HEALTH CONSULTATION

Carolina Steel Fabrication Facility
ALD004027579
Montgomery, Montgomery County

Prepared by:

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

Foreword

The Agency for Toxic Substances and Disease Registry (ATSDR) was established by Congress in 1980 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also called the *Superfund* law. That law set up a fund to pay for identifying and cleaning up our country's hazardous waste sites. The United States Environmental Protection Agency (EPA) and state environmental agencies oversee the site investigation and clean up actions. Historically, public health assessments and health consultations are conducted by environmental and health scientists from ATSDR. In 1993, the Alabama Department of Public Health (ADPH) entered into a cooperative agreement with ATSDR, the goal of which was that ADPH would develop the capacity to perform this function for ATSDR.

Public health assessments seek to discover whether people are being exposed to hazardous substances. If people are exposed or have the potential to be exposed, ATSDR decides whether the exposure is harmful and at what level health effects might occur. From these data, a decision can be made whether the exposure should be stopped or reduced.

Exposure: ADPH health assessors review environmental data to see how much contamination is at a site, where it is, and how people might come into contact with it. ADPH does not typically collect and analyze environmental samples, but, instead, reviews sampling data provided by EPA, other government agencies, businesses, or the public. When there is not enough environmental information available, the assessment will indicate that further sampling data are needed.

Health Effects: If the review of the environmental data shows that people have or could come into contact with hazardous substances, ADPH scientists evaluate whether that exposure may result in harmful effects. ADPH, as well as ATSDR, recognizes that children, because of their play activities and their smaller body size, may be most susceptible to these effects. As a policy, unless data are available to suggest otherwise, ADPH health professionals responsible for assessing effects in populations consider children to be more sensitive and vulnerable to hazardous substances. Thus, the health impact to children is considered first when evaluating the health threat to a community. The health impact to other high risk groups within the community (i.e., elderly, those with compromised immune systems, chronically ill, and women of child-bearing age) also receive special attention during the evaluation.

ADPH uses existing scientific information that can include the results of medical, toxicological, and epidemiologic studies and disease registry data to determine the health effects that may result from exposure. The science of environmental health is still developing, and sometimes scientific information on the health effects of certain substances may not be available. In such cases, the report will document the need for further data collection activities.

Conclusions: The report assigns a public health hazard category and describes any hazards at the site. It contains a public health action plan that recommends ways to stop or reduce exposure. Because ATSDR is an advisory agency, the report identifies actions that are appropriate for EPA, other responsible parties, or the research or education divisions of ATSDR to conduct. However, if there is an urgent public health hazard, ATSDR can issue a public health advisory to warn

people of the danger. When appropriate, ATSDR also authorizes health education or pilot studies of health effects, full-scale epidemiology studies, diseases registries, surveillance studies, or research on specific hazardous substances.

Interactive Process: The development of a health assessment or consultation is an interactive process. The approach requires accumulation of information from many sources, including, but not limited to: ATSDR; many city, state, and federal agencies; the companies responsible for cleaning up the site, the principal responsible party (PRP), and the community. Once an assessment has been completed, the conclusions are shared with all interested parties. They are asked to comment on an early draft of the report to make sure the data they provided are presented correctly and responsibly. Sometimes agencies will begin to carry out recommendations when they read the draft conclusions and recommendations.

Community: ADPH needs to determine what people in the area know about the site and what health concerns they may have about the site. Therefore, ADPH gathers information and comments from the public. The public is broadly defined to include people who live or work nearby, property owners, business owners, civic leaders, health professionals, community groups, and anyone else who is interested or concerned. The public is asked to comment on a draft of the report to ensure that the report addresses their health concerns. The final report contains a written response to public comments.

Comments: If you have questions or comments after reading this report, please send them to the

Alabama Department of Public Health
201 Monroe Street, Suite 1470
Montgomery, Alabama 36104.

Summary and Statement of Issues

A letter dated October 8, 2003, from the Alabama Department of Environmental Management (ADEM) requested that the Alabama Department of Public Health (ADPH) review environmental data relative to the Carolina Steel Fabrication Facility (CS) to determine if further investigation was necessary. Analysis from surface water and sediment samples collected from the Alabama River, Catoma Creek, and an unnamed tributary near the Carolina Steel Fabrication Facility were attached to the request.

