Health Consultation

Review of Sampling Plan for Sigmon Septic Tank Service Site

SIGMON'S SEPTIC TANK SERVICE FACILITY
STATESVILLE, IREDELL COUNTY, NORTH CAROLINA

EPA FACILITY ID: NCD062555792

JULY 27, 2005

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 conclusions previously issued.

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Prepared by:

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Background and Statement of Issues

The U. S. Environmental Protection Agency (EPA) requested the Agency for Toxic Substances and Disease Registry (ATSDR) to review and comment on an environmental sampling plan for Sigmon's Septic Tank Site. This health consultation presents comments on the proposed plan to collect water samples from both monitoring wells and private wells near the facility, as described in the Field Sampling Plan for Additional Soil and Groundwater Sampling (Black & Veatch 2004a).

The former septic tank service and waste removal facility is located at 1268 Eufola Road, approximately 5 miles southwest of Statesville, Iredell County, North Carolina (NCDENR 1998, NCDENR 2000, Black & Veatch 2004b). According to EPA Region IV site description (http://www.epa.gov/superfund/sites/npl/nar1726.htm), however, the site is considered an active facility. Recently, North Carolina Department of Environment and Natural Resources (NCDENR) reported that a certain segment of the property is currently used to illegally dump tree stumps and timber debris, even though the waste lagoons were closed by order of NCDENR in 1995. Former services provided by the business owners included the pumping and removal of septic tank wastes and heavy sludges for various customers (e.g., residential, commercial, and industrial), installation and repair of septic tanks, and a variety of other waste removal services to various industries.

Both federal and state environmental regulatory agencies have investigated groundwater near the facility for several years, making nearby residents well aware of any potential groundwater problems resulting from activities conducted at the facility (NCDENR 1998, NCDENR 2000, Black & Veatch 2004b).

ATSDR has previously reported on both the groundwater and surface water media in close proximity to the facility (ATSDR 2002a, ATSDR 2002b). In a health consultation released on March 29, 2002; ATSDR noted that two private wells showed nitrate levels greater than 10,000 ppb (ATSDR 2002a). Nitrate levels greater than 10,000 ppb pose an increased risk of higher methemoglobin levels in very young infants (0 to 6 months), if given formula prepared with water at such levels (EPA 1990, Bosch et al. 1950, Walton 1951). Similarly, potential health impacts to fetuses could occur if pregnant females drank water with comparable nitrate levels (Dorsch et al. 1984, Arbuckle et al. 1988, MMWR 2005). ATSDR found that the surface-water pathway presented a no apparent public health hazard, as stated in its health consultation released on July 9, 2002 (ATSDR 2002b).

Figure 1 shows a general depiction of the Sigmon Septic Tank Service Facility and nearby potable wells surrounding the facility. Former waste areas still remain at the facility. These former waste areas were used for waste handling and disposal during past operations at the septic tank service facility. Areas include the Lagoon Area, Waste Pile, and Open Pits (see Figure 1). These former waste areas at the facility are still believed to be the chief source of groundwater contamination within the area.

Discussion

The draft field sampling plan for the Sigmon Septic Tank Site is the second addendum of the original field sampling plan for the site (Black & Veatch 2004a). The draft field sampling plan provides a plan to collect additional soil and groundwater samples that will allow further assessment of potential impacts to human health. Additional sampling locations were chosen based upon multiple criteria, including proximity, accessibility, usage, and previous sampling data.

The draft sampling plan proposes to collect additional water samples from both monitoring wells and private wells. The collected water samples will subsequently be analyzed for volatile organic compounds, semi-volatile organic compounds, pesticides and poly-chlorinated biphenyls, metals, and nitrates.

ATSDR's 2002 health consultation reported a public health concern for two drinking water wells with high nitrate levels. The source of the nitrates could not be conclusively determined; however, if the source is the former waste lagoons, the nitrate levels should eventually return to normal following the cleanup of the former lagoon area. Alternatively, high nitrate levels could also be the result of well contamination from a nearby septic tank drain field or overloading of agricultural fertilizer near the drinking water wells. If a septic tank drain field is the more likely source of high nitrates, remediation of the former lagoon area probably won't provide long-term public health protection. Thus, the best public health remedy may be an alternate water source, such as connecting to the municipal water supply or installing another water supply well at a location away from both the septic tank drain fields and the former lagoon area.

