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SOURCE WATER ASSESSMENT PLAN

FOR HARFORD COMMUNITY COLLEGE

HARFORD COUNTY, MARYLAND

ALWI Project No. HA7E014

March 27, 2001

Prepared for

WHITNEY, BAILEY, COX AND MAGNANI

PURSUANT TO THE REQUIREMENTS OF
THE MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Prepared and Submitted By:

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President

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EXECUTIVE SUMMARY

Advanced Land and Water, Inc. (ALWI) was retained by Whitney, Bailey, Cox and Magnani, LLP (WBCM), to prepare a Source Water Assessment Plan (SWAP) for the Harford Community College (HCC) water service area, located near Churchville in Harford County, Maryland. This plan includes the three existing wells located on campus at Aberdeen Hall, Joppa Hall and Susquehanna Center.

In accordance with the Maryland Department of the Environment (MDE) guidance documents, this SWAP documents the methods and results of ALWI's work in delineating the Wellhead Protection Areas (WHPA), identifying and mapping existing and potential contaminant hazards within each WHPA, evaluating the susceptibility of the groundwater supplies to certain contaminants and formulating specific strategies to reduce the risk of contamination.

1. **Delineation** - ALWI used land surface topography and water balance analysis to guide the WHPA delineations around each well. ALWI determined that a portion of the HCC campus is situated within the WHPA of the adjoining Campus Hills water service area. One of the HCC wells is located within the previously delineated Campus Hills WHPA, resulting in partial overlap of WHPAs.

2. **Contamination Hazards** – ALWI identified and mapped existing and potential contamination hazards within the HCC WHPAs. Though no hazard warranting immediate corrective action was identified, ALWI ranked these hazards in terms of relative risk of susceptibility and provided concrete recommendations for their appropriate address.

3. **Management Tools** - ALWI provided specific recommendations herein for source reduction measures, public awareness programs and contingency plans. These center on identifying and mitigating the risk of subsurface contamination emanating from nearby commercial and industrial properties.

1.0 INTRODUCTION

Advanced Land and Water, Inc. (ALWI) was retained by Whitney, Bailey, Cox and Magnani, LLP (WBCM) to develop a Source Water Assessment Plan (SWAP) for the groundwater supply wells serving the Harford Community College (HCC) campus. HCC is located on Thomas Run Road, north and northeast of its intersection with MD Route 22, in eastern Harford County, Maryland. It is located immediately west of and proximal to the water service area of Campus Hills Water Works, Inc. ALWI performed the work herein pursuant to Proposal No. HA7E014A, which was authorized by WBCM on November 3, 1998. Though issuance of the final report was not approved until January 2001, ALWI completed its evaluation and draft report before the 1999 release of present Maryland Department of the Environment (MDE) SWAP guidelines.

1.1 PURPOSE AND BACKGROUND

This SWAP was developed pursuant to the requirements of the Harford County Health Department (HCHD) and recommendations made by the MDE Water Supply Program. The HCC water system was judged to be in particular need of wellhead protection because (1) the proximity of the on-site water supply wells to wastewater disposal areas increases the risk of bacterial and nutrient contamination and (2) little if any geographically removed water supply options exist should contamination occur.

At the outset of this project, ALWI understood that a portion of the HCC service area is within the wellhead protection area (WHPA) of the previously completed Campus Hills wellhead protection plan. That plan is understood to have been reviewed and accepted by MDE and HCC. None of the work herein is intended to alter or otherwise update the Campus Hills wellhead protection plan, except for additional detail that has become available during ALWI's work and directly relates to HCC.

As aforementioned, three wells presently serve the HCC Campus: the Joppa Well, the Susquehanna Well and the Aberdeen Well. A fourth well is planned to serve a future astronomical observatory with occasional, evenings-only use and 20 parking spaces. This plan addresses the three existing wells only because of the minimal projected use of the future observatory well.

1.2 REGULATORY FRAMEWORK

In performing this work, ALWI followed MDE's wellhead protection guidelines that stem from federal enabling statutes. 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 MDE's Wellhead Protection Program in June 1991.

Despite its overall hardness and resistance to erosion, localized permeabilities[2] in highly fractured zones may be several times greater than in surrounding less-fractured rock. The Port Deposit Gneiss is a relatively productive aquifer for the bedrock portion of Harford County with an average yield of approximately 20 gallons per minute (gpm). In fact, the highest yielding bedrock wells in Harford County with blown yields[3] ranging from 145 to 540 gpm are completed in fractured zones within the Port Deposit Gneiss.