Surface water sample results showed the presence of metals and chlorinated hydrocarbons exceeding comparison values set by the Agency for Toxic Substances and Disease Registry (ATSDR). The contaminants present in the various media are arsenic, cadmium, chloromethane, chromium, lead, mercury, methylene chloride, cis-1,2-dichloroethene, and trichloroethylene. Sediment samples showed elevated level of metals. In addition, volatile organic compounds (VOC)s have been detected in the public water supply wells north of the CS site, but are not at levels of health concern. Based on the current data, this site is categorized as posing no apparent public health hazard.

Background

The Carolina Steel Fabrication Facility (CS) is an active metal fabrication facility in western Montgomery, Montgomery County, Alabama. It has been in operation since 1995. An aerial view of the facility is shown in Figure 1. The approximately twenty (20) acre site consists of an office building, a maintenance building, a blast house building, and a total of eight high-bay prefabricated metal assembly buildings. The two story office building houses the administrative offices. The maintenance building is used for facility maintenance. It contains maintenance equipment, parts, drummed lubricating oil, and two parts washers. The blast house is currently not used and was historically used for sandblasting. Sandblasting is conducted, on occasion, outside of the blast house. Steel bridge girders are constructed in the eight high-bay buildings. The fabrication process includes cutting, welding, priming, and painting of the steel (1).

The immediate vicinity of the site is comprised of commercial and industrial facilities. Bordering CS to the west is Qualico Misc., Inc. (formerly RSC/Stairco), which is a metal fabrication facility. To the north is a vacant and wooded area. McInnis Corporation is located across Parker Street; southwest of CS. The site is bordered to the east by PM Agriculture, BFI, and Southeast Airgas. PM Agriculture produces cattle feed. BFI is a waste disposal company, and Southeast Airgas distributes industrial gases. To the south, CS is bordered by Thomason Street. The site is fenced and not accessible to the public. The nearest residence is located approximately 1700 feet to the north of the site. Catoma Creek is located about a mile from the site. There are no schools or day care facilities onsite or within 200 feet of the site (1,2).

The City of Montgomery Industrial Board purchased the Carolina Steel site from the United States Government in 1963. The U.S. Government obtained ownership of the site prior to 1940. The site is currently leased by CS, which is classified as a Small Quantity Generator that produces approximately 500 pounds of hazardous waste per month. Wastes containing hazardous constituents generated at the facility include paint residue, unused paints, and spent solvents. CS

has operated at the site since purchasing the operation from Trinity Industries in October of 1995. Trinity Industries operated a metal fabrication facility at the site from 1988 until 1995. From 1985 through 1987, Gamble's Steel Fabrication and Mosher Steel operated at the site. Aesco Steel operated at the site from 1974 until 1985, and prior to 1974, the site was undeveloped.

Based on newspaper articles, during the government ownership of this land, repair and painting of military machinery, vehicles, and equipment was performed. Products believed to have been used include: oils, grease, gasoline, paints and other solvents.

A Phase I Environmental Site Assessment (ESA) was performed by American Testing and Engineering Corporation (ATEC) in August 1995. Based on previous operations held at the site, ATEC recommended that soil and groundwater samples be collected. In September 1995, a Phase 2 ESA was conducted during which additional soil and groundwater samples were collected. As a result of the Phase 1 and Phase 2 ESA, a work-plan was developed outlining additional sampling activities. Mid-Atlantic Associates began sampling Carolina Steel in April 1999 and has continued assessing and monitoring the site (1,2).

Community Health Concerns

Due to the potential industrial impact to the groundwater and the vicinity of public water supply wells which supply drinking water to residents of Montgomery, ADEM conducted a Site Investigation at this facility. Although fishing occurs along Catoma Creek, there are no citizens actively involved at this site and no community concerns have been voiced.

