| 1017 | Chloride 250. | 107 | | 227 | ± | 07 17 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 24 | ± | 07 03 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 29 | ± | 07 01 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0.03 | ± | 07 01 91 | DSH |
| 1055 | Sulfate 250. | 137 | | 73 | ± | 07 09 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 3.61 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 0.01 | ± | 07 02 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0.05 | ± | 07 17 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | | 0.09 | ± | 07 09 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 863 | ± | 07 01 91 | LPD |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 550 | ± | 07 01 91 | DSH |
| 1058 | Volatile (550°C) | 139 | | 60 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 490 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 443 | ± | 07 10 91 | DSH |
| 1997 | Langlier Index 15°C | 136 | − | 8.157 | ± | | |
| | Calc Hardness | | | 10 | ± | 07 08 91 | JTC |
| | Bromide | | < | 0.05 | ± | 07 09 91 | JMV |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | 39-41 | 42 | 43-50 | 51-53 | 54-59 | |

PREPARED BY: Robert D. Hall

The results on this report are expressed in mg/L unless otherwise indicated. *Analyst's initials

'91 JUL 1 AM 9:17 137508

LAB #: 1-6

NAME OF WATER SYSTEM: North Bank Park B-77 REPORT RESULTS TO HEALTH OFFICIAL AT: VDH

SOURCE: Ground Water DOR OF CHEMISTRY

OTHER INFORMATION:

Name: Danville Field Office

Address:

City: Zip Code:

# Water Quality Report

# METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☒ Richmond ☐ Local Health Dept.
☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: SAMPLING LOCATION: Bldg 77 Well SOURCE TYPE:

COUNTY: Mecklenburg CODE: 7-9 Head ☐ Public-Community

INDEPENDENT CITY: ☒ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L

pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 2 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED

| Mo | Day | Yr |
|---|---|---|
| 0 6 | 27 | 9 1 |

(19-24)

TIME: 1 3 3 0 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other Well Head (29)

DATE REC:

DATE REP.

SAMPLE NUMBER : 37508 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.03 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | 0.023 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 4.0 |
| 1028 | Iron | 0.30 | 108 | | 2.39 |
| 1031 | Magnesium | | 108 | | 0.8 |
| 1032 | Manganese | 0.05 | 108 | | 0.02 |
| 1051 | Strontium | | 108 | | 0.05 |
| 1095 | Zinc | 5.0 | 108 | | 0.14 |
| 1022 | Copper | 1.0 | 108 | | 0.17 |
| 1042 | Potassium | | 108 | | 1.2 |
| 1052 | Sodium | 20. | 108 | | 130.8 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 10 |
| 1918 | Magnesium Hardness | | 136 | | 3 |
| 1013 | Ca & Mg Hardness | | 136 | | 13 |
| 1015 | Total Hardness*** | | 136 | | 18 |
| 1004 | Antimony | | 125 | | < 0.020 |

JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:26 7.5. 135112

LAB #: BUR. OF CHEMISTRY

NAME OF WATER SYSTEM: Buffalo Landing
SOURCE: Ground Water
OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept. ☐

PLANNING DISTRICT# 13
COUNTY: Mecklenburg
INDEPENDENT CITY:
SAMPLING LOCATION: Innkeeper Station
CODE: 7-9
SOURCE TYPE: ☐ Public-Community ☐ Public-Noncommunity

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$ mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 3 8 (10-16) TRANSACTION CODE 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)
TIME: 1310 (25-28)
COLLECTED BY: G. Westenhaver
CONTAINER TYPE: ☐ Glass ☒ Plastic
PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other
SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 6 6 9 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 2 9 3 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 2 9 3 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 3 9 0 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 9 3 9 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 2 5 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 2 5 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 3 0 0 0 0 | ± | 06 21 91 | PLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 0 0 1 1 0 0 | ± | 06 20 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 3 0 0 | ± | 06 20 91 | DBU |
| 1055 | Sulfate 250. | 137 | < | 0 0 0 5 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 0 0 2 7 0 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 0 0 0 0 1 0 0 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | | 0 0 0 2 1 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 9 5 2 0 0 0 | ± | 06 20 91 | BJM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 1 1 0 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 1 4 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 9 6 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 7 4 7 0 0 | ± | 06 26 91 | DBU |
| 1997 | Langlier Index, 15°C | 136 | — | 0 0 0 2 6 3 0 | ± | | |
| | CaCO3 Hardness | | | 1 7 0 | ± | 06 21 91 | JTC |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| | LAB I.D. 0 1 0 0 0 (34-38) | | | | | | |

DATE REC: 6-20-91
DATE REP: JUN 28 1991

PREPARED BY: Robert D. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:27 135773

LAB #: 1-6 BUR. OF CHEMISTRY

NAME OF WATER SYSTEM: BUFFALO LANDING

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: OFFICE OF WATER PROGRAMS
Address: 1847 Piney Forest Rd.
City: DANVILLE VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13 SAMPLING LOCATION: Comfort Station SOURCE TYPE:

COUNTY: Mecklenburg CODE: 7-9 ☐ Public-Community

INDEPENDENT CITY: ☐ Public-Noncommunity

FIELD TESTS: Temp: $Cl_2$: mg/L $CO_2$: mg/L

pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 3 8 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED

| Mo | Day | Yr |
|---|---|---|
| 0 6 | 1 9 | 9 1 |

19-24

TIME: 1 3 1 0

25-28

COLLECTED BY: G. WESTENHAVER

CONTAINER TYPE:
- ☐ Glass
- ☒ Plastic

PRESERVATIVE USED:
- ☐ None
- ☐ Ice
- ☐ Other
- ☒ Nitric Acid

SAMPLE TYPE:
- D ☒ Reg. Dist.
- P ☐ Plant Tap
- R ☐ Raw Water
- C ☐ Check
- M ☐ MCL Check
- ☐ Other

29

DATE REC:

DATE REP:

SAMPLE NUMBER : 35773 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.02 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 5.7 |
| 1028 | Iron | 0.30 | 108 | | 0.03 |
| 1031 | Magnesium | | 108 | | 2.0 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.21 |
| 1095 | Zinc | 5.0 | 108 | | 1.11 |
| 1022 | Copper | 1.0 | 108 | | 0.13 |
| 1042 | Potassium | | 108 | | 1.1 |
| 1052 | Sodium | 20. | 108 | | 10.2 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 14 |
| 1918 | Magnesium Hardness | | 136 | | 8 |
| 1013 | Ca & Mg Hardness | | 136 | | 23 |
| 1015 | Total Hardness*** | | 136 | | 25 |
| 1004 | Antimony | | 125 | | < 0.020 |

JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:27 75: 135774

LAB #: 

BUR. OF CHEMISTRY

**Water Quality Report**

NAME OF WATER SYSTEM: Buffalo Springs

SOURCE: Ground water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville Va Zip Code: 24540

# INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13

COUNTY: Mecklenburg

INDEPENDENT CITY:

SAMPLING LOCATION: ~~Buffalo Head~~ Gazebo

CODE: 7-9

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 3 9 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1 3 3 5 (25-28)

COLLECTED BY: G Westonhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

DATE REC: 6-20-91

DATE REP:

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | ØØ 76 70 ØØ | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | Ø 8 76 ØØØ | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | Ø 8 76 ØØØ | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | Ø 00 ØØØ | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 9 7 5 ØØØ | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | Ø ØØØ | ± | | |
| 1910 | Corrosion Index | 136 | | ØØ 1 25 9 ØØ | ± | | |
| 1025 | Fluoride 1.8 | 107 | | ØØ 67 7 ØØ | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 32 ØØØ | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | Ø Ø 5 ØØØØ | ± | 06 21 91 | PLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | Ø 1 23 ØØ | ± | 06 20 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | ØØØ 00 3 ØØ | ± | 06 20 91 | DSU |
| 1055 | Sulfate 250. | 137 | | Ø 8 9 2 ØØØ | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | ØØ 01 0 ØØ | ± | 06 21 91 | JMV |
| 1039 | Nitrogen-Ammonia | 147 | | ØØ 00 2 ØØ | ± | 06 21 91 | PLS |
| 1038 | Nitrogen-Nitrite | 163 | < | ØØ 01 0 ØØ | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | ØØ ØØ | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | ØØ ØØ | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | ØØ 01 0 ØØ | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 1 5 70 ØØØ | ± | 06 20 91 | EJM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 1 4 40 ØØØ | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 8 0 ØØØØ | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 1 3 6 0 ØØØØ | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | . | Ø 3 3 4 ØØ | ± | 06 26 91 | DSU |
| 1997 | Langlier Index 15°C | 136 | + | ØØØ 0 4 4 Ø | ± | | |
| | Calc Hardness | | | 9 5 0 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 01 0 | ± | 06 21 91 | JMV |
| (30-33) | LAB I.D. 0 1 0 0 0 (34-38) | (39-41) | (42) | (43-50) | (51-53) | (54-59) | |

PREPARED BY: [illegible]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:27 135775

LAB #: [ ] [ ] [ ] [ ] DIV OF CHEMISTRY (1-6)

NAME OF WATER SYSTEM: Buffalo Springs

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Grazebo

COUNTY: Mecklenburg

CODE: [ ] [ ] [ ] (7-9)

INDEPENDENT CITY:

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: ____ $Cl_2$: ____ mg/L $CO_2$ ____ mg/L
pH: ____ Alk: ____ mg/L Hard: ____ mg/L

P.W.S.I.D.#: 5 1 1 7 9 3 9 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1 3 3 5 (25-28)

COLLECTED BY: G. Wes Tenhaven

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other
(29)

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | < | 0000 0 1 0 | ± | | |
| 1010 | Barium | 1.0 | 108 | < | 0000 0 1 | ± | | |
| 1015 | Cadmium | 0.010 | 125 | < | 0000 0 1 0 | ± | | |
| 1020 | Chromium | 0.05 | 125 | < | 0000 0 1 0 | ± | | |
| 1030 | Lead | 0.05 | 125 | < | 0000 0 1 0 | ± | | |
| 1035 | Mercury | 0.002 | 106 | < | 0000 0 0 0 3 | ± | | |
| 1045 | Selenium | 0.01 | 125 | < | 0000 0 1 0 | ± | | |
| 1050 | Silver | 0.05 | 125 | < | 0000 0 1 0 | ± | | |
| 1002 | Aluminum | | 108 | < | 0 0 1 0 0 | ± | | |
| 1016 | Calcium | | 108 | | 0 3 5 7 0 0 | ± | | |
| 1028 | Iron | 0.30 | 108 | | 0 0 1 2 0 0 | ± | | |
| 1031 | Magnesium | | 108 | | 0 5 5 0 0 | ± | | |
| 1032 | Manganese | 0.05 | 108 | | 0 0 0 6 0 0 | ± | | |
| 1051 | Strontium | | 108 | | 0 5 4 0 0 | ± | | |
| 1095 | Zinc | 5.0 | 108 | < | 0 0 0 1 0 0 | ± | | |
| 1022 | Copper | 1.0 | 108 | | 0 0 0 7 0 0 | ± | | |
| 1042 | Potassium | | 108 | | 0 4 7 0 0 | ± | | |
| 1052 | Sodium | 20. | 108 | | 0 1 8 0 0 | ± | | |
| 1036 | Nickel | | 108 | < | 0 0 0 0 0 1 0 0 | ± | | |
| 1007 | Boron | | 108 | | 0 0 0 0 0 | ± | | |
| 1919 | Calcium Hardness | | 136 | | 8 9 2 0 0 0 | ± | | |
| 1918 | Magnesium Hardness | | 136 | | 2 3 0 0 0 0 | ± | | |
| 1913 | Ca & Mg Hardness | | 136 | | 9 1 5 0 0 0 0 | ± | | |
| 1915 | Total Hardness *** | | 136 | | 7 1 5 0 0 0 0 | ± | | |
| 1004 | Antimony | | 125 | < | 0 0 5 | ± | | |
| | | | | | | ± | | |
| | *** (Al, Ca, Fe, Mg, Mn, Sr, & Zn) | | | | | ± | | |
| (30-33) | LAB I.D. 0 1 0 0 0 (34-38) | | (39-41) | | (43-50) | (51-53) | (54-59) | |

DATE REC: 6-20-91

PREPARED BY: [signature]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:27 77. 135776

LAB #: BUR. OF CHEMISTRY

NAME OF WATER SYSTEM: Rudds Creek Utility #1

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

**Water Quality Report**

# INORGANIC

WSE 50

**Commonwealth of Virginia**
**Department of Health**
**Division of Water Programs**
**Bureau of Water Supply Engineering**

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept. ☐

PLANNING DISTRICT# 13

COUNTY: Mecklenburg

INDEPENDENT CITY:

SAMPLING LOCATION: Utility Bldg #1

CODE: 7-9

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 7 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1910 (25-28)

COLLECTED BY: G Westenhaver

CONTAINER TYPE: ☒ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

DATE REC: 6-20-91

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 7 3 9 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 1 3 2 3 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 1 3 2 3 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 0 0 | ± | / / / | |
| 1915 | Hardness-EDTA | 141 | | 0 1 9 2 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 1 1 6 3 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 2 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 0 4 0 4 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 3 0 0 0 0 | ± | 06 21 91 | PLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 0 1 2 0 0 | ± | 06 20 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 3 0 0 | ± | 06 20 91 | KSH |
| 1055 | Sulfate 250. | 137 | | 0 1 4 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 0 0 2 8 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | 0 0 0 0 2 0 0 | ± | 06 20 91 | PLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho. (As P) | 162 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 0 3 7 7 0 0 0 | ± | 06 20 91 | BTM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 0 2 1 3 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 0 3 0 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 0 1 8 3 0 1 0 0 | ± | | |
| 1049 | Silica (as $SiO_2$) | 143 | . | 0 0 2 6 7 0 0 | ± | 06 26 91 | [illegible] |
| 1997 | Langlier Index, 15°C | 136 | − | 0 0 0 0 4 2 0 | ± | | |
| | CaH Hardness | | | 0 1 3 0 | ± | 06 21 91 | [illegible] |
| | Bromide | | | 0 1 5 | ± | 06 21 91 | JMV |
| (30-33) | LAB I.D. 0 1 0 0 0 (34-38) | (39-41) | (42) | (43-50) | (51-63) | (64-69) | |

PREPARED BY: [illegible]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUL 20 PM 3:27 35777

LAB #: BUR. CHEMISTRY (1-6)

NAME OF WATER SYSTEM: Rudds Creek (Utility Bldg)

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13 SAMPLING LOCATION: Utility Bldg #1

COUNTY: Mecklenburg CODE: (7-9)

INDEPENDENT CITY:

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommun

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$: mg/ Hard: mg/

P.W.S.I.D.#: 5 1 1 7 9 5 7 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1910 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other (29)

DATE REC:

SAMPLE NUMBER : 35777 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.03 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 50.9 |
| 1028 | Iron | 0.30 | 108 | | 0.01 |
| 1031 | Magnesium | | 108 | | 10.3 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.13 |
| 1095 | Zinc | 5.0 | 108 | | 1.01 |
| 1022 | Copper | 1.0 | 108 | | 0.04 |
| 1042 | Potassium | | 108 | | 0.5 |
| 1052 | Sodium | 20. | 108 | | 10.2 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 127 |
| 1918 | Magnesium Hardness | | 136 | | 42 |
| 1013 | Ca & Mg Hardness | | 136 | | 170 |
| 1015 | Total Hardness*** | | 136 | | 171 |
| 1004 | Antimony | | 125 | | < 0.020 |

JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:27 79 135778

LAB #: BUR. OF CHEMISTRY (1-6)

NAME OF WATER SYSTEM: Rudds Creek Utility #2

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☐ Local Health Dept.
☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13
SAMPLING LOCATION: Utility Bldg
COUNTY: Mecklenburg
CODE: (7-9)
INDEPENDENT CITY:

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 6 0 (10-16)
TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1927 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

DATE REC: 6-20-91

DATE REP: [illegible] 1991

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | ØØ 7 9 4 ØØ | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | Ø 2 0 1 5 ØØØ | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | Ø 1 8 4 7 ØØØ | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | Ø 1 6 8 ØØØ | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 2 0 ØØØ | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | Ø ØØØ | ± | | |
| 1910 | Corrosion Index | 136 | | ØØ 1 2 4 2 ØØ | ± | | |
| 1025 | Fluoride 1.8 | 107 | | ØØ 0 1 3 ØØ | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 1 7 8 ØØØ | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | ØØ 2 ØØØØ | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | Ø 0 0 2 ØØ | ± | 06 20 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | ØØØ 0 0 3 ØØ | ± | 06 20 91 | BSU |
| 1055 | Sulfate 250. | 137 | | Ø 3 2 ØØØ | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | ØØ 0 1 0 ØØ | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | ØØ 0 1 1 ØØ | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | ØØ 0 1 0 ØØ | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | ØØ ØØ | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | ØØ ØØ | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | ØØ 0 1 0 ØØ | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 4 2 2 ØØØ | ± | 06 20 91 | ETM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 2 4 0 ØØØØ | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 2 0 ØØØØ | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 2 2 0 ØØØØ | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | · | Ø 2 7 7 ØØ | ± | 06 26 91 | BSU |
| 1997 | Langlier Index 15°C | 136 | + | ØØØ 0 3 7 Ø | ± | | |
| | CaH Hardness | | | 4 5 1 | ± | 06 21 91 | [illegible] |
| | Bromide | | | 0 1 4 | ± | 06 21 91 | JMV |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | 39-41 | 42 | 43-50 | 51-53 | 54-59 | |

PREPARED BY: [signature]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:21 135119

LAB #: BUR OF CHEMISTRY NAME OF WATER SYSTEM: Pilots Creek Utility REPORT RESULTS TO HEALTH OFFICIAL AT:

1-6

SOURCE: Ground Water

OTHER INFORMATION:

Name: OFFICE OF WATER PROGRAMS

Address: 1347 Piney Forest Rd.

City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13 SAMPLING LOCATION: Utility Bldg SOURCE TYPE:

COUNTY: Mecklenburg CODE: 7-9 ☐ Public-Community

INDEPENDENT CITY: ☐ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L

pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 6 0 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED

| Mo | Day | Yr |
|---|---|---|
| 06 | 19 | 91 |

19-24

TIME:

25-28

COLLECTED BY: G Westenhaver

CONTAINER TYPE:
- ☐ Glass
- ☒ Plastic

PRESERVATIVE USED:
- ☐ None
- ☐ Ice
- ☐ Other
- ☒ Nitric Acid

SAMPLE TYPE:
- D ☒ Reg. Dist.
- P ☐ Plant Tap
- R ☐ Raw Water
- C ☐ Check
- M ☐ MCL Check
- ☐ Other

29

DATE REC:

DATE REP:

SAMPLE NUMBER : 35779 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.06 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 57.7 |
| 1028 | Iron | 0.30 | 108 | | < 0.01 |
| 1031 | Magnesium | | 108 | | 11.7 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.27 |
| 1095 | Zinc | 5.0 | 108 | | 0.35 |
| 1022 | Copper | 1.0 | 108 | | 0.04 |
| 1042 | Potassium | | 108 | | 1.6 |
| 1052 | Sodium | 20. | 108 | | 18.1 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 144 |
| 1918 | Magnesium Hardness | | 136 | | 48 |
| 1013 | Ca & Mg Hardness | | 136 | | 192 |
| 1015 | Total Hardness*** | | 136 | | 193 |
| 1004 | Antimony | | 125 | | < 0.020 |

JUL 1991 RECEIVED OIL of Water Programs DANVILLE REGIONAL OFFICE

JT JUN 20 PM 3:21 81 135180

LAB #: BUR. OF CHEMISTRY (1-6)

NAME OF WATER SYSTEM: Ivy Hill Hand Pump

SOURCE: Ground water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1342 Piney Forest Rd.
City: Danville VA Zip Code: 24504.

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept. ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Hand Pump

COUNTY: Mecklenburg

CODE: (7-9)

INDEPENDENT CITY:

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 6 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED (19-24): Mo 06 Day 19 Yr 91

TIME: 1637 (25-28)

COLLECTED BY: G Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other HAND PUMP (29)

DATE REC: 6-20-91

DATE REP: JUN 9 2 1991

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | ø ø 673 ø ø | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | ø 656 ø ø ø | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | ø 656 ø ø ø | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | ø 00 ø ø ø | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 70 ø ø ø | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | ø ø ø ø | ± | | |
| 1910 | Corrosion Index | 136 | | ø ø 991 ø ø | ± | | |
| 1025 | Fluoride 1.8 | 107 | | ø ø 017 ø ø | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 83 ø ø ø | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | ø ø 32 ø ø ø ø | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | ø 170 ø ø | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | ø ø ø 003 ø ø | ± | 06 20 91 | BSH |
| 1055 | Sulfate 250. | 137 | | ø 08 ø ø ø | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | ø ø 010 ø ø | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | ø ø 001 ø ø | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | ø ø 010 ø ø | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | ø ø ø ø | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | ø ø ø ø | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | ø ø 010 ø ø | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 153 1 ø ø ø | ± | 06 20 91 | ETM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 105 ø ø ø ø | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 9 ø ø ø ø | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 96 ø ø ø ø | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | ø 483 ø ø | ± | 06 26 91 | BSH |
| 1977 | Langlier Index 15°C | 136 | — | ø ø ø 211 ø | ± | | |
| | Calc Hardness | | | 23 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 010 | ± | 06 21 91 | JMV |
| (30-33) | LAB I.D. 0 1 0 0 0 (34-38) | (39-41) | (42) | (43-50) | (51-53) | (54-59) | |

PREPARED BY: Robert D. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

LAB #: [ ] [ ] [ ] [ ] BUR. OF CHEMISTRY

1-6

**Water Quality Report**

NAME OF WATER SYSTEM: Ivy Hill Hand Pump

SOURCE: Groundwater

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1307 Piney Forest Rd
City: Danville VA Zip Code: 24504

# METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: [ ] [ ] [ ] 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 6 (10-16)

TRANSACTION CODE: Ø 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1637 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other
29

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|---|
| 1 0 0 5 | Arsenic | 0.05 | 1 2 5 | < | Ø Ø Ø Ø 0 1 0 | ± | | |
| 1 0 1 0 | Barium | 1.0 | 1 0 8 | | Ø Ø Ø Ø 0 1 | ± | | |
| 1 0 1 5 | Cadmium | 0.010 | 1 2 5 | < | Ø Ø Ø Ø 0 1 0 | ± | | |
| 1 0 2 0 | Chromium | 0.05 | 1 2 5 | < | Ø Ø Ø Ø 0 1 0 | ± | | |
| 1 0 3 0 | Lead | 0.05 | 1 2 5 | < | Ø Ø Ø Ø 0 1 0 | ± | | |
| 1 0 3 5 | Mercury | 0.002 | 1 0 6 | < | Ø Ø Ø Ø 0 0 0 3 | ± | | |
| 1 0 4 5 | Selenium | 0.01 | 1 2 5 | < | Ø Ø Ø Ø 0 1 0 | ± | | |
| 1 0 5 0 | Silver | 0.05 | 1 2 5 | < | Ø Ø Ø Ø 0 1 0 | ± | | |
| 1 0 0 2 | Aluminum | | 1 0 8 | < | Ø 0 1 Ø Ø | ± | | |
| 1 0 1 6 | Calcium | | 1 0 8 | | Ø 1 0 3 Ø Ø | ± | | |
| 1 0 2 8 | Iron | 0.30 | 1 0 8 | | Ø 1 4 7 Ø Ø | ± | | |
| 1 0 3 1 | Magnesium | | 1 0 8 | | Ø 7 4 Ø Ø | ± | | |
| 1 0 3 2 | Manganese | 0.05 | 1 0 8 | | Ø 0 2 2 Ø Ø | ± | | |
| 1 0 5 1 | Strontium | | 1 0 8 | | Ø 0 0 6 Ø Ø | ± | | |
| 1 0 9 5 | Zinc | 5.0 | 1 0 8 | | Ø 1 2 Ø Ø | ± | | |
| 1 0 2 2 | Copper | 1.0 | 1 0 8 | < | Ø 0 0 1 Ø Ø | ± | | |
| 1 0 4 2 | Potassium | | 1 0 8 | | Ø 3 2 Ø Ø | ± | | |
| 1 0 5 2 | Sodium | 20. | 1 0 8 | | Ø 1 4 6 Ø Ø | ± | | |
| 1 0 3 6 | Nickel | | 1 0 8 | < | Ø Ø Ø 0 0 1 Ø Ø | ± | | |
| 1 0 0 7 | Boron | | 1 0 8 | | Ø Ø Ø Ø Ø | ± | | |
| 1 9 1 9 | Calcium Hardness | | 1 3 6 | | 2 6 Ø Ø Ø | ± | | |
| 1 9 1 8 | Magnesium Hardness | | 1 3 6 | | 3 1 Ø Ø Ø | ± | | |
| 1 9 1 3 | Ca & Mg Hardness | | 1 3 6 | | 5 7 Ø Ø Ø Ø | ± | | |
| 1 9 1 5 | Total Hardness*** | | 1 3 6 | | 5 8 Ø Ø Ø Ø | ± | | |
| 1 0 0 4 | Antimony | | 1 2 5 | < | 0 0 5 | ± | | |
| | | | | | | ± | | |
| | ***(Al, Ca, Fe, Mg, Mn, Sr, & Zn) | | | | | ± | | |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | | 39-41 | | 43-50 | 51-53 | 54-59 | |

DATE REC:

DATE REP: 7-9-91

PREPARED BY: [illegible]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:26 89 135182

LAB #: [ ] 1-6 BUR. OF CHEMIST

NAME OF WATER SYSTEM: NBP "D" Utility Bldg
SOURCE: Ground Water

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd.
City: Danville, VA Zip Code: 24540

OTHER INFORMATION:

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13
COUNTY: Mecklenburg
INDEPENDENT CITY:
SAMPLING LOCATION: Utility Bldg.
CODE: [ ] 7-9

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$ mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 3 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1300 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Well (29) Hose

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 07.06 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 74.5 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 74.5 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 00 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 7.1 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | | ± | | |
| 1910 | Corrosion Index | 136 | | 1.058 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 028 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 73 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 2 | ± | 06 21 91 | RCS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 181 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 003 | ± | 06 20 91 | JBH |
| 1055 | Sulfate 250. | 137 | | 10 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 010 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 001 | ± | 06 21 91 | RCS |
| 1038 | Nitrogen-Nitrite | 163 | < | 010 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | | 014 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 168 | ± | 06 20 91 | ETM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 132 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 14 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 18 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 509 | ± | 06 26 91 | JBH |
| 1997 | Langlier Index 15°C | 136 | — | 1.45 | ± | | |
| | Calc Hardness | | | 44 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 010 | ± | 06 21 91 | JMV |
| | LAB I.D. 0 1 0 0 0 (34-38) | | | | | | |

DATE REC: 6-20-91
DATE REP: [illegible] 1001

PREPARED BY: [illegible]

91 JUN 20 PM 3:28 135783

LAB #: 1-6 BUR. OF CHEMISTRY

NAME OF WATER SYSTEM: NBP Dr. Utility Bldg

SOURCE: Ground Water

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

OTHER INFORMATION:

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: SAMPLING LOCATION: Well Head

COUNTY: Mecklenburg CODE: 7-9

INDEPENDENT CITY:

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 3 (10-16) TRANSACTION CODE 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1300 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☐ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☒ Other Well Head (29)

DATE REC:

DATE REP:

SAMPLE NUMBER : 35783 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.02 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 18.3 |
| 1028 | Iron | 0.30 | 108 | | 0.44 |
| 1031 | Magnesium | | 108 | | 4.1 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.19 |
| 1095 | Zinc | 5.0 | 108 | | < 0.01 |
| 1022 | Copper | 1.0 | 108 | | < 0.01 |
| 1042 | Potassium | | 108 | | 1.0 |
| 1052 | Sodium | 20. | 108 | | 14.1 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 46 |
| 1918 | Magnesium Hardness | | 136 | | 17 |
| 1013 | Ca & Mg Hardness | | 136 | | 63 |
| 1015 | Total Hardness*** | | 136 | | 64 |
| 1004 | Antimony | | 125 | | < 0.020 |

DATE REPORTED : 03-Jul-91 ANALYST : JIM ANDERSON

JUL 1991 RECEIVED Div. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:28 84 135784

LAB # BUR. OF CHEMISTRY

NAME OF WATER SYSTEM: Longwood Hand Pump

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24504

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT # 13

SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L
pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 8 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1705 (25-28)

COLLECTED BY: G. Washington

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Hand Pump (29)

DATE REC: 6-20-91

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 7 9 6 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 1 8 5 9 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 1 8 5 9 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 2 7 0 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 1 2 4 2 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 4 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 2 1 5 0 0 0 | ± | 06 21 91 | JMV |
| 1959 | Color (APHA) 15 CU | 129 | | 0 0 1 1 0 0 0 0 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 8 2 0 0 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | | 0 0 0 0 1 4 0 0 | ± | 06 20 91 | JG |
| 1055 | Sulfate 250. | 137 | | 0 9 4 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | 0 0 0 1 0 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | 0 0 0 0 4 0 0 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 4 2 7 0 0 0 0 | ± | 06 20 91 | BTM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 3 0 0 0 0 0 0 | ± | 06 20 91 | DK |
| 1058 | Volatile (550°C) | 139 | | 2 0 0 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 2 8 0 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | · | 0 3 7 0 0 0 | ± | 06 26 91 | BJH |
| 1977 | Langlier Index 15°C | 136 | + | 0 0 8 0 4 1 0 | ± | | |
| | CATT Hardness | | | 1 7 3 | ± | 06 21 91 | DK |
| | Bromide | | | 0 2 0 | ± | 06 21 91 | JMV |
| (30-33) | LAB I.D. 0 1 0 0 0 (34-38) | (39-41) | (42) | (43-50) | (51-53) | (54-59) | |

PREPARED BY: [illegible]

The results on this report are expressed in mg/L unless otherwise indicated. [illegible]

91 JUN 20 PM 3:20

LAB #: [ ] [ ] [ ] [ ] BUR. OF CHEMIS | NAME OF WATER SYSTEM: Longwood Hand Pump | REPORT RESULTS TO HEALTH OFFICIAL AT:

1-6

SOURCE: Ground Water | Name: Office of Water Programs

# Water Quality Report

OTHER INFORMATION: | Address: 1347 Piney Forest Rd

City: Danville VA Zip Code: 24504

## METALS

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

WSE 50

PLANNING DISTRICT#: 13 | SAMPLING LOCATION: Hand Pump | SOURCE TYPE:

COUNTY: Mecklenburg | CODE: [ ] [ ] [ ] 7-9 | ☐ Public-Community

INDEPENDENT CITY: | ☒ Public-Noncommunity

FIELD TESTS: Temp: | $O_2$: mg/L | $CO_2$: mg/L

pH: | Alk: mg/L | Hard: mg/L

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

P.W.S.I.D.#: 5 1 1 7 9 4 8 (10-16) | TRANSACTION CODE 0 3 (17-18)

DATE COLLECTED

| Mo | Day | Yr |
|---|---|---|
| 0 6 | 1 9 | 9 1 |

19-24

TIME: 1 7 0 5

25-28

COLLECTED BY: G Westenhaver

CONTAINER TYPE:
- ☐ Glass
- ☒ Plastic

PRESERVATIVE USED:
- ☐ None
- ☐ Ice
- ☐ Other
- ☒ Nitric Acid

SAMPLE TYPE:
- D ☒ Reg. Dist.
- P ☐ Plant Tap
- R ☐ Raw Water
- C ☐ Check
- M ☐ MCL Check
- ☐ Other Hand Pump

29

DATE REC:

DATE REP:

SAMPLE NUMBER : 35785 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.08 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 92.1 |
| 1028 | Iron | 0.30 | 108 | | 2.03 |
| 1031 | Magnesium | | 108 | | 7.9 |
| 1032 | Manganese | 0.05 | 108 | | 0.39 |
| 1051 | Strontium | | 108 | | 0.44 |
| 1095 | Zinc | 5.0 | 108 | | 0.41 |
| 1022 | Copper | 1.0 | 108 | | 0.02 |
| 1042 | Potassium | | 108 | | 5.8 |
| 1052 | Sodium | 20. | 108 | | 17.8 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 230 |
| 1918 | Magnesium Hardness | | 136 | | 33 |
| 1013 | Ca & Mg Hardness | | 136 | | 263 |
| 1015 | Total Hardness*** | | 136 | | 268 |
| 1004 | Antimony | | 125 | | < 0.020 |

ANALYST : JIM ANDERSON

JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

LAB #: [ ] 1-6

NAME OF WATER SYSTEM: John H. Kerr WB P-B H.P

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24541

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept

PLANNING DISTRICT#

SAMPLING LOCATION: Reg Dist H.P

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommu

COUNTY: Mecklenburg

CODE: [ ] 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 m
pH: Alk: mg/L Hard:

P.W.S.I.D.#: 5 1 1 7 9 5 9 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1315 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other
(29)

DATE REC:

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A |
|---|---|---|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | < | 0000.0101.0 | ± | | |
| 1010 | Barium | 1.0 | 108 | | 0000.0101 | ± | | |
| 1015 | Cadmium | 0.010 | 125 | < | 0000.0101.0 | ± | | |
| 1020 | Chromium | 0.05 | 125 | < | 0000.0101.0 | ± | | |
| 1030 | Lead | 0.05 | 125 | | 0000.0101.0 | ± | | |
| 1035 | Mercury | 0.002 | 106 | < | 0000.0000.003 | ± | | |
| 1045 | Selenium | 0.01 | 125 | < | 0000.0101.0 | ± | | |
| 1050 | Silver | 0.05 | 125 | < | 0000.0101.0 | ± | | |
| 1002 | Aluminum | | 108 | < | 0000.01 00 | ± | | |
| 1016 | Calcium | | 108 | | 0000.45 00 | ± | | |
| 1028 | Iron | 0.30 | 108 | | 0001.6 00 | ± | | |
| 1031 | Magnesium | | 108 | | 0000.02 00 | ± | | |
| 1032 | Manganese | 0.05 | 108 | | 0000.02.2 00 | ± | | |
| 1051 | Strontium | | 108 | | 0000.00.6 00 | ± | | |
| 1095 | Zinc | 5.0 | 108 | | 0000.3.1 00 | ± | | |
| 1022 | Copper | 1.0 | 108 | | 0000.02.3 00 | ± | | |
| 1042 | Potassium | | 108 | | 0000.1.2 00 | ± | | |
| 1052 | Sodium | 20. | 108 | | 0001.2 00 | ± | | |
| 1036 | Nickel | | 108 | < | 0000.00.1 00 | ± | | |
| 1007 | Boron | | 108 | | 0000 00 | ± | | |
| 1919 | Calcium Hardness | | 136 | | 0001.1 000 | ± | | |
| 1918 | Magnesium Hardness | | 136 | | 0000.3 000 | ± | | |
| 1913 | Ca & Mg Hardness | | 136 | | 0001.4.0 000 | ± | | |
| 1915 | Total Hardness*** | | 136 | | 0001.9.0 000 | ± | | |
| 1004 | Antimony | | 125 | < | 0000.00.5 | ± | | |
| | | | | | | ± | | |
| | ***(Al, Ca, Fe, Mg, Mn, Sr, & Zn) | | | | | ± | | |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | | 39-41 | | 43-50 | 51-53 | 54-59 | |

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's I

135 100

LAB #: [ ] [ ] [ ] [ ] [ ] [ ] 1-6

NAME OF WATER SYSTEM: John H. Kerr (NBP B H.P.)

REPORT RESULTS TO HEALTH OFFICIAL AT:

SOURCE: Grand Union

OTHER INFORMATION:

Name: Office of Water Programs

Address: 1347 Berry Forest Rd.

City: Danville VA Zip Code: 23540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: [ ] Abingdon [x] Danville [ ] Richmond [ ] Local Health Dept. [ ] Culpeper [ ] Lexington [ ] Virginia Beach [ ]

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Reg Dist. H.P.

SOURCE TYPE: [ ] Public-Community [x] Public-Noncommunity

COUNTY: Mecklenburg

CODE: [ ] [ ] [ ] 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L

pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5T9 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1315 (25-28)

COLLECTED BY: M. Humphrey

CONTAINER TYPE: [ ] Glass [x] Plastic

PRESERVATIVE USED: [x] None [ ] Ice [ ] Other

SAMPLE TYPE: D [x] Reg. Dist. P [ ] Plant Tap R [ ] Raw Water C [ ] Check M [ ] MCL Check S [ ] Other (29)

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 6 4 1 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 3 1 6 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 3 1 6 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 2 0 0 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 9 0 2 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 1 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 2 5 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 5 0 0 0 0 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 1 0 0 0 0 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 3 0 0 | ± | 06 20 91 | BH |
| 1055 | Sulfate 250. | 137 | < | 0 0 0 5 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 0 0 0 3 5 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 0 0 0 0 1 0 0 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 7 0 7 0 0 0 | ± | 06 20 91 | EM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 7 5 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 7 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 6 8 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 4 6 2 0 0 | ± | 06 26 91 | DSH |
| 1997 | Langlier Index, 15°C | 136 | – | 0 0 0 2 9 9 0 | ± | | |
| | CaH Hardness | | | 1 3 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| | LAB I.D. 0 1 0 0 0 (34-38) | | | | | | |

(30-33) (39-41) (42) (43-50) (51-53) (54-59)

DATE REC: 6-20-91

DATE REP: JUN 28 1991

PREPARED BY: Robert D. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

.07 135788

LAB #: BUR. OF CHEM. 1-6

NAME OF WATER SYSTEM: North Bond Park "B" Utility

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Application Water Programs
Address: 1307 Pinoak Ridge Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach

PLANNING DISTRICT# 13

COUNTY: Mecklenburg

INDEPENDENT CITY:

SAMPLING LOCATION: Well-Head

CODE: 7-9

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 1 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1345 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Well Head (29)

DATE REC: 6-20-91

DATE REP: JUN 0 8 1991

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | ØØ 666ØØ | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | Ø 621ØØØ | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | Ø 621ØØØ | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | Ø 00ØØØ | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 7 1ØØØ | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | Ø ØØØ | ± | | |
| 1910 | Corrosion Index | 136 | | ØØ 1 0 0 2 Ø Ø | ± | | |
| 1025 | Fluoride 1.8 | 107 | | ØØ 0 4 5 Ø Ø | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 3 7 ØØØ | ± | 06 21 91 | JMV |
| 1925 | Color (APHA) 15 CU | 129 | | ØØ 5 Ø ØØØ | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | Ø 1 1 ØØ | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | ØØØ 0 0 3 Ø Ø | ± | 06 20 91 | JSM |
| 1055 | Sulfate 250. | 137 | < | Ø 0 5 Ø Ø Ø | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | ØØ 0 4 6 Ø Ø | ± | / / / | |
| 1039 | Nitrogen-Ammonia | 147 | | ØØ 0 0 2 Ø Ø | ± | 06 24 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | ØØ 0 1 0 Ø Ø | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | ØØ ØØ Ø Ø | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | ØØ ØØ Ø Ø | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | ØØ 0 1 0 Ø Ø | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 1 3 9 3 Ø Ø Ø | ± | 06 20 91 | JTM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 1 0 5 Ø Ø Ø Ø | ± | 06 20 91 | JTM |
| 1058 | Volatile (550°C) | 139 | | 5 ØØØØ | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 1 0 0 ØØØØ | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | Ø 4 7 0 Ø Ø | ± | 06 26 91 | JSM |
| 1997 | Langlier Index 15°C | 136 | – | ØØ Ø 1 9 5 Ø Ø | ± | | |
| | Calc Hardness | | | 4 1 | ± | 06 21 91 | JMV |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | 39-41 | 42 | 43-50 | 51-53 | 54-59 | |

PREPARED BY: Robert A. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:28 135789

LAB #: BUR. OF CHEMIST

NAME OF WATER SYSTEM: North Bend Park B

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs Regional
Address: 1347 Auburn Court Rd
City: Danville Va Zip Code: 24540

# Water Quality Report

# METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept.

PLANNING DISTRICT#

SAMPLING LOCATION: Utility Bldg Well House

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE:

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 1

TRANSACTION CODE 8 13

DATE COLLECTED
Mo Day Yr
0 6 1 9 9 1
6-30-91 ON SAM

TIME: CONTAINE
1 3 4 5

COLLECTED BY: M. Humphrey

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other Well House

DATE REC:

SAMPLE NUMBER : 35789 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.01 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 14.8 |
| 1028 | Iron | 0.30 | 108 | | 1.29 |
| 1031 | Magnesium | | 108 | | 2.2 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.06 |
| 1095 | Zinc | 5.0 | 108 | | < 0.01 |
| 1022 | Copper | 1.0 | 108 | | < 0.01 |
| 1042 | Potassium | | 108 | | 1.3 |
| 1052 | Sodium | 20. | 108 | | 10.8 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 37 |
| 1918 | Magnesium Hardness | | 136 | | 9 |
| 1013 | Ca & Mg Hardness | | 136 | | 46 |
| 1015 | Total Hardness*** | | 136 | | 49 |
| 1004 | Antimony | | 125 | | < 0.020 |

JUL 1991 RECEIVED Div. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:28 91 : 135190

LAB #: BUR. OF CHEMISTRY

# Water Quality Report

NAME OF WATER SYSTEM: East Lake Creek Camp
SOURCE: Ground Water
OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13
COUNTY: Mecklenburg
INDEPENDENT CITY:

SAMPLING LOCATION: Comfort Station
CODE: 7-9

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$ mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 3 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 0 6 Day 1 9 Yr 9 1 (19-24)

TIME: 1 4 3 0 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

DATE REC: 6-20-91
DATE REP: 1991

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | $ | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 6.97 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 114.9 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 114.9 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0.0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 1.0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | | ± | | |
| 1910 | Corrosion Index | 136 | | 1.0.95 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0.17 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 4.6 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 5 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 38 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0.0.03 | ± | 06 20 91 | DSM |
| 1055 | Sulfate 250. | 137 | | 14 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | 0.10 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 0.01 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0.10 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0.10 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 231 | ± | 06 20 91 | BTM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 160 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 10 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 150 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 54.1 | ± | 06 26 91 | DSM |
| 1997 | Langlier Index/15°C | 136 | – | 8.8.8.1.08 | ± | | |
| | CaH Hardness | | | 83 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0.10 | ± | 06 21 91 | JMV |
| | LAB I.D. 0 1 0 0 0 | | | | | | |

PREPARED BY: [illegible]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:28 135791

LAB #: BUR. OF CHEMISTRY

NAME OF WATER SYSTEM: Eastlake Creek Camp

SOURCE: Ground water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piedmont Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#

SAMPLING LOCATION: Cement Station

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg CODE:

INDEPENDENT CITY:

FIELD TESTS: Temp: $Cl_2$: mg/L $CO_2$: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 3 TRANSACTION CODE: 0 3

DATE COLLECTED: Mo 06 Day 19 Yr 91

TIME: 1430

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☐ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other

DATE REC:

SAMPLE NUMBER : 35791 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | < 0.01 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 37.0 |
| 1028 | Iron | 0.30 | 108 | | 0.99 |
| 1031 | Magnesium | | 108 | | 3.7 |
| 1032 | Manganese | 0.05 | 108 | | 0.32 |
| 1051 | Strontium | | 108 | | 0.14 |
| 1095 | Zinc | 5.0 | 108 | | 0.38 |
| 1022 | Copper | 1.0 | 108 | | 0.02 |
| 1042 | Potassium | | 108 | | 0.9 |
| 1052 | Sodium | 20. | 108 | | 13.6 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 92 |
| 1918 | Magnesium Hardness | | 136 | | 15 |
| 1013 | Ca & Mg Hardness | | 136 | | 108 |
| 1015 | Total Hardness*** | | 136 | | 111 |
| 1004 | Antimony | | 125 | | < 0.020 |

JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

LAB #: 1-6 | NAME OF WATER SYSTEM: Staunton View Hand Pump | REPORT RESULTS TO HEALTH OFFICIAL AT:

SOURCE: Ground Water | Name: Office of Water Programs

OTHER INFORMATION: | Address: 1947 Piney Forest Rd

City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept.

