Proposed Plan Fact Sheet
Sigmon's Septic Tank Site

Statesville, Iredell County, North Carolina
June 2009

Region 4

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the Preferred Alternative for cleaning up the ground water at the Sigmon's Septic Tank Site and proposes a ROD Amendment for the Site soils. In addition, this Plan includes summaries of other cleanup alternatives evaluated for ground water. This document is issued by the U.S. Environmental Protection Agency (EPA), the lead agency for site activities, and the North Carolina Department of Environment and Natural Resources (NCDENR), the support agency. EPA, in consultation with the NCDENR, will select a final remedy for the site after reviewing and considering all information submitted during the 30-day public comment period. EPA, in consultation with the NCDENR, may modify the Preferred Alternative or select another response action presented in this Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). EPA has organized response actions for the site into two Operable Units (OUs). This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation/ Feasibility Study (RI/FS) Reports and a revised RI/FS for both OUs. These documents are located in the EPA's Administrative Record file for this site.

DATES TO REMEMBER

(mark your calendar)

PUBLIC COMMENT PERIOD: July 3 – August 5, 2009
U.S. EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: July 9, 2009, 6:30 pm
U.S. EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at

Celeste Henkel School
1503 Old Mountain Road
Statesville, North Carolina
Thursday – July 9, 2009
6:30pm – 7:30pm

For more information regarding the Site, see the Administrative Record at the following locations:

Iredell County Public Library
201 North Tradd Street
Statesville, NC 28117
(770) 878-3090
Hours: Mon-Wed (9am – 8:00 pm)
Thu & Sat (9am-5:00 pm)
Sun (1pm-5pm)

U.S. EPA Records Ctr
61 Forsyth Street, S.W.
Atlanta, GA 30303
Hours: Mon - Fri
(7:30am – 4:30pm)

EPA and the State encourage the public to review these documents to gain a more comprehensive understanding of the site and Superfund activities that have been conducted at the Sigmon's Septic Tank Site.

THE SUPERFUND PIPELINE

Pre-Remedial Response Process

- Preliminary Assessment
- Site Inspection
- Placement on National Priorities List *(may occur anytime prior to Remedial Action)

Remedial Response Process

Remedial Investigation/ Feasibility Study (RI/FS) & Remedy Selection | Remedial Design (RD) | Remedial Action (RA) | Operations & Maintenance (O&M)

↑ Proposed Plan

↑ Record of Decision

SITE HISTORY

Sigmon Septic Tank Service, a wholly owned subsidiary of AAA Enterprises, was owned and operated by the Sigmon family since 1948. In 1970, Henry Sigmon purchased the property at 1268 Eufola Road and moved operations to this location approximately 5 miles southwest of Statesville, Iredell, North Carolina. The business pumped septic tank wastes and heavy sludges from residential, commercial, and industrial customers; installed and repaired septic tanks; and provided a variety of industrial waste removal services. Private landowners own properties located to east and west of the Sigmon Septic Tank Services; Pine Grove Cemetery is also located east of the site. See Figure 1 Site Layout Map.

The Site is approximately 15.35 acres in size. According to Iredell County plat maps, the Site was divided into two properties at the time of its operation; the southern parcel is 8.9 acres in size and was listed in the name of the deceased Mr. Henry Sigmon, and the northern parcel is 6.45 acres in size and was owned by his daughter, Ms. Mary Sigmon. Mary Sigmon and her family lived in the onsite residence on the northern property. Several years ago, the Sigmon's property was sold. The former Sigmon residence is not currently occupied.

A 1.25-acre pond (former borrow pit) is located south of the Sigmon house. An office trailer is located south-southeast of the pond, and an open-walled, roofed storage shed is located southeast of the office. Access to the interior of the property (i.e., to the office and open-walled shed) is provided by a gravel driveway that runs north-south along the eastern site boundary. At the time of the initial EPA site visit (September 26, 2001), there were empty rusted drums, buckets, old tires, old car seats, and other debris within and near the storage shed; these have been removed since that time.

Approximately 100 feet (ft) south of the shed next to the gravel access road are six above-ground storage tanks containing liquid wastes: two rectangular concrete basins (approximately 1,000 gallons each); two cylindrical rusted tanks (approximately 10,000 gallons each); and two cylindrical rusted tanks (approximately 12,000 gallons each). These tanks were also removed by the property owner.

