

Health Consultation

ROSS METALS INCORPORATED

ROSSVILLE, FAYETTE COUNTY, TENNESSEE

EPA FACILITY ID: TND096070396

SEPTEMBER 20, 2002

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the consultations previously issued.

You May Contact ATSDR TOLL FREE at
1-888-42ATSDR

or

Visit our Home Page at: <http://www.atsdr.cdc.gov>

HEALTH CONSULTATION

ROSS METALS INCORPORATED

ROSSVILLE, FAYETTE COUNTY, TENNESSEE

EPA FACILITY ID: TND096070396

Prepared by:

Tennessee Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

BACKGROUND AND STATEMENT OF ISSUES

Ross Metals, Inc. (RMI) is an inactive secondary lead smelter that has been designated as a National Priorities List (NPL) Superfund site. It is located on 5 acres of land at 100 North Railroad Street in Rossville, Fayette County, Tennessee. It is bordered by a residential property to the east, the Southern Railroad tracks and Kellogg Corporation property to the south, woodland and wetlands to the north, and a municipal wastewater treatment plant to the west. A site layout is contained in Figure 1.

From 1979 until June 1992, RMI operated a secondary lead smelter at the site and disposed of the residual blast slag in an on-site landfill. These activities—plus improper storage and disposal practices—resulted in contamination of the site. Several substances were identified as being the primary contaminants of concern, including antimony, arsenic, and lead.

The U.S. Environmental Protection Agency (EPA) has conducted numerous inspections and sampling investigations at the site. Figure 2 contains an EPA activities time line. A public health assessment prepared by the Agency for Toxic Substances and Disease Registry (ATSDR) identified the high concentrations of lead at the RMI site as public health hazard. In October 1994, EPA began a Superfund Time Critical Removal of soil which continued through June 1995 (ATSDR 1999).

During the remediation, soil in an adjacent residential yard was sampled and analyzed to determine if the contamination had extended outside the RMI site. In May 1995, EPA requested ATSDR review and comment on the soil samples. ATSDR determined the level of lead (950-1,740 milligrams per kilogram [mg/kg]) in the soil exceeded levels recommended as protective of human health. ATSDR advised that the residents should be dissociated from the contaminated soils. In June 1995, an unspecified quantity of soil was placed in the residential yard closest to the site to mitigate exposure to the contamination. Because of their unstable condition, other vacant houses along Railroad Street were condemned by the city's building inspector (ATSDR 1999). In April 1999, only four houses remained occupied along Railroad Street. As of September 2002, only two houses appeared to be occupied. Of those two, three children who are under 10 years of age live in one of the houses.

On August 21, 2002, Benjamin Moore, Regional Representative for ATSDR, and Loretta Bush, Community Health Specialist for ATSDR, placed a conference call to Bonnie Bashor, the Director of Environmental Health Studies and Services with the Tennessee Department of Health (TDH). The purpose of the call was to discuss health issues and concerns regarding the ongoing remediation of the RMI site. The conference call stemmed from an earlier conversation between ATSDR and EPA. That conversation involved health concerns voiced by the residents during a July 2002 EPA meeting in which Phase II Remedial Work was discussed. With regard to the activities presently taking place at RMI, ATSDR requested during the conference call that TDH and ATSDR jointly visit the site to determine if possible health concerns or issues exist for the

family living in the closest house—particularly with respect to the children—during the remedial work activities by EPA.

DISCUSSION

Lead in Surface Soil

Lead is a naturally occurring, bluish-gray metallic element found in small amounts throughout the earth's crust. Lead has no taste or color. Lead does not dissolve in water, nor does it burn. Lead can form compounds—either naturally or manufactured—that have different physical properties. Lead has been widely used in batteries, ammunition, electronic circuitry, pipes, solder crystal, paint, fuel, and medical equipment. In the past 30 years, lead use has been reduced in products that frequently contact people or the environment. In fact, lead has been phased out of most pipes, paint, and fuel (ATSDR 1999a).