Discussion

Between April and June 1999, Mid-Atlantic Associates conducted a Site Assessment. The Site Assessment included the installation of 9 monitoring wells, collection of 16 soil samples, and the collection of 19 groundwater samples. Numerous sampling events took place between April 1999 and June 2000. In June 2000, Mid- Atlantic Associates conducted additional assessments at CS by installing 15 additional monitoring wells – 8 shallow, 4 intermediate, and 3 deep. Soil samples were collected from the borings of the shallow and intermediate wells, and groundwater samples were collected from each of the new wells. Evaluation of the data led Mid-Atlantic Associates to recommend sampling of the shallow and intermediate wells semi-annually and the deep monitoring well on an annual basis (1).

In May 2003, Mid-Atlantic conducted a scheduled semi-annual sampling of groundwater at the Carolina Steel site. Trichloroethylene levels exceeding the MCL (maximum contamination limit) of 5 pars per billion (ppb) were found in all of the intermediate wells and in 2 shallow wells. Mid-Atlantic recommends further groundwater monitoring take place at this site (1).

A Site Investigation (SI) was performed by ADEM in 2003. Sampling was conducted in several phases. The sampling indicated releases of chlorinated solvents and metals to surface water and

groundwater have occurred. The SI also indicated the presence of 31 active public water supply wells within four miles of the CS site (1).

Surface water drainage from CS is to the south into a ditch located along Thomason Street and west into three cement-lined drainage ditches located along Parker Street. The drainage eventually empties into Catoma Creek, a city drainage way located west of the site. Surface water and sediment from an unnamed tributary, Catoma Creek, and the Alabama River was sampled in September 2003 (1,2).

Some fishing is expected in Catoma Creek. However, no fish data is available for review in this health consultation.

Groundwater aquifers in the Montgomery vicinity include the Watercourse aquifer, the Eutaw aquifer, the Gordo aquifer, and the Coker aquifer. The CS site is located in the recharge area of the Watercourse aquifer. This recharge area is highly susceptible to contamination from surface sources (2).

Groundwater flow in this area is to the north northwest direction. Contaminants in groundwater samples were detected both up-gradient and down-gradient of the CS site. Soil samples from the shallow and intermediate zones indicate that trichloroethylene (TCE) and 1,2-Dichloroethene (DCE) contamination has moved through the soil profile over the years and is now detected only in the intermediate aquifer. In wells located north of the site, trichloroethylene and cis-1,2-dichloroethylene were also detected; however, the levels were below the maximum contaminant levels (MCLs) for these substances (3).
The Montgomery Water Works employs a blended system that uses 34 percent groundwater and 66 percent surface water and serves a population of 229, 300. Well samples are routinely collected by the Montgomery Water Works and Sewer Board.

Toxicological Evaluation

The Toxicological Evaluation portion of this section discusses the possible health hazards from exposure to the contaminants of concern in groundwater, surface water, sediment, and surface soil. Health outcome data are not available at this time.

To determine whether persons are, have been, or are likely to be exposed to contaminants, ADPH evaluates the environmental and human components that could lead to human exposure. An exposure pathway contains five elements: (1) a source of contamination, (2) contaminant transport through an environmental medium, (3) a point of exposure, (4) a route of human exposure, and (5) a receptor population. An exposure pathway is considered complete if there is evidence that all five of these elements are, have been, or will be present at the property. It is considered either a potential or an incomplete pathway if there is no evidence that at least one of the elements above are, have been, or will be present at the property, or that there is a lower probability of exposure.

When a substance is released from an area such as in industrial plant or from a container such as a drum, it enters the environment. This release does not always lead to exposure. You are

exposed to a substance only when you come in contact with it by breathing, eating, or drinking the substance, or by skin contact.

The CS site is fenced and not accessible to the public. Therefore, a completed exposure pathway to soil does not currently exist. In addition, the homes in the area are connected to municipal water. One well is getting some detections of chemicals that are found on the CS site. Therefore, the exposure pathway of groundwater ingestion currently exists. However, the levels detected are below MCL values. The off-site sediments and surface water are in areas where people could potentially be exposed on a periodic basis. Therefore, a completed exposure pathway exists for surface water and sediment..

