SPRING SOURCE AREA SURVEY
CLARYSVILLE WATER SYSTEM
ACHD SITE NO. 42
Clarysville, Allegany County, Maryland

ALWI Project No. AL7N001

1.0 INTRODUCTION

Advanced Land and Water, Inc. (ALWI) was retained by the Allegany County Health Department (ACHD) to prepare a spring source protection plan for the Clarysville Water System, located south of the Clarysville fire hall in eastern Allegany County, Maryland. This site, designated No. 42 by ACHD, is served by a spring that issues from a sloping, wooded area on the northeast side of Loar Hill, south of Clarysville.

The draft MDE "Transient Water Systems Operations Guidance" manual (herein termed the "Guidance Manual") defines a Non-Transient Non-Community (NTNC) Water System as one that "...serves at least 25 regular consumers over 6 months per year." Regular customers are continuously served, indicating that this water system is indeed a non-transient non-community system (NTNC).

1.1 PURPOSE

The Safe Drinking Water Act (SDWA) of 1974 required the U.S. Environmental Protection Agency (EPA) to develop enforceable drinking water quality standards to protect the public health. In 1986, amendments made to the SDWA strengthened provisions for the protection of underground sources of drinking water. These amendments included provisions for establishing Wellhead Protection Programs by individual states under "umbrella" EPA oversight. The EPA approved a statewide Wellhead Protection Program developed by MDE in June 1991.

The MDE program originally applied to community well water supplies, only. A newly proposed broadening of the Federal Clean Water Act will have the result of expanding the MDE Wellhead Protection Program to encompass non-community well water supplies both transient and non-transient in nature. ACHD, in cooperation with MDE, established this program to bring existing non-community well water supplies into compliance with the coming regulations. At the direction of ACHD, ALWI applied appropriate provisions of the MDE Wellhead Protection Program to this spring source assessment.

1.2 SCOPE

ALWI prepared this spring source protection plan following ACHD requirements, which followed MDE guidelines for transient system operation and wellhead protection.

1. **Site Reconnaissance, Photographic Documentation and Interviews** – ALWI was unable to observe the spring source due to heavily forested land, limited road access and its concealed and uncertain location. However, ALWI interviewed an employee of Allegany County DPW to document information on the use patterns, history and problems associated with the supply.

2. **Baseline Water Quality Assessment** - ALWI purged the water system and collected samples for analysis in the ACHD laboratory that is affiliated with the Maryland Department of Health and Mental Hygiene (DHMH). ALWI performed this fieldwork in accordance with MDE potable water sampling criteria including in-field measurements of turbidity, chlorine, and pH. ACHD selected the analyte list based on countywide experience with potability concerns and the capabilities of the aforementioned laboratory. The analytes included total and fecal coliform bacteria, nitrates, nitrites, iron, sulfur and manganese (Appendix B).

3. **Contamination Hazard Assessment** – ALWI identified existing and potential contaminant hazards within the delineated WHPA based on visual observations and the techniques enumerated above. ALWI ranked these hazards in term of relative risk and provided concrete suggestions for their appropriate address. More generally, herein ALWI provides specific recommendations for source reduction measures, contingency plans, and other methods that may help better protect against occurrences of water contamination.

2.0 WATER QUALITY ASSESSMENT

Slaughter and Darling (1962) reported the groundwater quality from the Conemaugh Formation as locally variable (iron concentrations range from 0.02 to as much as 6.0 micrograms per liter (mg/l); hardness ranges from 17 to 303 mg/l; and pH ranges from 6.5 to 8.3). ALWI interpreted that the slight reddish colors of the local rock exposures as likely attributable to the trace presence of iron.

At this location, ALWI collected baseline groundwater samples on September 22, 1999, in accordance with the MDE sampling procedures specified in COMAR 26.08.05. ALWI was unable to collect raw water samples, as there was no way to access the water supply before it ran through the chlorination disinfection system without risking cross-contamination. ACHD's laboratory analyzed the samples for those constituents of countywide concern. These included total coliform bacteria as specified in COMAR 26.04.01.11A-C, alkalinity, color, conductance, hardness, iron, manganese, nitrate-nitrite nitrogen (COMAR 26.04.01.14(4)(a)), nitrite nitrogen (COMAR 26.04.01.14(4)(b)), pH, and total dissolved solids. The results are included as Appendix A, and suggest potability relative to the samples collected.