PLANNING DISTRICT# 13 | SAMPLING LOCATION: Hand Pump | SOURCE TYPE:

COUNTY: Mecklenburg | CODE: 7-9 | ☐ Public-Community

INDEPENDENT CITY: | ☒ Public-Noncommunity

FIELD TESTS: Temp: | $Cl_2$: mg/L | $CO_2$ mg/L

pH: | Alk: mg/L | Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 8 (10-16) | TRANSACTION CODE 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1840 (25-28)

COLLECTED BY: G. Westerhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Hand Pump (29)

DATE REC: 6-20-91

DATE REP: JUN 28 1991

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 7 8 6 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 2 8 4 7 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 2 8 4 7 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 3 0 2 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 1 2 4 6 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 3 3 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 2 1 0 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 4 0 0 0 0 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 2 3 0 0 | ± | 06 21 91 | LRP |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 3 0 0 | ± | 06 20 91 | LBM |
| 1055 | Sulfate 250. | 137 | | 0 3 1 4 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 0 0 0 6 9 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | 0 0 0 0 1 0 0 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 0 1 0 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 5 9 4 0 0 0 | ± | 06 20 91 | BMM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 3 6 0 0 0 0 0 | ± | 06 20 91 | BL |
| 1058 | Volatile (550°C) | 139 | | 4 8 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 3 1 2 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 3 6 4 0 0 | ± | 06 26 91 | LBM |
| 1997 | Langlier Index 15°C | 136 | + | 0 0 0 0 3 9 0 | ± | | |
| | Ca++ Hardness | | | 1 3 0 | ± | 06 21 91 | JTC |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | 39-41 | 42 | 43-50 | 51-53 | 54-59 | |

PREPARED BY: Robert D. Pitts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:28 35793

LAB #: 1-6 BUR. OF CHEMIST

NAME OF WATER SYSTEM: Staunton View Hand Pump

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 8 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1 8 4 0 (25-28)

COLLECTED BY: G Westenhaver

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other Hand Pump (29)

DATE REC:

SAMPLE NUMBER : 35793 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.04 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 50.3 |
| 1028 | Iron | 0.30 | 108 | | 0.45 |
| 1031 | Magnesium | | 108 | | 38.1 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.24 |
| 1095 | Zinc | 5.0 | 108 | | 0.31 |
| 1022 | Copper | 1.0 | 108 | | 0.03 |
| 1042 | Potassium | | 108 | | 2.6 |
| 1052 | Sodium | 20. | 108 | | 32.0 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 126 |
| 1918 | Magnesium Hardness | | 136 | | 157 |
| 1013 | Ca & Mg Hardness | | 136 | | 282 |
| 1015 | Total Hardness*** | | 136 | | 284 |
| 1004 | Antimony | | 125 | | < 0.020 |

JUL 1991
RECEIVED
Div. of Water Programs
DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:28 95 135791

BUR. OF HEALTH

LAB #: (1-6)

NAME OF WATER SYSTEM: Eastland Creek Hard Rock

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Officer of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13

SAMPLING LOCATION: Hard Rock

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: (7-9)

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: S 1 1 7 9 4 2 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1500 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

DATE REC: 6-20-91

| CONT. I.D. (30-33) | CONTAMINANT NAME (Maximum Allowable Level) | MTD. (39-41) | S (42) | ANALYSIS RESULTS (43-50) | PRECISION (51-53) | ANALYSIS DATE Mo Day Yr (54-59) | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 6 7 3 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 5 5 1 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 5 5 1 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 7 6 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 9 5 9 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 0 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 5 9 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 3 0 0 0 0 | ± | 06 21 91 | PLS |
| 0100 | Turbidity (FTU). 1.0 | 001 | | 0 4 2 0 0 0 | ± | 06 21 91 | LRD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 3 0 0 | ± | 06 20 91 | LSU |
| 1055 | Sulfate 250. | 137 | < | 0 0 5 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | 0 0 0 1 0 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | 0 0 0 0 5 0 0 | ± | 06 21 91 | PLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 1 2 2 6 0 0 0 | ± | 06 20 91 | BTM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 7 5 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 5 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 7 0 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 1 6 9 0 0 | ± | 06 26 91 | LSU |
| 1997 | Langlier Index 15°C | 136 | – | 0 0 0 2 4 2 0 | ± | | |
| | Calc Hardness | | | 1 3 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| | LAB I.D. 0 1 0 0 0 (34-38) | | | | | | |

·91 JUN 20 PM 3:28 135795

LAB #: (1-6)

NAME OF WATER SYSTEM: Eastland Creek Hand Pump

SOURCE: BUR. OF ENTRY Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#

SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☐ Public-Noncommunity

COUNTY: Mecklenburg

CODE: (7-9)

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 2 (10-16) TRANSACTION CODE 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1500 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other (29)

DATE REC:

DATE REP: 7-9-91

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | < | 0001 | ± | | |
| 1010 | Barium | 1.0 | 108 | < | 0001 | ± | | |
| 1015 | Cadmium | 0.010 | 125 | < | 0001 | ± | | |
| 1020 | Chromium | 0.05 | 125 | < | 0001 | ± | | |
| 1030 | Lead | 0.05 | 125 | < | 0001 | ± | | |
| 1035 | Mercury | 0.002 | 106 | < | 0000 3 | ± | | |
| 1045 | Selenium | 0.01 | 125 | < | 0010 | ± | | |
| 1050 | Silver | 0.05 | 125 | < | 0001 | ± | | |
| 1002 | Aluminum | | 108 | < | 0 1 0 0 | ± | | |
| 1016 | Calcium | | 108 | | 0 1 0 0 | ± | | |
| 1028 | Iron | 0.30 | 108 | | 0 3 6 0 | ± | | |
| 1031 | Magnesium | | 108 | < | 0 2 0 0 | ± | | |
| 1032 | Manganese | 0.05 | 108 | | 0 2 7 0 | ± | | |
| 1051 | Strontium | | 108 | | 0 0 9 0 | ± | | |
| 1095 | Zinc | 5.0 | 108 | | 0 0 9 0 | ± | | |
| 1022 | Copper | 1.0 | 108 | | 0 < 1 0 | ± | | |
| 1042 | Potassium | | 108 | | 0 1 1 0 | ± | | |
| 1052 | Sodium | 20. | 108 | < | 0 0 1 0 | ± | | |
| 1036 | Nickel | | 108 | | 0 0 0 0 | ± | | |
| 1007 | Boron | | 108 | | 0 0 0 0 | ± | | |
| 1919 | Calcium Hardness | | 136 | | 0 0 0 | ± | | |
| 1918 | Magnesium Hardness | | 136 | | 0 0 0 | ± | | |
| 1913 | Ca & Mg Hardness | | 136 | | 0 0 0 0 | ± | | |
| 1915 | Total Hardness*** | | 136 | | 0 0 0 0 | ± | | |
| 1004 | Antimony | | 125 | < | 0 1 | ± | | |
| | | | | | | ± | | |
| | *** (Al, Ca, Fe, Mg, Mn, Sr, & Zn) | | | | | ± | | |
| (30-33) | LAB I.D. 0 1 0 0 0 (34-38) | | (39-41) | | (43-50) | (51-53) | (54-59) | |

PREPARED BY: Jy

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:28 135196

LAB #: 1-6

NAME OF WATER SYSTEM: Palmer Point

BUR. USOURCE: 115 Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept.

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Comfort Station

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 4 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1410 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29.)

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 6.28 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 116 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 116 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 33 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | | ± | | |
| 1910 | Corrosion Index | 136 | | 8.4 9 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0.20 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 51 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 2 | ± | 06 21 91 | RCS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 058 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 00.3 | ± | 06 20 91 | JSM |
| 1055 | Sulfate 250. | 137 | < | 05 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 444 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 001 | ± | 06 21 91 | RCS |
| 1038 | Nitrogen-Nitrite | 163 | < | 010 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 010 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 822 | ± | 06 20 91 | JSM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 70 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 13 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 57 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 33.4 | ± | 06 26 91 | JSM |
| 1997 | Langlier Index 15°C | 136 | – | 83.52 | ± | | |
| | Calc Hardness | | | 14 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 010 | ± | 06 21 91 | JMV |
| (30-33) | LAB I.D. 0 1 0 0 0 (34-38) | (39-41) | (42) | (43-50) | (51-53) | (54-59) | |

DATE REC: 6-20-91

DATE REP: JUN 28 1991

PREPARED BY: Robert D. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20. PH 3: 29 135797

LAB #: 1-6 BUR. OF CHEMISTRY

NAME OF WATER SYSTEM: Palmer Point

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Adair Ford Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

# METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#

SAMPLING LOCATION: Pump Station

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: $O_2$: mg/L $CO_2$: mg/L pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 6 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1410 (25-28)

COLLECTED BY: M. Humphries

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other (29)

DATE REC:

DATE REP:

SAMPLE NUMBER : 35797 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | < 0.01 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 4.4 |
| 1028 | Iron | 0.30 | 108 | | 0.09 |
| 1031 | Magnesium | | 108 | | 0.6 |
| 1032 | Manganese | 0.05 | 108 | | 0.01 |
| 1051 | Strontium | | 108 | | 0.03 |
| 1095 | Zinc | 5.0 | 108 | | 0.08 |
| 1022 | Copper | 1.0 | 108 | | < 0.01 |
| 1042 | Potassium | | 108 | | 1.5 |
| 1052 | Sodium | 20. | 108 | | 9.7 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 11 |
| 1918 | Magnesium Hardness | | 136 | | 3 |
| 1013 | Ca & Mg Hardness | | 136 | | 13 |
| 1015 | Total Hardness*** | | 136 | | 14 |
| 1004 | Antimony | | 125 | | < 0.020 |

DATE REPORTED : 03-Jul-91

ANALYST : JIM ANDERSON

4 JUL 1991 RECEIVED Div. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:29 99 135798

LAB #: 1-6 BUR. OF CHEM

NAME OF WATER SYSTEM: Longwood Camp
SOURCE: Ground Water
OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville Va Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13
SAMPLING LOCATION: Utility Bldg (CLD)
SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity
COUNTY: Mecklenburg
CODE: 7-9
INDEPENDENT CITY:
FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: S 1 1 7 9 4 7 (10-16)
TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)
TIME: 1017 (25-28)
COLLECTED BY: G Westenhaver
CONTAINER TYPE: ☐ Glass ☒ Plastic
PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other:
SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 6.84 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 8 47 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 8 47 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 00 0 0 0 | ± | / / / | |
| 1915 | Hardness-EDTA | 141 | | 93 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 1 0 59 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 01 20 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 54 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) .15 CU | 129 | | 0 0 1 0 0 0 0 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 01 0 0 0 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 03 0 0 | ± | 06 20 91 | JSM |
| 1055 | Sulfate 250. | 137 | | 0 1 39 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | 0 0 01 0 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 0 0 00 1 0 0 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 01 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 01 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 0 2 07 0 0 0 | ± | 06 20 91 | JSM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 0 1 52 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 0 1 02 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 0 1 40 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 4 84 0 0 0 | ± | 06 26 91 | JSM |
| 1997 | Langlier Index 15°C | 136 | – | 0 0 0 1 44 0 0 | ± | | |
| | CaH Hardness | | | 0 0 67 0 0 0 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0 0 01 0 0 0 | ± | 06 21 91 | JMV |

LAB I.D. 0 1 0 0 0 (30-33, 34-36)

DATE REC: 6-20-91

The results on this report are expressed in milligrams other than [illegible]

LAB #: 1-6

BUR. OF CHE

NAME OF WATER SYSTEM: Longwood (Camp)

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach

PLANNING DISTRICT# 13 SAMPLING LOCATION: Utility Bldg (Cold) SOURCE TYPE:

COUNTY: Mecklenburg CODE: 7-9 ☐ Public-Community

INDEPENDENT CITY: / ☒ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 7 (10-16) TRANSACTION CODE 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1 7 1 7 (25-28)

COLLECTED BY: G Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other (29)

DATE REC:

DATE REP:

SAMPLE NUMBER : 35799 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.02 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 26.0 |
| 1028 | Iron | 0.30 | 108 | | 0.01 |
| 1031 | Magnesium | | 108 | | 4.4 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.19 |
| 1095 | Zinc | 5.0 | 108 | | 0.64 |
| 1022 | Copper | 1.0 | 108 | | 0.18 |
| 1042 | Potassium | | 108 | | 2.2 |
| 1052 | Sodium | 20. | 108 | | 10.3 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 65 |
| 1918 | Magnesium Hardness | | 136 | | 18 |
| 1013 | Ca & Mg Hardness | | 136 | | 83 |
| 1015 | Total Hardness*** | | 136 | | 84 |
| 1004 | Antimony | | 125 | | < 0.020 |

DATE REPORTED : 03-Jul-91 ANALYST : JIM ANDERSON

JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:29 135000 135800

LAB #: [ ] [ ] [ ] [ ] [ ] 1-6 BUR OF LAB

NAME OF WATER SYSTEM: Clarksville Outpost

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd.
City: Danville VA. Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept.
☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13

SAMPLING LOCATION: Grange Comm. Office

SOURCE TYPE: ☐ Public-Community ☐ Public-Noncommunity

COUNTY: Mecklenburg

CODE: [ ] [ ] [ ] 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: $Cl_2$: mg/L. $CO_2$ mg/L
pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 0 10-16

TRANSACTION CODE: 0 3 17-18

DATE COLLECTED: Mo 06 Day 19 Yr 91 19-24

TIME: 1745 25-28

COLLECTED BY: G Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other 29

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0065 7 00 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 609 000 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 609 000 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 00 000 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 7 3 000 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 000 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 9 9 1 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 5 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 1 5 4 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 6 0 0 0 0 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 6 0 0 0 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 3 0 0 | ± | 06 20 91 | DBU |
| 1055 | Sulfate 250. | 137 | | 0 2 2 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 0 0 4 9 5 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 0 0 0 0 1 0 0 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 2 1 6 0 0 0 | ± | 06 20 91 | EM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 1 6 5 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 2 7 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 1 3 8 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | . | 0 6 9 5 0 0 | ± | 06 26 91 | DBU |
| 1097 | Langlier Index 15°C | 136 | — | 0 0 8 2 1 2 0 | ± | | |
| | Calc Hardness | | | 3 6 | ± | 06 21 91 | [illegible] |
| | Bromide | | | 0 1 1 | ± | 06 21 91 | JMV |
| 30-33 | LAB I.D. 0 1 0 0 0 34-38 | 39-41 | 42 | 43-50 | 51-53 | 54-59 | |

DATE REC: 6-20-91

DATE REP.: [illegible] 1991

PREPARED BY: [illegible]

The results on this report are expressed in [illegible]

91 JUN 20 PM 3:29 BUR. OF CHE 135801

LAB #: 1-6

NAME OF WATER SYSTEM: Clarksville Outpost

SOURCE: Ground water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☐ Local Health Dept.
☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13 SAMPLING LOCATION: Gen Comm Off SOURCE TYPE:

COUNTY: Mecklenburg CODE: 7-9 ☐ Public-Community

INDEPENDENT CITY: ☒ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 0 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1745 (25-28)

COLLECTED BY: G Westenhaver

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other
29

DATE REC:
DATE REP:

SAMPLE NUMBER : 35801 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.13 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | 0.027 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 13.9 |
| 1028 | Iron | 0.30 | 108 | | 4.70 |
| 1031 | Magnesium | | 108 | | 4.1 |
| 1032 | Manganese | 0.05 | 108 | | 0.05 |
| 1051 | Strontium | | 108 | | 0.48 |
| 1095 | Zinc | 5.0 | 108 | | 0.47 |
| 1022 | Copper | 1.0 | 108 | | 0.58 |
| 1042 | Potassium | | 108 | | 1.5 |
| 1052 | Sodium | 20. | 108 | | 25.6 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 35 |
| 1918 | Magnesium Hardness | | 136 | | 17 |
| 1013 | Ca & Mg Hardness | | 136 | | 52 |
| 1015 | Total Hardness*** | | 136 | | 62 |
| 1004 | Antimony | | 125 | | < 0.020 |

DATE REPORTED : 03-Jul-91 ANALYST : JTM ANDERSON

JUL 1991 RECEIVED Dh. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:29 03 135802

LAB #: 1-6 BUR. OF ENGIN.

NAME OF WATER SYSTEM: Eagle Point Hand Pump

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13

SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 1 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 2035 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Hand Pump (29)

DATE REC: 6-20-91

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | ØØ 677ØØ | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | Ø 7630ØØ | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | Ø 7630ØØ | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | Ø 00ØØØ | ± | / / / | |
| 1915 | Hardness-EDTA | 141 | | 74ØØØ | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | Ø ØØØ | ± | | |
| 1910 | Corrosion Index | 136 | | ØØ 1032ØØ | ± | | |
| 1025 | Fluoride 1.8 | 107 | < | ØØ 010Ø | ± | 06 24 91 | JC |
| 1017 | Chloride 250. | 107 | | 27ØØØ | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | ØØ 6ØØØ | ± | 06 21 91 | RCS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | Ø 16 ØØ | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | | ØØØ 006ØØ | ± | 06 20 91 | J.G. |
| 1055 | Sulfate 250. | 137 | | Ø 40ØØØ | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | ØØ 010Ø | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | ØØ 00ØØ | ± | 06 21 91 | RCS |
| 1038 | Nitrogen-Nitrite | 163 | < | ØØ 010Ø | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | ØØ ØØØØ | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | ØØ ØØØØ | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | ØØ 010Ø | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | Ø 159ØØØ | ± | 06 20 91 | BTM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | Ø 10ØØØØ | ± | 06 20 91 | |
| 1058 | Volatile (550°C) | 139 | | 22ØØØØ | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 88ØØØØ | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | · | Ø 324ØØ | ± | 06 26 91 | JBH |
| 1976 | Langlier Index 15°C | 136 | — | ØØ 8120Ø | ± | | |
| | Calc Hardness | | | 47ØØØ | ± | 06 21 91 | |
| | Bromide | | < | ØØ 010Ø | ± | 06 21 91 | JMV |

LAB I.D. 0 1 0 0 0 (34-38)

PREPARED BY:

The results on this report are expressed in mg/L unless otherwise indicated.

91 JUN 20 PM 3:29 135803

LAB #: 1-6

NAME OF WATER SYSTEM: Eagle P.T. Hand Pump

BUR. OF CHE SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13 SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 2 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo. 06 Day 19 Yr 91 (19-24)

TIME: 2035 (25-28)

COLLECTED BY: G. Westenhaven

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other (29)

DATE REC:

DATE REP:

SAMPLE NUMBER : 35803 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | < 0.01 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | 0.020 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 16.1 |
| 1028 | Iron | 0.30 | 108 | | 1.75 |
| 1031 | Magnesium | | 108 | | 4.2 |
| 1032 | Manganese | 0.05 | 108 | | 0.12 |
| 1051 | Strontium | | 108 | | 0.08 |
| 1095 | Zinc | 5.0 | 108 | | < 0.01 |
| 1022 | Copper | 1.0 | 108 | | 0.01 |
| 1042 | Potassium | | 108 | | 0.7 |
| 1052 | Sodium | 20. | 108 | | 7.3 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 40 |
| 1918 | Magnesium Hardness | | 136 | | 17 |
| 1013 | Ca & Mg Hardness | | 136 | | 58 |
| 1015 | Total Hardness*** | | 136 | | 61 |
| 1004 | Antimony | | 125 | | 0.04 |

DATE REPORTED : 03-Jul-91 ANALYST : JIM ANDERSON

4 JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:29 OS 135804

LAB #: (1-6) BUR. OF ...

NAME OF WATER SYSTEM: Ivy Hill Camp

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Program
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24504

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Well House

COUNTY: Mecklenburg

CODE: (7-9)

INDEPENDENT CITY:

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$ mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 5 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1 6 2 0 (25-28)

COLLECTED BY: G Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Well House (29)

DATE REC: 6-20-91

DATE REP: 0 0 1001

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | ØØ 654 ØØ | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | Ø 198 ØØØ | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | Ø 198 ØØØ | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | Ø 00 ØØØ | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 34 ØØØ | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | Ø ØØØ | ± | | |
| 1910 | Corrosion Index | 136 | | ØØ 888 ØØ | ± | | |
| 1025 | Fluoride 1.8 | 107 | | Ø Ø 013 ØØ | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 28 ØØØ | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | Ø Ø 3 ØØØ | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | Ø 0 1 0 ØØ | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | ØØØ 0 0 3 ØØ | ± | 06 20 91 | LSM |
| 1055 | Sulfate 250. | 137 | | Ø 1 5 ØØØ | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | ØØ 1 1 2 ØØ | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | ØØ 0 0 1 ØØ | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | ØØ 0 1 0 ØØ | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | ØØ ØØ | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | ØØ ØØ | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | ØØ 0 1 0 ØØ | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 65 9 ØØØ | ± | 06 20 91 | EM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 66 ØØØØ | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 7 ØØØØ | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 5 9 ØØØØ | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | Ø 4 0 9 ØØ | ± | 06 26 91 | LSM |
| 1997 | Langlier Index 15°C | 136 | – | ØØØ 3 1 3 Ø | ± | | |
| | Carb Hardness | | | 11 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | 39-41 | 42 | 43-50 | 51-53 | 54-59 | |

PREPARED BY: [signature]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:29 135805

LAB #: 1-6 BUR. OF C

NAME OF WATER SYSTEM: Jug Hill Camp

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24504

# Water Quality Report

# METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Well House

SOURCE TYPE: ☐ Public-Community ☐ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: | $O_2$: mg/L | $CO_2$: mg/L
pH: | Alk: mg/L | Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 5 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1620 (25-28)

COLLECTED BY: G. Wes Tenhaven

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other
29

DATE REC:

DATE REP.

SAMPLE NUMBER : 35805 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | < 0.01 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 4.5 |
| 1028 | Iron | 0.30 | 108 | | 0.02 |
| 1031 | Magnesium | | 108 | | 1.0 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.03 |
| 1095 | Zinc | 5.0 | 108 | | 0.19 |
| 1022 | Copper | 1.0 | 108 | | 0.12 |
| 1042 | Potassium | | 108 | | 1.6 |
| 1052 | Sodium | 20. | 108 | | 6.9 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 11 |
| 1918 | Magnesium Hardness | | 136 | | 4 |
| 1013 | Ca & Mg Hardness | | 136 | | 15 |
| 1015 | Total Hardness*** | | 136 | | 16 |
| 1004 | Antimony | | 125 | | < 0.020 |

JUL 1991
RECEIVED
Off. of Water Programs
DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:29 C7 135806

LAB #: (1-6)

BUR. OF

NAME OF WATER SYSTEM: Reddies Creek (Camp) North

SOURCE: Groundwater

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Program
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Culpeper ☑ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept.

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Camp Fort Sta

SOURCE TYPE: ☐ Public-Community ☑ Public-Noncommunity

COUNTY: Mecklenburg

CODE: (7-9)

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: S 1 1 7 9 5 5 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED (19-24): Mo 06 Day 19 Yr 91

TIME: (25-28) 2015

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☑ Plastic

PRESERVATIVE USED: ☑ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

| CONT. I.D. (30-33) | CONTAMINANT NAME (Maximum Allowable Level) | MTD. (38-41) | S (42) | ANALYSIS RESULTS (43-50) | PRECISION (51-53) | ANALYSIS DATE (54-59) Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 7 3 5 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 1 4 1 6 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 1 4 1 6 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 1 4 9 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 1 1 4 5 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 1 0 0 | ± | 06 24 91 | JC |
| 1017 | Chloride 250. | 107 | | 5 5 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 2 0 0 0 0 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 1 3 8 0 0 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 5 0 0 | ± | 06 20 91 | DSM |
| 1055 | Sulfate 250. | 137 | < | 0 0 0 5 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 0 0 0 4 6 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 0 0 0 0 0 1 0 0 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 0 1 0 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 2 7 9 0 0 0 | ± | 06 20 91 | EJM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 1 3 7 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 1 0 0 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 1 2 7 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 2 7 9 0 0 | ± | 06 26 91 | BM |
| 1997 | Langlier Index 15°C | 136 | − | 0 0 0 0 5 8 0 | ± | | |
| | CaCO3 Hardness | | | 8 9 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| | LAB I.D. 0 1 0 0 0 (34-38) | | | | | | |

DATE REC: 6-20-91

DATE REP: JUN 28 1991

PREPARED BY: [illegible]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

.91 JUN 20 PM 3:29 135807

BUR. OF

LAB #: (1-6)

NAME OF WATER SYSTEM: Rudds Creek (Camp) North

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Works
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Comfort Stn.

COUNTY: Mecklenburg

CODE: (7-9)

INDEPENDENT CITY:

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 5 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 2015 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other (29)

| CONT. I.D. (30-33) | CONTAMINANT NAME (Maximum Allowable Level) | MTD. (39-41) | S | ANALYSIS RESULTS (43-50) | PRECISION (51-53) | ANALYSIS DATE Mo Day Yr (54-59) | A* |
|---|---|---|---|---|---|---|---|
| 1005 | Arsenic .05 | 125 | < | 0000 1 | ± | | |
| 1010 | Barium 1.0 | 108 | < | 0000 1 | ± | | |
| 1015 | Cadmium 0.010 | 125 | < | 0000 1 | ± | | |
| 1020 | Chromium 0.05 | 125 | < | 0000 1 | ± | | |
| 1030 | Lead 0.05 | 125 | < | 0000 1 | ± | | |
| 1035 | Mercury 0.002 | 106 | < | 0000 0003 | ± | | |
| 1045 | Selenium 0.01 | 125 | < | 0000 1 0 | ± | | |
| 1050 | Silver 0.05 | 125 | < | 0000 1 | ± | | |
| 1002 | Aluminum | 108 | < | 0 1 00 | ± | | |
| 1016 | Calcium | 108 | | 0 3 1 00 | ± | | |
| 1028 | Iron 0.30 | 108 | | 0 0 2 00 | ± | | |
| 1031 | Magnesium | 108 | | 0 1 00 | ± | | |
| 1032 | Manganese 0.05 | 108 | < | 0 1 00 | ± | | |
| 1051 | Strontium | 108 | < | 0 1 00 | ± | | |
| 1095 | Zinc 5.0 | 108 | | 0 1 2 00 | ± | | |
| 1022 | Copper 1.0 | 108 | | 0 0 1 00 | ± | | |
| 1042 | Potassium | 108 | < | 0 1 00 | ± | | |
| 1052 | Sodium 20. | 108 | | 0 9 00 | ± | | |
| 1036 | Nickel | 108 | < | 0000 1 00 | ± | | |
| 1007 | Boron | 108 | | 000 00 | ± | | |
| 1919 | Calcium Hardness | 136 | | 0 00 | ± | | |
| 1918 | Magnesium Hardness | 136 | | 0 00 | ± | | |
| 1913 | Ca & Mg Hardness | 136 | | 0 0 00 | ± | | |
| 1915 | Total Hardness *** | 136 | | 0 0 00 | ± | | |
| 1004 | Antimony | 125 | < | 1 | ± | | |
| | | | | | ± | | |
| | *** (Al, Ca, Fe, Mg, Mn, Sr, & Zn) | | | | ± | | |

LAB I.D. 0 1 0 0 0 (34-38)

DATE REC:

DATE REP: 7-9-91

PREPARED BY:

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:29 09 135808

LAB #: 1-6

NAME OF WATER SYSTEM: Bluestone Lady Hand Pump

BUR. OF SOURCE: IR & Groundwater

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

**Water Quality Report**

# INORGANIC

WSE50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☑ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: 3.7 Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 X X (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1820 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☑ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Hand Pump (29)

DATE REC: 6-20-91

DATE REP: JUN 0 2 1991

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 6 5 8 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 50 2 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 50 2 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 66 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 98 6 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 0 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 2 73 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 4 0 0 0 0 | ± | 06 21 91 | PLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 28 0 0 0 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 3 0 0 | ± | 06 20 91 | DBS |
| 1055 | Sulfate 250. | 137 | < | 0 0 5 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | 0 0 0 1 0 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | < | 0 0 0 0 1 0 0 | ± | 06 21 91 | PLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (umhos/cm) | 145 | | 1 84 6 0 0 0 | ± | 06 20 91 | EJM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 1 14 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 1 0 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 1 04 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 32 2 0 0 | ± | 06 26 91 | DBS |
| 1997 | Langlier Index 15°C | 136 | — | 0 0 0 2 1 6 0 | ± | | |
| | Calc Hardness | | | 3 8 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| | LAB I.D. 0 1 0 0 0 (34-38) | | | | | | |

(30-33) (39-41) (42) (43-50) (51-53) (54-59)

PREPARED BY: Robert D. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:29 135809

BUR. OF CH.

LAB #: 1-6

NAME OF WATER SYSTEM: Bluestone Lady Hand Pump

SOURCE: Ground water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville Va Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 3 7 TRANSACTION CODE 0 3

E 511 10-16 7940 ON SAMPLE CONTAINER FOR PWSID#

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1120 (25-28)

COLLECTED BY: G Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other Hand Pump (29)

DATE REC:

DATE REP: 7-9-91

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | < | 0000/ | ± | | |
| 1010 | Barium | 1.0 | 108 | | 0000/ | ± | | |
| 1015 | Cadmium | 0.010 | 125 | < | 0000/ | ± | | |
| 1020 | Chromium | 0.05 | 125 | < | 0000/ | ± | | |
| 1030 | Lead | 0.05 | 125 | < | 0000/ | ± | | |
| 1035 | Mercury | 0.002 | 106 | < | 0000 0003 | ± | | |
| 1045 | Selenium | 0.01 | 125 | < | 0000 010 | ± | | |
| 1050 | Silver | 0.05 | 125 | < | 0000/ | ± | | |
| 1002 | Aluminum | | 108 | < | 0/ 00 | ± | | |
| 1016 | Calcium | | 108 | | 0 1 7 00 | ± | | |
| 1028 | Iron | 0.30 | 108 | | 0 1 8 00 | ± | | |
| 1031 | Magnesium | | 108 | | 0 5 7 00 | ± | | |
| 1032 | Manganese | 0.05 | 108 | | 0 0 5 00 | ± | | |
| 1051 | Strontium | | 108 | | 0 0 3 00 | ± | | |
| 1095 | Zinc | 5.0 | 108 | | 0 2 5 00 | ± | | |
| 1022 | Copper | 1.0 | 108 | < | 0 1 00 | ± | | |
| 1042 | Potassium | | 108 | | 0 3 00 | ± | | |
| 1052 | Sodium | 20. | 108 | | 0 1 6 00 | ± | | |
| 1036 | Nickel | | 108 | < | 0000 1 00 | ± | | |
| 1007 | Boron | | 108 | | 000 00 | ± | | |
| 1919 | Calcium Hardness | | 136 | | 00 00 | ± | | |
| 1918 | Magnesium Hardness | | 136 | | 00 00 | ± | | |
| 1913 | Ca & Mg Hardness | | 136 | | 0 00 00 | ± | | |
| 1915 | Total Hardness*** | | 136 | | 0 00 00 | ± | | |
| 1004 | Antimony | | 125 | < | 1 | ± | | |
| | | | | | | ± | | |
| | ***(Al, Ca, Fe, Mg, Mn, Sr, & Zn) | | | | | ± | | |

30-33 LAB I.D. 0 1 0 0 0 34-38 39-41 43-50 51-53 54-59

PREPARED BY: [illegible]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:29 135810

LAB #: 1-6

NAME OF WATER SYSTEM: Rudds Creek Hand Pump

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Hand Pump

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 5 6 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 2002 (25-28)

COLLECTED BY: G. Westerhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 . 7 8 2 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 1 6 7 3 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 1 6 7 3 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 1 4 9 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 1 2 0 0 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 7 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 3 9 0 0 0 | ± | 06 21 91 | JmV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 3 0 0 0 0 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 9 0 0 0 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 3 0 0 | ± | 06 20 91 | RBH |
| 1055 | Sulfate 250. | 137 | | 0 0 5 0 0 0 | ± | 06 21 91 | JmV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | 0 0 1 0 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | 0 0 0 7 0 0 | ± | 06 21 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 1 0 0 0 | ± | 06 21 91 | JmV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 1 0 0 0 | ± | 06 21 91 | JmV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 3 1 0 0 0 0 | ± | 06 20 91 | GTM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 1 9 2 0 0 0 0 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 1 8 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 1 7 4 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 2 9 7 0 0 | ± | 06 26 91 | RBH |
| 1997 | Langlier Index 15°C | 136 | – | 0 0 0 0 0 4 0 0 | ± | | |
| | Calc Hardness | | | 0 1 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JmV |
| | LAB I.D. 0 1 0 0 0 (34-38) | | | | | | |

DATE REC: 6-20-91

DATE REP: JUN 28 1991

PREPARED BY: Robert D. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:29 | 3581 |

BUR. OF

LAB #: 1-6

NAME OF WATER SYSTEM: Bill's Creek Hard Pump

SOURCE: TRY Ground water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT # 13

SAMPLING LOCATION: Hard Pump

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D. #: 3 1 1 7 9 5 2 (10-16)

TRANSACTION CODE 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 2000 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other (29)

DATE REC:

DATE REP:

SAMPLE NUMBER : 35811 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | < 0.01 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 34.1 |
| 1028 | Iron | 0.30 | 108 | | 0.89 |
| 1031 | Magnesium | | 108 | | 14.2 |
| 1032 | Manganese | 0.05 | 108 | | 0.01 |
| 1051 | Strontium | | 108 | | 0.13 |
| 1095 | Zinc | 5.0 | 108 | | 3.00 |
| 1022 | Copper | 1.0 | 108 | | 0.02 |
| 1042 | Potassium | | 108 | | 0.2 |
| 1052 | Sodium | 20. | 108 | | 14.3 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 85 |
| 1918 | Magnesium Hardness | | 136 | | 58 |
| 1013 | Ca & Mg Hardness | | 136 | | 144 |
| 1015 | Total Hardness*** | | 136 | | 150 |
| 1004 | Antimony | | 125 | | 0.02 |

DATE REPORTED : 03-Jul-91

ANALYST : JIM ANDERSON

JUL 1991
RECEIVED
Div. of Water Programs
DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:29 135812

LAB #: 1-6

DUR. UT

NAME OF WATER SYSTEM: Rudds Creek Comfort Sta.

SOURCE: Ground Water

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: OFFICE OF WATER PROGRAMS
Address: 1347 Piney Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Comfort Sta.