A waste pile (or stockpile) and former lagoons are located in the southern portion of the Site. The Site is fenced with a 4-ft barbed wire fence, and warning signs are posted on the fence and trees.

Regulatory and Environmental Investigation Timeline

- 1970 – Sigmon family relocates existing business to the Site.
- 1970 to 1978 – Wastewaters were discharged to the City of Statesville sewer.
- 1978-1992 – Septic wastes were disposed in ten unlined lagoons onsite (southern portion of the Site).
- April 1995 – the NCDENR conducted an extensive combined Preliminary Assessment/Site Inspection (PA/SI).
- March 2000 – An expanded Site Inspection (ESI) was completed.
- September, 2004 - EPA proposed the Site to the National Priorities List (NPL).
- April 27, 2005 – The Agency for Toxic substances and Disease Registry (ATSDR) assessed public health.
- August 2005 - RI/FS for OU1 was completed.
- March 24, 2006 – An Action Memorandum for a time critical removal action at the site was signed.
- September 2006 – Record of Decision (ROD) signed for OU1.
- August 2007 – Pre-Final Design Report completed for OU1.
- April 2009 – Science and Ecosystem Support Division (SESD) collected additional soil samples from stockpiles located in the southern portion of the Site.
- May 2009 – An Addendum to the Baseline Human Health Risk Assessments (BHHRA) for OU1 addressing vanadium in soil was completed.
- June 2009 – A FS Report for OU2 was completed.

SITE CHARACTERISTICS

During 2004 through 2009, EPA's contractor, Black & Veatch Special Projects Corp. (Black & Veatch), prepared reports which included RI/FS, BHHRA, a revised BHHRA, and a Screening Level Ecological Risk Assessment (SLERA). These documents identified the types, quantities, and locations of contaminants and developed ways to address the problems. The reports indicated that as a result of Site activities, contaminants exceeding human health levels were found in the ground water. The reports also documented that no cleanup is warranted for the soil at the Site.

Soils

In 2006, the final BHHRA prepared for OU1 determined that vanadium was the contaminant of concern (COC) in soil. Concentrations of vanadium were found in both onsite and offsite surface soils above 73 milligrams per kilogram (mg/kg), the risk-based remedial goal for the child resident at a hazard index (HI) of 1. Vanadium is considered a systemic toxicant or one that causes noncarcinogenic health effects.

In May 2009, the BHHRA Addendum prepared for OU1 revealed that the remedial goal for vanadium changed as a result of updated toxicity values. Toxicity information is subject to revision and is updated once new data becomes available. The oral reference dose (RfD) for vanadium was updated from 1×10^{-3} milligrams per kilogram per day (mg/kg/day) to 5×10^{-3} mg/kg/day and the dermal RFD changed from 2.6×10^{-4} mg/kg/day to 1.3×10^{-3} mg/kg/day. The remedial goal for vanadium in soil for the child resident increased five-fold from 73 mg/kg to 365 mg/kg. As a result, none of the individual concentrations for vanadium in soil exceeded the revised remedial goal for child resident. Therefore, soil is no longer a media of concern at the Site.

In April 2009, SESD collected additional samples from the stockpiles located in the southern portion of the site. The results of the sampling indicate that the stockpiles contain concentrations that range from 81 micrograms per kilogram (ug/kg) to 11,000 ug/kg for polynuclear aromatic hydrocarbons (PAHs) and 1.0 mg/kg to 3.4 mg/kg for arsenic. The remedy for the stockpile consists of Excavation, Off-Site Transportation and Disposal at Subtitle D Landfill, as outlined in the ROD for OU1.

Groundwater

During the RI process in early 2008, three metals and one volatile organic compound (VOC) were identified that exceed their respective cleanup level in groundwater including arsenic, iron, manganese, and 1,4-dichlorobenzene (VOC). Also, cadmium and thallium were identified as the two metals that exceed their respective cleanup level in the offsite residential potable well PW14, which is located northeast of the Site. Cadmium was detected in potable well PW14 at a concentration of 2.2 micrograms per liter (ug/L), slightly above the North Carolina 2L Standard of 1.75 ug/L. Thallium was detected in potable PW14 at a concentration of 2.2 ug/L, slightly above the North Carolina 2L Standard of 2 ug/L.