Lead exposure can be through ingestion, inhalation, or through dermal exposure, i.e., skin contact. Dermal exposure to lead is thought to be a minimal health risk. Inhalation of lead-contaminated dust is a greater health threat as it readily passes from the lungs into the blood. If consumed, differing percentages of lead will be absorbed into the blood, depending on the individual's age, types of food eaten, and the chemical form of the lead. Basically, children with empty stomachs absorb greater amounts of lead than any other group. The body can store lead in bones and teeth. Adults can eliminate as waste 99% of lead that enters their bodies. Children, however, are only able to eliminate 32% of lead that enters their bodies (ATSDR 1999a).

The nervous systems in both adults and children are lead's main target. Lead can affect nervous system function and cause weakness in long bone structures, such as wrists and ankles. There is inconclusive evidence that lead increases blood pressure. High levels of lead can damage the brain and kidneys. Children are much more sensitive to lead than are adults. Children can develop anemia, kidney damage, colic, muscle weakness, and brain damage from lead exposure. Lead poisoning is not thought to cause cancer in humans. (ATSDR 1999a). That said, however, lead is listed as a Group B2 probable human carcinogen by the EPA (ATSDR 2002).

On September 11, 2002, Benjamin Moore and Loretta Bush of ATSDR, together with Bonnie Bashor, David Borowski, and Carol Pope of THD, made an on-site visit to RMI. The agency staff also met with the family living closest to the site at their residence. One resident reported she had lived in the home during the pregnancies of three children. She stated that the children were born prematurely at 4, 6, and 8 months. She was concerned that the family could be experiencing health effects due to lead exposure from the RMI site. Purportedly about 5 or 6 years ago, the local health department tested all three children for blood lead levels. Only one child had a slightly elevated blood lead level (13 µg/dL).

The mother described this child as hyperactive, impatient, as having comprehension difficulties, and at times displaying slurred speech. Also, she said this child has a tendency to read backwards, and that the school has suggested she be placed in a special education class. Additionally, she stated her other daughter complains of “bad” headaches (at least 3 to 4 times daily), has constant nosebleeds, and has multiple allergies.

Describing her personal health issues, the mother reported headaches, respiratory problems and frequent fatigue. She was recently seen by a physician at the Collierville Family Medicine Clinic. According to the mother, the physician indicated she has some sort of “spots” on her lungs that could be scarring from pneumonia. After she informed the physician that she lived next to a former lead smelter site, she said he realized many of her symptoms could be related to possible lead exposure. Consequently, additional testing was ordered; but the mother said the results were within the normal range, except for low iron.

Other members of the family did not indicate any health concerns except the grandmother, who has hypertension and diabetes. No other young children who are less than six years of age visit the home regularly.

The following synopsis represents the family’s comments and concerns:

- The EPA did not remove and replace the soil in their yard, which is adjacent to the cleanup site. EPA only brought in soil to cover up the existing soil in their yard.
- A yard drainage problem is clearly evident, and the residents speculate about runoff from the cleanup site.
- The local health department did not provide the residents with the educational materials they were told they would receive.
- EPA had initially informed the residents that the remediation would take approximately 6 months.
- The residents are concerned that lead contamination could be causing adverse health effects.

The Tennessee Department of Health screened six areas of the residence for lead detection, using Lead Check swabs. Lead Check Swabs were used for qualitative measurement. Lead Check Swabs will indicate the presence of lead as low as 1-2 micrograms. Data is summarized as follows:

QUALITATIVE LEVELS OF SOIL
September 11, 2002

Sample Site	Lead Concentration (ppm)
Driveway	Not Detected
Front Porch	Not Detected
Picnic Table	Not Detected
Fence (directly borders the site)	Detected
Side of House Facing the Site	Detected
Inside Filter (A/C Unit)	Not Detected

Sampling areas were chosen to represent the full scope of the residence. This was to determine if existing remediation activities at the RMI site might pose any current health hazard to the family.

Soil was analyzed in six areas on the residence's small lot, which is not only adjacent, but is connected to the RMI Superfund site. See Figure 3. Of the six areas, only two—the fence and the side of the house—showed the presence of lead. Both of these areas are nearest the RMI remediation mound.

The EPA Superfund contractors continue with Phase II remediation activities and have reportedly been on site at RMI for approximately 1½ months. The soil removed from the immediate site has been covered with tarps, and the dirt mounds appeared to be watered regularly to reduce possible contamination via airborne dispersal. No dust was observed during the site visit, nor did the family report any dust problems.