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 6 1 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1 9 4 0 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 8.12 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 146 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 146 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 00 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 140 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | | ± | | |
| 1910 | Corrosion Index | 136 | | 1227 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 010 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 29 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 1 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 004 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 003 | ± | 06 20 91 | LSH |
| 1055 | Sulfate 250. | 137 | | 41 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | 010 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | 002 | ± | 06 20 91 | RLS |
| 1038 | Nitrogen-Nitrite | 163 | < | 010 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 010 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 284 | ± | 06 20 91 | BM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 175 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 10 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 165 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 256 | ± | 06 26 91 | LSH |
| 1997 | Langlier Index 15°C | 136 | + | 0204 | ± | | |
| | Calc Hardness | | | 97 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 010 | ± | 06 21 91 | JMV |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | 39-41 | 42 | 43-50 | 51-53 | 54-59 | |

DATE REC: 6-20-91

DATE REP: JUN 28 1991

PREPARED BY: Robert D. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:29 BUR. 135813

LAB #: 1-6

NAME OF WATER SYSTEM: Reids Creek Comfort Sta. REPORT RESULTS TO HEALTH OFFICIAL AT:
SOURCE: Reids Creek Water Name: Office of Water Programs
OTHER INFORMATION: Address: 1347 Piedmont Rd.
City: Danville Va Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept.
☐ Culpeper ☐ Lexington ☐ Virginia Beach

PLANNING DISTRICT# 13 SAMPLING LOCATION: Comfort Sta. SOURCE TYPE:
COUNTY: Mecklenburg CODE: 7-9 ☐ Public-Community
INDEPENDENT CITY: ☒ Public-Noncommunity
FIELD TESTS: Temp: $Cl_2$: mg/L $CO_2$: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: S 1 1 7 9 6 1 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1 9 4 0 (25-28)

COLLECTED BY: G. Westenhaver

CONTAINER TYPE:
☐ Glass
☒ Plastic

PRESERVATIVE USED:
☐ None
☐ Ice
☐ Other
☒ Nitric Acid

SAMPLE TYPE:
D ☒ Reg. Dist.
P ☐ Plant Tap
R ☐ Raw Water
C ☐ Check
M ☐ MCL Check
☐ Other
29

DATE REC:
DATE REP:

SAMPLE NUMBER : 35813 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | 0.03 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 39.3 |
| 1028 | Iron | 0.30 | 108 | | < 0.01 |
| 1031 | Magnesium | | 108 | | 7.3 |
| 1032 | Manganese | 0.05 | 108 | | < 0.01 |
| 1051 | Strontium | | 108 | | 0.51 |
| 1095 | Zinc | 5.0 | 108 | | 0.25 |
| 1022 | Copper | 1.0 | 108 | | 0.04 |
| 1042 | Potassium | | 108 | | 0.5 |
| 1052 | Sodium | 20. | 108 | | 15.2 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 98 |
| 1918 | Magnesium Hardness | | 136 | | 30 |
| 1013 | Ca & Mg Hardness | | 136 | | 128 |
| 1015 | Total Hardness*** | | 136 | | 129 |
| 1004 | Antimony | | 125 | | < 0.020 |

DATE REPORTED : 03-Jul-91 ANALYST : JTH ANDERSON

4 JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

91 JUN 20 PM 3:29 135814

LAB #: 1-6

DUR. OF STRY

NAME OF WATER SYSTEM: ISLAND CREEK HOME RUP

SOURCE: GROUND WATER

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: OFFICE OF WATER PROGRAMS
Address: 1347 PARK FOREST RD.
City: DANVILLE VA Zip Code: 24504

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Danville ☐ Richmond ☒ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Well Head

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard.: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 4 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1600 (25-28)

COLLECTED BY: G. WESTONHAVER

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other Well Head (29)

DATE REC: 6-20-91

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 07230 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0151000 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0151000 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 00000 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 14100 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0000 | ± | | |
| 1910 | Corrosion Index | 136 | | 0011200 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0014600 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 0028800 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0040000 | ± | 06 21 91 | PCS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0230000 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | | 0000140 | ± | 06 20 91 | J.G. |
| 1055 | Sulfate 250. | 137 | | 0020000 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | < | 0000100 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | 0000200 | ± | 06 21 91 | RCS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0000100 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0000 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0000 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0000100 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 0314000 | ± | 06 20 91 | BTM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 0190000 | ± | 06 20 91 | [illegible] |
| 1058 | Volatile (550°C) | 139 | | 0150000 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 0170000 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0285000 | ± | 06 26 91 | [illegible] |
| 1997 | Langlier Index 15°C | 136 | — | 0078000 | ± | | |
| | CaH Hardness | | | 0940000 | ± | 06 21 91 | [illegible] |
| | Bromide | | | 0025000 | ± | 06 21 91 | JMV |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | 39-41 | 42 | 43-50 | 51-53 | 54-59 | |

DATE REP.:

100010

LAB #: 1-6 | BUR. OF WATER SYSTEM: Island Creek Hand Pump | REPORT RESULTS TO HEALTH OFFICIAL AT:

SOURCE: Ground Water

OTHER INFORMATION:

Name: Office of Water Programs
Address: 1347 Auburn Forest Rd
City: Danville VA Zip Code: 24504

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT#: 13

SAMPLING LOCATION: Well Head

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg

CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2 mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 4 4 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 91 (19-24)

TIME: 1600 (25-28)

COLLECTED BY: G Weston Hayes

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other Well Head (29)

DATE REC:

DATE REP: 7-9-91

| CONT. I.D. | CONTAMINANT NAME (Maximum Allowable Level) | MTD. | S | ANALYSIS RESULTS | PRECISION | ANALYSIS DATE Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1 0 0 5 | Arsenic 0.05 | 1 2 5 | < | 0 0 0 0 1 | ± | | |
| 1 0 1 0 | Barium 1.0 | 1 0 8 | | 0 0 0 0 1 | ± | | |
| 1 0 1 5 | Cadmium 0.010 | 1 2 5 | < | 0 0 0 0 1 | ± | | |
| 1 0 2 0 | Chromium 0.05 | 1 2 5 | < | 0 0 0 0 1 | ± | | |
| 1 0 3 0 | Lead 0.05 | 1 2 5 | < | 0 0 0 0 1 | ± | | |
| 1 0 3 5 | Mercury 0.002 | 1 0 6 | < | 0 0 0 0 0 0 0 3 | ± | | |
| 1 0 4 5 | Selenium 0.01 | 1 2 5 | < | 0 0 0 0 0 1 0 | ± | | |
| 1 0 5 0 | Silver 0.05 | 1 2 5 | < | 0 0 0 0 1 | ± | | |
| 1 0 0 2 | Aluminum | 1 0 8 | < | 0 1 0 0 | ± | | |
| 1 0 1 6 | Calcium | 1 0 8 | | 0 3 4 0 0 | ± | | |
| 1 0 2 8 | Iron 0.30 | 1 0 8 | | 0 1 6 0 0 | ± | | |
| 1 0 3 1 | Magnesium | 1 0 8 | < | 0 1 0 0 | ± | | |
| 1 0 3 2 | Manganese 0.05 | 1 0 8 | | 0 0 0 0 | ± | | |
| 1 0 5 1 | Strontium | 1 0 8 | | 0 0 6 0 0 | ± | | |
| 1 0 9 5 | Zinc 5.0 | 1 0 8 | | 0 0 6 0 0 | ± | | |
| 1 0 2 2 | Copper 1.0 | 1 0 8 | < | 0 1 0 0 | ± | | |
| 1 0 4 2 | Potassium | 1 0 8 | | 0 1 7 0 0 | ± | | |
| 1 0 5 2 | Sodium 20. | 1 0 8 | | 0 0 0 0 | ± | | |
| 1 0 3 6 | Nickel | 1 0 8 | < | 0 0 0 1 0 0 | ± | | |
| 1 0 0 7 | Boron | 1 0 8 | | 0 0 0 0 0 | ± | | |
| 1 9 1 9 | Calcium Hardness | 1 3 6 | | 0 0 0 | ± | | |
| 1 9 1 8 | Magnesium Hardness | 1 3 6 | | 0 0 0 | ± | | |
| 1 9 1 3 | Ca & Mg Hardness | 1 3 6 | | 0 0 0 0 | ± | | |
| 1 9 1 5 | Total Hardness*** | 1 3 6 | | 0 0 0 0 | ± | | |
| 1 0 0 4 | Antimony | 1 2 5 | < | 1 | ± | | |
| | | | | | ± | | |
| | ***(Al, Ca, Fe, Mg, Mn, Sr, & Zn) | | | | ± | | |
| 30-33 | LAB I.D. 0 1 0 0 0 (34-38) | 39-41 | | 43-50 | 51-53 | 54-59 | |

PREPARED BY: [signature]

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 3:20

BUR

LAB #: 135816 (1-6)

NAME OF WATER SYSTEM: Grassy Creek

SOURCE: Groundwater

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Piney Forest Rd
City: Danville VA Zip Code: 24540

# Water Quality Report

## INORGANIC

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☐ Culpeper ☒ Danville ☐ Lexington ☐ Richmond ☐ Virginia Beach ☐ Local Health Dept.

PLANNING DISTRICT#: 13

COUNTY: Mecklenburg

INDEPENDENT CITY:

SAMPLING LOCATION: Well House

CODE: (7-9)

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

FIELD TESTS: Temp: pH: $Cl_2$: mg/L Alk: mg/L $CO_2$: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 6 2 (10-16)

TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED (19-24): Mo 06 Day 19 Yr 91

TIME (25-28): 1420

COLLECTED BY: G. Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☒ None ☐ Ice ☐ Other

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check S ☐ Other (29)

| CONT. I.D. (30-33) | CONTAMINANT NAME (Maximum Allowable Level) | MTD. (39-41) | S (42) | ANALYSIS RESULTS (43-50) | PRECISION (51-53) | ANALYSIS DATE (54-59) Mo Day Yr | A* |
|---|---|---|---|---|---|---|---|
| 1925 | pH (6.5-8.5) | 135 | | 0 0 7 0 7 0 0 | ± | 06 20 91 | JTC |
| 1927 | Alkalinity-Total | 157 | | 0 8 2 7 0 0 0 | ± | / / / | / |
| 1928 | Alkalinity-Bicarbonate | 157 | | 0 8 2 7 0 0 0 | ± | / / / | / |
| 1929 | Alkalinity-Carbonate | 157 | | 0 0 0 0 0 0 | ± | / / / | / |
| 1915 | Hardness-EDTA | 141 | | 7 9 0 0 0 | ± | 06 21 91 | JTC |
| 1932 | Acidity | 157 | | 0 0 0 0 | ± | | |
| 1910 | Corrosion Index | 136 | | 0 0 1 0 6 7 0 0 | ± | | |
| 1025 | Fluoride 1.8 | 107 | | 0 0 0 1 1 0 0 | ± | 06 24 91 | JG |
| 1017 | Chloride 250. | 107 | | 5 3 0 0 0 | ± | 06 21 91 | JMV |
| 1905 | Color (APHA) 15 CU | 129 | | 0 0 1 0 0 0 0 0 | ± | 06 21 91 | RLS |
| 0100 | Turbidity (FTU) 1.0 | 001 | | 0 2 8 0 0 | ± | 06 21 91 | LPD |
| 1027 | Hydrogen Sulfide 0.05 | 155 | < | 0 0 0 0 0 3 0 0 | ± | 06 20 91 | KBH |
| 1055 | Sulfate 250. | 137 | | 0 0 0 9 0 0 0 | ± | 06 21 91 | JMV |
| 1040 | Nitrogen-Nitrate 10.0 | 163 | | 0 0 0 1 2 0 0 | ± | / / / | / |
| 1039 | Nitrogen-Ammonia | 147 | | 0 0 0 0 1 0 0 | ± | 06 21 91 | RCS |
| 1038 | Nitrogen-Nitrite | 163 | < | 0 0 0 1 0 0 0 | ± | 06 21 91 | JMV |
| 1041 | Nitrogen-Total Kjeldahl | 175 | | 0 0 0 0 | ± | | |
| 1043 | Phosphate-Total (As P) | 162 | | 0 0 0 0 | ± | | |
| 1044 | Phosphate-Ortho (As P) | 162 | < | 0 0 0 1 0 0 0 0 | ± | 06 21 91 | JMV |
| 1926 | Specific Conductance (u mhos/cm) | 145 | | 1 7 8 9 0 0 0 0 | ± | 06 20 91 | EM |
| 1930 | Total Dissolved Solids (185°C) | 139 | | 1 4 0 0 0 0 0 0 | ± | 06 20 91 | DF |
| 1058 | Volatile (550°C) | 139 | | 1 2 0 0 0 0 0 | ± | / / / | / |
| 1059 | Fixed (550°C) | 139 | | 1 2 8 0 0 0 0 0 | ± | / / / | / |
| 1049 | Silica (as $SiO_2$) | 143 | | 0 5 8 7 0 0 0 | ± | 06 26 91 | LBM |
| 1997 | Langlier Index 15°C | 136 | — | 0 0 0 1 3 6 0 0 | ± | | |
| | CaTT Hardness | | | 0 8 | ± | 06 21 91 | [illegible] |
| | Bromide | | < | 0 1 0 | ± | 06 21 91 | JMV |
| | LAB I.D. 0 1 0 0 0 (34-38) | | | | | | |

DATE REC: 6-20-91

DATE REP: JUN 28 1991

PREPARED BY: Robert D. Potts

The results on this report are expressed in mg/L unless otherwise indicated. *A = analyst's initials

91 JUN 20 PM 2:29

LAB #: 1-6

NAME OF WATER SYSTEM: Grassy Creek 8 7

SOURCE: Groundwater

OTHER INFORMATION:

REPORT RESULTS TO HEALTH OFFICIAL AT:
Name: Office of Water Programs
Address: 1347 Andy Forest Rd.
City: Danville VA Zip Code: 24540

# Water Quality Report

## METALS

WSE 50

Commonwealth of Virginia
Department of Health
Division of Water Programs
Bureau of Water Supply Engineering

REGION: ☐ Abingdon ☒ Danville ☐ Richmond ☐ Local Health Dept. ☐ Culpeper ☐ Lexington ☐ Virginia Beach ☐

PLANNING DISTRICT# 13 SAMPLING LOCATION: Well House

SOURCE TYPE: ☐ Public-Community ☒ Public-Noncommunity

COUNTY: Mecklenburg CODE: 7-9

INDEPENDENT CITY:

FIELD TESTS: Temp: Cl2: mg/L CO2: mg/L
pH: Alk: mg/L Hard: mg/L

P.W.S.I.D.#: 5 1 1 7 9 6 2 (10-16) TRANSACTION CODE: 0 3 (17-18)

DATE COLLECTED: Mo 06 Day 19 Yr 21 (19-24) ???

TIME: 1420 (25-28)

COLLECTED BY: G Westenhaver

CONTAINER TYPE: ☐ Glass ☒ Plastic

PRESERVATIVE USED: ☐ None ☐ Ice ☐ Other ☒ Nitric Acid

SAMPLE TYPE: D ☒ Reg. Dist. P ☐ Plant Tap R ☐ Raw Water C ☐ Check M ☐ MCL Check ☐ Other (29)

DATE REC:

DATE REP:

SAMPLE NUMBER : 35817 DCLS : BUREAU OF CHEMISTRY

| CONT.I.D. | CONTAMINANT NAME (Maximum Allowable Level) | | MTD | S | ANALYSIS RESULTS UG/ML |
|---|---|---|---|---|---|
| 1005 | Arsenic | 0.05 | 125 | | < 0.010 |
| 1010 | Barium | 1.0 | 108 | | < 0.01 |
| 1015 | Cadmium | 0.010 | 125 | | < 0.010 |
| 1020 | Chromium | 0.05 | 125 | | < 0.010 |
| 1030 | Lead | 0.05 | 125 | | < 0.010 |
| 1035 | Mercury | 0.002 | 106 | | < 0.0003 |
| 1045 | Selenium | 0.01 | 125 | | < 0.010 |
| 1050 | Silver | 0.05 | 125 | | < 0.010 |
| 1002 | Aluminum | | 108 | | < 0.1 |
| 1016 | Calcium | | 108 | | 22.1 |
| 1028 | Iron | 0.30 | 108 | | 4.23 |
| 1031 | Magnesium | | 108 | | 2.7 |
| 1032 | Manganese | 0.05 | 108 | | 0.01 |
| 1051 | Strontium | | 108 | | 0.07 |
| 1095 | Zinc | 5.0 | 108 | | 0.10 |
| 1022 | Copper | 1.0 | 108 | | 0.02 |
| 1042 | Potassium | | 108 | | 1.3 |
| 1052 | Sodium | 20. | 108 | | 13.7 |
| 1036 | Nickel | | 108 | | < 0.01 |
| 1007 | Boron | | 108 | | |
| 1919 | Calcium Hardness | | 108 | | 55 |
| 1918 | Magnesium Hardness | | 136 | | 11 |
| 1013 | Ca & Mg Hardness | | 136 | | 66 |
| 1015 | Total Hardness*** | | 136 | | 75 |
| 1004 | Antimony | | 125 | | < 0.020 |

DATE REPORTED : 03-Jul-91 ANALYST : JIM ANDERSON

JUL 1991 RECEIVED Off. of Water Programs DANVILLE REGIONAL OFFICE

# COMMONWEALTH of VIRGINIA

*STATE WATER CONTROL BOARD*

*2111 N. Hamilton Street*

Richard N. Burton
Executive Director

Post Office Box 11143
Richmond, Virginia 23230-1143
(804) ~~367-0056~~ 527-5252
TDD (804) 367-9763

June 12, 1991

Ms. Chris Correale
U. S. Army Corps of Engineers
P. O. Box 1890
Wilmington, NC 28402-1890

Re: Kerr Reservoir - Water and Fish Tissue Data

Dear Ms. Correale:

For your information, enclosed are the water and fish tissue data on the samples collected during our recent "Initial Assessment" of Kerr Reservoir. Pllease let me know if you have any questions.

Sincerely,

Gerard Seeley, Jr.
Regional Director

GSJr/jct

Enclosure

WATER SAMPLES DATA SUMMARY (ALL less than 5 ug/l)



## STATION SAMPLE CODES

| Station | Transect | Distance to Shore | Sample Code | Pb, ug/l |
|---|---|---|---|---|
| Buffalo Landing Beach | 1, Downstream | 25 ft | Buf-1A | <5 |
| | | 100 ft | Buf-1B | <5 |
| | | 300 ft | Buf-1C | <5 |
| | | DI/HNO3 Blank | Buf-1D | <5 |
| | 2, Upstream | 25 ft | Buf-2A | <5 |
| | | 100 ft | Buf-2B | <5 |
| | | 300 ft | Buf-2C | <5 |
| | | DI Blank | Buf-2D | <5 |
| | | 300 ft dupl. | Buf-2E | <5 |
| Dan River Arm | off Staunton River State Park | | Dan-1A | <5 |
| Buoy 24 | off Buffalo Creek | | B24-1A | <5 |
| Buoy 18 | off Clarksville | | B18-1A. | <5 |
| Buoy 14 | off Grassy Creek | | B14-1A | <5 |
| Longwood Beach | 1, Downstream | 25 ft | Long-1A | <5 |
| | | 100 ft | Long-1B | <5 |
| | | 300 ft | Long-1C | <5 |
| | | 300 ft, bottom | Long-1D | <5 |
| | | DI/HNO3 Blank | Long-1E | <5 |
| | 3, Upstream | 25 ft | Long-2A | <5 |
| | | 100 ft | Long-2B | <5 |
| | | 300 ft | Long-2C | <5 |
| | | 100 ft dupl. | Long-2D | <5 |
| Rudds Creek Beaches | 1, Upper Beach | 25 ft | Rud-1A | <5 |
| | | 100 ft | Rud-1B | <5 |
| | | 300 ft | Rud-1C | <5 |
| | | 300 ft, bottom | Rud-1D | <5 |
| | | DI/HNO3 Blank | Rud-1E | <5 |
| | | 300 ft, bottom, dupl. | Rud-1F | <5 |
| | 2, Lower Beach | 25 ft | Rud-2A | <5 |
| | | 100 ft | Rud-2B | <5 |
| | | 300 ft | Rud-2C | <5 |
| Buoy 9. | @ powerline below Butchers Cr | | B9-1A | <5 |
| Ivy Hill Beach | 1, Downstream | 25 ft | Ivy-1A | <5 |
| | | 100 ft | Ivy-1B | <5 |
| | | 300 ft | Ivy-1C | <5 |
| | | DI/HNO3 Blank | Ivy-1D | <5 |
| | 2, Upstream | 25 ft | Ivy-2A | <5 |
| | | 100 ft | Ivy-2B | <5 |
| | | 300 ft | Ivy-2C | <5 |
| Buoy 4 | off Cusco Willa Pt, midchannel | | B4-1A | <5 |
| Palmer Pt Beach | 1, Upstream | 25 ft | Palm-1A | <5 |
| | | 100 ft | Palm-1B | <5 |
| Control Station | | 300 ft | Palm-1C | <5 |
| | | DI/HNO3 Blank | Palm-1D | <5 |
| | 2, Downstream | 25 ft | Palm-2A | <5 |
| | | 100 ft | Palm-2B | <5 |
| | | 300 ft | Palm-2C | <5 |
| | | 25 ft dupl. | Palm-2D | <5 |

OLD DOMINION UNIVERSITY

The Applied Marine Research Laboratory
College of Sciences
Norfolk, Virginia 23529-0456

# THE EVALUATION OF JOHN H. KERR RESERVOIR RESIDENT FISH SPECIES FOR LEAD AND OTHER METAL/METALLOID CONTAMINATION: PHASE I

FINAL REPORT

Prepared by

Principal Investigator: Dr. Raymond W. Alden III

Co-Principal Investigator: Mr. Adam A. Abbgy

Project Coordinator: Mr. Michael F. Helmstetter

Submitted to

Virginia Water Control Board
Office of Environmental Research and Standards
2111 N. Hamilton Street
Richmond, Virginia 23230

Attn: Mr. Thomas Felvey

May 1991

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| RESULTS | 1 |


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# THE EVALUATION OF JOHN H. KERR RESERVOIR RESIDENT FISH SPECIES FOR LEAD AND OTHER METAL/METALLOID CONTAMINATION: PHASE I

## INTRODUCTION

The Applied Marine Research Laboratory (AMRL) of the Old Dominion University College of Sciences provided research services to the Virginia Water Control Board (VWCB) to evaluate seventy-five (75) tissue samples for metal and metalloid contamination. The samples were collected by a VWCB sampling team May 17, 1991 from the John H. Kerr Reservoir and were delivered to the AMRL on May 21, 1991.

The project is divided in two phases. Phase I involves the rapid delivery of lead analysis of the tissue samples within ten (10) working days of sample receipt (data presented in this report). Phase two entails the analysis of the tissue samples for twelve (12) additional metal/metalloid elements (Table 1) to be performed within forty (40) working days of sample receipt.

It should be noted that the field chain-of-custody documents accompanying the sample containers were not completed during the field sampling and therefore the samples were delivered to the AMRL without an appropriate custody record. Custody was recaptured at the AMRL at the time of delivery and was monitored through all subsequent stages of the project.

## TECHNICAL APPROACH

At the current time there are no USEPA-approved methods for metals/metalloids in tissue samples. Therefore, through prior agreement with VWCB, the tissue samples were digested for lead and the other twelve (12) elements employing a modification of USEPA Method 3050 (in Test Methods for Evaluating Solid Waste, SW-846, 3rd Edition, 1986) which is designed for sediment, soil and sludge samples. The method involves nitric acid/hydrochloric acid/hydrogen peroxide digestion and is commonly employed for elemental analyses. Lead detection and quantitation were by GFAAS analysis in accordance with USEPA Method 7421 (in Test Methods for Evaluating Solid Waste, SW-846, 3rd Edition, 1986). The detection limit for this procedure was 0.04 $\mu$g/g wet weight (0.30 $\mu$g/g dry weight).

In addition to lead, the tissue sample extracts will be evaluated for twelve (12) other metal/metalloid elements (Table 1) in phase two of this contract. These analyses will all be in accordance with the Manual SW-846 7000 series methods for solid phase samples. Detection limits for these elements are provided in Table 1.

## RESULTS

The results of the lead in tissue analysis are presented in Table 2. Results of the twelve (12) additional elements will be included in a subsequent data report. The lead concentrations are reported as wet weight for comparison with human health risk criteria as well as by dry

weight for site-by-site comparisons and evaluations with reference site tissue data. The wet weight concentrations were converted to dry weight employing the following formula:

$$\mu g/g\ dry = \mu g/g\ wet \times \frac{sample\ wet\ weight\ (g)}{sample\ dry\ weight\ (g)}$$

The detection limits presented for the wet and dry weight calculations are based on mean percent moisture and sample size values.

A strict quality assurance quality control (QA/QC) program was followed during the processing of these samples. This included strict access custody of all samples, reagent blanks (at least one per 10-20 samples), matrix spikes (at least one per 10-20 samples) and sample duplicates (at least one per 10-20 samples). The quality control blanks evaluated in concert with these samples showed no detectable levels of lead. Matrix spike and matrix spike duplicate data for lead are presented in Table 3. In addition to the laboratory lead matrix spike data presented in Table 3, reference standard spike recoveries are presented utilizing NIST Reference Standard 1566a (lead in oyster tissue). Sample duplicate data are presented in Table 2 with sample results.

Table 1. List of the thirteen priority pollutant metal/metalloid elements and detection limits for tissue samples.

| Element | Detection Limit (µg/g dry weight) |
|---|---|
| Antimony | 2 |
| Arsenic | 0.05 |
| Beryllium | 0.2 |
| Cadmium | 0.2 |
| Chromium | 1 |
| Copper | 1 |
| Lead | 0.30 |
| Mercury | 0.05 |
| Nickel | 1.2 |
| Selenium | 0.05 |
| Silver | 0.1 |
| Thallium | 4 |
| Zinc | 0.2 |

Table 2. Lead concentration in tissue samples collected from the John H. Herr Reservoir. Concentrations are reported in μg/g wet weight and μg/g dry weight.

| AMRL ID No. | Sample Site ID | μg/g Wet Weight | μg/g Dry Weight |
|---|---|---|---|
| 36751 | LW | <0.04 | <0.30 |
| 36751 Duplicate | LW | <0.04 | <0.30 |
| 36752 | BC | <0.04 | <0.30 |
| 36753 | IH | <0.04 | <0.30 |
| 36754 | IH | <0.04 | <0.30 |
| 36755 | IH | <0.04 | <0.30 |
| 36756 | LW | <0.04 | <0.30 |
| 36757 | LW | <0.04 | <0.30 |
| 36757 Duplicate | LW | <0.04 | <0.30 |
| 36758 | LW | <0.04 | <0.30 |
| 36759 | LW | <0.04 | <0.30 |
| 36760 | LW | <0.04 | <0.30 |
| 36761 | LW | <0.04 | <0.30 |
| 36762 | LW | <0.04 | <0.30 |
| 36763 | LW | <0.04 | <0.30 |
| 36764 | LW | <0.04 | <0.30 |
| 36765 | IH | <0.04 | <0.30 |
| 36765 Duplicate | IH | <0.04 | <0.30 |
| 36766 | PP | <0.04 | <0.30 |
| 36767 | PP | <0.04 | <0.30 |
| 36768 | PP | <0.04 | <0.30 |
| 36769 | PP | <0.04 | <0.30 |
| 36770 | PP | <0.04 | <0.30 |
| 36771 | RC | <0.04 | <0.30 |
| 36772 | RC | <0.04 | <0.30 |
| 36773 | RC | 0.23 | 1.41 |
| 36774 | RC | <0.04 | <0.30 |
| 36775 | RC | 0.06 | 0.35 |
| 36776 | BC | <0.04 | <0.30 |
| 36777 | BC | 0.62 | 3.97 |
| 36778 | BC | 0.16 | 1.04 |
| 36779 | BC | 0.09 | 0.59 |
| 36780 | BC | <0.04 | <0.30 |
| 36781 | LW | 0.20 | 1.48 |
| 36782 | LW | 0.06 | 0.31 |
| 36783 | LW | 0.16 | 1.17 |
| 36784 | LW | <0.04 | <0.30 |
| 36785 | LW | <0.04 | <0.30 |
| 36786 | IH | <0.04 | <0.30 |

Table 2. (Cont'd)

| AMRL ID No. | Sample Site ID | µg/g Wet Weight | µg/g Dry Weight |
|---|---|---|---|
| 36787 | IH | <0.04 | <0.30 |
| 36788 | IH | <0.04 | <0.30 |
| 36789 | IH | <0.04 | <0.30 |
| 36790 | IH | 1.36 | 8.75 |
| 36791 | IH | <0.04 | <0.30 |
| 36791 Duplicate | IH | <0.04 | <0.30 |
| 36792 | IH | 0.40 | 3.09 |
| 36793 | IH | <0.04 | <0.30 |
| 36793 Duplicate | IH | <0.04 | <0.30 |
| 36794 | IH | <0.04 | <0.30 |
| 36795 | IH | <0.04 | <0.30 |
| 36795 Duplicate | IH | <0.04 | <0.30 |
| 36796 | IH | <0.04 | <0.30 |
| 36797 | BC | <0.04 | <0.30 |
| 36798 | BC | <0.04 | <0.30 |
| 36799 | BC | <0.04 | <0.30 |
| 36800 | BC | 0.06 | 0.55 |
| 36801 | BC | <0.04 | <0.30 |
| 36802 | BC | <0.04 | <0.30 |
| 36803 | BC | <0.04 | <0.30 |
| 36804 | BC | <0.04 | <0.30 |
| 36805 | BC | <0.04 | <0.30 |
| 36806 | BC | <0.04 | <0.30 |
| 36807 | PP | <0.04 | <0.30 |
| 36808 | PP | <0.04 | <0.30 |
| 36809 | PP | <0.04 | <0.30 |
| 36810 | PP | <0.04 | <0.30 |
| 36811 | PP | <0.04 | <0.30 |
| 36812 | PP | <0.04 | <0.30 |
| 36813 | PP | <0.04 | <0.30 |
| 36814 | PP | <0.04 | <0.30 |
| 36814 Duplicate | PP | <0.04 | <0.30 |
| 36815 | PP | <0.04 | <0.30 |
| 36815 Duplicate | PP | <0.04 | <0.30 |
| 36816 | PP | <0.04 | <0.30 |
| 36817 | RC | <0.04 | <0.30 |
| 36818 | RC | <0.04 | <0.30 |
| 36819 | RC | <0.04 | <0.30 |
| 36820 | RC | <0.04 | <0.30 |
| 36820 Duplicate | RC | <0.04 | <0.30 |
| 36821 | RC | <0.04 | <0.30 |

Table 2. (Cont'd)

| AMRL ID No. | Sample Site ID | µg/g Wet Weight | µg/g Dry Weight |
|---|---|---|---|
| 36822 | RC | <0.04 | <0.30 |
| 36823 | RC | <0.04 | <0.30 |
| 36824 | RC | <0.04 | <0.30 |
| 36825 | RC | <0.04 | <0.30 |

LW - LONGWOOD
BC - BUFFALO CREEK
RC - RUDD'S CREEK
IH - IVY HILL
PP - PALMER POINT

Table 3. Matrix Spike and matrix spike duplicate percent (%) recovery data.

| | Percent (%) Recovery | |
|---|---|---|
| Sample/Spike ID | Matrix Spike | Matrix Spike Duplicate |
| 36756 | 88 | 82 |
| 36764 | 77 | 96 |
| 36775 | 110 | 110 |
| 36784 | 81 | 89 |
| 36794 | 92 | 92 |
| 36800 | 94 | 92 |
| 36810 | 93 | 90 |
| 36817 | 90 | 97 |
| NIST 1556a-1 | 114 | |
| NIST 1556a-2 | 111 | |
| NIST 1556a-3 | 103 | |
| NIST 1556a-4 | 105 | |

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

AUG 30 1991

MEMORANDUM

SUBJECT: Response to Request for Determination on Disposal of Tungsten Tailings

FROM: Marcia E. Mulkey, Regional Counsel
Office of Regional Counsel (3RC00)

TO: John Armstead, Deputy Director
Hazardous Waste Management Division (3HW00)

This memorandum is in response to your memorandum dated August 5, 1991, in which you requested the Office of Regional Counsel's determination regarding disposal requirements under RCRA for tungsten tailings which were placed in play areas and on beaches in Virginia and North Carolina. You raised the question whether the mining waste exclusion in RCRA (the "Bevill" Amendment) exempts these tailings from regulation as hazardous wastes.

After consulting with Headquarters' "Bevill experts" Bob Hall, of the Office of Solid Waste, and Randolph Hill, of the Office of General Counsel, our Office concludes that the tungsten tailings, which are wastes from the beneficiation of an ore, are exempt from regulation as hazardous wastes under federal law. The Agency determined in 1986 that wastes from the extraction and beneficiation of ores are solid wastes which are not hazardous wastes. See 40 C.F.R. § 261.4(b)(7). Therefore, under the federal RCRA program, Subtitle C requirements for the disposal of hazardous wastes do not apply to these tailings.

However, if an authorized State under RCRA chooses to be more stringent in its State authorized program, and to fail to recognize the Bevill exemption, it can do so. Several States have done so. California, for example, has taken the position that if a mining waste exhibits a characteristic of a hazardous waste, it will regulate that waste as a hazardous waste, regardless of the fact that the federal government has exempted it from regulation.

It is Randolph Hill's impression that Virginia incorporated all of the federal requirements into its State hazardous waste program by reference. It therefore would not regulate these tungsten tailings as a hazardous waste. Assuming that North Carolina does not have a State equivalent of the Bevill Amendment, it can regulate these tailings as a hazardous waste.

I hope this response answers your question. If further information is needed, please contact Patricia Hilsinger of my staff at extension 7-2618.

Encl. 4

SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH

Chain of Custody Record CERCLA

Hazardous Waste Materials

Location of Sampling: ✓ Generator ____ Transporter ____ Treatment Facil
____ Storage Facility ____ Disposal Facility ____ Landfill
____ Other: ____

Company's Name Tungston Queen Mine Telephone( ) ____

Address Townsville, NC

Collector's Name Harvey Allen (signature) Telephone(919) 733-2801

Date Sampled 7/18/91 Time Sampled ____

Type of Process Generating Waste ____

Field Information

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Field Sample No. 16314 16315 16316

Chain of Possession:

| | signature | title | inclusive dates |
|---|---|---|---|
| 1. | Harvey Allen | Env. Engineer | 7/18/91 |
| 2. | [illegible] | Chemist | 18 July 91 |
| 3. | | | |

Results reported

| signature | title | date |
|---|---|---|
| [illegible] | Chemist | 16 Oct 91 |

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

N.C. Department of Environment, Health, & Natural Resources
Solid Waste Management Division

# SAMPLE ANALYSIS REQUEST

State Laboratory of Public Health
P.O. Box 28047, 306 N. Wilmington Street
Raleigh, North Carolina 27611

Site Number NCD 082 362 989 Field Sample Number 16314

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 7/18/91 Time 10:20

Agency: ___ Hazardous Waste ___ Solid Waste ✓ Superfund

## Sample Type

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Ground water (1) | ___ Solid (5) | SS-01 (Background- |
| ___ Surface water (2) | ___ Liquid (6) | New Mill) |
| ✓ Soil (3) | ___ Sludge (7) | |
| ___ Other (4) | ___ Other (8) | |

## TCLP Compounds

| Inorganic Compounds | Results(mg/l) |
|---|---|
| ✓ Arsenic | <0.01 |
| ✓ Barium | 0.25 |
| ✓ Cadmium | <0.08 |
| ✓ Chromium | <0.10 |
| ✓ Lead | <0.50 |
| ✓ Mercury | <0.02 |
| ✓ Selenium | <0.005 |
| ✓ Silver | <0.10 |

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## Organic Chemistry

| Parameter | Results(mg/l) |
|---|---|
| ___ P&T:GC/MS | |
| ___ Acid:B/N Ext. | |
| ___ MTBE | |

## Radiochemistry

| Parameter | Results (PCi/l) |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

## Microbiology

| Parameter | Results (Col/100ml) |
|---|---|
| | |

## Inorganic Chemistry

| Parameter | Results(~~mg/l~~)(mg/kg) |
|---|---|
| ✓ Arsenic | <2.0 |
| ✓ Barium | 32 |
| ✓ Cadmium | <20 |
| ___ Chloride | |
| ✓ Chromium | 30 |
| ___ Copper | |
| ___ Fluoride | |
| ___ Iron | |
| ✓ Lead | 20 |
| ___ Manganese | |
| ✓ Mercury | <0.09 |
| ___ Nitrate | |
| ✓ Selenium | <1.0 |
| ✓ Silver | <20 |
| ___ Sulfates | |
| ___ Zinc | |
| ___ pH | |
| ___ Conductivity | |
| ___ TDS | |
| ___ TOC | |

| Organic Compounds | Results(mg/l) |
|---|---|
| ___ benzene | |
| ___ carbon tetrachloride | |
| ___ chlordane | |
| ___ chlorobenzene | |
| ___ chloroform | |
| ___ o-cresol | |
| ___ m-cresol | |
| ___ p-cresol | |
| ___ cresol | |
| ___ 1,4-dichlorobenzene | |
| ___ 1,2-dichloroethane | |
| ___ 1,1-dichloroethylene | |
| ___ 2,4-dinitrotoluene | |
| ___ heptachlor | |
| ___ hexachlorobenzene | |
| ___ hexachlorobutadiene | |
| ___ hexachloroethane | |
| ___ methyl ethyl ketone | |
| ___ nitrobenzene | |
| ___ pentachlorophenol | |
| ___ pyridine | |
| ___ tetrachloroethylene | |
| ___ trichloroethylene | |
| ___ 2,4,5-trichlorophenol | |
| ___ 2,4,6-trichlorophenol | |
| ___ vinyl chloride | |
| ___ endrin | |
| ___ lindane | |
| ___ methoxychlor | |
| ___ toxaphene | |
| ___ 2,4-D | |
| ___ 2,4,5-TP (Silvex) | |

Date Received ___ Reported by ___

Date Extracted ___ Date Reported ___

Date Analyzed ___ Lab Number 013867 JUL 16 91

DHS 3191 (Revised 2/91)

N.C. Department of Environment, Health, & Natural Resources
Solid Waste Management Division

# SAMPLE ANALYSIS REQUEST

State Laboratory of Public Health
P.O. Box 28047, 306 N. Wilmington Street
Raleigh, North Carolina 27611

Site Number NCD 082 362 989 Field Sample Number 16315

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 7/18/91 Time 10:55

Agency: ___ Hazardous Waste ___ Solid Waste ✓ Superfund

## Sample Type

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Ground water (1) | ___ Solid (5) | SS-02 |
| ___ Surface water (2) | ___ Liquid (6) | (Northeast - upper |
| ✓ Soil (3) | ___ Sludge (7) | pond) |
| ___ Other (4) | ___ Other (8) | |

## TCLP Compounds

| Inorganic Compounds | Results (mg/l) |
|---|---|
| ✓ Arsenic | <0.01 |
| ✓ Barium | 0.15 |
| ✓ Cadmium | <0.08 |
| ✓ Chromium | <0.10 |
| ✓ Lead | 6.41 |
| ✓ Mercury | <0.02 |
| ✓ Selenium | <0.005 |
| ✓ Silver | <0.10 |

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## Organic Chemistry

| Parameter | Results (mg/l) |
|---|---|
| ___ P&T:GC/MS | |
| ___ Acid:B/N Ext. | |
| ___ MTBE | |

## Radiochemistry

| Parameter | Results (PCi/l) |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

## Microbiology

| Parameter | Results (Col/100ml) |
|---|---|
| | |

## Inorganic Chemistry

| Parameter | Results (~~mg/l~~) (mg/kg) |
|---|---|
| ✓ Arsenic | 33 |
| ✓ Barium | <7.7 |
| ✓ Cadmium | <15 |
| ___ Chloride | |
| ✓ Chromium | <20 |
| ___ Copper | |
| ___ Fluoride | |
| ___ Iron | |
| ✓ Lead | 910 |
| ___ Manganese | |
| ✓ Mercury | <0.09 |
| ___ Nitrate | |
| ✓ Selenium | <1.0 |
| ✓ Silver | <20 |
| ___ Sulfates | |
| ___ Zinc | |
| ___ pH | |
| ___ Conductivity | |
| ___ TDS | |
| ___ TOC | |

| Organic Compounds | Results (mg/l) |
|---|---|
| ___ benzene | |
| ___ carbon tetrachloride | |
| ___ chlordane | |
| ___ chlorobenzene | |
| ___ chloroform | |
| ___ o-cresol | |
| ___ m-cresol | |
| ___ p-cresol | |
| ___ cresol | |
| ___ 1,4-dichlorobenzene | |
| ___ 1,2-dichloroethane | |
| ___ 1,1-dichloroethylene | |
| ___ 2,4-dinitrotoluene | |
| ___ heptachlor | |
| ___ hexachlorobenzene | |
| ___ hexachlorobutadiene | |
| ___ hexachloroethane | |
| ___ methyl ethyl ketone | |
| ___ nitrobenzene | |
| ___ pentachlorophenol | |
| ___ pyridine | |
| ___ tetrachloroethylene | |
| ___ trichloroethylene | |
| ___ 2,4,5-trichlorophenol | |
| ___ 2,4,6-trichlorophenol | |
| ___ vinyl chloride | |
| ___ endrin | |
| ___ lindane | |
| ___ methoxychlor | |
| ___ toxaphene | |
| ___ 2,4-D | |
| ___ 2,4,5-TP (Silvex) | |

Date Received ___ Reported by ___

Date Extracted ___ Date Reported ___

Date Analyzed ___ Lab Number ___

DHS 3191 (Revised 2/91)

013868 JUL 18 91

N.C. Department of Environment, Health, & Natural Resources
Solid Waste Management Division

# SAMPLE ANALYSIS REQUEST

State Laboratory of Public Health
P.O. Box 28047, 306 N. Wilmington Street
Raleigh, North Carolina 27611

Site Number NCD 082 362 989 Field Sample Number 16316

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 7/18/91 Time 11:10

Agency: ___ Hazardous Waste ___ Solid Waste ✓ Superfund

## Sample Type

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Ground water (1) | ___ Solid (5) | SS-03 |
| ___ Surface water (2) | ___ Liquid (6) | (Northwest - upper |
| ✓ Soil (3) | ___ Sludge (7) | pond) |
| ___ Other (4) | ___ Other (8) | |

## TCLP Compounds

| Inorganic Compounds | Results(mg/l) |
|---|---|
| ✓ Arsenic | <0.01 |
| ✓ Barium | 0.12 |
| ✓ Cadmium | <0.08 |
| ✓ Chromium | <0.10 |
| ✓ Lead | 2.92 |
| ✓ Mercury | <0.02 |
| ✓ Selenium | <0.005 |
| ✓ Silver | <0.10 |

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## Organic Chemistry

| Parameter | Results(mg/l) |
|---|---|
| ___ P&T:GC/MS | |
| ___ Acid:B/N Ext. | |
| ___ MTBE | |

## Inorganic Chemistry

| Parameter | Results(~~mg/l~~)(mg/kg) |
|---|---|
| ✓ Arsenic | 17 |
| ✓ Barium | <7.5 |
| ✓ Cadmium | <15 |
| ___ Chloride | |
| ✓ Chromium | <20 |
| ___ Copper | |
| ___ Fluoride | |
| ___ Iron | |
| ✓ Lead | 240 |
| ___ Manganese | |
| ✓ Mercury | <0.09 |
| ___ Nitrate | |
| ✓ Selenium | <1.0 |
| ✓ Silver | <20 |
| ___ Sulfates | |
| ___ Zinc | |
| ___ pH | |
| ___ Conductivity | |
| ___ TDS | |
| ___ TOC | |

## Radiochemistry

| Parameter | Results (PCi/l) |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

## Microbiology

| Parameter | Results (Col/100ml) |
|---|---|
| | |

| Organic Compounds | Results(mg/l) |
|---|---|
| ___ benzene | |
| ___ carbon tetrachloride | |
| ___ chlordane | |
| ___ chlorobenzene | |
| ___ chloroform | |
| ___ o-cresol | |
| ___ m-cresol | |
| ___ p-cresol | |
| ___ cresol | |
| ___ 1,4-dichlorobenzene | |
| ___ 1,2-dichloroethane | |
| ___ 1,1-dichloroethylene | |
| ___ 2,4-dinitrotoluene | |
| ___ heptachlor | |
| ___ hexachlorobenzene | |
| ___ hexachlorobutadiene | |
| ___ hexachloroethane | |
| ___ methyl ethyl ketone | |
| ___ nitrobenzene | |
| ___ pentachlorophenol | |
| ___ pyridine | |
| ___ tetrachloroethylene | |
| ___ trichloroethylene | |
| ___ 2,4,5-trichlorophenol | |
| ___ 2,4,6-trichlorophenol | |
| ___ vinyl chloride | |
| ___ endrin | |
| ___ lindane | |
| ___ methoxychlor | |
| ___ toxaphene | |
| ___ 2,4-D | |
| ___ 2,4,5-TP (Silvex) | |