2.2 Saprolite and Soil Mantle

Natural chemical weathering of the shallow portion of the bedrock, due to percolating water, has chemically altered many of the original rock-forming minerals to clays and other secondary minerals. This has resulted in the development of shallow saprolite (weathered bedrock) and the overlying soil mantle. The thickness of the soil and saprolite is generally 30 to 50 feet, but it varies considerably over short distances. In highly fractured zones, enhanced groundwater storage and movement has accelerated the breakdown of the rock-forming minerals and has caused formation of a thicker saprolite.

2.3 Aquifer Recharge

Precipitation infiltrating through the soil on site and/or in up-gradient areas is the primary source of water for the production wells. Generally, overlying soil horizons act to absorb and then slowly release infiltrating precipitation. However, in areas where fracture zones have formed, percolating groundwater can reach the water table quickly by migrating through narrow, interconnected joints, fractures, faults and cleavage planes in the bedrock.

2.4 Fracture-Controlled Ground Water Flow

Generally, bedrock fracture zones (where present) function as both downward and lateral water conduits. As a result, fracture zones receive and transmit water at a rate higher than would otherwise be available in unfractured areas. Generally, fractures are preferential conduits for groundwater flow and contaminant transport. Drawdown responses are both more immediate and more marked along fractures as opposed to across fractures.

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[2] Permeability is a measure of the rock's capability to transmit water to a well.

[3] "Blown yield", sometimes called "blown-test yield" is the discharge rate of the well estimated during a period in the drilling program when the high-volume air compressor on the drilling rig is used to evacuate the well bore. Blown yields typically exceed sustainable pumped yields but can provide a preliminary indication of well performance before rig demobilization. Reported yields on Maryland Well Completion Reports typically are blown yields and COMAR contains provisions for the duration and discharge rates for blown yields to be used to determine the adequacy of a groundwater supply for domestic use.

2.5 NATURAL WATER QUALITY

The quality of groundwater found in the Port Deposit Gneiss is generally soft and mildly to moderately acidic; some residential users add crushed limestone to help neutralize an otherwise low pH [typically near 6.0] (Nutter, 1997; Nutter and Smigaj, 1975). Laboratory analyses of samples from Well No. 4 in the adjacent Campus Hills water service area typify local water quality conditions and suggest that the water from this well is fit for potable uses with minimal treatment.

In general, turbidity and coliform bacteria may be localized concerns, but occurrences of these are not regionally pervasive and may be more attributable to well construction problems than due to the geologic or hydrologic setting of the well. The potential for adverse water quality problems (e.g., turbidity, bacteria, particulate entrainment) may increase with well yield because of longer development times and greater subsurface weathering often associated with high-yield wells. Given the age of the three existing wells, however, they are likely fully developed. Accordingly, ALWI judges that little risk exists for particulate pathogen entrainment.

ALWI visited the Harford County Soil Conservation Service to review historical aerial photographs of the HCC campus dating back to 1938. These aerial photographs suggest that most of the land within the WHPA was originally pastureland and forest until institutional land uses began after World War II. High nitrate concentrations from historic agricultural fertilization practices are not anticipated, but low to moderate levels are common regionally. Some nitrates may arise from incomplete filtration of wastewater discharged through septic systems within the WHPA. To date, this has not been an overriding concern.

3.0 WHPA DELINEATIONS

In crystalline bedrock aquifers, the MDE Source Water Assessment Guidance Document (1999) specifies that WHPA delineations be based on topography and fracture trace analysis then modified as necessary based on water balance analysis. The specific methods ALWI used to generate each WHPA for HCC are presented in Appendix A. The resultant WHPAs are shown in Plate 1.

3.1 ABERDEEN HALL WHPA

Most of this WHPA is underlain by pervious surfaces (85%). Usage patterns are roughly the same throughout the year, suggesting little seasonal movement of the WHPA boundary. The water balance assessments (Tables 1 and 2) do not mandate extension of this WHPA east of the HCC property-line. Moreover, an interpretation of the date within these tables indicates that the area of the WHPA may be somewhat over-estimated for conservatism unless HCC finds that this well possesses reserve capacity.

If a smaller area is to be considered, ALWI would move its down-gradient extent westward, away from the HCC property line given the lack of firm data to support down-hill groundwater capture and the associated reversal of natural flow gradients. However, for the conservative and

cost-effective implementation of wellhead protection, ALWI delineated the WHPA as shown on Plate 1.

3.2 JOPPA HALL WHPA

The Joppa WHPA (Plate 1) is the largest at HCC but also assumes down-gradient flow reversals without hydrologic data to support that assumption. Much of the area nearest the well and directly up gradient of it is impervious, which raises a concern about sustainable well yields during prolonged droughts or in the face of planned demand increases. Fortunately, HCC personnel reported that the residential dormitory component of the Joppa Hall demand lessons in the summer when supply shortfalls could otherwise occur. Accordingly, ALWI interprets little, if any, seasonal fluctuation of the WHPA boundary. As with the Aberdeen Hall well, for the maintenance of conservatism ALWI does not support lessening the WHPA (except for the possibility of reigning in its northeastward extent into the forest[4]).