In May 1998, ASTDR conducted an exposure investigation, collecting surface soil and dust wipe samples from the residence. None of the environmental samples exceeded the EPA screening level of 400mg/kg (ATSDR 1999). Nevertheless, the Lead Check testing that was completed September 11, 2002, suggested recontamination of lead from an unknown source. According to ASTDR Public Health Advisor Benjamin Moore, plans are underway to add an unknown quantity of soil cover and reseed the family's yard. Grass cover on areas of lead contamination mitigates exposure to lead by keeping dust from being inhaled. It also limits the amount of soil that inadvertently gets on the fingers of playing children, thereby decreasing the ingestion rate of any lead-contaminated soil.

The ASTDR and TDH staff observed standing water in various areas of the yard, particularly the back portion of the lot closest to the RMI site. Potentially, water could be eroding, leaching, or both from the remediation mound of contaminated material onto the family's property.

Blood Lead Testing

In May 1998 ASTDR conducted an exposure investigation at the family's residence which, again, is adjacent to—and on the east side connected to—the RMI site. Six members of the household were tested for blood lead levels (BLL). Three of the test subjects were children. One of the children, age 1, was shown to have a blood level of 13 µg/dL. The Centers for Disease Control and Prevention (CDC) considers a level of lead above 10 µg/dL to be of concern. This child apparently did not reside at the home according to the report. But whether the elevated blood level can be completely associated to the past exposure from the RMI site is not known. Homes in the vicinity were shown to have lead-based paint on their walls and old cars stored on their lots. Both represent a potential source of lead. The actual source for the elevated BLL was, however, undetermined (ATSDR 1999). During the site visit in September 2002, residents said the infant with the elevated blood lead levels could have been another niece who visits regularly. The test results for the other five household members were within normal limits for blood lead.

The data does not establish whether the blood tested was obtained via capillary or venous means. Capillary blood levels have been shown to have a very high false positive rate. This means the reported level is higher than 10µg/dL when the levels in the circulatory system are actually below that.

Inquiries have been made at the local health department in an attempt to obtain the results of the blood level tests performed in May 1998. The Fayette County Health Department reports the family did not have their tests performed here. Other inquires have not been successful in obtaining these results.

To establish baselines for monitoring purposes during this portion of the remediation process at the RMI site, lead blood levels were obtained on the three children who are less than 10 years of age. Blood was drawn by the Fayette County Health Department on October 8, 2002. The blood was drawn intravenously to assure a more accurate analysis.

The children tested well below the 10 µg/dL (micrograms per deciliter) level that CDC considers of concern. The results ranged from 1.6 to 4.4 µg/dL.

ATSDR Child Health Initiative

In 1996 ATSDR initiated an agency-wide emphasis on environmental hazards to children's health, and an emphasis on child health in all agency activities. The initiative was in recognition of the special vulnerabilities of children when they are exposed to hazardous substances.

Children, especially those 6 years of age or younger, are more sensitive to the effects of lead than are adults. Even at low levels of lead exposure, a child's mental and physical growth could be impaired. Levels of 10 μ /dL in children's blood have been associated with decreased IQ, impaired hearing and growth, and some neurological effects. And neurological effects have been shown to persist even after exposure has ceased and blood levels have returned to normal. The reported symptoms of neurological effects include poor memory, difficulty reading and concentrating, depression, and sleep disturbances.

Establishing a baseline blood level for comparison emphasizes the commitment by ATSDR to the child health initiative. ATSDR can then follow and monitor the children at regular intervals to ensure the risk to recontamination from the RMI remediation is readily recognized and promptly addressed.

CONCLUSIONS

1. No apparent health hazard exists for the family residing adjacent to the site.
2. Of the six areas tested at the residence, only two tested positive for lead.

RECOMMENDATIONS

1. Continue to prevent migration of lead contamination off site.
2. Continue with plans to remediate the residence yard.

PUBLIC HEALTH ACTION PLAN

1. Obtain the children's lead blood levels at the onset of remediation phase, in 3 months, and again at 6 months or the end of the clean up, whichever occurs first.
2. Provide education material to support and reduce the risk of recontamination to the family, especially the children.