APDH evaluated chemical contaminants at the CS site by comparing concentrations of chemical contaminants in the samples with health-based assessment comparison (HAC) values for non-cancer and cancer endpoints. ADPH used the U.S. Environmental Protection Agency's (USEPA) reference doses (RfDs) or the Agency for Toxic Substances and Disease Registry's (ATSDR) minimal risk levels (MRLs) to derive the noncancer HAC values. RfDs and MRLs are estimates of daily exposures to contaminants that are unlikely to cause adverse noncancer health effects, even if exposure occurs over a lifetime. Many of the constants used to calculate HAC values have margins of safety built into them. Thus, adverse health effects will not necessarily occur simply because concentrations of toxicants exceed HAC values.

Tables 1, 2, and 3 list the chemicals that were detected at concentrations exceeding HAC values at this site.

Table 1. Groundwater Sampling

Collection date	Contaminant	Location	Max Level (µg/g)	Comparison Value (ppb)	Reference
05/2003	Cis-1,2-Dichloroethene	MW-20I	18	.04	CREG
05/2003	Trichloroethylene	MW-20I	50	5	MCL

CREG - Cancer Risk Evaluation Guide
MCL- Maximum Contaminant Level

Table 2.Surface Water Sample Analysis

Collection date	Contaminant	Location	Max. Level (µg/L)	Comparison Value (ppb)	Reference
09/2004	Arsenic	Catoma Creek	42.5	0.02	CREG
09/2004	Chloromethane	Alabama River	23.5	3	LTHA
09/2004	Lead	Catoma Creek	449	0	MCLG
09/2004	Methylene Chloride	Alabama River	16.9	5	CREG

CREG - Cancer Risk Evaluation Guide
LTHA - Lifetime Health Advisory for drinking water (EPA)
MCLG - Maximum Contaminant Level Goal for drinking water (EPA)

Table 3. Sediment Sample Analysis

Collection date	Contaminant	Location	Max Level (µg/g)	Comparison Value (ppm)	Reference
09/2004	Arsenic	Alabama River	380	0.5	CREG
09/2004	Cadmium	Alabama River	31.8	10	Chronic Child EMEG
09/2004	Chromium	Catoma Creek	876	not listed	
09/2004	Lead	Catoma Creek	929	not listed	
09/2004	Mercury	Catoma Creek	4.57	not listed	

CREG - Cancer Risk Evaluation Guide
EMEG - Environmental Media Evaluation Guide (ATSDR)

a. Arsenic

Arsenic levels exceeding ATSDR comparison values were found in both surface water and sediment samples. Levels of inorganic arsenic (ranging from 300 to 30,000 ppb) in food or water may cause irritation of the stomach and intestine. Other effects from swallowing inorganic arsenic include decreased production of red and white blood cells which may cause fatigue, abnormal heart rhythm, and impaired nerve function. The International Agency for Research on Cancer (IARC) has determined that inorganic arsenic is a known carcinogen. Little data are available on the health effects of organic arsenic exposure. Animal studies show that low doses of organic arsenic are less toxic than inorganic arsenic, however high doses can produce some of the same effects (4). Because of the low frequency at which people are expected to come into contact with the sediment and surface water near this site, the symptoms listed are not expected to occur at this site.

b. Cadmium

Cadmium present in sediment samples exceeded ATSDR's comparison values. Breathing high levels of cadmium can severely damage the lungs and can cause death. Eating food or drinking water with

very high levels of cadmium severely irritates the stomach, leading to vomiting and diarrhea. Long-term exposure to lower levels of cadmium in air, food, or water leads to accumulation of cadmium in the kidneys and possible kidney disease. IARC has determined that cadmium is carcinogenic to humans (5). Because of the low frequency at which people are expected to come into contact with the sediment near this site, the symptoms listed are not expected to occur at this site.

c. Chromium

No comparison value was available for chromium; as such, it is designated a contaminant of concern. Chromium is an industrially important metal which has the potential to contaminate drinking water sources. Chromium VI is more water soluble, more easily enters living cells, and is much more toxic than chromium III. Chromium VI is a human carcinogen as determined by the National Toxicology Program (NTP), IARC, the U.S. Environmental Protection Agency (U.S. EPA), and California Office of Environmental Health Hazard Assessment (OEHHA). (NTP, 1998;IARC, 1990; U.S. EPA, 1998b; Siegel, 1990). OEHHA has made a health protective assumption that chromium VI is a potential human carcinogen by the oral route (Siegel, 1990). Chromium III has not been shown to be carcinogenic to animals or humans by the oral route (IARC,1990; U.S.EPA, 1998a; ATSDR, 1993 and 1998).