3.0 DELINEATION OF SOURCE PROTECTION AREA

ALWI delineated an area of potential concern surrounding this site's spring using generalized criteria developed by MDE for non-community supplies, as modified by ALWI (with ACHD consent) based on the specific topographic setting of the site. ALWI began by using a fixed radius of 1,000 feet around the well. From this radial area, ALWI then excluded downgradient

areas more than 100 feet from the wellhead as well as areas unlikely to contribute recharge to the well based on intervening streams and/or drainage divides. ALWI also excluded steeply-sloping cross-gradient areas.

The resultant delineation is shown on the "Water Plant Information" survey form (Appendix B) and encompasses approximately 60% of the circle (originally 72 acres in size) or 43 acres. Within an assumed 600 gallons per day per acre (gpd/ac) of annualized groundwater recharge (Slaughter and Darling, 1962, Table 37), slightly less than 26,000 gallons per day exists within the aquifer beneath this surveyed area. In actuality, the modest demand of this well is much smaller than the total available in the surveyed area, lending a high degree of conservatism to this analysis.

An interview with the owner suggested little if any seasonal peaking in demand, and ALWI used this to interpret little, if any, seasonal fluctuation of the surveyed area boundary. Negligible nitrate-nitrogen concentrations were detected in the sample ALWI collected. This obviated the need for a nitrate balance assessment.

4.0 CONTAMINANT THREATS ASSESSMENT

ALWI performed a site reconnaissance on September 22, 1999. During the reconnaissance, local land use conditions were observed with emphasis on the potential use, storage and disposal practices of hazardous materials and petroleum products. Such conditions may have included visual evidence for present or former spills, stained or discolored ground surfaces, stressed vegetation, unusual odors, or visible underground storage tank (UST) facilities. Adjacent and nearby properties were also visually scanned for such evidence from the property and nearby public right-of-ways. Off-site properties were not entered. ALWI relied upon the accuracy of historical interview information provided by the owner and his employees to provide context for some of its observations.

Spring sources are at high risk for surface water influence as defined in the MDE guidance document. This risk would be better quantified with better information on the construction of the catchment potential for variance in surface water indicator parameters (raw water bacteria; temperature and turbidity) with differing precipitation regimes. Ultimate decisions regarding possible filtration retrofits and/or bottled water conversions are appropriately driven by economic considerations.

Depending on their construction, the spring box(es) themselves may serve as potential sources of contamination. Appropriate sanitation of these structures is important to prevent possible contamination of the water supply with bacteria or other constituents of surface water runoff. ALWI was told that the spring catchments inside the spring boxes are concealed beneath metal lids situated on the forest floor. Potential potability risks may arise from animal feces and insects entering the spring boxes.

ALWI performed a reconnaissance in an attempt to identify potential contamination sources in the delineated surveyed area. ALWI identified no obvious sources of contamination other than the on-site risks listed above, though the reported location of the spring is proximal to the eastbound lanes of I-68. The hazard posed by vehicle drippings and highway deicing could not be assessed.

5.0 CONCLUSION AND RECOMMENDATIONS

ALWI found that the supply appears potable relative to the analyses performed. No discharge to groundwater has been confirmed by any of the facilities or practices ALWI observed. ALWI has ranked its observation in decreasing order of overall relative risk. ALWI provides specific recommendations at the conclusion of each respective observation or interpretation.