Date Received ___ Reported by ___

Date Extracted ___ Date Reported ___

Date Analyzed ___ Lab Number 013869 JUL 18 91

DHS 3191 (Revised 2/91)

Chain of Custody Record

Hazardous Waste Materials

CERCLA

Location of Sampling: ✓ Generator ____ Transporter ____ Treatment Facil

____ Storage Facility ____ Disposal Facility ____ Landfill

____ Other: ____

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Company's Name Tungston Queen Mine Telephone( — )

Address Townsville, NC

Collector's Name Harvey Allen Telephone( 919 ) 733 - 2801
signature

Date Sampled 5/21/91 Time Sampled —

Type of Process Generating Waste Mining

Field Information

Field Sample No. 16179 16180 16181 16182 16183 16184

Chain of Possession:

| | signature | title | inclusive dates |
|---|---|---|---|
| 1. | Harvey Allen | Env. Engineer | 5/21/91 - 5/22/91 |
| 2. | Joyce Dunn | Chem Tech III | 22 May 91 |
| 3. | | | |

Results reported

| signature | title | date |
|---|---|---|
| [illegible] | Chemist | 8 Aug 91 |

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public He
P. O. Box 28
306 N. Wilmington St
Raleigh, 27

Site Number NCD 062 362 989 Field Sample Number 16179

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 11:30

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ✓ Groundwater (1) | Solid (5) | DW-01 (Dixon Well) Cubes |
| Surface Water (2) | Liquid (6) | |
| Soil (3) | Sludge (7) | |
| Other (4) | Other (8) | |

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JUN 2 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | | | |
|---|---|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| Arsenic | | ✓ Arsenic | <0.01 | ✓ Silver | <0.05 | | |
| Barium | | ✓ Barium | <0.04 | Sulfates | | | |
| Cadmium | | ✓ Cadmium | 0.005 | Zinc | | | |
| Chromium | | Chloride | | Ph | | | |
| Lead | | ✓ Chromium | <0.01 | Conductivity | | | |
| Mercury | | Copper | | TDS | | | |
| Selenium | | Fluoride | | TOC | | | |
| Silver | | Iron | | | | | |
| | | ✓ Lead | .008 | | | | |
| | | Manganese | | | | | |
| | | ✓ Mercury | <0.0002 | | | | |
| | | Nitrate | | | | | |
| | | ✓ Selenium | <0.005 | | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| P&T:GC/MS | | EDB | | Methoxychlor | |
| Acid:B/N Ext. | | PCB's | | Toxaphene | |
| TOX | | Petroleum | | 2,4-D | |
| | | Endrin | | 2,4,5-TP (silvex) | |
| | | Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| (MF) Coliform Colonies/100mls |
| (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| Gross Alpha | |
| Gross Beta | |

Date Received Date Reported 24 June 91

Date Extracted Date Analyzed

Reported By [illegible] Lab Number 011750 [illegible]

DHS 3191 (Revised 7/85)

N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Heal
P. O. Box 280
306 N. Wilmington Str
Raleigh, 276

Site Number NCD 062 362 989 Field Sample Number 16180

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 2:30

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Groundwater (1) | ___ Solid (5) | SW-01 (upstream) Cubes |
| ✓ Surface Water (2) | ___ Liquid (6) | |
| ___ Soil (3) | ___ Sludge (7) | |
| ___ Other (4) | ___ Other (8) | |

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JUN 26 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| ___ Arsenic | | ✓ Arsenic | <0.01 | ✓ Silver | <0.05 |
| ___ Barium | | ✓ Barium | 0.04 | ___ Sulfates | |
| ___ Cadmium | | ✓ Cadmium | <0.005 | ___ Zinc | |
| ___ Chromium | | ___ Chloride | | ___ Ph | |
| ___ Lead | | ✓ Chromium | <0.01 | ___ Conductivity | |
| ___ Mercury | | ___ Copper | | ___ TDS | |
| ___ Selenium | | ___ Fluoride | | ___ TOC | |
| ___ Silver | | ___ Iron | | | |
| | | ✓ Lead | <0.005 | | |
| | | ___ Manganese | | | |
| | | ✓ Mercury | <0.0002 | | |
| | | ___ Nitrate | | | |
| | | ✓ Selenium | <0.005 | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ___ P&T:GC/MS | | ___ EDB | | ___ Methoxychlor | |
| ___ Acid:B/N Ext. | | ___ PCB's | | ___ Toxaphene | |
| ___ TOX | | ___ Petroleum | | ___ 2,4-D | |
| | | ___ Endrin | | ___ 2,4,5-TP (silvex) | |
| | | ___ Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| ___ (MF) Coliform Colonies/100mls |
| ___ (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

Date Received ___ Date Reported ___

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 011751

DHS 3191 (Revised 7/85)

N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Hea
P. O. Box 28(
306 N. Wilmington St
Raleigh, 27(

Site Number NCD 062 362 989 Field Sample Number 16181

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 3:30

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Groundwater (1) | ___ Solid (5) | SW-02 (downstream) Cubes |
| ✓ Surface Water (2) | ___ Liquid (6) | |
| ___ Soil (3) | ___ Sludge (7) | |
| ___ Other (4) | ___ Other (8) | |

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SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| Arsenic | | ✓ Arsenic | <0.01 | ✓ Silver | <0.05 |
| Barium | | ✓ Barium | <0.04 | Sulfates | |
| Cadmium | | ✓ Cadmium | <0.005 | Zinc | |
| Chromium | | Chloride | | Ph | |
| Lead | | ✓ Chromium | <0.01 | Conductivity | |
| Mercury | | Copper | | TDS | |
| Selenium | | Fluoride | | TOC | |
| Silver | | Iron | | | |
| | | ✓ Lead | .008 | | |
| | | Manganese | | | |
| | | ✓ Mercury | <0.0002 | | |
| | | Nitrate | | | |
| | | ✓ Selenium | <0.005 | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| P&T:GC/MS | | EDB | | Methoxychlor | |
| Acid:B/N Ext. | | PCB's | | Toxaphene | |
| TOX | | Petroleum | | 2,4-D | |
| | | Endrin | | 2,4,5-TP (silvex) | |
| | | Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| (MF) Coliform Colonies/100mls |
| (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| Gross Alpha | |
| Gross Beta | |

Date Received ___ Date Reported ___

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 011752

DHS 3191 (Revised 7/85)

CERCLA

N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Hea
P. O. Box 280
306 N. Wilmington Str
Raleigh, 276

Site Number NCD 062 362 989 Field Sample Number 16182

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 2:30

Type of Sample:

| Environmental | Concentrate |
|---|---|
| ___ Groundwater (1) | ___ Solid (5) |
| ___ Surface Water (2) | ___ Liquid (6) |
| ___ Soil (3) | ___ Sludge (7) |
| ✓ Other (4) Sediment | ___ Other (8) |

Comments: SED-01 (upstream) Inorg 250 ml

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SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/Kg | Parameter | Results mg/1 |
| ✓ Arsenic | <0.01 | ✓ Arsenic | <2.0 | ✓ Silver | <20 |
| ✓ Barium | 0.62 | ✓ Barium | 65 | ___ Sulfates | |
| ✓ Cadmium | <0.08 | ✓ Cadmium | <15 | ___ Zinc | |
| ___ Chromium | <0.10 | ___ Chloride | | ___ Ph | |
| ✓ Lead | <0.50 | ✓ Chromium | <20 | ___ Conductivity | |
| ✓ Mercury | <0.02 | ___ Copper | | ___ TDS | |
| ✓ Selenium | <0.005 | ___ Fluoride | | ___ TOC | |
| ✓ Silver | <0.10 | ___ Iron | | | |
| | | ✓ Lead | 18 | | |
| | | ___ Manganese | | | |
| | | ✓ Mercury | <0.1 | | |
| | | ___ Nitrate | | | |
| | | ✓ Selenium | <1.0 | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ___ P&T:GC/MS | | ___ EDB | | ___ Methoxychlor | |
| ___ Acid:B/N Ext. | | ___ PCB's | | ___ Toxaphene | |
| ___ TOX | | ___ Petroleum | | ___ 2,4-D | |
| | | ___ Endrin | | ___ 2,4,5-TP (silvex) | |
| | | ___ Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| ___ (MF) Coliform Colonies/100mls |
| ___ (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

Date Received ___ Date Reported ___

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 011753

DHS 3191 (Revised 7/85)

CERCLA

N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Heal
P. O. Box 280
306 N. Wilmington Stre
Raleigh, 276

Site Number NCD 062 362 989 Field Sample Number 16183

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 3:30

Type of Sample:

| Environmental | Concentrate |
|---|---|
| ___ Groundwater (1) | ___ Solid (5) |
| ___ Surface Water (2) | ___ Liquid (6) |
| ___ Soil (3) | ___ Sludge (7) |
| ✓ Other (4) Sediment | ___ Other (8) |

Comments SED-02 (downstream) Inorg 250ml

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SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/Kg | Parameter | Results mg/1 |
| ✓ Arsenic | <0.01 | ✓ Arsenic | <2.0 | ✓ Silver | <20 |
| ✓ Barium | 0.43 | ✓ Barium | 49 | Sulfates | |
| ✓ Cadmium | <0.08 | ✓ Cadmium | <15 | Zinc | |
| ✓ Chromium | <0.10 | Chloride | | Ph | |
| ✓ Lead | <0.50 | ✓ Chromium | <20 | Conductivity | |
| ✓ Mercury | <0.02 | Copper | | TDS | |
| ✓ Selenium | <0.005 | Fluoride | | TOC | |
| ✓ Silver | <0.10 | Iron | | | |
| | | ✓ Lead | 19 | | |
| | | Manganese | | | |
| | | ✓ Mercury | <0.1 | | |
| | | Nitrate | | | |
| | | ✓ Selenium | <1.0 | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| P&T:GC/MS | | EDB | | Methoxychlor | |
| Acid:B/N Ext. | | PCB's | | Toxaphene | |
| TOX | | Petroleum | | 2,4-D | |
| | | Endrin | | 2,4,5-TP (silvex) | |
| | | Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| (MF) Coliform Colonies/100mls |
| (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| Gross Alpha | |
| Gross Beta | |

Date Received ___ Date Reported ___

Date Extracted ___ Date Analyzed ___

Reported By ___ Lab Number 011754

DHS 3191 (Revised 7/85)

CERCLA

N.C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public He:
P. O. Box 28
306 N. Wilmington St
Raleigh, 27

Site Number NCD 062 362 989 Field Sample Number 16184

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 4:00

Type of Sample:

| Environmental | Concentrate |
|---|---|
| ____ Groundwater (1) | ____ Solid (5) |
| ____ Surface Water (2) | ____ Liquid (6) |
| ✓ Soil (3) | ____ Sludge (7) |
| ____ Other (4) | ____ Other (8) |

Comments: MSS-01 (Composite @ New Mill) Inorg 250ml

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AUG 14 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/Kg | Parameter | Results mg/1 |
| ✓ Arsenic | <0.01 | ✓ Arsenic | 310 | ✓ Silver | 290 |
| ✓ Barium | <0.04 | ✓ Barium | 20 | Sulfates | |
| ✓ Cadmium | <0.08 | Cadmium | 200 | Zinc | |
| ✓ Chromium | <0.10 | Chloride | | Ph | |
| ✓ Lead | 17.60 | ✓ Chromium | <20 | Conductivity | |
| ✓ Mercury | <0.02 | Copper | | TDS | |
| ✓ Selenium | <0.005 | Fluoride | | TOC | |
| ✓ Silver | <0.10 | ✓ Iron | | | |
| | | ✓ Lead | 20,000 | | |
| | | ✓ Manganese | | | |
| | | ✓ Mercury | ≤ 0.125 | | |
| | | ✓ Nitrate | | | |
| | | ✓ Selenium | 13 | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| P&T:GC/MS | | EDB | | Methoxychlor | |
| Acid:B/N Ext. | | PCB's | | Toxaphene | |
| TOX | | Petroleum | | 2,4-D | |
| | | Endrin | | 2,4,5-TP (silvex) | |
| | | Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| (MF) Coliform Colonies/100mls |
| (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| Gross Alpha | |
| Gross Beta | |

Date Received ____ Date Reported ____

Date Extracted ____ Date Analyzed ____

Reported By ____ Lab Number 011755

DHS 3191 (Revised 7/85)

CERCLA

N.C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 28047
306 N. Wilmington Street
Raleigh, 27611

Site Number NCD 082 362 989 Field Sample Number 14812

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 11:30

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ✓ Groundwater (1) | Solid (5) | DW-01 (Dixon Well) VOA |
| Surface Water (2) | Liquid (6) | |
| Soil (3) | Sludge (7) | |
| Other (4) | Other (8) | |

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SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| Arsenic | | Arsenic | | Silver | |
| Barium | | Barium | | Sulfates | |
| Cadmium | | Cadmium | | Zinc | |
| Chromium | | Chloride | | Ph | |
| Lead | | Chromium | | Conductivity | |
| Mercury | | Copper | | TDS | |
| Selenium | | Fluoride | | TOC | |
| Silver | | Iron | | | |
| | | Lead | | | |
| | | Manganese | | | |
| | | Mercury | | | |
| | | Nitrate | | | |
| | | Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ✓ P&T:GC/MS | | EDB | | Methoxychlor | |
| Acid:B/N Ext. | | PCB's | | Toxaphene | |
| TOX | | Petroleum | | 2,4-D | |
| | | Endrin | | 2,4,5-TP (silvex) | |
| | | Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| (MF) Coliform Colonies/100mls |
| (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| Gross Alpha | |
| Gross Beta | |

Date Received 5-22-91 nw Date Reported 7-16-91

Date Extracted Date Analyzed VOC 6/6/91 JPM

Reported By John L. Neal Lab Number 911886

DHS 3191 (Revised 7/85)

#911886 – 911894

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N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Healt
P. O. Box 2804
306 N. Wilmington Stre
Raleigh, 2761

Site Number NCD 062 362 989 Field Sample Number 14813

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 11:30

Type of Sample:

| Environmental | Concentrate |
|---|---|
| ✓ Groundwater (1) | Solid (5) |
| Surface Water (2) | Liquid (6) |
| Soil (3) | Sludge (7) |
| Other (4) | Other (8) |

Comments: DW-01 (Dixon Well) 2L BNA's

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JUL 17 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| Arsenic | | Arsenic | | Silver | |
| Barium | | Barium | | Sulfates | |
| Cadmium | | Cadmium | | Zinc | |
| Chromium | | Chloride | | Ph | |
| Lead | | Chromium | | Conductivity | |
| Mercury | | Copper | | TDS | |
| Selenium | | Fluoride | | TOC | |
| Silver | | Iron | | | |
| | | Lead | | | |
| | | Manganese | | | |
| | | Mercury | | | |
| | | Nitrate | | | |
| | | Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ✓ P&T:GC/MS | | EDB | | Methoxychlor | |
| ✓ Acid:B/N Ext. | | PCB's | | Toxaphene | |
| TOX | | Petroleum | | 2,4-D | |
| | | Endrin | | 2,4,5-TP (silvex) | |
| | | Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| (MF) Coliform Colonies/100mls |
| (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| Gross Alpha | |
| Gross Beta | |

Date Received 5-22-91 nw Date Reported

Date Extracted 6-12-91 AA, NW Date Analyzed 7-11-91 BD

Reported By Lab Number 911887

DHS 3191 (Revised 7/85)

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Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 2804
306 N. Wilmington Street
Raleigh, 2761

Site Number NCD 082 362 989 Field Sample Number 14814

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 2:30

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Groundwater (1) | ___ Solid (5) | SW-01 (upstream) VOA |
| ✓ Surface Water (2) | ___ Liquid (6) | |
| ___ Soil (3) | ___ Sludge (7) | |
| ___ Other (4) | ___ Other (8) | |

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JUL 17 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| ___ Arsenic | | ___ Arsenic | | ___ Silver | |
| ___ Barium | | ___ Barium | | ___ Sulfates | |
| ___ Cadmium | | ___ Cadmium | | ___ Zinc | |
| ___ Chromium | | ___ Chloride | | ___ Ph | |
| ___ Lead | | ___ Chromium | | ___ Conductivity | |
| ___ Mercury | | ___ Copper | | ___ TDS | |
| ___ Selenium | | ___ Fluoride | | ___ TOC | |
| ___ Silver | | ___ Iron | | | |
| | | ___ Lead | | | |
| | | ___ Manganese | | | |
| | | ___ Mercury | | | |
| | | ___ Nitrate | | | |
| | | ___ Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ✓ P&T:GC/MS | | ___ EDB | | ___ Methoxychlor | |
| ___ Acid:B/N Ext. | | ___ PCB's | | ___ Toxaphene | |
| ___ TOX | | ___ Petroleum | | ___ 2,4-D | |
| | | ___ Endrin | | ___ 2,4,5-TP (silvex) | |
| | | ___ Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| ___ (MF) Coliform Colonies/100mls |
| ___ (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

Date Received 5-22-91 nw Date Reported

Date Extracted Date Analyzed 7-15-91 nw

Reported By Lab Number 911888

DHS 3191 (Revised 7/85)

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N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 2804
306 N. Wilmington Street
Raleigh, 2761

Site Number NCD 062 362 989 Field Sample Number 14815

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 2:30

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Groundwater (1) | ___ Solid (5) | SW-01 (upstream) 2L BNA's |
| ✓ Surface Water (2) | ___ Liquid (6) | |
| ___ Soil (3) | ___ Sludge (7) | |
| ___ Other (4) | ___ Other (8) | |

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JUL 17 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| ___ Arsenic | | ___ Arsenic | | ___ Silver | |
| ___ Barium | | ___ Barium | | ___ Sulfates | |
| ___ Cadmium | | ___ Cadmium | | ___ Zinc | |
| ___ Chromium | | ___ Chloride | | ___ Ph | |
| ___ Lead | | ___ Chromium | | ___ Conductivity | |
| ___ Mercury | | ___ Copper | | ___ TDS | |
| ___ Selenium | | ___ Fluoride | | ___ TOC | |
| ___ Silver | | ___ Iron | | | |
| | | ___ Lead | | | |
| | | ___ Manganese | | | |
| | | ___ Mercury | | | |
| | | ___ Nitrate | | | |
| | | ___ Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ✓ P&T:GC/MS | | ___ EDB | | ___ Methoxychlor | |
| ✓ Acid:B/N Ext. | | ___ PCB's | | ___ Toxaphene | |
| ___ TOX | | ___ Petroleum | | ___ 2,4-D | |
| | | ___ Endrin | | ___ 2,4,5-TP (silvex) | |
| | | ___ Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| ___ (MF) Coliform Colonies/100mls |
| ___ (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

Date Received 5-22-91 nw Date Reported

Date Extracted 6-12-91 AA, NW Date Analyzed 7-11-91 BD

Reported By Lab Number 911889

DHS 3191 (Revised 7/85)

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Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 2804
306 N. Wilmington Street
Raleigh, 2761

Site Number NCD 062 362 989 Field Sample Number 14816

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 3:30

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Groundwater (1) | ___ Solid (5) | SW-02 (downstream) VOA |
| ✓ Surface Water (2) | ___ Liquid (6) | |
| ___ Soil (3) | ___ Sludge (7) | |
| ___ Other (4) | ___ Other (8) | |

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JUL 17 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| ___ Arsenic | | ___ Arsenic | | ___ Silver | |
| ___ Barium | | ___ Barium | | ___ Sulfates | |
| ___ Cadmium | | ___ Cadmium | | ___ Zinc | |
| ___ Chromium | | ___ Chloride | | ___ Ph | |
| ___ Lead | | ___ Chromium | | ___ Conductivity | |
| ___ Mercury | | ___ Copper | | ___ TDS | |
| ___ Selenium | | ___ Fluoride | | ___ TOC | |
| ___ Silver | | ___ Iron | | | |
| | | ___ Lead | | | |
| | | ___ Manganese | | | |
| | | ___ Mercury | | | |
| | | ___ Nitrate | | | |
| | | ___ Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ✓ P&T:GC/MS | | ___ EDB | | ___ Methoxychlor | |
| ___ Acid:B/N Ext. | | ___ PCB's | | ___ Toxaphene | |
| ___ TOX | | ___ Petroleum | | ___ 2,4-D | |
| | | ___ Endrin | | ___ 2,4,5-TP (silvex) | |
| | | ___ Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| ___ (MF) Coliform Colonies/100mls |
| ___ (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

Date Received 5-22-91 nw Date Reported

Date Extracted Date Analyzed 7-16-91 nw

Reported By Lab Number 911890

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Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 2804
306 N. Wilmington Street
Raleigh, 2761

Site Number NCD 062 362 989 Field Sample Number 14817

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 3:30

Type of Sample:

| Environmental | Concentrate | Comments |
|---|---|---|
| ____ Groundwater (1) | ____ Solid (5) | SW-02 (downstream) 2L BNA's |
| ✓ Surface Water (2) | ____ Liquid (6) | |
| ____ Soil (3) | ____ Sludge (7) | |
| ____ Other (4) | ____ Other (8) | |

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## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| ____ Arsenic | | ____ Arsenic | | ____ Silver | |
| ____ Barium | | ____ Barium | | ____ Sulfates | |
| ____ Cadmium | | ____ Cadmium | | ____ Zinc | |
| ____ Chromium | | ____ Chloride | | ____ Ph | |
| ____ Lead | | ____ Chromium | | ____ Conductivity | |
| ____ Mercury | | ____ Copper | | ____ TDS | |
| ____ Selenium | | ____ Fluoride | | ____ TOC | |
| ____ Silver | | ____ Iron | | | |
| | | ____ Lead | | | |
| | | ____ Manganese | | | |
| | | ____ Mercury | | | |
| | | ____ Nitrate | | | |
| | | ____ Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ____ P&T:GC/MS | | ____ EDB | | ____ Methoxychlor | |
| ✓ Acid:B/N Ext. | | ____ PCB's | | ____ Toxaphene | |
| ____ TOX | | ____ Petroleum | | ____ 2,4-D | |
| | | ____ Endrin | | ____ 2,4,5-TP (silvex) | |
| | | ____ Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| ____ (MF) Coliform Colonies/100mls |
| ____ (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| ____ Gross Alpha | |
| ____ Gross Beta | |

Date Received 5-22-91 nw Date Reported

Date Extracted 6-12-91 AA, NW Date Analyzed 7-11-91 BD

Reported By Lab Number 911891

DHS 3191 (Revised 7/85)

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N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 2804
306 N. Wilmington Street
Raleigh, 2761

Site Number NCD 062 362 989 Field Sample Number 14818

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 2:30

Type of Sample:

| Environmental | Concentrate |
|---|---|
| ____ Groundwater (1) | ____ Solid (5) |
| ____ Surface Water (2) | ____ Liquid (6) |
| ____ Soil (3) | ____ Sludge (7) |
| ✓ Other (4) Sediment | ____ Other (8) |

Comments: SED-01 (upstream) VOA/BNA's

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JUL 17 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| Arsenic | | Arsenic | | Silver | |
| Barium | | Barium | | Sulfates | |
| Cadmium | | Cadmium | | Zinc | |
| Chromium | | Chloride | | Ph | |
| Lead | | Chromium | | Conductivity | |
| Mercury | | Copper | | TDS | |
| Selenium | | Fluoride | | TOC | |
| Silver | | Iron | | | |
| | | Lead | | | |
| | | Manganese | | | |
| | | Mercury | | | |
| | | Nitrate | | | |
| | | Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ✓ P&T:GC/MS | | EDB | | Methoxychlor | |
| ✓ Acid:B/N Ext. | | PCB's | | Toxaphene | |
| TOX | | Petroleum | | 2,4-D | |
| | | Endrin | | 2,4,5-TP (silvex) | |
| | | Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| (MF) Coliform Colonies/100mls |
| (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| Gross Alpha | |
| Gross Beta | |

Date Received 5-22-91 nw Date Reported

Date Extracted 6-18-91 AA Date Analyzed BNA 7-11-91 BQ PT 7-16-91 nw

Reported By Lab Number 911892

DHS 3191 (Revised 7/85)

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N.C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Health
P. O. Box 2804
306 N. Wilmington Street
Raleigh, 2761

Site Number NCD 082 362 989 Field Sample Number 14819

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 3:30

Type of Sample:

| Environmental | Concentrate |
|---|---|
| ____ Groundwater (1) | ____ Solid (5) |
| ____ Surface Water (2) | ____ Liquid (6) |
| ____ Soil (3) | ____ Sludge (7) |
| ✓ Other (4) Sediment | ____ Other (8) |

Comments: SED-02 (downstream) VOA/BNA's

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JUL 17 1991
SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| ____ Arsenic | | ____ Arsenic | | ____ Silver | |
| ____ Barium | | ____ Barium | | ____ Sulfates | |
| ____ Cadmium | | ____ Cadmium | | ____ Zinc | |
| ____ Chromium | | ____ Chloride | | ____ Ph | |
| ____ Lead | | ____ Chromium | | ____ Conductivity | |
| ____ Mercury | | ____ Copper | | ____ TDS | |
| ____ Selenium | | ____ Fluoride | | ____ TOC | |
| ____ Silver | | ____ Iron | | | |
| | | ____ Lead | | | |
| | | ____ Manganese | | | |
| | | ____ Mercury | | | |
| | | ____ Nitrate | | | |
| | | ____ Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ✓ P&T:GC/MS | | ____ EDB | | ____ Methoxychlor | |
| ✓ Acid:B/N Ext. | | ____ PCB's | | ____ Toxaphene | |
| ____ TOX | | ____ Petroleum | | ____ 2,4-D | |
| | | ____ Endrin | | ____ 2,4,5-TP (silvex) | |
| | | ____ Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| ____ (MF) Coliform Colonies/100mls |
| ____ (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| ____ Gross Alpha | |
| ____ Gross Beta | |

Date Received 5-22-91 nw Date Reported

Date Extracted 6-18-91 AA Date Analyzed BNA 7-11-91 BD PT 7-16-91 nw

Reported By Lab Number 911893

DHS 3191 (Revised 7/85)

N. C. Department of Human Resources
Division of Health Services

# SAMPLE ANALYSES REQUEST

State Laboratory of Public Heal
P. O. Box 280
306 N. Wilmington Stre
Raleigh, 276

Site Number NCD 082 362 989 Field Sample Number 14820

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 5/21/91 Time 4:00

Type of Sample:

| Environmental | Concentrate |
|---|---|
| ____ Groundwater (1) | ____ Solid (5) |
| ____ Surface Water (2) | ____ Liquid (6) |
| ✓ Soil (3) | ____ Sludge (7) |
| ____ Other (4) | ____ Other (8) |

Comments: MSS-01 (Composite @ New Mill) VOA/BNAs

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SUPERFUND SECTION

## INORGANIC CHEMISTRY

| Extractables | | Total | | | |
|---|---|---|---|---|---|
| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
| ____ Arsenic | | ____ Arsenic | | ____ Silver | |
| ____ Barium | | ____ Barium | | ____ Sulfates | |
| ____ Cadmium | | ____ Cadmium | | ____ Zinc | |
| ____ Chromium | | ____ Chloride | | ____ Ph | |
| ____ Lead | | ____ Chromium | | ____ Conductivity | |
| ____ Mercury | | ____ Copper | | ____ TDS | |
| ____ Selenium | | ____ Fluoride | | ____ TOC | |
| ____ Silver | | ____ Iron | | | |
| | | ____ Lead | | | |
| | | ____ Manganese | | | |
| | | ____ Mercury | | | |
| | | ____ Nitrate | | | |
| | | ____ Selenium | | | |

## ORGANIC CHEMISTRY

| Parameter | Results mg/1 | Parameter | Results mg/1 | Parameter | Results mg/1 |
|---|---|---|---|---|---|
| ✓ P&T:GC/MS | | ____ EDB | | ____ Methoxychlor | |
| ✓ Acid:B/N Ext. | | ____ PCB's | | ____ Toxaphene | |
| ____ TOX | | ____ Petroleum | | ____ 2,4-D | |
| | | ____ Endrin | | ____ 2,4,5-TP (silvex) | |
| | | ____ Lindane | | | |

## MICROBIOLOGY

| Parameter |
|---|
| ____ (MF) Coliform Colonies/100mls |
| ____ (MPN) Coliform Colonies/100mls |

## RADIOCHEMISTRY

| Parameter | Results PCi/1 |
|---|---|
| ____ Gross Alpha | |
| ____ Gross Beta | |

Date Received 5-22-91 nw Date Reported

Date Extracted 6-18-91 AA Date Analyzed BNA 7-11-91 BD PT 7-16-91 nw

Reported By Lab Number 911894

DHS 3191 (Revised 7/85)

SOLID AND HAZARDOUS WASTE SECTION

# Chain of Custody Record

CERCLA

## Hazardous Waste Materials

Location of Sampling: ✓ Generator ___ Transporter ___ Treatment Facil
___ Storage Facility ___ Disposal Facility ___ Landfill
___ Other: ___

Company's Name Tungston Queen Mine Telephone( )

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SUPERFUND SECTION

Address Townsville, N.C.

Collector's Name Harley Allen (signature) Telephone(919) 492-3801

Date Sampled 5/21/91 Time Sampled —

Type of Process Generating Waste Mining

Field Information

Field Sample No. 14812 14813 14814 14815 14816 14817 14818
14819 14820

Chain of Possession:

| | signature | title | inclusive dates |
|---|---|---|---|
| 1. | Harley Allen | Env. Engineer | 5/21/91 - 5/22/91 |
| 2. | Angela D. Antle | Chem Tech | 5-22-91 |
| 3. | | | |

Results reported

| signature | title | date |
|---|---|---|
| John R. Neal | Chemist | 7-16-91 |

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

| BASE/NEUTRAL AND ACID EXTRACTABLES | LAB NO | 911887 | 911889 | 911891 | 911892 | 911893 | 911894 |
|---|---|---|---|---|---|---|---|
| | FIELD # | 14813 | 14815 | 14817 | 14818 | 14819 | 14820 |
| COMPOUND | TYPE | (1) | (2) | (2) | (4) | (4) | (3) |
| | UNITS | µg/l ~~µg/kg~~ | µg/l ~~µg/kg~~ | µg/l ~~µg/kg~~ | ~~µg/l~~ µg/kg | ~~µg/l~~ µg/kg | ~~µg/l~~ µg/kg |
| N-nitrosodimethylamine | 10/330 | U | U | U | U | U | U |
| bis(2-chloroethyl)ether | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2-chlorophenol | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| phenol | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 1,3-dichlorobenzene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 1,4-dichlorobenzene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 1,2-dichlorobenzene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| bis(2-chloroisopropyl)ether | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| hexachloroethane | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| N-nitroso-di-n-propylamine | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| nitrobenzene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| isophorone | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2-nitrophenol | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2,4-dimethylphenol | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| bis(2-chloroethoxy)methane | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2,4-dichlorophenol | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 1,2,4-trichlorobenzene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| naphthalene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| hexachlorobutadiene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 4-chloro-m-cresol | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| hexachlorocyclopentadiene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2,4,6-trichlorophenol | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2-chloronaphthalene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| acenaphthylene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| dimethyl phthalate | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2,6-dinitrotoluene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| acenaphthene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2,4-dinitrophenol | 50/1650 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2,4-dinitrotoluene | 10/330 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 4-nitrophenol | 50/1650 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| fluorene | 10/330 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 4-chlorophenylphenylether | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| diethyl phthalate | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 4,6-dinitro-o-cresol | 50/1650 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| diphenylamine | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| azobenzene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 4-bromophenylphenylether | 10/330 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| hexachlorobenzene | 10/330 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| pentachlorophenol | 50/1650 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| phenanthrene | 10/330 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| anthracene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| dibutyl phthalate | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| fluoranthene | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |

MDL
$H_2O$/SOIL

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit. MDL
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

RECEIVED
JUL 17 1991
SUPERFUND SECTION

N.C. Division of Health Services
DHS 3068-0 (4/86 Laboratory)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

| BASE/NEUTRAL AND ACID EXTRACTABLES COMPOUND | LAB NO | 911887 | 911889 | 911891 | 911892 | 911893 | 911894 |
|---|---|---|---|---|---|---|---|
| | FIELD # | 14813 | 14815 | 14817 | 14818 | 14819 | 14820 |
| | TYPE | (1) | (2) | (2) | (4) | (4) | (3) |
| | UNITS | µg/l ~~µg/kg~~ | µg/l ~~µg/kg~~ | µg/l ~~µg/kg~~ | ~~µg/l~~ µg/kg | ~~µg/l~~ µg/kg | ~~µg/l~~ µg/kg |
| pyrene | 10/330 | U | U | U | U | U | U |
| benzidine | 50/1650 | | | | | | |
| butyl benzyl phthalate | 10/330 | | | | | | |
| benz(a)anthracene | | | | | | | |
| chrysene | | | | | | | |
| 3,3-dichlorobenzidine | 50/1650 | | | | | | |
| bis(2-ethylhexyl)phthalate | 10/330 | | | | | | |
| di-n-octyl phthalate | 10/330 | | | | | | |
| benzo(b)fluoranthene | 50/1650 | | | | | | |
| benzo(k)fluoranthene | | | | | | | |
| benzo(a)pyrene | | | | | | | |
| indeno(1,2,3-cd)pyrene | | | | | | | |
| dibenzo(a,h)anthracene | | | | | | | |
| benzo(g,h,i)perylene | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| aniline | 50/1650 | U | U | U | U | U | U |
| benzoic acid | | | | | | | |
| benzyl alcohol | | | | | | | |
| 4-chloroaniline | | | | | | | |
| dibenzofuran | 10/330 | | | | | | |
| 2-methylnaphthalene | | | | | | | |
| 2-methylphenol | | | | | | | |
| 4-methylphenol | | | | | | | |
| 2-nitroaniline | 50/1650 | | | | | | |
| 3-nitroaniline | | | | | | | |
| 4-nitroaniline | | | | | | | |
| 2,4,5-trichlorophenol | | | | | | | |

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JUL 17 1991
SUPERFUND SECTION

MDL
$H_2O$/ 501L

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit. MDL
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

N.C. Division of Health Services
DHS 3068-0 (4/86 Laboratory)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

| PURGEABLE COMPOUNDS | LAB NO | 911886 | 911888 | 911890 | 911892 | 911893 | 911894 |
|---|---|---|---|---|---|---|---|
| | FIELD # | 14812 | 14814 | 14816 | 14818 | 14819 | 14820 |
| COMPOUND | TYPE | (1) | (2) | (2) | (4) | (4) | (3) |
| | UNITS | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg |
| chloromethane | 10 ppb | | u | u | u | u | u |
| bromomethane | 10 | | | | | | |
| dichlorodifluoromethane | 5 | | | | | | |
| vinyl chloride | 10 | | | | | | |
| chloroethane | 10 | | | | | | |
| methylene chloride | 5 | | | | | | |
| trichlorofluoromethane | | | | | | | |
| ethene, 1,1-dichloro | | | | | | | |
| ethane, 1,1-dichloro- | | | | | | | |
| 1,2-trans-dichloroethene | | | | | | | |
| chloroform | | | | | | | |
| ethane, 1,2-dichloro- | | | | | | | |
| ethane, 1,1,1-trichloro- | | | | | | | |
| carbontetrachloride | | | | | | | |
| bromodichloromethane | | | | | | | |
| propane, 1,2-dichloro- | | | | | | | |
| 1,3-trans-dichloropropene | | | | | | | |
| trichloroethylene | | | | | | | |
| chlorodibromomethane | | | | | | | |
| benzene | | | | | | | |
| ethane, 1,1,2-trichloro- | | | | | | | |
| 1,3-cis-dichloropropene | | | | | | | |
| 2-chloroethyl vinyl ether | 10 | | | | | | |
| bromoform | 10 | | | | | | |
| ethane, 1,1,2,2-tetrachloro- | 5 | | | | | | |
| ethene, tetrachloro- | | | | | | | |
| toluene | | | | | | | |
| chlorobenzene | | | | | | | |
| ethylbenzene | | | | | | | |
| | | | | | | | |
| acetone | 10 ppb | | u | u | u | u | u |
| 2-butanone | 10 | | | | | | |
| carbondisulfide | 5 | | | | | | |
| 2-hexanone | 10 | | | | | | |
| 4-methyl-2-pentanone | 10 | | | | | | |
| styrene | 5 | | | | | | |
| vinyl acetate | 10 | | | | | | |
| xylenes (total) | 5 | | | | | | |

See VOC results

RECEIVED
JUL 17 1991
SUPERFUND SECTION

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit.
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

N.C. Division of Health Services

DHS 3068-O (4/86 Laboratory)

N. C. DEPARTMENT OF ENVIRONMENT, HEALTH, & NATURAL RESOURCES
DIVISION OF LABORATORY SERVICES, ENVIRONMENTAL SCIENCES SECTION
P.O. BOX 28047 - 306 N. WILMINGTON ST, RALEIGH, N.C. 27611

Laboratory No. 911886 PURGEABLE COMPOUNDS Date of Analysis 6/6/91

| COMPOUND | µg/l |
|---|---|
| Dichlorodifluoromethane | u |
| Chloromethane | |
| ✓Vinyl Chloride | |
| Bromomethane | |
| Chloroethane | |
| Trichlorofluoromethane | |
| ✓1,1-Dichloroethylene | |
| Methylene Chloride | |
| tert-Butyl Methyl Ether | |
| trans-1,2-Dichloroethylene | |
| Isopropyl ether | |
| 1,1-Dichloroethane | |
| 2,2-Dichloropropane | |
| cis-1,2-Dichloroethylene | |
| Chloroform | |
| (BCM) Bromochloromethane | |
| ✓1,1,1-Trichloroethane | |
| 1,1-Dichloropropene | |
| ✓Carbon Tetrachloride | |
| ✓Benzene | |
| ✓1,2-Dichloroethane | |
| ✓Trichloroethylene | |
| 1,2-Dichloropropane | |
| Bromodichloromethane | |
| Dibromomethane | |
| Toluene | |
| 1,1,2-Trichloroethane | |
| Tetrachloroethylene | |
| 1,3-Dichloropropane | |
| Dibromochloromethane | |
| 1,2-Dibromoethane (EDB) | |
| 1-Chlorohexane | ✓ |

| COMPOUND | µg/l |
|---|---|
| Chlorobenzene | u |
| Ethylbenzene | |
| 1,1,1,2-Tetrachloroethane | |
| p-Xylene | |
| m-Xylene | |
| o-Xylene | |
| Styrene | |
| Bromoform | |
| Isopropylbenzene | |
| 1,1,2,2-Tetrachloroethane | |
| Bromobenzene | |
| n-Propylbenzene | |
| 1,2,3-Trichloropropane | |
| 2-Chlorotoluene | |
| 1,3,5-Trimethylbenzene | |
| 4-Chlorotoluene | |
| tert-Butyl Benzene | |
| Pentachloroethane | |
| 1,2,4-Trimethylbenzene | |
| sec-Butyl Benzene | |
| p-Isopropyltoluene | |
| 1,3-Dichlorobenzene | |
| ✓1,4-Dichlorobenzene | |
| n-Butylbenzene | |
| 1,2-Dichlorobenzene | |
| Bis (2-Chloroisopropyl) Ether | |
| 1,2-Dibromo-3-Chloropropane | |
| 1,2,4-Trichlorobenzene | |
| Hexachlorobutadiene | |
| Naphthalene | |
| 1,2,3-Trichlorobenzene | ✓ |

RECEIVED
JUL 17 1991
SUPERFUND SECTION

COMMENTS:

MDL - Minimum Detection Limit for water (EPA Method 502.2), is 1.0 µg/l.

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected.
NA - Not analyzed.
1/ - Tentative identification.
✓ - Regulated VOC
T - Trihalomethane

N.C. Dept. of Environment, Health, & Natural Resources
DEHNR 3068-O (Rev. 1/91 Laboratory Services)

DRAFT

MEMORANDUM

TO: Grover Nicholson
Superfund Section

FROM: Jeff Reid
Chief Geologist
North Carolina Geological Survey

SUBJECT: Tungsten Queen Mine, Vance County

DATE: September 18, 1992

Thank you for meeting with me Friday, August 21 in your office. Our meeting was prompted by Assistant Secretary Edythe McKinney's request to Mr. Charles H. Gardner on August 10, 1992 about contamination at the subject site.

The focus of concern is primarily lead in the tailings. As we discussed I was asked by Deputy Secretary Carl in August 1991 to address this issue with respect to tailings used by the U.S. Corps of Engineers to nourish beaches along Kerr Lake. My report showed that the lead content is contained in the mineral galena. Galena, a lead sulfide, is extremely stable at the earth's surface and only under very unusual conditions of pH or EH is it soluble.