Nitrate concentrations within the Joppa well water are the highest on campus (Appendix B). No known nitrate sources are located within the WHPA. Several possible explanations exist:

1. The WHPA may be undersized, which is an unlikely possibility given the water balance results.

2. The well receives water from outside the WHPA due to flow through unmapped fractures, which is possible but expensive to prove.

3. Other, older septic fields exist and act as continuing nitrate sources, which is also possible and similarly expensive to establish. In any case, some uncertainty remains though development of confirming data is unlikely worth the associated cost given that nitrate concentrations remain at 50% of the maximum allowable contaminant level (MCL) of 10 milligrams per liter (mg/l).

3.3 SUSQUEHANNA CENTER WHPA

Delineation of this WHPA proved the most difficult and the most sensitive to assumption and adjustment. As drawn (Plate 1), the WHPA experiences an approximate 39% demand deficit during drought conditions. The operational history of the well does not reflect supply shortfalls and ALWI acknowledges that it remains possible that the WHPA defined herein may underestimate the actual capture zone[5] during drought recharge and peak use periods. However, it is also possible that peak demands are accomplished by the transient dewatering of local aquifer storage.

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[4] The forest presents little contamination risk and is not planned for development, so altering this boundary appears unnecessary on the northern side.

[5] A capture zone is the area from which a well draws water while it is pumping.

To maintain conservatism in the nitrate loading assessments, ALWI included the entire Susquehanna Center and Fallston Hall septic field areas within the contaminant risk assessment herein but without a corresponding increase in the area of the WHPA. Accordingly, this well appears at highest risk for nitrate contamination and supply shortfalls. ALWI recommends detailed summertime testing of this well to better define the WHPA and to better evaluate its long-term safe yield. Such testing could verify the delineation of the Susquehanna Center WHPA in light of the uncertainties raised herein.

3.4 HCC Component of Campus Hills WHPA

A portion of the HCC campus lies within the Campus Hills WHPA. The Campus Hills wellhead protection plan assigned an average daily flow of 3,300 gallons per day (gpd) to the Susquehanna Center well based on data made available to that plan's author (Atlantic Geoscience Corporation) by HCC personnel in 1997. Data provided to ALWI by HCC in 1998 (e.g., Tables 1 and 2) reflect an actual average withdrawal from the Susquehanna Center well of approximately 6,200 gpd. This difference results in slightly less water available within the Campus Hills WHPA but is unlikely to be statistically significant in terms of either supply availability or nitrate loading within the Campus Hills WHPA.

4.0 CONTAMINANT THREATS ASSESSMENT

ALWI identified the following potential sources of contamination within the WHPA: nitrate-laden wastewater discharges and runoff, fuel spills, salt from road de-icing, various educational uses of hazardous and petroleum products and wastes and unauthorized dumping. These potential sources were reviewed using a combination of site development plan reviews, regulatory database reviews, field reconnaissance and interview information.

4.1 Nitrate Loading Assessment

WBCM previously evaluated nitrate loading from a gross acreage, campus-wide perspective and concluded, using highly conservative input criteria, that the acreage needed for wastewater disposal (78 acres) was less than the gross acreage of the campus (Appendix C). ALWI now supplements this analysis by estimating nitrate loading within each WHPA using methods MDE approved for Campus Hills.

ALWI's nitrate loading is summarized in Table 3 and projects ultimate influent nitrate concentrations ranging from 4.2 to 7.9 mg/l. ALWI does not see the need for nitrate pre-treatment in this area[6] because the forecasted concentration would remain well below 10 mg/l of existing concentration.

[6] ALWI is aware that a bill requiring nitrate pre-treatment on a regional or statewide level is pending before the Maryland General Assembly during the 2000 legislative session and may be poised at some future time. ALWI also understands that HCC is providing denitrification on one newly installed disposal field. HCC should remain abreast of the status of this pending legislation. Its passage could result in the need for HCC to require nitrate pre-treatment in this area, for consistency and conformity.

In keeping with past MDE guidance on similar nitrate assessments and to maintain an appropriate level of conservatism, ALWI performed this assessment pursuant to the following governing assumptions:

1. **Nitrate Sources** – ALWI's field reconnaissance suggest that the only nitrate sources in the WHPA were septic discharge and ball field fertilization. ALWI identified no other sources of unusually high strength nitrate concentrations within the WHPAs. As such, existing nitrate concentrations (2.0 – 5.0 mg/l) are considered background.

2. **Flow Mass Balance** – ALWI assumed an initial nitrate concentration of 40 mg/l in the wastewater effluent and used a 3.785-liter per gallon conversion in its calculations (Row No. 6 of Table 3). Approximately 75% of water used by residents in the dormitories is returned to the groundwater via septic discharge.