REFERENCES

[ATSDR] Agency for Toxic Substances and Disease Registry]. 2002. Health guidelines comparison values. Atlanta: US Department of Health and Human Services.

[ATSDR] Agency for Toxic Substances and Disease Registry. 1999. Public health assessment for Ross Metals Incorporated. Atlanta: US Department of Health and Human Services.

[ATSDR] Agency for Toxic Substances and Disease Registry. 1999a. Toxicological profile for lead. Atlanta: US Department of Health and Human Services.

[EPA] US Environmental Protection Agency. 1998. Clarification to the 1994 revised interim soil lead guidance for CERCLA sites and RCRA corrective action facilities. Washington, DC: EPA/540/F-98/030.

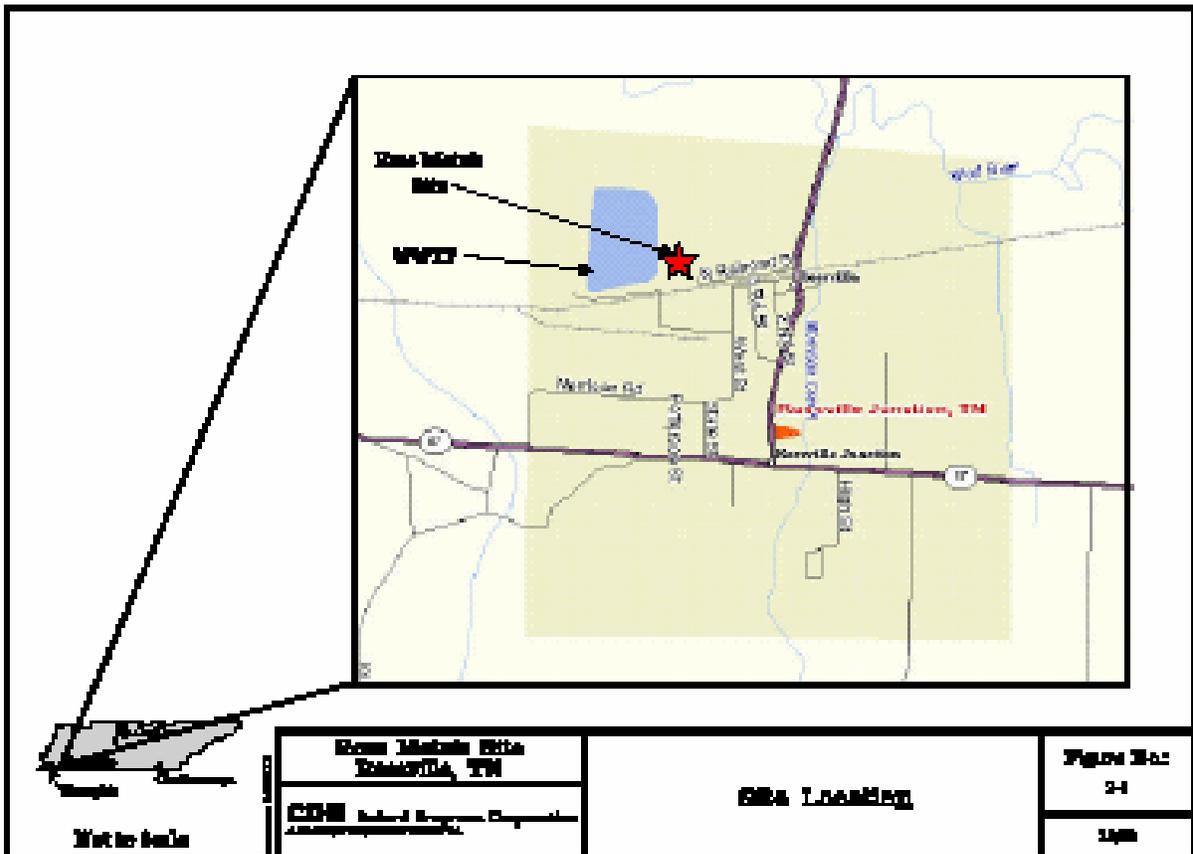
REPORT PREPARED BY

Ms. Bonnie Bashor, Director of Environmental Health Studies and Services
Ms. Carol Pope, Nurse Consultant
Tennessee Department of Health
Division of Communicable and Environmental Disease Services
4th Floor Cordell Hull Building
425 5th Avenue North
Nashville, TN 37247-4911

ATSDR TECHNICAL PROJECT OFFICER

Mr. Alan Yarbrough
Division of Health Assessment and Consultation
Superfund Site Assessment Branch

Figure 1
SITE MAP FOR ROSS METALS, INC.