The following is a summary of our discussion of August 21 and provides a potential action plan that may lead to significant savings of tax dollars by not having to conduct further action.

- The mine's tailing piles are a low-toxicity, high-volume problem.
- A preliminary inspection and desktop assessment was done by yourself in 1985 which ranked the site as a low priority for inspection.
- The site was inspected for phase II by Greenhorne and O'Mara, Inc. in 1991 with the report just published July 29, 1992.
- Under EPA's hazard ranking system, further work is required under the National Contingency Plan
- We agreed that the information which I provided Dr. Carl in my memorandum of August 8, 1991 be included in the report to be produced from the forthcoming work. If lead values are still "high" the relative insolubility of galena provides strong evidence that it is neither practical nor necessary to remove the tailings.
- Your new report by will acknowledge the mineralized zone whose strike extent of several miles has been prospected along its length. In short, a large area is mineralized. It is impractical to remove galena from the entire length of the mineralized zone.

JCR:cs
Attachment

| Post-it ™ brand fax transmittal memo 7671 | # of pages ▸ 1 |
|---|---|
| To Grover Nicholson | From Jeff Reid |
| Co. Superfund Section | Co. NC Geological Survey |
| Dept. Oberlin Rd | Phone # 733-2423 |
| Fax # 733-4811 | Fax # 733-2622 |

22 September 1992

To: File

From: Grover Nicholson GN

Re: Tungsten Queen Mine

Today I received a note from Terry Waddell (see attached) concerning a call from Mac Dunston, who lives near the tungsten mine. I called Mr. Dunston and he told me the following:

1. He owns one rental house and two rental mobile homes near the mine. All three residences share one well. The well is 300 to 400 feet deep and has a submersible pump. Lottie Coleman lives in the house, Bimbo Jefferson lives in the mobile home on SR1348, and Clifton Hill lives in the other mobile home.

2. He is concerned because of an article in the Henderson Dispatch that referred to widespread well contamination in the area.

3. He said the residents have not used the well for drinking water for 2 years, because the water tastes bad and, when filling a bathtub, forms a white scum.

I told Mr. Dunston that I had not seen the article in the paper, and that, during our investigation, we sampled only one drinking water well and it was not contaminated. I said that I would contact the paper and try to get a copy of the article.

I called the Henderson Dispatch, (919) 492-4001, and talked with Gerald Fuller, the City Editor. Mr. Fuller knew of the article and agreed to FAX a copy to me. After I received and read the article, I found that Mr. Dunston had been confused by the wording. We found ground water contamination in a temporary monitoring well. We did not find widespread drinking water well contamination.

# MEMO

Terry Waddell

DATE: 9/21/82

TO: Land Quality / Hazardous Waste SUBJECT: Complaint

Mac Beaston
494-5437

all well
hazy Waste
Tons of
Drums of

(Tungsten Mine) Vance Co.

Concerned about spoil
& hazardous waste
Carl said drums at site)

off SR 1348

Jim T.

Grover,
DEM recieved this call concerning Tungsten Mine site.
I call the man, he indicated that he has not seen the drum in several year, but he was concerned about his water. I told him that it was superfund site & I would give his name to you and may be you could call him and try to answer his questions.
Thank
Terry Waddell
571 4700

olina Department of Environment,
d Natural Resources

For Grover Nicholson, N.C. Superfund
from Gerald Fuller, Henderson Daily Dispatch

State, EPA Studying Tungsten Mine's Effects On Water The tungsten motherlode may have given birth to environmental contamination and health risks in the Townsville area.

Environmental analysts found elevated lead and cadmium levels in Island Creek and in groundwater near the abandoned Tungsten Queen Mine, located four miles from Townsville and 16 miles from Henderson.

The mine site is the largest known tungsten ore deposit in America.

"This site is not a screaming emergency, even though there is contamination on-site," Grover Nicholson of the N.C. Department of Environment, Health and Natural Resources Superfund Section said this morning.

But though the extent of the danger, if any, to humans or wildlife has not yet been confirmed, a preliminary study conducted for EHNR found "the site may pose a threat to the public health and/or the environment."

Nicholson said arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver in excess of state and federal maximum levels had been detected in nearby groundwater.

"The nearest drinking water well appears to be at the threshold of being contaminated with cadmium and possibly lead," Nicholson wrote in a July 29 letter to Kathy Amoroso, federal Environmental Protection Agency project officer in Atlanta.

The letter to EPA, accompanied by a report that Greenhorne and O'Mara Inc. prepared for state officials, asks the agency to determine whether contamination from the mine site endangers nearby drinking water wells, wetlands or Kerr Lake.

The Greenhorne and O'Mara study indicates that 1,997 people live within four miles of the site and that those people depend on groundwater for their drinking water.

Aside from mining residue, another potential source of contamination is leftover chemicals used in processing tungsten.

"Raw chemicals are stored in various buildings and are easily accessible," according to the Greenhorne and O'Mara report. The study found three leaking drums in the main chemical storage room labeled "sodium cyanide."

The researchers estimate the ponds at the site contain more than 2 million tons of mining residue with elevated levels of copper, zinc, lead, iron and titanium.

The water in Island Creek, [illegible]
of lead, the research[illegible]s reported.

The ore deposit w[illegible]scovered in 1942 by Josep[illegible] Richard Hamme. The brothers operated the mine until they sold it to Haile Mines Inc. in 1944.

The mine quickly became the nation's largest tungsten producer.

Ranchers Exploration and Development Corp. bought the property in 1968, renaming it Tungsten Queen Mine.

The company restored the existing equipment and built a new processing mill.

But technical problems in the processing facility, combined with a sagging tungsten market, led to the mine's closing in August 1971. It has not reopened.

Nicholson said Army Corps of Engineers officials had indicated that they had considered flooding additional acreage in the Kerr Lake area to eliminate the cost of operating a pumping station that keeps the mine site above water, but that the action would not be taken without determining whether the site would endanger the lake.

Despite the state's preliminary findings, some lifelong residents of the area are losing no sleep over the matter.

For instance, Wallace Edwards, a Vance County commissioner and longtime Williamsboro businessman, called the contamination concern "a whole bunch of malarky."

Edwards pointed out that "that same rock goes all the way across Vance County. If there's lead in that rock up there at Tungsten, then there's lead in my rock here, too, and my well is dug right down into the rock. And I don't feel like I'm getting nothing here."

Nicholson explained that sites considered for the Superfund program, a federal hazardous waste site clean-up effort, move through a "hierarchy of investigations" serving as a "sifter" to select the high-priority sites.

The next investigation will determine if the abandoned Tungsten Queen Mine is rated "high-priority," then environmental enforcement officials will seek the person or firm primarily responsible for the environmental damage if that person or firm can be found. If such a "Primary Responsible Party" is located, then the party or firm will be required to remedy the site.

If no PRP is located, then Superfund money will cover the cleanup costs, Nicholson said.

The state Superfund expects to hear more from EPA by the end of October.

**North Carolina Department of Environment, Health, and Natural Resources**

Tungsten Queen Mine

*William L. Meyer, Director*
*Solid Waste Management Division*

**To:** EDITHE **Date:** 4/14/92

**Please:**

____ *Draft a reply for my signature* ✓ *For your information*

____ *Take appropriate action* ____ *See me about attached*

____ *Approve* ____ *Handle and report to me*

____ *Note and return attached material to me*

**Remarks:**

- US Corp of Engineers
- removed LEAD contaminated sand from Kerr Reservoir in N.C. & Va to mine TAILING site in VANCE County
- We are reviewing the VANCE Co. mine site under Fed Superfund program for potential REMEDIATION (ongoing for ever - IT DOES NOT appear to be A NPL site)
- The Corps DOES not intend to remove ANY MORE TAILINGS - no health risk & not Fed. FACILITIES.
- The TAILINGS "OWNED" by operators of state sites have used the contaminated sand stabilized with concrete for motor home parking areas and one turn-around area
- It is finished - I hope

N.C. Department of Environment, Health, & Natural Resources
Solid Waste Management Division

# SAMPLE ANALYSIS REQUEST

State Laboratory of Public Health
P.O. Box 28047, 306 N. Wilmington Street
Raleigh, North Carolina 27611

Site Number NCD 082 362 989 Field Sample Number 15031

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 7/17/91 Time

Agency: ___ Hazardous Waste ___ Solid Waste ✓ Superfund

## Sample Type

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Ground water (1) | ___ Solid (5) | Trip Blank |
| ___ Surface water (2) | ___ Liquid (6) | |
| ___ Soil (3) | ___ Sludge (7) | |
| ✓ Other (4) | ___ Other (8) | |

## Organic Chemistry

| Parameter | Results(mg/l) |
|---|---|
| ✓ P&T:GC/MS | |
| Acid:B/N Ext. | |
| MTBE | |

## Radiochemistry

| Parameter | Results (PCi/l) |
|---|---|
| Gross Alpha | |
| Gross Beta | |

## Microbiology

| Parameter | Results (Col/100ml) |
|---|---|
| | |

## Inorganic Chemistry

| Parameter | Results(mg/l)(mg/kg) |
|---|---|
| Arsenic | |
| Barium | |
| Cadmium | |
| Chloride | |
| Chromium | |
| Copper | |
| Fluoride | |
| Iron | |
| Lead | |
| Manganese | |
| Mercury | |
| Nitrate | |
| Selenium | |
| Silver | |
| Sulfates | |
| Zinc | |
| pH | |
| Conductivity | |
| TDS | |
| TOC | |

## TCLP Compounds

| Inorganic Compounds | Results(mg/l) |
|---|---|
| Arsenic | |
| Barium | |
| Cadmium | |
| Chromium | |
| Lead | |
| Mercury | |
| Selenium | |
| Silver | |

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SEP 9 1991
SUPERFUND SECTION

| Organic Compounds | Results(mg/l) |
|---|---|
| benzene | |
| carbon tetrachloride | |
| chlordane | |
| chlorobenzene | |
| chloroform | |
| o-cresol | |
| m-cresol | |
| p-cresol | |
| cresol | |
| 1,4-dichlorobenzene | |
| 1,2-dichloroethane | |
| 1,1-dichloroethylene | |
| 2,4-dinitrotoluene | |
| heptachlor | |
| hexachlorobenzene | |
| hexachlorobutadiene | |
| hexachloroethane | |
| methyl ethyl ketone | |
| nitrobenzene | |
| pentachlorophenol | |
| pyridine | |
| tetrachloroethylene | |
| trichloroethylene | |
| 2,4,5-trichlorophenol | |
| 2,4,6-trichlorophenol | |
| vinyl chloride | |
| endrin | |
| lindane | |
| methoxychlor | |
| toxaphene | |
| 2,4-D | |
| 2,4,5-TP (Silvex) | |

Date Received 7-18-91 Reported by John L. Neal

Date Extracted ___ Date Reported 9-4-91

Date Analyzed VOC 8/22/91 JDM Lab Number 912677

DHS 3191 (Revised 2/91)

#912677-912680

**Purpose:** Enforcement and compliance with the N.C. Solid and Hazardous Waste Management Rules.

**Preparation:** A sample analyses request form must be completed for each type of evaluation requested (e.g., inorganic, organic, microbiology, radiochemistry). For sampling conditions which require more than one (1) container (i.e., ground or surface water) a sample label must be affixed to one of the containers. The collector must then write the **site** and **sample** number on the duplicate container.

**Do not** submit an analysis request form without any parameters indicated.

Equivalent measurements: **ppm** = $\mu$g/ml = mg/l = $\mu$g/g = mg/kg
**ppb** = $\mu$g/l = $\mu$g/1000g = $\mu$g/kg

## DEFINITIONS/INSTRUCTIONS

**Site Number** - A unique twelve-digit site/location identifier (i.e., the EPA identification number).

**Field Sample Number** - A unique six-digit sample identifier which is pre-printed on the sample label.

**Name of Site** - Name of facility, landfill, etc.

**Site Location** - City and county.

**Collected By** - Name and staff identification number of collector.

**Date and Time Collected** - Self-explanatory.

**Environmental** - A sample of a naturally occurring substance such as ground water, surface water, or soils which may be contaminated.

**Concentrate** - A sample of a waste, including but not limited to, sludges, resins, treatment effluents, or drummed wastes.

**Comments** - Lists details regarding sample or sample point (e.g., sample location, well number, phase separation, and/or odors.

**Inorganic Chemistry** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided.

**Organic Chemistry** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided.

**TCLP Compounds** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided. TCLP can only be performed on solid or semi-solid samples. For totals of the inorganic parameters, check (✓) the corresponding parameter under **Inorganic Chemistry**.

**Microbiology** and **Radiochemistry** - Contact the Raleigh office prior to sampling either of these.

**Distribution:**
1. Send or deliver the original to the State Laboratory of Public Health.
2. The Lab then sends a copy (with results) to the Solid Waste Management Division.
3. The Solid Waste Management Division sends a copy to the field person or collector.

**Disposition:** This form may be destroyed in accordance with the Environmental Health, Solid and Hazardous Waste Section of the Records Disposition Schedule as published by the North Carolina Division of Archives and History

Additional forms may be ordered from: Solid Waste Management Division
Hazardous Waste Section
P.O. Box 27687
Raleigh, NC 27611

N.C. Department of Environment, Health, & Natural Resources
Solid Waste Management Division

# SAMPLE ANALYSIS REQUEST

State Laboratory of Public Health
P.O. Box 28047, 306 N. Wilmington Street
Raleigh, North Carolina 27611

Site Number NCD 082 362 989 Field Sample Number 15032

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 7/18/91 Time 10:20

Agency: ____ Hazardous Waste ____ Solid Waste ✓ Superfund

## Sample Type

| Environmental | Concentrate | Comments |
|---|---|---|
| ____ Ground water (1) | ____ Solid (5) | SS-01 (Background) |
| ____ Surface water (2) | ____ Liquid (6) | New Mill |
| ✓ Soil (3) | ____ Sludge (7) | |
| NA Other (4) | ____ Other (8) | |

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## Organic Chemistry

| Parameter | Results(mg/l) |
|---|---|
| ✓ P&T:GC/MS | |
| ✓ Acid:B/N Ext. | |
| ____ MTBE | |

## Radiochemistry

| Parameter | Results (PCi/l) |
|---|---|
| ____ Gross Alpha | |
| ____ Gross Beta | |

## Microbiology

| Parameter | Results (Col/100ml) |
|---|---|
| | |

## Inorganic Chemistry

| Parameter | Results(mg/l)(mg/kg) |
|---|---|
| ____ Arsenic | |
| ____ Barium | |
| ____ Cadmium | |
| ____ Chloride | |
| ____ Chromium | |
| ____ Copper | |
| ____ Fluoride | |
| ____ Iron | |
| ____ Lead | |
| ____ Manganese | |
| ____ Mercury | |
| ____ Nitrate | |
| ____ Selenium | |
| ____ Silver | |
| ____ Sulfates | |
| ____ Zinc | |
| ____ pH | |
| ____ Conductivity | |
| ____ TDS | |
| ____ TOC | |

## TCLP Compounds

| Inorganic Compounds | Results(mg/l) |
|---|---|
| ____ Arsenic | |
| ____ Barium | |
| ____ Cadmium | |
| ____ Chromium | |
| ____ Lead | |
| ____ Mercury | |
| ____ Selenium | |
| ____ Silver | |

| Organic Compounds | Results(mg/l) |
|---|---|
| ____ benzene | |
| ____ carbon tetrachloride | |
| ____ chlordane | |
| ____ chlorobenzene | |
| ____ chloroform | |
| ____ o-cresol | |
| ____ m-cresol | |
| ____ p-cresol | |
| ____ cresol | |
| ____ 1,4-dichlorobenzene | |
| ____ 1,2-dichloroethane | |
| ____ 1,1-dichloroethylene | |
| ____ 2,4-dinitrotoluene | |
| ____ heptachlor | |
| ____ hexachlorobenzene | |
| ____ hexachlorobutadiene | |
| ____ hexachloroethane | |
| ____ methyl ethyl ketone | |
| ____ nitrobenzene | |
| ____ pentachlorophenol | |
| ____ pyridine | |
| ____ tetrachloroethylene | |
| ____ trichloroethylene | |
| ____ 2,4,5-trichlorophenol | |
| ____ 2,4,6-trichlorophenol | |
| ____ vinyl chloride | |
| ____ endrin | |
| ____ lindane | |
| ____ methoxychlor | |
| ____ toxaphene | |
| ____ 2,4-D | |
| ____ 2,4,5-TP (Silvex) | |

Date Received 7-18-91 Reported by

Date Extracted 8-12-91 AA/BN Date Reported

Date Analyzed BNA 8-28-91 PT 9-4-91 Lab Number 912678

DHS 3191 (Revised 2/91) BO

**Purpose:** Enforcement and compliance with the N.C. Solid and Hazardous Waste Management Rules.

**Preparation:** A sample analyses request form must be completed for each type of evaluation requested (e.g., inorganic, organic, microbiology, radiochemistry). For sampling conditions which require more than one (1) container (i.e., ground or surface water) a sample label must be affixed to one of the containers. The collector must then write the **site** and **sample** number on the duplicate container.

**Do not** submit an analysis request form without any parameters indicated.

Equivalent measurements: **ppm** = $\mu$g/ml = mg/l = $\mu$g/g = mg/kg
**ppb** = $\mu$g/l = $\mu$g/1000g = $\mu$g/kg

## DEFINITIONS/INSTRUCTIONS

**Site Number** - A unique twelve-digit site/location identifier (i.e., the EPA identification number).

**Field Sample Number** - A unique six-digit sample identifier which is pre-printed on the sample label.

**Name of Site** - Name of facility, landfill, etc.

**Site Location** - City and county.

**Collected By** - Name and staff identification number of collector.

**Date and Time Collected** - Self-explanatory.

**Environmental** - A sample of a naturally occurring substance such as ground water, surface water, or soils which may be contaminated.

**Concentrate** - A sample of a waste, including but not limited to, sludges, resins, treatment effluents, or drummed wastes.

**Comments** - Lists details regarding sample or sample point (e.g., sample location, well number, phase separation, and/or odors.

**Inorganic Chemistry** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided.

**Organic Chemistry** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided.

**TCLP Compounds** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided. TCLP can only be performed on solid or semi-solid samples. For totals of the inorganic parameters, check (✓) the corresponding parameter under **Inorganic Chemistry**.

**Microbiology** and **Radiochemistry** - Contact the Raleigh office prior to sampling either of these.

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2. The Lab then sends a copy (with results) to the Solid Waste Management Division.
3. The Solid Waste Management Division sends a copy to the field person or collector.

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Hazardous Waste Section
P.O. Box 27687
Raleigh, NC 27611

N.C. Department of Environment,
Health, & Natural Resources
Solid Waste Management Division

# SAMPLE ANALYSIS REQUEST

State Laboratory of Public Health
P.O. Box 28047, 306 N. Wilmington Street
Raleigh, North Carolina 27611

Site Number NCD 082 362 989 Field Sample Number 15033

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 7/18/91 Time 10:55

Agency: ____ Hazardous Waste ____ Solid Waste ✓ Superfund

## Sample Type

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Ground water (1) | ___ Solid (5) | SS-02 |
| ___ Surface water (2) | ___ Liquid (6) | (Northeast - upper |
| ✓ Soil (3) | ___ Sludge (7) | pond) |
| ___ Other (4) | ___ Other (8) | |

## Organic Chemistry

| Parameter | Results(mg/l) |
|---|---|
| ✓ P&T:GC/MS | |
| ✓ Acid:B/N Ext. | |
| ___ MTBE | |

## Radiochemistry

| Parameter | Results (PCi/l) |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

## Microbiology

| Parameter | Results (Col/100ml) |
|---|---|
| | |

## Inorganic Chemistry

| Parameter | Results(mg/l)(mg/kg) |
|---|---|
| ___ Arsenic | |
| ___ Barium | |
| ___ Cadmium | |
| ___ Chloride | |
| ___ Chromium | |
| ___ Copper | |
| ___ Fluoride | |
| ___ Iron | |
| ___ Lead | |
| ___ Manganese | |
| ___ Mercury | |
| ___ Nitrate | |
| ___ Selenium | |
| ___ Silver | |
| ___ Sulfates | |
| ___ Zinc | |
| ___ pH | |
| ___ Conductivity | |
| ___ TDS | |
| ___ TOC | |

## TCLP Compounds

| Inorganic Compounds | Results(mg/l) |
|---|---|
| ___ Arsenic | |
| ___ Barium | |
| ___ Cadmium | |
| ___ Chromium | |
| ___ Lead | |
| ___ Mercury | |
| ___ Selenium | |
| ___ Silver | |

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| Organic Compounds | Results(mg/l) |
|---|---|
| ___ benzene | |
| ___ carbon tetrachloride | |
| ___ chlordane | |
| ___ chlorobenzene | |
| ___ chloroform | |
| ___ o-cresol | |
| ___ m-cresol | |
| ___ p-cresol | |
| ___ cresol | |
| ___ 1,4-dichlorobenzene | |
| ___ 1,2-dichloroethane | |
| ___ 1,1-dichloroethylene | |
| ___ 2,4-dinitrotoluene | |
| ___ heptachlor | |
| ___ hexachlorobenzene | |
| ___ hexachlorobutadiene | |
| ___ hexachloroethane | |
| ___ methyl ethyl ketone | |
| ___ nitrobenzene | |
| ___ pentachlorophenol | |
| ___ pyridine | |
| ___ tetrachloroethylene | |
| ___ trichloroethylene | |
| ___ 2,4,5-trichlorophenol | |
| ___ 2,4,6-trichlorophenol | |
| ___ vinyl chloride | |
| ___ endrin | |
| ___ lindane | |
| ___ methoxychlor | |
| ___ toxaphene | |
| ___ 2,4-D | |
| ___ 2,4,5-TP (Silvex) | |

Date Received 7-18-91 WB Reported by

Date Extracted 8-13-91 AA, BN Date Reported

Date Analyzed BNA 8-28-91 PT 9-4-91 Lab Number 912679

DHS 3191 (Revised 2/91) BD nw

**Purpose:** Enforcement and compliance with the N.C. Solid and Hazardous Waste Management Rules.

**Preparation:** A sample analyses request form must be completed for each type of evaluation requested (e.g., inorganic, organic, microbiology, radiochemistry). For sampling conditions which require more than one (1) container (i.e., ground or surface water) a sample label must be affixed to one of the containers. The collector must then write the **site** and **sample** number on the duplicate container.

**Do not** submit an analysis request form without any parameters indicated.

Equivalent measurements: **ppm** = $\mu$g/ml = mg/l = $\mu$g/g = mg/kg
**ppb** = $\mu$g/l = $\mu$g/1000g = $\mu$g/kg

## DEFINITIONS/INSTRUCTIONS

**Site Number** - A unique twelve-digit site/location identifier (i.e., the EPA identification number).

**Field Sample Number** - A unique six-digit sample identifier which is pre-printed on the sample label.

**Name of Site** - Name of facility, landfill, etc.

**Site Location** - City and county.

**Collected By** - Name and staff identification number of collector.

**Date and Time Collected** - Self-explanatory.

**Environmental** - A sample of a naturally occurring substance such as ground water, surface water, or soils which may be contaminated.

**Concentrate** - A sample of a waste, including but not limited to, sludges, resins, treatment effluents, or drummed wastes.

**Comments** - Lists details regarding sample or sample point (e.g., sample location, well number, phase separation, and/or odors.

**Inorganic Chemistry** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided.

**Organic Chemistry** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided.

**TCLP Compounds** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided. TCLP can only be performed on solid or semi-solid samples. For totals of the inorganic parameters, check (✓) the corresponding parameter under **Inorganic Chemistry**.

**Microbiology** and **Radiochemistry** - Contact the Raleigh office prior to sampling either of these.

**Distribution:**
1. Send or deliver the original to the State Laboratory of Public Health.
2. The Lab then sends a copy (with results) to the Solid Waste Management Division.
3. The Solid Waste Management Division sends a copy to the field person or collector.

**Disposition:** This form may be destroyed in accordance with the Environmental Health, Solid and Hazardous Waste Section of the Records Disposition Schedule as published by the North Carolina Division of Archives and History

Additional forms may be ordered from: Solid Waste Management Division
Hazardous Waste Section
P.O. Box 27687
Raleigh, NC 27611

N.C. Department of Environment, Health, & Natural Resources
Solid Waste Management Division

# SAMPLE ANALYSIS REQUEST

State Laboratory of Public Health
P.O. Box 28047, 306 N. Wilmington Street
Raleigh, North Carolina 27611

Site Number NCD 082 362 989 Field Sample Number 15034

Name of Site Tungston Queen Mine Site Location Townsville, NC

Collected By Harvey Allen ID# 76 Date Collected 7/18/91 Time 11:10

Agency: ___ Hazardous Waste ___ Solid Waste ✓ Superfund

## Sample Type

| Environmental | Concentrate | Comments |
|---|---|---|
| ___ Ground water (1) | ___ Solid (5) | SS-03 |
| ___ Surface water (2) | ___ Liquid (6) | (Northwest - upper |
| ✓ Soil (3) | ___ Sludge (7) | pond) |
| ___ Other (4) | ___ Other (8) | |

## Organic Chemistry

| Parameter | Results(mg/l) |
|---|---|
| ✓ P&T:GC/MS | |
| ✓ Acid:B/N Ext. | |
| ___ MTBE | |

## Radiochemistry

| Parameter | Results (PCi/l) |
|---|---|
| ___ Gross Alpha | |
| ___ Gross Beta | |

## Microbiology

| Parameter | Results (Col/100ml) |
|---|---|
| | |

## Inorganic Chemistry

| Parameter | Results(mg/l)(mg/kg) |
|---|---|
| ___ Arsenic | |
| ___ Barium | |
| ___ Cadmium | |
| ___ Chloride | |
| ___ Chromium | |
| ___ Copper | |
| ___ Fluoride | |
| ___ Iron | |
| ___ Lead | |
| ___ Manganese | |
| ___ Mercury | |
| ___ Nitrate | |
| ___ Selenium | |
| ___ Silver | |
| ___ Sulfates | |
| ___ Zinc | |
| ___ pH | |
| ___ Conductivity | |
| ___ TDS | |
| ___ TOC | |

## TCLP Compounds

| Inorganic Compounds | Results(mg/l) |
|---|---|
| ___ Arsenic | |
| ___ Barium | |
| ___ Cadmium | |
| ___ Chromium | |
| ___ Lead | |
| ___ Mercury | |
| ___ Selenium | |
| ___ Silver | |

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| Organic Compounds | Results(mg/l) |
|---|---|
| ___ benzene | |
| ___ carbon tetrachloride | |
| ___ chlordane | |
| ___ chlorobenzene | |
| ___ chloroform | |
| ___ o-cresol | |
| ___ m-cresol | |
| ___ p-cresol | |
| ___ cresol | |
| ___ 1,4-dichlorobenzene | |
| ___ 1,2-dichloroethane | |
| ___ 1,1-dichloroethylene | |
| ___ 2,4-dinitrotoluene | |
| ___ heptachlor | |
| ___ hexachlorobenzene | |
| ___ hexachlorobutadiene | |
| ___ hexachloroethane | |
| ___ methyl ethyl ketone | |
| ___ nitrobenzene | |
| ___ pentachlorophenol | |
| ___ pyridine | |
| ___ tetrachloroethylene | |
| ___ trichloroethylene | |
| ___ 2,4,5-trichlorophenol | |
| ___ 2,4,6-trichlorophenol | |
| ___ vinyl chloride | |
| ___ endrin | |
| ___ lindane | |
| ___ methoxychlor | |
| ___ toxaphene | |
| ___ 2,4-D | |
| ___ 2,4,5-TP (Silvex) | |

Date Received 7-18-91 NB Reported by

Date Extracted 8-13-91 AA, BN Date Reported

Date Analyzed BNA ~~8-28-91~~ BD PT 9-4-91 NW Lab Number 912680

DHS 3191 (Revised 2/91)

**Purpose:** Enforcement and compliance with the N.C. Solid and Hazardous Waste Management Rules.

**Preparation:** A sample analyses request form must be completed for each type of evaluation requested (e.g., inorganic, organic, microbiology, radiochemistry). For sampling conditions which require more than one (1) container (i.e., ground or surface water) a sample label must be affixed to one of the containers. The collector must then write the **site** and **sample** number on the duplicate container.

**Do not** submit an analysis request form without any parameters indicated.

Equivalent measurements: **ppm** = $\mu$g/ml = mg/l = $\mu$g/g = mg/kg
**ppb** = $\mu$g/l = $\mu$g/1000g = $\mu$g/kg

## DEFINITIONS/INSTRUCTIONS

**Site Number** - A unique twelve-digit site/location identifier (i.e., the EPA identification number).

**Field Sample Number** - A unique six-digit sample identifier which is pre-printed on the sample label.

**Name of Site** - Name of facility, landfill, etc.

**Site Location** - City and county.

**Collected By** - Name and staff identification number of collector.

**Date and Time Collected** - Self-explanatory.

**Environmental** - A sample of a naturally occurring substance such as ground water, surface water, or soils which may be contaminated.

**Concentrate** - A sample of a waste, including but not limited to, sludges, resins, treatment effluents, or drummed wastes.

**Comments** - Lists details regarding sample or sample point (e.g., sample location, well number, phase separation, and/or odors.

**Inorganic Chemistry** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided.

**Organic Chemistry** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided.

**TCLP Compounds** - Check (✓) the desired parameters to be analyzed. If not listed, enter the element/compound in the space provided. TCLP can only be performed on solid or semi-solid samples. For totals of the inorganic parameters, check (✓) the corresponding parameter under **Inorganic Chemistry**.

**Microbiology** and **Radiochemistry** - Contact the Raleigh office prior to sampling either of these.

**Distribution:**
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2. The Lab then sends a copy (with results) to the Solid Waste Management Division.
3. The Solid Waste Management Division sends a copy to the field person or collector.

**Disposition:** This form may be destroyed in accordance with the Environmental Health, Solid and Hazardous Waste Section of the Records Disposition Schedule as published by the North Carolina Division of Archives and History

Additional forms may be ordered from: Solid Waste Management Division
Hazardous Waste Section
P.O. Box 27687
Raleigh, NC 27611

SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH

Chain of Custody Record CERCLA

Hazardous Waste Materials

Location of Sampling: ✓ Generator ___ Transporter ___ Treatment Facil
___ Storage Facility ___ Disposal Facility ___ Landfill
___ Other: ___

Company's Name Tungston Queen Mine Telephone( )

Address Townsville, NC

Collector's Name Harvey Allen (signature) Telephone( 919 ) 733 - 2801

Date Sampled 7/18/91 Time Sampled

Type of Process Generating Waste

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SUPERFUND SECTION

Field Information

Field Sample No. 15031 15032 15033 15034

Chain of Possession:

1. Harvey Allen (signature) Env. Engineer (title) 7/17/91 - 7/18/91 (inclusive dates)

2. WC Glenn Jr (signature) Chemistry Tech. (title) 7-18-91 (inclusive dates)

3. ___ (signature) ___ (title) ___ (inclusive dates)

Results reported

John L. Neal (signature) Chemist (title) 9-4-91 (date)

Instructions: Complete all applicable information including signatures, and submit with analysis request forms.

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

| BASE/NEUTRAL AND ACID EXTRACTABLES | LAB NO | 912678 | 912679 | 912680 | | | |
|---|---|---|---|---|---|---|---|
| | FIELD # | 15032 | 15033 | 15034 | | | |
| COMPOUND | TYPE | (3) | (3) | (3) | ( ) | ( ) | ( ) |
| | UNITS | ~~µg/l~~ µg/kg | ~~µg/l~~ µg/kg | ~~µg/l~~ µg/kg | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg |
| N-nitrosodimethylamine | 10/330 | U | U | U | | | |
| bis(2-chloroethyl)ether | ↓ | ↓ | ↓ | ↓ | | | |
| 2-chlorophenol | | | | | | | |
| phenol | | | | | | | |
| 1,3-dichlorobenzene | | | | | | | |
| 1,4-dichlorobenzene | | | | | | | |
| 1,2-dichlorobenzene | | | | | | | |
| bis(2-chloroisopropyl)ether | | | | | | | |
| hexachloroethane | | | | | | | |
| N-nitroso-di-n-propylamine | | | | | | | |
| nitrobenzene | | | | | | | |
| isophorone | | | | | | | |
| 2-nitrophenol | | | | | | | |
| 2,4-dimethylphenol | | | | | | | |
| bis(2-chloroethoxy)methane | | | | | | | |
| 2,4-dichlorophenol | | | | | | | |
| 1,2,4-trichlorobenzene | | | | | | | |
| naphthalene | | | | | | | |
| hexachlorobutadiene | | | | | | | |
| 4-chloro-m-cresol | | | | | | | |
| hexachlorocyclopentadiene | | | | | | | |
| 2,4,6-trichlorophenol | | | | | | | |
| 2-chloronaphthalene | | | | | | | |
| acenaphthylene | | | | | | | |
| dimethyl phthalate | | | | | | | |
| 2,6-dinitrotoluene | | | | | | | |
| acenaphthene | ↓ | | | | | | |
| 2,4-dinitrophenol | 50/1650 | | | | | | |
| 2,4-dinitrotoluene | 10/330 | | | | | | |
| 4-nitrophenol | 50/1650 | | | | | | |
| fluorene | 10/330 | | | | | | |
| 4-chlorophenylphenylether | ↓ | | | | | | |
| diethyl phthalate | ↓ | | | | | | |
| 4,6-dinitro-o-cresol | 50/1650 | | | | | | |
| diphenylamine | ↓ | | | | | | |
| azobenzene | ↓ | | | | | | |
| 4-bromophenylphenylether | 10/330 | | | | | | |
| hexachlorobenzene | 10/330 | | | | | | |
| pentachlorophenol | 50/1650 | | | | | | |
| phenanthrene | 10/330 | | | | | | |
| anthracene | ↓ | | | | | | |
| dibutyl phthalate | ↓ | | | | | | |
| fluoranthene | ↓ | ↓ | ↓ | ↓ | | | |

MDL
$H_2O$/501L

RECEIVED
SEP 9 1991
SUPERFUND SECTION

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit. MDL
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

N.C. Division of Health Services
DHS 3068-0 (4/86 Laboratory)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

| BASE/NEUTRAL AND ACID EXTRACTABLES | LAB NO | 912678 | 912679 | 912680 | | | |
|---|---|---|---|---|---|---|---|
| | FIELD # | 15032 | 15033 | 15034 | | | |
| COMPOUND | TYPE | (3) | (3) | (3) | ( ) | ( ) | ( ) |
| | UNITS | ~~µg/l~~ µg/kg | ~~µg/l~~ µg/kg | ~~µg/l~~ µg/kg | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg |
| pyrene | 10/330 | U | U | U | | | |
| benzidine | 50/1650 | | | | | | |
| butyl benzyl phthalate | 10/330 | | | | | | |
| benz(a)anthracene | | | | | | | |
| chrysene | | | | | | | |
| 3,3-dichlorobenzidine | 50/1650 | | | | | | |
| bis(2-ethylhexyl)phthalate | 10/330 | | | | | | |
| di-n-octyl phthalate | 10/330 | | | | | | |
| benzo(b)fluoranthene | 50/1650 | | | | | | |
| benzo(k)fluoranthene | | | | | | | |
| benzo(a)pyrene | | | | | | | |
| indeno(1,2,3-cd)pyrene | | | | | | | |
| dibenzo(a,h)anthracene | | | | | | | |
| benzo(g,h,i)perylene | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| aniline | 50/1650 | U | U | U | | | |
| benzoic acid | | | | | | | |
| benzyl alcohol | | | | | | | |
| 4-chloroaniline | | | | | | | |
| dibenzofuran | 10/330 | | | | | | |
| 2-methylnaphthalene | | | | | | | |
| 2-methylphenol | | | | | | | |
| 4-methylphenol | | | | | | | |
| 2-nitroaniline | 50/1650 | | | | | | |
| 3-nitroaniline | | | | | | | |
| 4-nitroaniline | | | | | | | |
| 2,4,5-trichlorophenol | | | | | | | |

RECEIVED
SEP 9 1991
SUPERFUND SECTION

MDL
$H_2O$/ 50/L

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit. MDL
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.

N.C. Division of Health Services
DHS 3068-0 (4/86 Laboratory)

N. C. DEPARTMENT OF ENVIRONMENT, HEALTH, & NATURAL RESOURCES
DIVISION OF LABORATORY SERVICES, ENVIRONMENTAL SCIENCES SECTION
P.O. BOX 28047 - 306 N. WILMINGTON ST, RALEIGH, N.C. 27611

Laboratory No. 912677 PURGEABLE COMPOUNDS Date of Analysis 8/22/91

| COMPOUND | µg/l |
|---|---|
| Dichlorodifluoromethane | U |
| Chloromethane | |
| ✓Vinyl Chloride | |
| Bromomethane | |
| Chloroethane | |
| Trichlorofluoromethane | |
| ✓1,1-Dichloroethylene | |
| Methylene Chloride | |
| tert-Butyl Methyl Ether | |
| trans-1,2-Dichloroethylene | |
| Isopropyl ether | |
| 1,1-Dichloroethane | |
| 2,2-Dichloropropane | |
| cis-1,2-Dichloroethylene | |
| Chloroform | |
| (BCM) Bromochloromethane | |
| ✓1,1,1-Trichloroethane | |
| 1,1-Dichloropropene | |
| ✓Carbon Tetrachloride | |
| ✓Benzene | |
| ✓1,2-Dichloroethane | |
| ✓Trichloroethylene | |
| 1,2-Dichloropropane | |
| Bromodichloromethane | |
| Dibromomethane | |
| Toluene | |
| 1,1,2-Trichloroethane | |
| Tetrachloroethylene | |
| 1,3-Dichloropropane | |
| Dibromochloromethane | |
| 1,2-Dibromoethane (EDB) | |
| 1-Chlorohexane | ✓ |

| COMPOUND | µg/l |
|---|---|
| Chlorobenzene | U |
| Ethylbenzene | |
| 1,1,1,2-Tetrachloroethane | |
| p-Xylene | |
| m-Xylene | |
| o-Xylene | |
| Styrene | |
| Bromoform | |
| Isopropylbenzene | |
| 1,1,2,2-Tetrachloroethane | |
| Bromobenzene | |
| n-Propylbenzene | |
| 1,2,3-Trichloropropane | |
| 2-Chlorotoluene | |
| 1,3,5-Trimethylbenzene | |
| 4-Chlorotoluene | |
| tert-Butyl Benzene | |
| Pentachloroethane | |
| 1,2,4-Trimethylbenzene | |
| sec-Butyl Benzene | |
| p-Isopropyltoluene | |
| 1,3-Dichlorobenzene | |
| ✓1,4-Dichlorobenzene | |
| n-Butylbenzene | |
| 1,2-Dichlorobenzene | |
| Bis (2-Chloroisopropyl) Ether | |
| 1,2-Dibromo-3-Chloropropane | |
| 1,2,4-Trichlorobenzene | |
| Hexachlorobutadiene | |
| Naphthalene | |
| 1,2,3-Trichlorobenzene | ✓ |

RECEIVED
SEP 6 1991
SUPERFUND SECTION

COMMENTS:

MDL - Minimum Detection Limit for water (EPA Method 502.2), is 1.0 µg/l.