3. **Distribution of Subsurface Nitrates** – There is full mixing of nitrates as they enter the groundwater, which creates equal concentrations throughout each WHPA. ALWI did not adjust the recharge rate to impervious areas within the WHPAs. Stormwater management merely acts to relocate recharge, without reducing or increasing percolation and the associated concentration of nitrates.

No nitrate loading assessment has been prepared for Joppa Hall because septic disposal areas are not within its WHPA.

4.2 Regulatory Database Review

ALWI acquired a site-specific listing of Federal and State environmental databases from Environmental Data Resources, Inc. [EDR] (Appendix D). ALWI reviewed this listing for facilities where government agencies track the use, handling, storage, disposal and treatment of hazardous waste and petroleum. HCC was a registered underground storage tank (UST) site and a generator of hazardous waste. Accordingly, the subject site is listed within the following databases:

1. **Underground Storage Tanks** – According to the EDR Report (Appendix D), HCC manages registered USTs. ALWI notes poor correlation between the number of former USTs (1) in the database report and (2) documented in the site reconnaissance section (below). HCC's verbal report of a remaining on-site waste oil UST, but no remaining gasoline USTs, is not readily explained.

2. **RCRA Hazardous Waste Generation** - HCC was listed as a small-quantity hazardous waste generator under provisions of the Resource Conservation and Recovery Act (RCRA). The generation of hazardous waste is tracked and reported under applicable provisions of RCRA. The type of waste is unknown; however, HCC generates between 220 and 2,200 lbs./month.

ALWI notes that the inclusion of registered UST sites and hazardous waste generation sites within the EDR database is an incidence of environmental compliance. Inclusion does not necessarily imply the existence of a reported environmental release.

EDR also provided an unsorted list of potentially contaminated properties within the local zip code which may fall within the defined search area but could not be assigned specific geographic coordinates ("orphan sites"). HCC was not listed as an orphan site.

4.3 Visual Site Reconnaissance

ALWI supplemented the EDR database review by performing a visual reconnaissance of the WHPA and surrounding area on December 12 and 23, 1998. During each 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 UST facilities. Adjacent and nearby properties were visually scanned for such evidence from HCC property and nearby public rights-of-way. Off-site properties were not entered. ALWI relied upon the accuracy of historical interview information provided by HCC personnel to provide context for some of its observations.

On December 23, 1998, ALWI observed several potential groundwater contamination sources in each of the three WHPAs. No discharge to groundwater has been confirmed by any of the facilities or practices ALWI observed. However, within each subsection, ALWI has ranked its observations in decreasing order of overall relative risk. ALWI provides specific recommendations at the conclusion of each respective observation or interpretation and suggest that these be integrated into a long-term environmental risk management plan.

4.3.1 Campus-Wide Observations

1. **Former USTs** - Fuel oil was used for heat prior to the availability of natural gas service. HCC removed the USTs as part of a campus-wide upgrade program earlier in the 1990s and secured closure from the MDE Oil Control Program relative to these USTs. Based on experience, ALWI has observed that UST sites may achieve closure from the MDE Oil Control Program even with the continued presence of low to moderate degrees of subsurface petroleum contamination. Given the proximity of the former UST site to each well (less than 100 feet of separation in all three cases), ALWI recommends analytical testing of the supplies to confirm the absence of fuel oil constituents.

2. **Wellheads** - ALWI observed that all three wells possess steel casings with above-ground stickup and pitless connections. ALWI did not observe visual evidence of stormwater infiltration along the well casings and noted that the wells are located outside of roadway areas and have secure-fitting caps of the conventional conduit type. HCC personnel indicated that a contractor regrouted and extended the well casings above ground several years ago, and

that the wells originally had subsurface completions. The new well caps appear not to have screening of the type designed to prevent the entrance of earwigs and other small insects into the well casing. Therefore, ALWI recommends replacement of the conventional conduit-style well caps with more modern caps better designed to prevent the entrance of earwigs and other insects.

3. **Stormwater Management** – Except as otherwise noted, existing stormwater conveyance and disposal facilities discharge outside the WHPAs. It is always possible for smaller amounts of stormwater not to enter the collection system. Stormwater appears not to pose an undue wellhead protection hazard in light of the other observations and findings herein.

4.3.2 Aberdeen Hall WHPA

1. **Chemistry Laboratories** – Aberdeen Hall houses chemistry laboratories. Liquid discharges from the laboratory sinks are piped to a 200-gallon pH-neutralizing tank. Muriatic acid and sodium hydroxide (soda ash) are used as buffers, and the post-treatment wastewater is discharged to the subsurface via the drainfield that is presently within the WHPA but is scheduled for relocation outside the WHPA. Bay Associates, Inc. holds a contract with HCC for the removal and disposal of hazardous waste from the chemistry building. No analytical testing data of either the wastewater stream nor the influent water was available. It is unknown whether contaminants remain in the wastewater. ALWI recommends that analyses be performed for the full MDE criteria for new public supply sources, exclusive of surface water influence testing and other statewide waiver analytes.