In December 2008, SESD conducted additional sampling of the offsite residential potable wells. The samples were collected from residential potable wells located to the northeast of the Site in the Big Tree Subdivision. A total of 18 residential potable wells were sampled for target analyte list (TAL) metal analysis. No COCs were detected above the cleanup levels in any of the samples. The results for cadmium and thallium in PW14 were both reported as nondetect. The ground water COCs for the Sigmon's Septic Tank Site are listed in Table 1.

Table 1

Metals

Metals are naturally occurring in the earth's soils. They may also be present in chemicals used in industrial processes. The following metals were identified in the human health risk assessment as COCs:

Arsenic: Arsenic was identified in the human health risk assessment as a COC for deep groundwater. The maximum concentration found in deep groundwater was 22 ug/L. The maximum contaminant level (MCL) of 10 ug/L is the cleanup goal.

Iron: Iron was identified in the shallow and deep groundwater as a COC. The maximum concentration found in groundwater was 24,000 ug/L. The remedial goal for the child resident (HI=1) is 11,000 ug/L.

Manganese: Manganese was identified in the shallow and deep ground water as a COC. The maximum concentration found in ground water was 24,000 ug/L. The lifetime health advisory of 300 ug\L is the cleanup goal.

Volatile Organic Compounds

VOCs are commonly found in solvents. Solvents were used at the Site while it was in operation. The following VOC was identified as COCs for ground water:

1,4-dichlorobenzene: 1,4-dichlorobenzene was identified in the deep ground water as a COC. The maximum concentration found in ground water was 13 ppb. The cleanup goal is the North Carolina 2L Standard which is equal to 1.4 ppb.

SCOPE AND ROLE OF THE ACTION

- During the RI phase, the site was divided into two OUs because additional ground water plume delineation was required after the evaluation of soil, sediment, and surface water was completed. OU1 addresses Site soil, stockpiles, sediment, and surface water contamination; and OU2 addresses ground water contamination. It has been determined that soil, sediment and surface water do not pose a risk to human health or the environment and these media are not sources of contamination. However, the stockpiles do pose a human health risk. The stock piles will be remediated in accordance with the ROD for OU1.

- The Remedial Alternative for OU2 will monitor and if necessary address ground water contamination in the surficial and bedrock aquifers and the off site potable wells located in general vicinity of the site. The objective of the remedy is to prevent current and future exposure to contaminated media through institutional controls and monitoring of ground water at the site. This response will mitigate the threat posed by exposure of receptors to ground water at the site.

SUMMARY OF SITE RISKS

Baseline risk assessments were conducted for OUs 1 and 2, to determine the current and future effects of contaminants on human health and the environment. Also, a screening level ecological risk assessment was completed to evaluate risk to the environment from the site contaminants. As part of OU1, it was determined that there were no ecological risks associated with the site. Also, the soil , sediment, and surface water are no longer media of concern at the Site. Nevertheless, the ground water was evaluated for carcinogenic and noncarcenogenic risks as OU2.

The BHHRA for OU2 focused on health effects for both children and adults, in a residential setting, and workers that could result from current and future direct contact with: (1) contaminated ground water (*e.g.*, through ingestion, dermal contact, and inhalation of volatile contaminants).

It is the EPA's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund human health risk assessment estimates the "baseline risk." This is an estimate of the likelihood of health problems occurring if no cleanup action were taken at a site. To estimate the baseline risk at a Superfund site, EPA undertakes a four-step process:

Step 1: Analyze Contamination
Step 2: Estimate Exposure
Step 3: Assess Potential Health Dangers
Step 4: Characterize Site Risk

In Step 1, EPA looks at the concentrations of contaminants found at a site as well as past scientific studies on the effects these contaminants have had on people (or animals, when human studies are unavailable). Comparisons between site-specific concentrations and health-based concentrations help EPA to determine which contaminants are most likely to pose the greatest threat to human health.

In Step 2, EPA considers the different ways that people might be exposed to the contaminants identified in Step 1, the concentrations that people might be exposed to, and the potential frequency and duration of exposure. Using this information, EPA calculates a "reasonable maximum exposure" (RME) scenario, which portrays the highest level of human exposure that could reasonably be expected to occur.

In Step 3, EPA uses the information from Step 2 combined with information on the toxicity of each chemical to assess potential health risks. EPA considers two types of risk: cancer risk and non-cancer risk. The likelihood of any kind of cancer resulting from a Superfund site is generally expressed as an upper bound probability; for example, a "1 in 10,000 chance." In other words, the exposed individual would have an excess cancer risk of one in 10,000 due to site contaminants. This excess risk would be over and above the existing cancer risk for the individual. For non-cancer health effects, EPA calculates a "hazard index." The key concept here is that a "threshold level" (measured usually as a hazard index of less than 1) exists below which non-cancer health effects are not expected.