1. **Surface Water Influence** – The spring source is at "high" risk of surface water influence as defined by MDE. Property ownership interests should collect and analyze groundwater samples for indicators of groundwater under the direct influence of surface water (e.g., turbidity, temperature, and bacteria analyses performed daily for four consecutive days immediately after a 0.5-inch rainfall event). Depending on the results of the analyses indicated above, the DPW should evaluate the cost and feasibility of retrofitting the existing water supply system with appropriate filtration measures to better protect from human health pathogens typically found in surface water (e.g., *Giardia* and *Cryptosporidium*) and/or to replace the supply with a well. If no action is taken to investigate and mitigate this risk, all water should be boiled for ten minutes before commercial use and appropriate placarding should be provided to warn against use of an untested source for potable purposes.

2. **Highway and Parking Area Deicing** – Highway deicing practices may increase a seasonal risk of sodium and chloride contamination. The State Highway Administration (SHA) is unlikely to curtail or otherwise change deicing practices on Vale Summit Road (MD Route 55) or on the National Freeway (I-68). Baseline and bi-annual sampling for sodium and chlorides should be considered.

6.0 SELECTED REFERENCES

Cleaves, Emery T., Jonathan Edwards Jr. and John D. Glaser, 1968. Geologic Map of Maryland: Maryland Geologic Survey, 1:250,000.

MDE Public Drinking Water Program, 1998, Transient Water System Operations Guidance; Guidance For Counties With Delegated Responsibilities (Draft), 45p.

Slaughter, Turbit H. and John M. Darling, 1963, The Water Resources of Allegany and Washington Counties: Maryland Department of Geology, Mines, and Water Resources, Bulletin 24, p. 408.

NONCOMMUNITY WATER SUPPLY SANITARY SURVEY

1. System Name: Clarysville Water System

2. WAS: 42

3. System Information:

Address: 701 Kelly Road, Suite 242

Cumberland, Maryland

Phone No.: (301) 777-5936

4. ADC Map/Grid: N/A

5. Tax Map/Plat: N/A

6. Population:

Transient ____
Regular 25
Total 25+/-

7. Property Information:

Owner's Name Allegany County Dept. of Public Works

Address: 701 Kelly Road, Suite 242

Cumberland, Maryland

Phone No.: (301) 777-5936

8. No. Service Connections:

9. Type of Facility:

Food Service _____
Church _____
Campground _____
Daycare _____
Other (specify) _____

10. Contact Person:

Name: _____

Phone No. _____

11. Operator:

Name: _____

Cert. No. _____

12. Sample History (Has the system had any violations?):

Bacteria: None apparent or reported

Nitrate: None apparent or reported

SURVEY RESULTS

13. Comments on System, Recommendations:

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14. Inspected by: Mark W. Eisner

15. Date inspected: 9/22/99

16. System Vulnerability

Protected _____ Vulnerable Yes (see report)

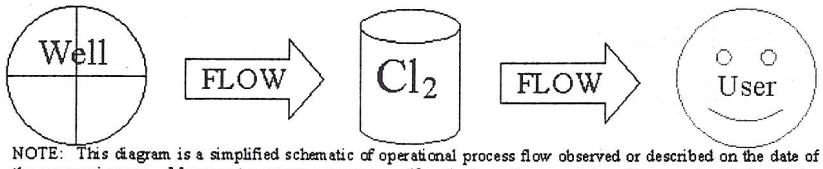
WATER PLANT INFORMATION

17. Type of Treatment:
(Check all that apply)

Disinfection
- Gas Chlorine: _____
- Sodium Hypochlorite __x__
- Ultraviolet Radiation _____

Iron Removal _____
Nitrate Removal _____
PH Neutralizer _____
Other _____
Unknown _____

18. System Schematic (Process Flow):



NOTE: This diagram is a simplified schematic of operational process flow observed or described on the date of the reconnaissance. Many water systems possess malfunctioning, disconnected and/or occasionally/regularly-bypassed equipment. Actual treatment processes may differ, therefore, from those shown herein.