2. **Existing Subsurface Disposal Facilities** – HCC personnel indicated that the existing septic tank has seams that may be sources of direct leakage without benefit of drainfield dispersal. The existing septic tank and drainfields are scheduled for replacement with a new system located outside the WHPA. HCC plans to retain the current system for potential future use once natural attenuation occurs within the existing drainfields. ALWI recommends that the septic tank be replaced with a seamless model before renewed use commences.

3. **Above Ground Fuel Tanks** – ALWI observed above ground fuel storage tanks (ASTs) within the maintenance yard of HCC, located within the eastern portion of the WHPA. These ASTs appeared in nearly new condition and had secondary containment systems. ALWI recommends continued regular maintenance of these fuel storage systems including development and/or review of components of a campus-wide Pollution Prevention Plan regarding specific protocols to be employed in case of a leak or overfill.

4. **Maintenance Supplies Storage Sheds** – ALWI observed the presence of maintenance storage sheds near the eastern end of the WHPA. Because of maintenance activities at the time of ALWI's site reconnaissance, these sheds could not be entered. ALWI recommends that potential liquid and solid contaminants be stored in sealed containers in precise accordance with manufacturers and distributors recommendations. The buildings should be wind- and watertight with solid floors. Leaks and spills should be cleaned up at once using

non-reactive absorbent materials whenever possible. The use of water for cleanup and fire fighting should be limited so that potential contaminants are not entrained.

5. **Stormwater Discharge in Drainfield Areas** - Stormwater from the parking areas near the maintenance shop and barn flows westward to discharge near and over the existing drainfield. During seasonally high water table conditions, percolating stormwater may raise the groundwater table in the drainfield area to the level of the drainfields. This could lessen the absorption capacity of the soils. ALWI recommends that a soil boring and associated infiltrometer test be performed in the area of the existing field before its future reuse. Depending on the results of such an investigation, it may be prevalent to redirect stormwater away from the drainfields. Other stormwater within the WHPA area discharges diffusely and generally toward the northeast.

ALWI also learned of a printing shop located within the Harford Learning Resources Center, located outside but near the WHPA. ALWI did not enter the print shop, but HCC personnel represented that it has modern waste handling and disposal systems and safeguards.

4.3.3 Joppa Hall WHPA

On December 23, 1999, ALWI and WBCM personnel toured Joppa Hall and adjacent exterior areas within the WHPA. This one-story structure is situated across a level asphalt driveway, south of the well. This building houses instructional areas for automotive maintenance and the creative arts (e.g., painting, ceramics, etc.), as well as other disciplines less likely to involve the use of hazardous materials and petroleum products in education. ALWI observed the following specific practices judged to represent existing or potential contaminant threats and ranked in decreasing order of concern:

1. **Floor Drains** - ALWI observed open floor drains in portions of the automotive maintenance and creative arts areas. Unlined, trench-style floor drains cross the middle of the floor of the shop. ALWI observed an area used for the storage of paints, thinners and solvents in the shop area as well. Both 55-gallon drums as well as many smaller cans were observed. Most of the containers were closed, but some were open. No secondary containment systems were evident. The drains reportedly connect to a subfloor oil/water separator located near the southeastern corner of the body shop. ALWI observed the steel lid of a manway but could not observe the separator itself. Some floor drains were also observed in boiler room areas, where fuel oil had previously been used for heat. ALWI could not verify the outfall locations of any of these floor drains. ALWI recommends that the floor drains be sealed concurrently with the adoption of building-wide protocols to obviate their need.

2. **Waste Oil UST** – Though not observed by ALWI, waste oil is reportedly stored within an UST located at Joppa Hall. The size, age and condition of this UST are unknown. The status of its compliance with the December 22, 1998 upgrade requirement is similarly unknown. ALWI recommends removal and closure of this UST and its replacement with an AST of design similar to those at the previously mentioned maintenance yard.

3. **Vehicle Lifts** – ALWI observed hydraulic vehicle lifts in the shop area. No visible leakage or spillage of hydraulic oil associated with the lifts was observed at floor level. Some lifts had been rendered permanently inoperable by the removal of surface equipment but others appear to remain functional. According to COMAR 26.10.02.02.B (3), hydraulic lift tanks are exempt from UST regulatory registration and reporting requirements. However, releases from hydraulic lift systems may be regulated. ALWI recommends that the subfloor lifts be removed, properly closed and replaced with above-ground systems of modern design.