As already stated, high nitrate levels in groundwater may also be the result of overloading the soil with agricultural fertilizers. Measuring fecal coliforms in conjuncture with information citing the locations of septic drain fields and the local farming practices may help to determine the true nitrate sources. High fecal coliforms are usually measured in wells contaminated by septic tank effluent or other waste water-effluent; however, when high nitrate levels are present without fecal coliforms, this result may indicate the source is probably agricultural fertilizer.

ATSDR's 2002 health consultation also reported that lead levels in two drinking-water wells were higher than EPA's Lead Action Level of 15 parts per billion (ppb). The source of the lead was not determined. Lead concentrations higher than 50 ppb can be the result of lead leaching from lead solder, possibly used in water wells and home plumbing connections. Moreover, leaching of lead solder is often associated with naturally acidic groundwater. If the source of the lead is from plumbing connections, the best public health remedy may be replacing the plumbing connections by using lead-free solder or alternative materials.

Other information will help in evaluating the source of the contamination, such as information on the construction of the private wells (including plumbing), location of septic tank fields, or agricultural activities in immediate vicinity of the drinking water wells. Also, a summary of

field pH measurements for the collected water samples will help in evaluating the possible leaching of lead solder. Finally, information on the sampling location (i.e., kitchen tap, well house tap) and intervening connections and devices (i.e., water softening tanks, filtration systems) will help environmental health scientists in their evaluation and recommendations to best protect public health.

Conclusions

In general, the Draft Field Sampling Plan should allow for further characterization and delineation of substances suspected of contaminating the underlying groundwater in the near vicinity of the Sigmon Septic Tank Service Facility. ATSDR, however, suggests that the sample collection procedures be altered accordingly to fully ascertain the potential source areas of the substances and their migratory paths. ATSDR is confident that once the recommended changes (as described below) are considered, the Field Sampling Plan should provide a data set that will allow for better delineation and characterization of contaminants and their respective source areas. Moreover, the additional information will help to improve the public health recommendations for residents who may be using contaminated water.

Recommendations

This section will address specific comments and recommendations for changes to the Draft Field Sampling Plan for the Sigmon Septic Tank Service Facility.

1. Sample and analyze both nearby monitoring wells and private wells for nitrates and nitrites.

2. Sample and analyze both nearby monitoring wells and private wells for total and fecal coli forms as an attempt to distinguish whether the source of nitrates is from fertilizer (i.e., surrounding area or community is farming/rural) or from the sewage lagoons at the site or residential private septic tanks.

   In lieu of other cost saving strategies, EPA may consider sampling and analyzing the coli forms only in the private wells suspected of nitrate contamination or allowing the local health department to collect and analyze the water samples for both the coli forms and nitrates/nitrites, because they usually collect and analyze such samples on a routine basis.

3. Document well history and construction details along with observations of both the monitoring wells and private wells within the data evaluation report of this investigation (note; digital photos may be useful). Such information may include but are not limited to the following list:

- well bore measurements (e.g., diameter of surface casing);
- date well was drilled and completed;
- initial static water level measured for the well;
- type of well pump;
- presence of water softener devices or water filters;
- type of plumbing pipe (zinc, copper, plastic, black iron, etc.);
- observations of well housing and any materials stored in well housing (e.g., pesticides, fuel containers);
- observations of materials seen inside of the well bore (e.g., lead weights are sometimes used to weigh down a flexible plastic pipe and drop it to the bottom of large-diameter wells);
- observations of the immediate area surrounding the wells (probably critical if the well is located within the surface water drainage of farm fields, livestock pastures or feed lots, manufacturing or industrial facilities).

4. Record the locations of nearby private wells if such locations have not been surveyed and recorded.

5. Record the locations, relative to drinking water wells and residences, of residential septic tanks and their connected drain lines and attached leach fields.

6. Measure and record the depth of private wells when such wells have no available driller's log. Only make such depth measurements when it is specifically known no damage will occur to the well pump, pressure tank, and plumbing pipe.

7. Document the precise location of where the water samples are collected from the private well (e.g., kitchen tap, wellhead faucet or spigot) within the data evaluation report of this investigation. Moreover, document the measured values of the on-site field parameters (e.g., pH, conductivity, temperature) within the report.

8. Provide additional information about the evaluation of well equilibrium conditions (how long since the pump was activated; presence of submersible pump or foot valve in well) and the water elevation technique (e.g., steel tape, conductivity tape, sonic measurement) used when reporting water elevations for the private wells.