There are few data available on which to base an estimate of the chromium VI fraction of total chromium in potential drinking water sources. Only one study was located in the literature which deals with speciation of chromium in potential drinking water supplies (Kacynski and Kieber, 1993). The study took place in North Carolina where the relative amounts of the two chromium species were determined from sampling a number of surface water sources, including both salt and fresh water. The samples were analyzed using iron hydroxide co-precipitation of chromium followed by graphite furnace atomic absorption spectroscopy. This method enables Cr III and Cr VI to be determined from the same samples. Only total chromium was reported for the samples submitted. Because of the low frequency at which people are expected to come into contact with the sediment near this site, the symptoms listed are not expected to occur at this site.

d. Chloromethane

Chloromethane was found in surface water at levels that exceeded comparison values. No studies were found regarding death in humans or animals after oral or dermal exposure to chloromethane. No adverse systemic effects from acute oral or dermal exposure to chloromethane have been observed. Studies of oral and dermal contact to chloromethane have not determined a link to an increase incidence of cancer (7). Because of the low frequency at which people are expected to come into contact with the surface water near this site, the symptoms listed are not expected to occur at this site.

e. Lead

Lead affects every organ in the body. The main target for lead toxicity is the nervous system, both in adults and in children. Long-term exposure to lead at work has resulted in decreased performance in some tests that measure functions of the nervous system. At high levels of exposure, lead can severely damage the brain and kidneys in adults or children.

If a child swallows large amounts of lead, he can develop anemia, kidney damage, colic, muscle weakness, and/or brain damage. Swallowing smaller amounts of lead results in less severe effects on blood and brain functions. At even lower levels of exposure to lead, a child's mental and physical growth can be impaired. The Department of Health and Human Services has determined that lead acetate and lead phosphate may reasonably be expected to be capable of causing cancer, based on evidence from animal studies (8). Because of the low frequency at which people are expected to come into contact with the sediment near this site, the symptoms listed are not expected to occur at this site.

f. Mercury

Exposure to mercury occurs from breathing contaminated air, ingesting contaminated water and food, and having dental and medical treatments. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Children poisoned by mercury may develop problems of their nervous and digestive systems, and kidney damage (9). Because of the low frequency at which people are expected to come into contact with the sediment near this site, the symptoms listed are not expected to occur at this site.

g. Methylene Chloride

Methylene chloride is mainly released to the environment in air and to a lesser extent in water and soil, due to industrial and consumer uses. The World Health Organization has determined that methylene chloride may cause cancer in humans. The Department of Health and Human Services has determined that methylene chloride may reasonably be anticipated to be a carcinogen. IARC has classified methylene chloride in Group 2B, possibly carcinogenic to humans. The EPA has determined that methylene chloride is a probable cancer-causing agent in humans (10). Because of the low frequency at which people are expected to come into contact with the surface water near this site, the symptoms listed are not expected to occur at this site.

h. 1,2-Dichloroethylene

1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]). There are two forms of 1,2-dichloroethene; one is called *cis*-1,2-dichloroethene and the other is called *trans*-1,2-di-chloroethene. Sometimes both forms are present as a mixture. Low doses of *cis*-1,2-dichloroethene caused effects on the blood, such as decreased numbers of red blood cells, and also effects on the liver. The long-term (365 days or longer) human health effects after exposure to low concentrations of 1,2-dichloroethene aren't known. One animal study suggested that an exposed fetus may not grow as quickly as one that has not been exposed.