4. **Inoperable Vehicles and Outdoor Automotive Parts** - Between 10 and 20 inoperable vehicles were parked at scattered locations on the parking lot east of Joppa Hall at the time of ALWI's reconnaissance. Many of these vehicles appeared abandoned. ALWI did not observe widespread leakage of automotive fluids (e.g., oil, antifreeze, etc.) beneath the parked vehicles. ALWI did observe scrap metal and other vehicular components, (e.g. batteries, radiators, fuel tanks, etc.) outdoors. The condition and location of these batteries suggested the potential for rainwater to degrade their casings and to mobilize their corrosive contents. ALWI recommends that batteries and other parts containing environmentally sensitive liquids not be stored outdoors. ALWI also recommends that inoperable vehicles not be stored for extended periods unless all of their liquid contents (oils, antifreeze, etc.) have been drained and appropriately stored or disposed.

Based on ALWI's past observations of buildings of similar age and design, it is possible that the floor drains outfall to unmapped and forgotten disposal facilities within the WHPA. Pending MDE concurrence, ALWI recommends a subfloor and subsurface mapping program to determine the integrity, locations, and routing of both present and historic floor drain systems.

Depending on the results of these investigative and corrective measures, a more comprehensive environmental compliance audit of the creative arts and automotive maintenance programs could be considered. This would better ensure that potential groundwater contaminants do not enter the building's wastewater collection and disposal system. Such an audit would provide specific guidelines to help on-site personnel to ensure that these substances are managed, handled, stored and disposed of according to all appropriate regulations and prudent guidelines.

4.3.4 Susquehanna Center WHPA

ALWI observed that the areas nearest the Susquehanna Center well are paved. Susquehanna Center houses an indoor swimming pool. Treatment chemicals, mainly bromine and sodium hydroxide, are housed in a storeroom in an adjacent room lower in elevation. A chemical mixing tank exists in this location. The room bears visual indications of prior flood events. Floods could mobilize the treatment chemicals and discharge them outdoors within the WHPA. ALWI recommends that all equipment be regularly serviced and maintained and that chemicals be stored using secondary containment, above floor level[7].

[7] The treatment room could also be equipped with a sump pump and/or gravity drain conveyed to outdoor outfall downgradient and outside the WHPA.

5.0 WHPA MANAGEMENT AND PLAN IMPLEMENTATION MEASURES

For any wellhead protection plan to be beneficial to its udders, it has to be well reasoned, technically defensible and easy to implement. ALWI recommends a combination of measures to better assess present conditions and to mitigate the susceptibility of the HCC groundwater supplies to the threat of future contamination.

5.1 SUPPLEMENTAL ASSESSMENT AND SOURCE REDUCTION RECOMMENDATIONS

In the wellhead protection plan prepared for Campus Hills, Atlantic Geoscience Corporation (AGC) made certain recommendations regarding contaminant hazard mitigation at HCC. These focused on the potential risks to the Campus Hills wellfield. Some of AGC's recommendations equally apply to the HCC WHPAs. In consideration of AGC's original recommendations and MDE's responses thereto, and particularly in light of the more detailed HCC site reconnaissance data presented herein, below ALWI recommends various measures to better assess and reduce susceptibility to future contamination risks.

ALWI recognizes that the full adoption of its source reduction recommendations will require both time and capital. Necessary moneys may exceed the present budgetary capability of the HCC Facilities Department. Therefore, some prioritization of risk mitigation measures appears appropriate and ALWI recommends that the at-risk populations[8] be considered in assigning such priorities, despite the fact that present data indicates the greatest overall susceptibility to elevated nitrate levels.

1. **Recommended Corrective and Preventative Actions at Joppa Hall** - ALWI recommends the following measures for priority funding and implementation:

   - Baseline Sampling – ALWI recommends that HCC collect and analyze groundwater samples for the potential presence of contaminants likely originating from operations and activities at Joppa Hall. Given the range of materials used by both the automotive and creative arts facilities, ALWI recommends that analyses be performed for the full MDE criteria for new public supply sources, exclusive of surface water influence testing and other statewide waiver analytes[9]. The need for specialized treatment[10] and/or a

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[8] ALWI recognizes that the Joppa Hall well serves an on-campus day-care center. Generally, toxicological studies suggest that children are one of the greatest at-risk groups to even low levels of certain contaminants.

[9] The complete analytical list is available from the MDE Water Supply Program on request, and includes volatile and semi-volatile organic compounds, pesticides, herbicides, synthetic organic compounds, priority pollutant metals and other compounds for which knowing the concentrations is useful in designing effective treatment.

[10] Aeration and carbon absorption are common treatment technologies for volatile organic contamination. At low concentrations, routine chlorination sometimes provides sufficient oxidation to mitigate the risk.

subsurface investigation[11] would depend on the analytical results. ALWI also recommends sampling be performed concurrently with a well yield evaluation, which can be done by extending the pre-sampling purge period while monitoring flow rate and drawdown.