19. System Storage:

Ground Storage _____
Elevated Storage _____
Hydropneumatic Tank __x__
Other _____

20. Storage Capacity:

Typical Domestic

21. Untreated water sampling tap?

Yes _____ No __x__

WELL INFORMATION

22. Well Information: N/A

Tag Number:

Year Drilled: _____

Casing Depth: _____

Well Depth: _____

Well Yield: _____

Casing Height: _____

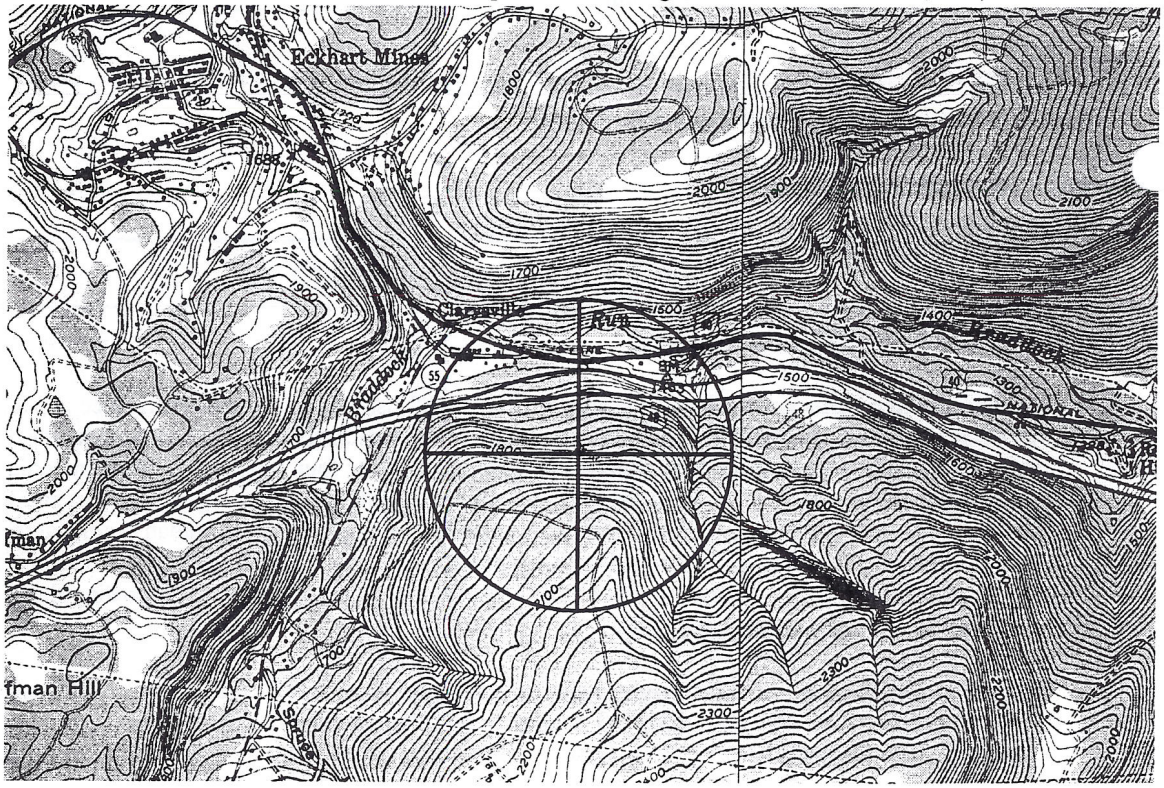
Grout Depth: _____

Pitless Adapter? _____

Wiring OK?

Pump OK?

24. Well Location Diagram (1 in. = 1250 ft.) with Approximate Distances from Potential Contaminant Sources (i.e. septic, sewer lines, structures, petroleum storage, surface water bodies, etc.):



23. Well Type:

Drilled __x__
Driven _____
Dug _____

25. Aquifer:

Name:
GAP #: _____
Confined _____
Unconfined ____
Semi-confined _____

26. Quantity Used:

Daily Avg (gpd) <600
Pumping Rate (gpm) _____
Hours run per day _____

27. Well Cap: N/A

Type? _____
Seal Tight?
Vented?
Screened?
Conduit OK?

28. Casing Diameter: N/A

2" _____
4" _____
6" __x__
Other _____

29. Casing Type: N/A

PVC _____
Metal _____
Concrete _____