In Step 4, EPA determines whether site risks are excessive for people at or near the Superfund site. The results of the three previous steps are combined, evaluated and summarized. EPA adds up the potential risks for each receptor.

Human Health Risks

There were four potentially exposed populations evaluated in the BHHRA for OU2. They included Current and Future, Onsite and Offsite Child and Adult Resident, Future Onsite Outdoor Worker, and Future Onsite Construction Worker.

The COCs were refined by characterizing quantitative and qualitative risks to human health. The COCs for the Site groundwater are as follows:

- Shallow/Regolith Ground Water – manganese in monitoring wells MW13B and MW14.
- Deep/Bedrock Ground Water – MW11C (1,4-dichlorobenzene, arsenic, iron, and manganese) and MW17C (manganese).

The results of the BHHRA indicate that the cancer risk for the lifetime resident and the noncarcinogenic risk for the child resident exposed to ground water at the Site are as follows:

CANCER RISK

- The Total Incremental Lifetime Cancer Risk in a Future Use Scenario is 3×10^{-4}. This value is outside of EPA's Acceptable Target Range of 1×10^{-4} to 1×10^{-6}

NONCARCINOGENIC RISK

- Non-Cancer Hazards, as Measured Hazard Indices (HIs) in a Future Use Scenario for the Child Resident is HI = 36. This value is greater than 1, EPA's Acceptable Target.

The risks and hazard levels indicate that there is potential unacceptable risk to future children and adult residents, from direct exposure to contaminated ground water. These risk estimates are based on reasonable maximum exposure scenarios and were developed by taking into account various conservative assumptions about the frequency and duration of an individual's exposure to the ground water, as well as the toxicity of the COCs.

REMEDIAL ACTION OBJECTIVES

The Remedial Action Objectives (RAOs) for the site are to reduce risk posed to receptors by COC concentrations in ground water greater than the cleanup levels for the Site.

- Mitigate the threat posed by exposure to ground water to receptors at the Site.
- Monitor/control ground water at the Site with concentrations above the MCL of 10 ug\L for arsenic; the risk-based remedial goal for the child resident (HI=1) of 11,000 ug/L for iron; the lifetime health advisory of 300 ug/L for manganese; and the North Carolina 2L Standard of 300 ug/L for 1,4-dichlorobenzene.

SUMMARY OF REMEDIAL ALTERNATIVES

GROUND WATER ALTERNATIVES

Alternative 1: NO ACTION

Estimated Capital Cost: $5,263
Estimated Annual O&M Cost: $125,581
Estimated 5-Year Review Cost: $39,828
Estimated Present Worth Cost: $170,700
Estimated Construction Time Frame: None

Regulations governing the Superfund program generally require that the "no action" alternative be evaluated generally to establish a baseline for comparison. Under this alternative, EPA would take no action at the site to prevent exposure to the ground water contamination. Since hazardous wastes would remain on-site, 5-Year Reviews would be required. The above Present Worth Cost estimate assumes six 5-year reviews over a 30 year period.

Alternative 2a: Monitored Natural Attenuation (MNA)

Estimated Capital Cost: $90,514
Estimated Annual O&M Cost: $631,699
Estimated 5-Year Review Cost: $13,648
Estimated Present Worth Cost for 2a: $735,900
Estimated Time Frame: 30 years

Potable well sampling would be conducted to ensure protection of residents drinking ground water from potable wells. A contaminant migration assessment would be conducted to determine if migration of site ground water to potable wells may occur. Baseline sampling of potable wells during drought conditions

would be conducted to assist in determining if COCs detected in potable wells are site related.

In this alternative COCs in ground water onsite and offsite will be monitored overtime.

Government-enforced administrative controls (such as zoning restrictions or local ground water-use ordinances) would be applied to discourage receptor populations from inadvertently exposing themselves to contaminated ground water. Area residents would be notified of the potential for exposure to COCs from drinking wells. Implementation of the state of North Carolina administrative controls would include a plat map and a declaration of perpetual land use restrictions documentation.