- Automotive Service Facility Upgrades – ALWI recommends that the UST and hydraulic lifts be removed, properly closed, and replaced with above-ground equipment of modern design. ALWI also recommends that removal and disposal of outdoor automotive supplies occur at the same time for cost-effectiveness.

- Close Floor Drains – ALWI recommends that (1) the present practice of disposing of waste liquids into floor drains with unknown outfalls cease; (2) plumbing be modified to eliminate this continued possibility; and (3) classrooms with special disposal needs be equipped with self-contained equipment of modern design.

2. **Baseline Analyses of Groundwater at Susquehanna Center and Aberdeen Hall** - Depending on the availability of funding and regulatory concurrence, ALWI recommends baseline sampling and yield evaluations[12] for the Susquehanna and Aberdeen Hall wells, though the analyte list at Susquehanna Center likely can be restricted to petroleum hydrocarbons, swimming pool chemicals, deicing compounds, nitrate-nitrogen, and coliform bacteria. Sampling should be repeated on a quarterly and/or annual basis depending on the findings.

3. **Environmental Facilities Compliance Audit (all three WHPAs)** - AGC recommended a detailed review of environmental compliance practices associated with HCC facilities and operations. ALWI recommends that such an audit address both existing and proposed hazardous materials handling, fertilizer and pesticide application, petroleum products storage, de-icing and wastewater discharge practices. Such an audit would provide specific guidelines to help on-site personnel that the facilities are managed in accordance with all appropriate regulations and prudent guidelines. It would also help prioritize funding for specific source reduction programs[13] and engineering controls.

4. **Best Management Practices (BMP) and Pollution Prevention Plan (PPP) Protocols** – To further mitigate the risk of an existing (undetected) or future contamination occurrence,

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[11] If the analyses suggest contamination from semi-volatile or non-volatile organic compounds and/or metals, HCC may find it more cost-effective to locate and remediate the source (i.e., excavate and remove soils beneath the floor drains and/or in the vicinity of a former disposal field) than to design and furnish treatment.

[12] ALWI recommends that the purge period prior to sampling be of several days duration and be closely monitored so the time, flow rate, and drawdown data may be used to derive sustainable yield projections for these wells.

[13] For example, the Joppa Hall and Susquehanna Center WHPAs extend to and slightly across Thomas Run Road. Deicing along this road (and elsewhere on campus) may be a secondary contaminant hazard. A wise precaution would involve the use of non-chemical abrasives to replace some salt usage. The degree of salt in the mix can be guided, in part, on sampling results

ALWI recommends implementation of a systematized program for proactive mitigation of future contamination occurrences. For example, such a program could specify certain limits on the use of fertilizer on portions of the HCC campus within WHPAs. More generally, such a program could provide a framework for a multi-year risk assessment and reduction program.

5.2 Community Awareness and Public Outreach

ALWI recommends that certain voluntary programs be established campus-wide to better minimize contamination occurrences both within, and immediately adjacent to, the WHPAs. Such a program would foster campus-wide inter-departmental awareness, education and student involvement in the day-to-day implementation of an effective wellhead protection plan. As an initial measure, ALWI recommends that HCC develop a letter or flyer for widespread on-campus distribution to educate and inform students and faculty about the importance of environmentally conscientious waste management practices. HCC could also consider posting signage cautioning against dumping in the WHPAs.

5.3 Contingency Planning

According to MDE wellhead protection guidance documents, an effective contingency plan should have six key components: inventory of threats; design of response; assignment of responsibilities; identification of resources (logistical, technical, and financial); periodic review and updates; and public involvement. Threats have been inventoried and public participation measures suggested earlier in this document.

ALWI recommends that the following step-wise procedures from implementation in the event of an acute threat of water supply contamination:

1. **Confirm Source/ Notify Owner / Reduce Threat** – HCC should verify the nature, source and degree of contamination within the aquifer and/or water supply system. The owner(s) (i.e. potentially responsible party) should be identified and notified so that corrective action can be taken. At the same time, contamination threat reduction measures should be evaluated and implemented to mitigate degradation of the water supply and any associated health risks (e.g. distribution system flushing, sampling, spill clean-up, equipment maintenance and cleaning as necessary).

2. **Notify Users / Reduce Demand** – The detection of contamination warrants public notification before the contamination reaches connections to the service. Depending on the conditions observed, it might be necessary to reduce demand, boil water or in a worst-case scenario refrain from unnecessary water supply usage (e.g. use bottled water for cooking and drinking).

3. **Retrofit for Treatment** – If detected, the degree and nature of contamination may necessitate treatment prior to distribution (centralized treatment) or treatment within each

building (point-of-use treatment). A quick cost evaluation of the treatment process options would aid in the decision making process.