Exposure to 1,2-dichloroethene has not been shown to affect fertility in people or animals. The EPA has determined that *cis*-1,2-dichloroethene is not classifiable as to its human carcinogenicity. No EPA cancer classification is available for *trans*-1,2-dichloroethene (11). Since no private wells are known to be located near the site, exposure to elevated levels of 1,2-dichlorethylene is not occurring. This chemical has been detected in a public water supply well

in the vicinity of the site. However, the levels detected are below MCL values, and no adverse health effects are likely.

i. Trichloroethylene

Trichloroethylene was once used as an anesthetic for surgery. People who are exposed to large amounts of trichloroethylene can become dizzy or sleepy and may become unconscious at very high levels. Death may occur from inhalation of large amounts. Many people have jobs where they work with trichloroethylene and can breathe it or get it on their skin. Some people who get concentrated solutions of trichloroethylene on their skin develop rashes. People who breathe moderate levels of trichloroethylene may have headaches or dizziness. It is possible that some people who breathe high levels of trichloroethylene may develop damage to some of the nerves in the face. People have reported health effects when exposed to the level of trichloroethylene at which its odor is noticeable. Effects have also occurred at much higher levels. The effects reported at high levels include liver and kidney damage and changes in heart beat. The levels at which these effects occur in humans are not well characterized. Animals that were exposed to moderate levels of trichloroethylene had enlarged livers, and high-level exposure caused liver and kidney damage.

It is uncertain whether people who breathe air or drink water containing trichloroethylene are at higher risk of cancer, or of having reproductive effects. More and more studies suggest that more birth defects may occur when mothers drink water containing trichloroethylene. People who used water for several years from two wells that had high levels of trichloroethylene may have had a higher incidence of childhood leukemia than other people, but these findings are not conclusive. In another study of trichloroethylene exposure from well water, increased numbers of children were reported to be born with heart defects, which is supported by data from some animal studies showing developmental effects of trichloroethylene on the heart. However, other chemicals were also in the water from this well and may have contributed to these effects. One study reported a higher number of children with a rare defect in the respiratory system and eye defects. Another study reported that the risk for neural tube defects and oral cleft palates were higher among mothers with trichloroethylene in their water during pregnancy. Children listed in the National Exposure Subregistry of persons exposed to trichloroethylene were reported to have higher rates of hearing and speech impairment. There are many questions regarding these reports. There were small numbers of children with defects and trichloroethylene levels at which the effects occurred were not defined well. Thus, it is not possible to make firm conclusions about the exact effects of trichloroethylene from these studies, and more studies need to be done (12).

Since no private wells are known to be located near the site, exposure to elevated levels of trichloroethylene is not occurring. This chemical has been detected in a public water supply well in the vicinity of the site. However, the levels detected are below MCL values, and no adverse health effects are likely.

Children's Health Concerns

Children are at greater risk than adults from certain kinds of exposure to hazardous substances emitted from waste sites and emergency events. They are more likely to be exposed because

children play outside more often than adults, increasing the likelihood that they will come into contact with chemicals in the environment. Since they are shorter than adults, they breathe more dust, soil, and heavy vapors close to the ground. Children are also smaller, resulting in higher doses of chemical exposure per body weight. Depending on the stage of growth, children may sustain damage from toxic exposures. ATSDR and ADPH recognize the unique vulnerabilities of children exposed to environmental contamination and hazards. ADPH considered the greater sensitivity of children in Montgomery when drawing conclusions and making recommendations in this health consultation.

Conclusions

ADPH has determined the CS site poses no apparent public health hazard with respect to the various media which have been sampled. Exposure to site-related chemicals in groundwater, surface water, and sediment may be occurring. However, the frequency and level of exposure is not likely to result in any adverse health effects. Due to the lack of fish tissue data, the CS site poses an indeterminate hazard with respect to fish consumption.

Recommendations

Drinking water wells down-gradient of the site may reasonably be expected to be impacted by contaminants from this site. Catoma Creek, the Alabama River and the un-named tributary near the CS site show the presence of metals above the comparison values. Additional testing (including the public water supply wells) is needed. Based on the results of sampling at the CS site, ADPH recommends continued monitoring of groundwater and the public water supply wells in the vicinity of the site. In addition, ADPH recommends that ADEM collect fish tissue data in Catoma Creek.

Public Health Action Plan

ADPH will continue to work with EPA and ADEM to review sampling data.