9. Resample private well SS-PW-02. During the initial round of sampling conducted in October 2002, EPA contractors (Black & Veatch) could not collect a water sample from the well because it was dry and showed no recorded water level. Moreover, no mention of the private well was made in the second round of sampling conducted in May 2004. If this private well now shows a water level, it is imperative that a water sample is collected because ATSDR listed this well as one of two wells (wells contained nitrate levels in excess of 10,000 ppb) posing a potential health risk to young infants and pregnant females in its previous health consultation for the site.

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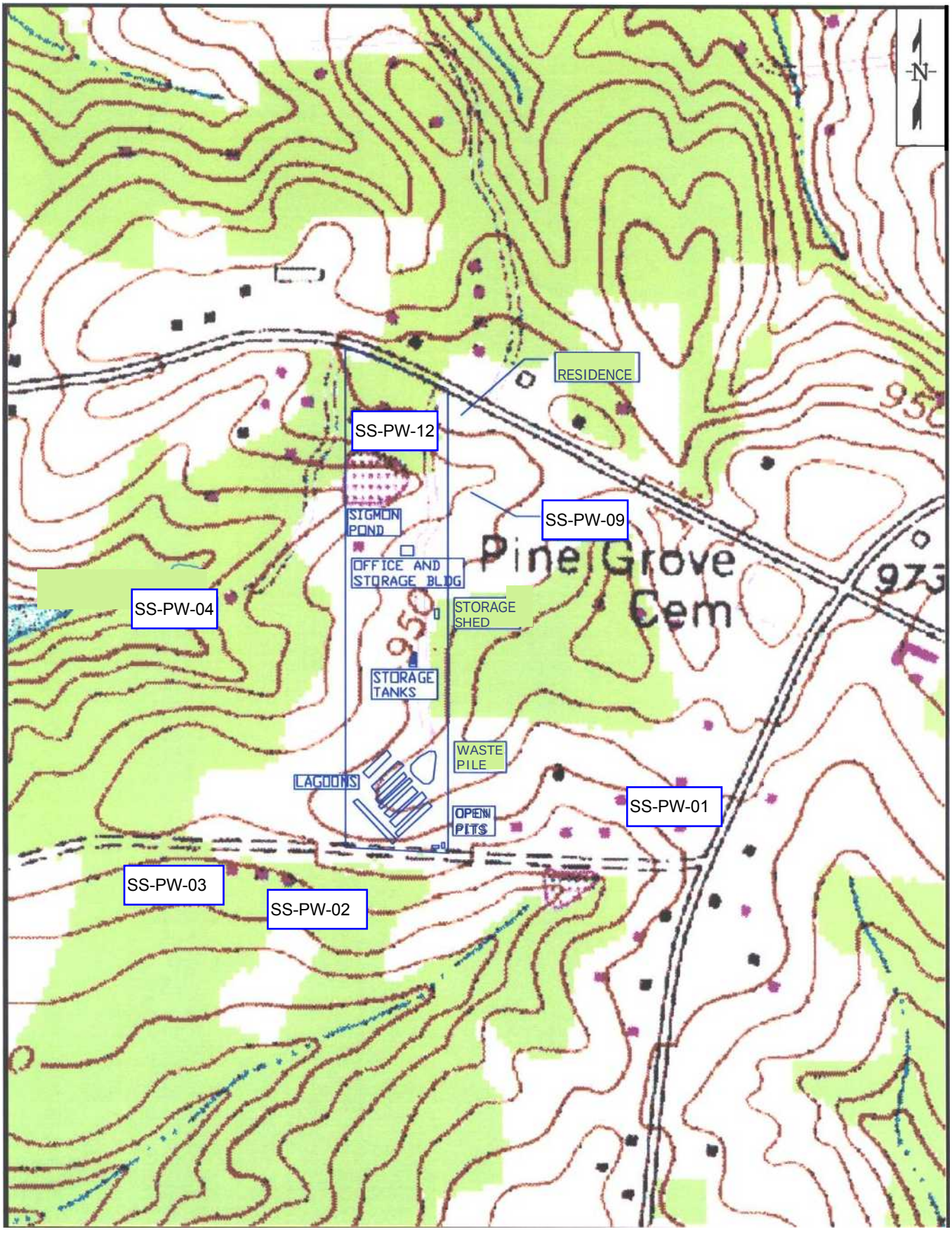
APPENDIX A



REP. - USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP; TROUTMAN, NC 1993. 1" = 600'

SITE LAYOUT MAP
SIGMON'S SEPTIC TANK SITE
STATESVILLE, IREDELL COUNTY, NORTH CAROLINA

FIGURE
1