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected.
NA - Not analyzed.
1/ - Tentative identification.
✓ - Regulated VOC
T - Trihalomethane

N.C. Dept. of Environment, Health, & Natural Resources
DEHNR 3068-O (Rev. 1/91 Laboratory Services)

STATE LABORATORY OF PUBLIC HEALTH
DIVISION OF HEALTH SERVICES, N.C. DEPARTMENT OF HUMAN RESOURCES
P.O. BOX 28047 - 306 N. WILMINGTON, ST., RALEIGH, N.C. 27611

ORGANIC CHEMICAL ANALYSIS

| PURGEABLE COMPOUNDS | LAB NO | 912678 | 912679 | 912680 | | | |
|---|---|---|---|---|---|---|---|
| | FIELD # | 15032 | 15033 | 15034 | | | |
| COMPOUND | TYPE | (3) | (3) | (3) | ( ) | ( ) | ( ) |
| | UNITS | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg | µg/l µg/kg |
| chloromethane | 10 ppb | u | u | u | | | |
| bromomethane | ↓ | ↓ | ↓ | ↓ | | | |
| dichlorodifluoromethane | 5 ppb | | | | | | |
| vinyl chloride | ↓ | | | | | | |
| chloroethane | ↓ | | | | | | |
| methylene chloride | ↓ | | | | | | |
| trichlorofluoromethane | ↓ | | | | | | |
| ethene, 1,1-dichloro | ↓ | | | | | | |
| ethane, 1,1-dichloro- | ↓ | | | | | | |
| 1,2-trans-dichloroethene | ↓ | | | | | | |
| chloroform | ↓ | | | | | | |
| ethane, 1,2-dichloro- | ↓ | | | | | | |
| ethane, 1,1,1-trichloro- | ↓ | | | | | | |
| carbontetrachloride | ↓ | | | | | | |
| bromodichloromethane | ↓ | | | | | | |
| propane, 1,2-dichloro- | ↓ | | | | | | |
| 1,3-trans-dichloropropene | ↓ | | | | | | |
| trichloroethylene | ↓ | | | | | | |
| chlorodibromomethane | ↓ | | | | | | |
| benzene | ↓ | | | | | | |
| ethane, 1,1,2-trichloro- | ↓ | | | | | | |
| 1,3-cis-dichloropropene | 10 ppb | | | | | | |
| 2-chloroethyl vinyl ether | ↓ | | | | | | |
| bromoform | 5 ppb | | | | | | |
| ethane, 1,1,2,2-tetrachloro- | ↓ | | | | | | |
| ethene, tetrachloro- | ↓ | | | | | | |
| toluene | ↓ | | | | | | |
| chlorobenzene | ↓ | | | | | | |
| ethylbenzene | ↓ | ↓ | ↓ | ↓ | | | |
| | | | | | | | |
| acetone | 10 ppb | u | u | u | | | |
| 2-butanone | 10 | ↓ | ↓ | ↓ | | | |
| carbondisulfide | 5 | ↓ | ↓ | ↓ | | | |
| 2-hexanone | 10 | ↓ | ↓ | ↓ | | | |
| 4-methyl-2-pentanone | 10 | ↓ | ↓ | ↓ | | | |
| styrene | 5 | ↓ | ↓ | ↓ | | | |
| vinyl acetate | 10 | ↓ | ↓ | ↓ | | | |
| xylenes (total) | 5 ↓ | ↓ | ↓ | ↓ | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | ↑MDL↑ | | | | | | |
| | | | | | | | |

RECEIVED
SEP 1981
SUPERFUND SECTION

J - Estimated value.
K - Actual value is known to be less than value given.
L - Actual value is known to be greater than value given.
U - Material was analyzed for but not detected. The number is the Minimum Detection Limit.
NA - Not analyzed.
1/ - Tentative identification.
2/ - On NRDC List of Priority Pollutants.
C - SUSPECT LAB CONTAMINATION.

N.C. Division of Health Services

DHS 3068-O (4/86 Laboratory)

# STATE OF NORTH CAROLINA

*Department of Environment, Health, and Natural Resources*
*Division of Solid Waste Management*
*Superfund Section*

## Tungsten Queen Mine
## NCD 082362989

## Phase II
## Screening Site Inspection
## Volume IIa
## Appendix C
## Case Narrative & Volatile Analytical Data

July 1991

By:

Greenhorne & O'Mara, Inc.

# STATE OF NORTH CAROLINA

*Department of Environment, Health, and Natural Resources*
*Division of Solid Waste Management*
*Superfund Section*

## Tungsten Queen Mine
## NCD 082362989

## Phase II
## Screening Site Inspection
## Volume IIb
## Appendix C
## Semi-Volatile Analytical Data

July 1991

*By:*

Greenhorne & O'Mara, Inc.

# STATE OF NORTH CAROLINA

*Department of Environment, Health, and Natural Resources*
*Division of Solid Waste Management*
*Superfund Section*

## Tungsten Queen Mine
## NCD 082362989

## Phase II
## Screening Site Inspection
## Volume IIc
## Appendix C
## Metals Raw Data

July 1991

By:

Greenhorne & O'Mara, Inc.

# STATE OF NORTH CAROLINA

*Department of Environment, Health, and Natural Resources*
*Division of Solid Waste Management*
*Superfund Section*

## Tungsten Queen Mine
## NCD 082362989

## Phase II
## Screening Site Inspection
## Volume IId
## Appendix C
## Metals Data

July 1991

*By:*

Greenhorne & O'Mara, Inc.

## SITE HEALTH AND SAFETY PLAN

### A. General Information

Site Name Tungston Queen Mine ID # NCD 082 362 989

Location SR 1348 near Tungsten, Vance County, NC 27584 Date May 14, 1991

Proposed Date of Investigation May 21, 1991

Date of Briefing May 20, 1991

Date of Debriefing May 22, 1991

Nature of Visit (check one):

| | |
|---|---|
| On-Site Reconnaissance (PA) | |
| On-Site Reconnaissance (SI) | |
| Site Investigation | X |

Health Department Official Contacted Ms. Evans for Mitchell Arnold

Date of Contact May 1, 1991

Site Investigation Team: All site personnel have read the Site Health and Safety Plan and are familiar with its provisions.

| | Personnel | Responsibilities | Signature |
|---|---|---|---|
| Team 1 | Harvey Allen | team leader, sampling | Harvey Allen |

Plan Preparation:

Prepared By: David Lilley, Industrial Hygienist David B. Lilley

Reviewed By: Jack Butler, Environmental Engineer Jack Butler

## B. SITE/WASTE CHARACTERISTICS

Waste Type(s) X Liquid X Solid ____ Sludge ____ Gas

Characteristics ____ Corrosive X Ignitable ____ Radioactive

X Volatile X Toxic ____ Reactive ____ Other

List Known or Suspected Hazards (physical, chemical biological or radioactive) on Site and their toxicological effects. Also, if known, list chemical amounts

| HAZARD | WARNING PROPERTIES | EXPOSURE LIMIT |
|---|---|---|
| Gasoline | Odor Threshold (OT) = 0.005-10 ppm | 300 ppm |
| Diesel Fuel | OT = 0.01 - 0.25 ppm | none |
| Lead | OT = no data | 0.05 $mg/m^3$ |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

ID # NCD 082 362 989

Facility Description: Size unknown Buildings unknown

Disposal Methods Being Investigated Possible leaking underground storage tanks.

Unusual Features on Site (dike integrity, power lines, terrain, etc.):
The site is an abandoned mine.

History of the Site: The site is a mine that was closed in 1972 and not reopened. A 600-gallon gasoline tank and a 12,000 diesel fuel tank were were removed from the site. There was no evidence of leakage from these underground storage tanks.

## C. HAZARD EVALUATION

The site can be toured and sampled in level D protection. PE or PVC gloves will be worn while collecting water samples. Steel toed hiking boots may be worn while conducting tour or sampling on gravel, asphalt, or vegetated soil, steel toed work boots will be worn while conducting tour or sampling barren soil. Stay clear of contractors while they augur.

## D. WORK PLAN INSTRUCTION

Map or Sketch Attached? yes

Perimeter Identified? no

Command Post Identified? no

Zones of Contamination Identified? no

Personal Protective Equipment/Level of Protection: ____C ___X___D

Modifications Wear goggles, face shield, and PVC gloves while preparing acid preserved samples, goggles and PVC gloves while collecting acid preserved samples. Avoid breathing acid vapors. Rinse pipetts with deionized water before disposing of in trash bag.

ID # NCD 082 362 989

Surveillance Equipment:

| | | | |
|---|---|---|---|
| _____ | HNU | _____ | Detector Tubes and Pumps |
| _____ | OVA | _____ | 02 Meter |
| _____ | Explosimeter | _____ | Radiation Monitor |

Decontamination Procedures

_____ Level C Respirator wash, respirator removal, suit wash (if needed), suit removal, boot wash, boot removal and glove removal.

__X__ Level D Boot wash and rinse and boot removal, suit removal, glove and goggle removal.

Modifications Dispose of trash properly, on-site if possible.

Work Schedule/Visit Objectives The purpose of this visit is to determine if the site poses a threat to the public health or environment because of releases of contaminants to soil, surface water, groundwater, or air. Sampling to be done by Superfund personnel may consist of groundwater, surface water, and sediment sampling.

EMERGENCY PRECAUTIONS

| Route of Exposure | First Aid |
|---|---|
| Eyes | irrigate immediately |
| Skin | soap and water wash |
| Inhalation | fresh air and artificial respiration |
| Ingestion | get medical attention immediately |

ID # NCD 082 362 989

Location of Nearest Phone: unknown, the site is not operational

Hospital (Address and Phone Number)

Maria Parham Hospital, Ruin Creek Road at I-85, PO Drawer 59, Henderson, NC (919) 438-4143 - can handle chemically contaminated patients

Emergency Transportation Systems (Phone Numbers)

Fire 911

Ambulance 911

Rescue Squad 911

Emergency Route to Hospital Take a left onto SR 1348 and travel to SR 1342 and turn left. Stay on SR 1342 to Route 39 and take a right. Stay on 39 to Route 85 and travel south. Follow the signs to the hospital, which is about 12 miles from the site.

PREVAILING WEATHER CONDITIONS AND FORECAST Partly cloudy with a chance of rain, highs in the 80s.

**EQUIPMENT CHECKLIST**

| | | | |
|---|---|---|---|
| | Air purifying respirator | X | First Aid Kit |
| | Cartridges for respirator | X | 3 gal. Deionized H20 |
| X | Eye Wash Unit | X | Rainsuit |
| | HNU | X | Gloves (PE/PVC/nitrile/cloth) |
| | OVA | X | Boots/Boot Covers |
| | Explosimeter | X | Coveralls (tyvek/saranex) |
| | Radiation Monitor | X | Eye Protection |
| X | Decontamination Materials | X | Hard Hat |

Poison Control Center - State Coordinator
Duke University Medical Center
Telephone: 1-800-672-1697
Box 3024
Durham, NC 27710

| | | | |
|---|---|---|---|
| ASHEVILLE<br>704-255-4490 | Western NC Poison Control Center<br>Memorial Mission Hosp.<br>509 Biltmore Ave. 28801 | HENDERSONVILLE<br>704-693-6522<br>Ext. 555,556 | Margaret R. Pardee Memorial Hospital<br>Fleming St., 28739 |
| CHARLOTTE<br>704-379-5827 | Mercy Hospital<br>2001 Vail Ave, 28207 | HICKORY<br>704-322-6649 | Catawba Mem. Hosp.<br>Fairgrove Chur. Rd 28601 |
| DURHAM<br>1-800-672-1697 | Duke Univ. Med. Center<br>Box 3007, 27710 | JACKSONVILLE<br>919-577-2555 | Onslow Mem. Hospital<br>Western Blvd. 28540 |
| GREENSBORO<br>919-379-4105 | Moses Cone Hospital<br>1200 N. Elm St. 27420 | WILMINGTON<br>919-343-7046 | New Hanover Mem. Hospital<br>2131 S. 17th St. 28401 |

safeform.127

HAZARDOUS SUBSTANCE INFORMATION FORM

Chemical Name: Gasoline

I. PHYSICAL/CHEMICAL PROPERTIES

| | Refere |
|---|---|
| Chemical Formula mixture of $C_4$ to $C_{12}$ hydrocarbons | 1 |
| Natural Physical State at 25°C liquid | 1 |
| Vapor Pressure "evaporates quickley" mm Hg at 20°C | 1 |
| Melting Point _____ °F/°C Boiling Point 60 - 204 °F/°C | 1 |
| Flash Point (open or closed cup) -45 °C/°F | 1 |
| Solubility - $H_2O$ insoluble | 1 |
| Other absolute alcohol, ether, chloroform, benzene | 1 |

Physical Features: (odor, color, etc.) Mobile liquid with a characteristic odor (1)

II. TOXICOLOGICAL DATA

Standards: 300ppm (2) TLV 300ppm (3) PEL _____ IDLH

Routes of Exposure: Inhalation, Ingestion, Skin and/or Eye contact

Acute/Chronic Symptoms: Inhalation causes intense burning in throat and l possibly bronchopneumonia. Ingestion causes inebriation, vomiting, sleepiness, fever, confusion, and bluish coloration of the skin.

First Aid: Inhalation: artificial respiration; Ingestion: get medical attention immediately; Eye contact: irrigate immediately; Skin contact: soap and water wash immediately

Chemical Name: Gasoline

III. HAZARDOUS CHARACTERISTIC — Refer

A. Combustibility Yes X No ____ — 1

Toxic by-products _____

B. Flammability LEL 1.3% UEL 6.0% — 1

C. Reactivity Hazard Dissolves fats, oils, natural resins — 1

D. Corrosivity Hazard yes/no pH: _____

Neutralizing agent: _____

E. Radioactive Hazard — Exposure Rate

| | | |
|---|---|---|
| Background | yes/no | _____ |
| Alpha particles | yes/no | _____ |
| Beta particles | yes/no | _____ |
| Gamma radiation | yes/no | _____ |

IV. REFERENCES


1. The Merck Index, 11th Edition, 1989.
2. Threshold Limit Values and Biological Exposure Indices for 1990-1991, ACGIH.
3. CFR 1910.1000.

HAZARDOUS SUBSTANCE INFORMATION FORM

Chemical Name: Fuel Oil

I. PHYSICAL/CHEMICAL PROPERTIES

| | Reference |
|---|---|
| Chemical Formula _____ | _____ |
| Natural Physical State at 25°C _____ | _____ |
| Vapor Pressure _____ mm Hg at 20°C | _____ |
| Melting Point _____ °F/°C Boiling Point _____ °F/°C | _____ |
| Flash Point (open or closed cup) >100 °C/°F | 1 |
| Solubility - $H_2O$ _____ | _____ |
| Other _____ | _____ |

Physical Features: (odor, color, etc.) Can be a distilled fraction of petroleum, a residuum from refinery operations or a blend. No. 2 is a straight run or cracked distallate. (1)

II. TOXICOLOGICAL DATA

Standards: none given TLV none given PEL none given IDLH _____

Routes of Exposure: Inhalation, skin

Acute/Chronic Symptoms: _____

First Aid: Inhalation: artificial respiration; Ingestion: get medical attention immediately; Eye contact: irrigate immediately; Skin contact: soap and water wash immediately

Chemical Name: Fuel oil

III. HAZARDOUS CHARACTERISTICS — Reference

A. Combustibility Yes X No ____ — 1

Toxic by-products None given

B. Flammability LEL _____ UEL _____

C. Reactivity Hazard _____

D. Corrosivity Hazard yes/no pH: _____

Neutralizing agent: _____

E. Radioactive Hazard — Exposure Rate

| | | |
|---|---|---|
| Background | yes/no | _____ |
| Alpha particles | yes/no | _____ |
| Beta particles | yes/no | _____ |
| Gamma radiation | yes/no | _____ |

IV. REFERENCES

1. The Condensed Chemical Dictionary, 1989

HAZARDOUS SUBSTANCE INFORMATION FORM

Chemical Name: Lead, inorganic dusts

I. PHYSICAL/CHEMICAL PROPERTIES

| | Reference |
|---|---|
| Chemical Formula Pb | 1 |
| Natural Physical State at 25°C solid | 1 |
| Vapor Pressure N/A mm Hg at 20°C | 1 |
| Melting Point 327.4 °F/°C Boiling Point 1,740 °F/°C | 1 |
| Flash Point (open or closed cup) N/A °C/°F | |
| Solubility - $H_2O$ N/A | |
| Other N/A | |

Physical Features: (odor, color, etc.) appearance and odor vary depending upon specific compound.

II. TOXICOLOGICAL DATA

suspected or confermed human carcinogen

Standards: .15 mg/m$^3$ (2) TLV 0.05 mg/m$^3$ (3) PEL N/A (4) IDLH

Routes of Exposure: inhalation, ingestion, eye contact, skin contact(3)

Acute/Chronic Symptoms: Acute: lassitude, pallor, constipation, abdominal pain, gingival gum line, tremors. Target organs: GI tract, CNS, kidneys, blood.(3)

First Aid: Inhalation: artificial respiration; Ingestion: get medical attention immediately; Eye contact: irrigate immediately; Skin contact: soap and water wash immediately

Chemical Name: Lead, inorganic dusts

III. HAZARDOUS CHARACTERISTICS — Reference

A. Combustibility Yes ___ No X ___ _____

Toxic by-products _____ _____

_____ _____

B. Flammability LEL N/A UEL _____ _____

C. Reactivity Hazard None _____ _____

D. Corrosivity Hazard yes/no pH: _____ _____

Neutralizing agent: _____ _____

E. Radioactive Hazard — Exposure Rate

| | | | |
|---|---|---|---|
| Background | yes/no | _____ | _____ |
| Alpha particles | yes/no | _____ | _____ |
| Beta particles | yes/no | _____ | _____ |
| Gamma radiation | yes/no | _____ | _____ |

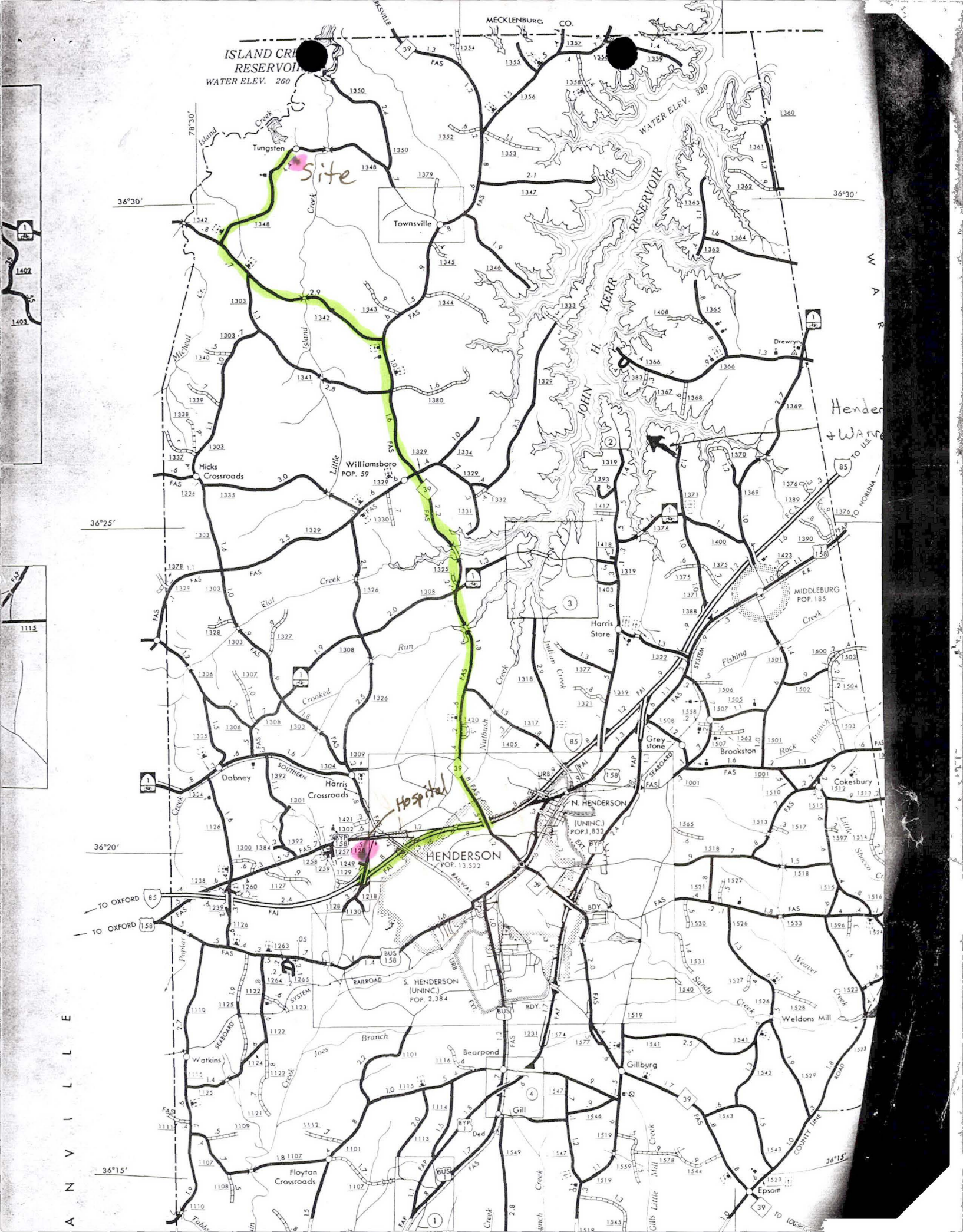
IV. REFERENCES


(1) The Merck Index, 11th Edition, 1989

(2) Threshold Limit Values and Biological Exposure Indices for 1990-1991, ACGIH.

(3) 29 CFR 1910.1025

(4) Pocket Guide to Chemical Hazards, NIOSH, 1987.


MECKLENBURG CO.
ISLAND CREEK RESERVOIR
WATER ELEV. 260
WATER ELEV. 320
JOHN H. KERR RESERVOIR
Tungsten
Site
Townsville
Williamsboro
POP. 59
Hicks Crossroads
Harris Store
MIDDLEBURG
POP. 185
Dabney
Harris Crossroads
Hospital
N. HENDERSON
(UNINC.)
POP. 1,832
HENDERSON
POP. 13,522
Grey stone
Brookston
Cokesbury
TO OXFORD
TO OXFORD
S. HENDERSON
(UNINC.)
POP. 2,384
Weldons Mill
Watkins
Bearpond
Gillburg
Gill
Floytan Crossroads
Epsom
TO NORLINA
36°30'
36°25'
36°20'
36°15'
78°30'

MEMORANDUM

TO: Dr. Ernest A. Carl, Deputy Secretary
Environment, Health, and Natural Resources

FROM: Jeffrey C. Reid, Chief Geologist jcr/mka
Division of Land Resources
Geological Survey Section

SUBJECT: Galena in tungsten tailings - Tungsten Queen Mine, Hamme Tungsten District, North Carolina

DATE: August 8, 1991

Published mineralogy studies of the subject ore deposit and mine show the principal minerals in the veins are huebnerite ($Mn(Fe)WO_4$), pyrite ($FeS$), galena ($PbS$), tetrahedrite ($(Cu,Fe,Zn,Ag)_{12},Sb_4S_{12}$), sphalerite ($ZnS_2$), chalcopyrite ($CuFeS_2$), and scheelite ($CaWO_4$). Quartz($SiO_2$), the dominant accessory mineral, is accompanied by fluorite ($CaF_2$), sericite (common white mica mineral), and rhodochrosite ($MnCO_3$). All these minerals occur naturally. Galena ($PbS$) is the main mineral containing lead.

Extensive published technical peer-reviewed detailed field studies and thermodynamic mineral equilibrium studies show that galena ($PbS$) has 1) a low solubility product, 2) and is chemically stable in Eh and pH conditions of normal surface waters and groundwater. Galena is thermodynamically stable in the entire sulfide mineral zone. Only under acidic-oxidizing environments does galena become modified to anglesite ($PbSO_4$). Only under alkaline-oxidizing environments does galena become modified to cerrusite ($PbCO_3$). Both anglesite and cerrusite have low solubility products.

This information shows that galena, the principle lead-bearing mineral in the mine, is thermodynamically stable under most conditions at the earth's surface. Because it is thermodynamically stable, direct ingestion of copious (and unrealistic) quantities of beach nourishment material would be required for an individual human in order to be of concern.

Published geochemical soil surveys along the surface expression of the tungsten mineralization show low lead levels which are unremarkable in exploration geochemistry. The range of data (in ppm) appears to be from 10 to 80 ppm; visual reconnaissance examination shows most of the subject data appear to lie in the 15-25 ppm range. Regulatory agencies need to recognize that natural geochemical processes disburse metallic species to the environment.

Geochemical surveys, supplemented by petrography, mineral chemistry, and geostatistics may be used to confirm the mineral species, its concentration, paragenesis, and its contribution of metals to the environment, if any.

These studies provide accurate information to analyze sites such as these and provide direct evidence of potential leaching of the mineral of concern, if any. Analytical techniques, including uptake of the mineral in solution and digestion techniques, use of analytical standards, and accuracy and precision of data and appropriate geochemical standards should be evaluated carefully.

JCR/mkd

cc: Charles H. Gardner
P. Albert Carpenter III

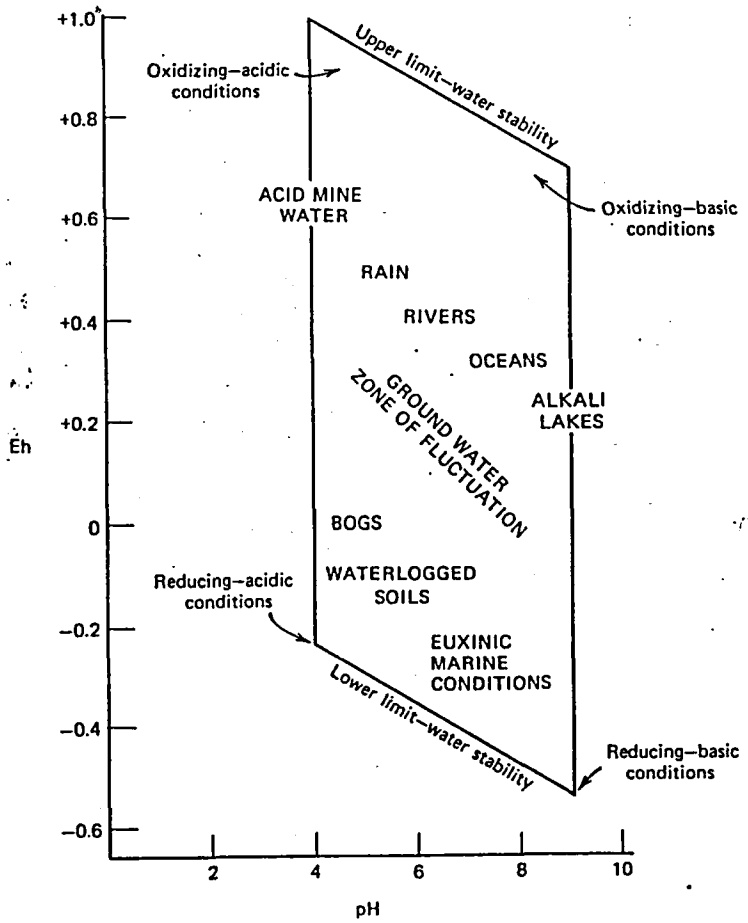



Figure 3-1. Generalized Eh-pH diagram showing the position of selected natural environments. The parallelogram shows the most usual limits of Eh and pH in the zone of weathering and in near-surface conditions.

from a magnetite body. In less oxygenated environments, say that of deep ground water with the same or slightly higher pH, magnetite need not be dissolved. But take the environment of stagnant bog water, conditions are both reducing and acid, and goethite and magnetite will both be leached—with goethite to be formed again at a spring or seep where oxygen is again available.

Just beneath an organic layer (A horizon) in soils, low pH and reducing Eh conditions exist, and iron is leached and carried to a zone of accumulation in lower levels of soil. However, under moist tropical conditions where organic

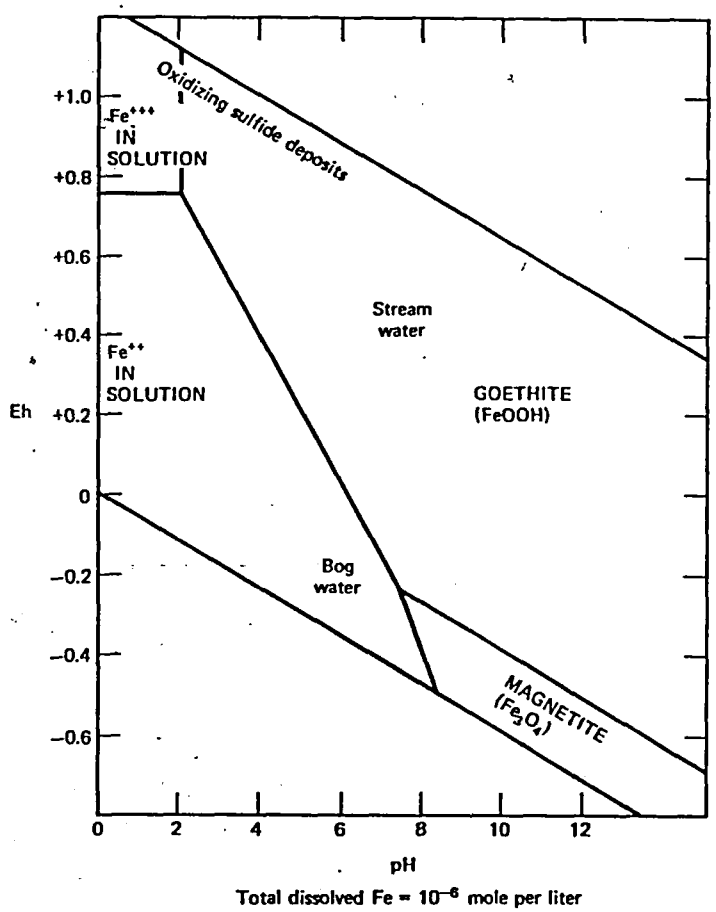



Figure 3-2. Eh-pH diagram showing stability fields for goethite and magnetite. (After P. L. Cloke, "The geochemical application of Eh-pH diagrams," *Jour. Geol. Education*, v. 14, no. 4, p. 146, 1966. Copyright © 1976, National Association of Geology Teachers, Inc. Used by permission of the publisher.)

matter decays quickly, soil water does not become acid or reducing and an accumulation of goethite concretions develops. Later and more active erosion may expose some of the concretions as a lateritic crust, or cuirasse.

In an oxidizing pyritic sulfide deposit where low pH and high Eh conditions exist, goethite and sulfuric acid may form in combination with the high concentration of ferric iron in solution shown in the upper left-hand side of Figure 3-2. Some of the goethite may also go back into solution. When this solution percolates into the orebody, it can cause the oxidation and leaching

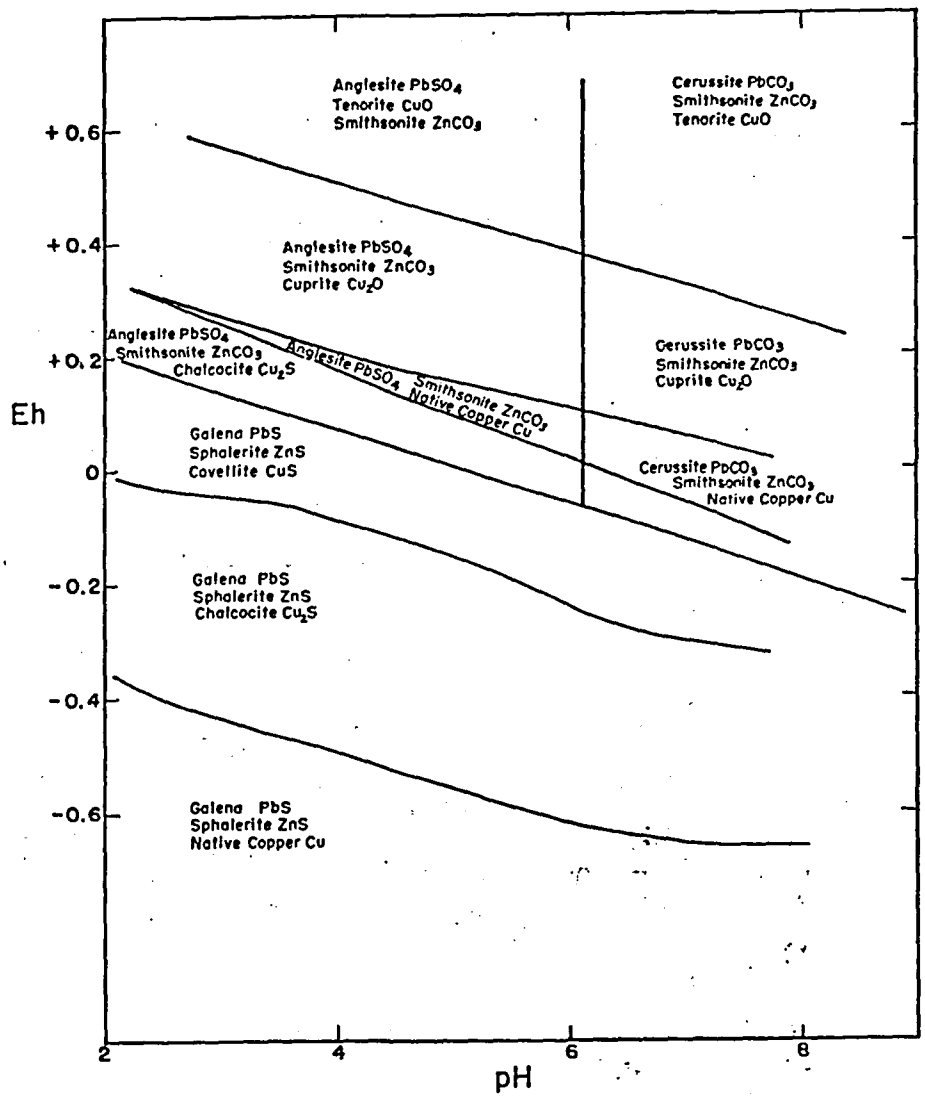



Figure 3-3. Composite diagram of stability of mental sulfides and oxidation products at 25°C and 1 atm total pressure in the presence of total dissolved carbonate = $10^{-1.5}$, total dissolved sulfur = $10^{-1}$. (After R. M. Garrels, *Geochim. et Cosmochim. Acta*, v. 5, Fig. 5, p. 166, 1953. Copyright © 1953, Pergamon Press Ltd. Used by permission of the publisher.)

# STATE OF NORTH CAROLINA

*Department of Environment, Health, and Natural Resources*
*Division of Solid Waste Management*
*Superfund Section*

## Tungsten Queen Mine
## NCD 082362989

## Phase II
## Screening Site Inspection
## Volume IIa
## Appendix C
## Case Narrative & Volatile Analytical Data

July 1991

*By:*

Greenhorne & O'Mara, Inc.

# STATE OF NORTH CAROLINA

***Department of Environment, Health, and Natural Resources***
***Division of Solid Waste Management***
***Superfund Section***

## Tungsten Queen Mine
## NCD 082362989

## Phase II
## Screening Site Inspection
## Volume IIb
## Appendix C
## Semi-Volatile Analytical Data

**July 1991**

*By:*

**Greenhorne & O'Mara, Inc.**

# STATE OF NORTH CAROLINA

*Department of Environment, Health, and Natural Resources*
*Division of Solid Waste Management*
*Superfund Section*

## Tungsten Queen Mine
## NCD 082362989

## Phase II
## Screening Site Inspection
## Volume IIc
## Appendix C
## Metals Raw Data

July 1991

*By:*

Greenhorne & O'Mara, Inc.

# STATE OF NORTH CAROLINA

***Department of Environment, Health, and Natural Resources***
***Division of Solid Waste Management***
***Superfund Section***

## Tungsten Queen Mine
## NCD 082362989

## Phase II
## Screening Site Inspection
## Volume IId
## Appendix C
## Metals Data

**July 1991**

*By:*

**Greenhorne & O'Mara, Inc.**

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

July 30, 1991

RECEIVED
AUG 01 1991
SUPERFUND SECTION

IN REPLY REFER TO

Planning Division

Dear Sir or Madam:

As you are aware, mine tailings from the abandoned tungsten Queen mine near Island Creek, Vance County, North Carolina, have been placed in five recreation areas operated by the Corps of Engineers at John H. Kerr Dam and Reservoir (enclosure 1). These recreation areas are all located in Virginia. We had extensive chemical tests performed on the tailings from the recreation areas and have received most of the preliminary results for the areas sampled in May 1991.

Based on our preliminary review of the results, lead appears to be the only parameter of concern (enclosure 2). The total concentrations of lead may not pose a public health risk (all total concentrations are less than 500 mg/kg), but several of the toxicity characteristic leaching procedure (TCLP) test results exceed the regulatory limit (40 CFR 261.24) of 5.0 mg/l.

Any required removal and treatment actions would probably occur in Virginia, but transportation and disposal could occur in both North Carolina and Virginia. Therefore, agencies from both states and Regions III and IV of the U.S. Environmental Protection Agency would likely be involved in this project.

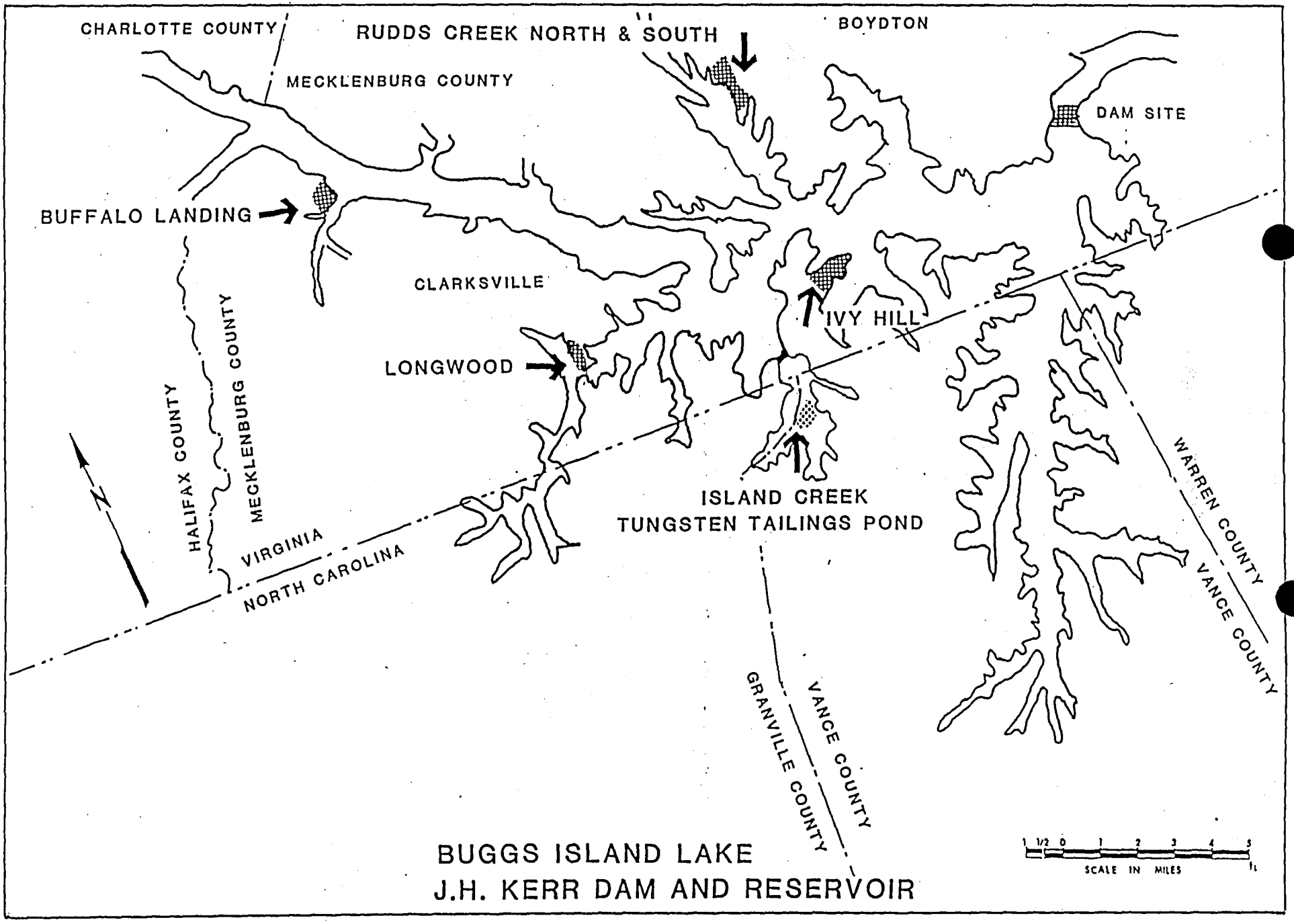
In order to develop an acceptable removal, treatment, transportation, and disposal plan, we desire to meet with you or members of your staff to discuss the agenda items indicated in enclosure 3. The meeting is scheduled for August 13, 1991, at 1 pm in the Monroe Building, Conference Room B, 101 North 14th Street (U.S. 360), downtown Richmond, Virginia. The Monroe Building is 21 stories tall and is located at the intersection of Broad (U.S. 250) and 14th Streets. Fourteenth Street parallels and is just west of I-95 and can be accessed from I-95 via the Broad Street exit. Fee parking is available in a deck on 14th Street about two blocks south of the Monroe Building.

If you have any questions, please contact Mr. Frank Yelverton of my Environmental Resources Branch staff at (919) 251-4640 or FTS 232-4640.

