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Doc # 4084

Project:
Albion Water Supply
Revision No.
Revision Date: 1/31-06

Work Plan for Extended Site Survey (ESS)
Municipal Water Supply Wells in Albion, Iowa
Activity code #3927

The following is a description of the intended work to be conducted by IDNR in the vicinity of the water supply wells #1 and #2 in Albion, Iowa. The purpose of the investigation is to determine if ground water contamination observed in these wells is from non-point local application of nitrogen based fertilizer or from an unidentified point source(s). The contamination has the potential to impact human health and has resulted in the placement of these wells on standby status.

I). Well #1 and #2 Operational History:

These two wells are shallow (24 ft. and 26 ft respectively) and are located just outside of the community of Albion, Iowa on the north side of state highway #330 in the alluvial valley of the Iowa River. The exact location is T84N R18W Sec. 7 NW NE SW SE NE.

Drilling records indicate that well #1 was drilled in June of 1951 and well #2 was drilled in April of 1969. No data were available at the time of this work plan regarding casing, pumping rate, or geology of the wells, however drilling data available for nearby water test holes shows 30 feet of Pleistocene age sand and gravel silt and till over (Maple Mill) shale.

II.) Preliminary Activity

The site was referred to Contaminated Sites for assessment from the Water Supply Section in March 2002 because of repeated violation of drinking water standard for nitrate. After a site visit an Initial Site Survey (ISS) was completed and it was recommended that additional assessment (ESS) be conducted to attempt to determine the source of the nitrate contamination. The wells were placed on emergency standby status because of nitrate violations (the #2 in1998 followed by #1 in 1999.)

On January 16, 2005 IDNR met with the city council and mayor and discussed possible assessment of the wells and to arrange for property access since the wells actually are located on private property of local resident Mr. Clarence Mann.

Contact Information:
Karen Betts – City Clerk
Albion City Hall
1-641-488-2244
And
Rhonda Guy – City Water Utility Manager
1-641-521-0741

III.) Schedule of Site Assessment Activities:

Site assessment will be conducted in two phases. Phase 1 beginning (weather permitting) on 2/7/06 and be completed (weather permitting) on 2/10/06. This phase will consist include sampling surface water, characterizing ground water conditions (conductivity testing) and obtaining ground water samples in the vicinity of the city wells for analysis for nitrate.

The second phase will be conducted during the week of 2/20/06 and will include gauging ground water flow direction from temporary wells and further ground water and surface water samples based on the results of phase 1.

Further assessment could be conducted under CERCLA (PA/SI) if the results of the ESS Phase I/II sampling indicates the potential for a point source exists.

IV.) Field Equipment List and SOPs:

See ESD Quality Management Plan and Section Equipment SOPs(see appendix)

V.) Contaminants of Concern (COCs)

The primary contaminant of concern (COC) nitrate-nitrogen as it is observed in the city wells. Presumably the source(s) are either from surface application of nitrogen-based fertilizer, an as yet determined point source (i.e., spill or livestock operation) or both. As a result, other possible secondary contaminants that may be analyzed for include, organic nitrogen (N)-series: (NO_3+NO_2-N, NH_4-N), common herbicides, fecal bacteria, antibiotics.

VI.) Sampling Methods

Field Screening

Surface and ground water samples will be field screened for nitrate/nitrite concentration with Hach® water quality test strips. Field screening with test strips will provide general quantitative guidance for field sampling.

Surface water Sampling

Surface water sample may be collected for analyses for the listed COCs from any observed ponds, ditches, flowing streams, or running field tiles in the area. See department SOPs in the ESD QAPP for sample collection and handling methods.

Ground Water Sampling

Up to 8 direct push soil borings are planned to a maximum depth of 32 feet (the target depth of the base of the alluvial aquifer). The borings will be separated by roughly 50-

foot intervals around the west, northwest and north of the well head area. Three of these borings will be instrumented and logged utilizing electrical conductivity equipment (SC 400 conductivity probe and FC 4000 field instrument). The purpose of the conductivity logging is to confirm the alluvial geology described in the GEOSAM strip logs, delineate characteristics of the alluvial aquifer (thickness of water bearing zones for sampling) and aquitards (impediments to water movement). In addition, the depth of the water table and gradient (direction of ground water flow) on and around the well head area will be determined with the installation of three temporary piezometers.

Ground Water Sampling Quality Assurance:

As described in the ESD QAPP, field teams will collect one duplicate ground water sample from each boring and carry daily trip blanks that will be submitted with all field samples. Maintenance and calibration of sampling equipment will be conducted daily or more frequently as necessary.

Off Site Soil and Ground water Impacts

No off site ground water sampling will be conducted during this ESS. If the need for off site sampling is indicated from the work described in this work plan it will be described and conducted under separate site assessment.

VII.) Field Decontamination Methods:

Upon completion of a soil boring for the purpose of soil and/or ground water sampling and before initiating further subsurface sampling all drilling equipment that penetrated the surface soil shall be decontaminated. The field decontamination method consists of a three stage (wash, rinse and dry) process that will first wash the used equipment is a soap and water mixture to be followed by a second rinse stage and completed by a hand drying state. Before reuse, the decontaminated equipment will be visually inspected to ensure that it is sufficiently clean. The equipment identified for decontamination includes but is not limited to (all parts of the soil core assembly, extension rods used for that particular soil boring, any and all water sample assembly including tubing and Watera ™ valve), water level indicator and any tools to assemble sampling equipment.

VIII.) Reports

Field Activity Report

A standard ESS report will be generated by the IDNR, Project Manager, and submitted to the EPA Project within 60 days of completion of the field activities described in this QAPP. The narrative report will include a discussion of all field activities, and a recommendation to either drop the site from the CERCLA pre-remedial program or to further assess the site under CERCLA as a Site Investigation.

IX). Health and Safety Plan:

Operation of Field Equipment

Operation of the all equipment (GeoProbe™) during fieldwork will follow safety recommendations described by the manufacturer and as referenced in Iowa Departments Quality Management Plan.

Personal Protection:

All IDNR staff participating in fieldwork will have Level D personal protection to include ear, eye and head protection and long sleeve shirt long (denim) pants and safety shoes.

Route to nearest Hospital

The nearest hospital is the Marshalltown Hospital located in Marshalltown, Iowa. The Pocahontas health facility is approximately 5 miles east on highway 330 east to highway 14 and 5 miles south. **The address is 3 S. Fourth Street. Tel#. 641-754- 5151**

On site first aid

All field staff are familiar with the location and contents of the on board first aid equipment. First Aid is also available at the Albion fire station located on Main Street. The route to Marshalltown hospital is described in this work plan. All staff are 40 hour OSHA safety trained with updated 8 hour annual refresher training.

Daily Safety Meetings

All participating field staff will attend a daily "tail gate" safety meeting to review safety issues on site and each member will sign the safety log.