Alternative 2b: MNA with Contingencies

Estimated Capital Cost: $252,043
Estimated Annual O&M Cost: $1,073,019
Estimated 5-Year Review Cost: $13,648
Estimated Present Worth Cost for 2b: $1,339,000
Estimated Time Frame: 30 years

In this alternative COCs in ground water onsite and offsite will be monitored overtime. If during monitoring, it is determined that MNA is not occurring then contingencies may be applied for adequate protection of human health and the environment. The treatment contingency in this alternative is the injection of an oxidant/reductant to enhance natural attenuation by oxidizing/reducing COCs in situ.

Government-enforced administrative controls (such as zoning restrictions or local ground water-use ordinances) would be applied to discourage receptor populations from inadvertently exposing themselves to contaminated ground water. Area residents would be notified of the potential for exposure to COCs from drinking wells. Implementation of the state of North Carolina administrative controls would include a plat map and a declaration of perpetual land use restrictions documentation.

Mandatory five-year reviews would be required over the course of a 30-year period resulting in a total of six five-year reviews.

Alternative 4: Enhanced Attenuation with Chemical Oxidation/Reduction

Estimated Capital Cost: $409,037
Estimated Annual O& M Cost: $632,211
Estimated 5-Year Review Cost: $230,206
Estimated Present Worth Cost: $1,271,500
Estimated Time Frame: 30 years

This alternative consists of in situ chemical oxidation/reduction, source controls, government controls, informational tools, city water supply hook-up, and MNA. In situ chemical oxidation/reduction would be used to enhance natural attenuation that may be occurring.

Government-enforced administrative controls (e.g. zoning restrictions or local groundwater-use ordinances) would be applied to discourage receptor populations from inadvertently exposing themselves to contaminated ground water. Area resident would be notified of the potential for exposure to COCs from drinking wells. Implementation of the state of North Carolina administrative controls would include a plat map and a declaration of perpetual land use restrictions documentation. It is assumed that only the affected residents would be hooked up to the city water supply.

Under this alternative, a treatment compound would be injected into the subsurface to oxidize or reduce COCs in ground water. Bench-scale treatability testing would likely be required to determine the appropriate treatment compound. The treatment compound would be injected through permanent injection wells into the shallow and bedrock aquifers of the two suspected source areas of the site where concentrations of COCs in ground water exceed clean-up levels. Permanent injection wells would be installed because it is likely that more than one injection will be required. A frequency of every two years is assumed for the cost estimate.

Mandatory five-year reviews would be required over the course of a 30-year period resulting in a total of six five-year reviews.

EVALUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. The "Detailed Analysis of Alternatives" can be found in the FS.

SUMMARY OF THE PREFERRED ALTERNATIVE

The preferred alternative for groundwater is MNA. In this alternative COCs in ground water onsite and offsite wells will be monitored overtime.

Government-enforced administrative controls (such as zoning restrictions or local ground water-use ordinances) would be applied to discourage receptor populations from inadvertently exposing themselves to contaminated ground water. Area residents would be notified of the potential for exposure to COCs from drinking wells. Implementation of the state of North Carolina administrative controls would include a plat map and a declaration of perpetual land use restrictions documentation.

The remedy for the stockpile consists of Excavation, Off-Site Transportation and Disposal at Subtitle D Landfill, as outlined in the ROD for OU1.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Overall Protectiveness of Human Health and the Environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.
Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Site Layout
Sigmon's Septic Tank Site
Statesville, Iredell County, North Carolina

Figure 1

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the Sigmon's Septic Tank Site is important to EPA. Comments provided by the public are valuable in helping EPA select a final cleanup remedy for the site. You may use the space below to write your comments. Comments must be postmarked by August 1, 2009. If you have any questions about the comment period, please contact Beverly Hudson-Stepter at (404) 562-8816 or through EPA's toll-free number at 1-800-435-9233. Those with electronic communications capabilities may submit their comments to EPA via Internet at the following e-mail address:

STEPTER.BEVERLY @EPAMAIL.EPA.GOV.

Comments may also be mailed to:

Beverly Hudson-Stepter
4WD-SRSEB
US Environmental Protection Agency
61 Forsyth Street, SW
Atlanta, GA 30303

Your Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

U.S. Environmental Protection Agency
61 Forsyth Street, SW
Beverly Hudson-Stepter
Remedial Project Manager
Atlanta, Georgia 30303-8960

Linda Starks, Community Involvement Coordinator
Office of Superfund Public Affairs & Outreach
11th Floor

Official Business
Penalty for Private Use $300