Sincerely,

K. B. Old, Jr. for
Lawrence W. Saunders
Chief, Planning Division

Enclosures




BUGGS ISLAND LAKE
J.H. KERR DAM AND RESERVOIR

Enclosure 1

PRELIMINARY

JOHN H. KERR RESERVOIR — LABORATORY ANALYSES FOR: LEAD — DATE SAMPLED: 05/24/91

| SEDIMENT SAMPLE # | SAMPLE ORIGIN | TCLP STATS ug/l | | TCLP ug/l | OVER REG LIMIT | EP TOX ug/l | OVER REG LIMIT | TOTAL mg/kg |
|---|---|---|---|---|---|---|---|---|
| KERR/S1 | PALMER POINT BEACH (CONTROL) | SITE MEAN = | 202.1 | < 200.0 | | | | < 10.0 |
| KERR/S2 D | " | STD. DEV. = | 5.1 | 225.0 | | | | < 10.0 |
| KERR/S3 D | " | UPPER 80% CI = | 205.2 | < 200.0 | | | | < 10.0 |
| KERR/S4 | " | | | < 200.0 | | | | < 10.0 |
| KERR/S5 | " | | | < 200.0 | | | | < 10.0 |
| KERR/S6 | " | | | < 200.0 | | | | < 10.0 |
| KERR/S7 | " | | | < 200.0 | | | | < 10.0 |
| KERR/S8 | NORTH BEND (MAYS CHAPEL) BEACH | SITE MEAN = | 381.7 | < 200.0 | | | | < 10.0 |
| KERR/S9 | " (CONTROL) | STD. DEV. = | 157.5 | 350.0 | | | | < 10.0 |
| KERR/S10 D | " | UPPER 80% CI = | 476.6 | 430.0 | | | | < 10.0 |
| KERR/S11 D | " | | | 490.0 | | | | < 10.0 |
| KERR/S12 | " | | | 520.0 | | | | < 10.0 |
| KERR/S13 | " | | | 560.0 | | | | < 10.0 |
| KERR/S14 | " | | | < 200.0 | | | | < 10.0 |
| KERR/S15 D | RUDDS CREEK NORTH BEACH | SITE MEAN = | 4,098.3 | 4,480.0 | | | | 176.0 |
| KERR/S16 D | " | STD. DEV. = | 1,084.4 | 4,740.0 | | | | 216.0 |
| KERR/S17 | " | UPPER 80% CI = | 4,751.8 | 4,730.0 | | | | 266.0 |
| KERR/S18 | " | | | 5,340.0 | * | 1,432.0 | | 199.0 |
| KERR/S19 | " | | | 2,830.0 | | | | 154.0 |
| KERR/S20 | " | | | 2,690.0 | | | | 152.0 |
| KERR/S21 | " | | | 4,390.0 | | | | 272.0 |
| KERR/S22 | RUDDS CREEK SOUTH BEACH | SITE MEAN = | 2,928.3 | 300.0 | | | | 54.0 |
| KERR/S23 | " | STD. DEV. = | 1,743.4 | 4,200.0 | | | | 240.0 |
| KERR/S24 | " | UPPER 80% CI = | 3,978.9 | 3,270.0 | | | | 219.0 |
| KERR/S25 D | " | | | 4,160.0 | | | | 312.0 |
| KERR/S26 D | " | | | 4,720.0 | | | | 354.0 |
| KERR/S27 | " | | | 4,120.0 | | | | 264.0 |
| KERR/S28 | " | | | 1,240.0 | | | | 99.0 |
| KERR/S29 | LONGWOOD BEACH | SITE MEAN = | 4,490.1 | 2,080.0 | | | | 105.0 |
| KERR/S30 | " | STD. DEV. = | 1,415.6 | 4,760.0 | | | | 236.0 |
| KERR/S31 | " | UPPER 80% CI = | 5,343.1 | 5,500.0 | * | 976.0 | | 239.0 |
| KERR/S32 | " | | | 6,180.0 | * | 2,320.0 | | 272.0 |
| KERR/S33 D | " | | | 3,841.0 | | | | 176.0 |
| KERR/S34 D | " | | | 4,120.0 | | | | 244.0 |
| KERR/S35 | " | | | 4,440.0 | | | | 325.0 |
| KERR/S36 | LONGWOOD STOCKPILE | Not Applicable | | 12,200.0 | * | 2,528.0 | | 422.0 |
| KERR/S37 | LONGWOOD PICNIC | SITE MEAN = | 7,996.3 | 8,930.0 | * | 2,216.0 | | 332.0 |
| KERR/S38 | " | STD. DEV. = | 1,414.7 | 7,490.0 | * | 1,344.0 | | 338.0 |
| KERR/S39 D | " | UPPER 80% CI = | 8,704.0 | 7,460.0 | * | 1,053.0 | | 355.0 |
| KERR/S40 D | " | | | 7,060.0 | * | 856.0 | | 343.0 |
| KERR/S41 | " | | | 9,430.0 | * | 1,408.0 | | 371.0 |
| KERR/S42 | " | | | 7,970.0 | * | 1,008.0 | | 349.0 |
| KERR/S43 | " | | | 8,750.0 | * | 2,848.0 | | 334.0 |
| KERR/S44 | " | | | 9,070.0 | * | 3,472.0 | | 394.0 |
| KERR/S45 | " | | | 5,070.0 | * | 312.0 | | 306.0 |
| KERR/S46 | BUFFALO LANDING BEACH | SITE MEAN = | 2,005.0 | 2,980.0 | | | | 206.0 |
| KERR/S47 | " | STD. DEV. = | 1,349.4 | < 200.0 | | | | 33.0 |
| KERR/S48 | " | UPPER 80% CI = | 2,818.1 | 360.0 | | | | 77.0 |
| KERR/S49 | " | | | 3,130.0 | | | | 173.0 |
| KERR/S50 | " | | | 2,760.0 | | | | 163.0 |
| KERR/S51 D | " | | | 2,690.0 | | | | 198.0 |
| KERR/S52 D | " | | | 2,510.0 | | | | 141.0 |
| KERR/S53 D | IVY HILL BEACH | SITE MEAN = | 4,374.2 | 2,760.0 | | | | 136.0 |
| KERR/S54 D | " | STD. DEV. = | 949.0 | 2,570.0 | | | | 136.0 |
| KERR/S55 | " | UPPER 80% CI = | 4,946.0 | 5,400.0 | * | 1,176.0 | | 277.0 |
| KERR/S56 | " | | | 4,570.0 | | | | 293.0 |
| KERR/S57 | " | | | 4,300.0 | | | | 240.0 |
| KERR/S58 | " | | | 4,250.0 | | | | 258.0 |
| KERR/S59 | " | | | 5,060.0 | * | 1,368.0 | | 236.0 |
| KERR/S60 | RUDDS CREEK N. TOT LOT (CONTROL) | Not Applicable | | < 200.0 | | | | < 10.0 |
| KERR/S61 | RUDDS CREEK S. TOT LOT | SITE MEAN = | 4,356.7 | 3,120.0 | | | | 274.0 |
| KERR/S62 | " | STD. DEV. = | 2,064.5 | 3,210.0 | | | | 328.0 |
| KERR/S63 | " | UPPER 80% CI = | 6,604.7 | 6,740.0 | * | 832.0 | | 345.0 |
| | EPA REGULATORY LIMIT | | | 5,000.0 | | 5,000.0 | | Not Applicable |

D = DUPLICATES; (DUPLICATE MEAN + NON-DUPLICATES)/n = SITE MEAN; MEANS COMPUTED DISREGARDING < SIGN. PRINT DATE: 07/29/91
Flame AA detection limits: for TCLP = 200 ug/l; for EP TOX = 200 ug/l; for Total = 10 mg/kg.
TCLP (Toxicity Characteristic Leachate Procedure) by acid digestion method 3010A, SW-846; flame (FAA) method 7420.
EP TOX test run only for samples exceeding TCLP limit; extract digestion method 3010A, SW-846; flame (FAA) method 7420.
Total concentration by method 3050A, SW-846. * = VALUES EQUAL TO OR OVER EPA LIMIT FOR HAZARDOUS MATERIAL. FILE.KER1PB05

Enclosure 2

PRELIMINARY

LABORATORY ANALYSES FOR: LEAD
LOTUS.KPB05QC1

JOHN H. KERR RESERVOIR
QUALITY ASSURANCE/QUALITY CONTROL PROGRAM - FIELD DUPLICATES

SAMPLE DATE: 05/24/90
PRINT DATE: 07/29/91

DETECTION LIMIT = 200 ug/l

| SAMPLE # | ORIGIN | TYPE | LAB TEST | FIELD DUPLICATES #1 ug/l | FIELD DUPLICATES #2 ug/l | RESULT < 5X DL? #1 | RESULT < 5X DL? #2 | RELATIVE % DIFF (RPD) | CONTROL LIMIT IF <5X DL +/- ug/l | CONTROL LIMIT IF =/>5X +/- % RPD | LIMIT EXCEEDED IF <5X DL (2X DL) | LIMIT EXCEEDED IF =/>5X DL (35% RPD) | NO LIMIT EXCEEDED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KERR/S2,3 | PALMER PT BEACH | SED | TCLP | 225.0 | < 200.0 | YES | YES | --------- | 400.0 | -------- | --- | --- | YES |
| KERR/S10,11 | MAYS CHAPEL BEACH | SED | TCLP | 430.0 | 490.0 | YES | YES | --------- | 400.0 | -------- | --- | --- | YES |
| KERR/S15/16 | RUDDS CR N BEACH | SED | TCLP | 4,480.0 | 4,740.0 | NO | NO | (5.6) | -------- | 35.0 | --- | --- | YES |
| KERR/S25,26 | RUDDS CR S BEACH | SED | TCLP | 4,160.0 | 4,720.0 | NO | NO | (12.6) | -------- | 35.0 | --- | --- | YES |
| KERR/S33,34 | LONGWOOD BEACH | SED | TCLP | 3,841.0 | 4,120.0 | NO | NO | (7.0) | -------- | 35.0 | --- | --- | YES |
| KERR/S39,40 | LONGWOOD PICNIC | SED | TCLP | 7,460.0 | 7,060.0 | NO | NO | 5.5 | -------- | 35.0 | --- | --- | YES |
| KERR/S51,52 | BUFFALO LDG BEACH | SED | TCLP | 2,690.0 | 2,510.0 | NO | NO | 6.9 | -------- | 35.0 | --- | --- | YES |
| KERR/S53,54 | IVY HILL BEACH | SED | TCLP | 2,760.0 | 2,570.0 | NO | NO | 7.1 | -------- | 35.0 | --- | --- | YES |

DETECTION LIMIT = 200 ug/l

| SAMPLE # | ORIGIN | TYPE | LAB TEST | FIELD DUPLICATES #1 ug/l | FIELD DUPLICATES #2 ug/l | RESULT < 5X DL? #1 | RESULT < 5X DL? #2 | RELATIVE % DIFF (RPD) | CONTROL LIMIT IF <5X DL +/- ug/l | CONTROL LIMIT IF =/>5X +/- % RPD | LIMIT EXCEEDED IF <5X DL (2X DL) | LIMIT EXCEEDED IF =/>5X DL (35% RPD) | NO LIMIT EXCEEDED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KERR/S39,40 | LONGWOOD PICNIC | SED | EP TOX | 1,053.0 | 856.0 | NO | YES | --------- | 400.0 | -------- | --- | --- | YES |

DETECTION LIMIT = 10 mg/kg

| SAMPLE # | ORIGIN | TYPE | LAB TEST | FIELD DUPLICATES #1 mg/kg | FIELD DUPLICATES #2 mg/kg | RESULT < 5X DL? #1 | RESULT < 5X DL? #2 | RELATIVE % DIFF (RPD) | CONTROL LIMIT IF <5X DL +/- mg/kg | CONTROL LIMIT IF =/>5X +/- % RPD | LIMIT EXCEEDED IF <5X DL (2X DL) | LIMIT EXCEEDED IF =/>5X DL (35% RPD) | NO LIMIT EXCEEDED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KERR/S2,3 | PALMER PT BEACH | SED | TOTAL | < 10.0 | < 10.0 | YES | YES | --------- | 20.0 | -------- | --- | --- | YES |
| KERR/S10,11 | MAYS CHAPEL BEACH | SED | TOTAL | < 10.0 | < 10.0 | YES | YES | --------- | 20.0 | -------- | --- | --- | YES |
| KERR/S15/16 | RUDDS CR N BEACH | SED | TOTAL | 176.0 | 216.0 | NO | NO | (20.4) | -------- | 35.0 | --- | --- | YES |
| KERR/S25,26 | RUDDS CR S BEACH | SED | TOTAL | 312.0 | 354.0 | NO | NO | (12.6) | -------- | 35.0 | --- | --- | YES |
| KERR/S33,34 | LONGWOOD BEACH | SED | TOTAL | 176.0 | 244.0 | NO | NO | (32.4) | -------- | 35.0 | --- | --- | YES |
| KERR/S39,40 | LONGWOOD PICNIC | SED | TOTAL | 355.0 | 343.0 | NO | NO | 3.4 | -------- | 35.0 | --- | --- | YES |
| KERR/S51,52 | BUFFALO LDG BEACH | SED | TOTAL | 198.0 | 141.0 | NO | NO | 33.6 | -------- | 35.0 | --- | --- | YES |
| KERR/S53,54 | IVY HILL BEACH | SED | TOTAL | 136.0 | 136.0 | NO | NO | 0.0 | -------- | 35.0 | --- | --- | YES |

# PRELIMINARY

LABORATORY ANALYSES FOR: LEAD
LOTUS.KPB05QC2

JOHN H. KERR RESERVOIR
QUALITY ASSURANCE/QUALITY CONTROL PROGRAM - LAB DUPLICATES

SAMPLE DATE: 05/24/90
PRINT DATE: 07/29/91

| DETECTION LIMIT = 200 ug/l<br>SAMPLE # | ORIGIN | TYPE | LAB TEST | LAB DUPLICATES #1 ug/l | LAB DUPLICATES #2 ug/l | RESULT < 5X DL? #1 | RESULT < 5X DL? #2 | RELATIVE % DIFF (RPD) | CONTROL LIMIT IF <5X DL +/- ug/l | CONTROL LIMIT IF =/>5X +/- % RPD | LIMIT EXCEEDED IF <5X DL (2X DL) | LIMIT EXCEEDED IF =/>5X DL (35% RPD) | NO LIMIT EXCEEDED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KERR/S5 | PALMER PT BEACH | SED | TCLP | 250.0 | < 200.0 | YES | YES | --------- | 400.0 | -------- | --- | --- | YES |
| KERR/S13 | MAYS CHAPEL BEACH | SED | TCLP | 640.0 | 560.0 | YES | YES | --------- | 400.0 | -------- | --- | --- | YES |
| KERR/S21 | RUDDS CR N BEACH | SED | TCLP | 4,450.0 | 4,390.0 | NO | NO | 1.4 | -------- | 35.0 | --- | --- | YES |
| KERR/S25 | RUDDS CR S BEACH | SED | TCLP | 4,350.0 | 4,160.0 | NO | NO | 4.5 | -------- | 35.0 | --- | --- | YES |
| KERR/S32 | LONGWOOD BEACH | SED | TCLP | 6,320.0 | 6,180.0 | NO | NO | 2.2 | -------- | 35.0 | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | TCLP | 8,320.0 | 8,930.0 | NO | NO | (7.1) | -------- | 35.0 | --- | --- | YES |
| KERR/S47 | BUFFALO LDG BEACH | SED | TCLP | 200.0 | < 200.0 | YES | YES | --------- | 400.0 | -------- | --- | --- | YES |
| KERR/S57 | IVY HILL BEACH | SED | TCLP | 4,470.0 | 4,300.0 | NO | NO | 3.9 | -------- | 35.0 | --- | --- | YES |

| DETECTION LIMIT = 200 ug/l<br>SAMPLE # | ORIGIN | TYPE | LAB TEST | LAB DUPLICATES #1 ug/l | LAB DUPLICATES #2 ug/l | RESULT < 5X DL? #1 | RESULT < 5X DL? #2 | RELATIVE % DIFF (RPD) | CONTROL LIMIT IF <5X DL +/- ug/l | CONTROL LIMIT IF =/>5X +/- % RPD | LIMIT EXCEEDED IF <5X DL (2X DL) | LIMIT EXCEEDED IF =/>5X DL (35% RPD) | NO LIMIT EXCEEDED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KERR/S32 | LONGWOOD BEACH | SED | EP. TOX | 2,320.0 | 2,280.0 | NO | NO | 1.7 | -------- | 35.0 | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | EP TOX | 2,216.0 | 2,136.0 | NO | NO | 3.7 | -------- | 35.0 | --- | --- | YES |

| DETECTION LIMIT = 10 mg/kg<br>SAMPLE # | ORIGIN | TYPE | LAB TEST | LAB DUPLICATES #1 mg/kg | LAB DUPLICATES #2 mg/kg | RESULT < 5X DL? #1 | RESULT < 5X DL? #2 | RELATIVE % DIFF (RPD) | CONTROL LIMIT IF <5X DL +/- mg/kg | CONTROL LIMIT IF =/>5X +/- % RPD | LIMIT EXCEEDED IF <5X DL (2X DL) | LIMIT EXCEEDED IF =/>5X DL (35% RPD) | NO LIMIT EXCEEDED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KERR/S5 | PALMER PT BEACH | SED | TOTAL | < 10.0 | < 10.0 | YES | YES | --------- | 20.0 | -------- | --- | --- | YES |
| KERR/S13 | MAYS CHAPEL BEACH | SED | TOTAL | < 10.0 | < 10.0 | YES | YES | --------- | 20.0 | -------- | --- | --- | YES |
| KERR/S21 | RUDDS CR N BEACH | SED | TOTAL | 272.0 | 249.0 | NO | NO | 8.8 | -------- | 35.0 | --- | --- | YES |
| KERR/S25 | RUDDS CR S BEACH | SED | TOTAL | 312.0 | 261.0 | NO | NO | 17.8 | -------- | 35.0 | --- | --- | YES |
| KERR/S32 | LONGWOOD BEACH | SED | TOTAL | 272.0 | 292.0 | NO | NO | (7.1) | -------- | 35.0 | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | TOTAL | 332.0 | 330.0 | NO | NO | 0.6 | -------- | 35.0 | --- | --- | YES |
| KERR/S47 | BUFFALO LDG BEACH | SED | TOTAL | 33.0 | 40.0 | YES | YES | --------- | 20.0 | -------- | --- | --- | YES |
| KERR/S57 | IVY HILL BEACH | SED | TOTAL | 240.0 | 253.0 | NO | NO | (5.3) | -------- | 35.0 | --- | --- | YES |

# PRELIMINARY

LABORATORY ANALYSES FOR: LEAD
LOTUS.KPB05QC3

JOHN H. KERR RESERVOIR
QUALITY ASSURANCE/QUALITY CONTROL PROGRAM - SPIKES/REFERENCES

SAMPLE DATE: 05/24/90
PRINT DATE: 07/29/91

| MATRIX SPIKE ANALYSES | | | | SPIKES | | | | | SAMPLE RECOVERY RANGE IN PERCENT | | | | DATA QUALITY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE # | ORIGIN | TYPE | LAB TEST | SAMPLE RESULT ug/l | SAMPLE+ SPIKE ug/l | SPIKE ADDED ug/l | PERCENT RECOVERY | SAMPLE RESULT < IDL? | <30 | 30-74 | 75-125 | >125 | UNUSABLE | ESTIMATED | ACCEPTABLE |
| KERR/S5 | PALMER PT BEACH | SED | TCLP | < 200.0 | 5,930.0 | 5,000.0 | 118.6 | YES | --- | --- | YES | --- | --- | --- | YES |
| KERR/S13 | MAYS CHAPEL BEACH | SED | TCLP | 560.0 | 5,690.0 | 5,000.0 | 102.6 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S21 | RUDDS CR N BEACH | SED | TCLP | 4,390.0 | 9,920.0 | 5,000.0 | 110.6 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S25 | RUDDS CR S BEACH | SED | TCLP | 4,160.0 | 9,840.0 | 5,000.0 | 113.6 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S32 | LONGWOOD BEACH | SED | TCLP | 6,180.0 | 11,930.0 | 5,000.0 | 115.0 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | TCLP | 8,930.0 | 13,620.0 | 5,000.0 | 93.8 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S47 | BUFFALO LDG BEACH | SED | TCLP | < 200.0 | 4,990.0 | 5,000.0 | 99.8 | YES | --- | --- | YES | --- | --- | --- | YES |
| KERR/S57 | IVY HILL BEACH | SED | TCLP | 4,300.0 | 9,450.0 | 5,000.0 | 103.0 | --- | --- | --- | YES | --- | --- | --- | YES |

| POST-SPIKE ANALYSES | | | | SPIKES | | | | | SAMPLE RECOVERY RANGE IN PERCENT | | | | DATA QUALITY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE # | ORIGIN | TYPE | LAB TEST | SAMPLE RESULT ug/l | SAMPLE+ SPIKE ug/l | SPIKE ADDED ug/l | PERCENT RECOVERY | SAMPLE RESULT < IDL? | <30 | 30-74 | 75-125 | >125 | UNUSABLE | ESTIMATED | ACCEPTABLE |
| KERR/S5 | PALMER PT BEACH | SED | TCLP | < 200.0 | 5,690.0 | 5,000.0 | 113.8 | YES | --- | --- | YES | --- | --- | --- | YES |
| KERR/S13 | MAYS CHAPEL BEACH | SED | TCLP | 560.0 | 5,580.0 | 5,000.0 | 100.4 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S21 | RUDDS CR N BEACH | SED | TCLP | 4,390.0 | 10,110.0 | 5,000.0 | 114.4 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S25 | RUDDS CR S BEACH | SED | TCLP | 4,160.0 | 10,070.0 | 5,000.0 | 118.2 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S32 | LONGWOOD BEACH | SED | TCLP | 6,180.0 | 11,860.0 | 5,000.0 | 113.6 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | TCLP | 8,930.0 | 13,510.0 | 5,000.0 | 91.6 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S47 | BUFFALO LDG BEACH | SED | TCLP | < 200.0 | 5,100.0 | 5,000.0 | 102.0 | YES | --- | --- | YES | --- | --- | --- | YES |
| KERR/S57 | IVY HILL BEACH | SED | TCLP | 4,300.0 | 9,380.0 | 5,000.0 | 101.6 | --- | --- | --- | YES | --- | --- | --- | YES |

| PRE-SPIKE ANALYSES | | | | SPIKES | | | | | SAMPLE RECOVERY RANGE IN PERCENT | | | | DATA QUALITY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE # | ORIGIN | TYPE | LAB TEST | SAMPLE RESULT ug/l | SAMPLE+ SPIKE ug/l | SPIKE ADDED ug/l | PERCENT RECOVERY | SAMPLE RESULT < IDL? | <30 | 30-74 | 75-125 | >125 | UNUSABLE | ESTIMATED | ACCEPTABLE |
| KERR/S32 | LONGWOOD BEACH | SED | EP TOX | 2,320.0 | 6,336.0 | 5,000.0 | 80.3 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | EP TOX | 2,216.0 | 6,288.0 | 5,000.0 | 81.4 | --- | --- | --- | YES | --- | --- | --- | YES |

| POST-SPIKE ANALYSES | | | | SPIKES | | | | | SAMPLE RECOVERY RANGE IN PERCENT | | | | DATA QUALITY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE # | ORIGIN | TYPE | LAB TEST | SAMPLE RESULT ug/l | SAMPLE+ SPIKE ug/l | SPIKE ADDED ug/l | PERCENT RECOVERY | SAMPLE RESULT < IDL? | <30 | 30-74 | 75-125 | >125 | UNUSABLE | ESTIMATED | ACCEPTABLE |
| KERR/S32 | LONGWOOD BEACH | SED | EP TOX | 2,320.0 | 6,504.0 | 5,000.0 | 83.7 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | EP TOX | 2,216.0 | 6,496.0 | 5,000.0 | 85.6 | --- | --- | --- | YES | --- | --- | --- | YES |

| STANDARD REFERENCES - EP TOX | | | | SAMPLE RESULT | ACTUAL VALUE | | PERCENT RECOVERY | SAMPLE RESULT | RECOVERY % RANGE | | | | DATA QUALITY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE # | ORIGIN | TYPE | LAB TEST | ug/l | ug/l | | | < IDL? | <30 | 30-74 | 75-125 | >125 | UNUSABLE | ESTIMATED | ACCEPTABLE |
| LOT 9935 | ER ASSOCIATES | SED | EP TOX | 254.0 | 264.0 | | 96.2 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9935 | ER ASSOCIATES | SED | EP TOX | 249.0 | 264.0 | | 94.3 | --- | --- | --- | YES | --- | --- | --- | YES |

Detection limit is 200 ug/l for both TCLP and EP TOX tests.

# PRELIMINARY

LABORATORY ANALYSES FOR: LEAD
LOTUS.KPB05QC4

JOHN H. KERR RESERVOIR
QUALITY ASSURANCE/QUALITY CONTROL PROGRAM - SPIKES/REFERENCES

SAMPLE DATE: 05/24/90
PRINT DATE: 07/29/91

| PRE-SPIKE ANALYSES | | | | | | | | | RECOVERY % RANGE | | | | DATA QUALITY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE # | ORIGIN | TYPE | LAB TEST | SAMPLE RESULT mg/kg | SAMPLE+ SPIKE mg/kg | SPIKE ADDED mg/kg | PERCENT RECOVERY | SAMPLE RESULT < IDL? | <30 | 30-74 | 75-125 | >125 | UNUSABLE | ESTIMATED | ACCEPTABLE |
| KERR/S5 | PALMER PT BEACH | SED | TOTAL | < 10.0 | 622.0 | 679.0 | 91.6 | YES | --- | --- | YES | --- | --- | --- | YES |
| KERR/S13 | MAYS CHAPEL BEACH | SED | TOTAL | < 10.0 | 646.0 | 674.0 | 95.8 | YES | --- | --- | YES | --- | --- | --- | YES |
| KERR/S21 | RUDDS CR N BEACH | SED | TOTAL | 272.0 | 927.0 | 698.0 | 93.8 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S25 | RUDDS CR S BEACH | SED | TOTAL | 312.0 | 960.0 | 668.0 | 97.0 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S32 | LONGWOOD BEACH | SED | TOTAL | 272.0 | 911.0 | 612.0 | 104.4 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | TOTAL | 332.0 | 927.0 | 594.0 | 100.2 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S47 | BUFFALO LDG BEACH | SED | TOTAL | 33.0 | 630.0 | 629.0 | 94.9 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S57 | IVY HILL BEACH | SED | TOTAL | 240.0 | 929.0 | 680.0 | 101.3 | --- | --- | --- | YES | --- | --- | --- | YES |
| POST-SPIKE ANALYSES | | | | | | | | | | | | | | | |
| KERR/S5 | PALMER PT BEACH | SED | TOTAL | < 10.0 | 648.0 | 655.0 | 98.9 | YES | --- | --- | YES | --- | --- | --- | YES |
| KERR/S13 | MAYS CHAPEL BEACH | SED | TOTAL | < 10.0 | 660.0 | 670.0 | 98.5 | YES | --- | --- | YES | --- | --- | --- | YES |
| KERR/S21 | RUDDS CR N BEACH | SED | TOTAL | 272.0 | 973.0 | 695.0 | 100.9 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S25 | RUDDS CR S BEACH | SED | TOTAL | 312.0 | 986.0 | 703.0 | 95.9 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S32 | LONGWOOD BEACH | SED | TOTAL | 272.0 | 870.0 | 603.0 | 99.2 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S37 | LONGWOOD PICNIC | SED | TOTAL | 332.0 | 898.0 | 496.0 | 114.1 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S47 | BUFFALO LDG BEACH | SED | TOTAL | 33.0 | 633.0 | 629.0 | 95.4 | --- | --- | --- | YES | --- | --- | --- | YES |
| KERR/S57 | IVY HILL BEACH | SED | TOTAL | 240.0 | 888.0 | 669.0 | 96.9 | --- | --- | --- | YES | --- | --- | --- | YES |

| STANDARD REFERENCES - TOTAL | | | | | | | | | RECOVERY % RANGE | | | | DATA QUALITY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE # | ORIGIN | TYPE | LAB TEST | SAMPLE RESULT mg/kg | ACTAL VALUE mg/kg | | PERCENT RECOVERY | SAMPLE RESULT < IDL? | <30 | 30-74 | 75-125 | >125 | UNUSABLE | ESTIMATED | ACCEPTABLE |
| 11583 | DIG. # 1 A | SED | TOTAL | 145.0 | 161.0 | | 90.1 | --- | --- | --- | YES | --- | --- | --- | YES |
| 11584 | DIG. # 2 A | SED | TOTAL | 151.0 | 161.0 | | 93.8 | --- | --- | --- | YES | --- | --- | --- | YES |
| 11585 | DIG. # 3 A | SED | TOTAL | 143.0 | 161.0 | | 88.8 | --- | --- | --- | YES | --- | --- | --- | YES |
| 11586 | DIG. # 1 | SED | TOTAL | 21.1 | 28.2 | | 74.8 | --- | --- | --- | YES | --- | --- | --- | YES |
| 11587 | DIG. # 2 | SED | TOTAL | 19.2 | 28.2 | | 68.1 | --- | --- | YES | --- | --- | --- | YES | --- |
| 11588 | DIG. # 3 | SED | TOTAL | 16.7 | 28.2 | | 59.2 | --- | --- | YES | --- | --- | --- | YES | --- |
| SRM 2704 | DIG. # 1 B | SED | TOTAL | 165.0 | 161.0 | | 102.5 | --- | --- | --- | YES | --- | --- | --- | YES |
| SRM 2704 | DIG. # 2 B | SED | TOTAL | 167.0 | 161.0 | | 103.7 | --- | --- | --- | YES | --- | --- | --- | YES |
| SRM 2704 | DIG. # 3 B | SED | TOTAL | 171.0 | 161.0 | | 106.2 | --- | --- | --- | YES | --- | --- | --- | YES |

| STANDARD REFERENCES - TCLP | | | | | | | | | RECOVERY % RANGE | | | | DATA QUALITY | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE # | ORIGIN | TYPE | LAB TEST | SAMPLE RESULT ug/l | ACTUAL VALUE ug/l | | PERCENT RECOVERY | SAMPLE RESULT < IDL? | <30 | 30-74 | 75-125 | >125 | UNUSABLE | ESTIMATED | ACCEPTABLE |
| LOT 9935 | ER ASSOCIATES | SED | TCLP | 256.0 | 264.0 | | 97.0 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9935 | ER ASSOCIATES | SED | TCLP | 259.0 | 264.0 | | 98.1 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9935 | ER ASSOCIATES | SED | TCLP | 266.0 | 264.0 | | 100.8 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9935 | ER ASSOCIATES | SED | TCLP | 270.0 | 264.0 | | 102.3 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9935 | ER ASSOCIATES | SED | TCLP | 255.0 | 264.0 | | 96.6 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9935 | ER ASSOCIATES | SED | TCLP | 251.0 | 264.0 | | 95.1 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9938 | ER ASSOCIATES | SED | TCLP | 179.0 | 170.0 | | 105.3 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9938 | ER ASSOCIATES | SED | TCLP | 172.0 | 170.0 | | 101.2 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9938 | ER ASSOCIATES | SED | TCLP | 169.0 | 170.0 | | 99.4 | --- | --- | --- | YES | --- | --- | --- | YES |
| LOT 9938 | ER ASSOCIATES | SED | TCLP | 191.0 | 170.0 | | 112.4 | --- | --- | --- | YES | --- | --- | --- | YES |

Detection limit is 10 mg/kg for total analyses and 200 ug/l for TCLP analyses

# PRELIMINARY

LABORATORY ANALYSES FOR: LEAD
LOTUS.KPB05QC5

JOHN H. KERR RESERVOIR
QUALITY ASSURANCE/QUALITY CONTROL PROGRAM - RINSES/BLANKS

SAMPLE DATE: 05/24/90
PRINT DATE: 07/29/91

WATER SAMPLES/RINSES
DETECTION LIMIT = 200 ug/l

| SAMPLE # | ORIGIN | TYPE | LAB TEST | SAMPLE RESULT ug/l |
|---|---|---|---|---|
| KERR/W1 | PALMER PT BEACH | WATER | TOTAL | < 200.0 |
| KERR/W2 | PALMER PT BEACH | WATER | TOTAL | < 200.0 |
| KERR/W3 | PALMER PT BEACH | WATER | TOTAL | < 200.0 |
| KERR/W4 | MAYS CHAPEL BEACH | WATER | TOTAL | < 200.0 |
| KERR/W5 | RUDDS CR N BEACH | WATER | TOTAL | < 200.0 |
| KERR/W6 | RUDDS CR S BEACH | WATER | TOTAL | < 200.0 |
| KERR/W7 | LONGWOOD BEACH | WATER | TOTAL | < 200.0 |
| KERR/W8 | LONGWOOD BEACH | WATER | TOTAL | < 200.0 |
| KERR/W9 | LONGWOOD STOCKPILE | WATER | TOTAL | < 200.0 |
| KERR/W10 | BUFFALO LDG BEACH | WATER | TOTAL | < 200.0 |
| KERR/W11 | IVY HILL BEACH | WATER | TOTAL | < 200.0 |
| KERR/W12 | TRIP BLANK | WATER | TOTAL | < 200.0 |
| KERR/W13 | TRIP BLANK | WATER | TOTAL | < 200.0 |
| KERR/W14 | TRIP BLANK | WATER | TOTAL | < 200.0 |
| KERR/W14 | REPLICATE | WATER | TOTAL | < 200.0 |

CALIBRATION BLANKS
DETECTION LIMIT = 10 mg/kg

| SAMPLE # | TYPE | LAB TEST | SAMPLE RESULT mg/kg |
|---|---|---|---|
| CALIBRATION BLANK 1 | BLANK | TOTAL | < 10.0 |
| CALIBRATION BLANK 2 | BLANK | TOTAL | < 10.0 |
| CALIBRATION BLANK 3 | BLANK | TOTAL | < 10.0 |
| CALIBRATION BLANK 4 | BLANK | TOTAL | < 10.0 |

METHOD BLANKS
DETECTION LIMIT = 10 mg/kg

| SAMPLE # | TYPE | LAB TEST | SAMPLE RESULT mg/kg |
|---|---|---|---|
| METHOD BLANK 1 | BLANK | TOTAL | < 10.0 |
| METHOD BLANK 2 | BLANK | TOTAL | < 10.0 |
| METHOD BLANK 3 | BLANK | TOTAL | < 10.0 |
| METHOD BLANK 4 | BLANK | TOTAL | < 10.0 |

3072pnfy/fyagenda

John H. Kerr Reservoir
Mine Tailings in Recreation Areas
Interagency Meeting

August 13, 1991

DRAFT AGENDA

1. Status of Data
   a. Lead (Pb) only apparent parameter of concern (enclosure 2).
   b. Quality control/quality assurance under review - looks good based on preliminary review.
   c. No apparent health concerns - lead totals all < 500 mg/kg.
   d. Hazardous materials - TCLP upper 80% confidence interval for lead > 5 mg/l for one recreation area and just below 5 mg/l for two others.
   e. EP toxicity for lead all < 5 mg/l.

2. Treatment Methods for Hazardous Materials
   a. Stabilization - lime.
   b. Solidification - concrete.
   c. Others.
   d. Post-treatment tests.
      1) Treated material.
      2) Soils/sediments exposed following removal of hazardous material.

3. Disposal Options
   a. Hazardous materials.
      1) Subtitle C facility without treatment.
      2) Subtitle D facility with treatment.
      3) NC mine tailings site with or without treatment.
      4) Beneficial uses - e.g. concrete pads and roadways.
   b. Non-hazardous materials.
      1) Subtitle D facility.
      2) NC mine tailings site.
      3) Leave in place.

4. Time Requirements
   a. Clean-up.
      1) Hazardous materials.
         a) Rapid Response Team.
         b) Independent contractor.
         c) Additional testing.
      2) Non-hazardous materials - independent contractor.
   b. Renourishment with clean sand.
   c. Required permits and environmental documentation.

5. Additional Meetings
   a. Agency.
   b. Public.

6. Other

Enclosure 3

FILE COPY

16 May 1991

TO: File

FROM: Jack Butler

SUBJECT: Tungsten Queen Mine
NCD082362989

Mr. Jeff Reid, NC Land Resources (733-2423), was contacted on this date in an attempt to determine the owner and security status of the subject site. Mr. Reid reported that he had not visited the site yet and therefore did not know if the site was accessible; however, he was planning to visit the site next week due to a petition from the Army Corps of Engineers to flood the site. Mr. Reid was informed that this site was in the Superfund inventory and that Harvey Allen of our office was planning to conduct a Site Investigation visit at the site on 21 May 1991. Mr. Reid requested that Mr. Allen contact him so he could arrange to be present during the Site Investigation visit. Mr. Reid reported that this was a "pre-law" or unpermitted mine which has been inactive since 1971 or earlier.

Mr. Reid referred my question concerning the owner of the site to Mr. Steve Sikick, US Bureau of Mines (205/759-9466). An attempt was made to contact Mr. Sikick on this date, but he was not in. Mr. Doss White of Mr. Sikick's staff returned my call and reported that according to this records the site is owned by Hecla Mining, 6500 Mineral Drive, Post Office Box C-8000, Coeur d-alene, Idaho 83814, phone (208) 769-4100. Mr. White also suggested that we may want to contact Mr. Bill Cochran at the US Bureau of Mines office in Denver (303/776-0421).

JB/ds/1

State of North Carolina
Department of Environment, Health, and Natural Resources
**Division of Solid Waste Management**
**P.O. Box 27687 · Raleigh, North Carolina 27611-7687**

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

May 1, 1991

Mr. Mitchell Arnold
Environmental Health Supervisor
Granville-Vance District Health Department
115 Emergency Road
Henderson, NC 27536

RE: Phase II Screening Site Investigation
Tungston Queen Mine
NCD 082 362 989

Dear Mr. Arnold:

David Lilley of the NC Superfund Section spoke with Ms. Evans of your office today to notify you that the NC Superfund Section's Contractors will conduct a screening site investigation of the subject site located in Vance County, North Carolina. The investigation will be conducted on May 21, 1991 by Billy Dixon of Greenhorne and O'Mara, Inc.

The purpose of the investigation is to determine if the site poses a hazard to public health or the environment because of releases of contaminants to soil, surface water, groundwater, or air. The investigation team will take samples on and around the site to determine if a hazardous condition exists. Additionally, they will locate all nearby water supplies (surface and groundwater, community and private) and any close sensitive environments, schools, and day care centers.

This investigation is not an emergency situation but is a normal step in the evaluation of all uncontrolled and unregulated potential hazardous waste sites in North Carolina. You may want to have your representative meet the investigation team at the site. If so, please contact Bill Piske at (919) 782-9088 and he will coordinate a meeting. I am enclosing background data on the site for your information.

If the investigation indicates the need for future study of the site, we will contact your office to advise. If you have any questions, please don't hesitate to call David Lilley or me at (919) 733-2801.

Sincerely,

Harley H. Allen for

Grover Nicholson, Head
Contracts Management Branch
Superfund Section

Enclosures

cc: Jim Coffey
Doug Holyfield
Steve Reid
Patricia Bowden
Ann Rudd
David Lilley
File

# Federal
## Trip Notification & Authorization

Prepared by: Harvey Allen

Today's Date: 4/29/91

*Use Black Ink or Typewriter only-Staff to fill out first 2 blocks only.

### Site Trip

Date of Trip: May 21, 1991

If trip date changed or cancelled note below:
Trip Date Changed To: _____ Cancelled: ___

NCD#: 082 362 989 Site Name: Tungston Queen Mine
City: Townsville County: Vance

Reason for Trip: Phase II, Screening Site Investigation

Name of Hotel (Overnight Trip): _____ Hotel Telephone Number: ( ) ___ - _____

Authorized by: [signature]
Industrial Hygienist

Project Team Leader: Billy Dixon (G&O)

Assistants: Harvey Allen, NCSS, _____, _____

Attach To Notification Form: 1 copy each:
Submit to the
Industrial Hygienist

- Preliminary Assessment Form (First page only)
- Site Map
- PA Transmittal Letter

(Please list appropriate County Health Department contact person to call to advise of trip)

Environmental Supervisor or Health Director to call: Mr. Mitchell Arnold Title: Supervisor Env. Health
(Note if Dr., M.P., etc.)

Telephone Number: (919) 492-7915

Notes: Health Department Official Contacted: MS-Evans
Back Up Letter Required: Yes ✓ No ___

Notified Ms. Evans on 5-1-91 (DBL)

Note: Signed original to Data Manager

10 May 1991

## PRELIMINARY DATA

TABLE 1. Results of sediment analyses of Island Creek Tungsten Mine Tailings and sediments from J. H. Kerr Recreation Areas. Samples were taken April 9, 1991.

| | | Lead (Pb) Concentration | |
|---|---|---|---|
| Sample Location | Statistic | TCLP mg/l | TOTAL mg/kg |
| Mine Tailings | mean | 4.42 | 309 |
| n=5 | s.d. | 1.10 | 124.2 |
| | upper 95% C.I. | 5.37 | |
| | max | 5.91 | 473 |
| | min | 2.90 | 176 |
| Rudds Creek | mean | 3.96 | 365 |
| Play Area | s.d. | 1.62 | 42.8 |
| n=3 | upper 95% C.I. | 5.80 | |
| | max | 5.77 | 414 |
| | min | 2.59 | 335 |
| Longwood | mean | 6.19 | 436 |
| Play Area | s.d. | 1.23 | 44.2 |
| n=3 | upper 95% C.I. | [illegible] | |
| | max | [illegible] | 489 |
| | min | 2.28 | 386 |
| Control | max | 0.012 | 25 |
| Areas | | | |

Note:

Extraction Methods - Total - EPA Meth
- TCLP (EPA Method 1311)

Analysis Methods - Lead - EPA Method 7420

In:

U.S. Environmental Protection Agency, EPA 530/SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846 Third Edition, November 1986 with December 1987 revisions

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

April 26, 1991

Mr. Shawn Szambathy
Mine Supply, Inc.
P.O. Box 11703
Spokane, Washington 99211

RE: Tungston Queen Mine
NCD 082 362 989
Screening Site Investigation

As per our telephone conversation of April 24, 1991, the EPA has directed the North Carolina Superfund Section to perform a Screening Site Investigation at your facility. As discussed, I will be at your sites on May 21, 1991, along with our contractor, Greenhorne & O'Mara, Inc. to take environmental media samples. These samples will consist basically of the following:

- Two to four ground water samples from temporary hand augured wells or onsite monitoring wells, if applicable;
- Two to four soil samples;
- Two nearby surface water samples, if applicable; and
- Two sediment samples from nearby surface waters, if applicable.