**FIGURE 2
ACTION TIME LINE OF ACTIVITIES
FOR ROSS METALS, INC.**

TIME LINE FOR ROSS METALS, INCORPORATED	
<u>DATE:</u>	<u>ACTIONS TAKEN:</u>
November 1988	<ul style="list-style-type: none"> • RMI submitted a Resource Conservation Recovery Act (RCRA) Part B Application for disposal of blast furnace slag into an on-site landfill
December 7, 1988	<ul style="list-style-type: none"> • EPA conducted a sampling investigation to determine if the waste generated by the facility should be regulated
May 9, 1990	<ul style="list-style-type: none"> • EPA conducted another sampling investigation to determine if the smelting and landfill activities at the site were causing adverse environmental impacts
June 1990	<ul style="list-style-type: none"> • The RCRA part B application was denied when blast slag was classified by EPA as a hazardous waste
September 1990	<ul style="list-style-type: none"> • A Complaint and Compliance Order was issued against RMI
November 28, 1990	<ul style="list-style-type: none"> • EPA conducted a site investigation at RMI. Results indicated lead contamination in all media sampled
June 22, 1992	<ul style="list-style-type: none"> • RMI ceased operations
June 1994 through December 1998	<ul style="list-style-type: none"> • Houses along Railroad Street (not being owned by residents) were condemned
October 1994 through June 1995	<ul style="list-style-type: none"> • EPA conducted a Superfund Time-Critical Removal of soil. Soil in an adjacent residential yard was sampled for lead contamination
May 1995	<ul style="list-style-type: none"> • EPA requested ATSDR review and comment on the soil samples taken from the residential yard which is near the RMI site
May 1995	<ul style="list-style-type: none"> • ATSDR determined the lead level in the yard (950-1,740 milligrams per kilogram) exceeded the recommended levels protective of human health
June 1995	<ul style="list-style-type: none"> • An unspecified quantity of soil was remediated in the residential yard
June 1995	<ul style="list-style-type: none"> • EPA conducted a Superfund pre-remedial Investigation

December 1995	<ul style="list-style-type: none"> • EPA asked ATSDR to suggest environmental sampling, with special emphasis on homes occupied by children
November 1996	<ul style="list-style-type: none"> • EPA conducted a Superfund Remedial Site Characterization
January 1997	<ul style="list-style-type: none"> • EPA held a public meeting in Rossville to address concerns about the site
June 1997	<ul style="list-style-type: none"> • ATSDR headquarters staff visited the RMI site area and gathered data for a Public Health Assessment
April 21, 1998	<ul style="list-style-type: none"> • ATSDR and Tennessee Department of Environment and Conservation (TDEC) held a public meeting to explain the Exposure Investigation
May 1998	<ul style="list-style-type: none"> • ATSDR conducted an Exposure Investigation
January 7, 1999	<ul style="list-style-type: none"> • ATSDR completed and issued report of the Exposure Investigation
June 8, 1999	<ul style="list-style-type: none"> • Public Health Assessment completed
July 2002	<ul style="list-style-type: none"> • Contractors began Phase 2 of remediation of RMI site
September 11, 2002	ATSDR and TDH completed the site visit for the Health Consultation

**FIGURE 3
RESIDENCE IN RELATIONSHIP TO RMI SITE**



(Photo credit: David Borowski, TDH)

**FIGURE 4
REMEDIATION ACTIVITIES AT THE RMI SITE**



(Photo Credit: David Borowski, TDH)

CERTIFICATION

This Ross Metals Incorporated Health Consultation was prepared by the Tennessee Department of Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health consultation was begun.

Alan W. Yarbrough

Technical Project Officer, SPS, SSAB, DHAC, ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

Roberta Erlwein

Chief, State Program Section, SSAB, DHAC, ATSDR

Electronic Document