Preparer of Report

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Alabama Department of Public Health

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12. Agency for Toxic Substances and Disease Registry (ATSDR). 1996. Toxicological Profile forTrichloroethylene. *Update*. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

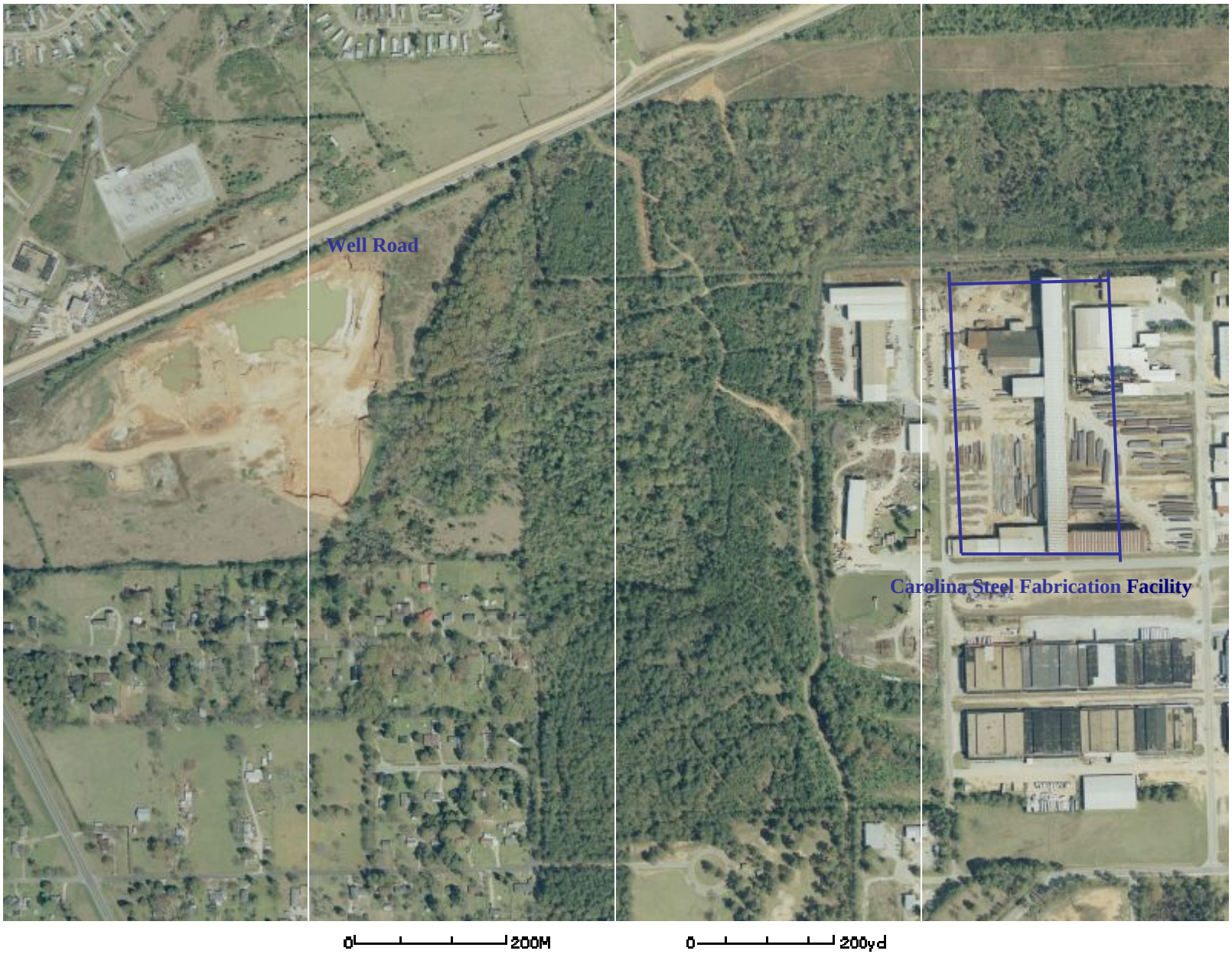
CERTIFICATION

This Carolina Steel Health Consultation was prepared by the Alabama Department of Community 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.

Technical Project Officer, Cooperative Agreement Team, SPAB, DHAC, ATSDR

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

Team Leader, Cooperative Agreement Team, SPAB, DHAC, ATSDR



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