Also, as discussed, the purpose of the Screening Site Investigation is to determine if there have been releases of hazardous contaminants to the environment, and therefore, whether the site may pose a threat to human health or the environment.



An Equal Opportunity Affirmative Action Employer

Thank you for your cooperation and if you have any further questions, please call me at (919) 733-2801.

Sincerely:

Harvey H. Allen

Harvey H. Allen, PE

cc: Bill Piske, Greenhorne & O'Mara

NUS CORPORATION
1927 LAKESIDE PARKWAY
SUITE 614
TUCKER, GEORGIA 30084
404-938-7710

RECEIVED
DEC 20 1989
SUPERFUND SECTION

C-586-12-9-148

December 18, 1989

Mr. Grover Nicholson
Superfund Branch
North Carolina Department of Human Resources
Post Office Box 2091
Raleigh, North Carolina 27602-2091

Subject: Scheduled FIT Reconnaissances in North Carolina

Dear Mr. Nicholson:

The EPA Field Investigation Team (FIT) will be visiting the state of North Carolina during January 1990. FIT will be conducting offsite reconnaissances and gathering information to investigate the following sites:

| Date | EPA ID No. | Site Name | County | FIT Proj. Manager |
|---|---|---|---|---|
| Jan. 9-11 | NCD053528170 | Laurens Glass | Vance | Dan Howard |
| | NCD082362989 | Tungsten Queen Mine | Vance | Dan Howard |
| | NCD086326741 | Texaco Inc. | Wake | Walter Riley |
| | NCD065302267 | Waste Industries | Wake | Walter Riley |
| Jan. 18-19 | NCD000828905 | Package Products Co. Flexible | Mecklenburg | Jerald Tittle |
| | NCD066309113 | Piedmont Heat Treating Corp. | Mecklenburg | Jerald Tittle |
| | NCD980728620 | Southeastern Pollution Control | Mecklenburg | Maureen Gordon |
| | NCD095470332 | Thonit A. Simmons Co. | Mecklenburg | Maureen Gordon |

The following two sites were added to the December 18-20 trip to Mecklenburg County (my letter of November 22, 1989):

| EPA ID No. | Site Name | County | FIT Proj. Manager |
|---|---|---|---|
| NCD002462414 | Jones Chemicals Inc. of North Carolina | Mecklenburg | Cliff Leonard |
| NCD024488025 | Smith Metal & Iron Co. | Mecklenburg | Cliff Leonard |

Please notify the appropriate local agencies. I appreciate your help in this matter.

Very truly yours, Approved:

Joan J. Dupont

Joan J. Dupont
North Carolina Coordinator

JJD/dwf

cc: Kelly Cain
Robert Morris

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

21 December 1989

Charles D. Rollins, MD
Health Director
115 Emergency Road
Henderson, NC 27536

Re: Off-Site Reconnaissances
Laurens Glass NCD 053 528 170
Tungsten Queens Mine NCD 082 362 989

Dear Mr. Rollins:

David Lilley of the NC Superfund Section spoke with you today to notify you that the EPA Field Investigation Team (FIT) will conduct off-site reconnaissances of the subject sites located in Henderson and Townsville, NC. These reconnaissances will be conducted on 9-11 January 1989 by Dan Howard and Walter Riley of NUS Corporation.

The purpose of these reconnaissances is to determine if the sites pose a hazard to public health or the environment because of releases of contaminants to soil, surface water, groundwater, or air. The investigation team will locate all nearby water supplies (surface and groundwater, community and private) and any close sensitive environments, schools and day care centers.

These reconnaissances are not emergency situations but are normal steps in the evaluation of all uncontrolled and unregulated potential hazardous waste sites in North Carolina. You may want to have your representative meet the investigation team at the sites. If so, please contact Dan Howard at 1-800-888-7710 and he will coordinate a meeting. I am enclosing background data on the sites for your information.

If these reconnaissances indicate the need for future study of the sites, we will contact your office to advise. If you have any questions, please don't hesitate to call David Lilley or me at (919) 733-2801.

Sincerely,

Grover Nicholson, Head
CERCLA Branch
Solid Waste Management Division

GN/DL/db/site5doc.gn

Enclosures

cc: Gordon Layton
Doug Holyfield
Steve Reid
Lois Walker
Ann Rudd
David Lilley
File

FEDERAL

TRIP

NOTIFICATION

& AUTHORIZATION

TODAY'S DATE: December 21, 1989
PREPARED BY: David Lilley (Staff member filling out form)

SITE TRIP

DATE OF TRIP: January 9-11, 1990
If trip date changed or cancelled note below:
CHANGE OF DATE TO: _____ OR CANCELLED: _____

SITE NAME: Tungsten Queen Mine
NCD#: NCD 082 362 989
REASON FOR TRIP: off-site reconnaissance (FIT)

CITY: Townsville COUNTY: Vance

If Overnight trip, Hotel staying at: _____
Telephone Number: _____

(Please list appropriate county health person to call to advise of trip)
ENVIRONMENTAL SUPERVISOR OR
HEALTH DIRECTOR TO CALL: Charles D. Rollins, MD TITLE: Health Director
(Note if Dr., M.P., etc.)
Telephone Number: (919) 492-7915

Project Team Leader: Dan Howard
Assistants: _____

AUTHORIZED BY: David B. Lilley
CERCLA ~~Unit Supervisor~~
Notification Officer

ATTACHMENT
TO NOTIFICATION FORM: 4 copies each of PRELIMINARY ASSESSMENT FORM (1st page only)
NOTIFICATION FORM, & EPA TRANSMITTAL LETTER

Staff Notification Procedure: (Use black Ink or Typewriter Only)
1. Above form goes to Data Management Coordinator (DMC) 10 days prior to trip
2. If date of trip changes - note changed date, or mark "X" if cancelled
3. DAY AFTER TRIP, submit to Lee Crosby a short paragraph on site trip.

NOTES:
HEALTH DEPT. OFFICIAL CONTACTED: Dr. Rollins
BACK UP LETTER REQUIRED: Yes X No
notified Dr. Rollins on 12-21-89

North Carolina Department of Human Resources
**Division of Health Services**
**P.O. Box 2091 • Raleigh, North Carolina 27602-2091**

James G. Martin, Governor
Phillip J. Kirk, Jr., Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

25 November 1985

Ms. Colleen Kelley
HECLA Mining Company
P.O. Box 320
Wallace, Idaho 83873

Re: Preliminary Assessment of Tungsten Queen Mine

Dear Ms. Kelley:

Please find attached a copy of the Preliminary Assessment of the Tungsten Queen Mine. This assessment assigns a priority for inspection of the site based on its potential hazard to environment and/or population. As you can see from the assessment, a Low priority was assigned. The Tungsten Queen Mine facility will be inspected on a time available basis.

If you have any questions, please call me at (919) 733-2178.

Sincerely,

Grover Nicholson, Geologist
Solid and Hazardous Waste Management Branch
Environmental Health Section

GN/tb/0210b

Date: 6 August 1987

To: File

From: Grover Nicholson

Re: Tungsten-Queen Mine NCD 082 362 989

Colleen Kelley, Environmental Supervisor for Hecla Mining Company, called today and spoke with Lois Walker. She said that the Tungsten-Queen Mine in Vance County, North Carolina has been sold by Hecla Mining Company to Atlas Mine and Mill. The contact person at Atlas is Shawn Fzambathy, N. 1115 Havanna Street, Spokane, Washington, 99202, telephone (509) 535-2039.

North Carolina Department of Human Resources
**Division of Health Services**
**P.O. Box 2091 • Raleigh, North Carolina 27602-2091**

James G. Martin, Governor
Phillip J. Kirk, Jr., Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

13 December 1985

Perry Nelson, Chief
Groundwater Section
Division of Environmental Management

RE: Underground Storage Tank Removal

Dear Perry:

I received correspondence from Hecla Mining Company today concerning the removal of two subsurface tanks at the Tungsten-Queen Mine in Townsville, NC. I thought you would want to know about it so I am sending attached a copy of the letter and map of the site.

Sincerely,

Grover Nicholson, Geologist
Solid and Hazardous Waste Management Branch
Environmental Health Section

GN/tb/0210b

Attachment

Hecla Mining Company

December 9, 1985

Mr. Grover Nicholson
Solid and Hazardous Waste Management Branch
Environmental Health Section
North Carolina Dept. of Human Resources
P. O. Box 2091
Raleigh, North Carolina 27602-2091

Re: Tungsten-Queen Mine

Dear Mr. Nicholson:

Thank you for the copy of the Preliminary Assessment of the Tungsten-Queen Mine. For your records, we have just completed the removal of two underground fuel storage tanks at the Tungsten-Queen. A 600-gallon gasoline tank, which was installated the time of construction of the new mill approximately 1970, was removed and found to be dry. No leakage was observed. A second tank, estimated to be approximately 12,000 gallons and dating back to the original mill construction approximately 1942, was also removed. This tank was approximately half full of what appears to be diesel fuel with probably some water dilution. Again, no leakage was observed. Arrangements are currently being made for removal and disposal of the remaining diesel fuel. If you should have any questions about the tanks, please give me a call.

Sincerely,

Colleen D Kelley

Colleen D. Kelley
Environmental Supervisor

CDK:jr
xc: Howard Compton

P.O. Box 320, Wallace, Idaho 83873 • (208) 752-1251 • TELEX 326476

Hecla Mining Company

February 26, 1985

Mr. Grover Nicholson
North Carolina Division of Health Services
P.O. Box 2091
Raleigh, North Carolina 27602

Re: Tungsten Queen Property
Hecla Mining Company

Dear Mr. Nicholson:

As you previously requested by phone, I am transmitting to you the only analytical data in our possession on the Tungsten Queen tailings ponds. We have also included a short summary on the history of the mine and a process flow diagram.

Because of the sensitive nature of the ore reserve estimates in the Meyertons report, Hecla Mining Company formally requests that this report be classified as proprietary and confidential.

If you should decide to conduct water sampling of the area, please contact me at 208-752-1251 so that I may arrange to accompany you and collect samples for our own analysis. Also, if you should have any further questions on the property, please give me a call.

Sincerely,

Colleen D. Kelley

Colleen D. Kelley
Environmental Supervisor

CDK/jr
Enclosure

P.O. Box 320, Wallace, Idaho 83873 • (208) 752-1251 • TELEX 326476

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## HISTORY

### The Tungsten Queen Mine

The Tungsten Queen Mine is located at Tungsten, N.C., 16 miles northwest of Henderson, N.C. and 2 miles south of the Virginia state line. The ore occurs in a near vertical vein varying in width from a few inches to several feet. Huebnerite is the principal tungsten mineral and is accompanied by a minor amount of scheelite. Pyrite is the predominate metallic mineral found in the quartz veins and is accompanied by lesser amounts of chalcopyrite, galena, sphalerite, and tetrahedrite.

The property was discovered by Joseph and Richard Hamme in May 1942, while searching for strategic minerals for use in World War II. They worked the vein until 1944, then sold the property to Haile Mines, Inc. The mine was brought into production at a time when the U.S. was consuming twice as much tungsten as it was producing. The deposit was regarded as a unique national resource, and soon became the largest producer of tungsten in the country.

The mine reopened in May 1960, but closed again in 1963, when prices failed to improve.

An economic study of tungsten was conducted by Ranchers in 1966 which confirmed that the demand for tungsten was increasing. The Company's geologists immediately began a systematic search of existing tungsten deposits. The end result of this search was that, in 1968, Ranchers acquired an option to purchase the Hamme Mine, the most promising prospect encountered during this search.

The property was dewatered and ore reserves were evaluated. The results were reassuring, and in December the property was purchased and renamed the Tungsten Queen. Some 13 months later, after a period of intense activity which included repair and deepening of the main shaft, rehabilitation of existing drifts, and completion of engineering and metallurgical studies, ground was broken January 1970 for a new processing mill which was completed in August 1970.

By late October of 1970, the mill was in production. A very elementary process flowsheet for the mill is attached. Process flow problems coupled with falling tungsten prices forced the closure of the mill in August of 1971. Some of the alternatives examined after the shutdown included suggestions to modify the existing milling circuit to make it more efficient, and the possibility of reprocessing the previously deposited tailings. Although studies were done to examine both of these possibilities, nothing further than the initial studies were done.

The study, aimed at reprocessing the tailings, found the overall weight averaged tailings grade to be approximately 0.2% $WO_3$. Previous work done on the tailings indicated the overall average tailings grade to be on the order of 0.1% $WO_3$. A semi-quantitative analysis was performed on one of the higher grade tailings samples. The results of this analysis is attached. The amount of impounded tailings reported by this study was 2,038,000 tons.

JO RESCENT
X RAY
SPEC TROGRAPHIC
Analytical Laboratory

CONFIDENTIAL

718 Sherman Street (rear)
Denver, Colorado 80203
Phone 255-9396
Merlyn L. Salmon, Manager

XXXX QUALITATIVE
XXXX SEMI-QUANTITATIVE
_____ QUANTITATIVE

# ANALYTICAL REPORT

Job Number 18921
Page 2 of 2 Pages
Date 5 Nov 1975

TO:

R. Meyertons

SAMPLE: TQ Tailing Pit 10

NOTE: The values below are estimated percentages for the metal equivalent of the indicated elements. No check was made for elements with atomic numbers less than 22 (below titanium).

| | | | | | |
|---|---|---|---|---|---|
| Copper | 0.15 | Iron | 6.3 | Lanthanum | |
| Silver | 0.008 | Cobalt | | Cerium | |
| Gold | | Nickel | 0.008 | Praseodymium | |
| Zinc | 0.17 | Cesium | | Neodymium | |
| Cadmium | 0.006 | Rubidium | 0.11 | Samarium | |
| Mercury | | Barium | 0.012 | Europium | |
| Gallium | | Strontium | 0.005 | Gadolinium | |
| Indium | | Titanium | 0.13 | Terbium | |
| Thallium | | Zirconium | 0.011 | Dysprosium | |
| Germanium | | Hafnium | | Holmium | |
| Tin | | Thorium | | Erbium | |
| Lead | 0.18 | Vanadium | 0.008 | Thulium | |
| Arsenic | 0.003 | Columbium | | Ytterbium | |
| Antimony | 0.020 | Tantalum | | Lutetium | |
| Bismuth | | Chromium | 0.007 | Yttrium | |
| Selenium | | Molybdenum | 0.012 | | |
| Tellurium | | Tungsten | 0.34 | | |
| Bromine | | Uranium | | | |
| Iodine | | Manganese | 0.13 | | |

By Merlyn L. Salmon

NOTE: A PORTION OF THE REPORTED SAMPLES WILL BE RETAINED ON FILE FOR A PERIOD OF FIVE YEARS FROM THE ABOVE DATE. THE REMAINDER OF THE SAMPLE WILL BE RETAINED

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# A PRELIMINARY ESTIMATE

# OF

# TUNGSTEN CONTENT OF TUNGSTEN QUEEN TAILING

# FOR

# RANCHERS EXPLORATION & DEVELOPEMENT CORPORATION

1776 MONTANO ROAD

ALBUQUEQUE, N.M. 87107

Ralph Meyertons

November 15, 1975

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## INTRODUCTION AND SUMMARY

Ranchers Exploration and Developement Corporation requested a preliminary investigation of the the tungsten content of the Tungsten Queen Tailing pond.

Thirteen pits were excavated in the pond using a backhoe. Samples were taken from each pit for size and chemical analyses. A topographic map prepared by Aero Services Corporation for Ranchers in 1969 was used to estimate volume of material present. The pond is estimated to contain 2,038,000 tons of material averaging 0.218 % $WO_3$ for a total content of 445,600 STU $WO_3$. This is classed as a probable reserve rather than "proven" or "possible" reserve.

The tungsten is concentrated in the fine sands and slimes, with lessor concentrations in the coarse sands lying immediately below the former Tungsten Mining Corporation mill. A summary of the tungsten distribution is presented in table 1.

TABLE 1

DISTRIBUTION OF TUNGSTEN IN TUNGSTEN QUEEN TAILING

| ZONE | QUANTITY TONS | SIZE ANALYSES % -400 mesh | TUNGSTEN ANALYSES % $WO_3$ | CONTENT STU $WO_3$ |
|---|---|---|---|---|
| 1 | 80,000 | 4 | 0.239 | 19,100 |
| 2 | 600,000 | 6 | 0.088 | 52,900 |
| 3 | 600,000 | 45 | 0.251 | 150,600 |
| 4 | 383,000 | 80 | 0.410 | 157,000 |
| 5 | 375,000 | 5 | 0.176 | 66,000 |
| TOTAL | 2,038,000 | | 0.218 | 445,600 |

The pits ranged from five to eight feet deep, and did nowhere reach to the bottom of the sand. Pond material appears to be about thirty feet deep over most of the pond, increasing to forty feet in narrow zone under the 1970 tailing dam.

The data indicates that the value of the tungsten in the tailing is contingent upon developement of a process to recover minus 400 mesh size hubnerite and separate it from sericite & muscovite.

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## SAMPLING PROCEDURES

Pits were excavated in the tailing pond material with a backhoe. Depth of the holes ranged from five to eight feet depth. The holes dug in sand filled rapidly with water and the sides collapsed as the hole was excavated. Water table ranged from one to two feet. Pits in fine sand and slime did not backfill or collapse since the fine material has a very low permiability. Slime holes remained open for days.

Material excavated from the pits was piled adjacent to each hole. Sands were sampled with an auger, taking about 15 auger samples per pit. Slimes were sampled by cutting a vertical channel in each side of the pit. Each sample contained about ten pounds of material.

Individual samples were dried, lumps broken by passing through a riddle and cut down with a Jones splittor. About 150 grams of each was sent for analyses to Hazen Research Inc. The analytical laboratory pulverized each sample to minus 200 mesh with a Blueler mill prior to analyses. The thiocyanate colorimetric method was used to make the tungsten determination.

## TONNAGE FACTOR

The in place density of slime zone material was measured by a liquid displacement pocedure on solid pieces of slime. A factor of 23.5 cubic feet per ton was obtained. A factor of 20 cubic feet per ton was assumed for sands.

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## TUNGSTEN CONTENT OF THE TAILING POND

An estimate of the tungsten content of the tailing pond was prepared from analyses of thirteen pit samples and volume data indicated on the Aero Services Corporation map, a portion of which is shown as figure 1. The map indicates elevation at a number of locations on the surface of the sands as well as the approximate location of the former 275 foot contour under the pond material.

The analytical data was grouped to represent four zones of different size and composition. Zone 1, represented by pit 13, contains coarse sand relativly rich in tungsten at the base of the former Tungsten Mining Corporation mill. Zone 2, with seven pits, contains coarse sand carrying one to two pounds tungstic oxide per ton. It is located below the dam built in 1970 to impound tailing from the Ranchers' mill. Zone 3, with two pits, represents fine sand containing about five pounds tungstic oxide per ton. Zone 4, with three pits, represents the slime zone. The slimes carry seven to nine pounds tungstic oxide per ton. A fifth zone was defined as that material under water impounded by the 1970 dam. Analyses of this zone was eastimated from pits 1 and 13.

Data and calculations used to estimate tungsten content of each zone are shown in table 2. Location of the sample pits is indicated by the numbered circles on the topographic map.

## MINERALOGY

Coarse sands are composed mainly of quartz, with less than ten percent sericite and heavy minerals. Tungsten minerals are present as locked middling grains.

Fine sands and slimes are predominantly sericite and micas. Wood fiber constitutes one to three percent of the slime. Tungsten minerals, pyrite and other heavy minerals appear to be completly liberated.

## CORRELATION OF TUNGSTEN ANALYSES WITH SIZE

The graph illustrating the relationship of tungsten analyses to minus 400 mesh size, figure 2, indicates that tungsten content is related to slime content of an individual sample. This is not true of zone 1, where middlings predominate. Size data are presented in table 3. Chemical analyses by Hazen Research and X Ray analyses by Fluo X Spec Laboratory are appended.

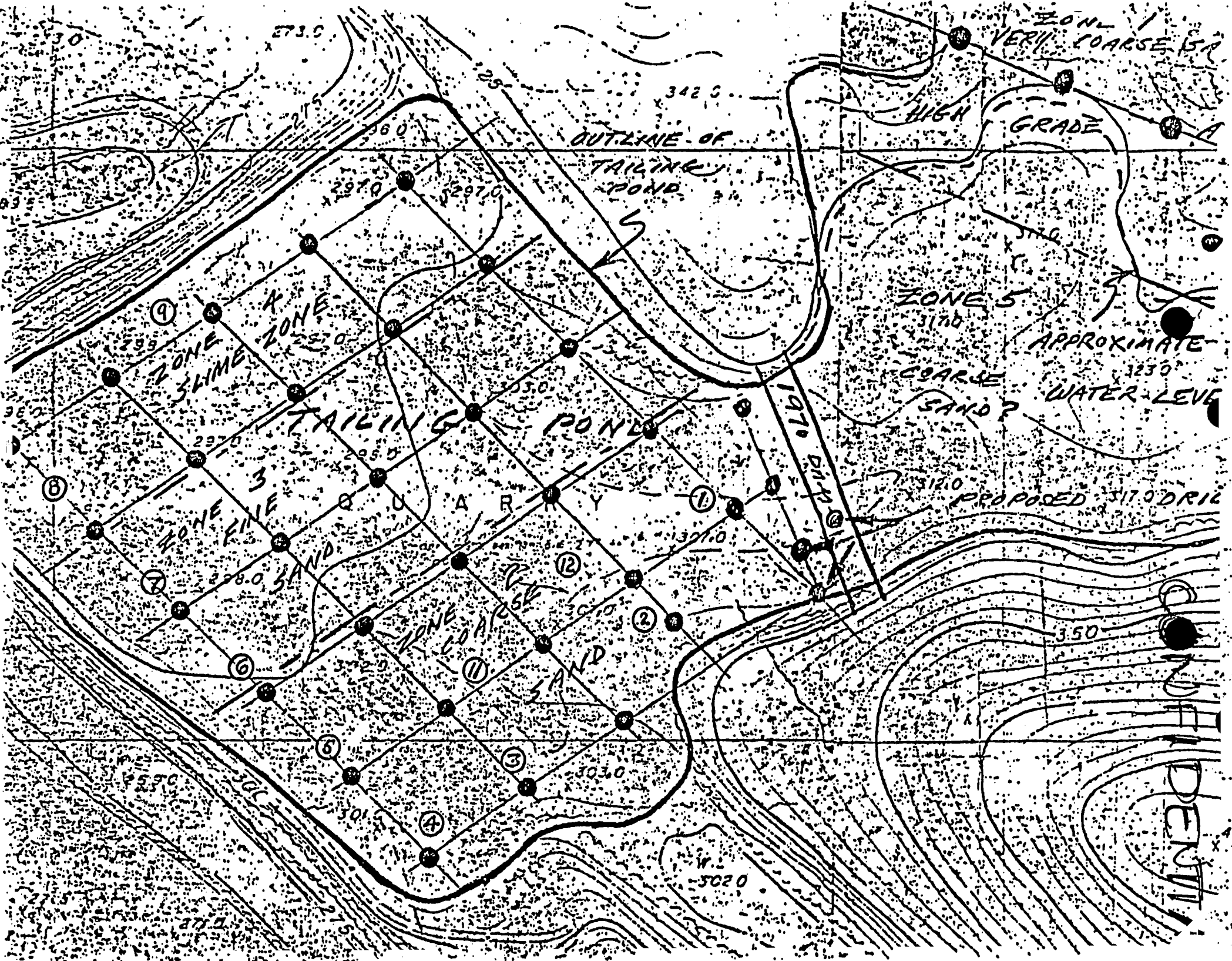
OUTLINE OF
TAILING
POND
ZONE 4
SLIME
ZONE
TAILING POND
ZONE 3
FINE SAND
BORROW
ZONE 2
COARSE
SAND
ZONE 1
VERY COARSE SAND
HIGH GRADE
ZONE 5
COARSE SAND
APPROXIMATE
WATER LEVEL
1970 DITCH
PROPOSED DRIC
DETAIL

TABLE 2

TUNGSTEN QUEEN TAILING POND

ESTIMATION OF PROBABLE TUNGSTEN RESERVE

| Material: | ZONE 1 Coarse Sand | | ZONE 2 Coarse Sand | | ZONE 3 Fine Sand | | ZONE 4 Slime | | ZONE 5 Coarse Sand | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PIT | % $WO_3$ | PIT | % $WO_3$ | PIT | % $WO_3$ | PIT | % $WO_3$ | PIT | % $WO_3$ | |
| | 13 | 0.239 | 1 | 0.114 | 6 | 0.249 | 8 | 0.389 | 1 | 0.114 | |
| | | | 2 | 0.088 | 7 | 0.253 | 9 | 0.388 | 13 | 0.239 | |
| | | | 3 | 0.065 | | | 10 | 0.453 | | | |
| | | | 4 | 0.099 | | | | | | | |
| | | | 5 | 0.112 | | | | | | | |
| | | | 11 | 0.069 | | | | | | | |
| | | | 12 | 0.070 | | | | | | | |
| Average Analyses | | 0.239 | | 0.0881 | | 0.251 | | 0.410 | | 0.1765 | 0.218 7 |
| Area of Zone, $ft^2$ | | 160,000 | | 400,000 | | 400,000 | | 300,000 | | 250,000 | |
| Estimated depth, ft | | 10 | | 30 | | 30 | | 30 | | 30 | |
| Volume, $ft^3$ | | 1,600,000 | | 12,000,000 | | 12,000,000 | | 9,000,000 | | 7,500,000 | |
| Tonnage Factor, $ft^3/t$ | | 20 | | 20 | | 20 | | 23.5 | | 20 | |
| Quantity, tons | | 80,000 | | 600,000 | | 600,000 | | 383,000 | | 375,000 | 2,038,000 |
| Tungsten Content, STU | | 19,100 | | 52,900 | | 150,600 | | 157,000 | | 66,000 | 445,600 |

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TABLE 3

TUNGSTEN QUEEN TAILING POND

TUNGSTEN AND SIZE ANALYSES- PIT SAMPLES

PERCENT WEIGHT

| PIT | ANALYSES %$WO_3$ | MESH | 10 | 14 | 20 | 28 | 35 | 48 | 65 | 100 | 200 | 270 | 400 | -400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.114 | Increm | 0.3 | 2.7 | 8.1 | 10.9 | 12.4 | 16.2 | 15.6 | 13.2 | 13.5 | 1.9 | 1.7 | 3.4 |
| | | Cumul. | | 3.0 | 11.1 | 22.0 | 34.4 | 50.6 | 66.2 | 79.4 | 93.0 | 94.9 | 96.6 | 100.0 |
| 2 | 0.088 | Increm | 0.6 | 3.6 | 9.6 | | 19.1 | 13.8 | 15.5 | 13.8 | 16.6 | 2.0 | 1.9 | 3.4 |
| | | Cumul. | | 4.2 | 13.8 | | 32.9 | 46.7 | 62.3 | 76.1 | 92.7 | 94.7 | 96.6 | 100.0 |
| 3 | 0.065 | Increm | 0.6 | 3.7 | 7.9 | 9.2 | 8.1 | 12.2 | 14.1 | 15.1 | 20.2 | 2.8 | 2.6 | 3.5 |
| | | Cumul. | | 4.3 | 12.2 | 21.4 | 29.6 | 41.8 | 55.9 | 71.1 | 91.1 | 94.0 | 96.5 | 100.0 |
| 4 | 0.099 | Increm | | | | | 11.8 | 5.2 | 8.3 | 13.7 | 38.9 | 8.2 | 7.2 | 6.6 |
| | | Cumul. | | | | | | 17.0 | 25.3 | 39.0 | 77.9 | 86.1 | 93.4 | 100.0 |
| 5 | 0.122 | Increm | | | | | 2.7 | 1.3 | 3.1 | 8.7 | 40.1 | 11.6 | 14.1 | 18.3 |
| | | Cumul. | | | | | | 4.1 | 7.2 | 15.9 | 56.0 | 67.6 | 81.7 | 100.0 |
| 6 | 0.249 | Increm | | | | | 0.2 | 0.2 | 0.6 | 2.9 | 24.3 | 10.4 | 19.5 | 42.0 |
| | | Cumul. | | | | | | 0.4 | 1.0 | 3.8 | 28.2 | 38.5 | 58.0 | 100.0 |
| 7 | 0.253 | Increm | | | | | | | 0.1 | 0.5 | 17.0 | 12.8 | 21.1 | 45.5 |
| | | Cumul. | | | | | | | | 0.6 | 17.6 | 30.4 | 54.5 | 100.0 |
| 8 | 0.389 | Increm | | | | | 0.1 | 0.1 | 0.1 | 0.1 | 4.5 | 5.4 | 20.6 | 69.1 |
| | | Cumul. | | | | | | 0.2 | 0.3 | 0.4 | 4.9 | 10.3 | 30.9 | 100.0 |
| 9 | 0.388 | Increm | | | | | | 0.1 | 0.1 | 0.2 | 2.6 | 2.9 | 13.5 | 80.6 |
| | | Cumul. | | | | | | | 0.2 | 0.4 | 3.0 | 5.9 | 19.4 | 100.0 |
| 10 | 0.453 | Increm | | | | | | | 0.1 | 0.1 | 1.4 | 1.8 | 9.6 | 87.0 |
| | | Cumul. | | | | | | | | 0.2 | 1.6 | 3.4 | 13.0 | 100.0 |
| 11 | 0.061 | Increm | 0.1 | 4.2 | 5.2 | 9.1 | 9.2 | 7.1 | 13.2 | 15.5 | 24.2 | 3.6 | 3.6 | 4.0 |
| | | Cumul | | 4.3 | 9.5 | 18.6 | 27.8 | 34.9 | 48.1 | 63.5 | 88.7 | 92.3 | 96.0 | 100.0 |

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TABLE 3 Continued

| PIT | ANALYSES % $WO_3$ | MESH | 10 | 14 | 20 | 28 | 35 | 48 | 65 | 100 | 200 | 270 | 400 | -400 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | 0.070 | Increm | 0.6 | 3.8 | 8.1 | 9.5 | 9.2 | 12.7 | 14.9 | 14.8 | 18.4 | 2.4 | 2.3 | 3.3 |
| | | Cumul. | | 4.4 | 12.6 | 22.1 | 31.2 | 43.9 | 58.8 | 73.7 | 92.1 | 94.6 | 96.7 | 100.0 |
| 13 | 0.239 | Increm | 0.6 | 3.3 | 7.7 | 11.3 | 12.5 | 16.2 | 15.7 | 12.0 | 13.0 | 1.6 | 1.8 | 4.2 |
| | | Cumul. | | 3.9 | 11.7 | 23.0 | 35.5 | 51.7 | 67.4 | 79.4 | 92.3 | 94.0 | 95.8 | 100.0 |

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TUNGSTEN QUEEN TAILING

RELATIONSHIP OF TUNGSTEN CONTENT TO SIZE ANALYSES

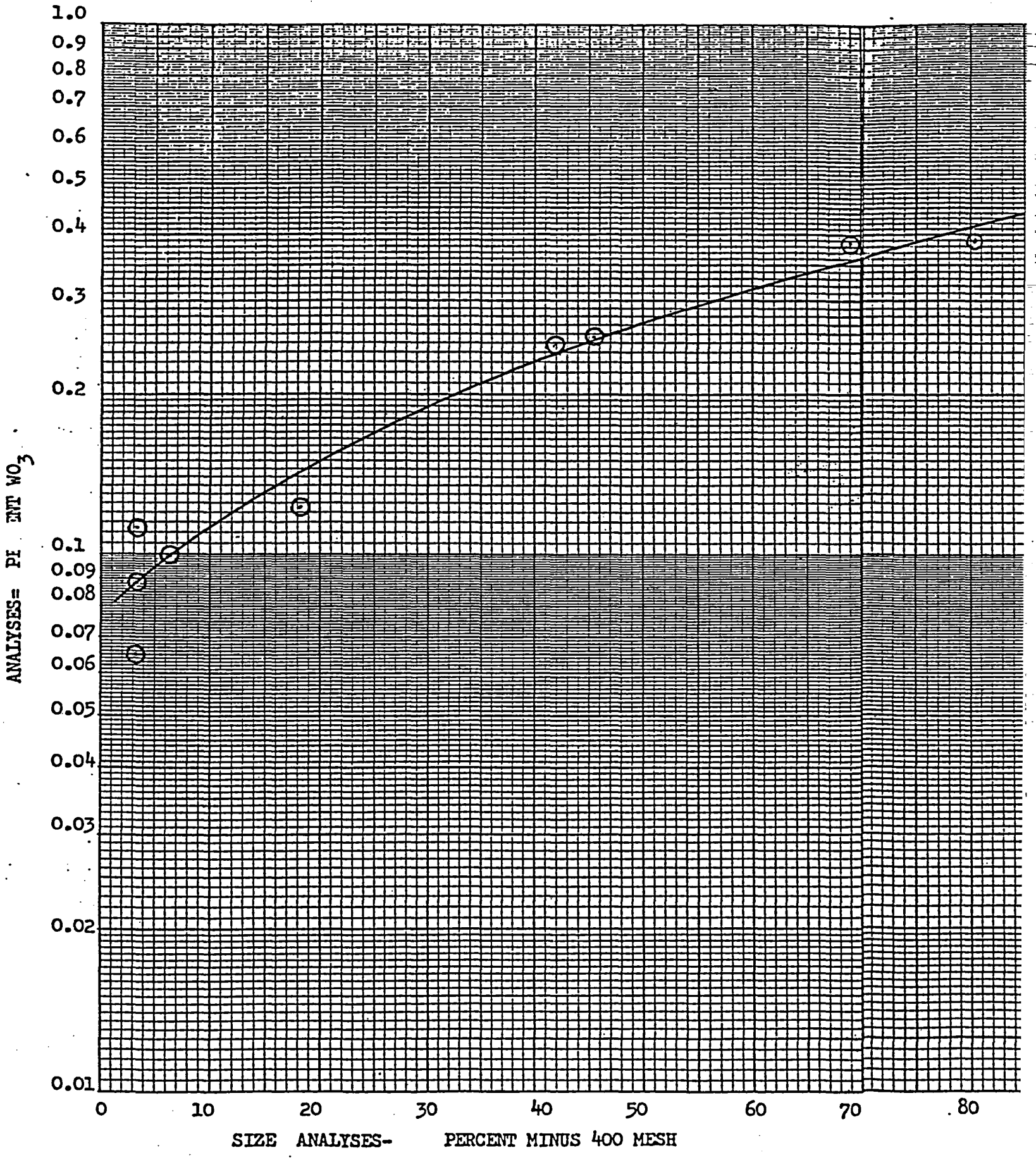


FIGURE 2

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# HAZEN RESEARCH, INC.

4601 INDIANA STREET
GOLDEN, COLORADO • 80401
TELEPHONE 303/279-4501

## REPORT OF ANALYSIS

Mr. Ralph Meyertons
Box 160
Townsville, North Carolina 27584

Date: November 6, 1975

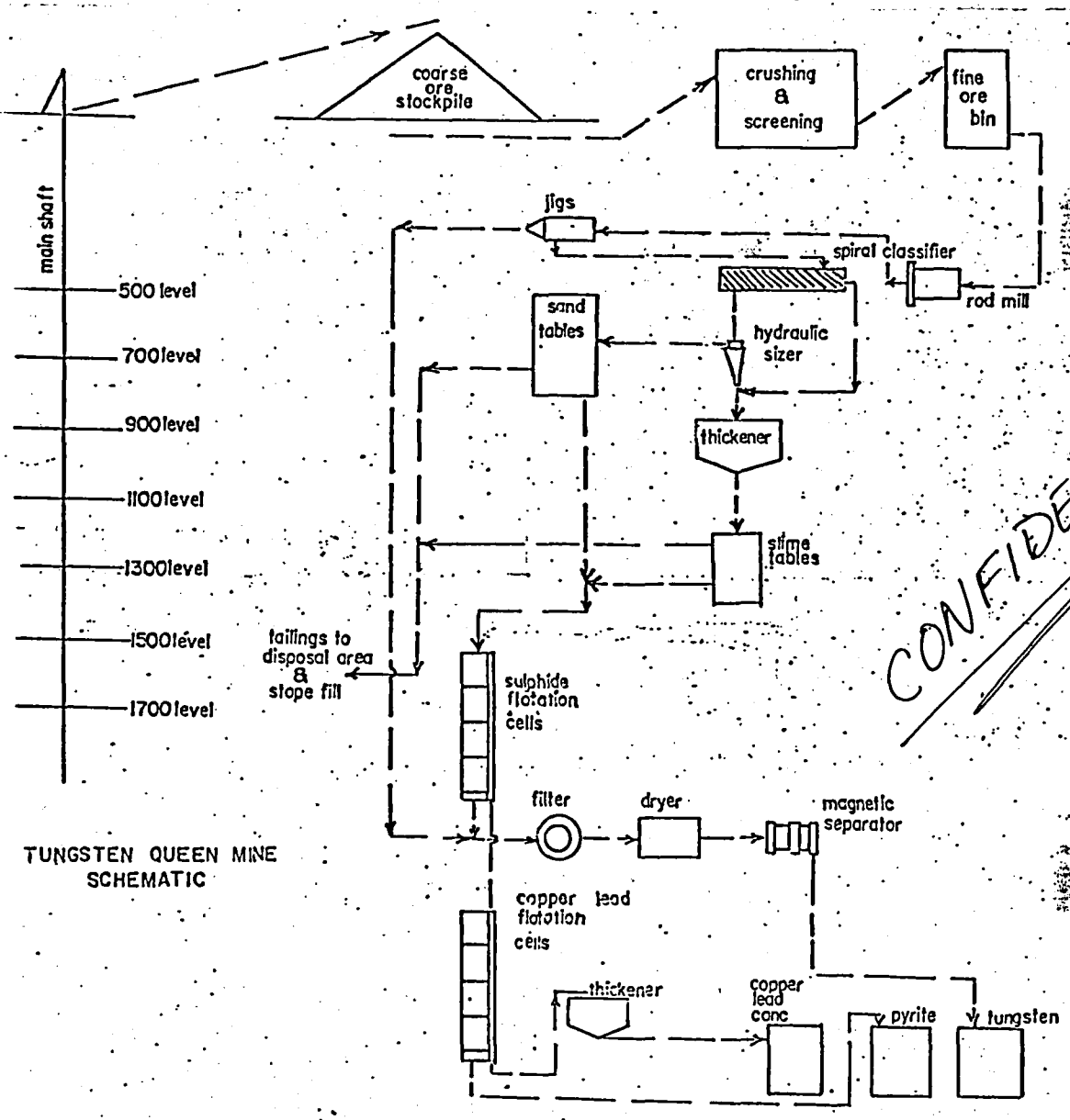
HRI Project No. 1618-04
HRI Series No. 8863
Samples Rec'd 10/31/75

| Analysis No. | Sample Designation | % $WO_3$ |
|---|---|---|
| 8863-1 | TQ Tail Pit 1 | 0.114 |
| -2 | TQ Tail Pit 2 | 0.088 |
| -3 | TQ Tail Pit 3 | 0.065 |
| -4 | TQ Tail Pit 4 | 0.099 |
| -5 | TQ Tail Pit 5 | 0.122 |
| -6 | TQ Tail Pit 6 | 0.249 |
| -7 | TQ Tail Pit 7 | 0.253 |
| -8 | TQ Tail Pit 8 | 0.389 |
| -9 | TQ Tail Pit 9 | 0.388 |
| -10 | TQ Tail Pit 10 | 0.453 |
| -11 | TQ Tail Pit 11 | 0.061 |
| -12 | TQ Tail Pit 12 | 0.070 |
| -13 | TQ Tail Pit 13 | 0.239 |

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

eam

DJB PCB FILE

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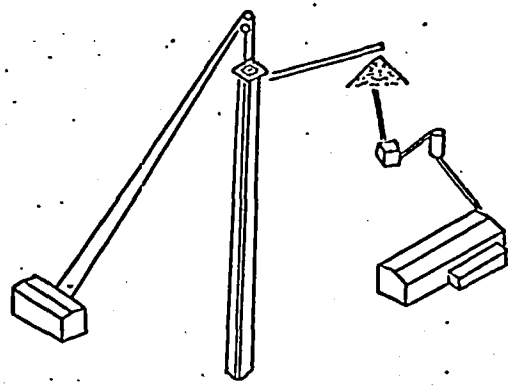
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