4. **Develop Alternative Water Source(s)** – ALWI anticipates that careful monitoring and contingency planning herein will largely preclude catastrophic water supply problems. In the event that water quality within the production wells degrades beyond effective treatment (or should the cost of treatment prove to be exorbitant), alternative sources of water may need consideration. HCC should consider drilling new productions wells in a location outside the contamination plume.

Close cooperation of the following entities would be necessary for the timely and cost-effective address and resolution of the problem: HCC, HCHD, and MDE. HCC should establish a financial reserve to fund contingencies and should remain abreast of MDE grant programs regarding the same. A list of contact names, addresses, telephones, faxes and pager numbers should be developed and kept current. Copies should be provided to HCC facilities and administrative personnel, Harford County (including the Departments of Public Works, Emergency Response, and Environmental Health); MDE (including PDWP and Oil Control Programs); down-gradient homeowners associations at Campus Hills, and Campus Hills Waterworks, Inc. The list should be reviewed and updated tri-annually for currency.

ALWI anticipates that careful monitoring and contingency planning herein will largely preclude catastrophic water supply problems. Nevertheless, one additional alternative is available in the remote event of a catastrophic failure of the HCC water system to provide water of acceptable quantity and/or quality. This would involve designing and establishing an emergency interconnection with the Board of Education's water system on the west side of Thomas Run Road. Such a connection would benefit both the Vo-Tec School and the HCC. It is doubtful that HCC could support the needs of the school on an ongoing basis, but the availability of a partial supply on a short-term basis may be helpful while a more comprehensive solution to a catastrophe is designed and constructed.

In theory, a similar connection could be considered to the Campus Hills water system. However, present information suggests that no Campus Hills water mains of suitable size are available near enough to the HCC property line to make the connection cost-feasible from the water company's perspective. Historic supply and operational difficulties at Campus Hills may also lessen the feasibility of such an interconnection, and ALWI did not evaluate it further.

6.0 CONCLUSIONS

In preparing the conclusions enumerated below, ALWI has utilized its best level of effort consistent with its professional standards, present scientific judgment and knowledge. ALWI has upheld accepted industry practice and prepared this report within the budgetary and work scope limitations set forth in our contract with WBCM. This report has been prepared for the benefit and sole use of WBCM, and may not be obtained or used for any other purpose, by any other organization or entity, without the express authorization of WBCM. (ALWI understands that

WBCM has authorized HCC to make use of this report). Any other person or entity obtaining or using this report implicitly agrees, by their use of this document, to be bound by the terms and conditions of the agreement between ALWI and WBCM, including the limitations contained therein.

Subject to the provisions of the preceding paragraph, ALWI's findings and professional opinions follow:

1. **WHPA Delineation** - ALWI delineated each of the three WHPAs using topographic and water balance criteria. No identified fractures cross through any of the WHPAs, though ALWI interpreted that the predominant northeast to southwest trend of regional fracturing likely exerts some influence on groundwater flow and contaminant transport directions.

2. **Contamination Hazards** – Certain facility uses and institutional activities represent risks of existing or future groundwater contamination. ALWI identified site-wide potential contamination concerns relating to fuel storage, roadway deicing, nitrate-laden wastewater discharges and stormwater management. ALWI also observed WHPA-specific conditions warranting investigation and/or correction as specified herein. Identification of specific at-risk sub-populations (e.g., children in the day care center served by the Joppa Hall well), combined with baseline sampling, would allow prioritization of corrective and other measures. In turn, this would allow HCC appropriately focuses resources on improving practices representing the greatest immediate risk.

3. **Management Tools and Contingency Plans** - Herein ALWI presents several recommendations for proactive risk assessment and reduction. ALWI outlines a community awareness program and suggests contingency plans that HCC may implement in case of future water quantity or quality problems.

7.0 SUMMARY OF RECOMMENDATIONS

ALWI recommends comprehensive baseline analyses of each on-site groundwater supply in accordance with the specifications set forth herein. In part depending on the findings, funds should be allocated for priority source reduction measures at Joppa Hall where an at-risk population (children in a day acre center) uses the water. These measures include removal of the waste oil UST, closure of the floor drains and removal of the vehicle lifts. Longer-term plans for source reduction, ongoing monitoring and community awareness should be predicated on the availability of funds and the results of a recommended campus-wide environmental compliance audit.

8.0 SELECTED REFERENCES

Dingman, R.J. Ferguson, H.F., and Martin, R.O.R., 1956, Water Resources of Baltimore and Harford Counties: Maryland Geological Survey Bulletin 17, 233 p.

Nutter, L.J., 1977, Ground-Water Resources of Harford County, Maryland: Maryland Geological Survey Bulletin No. 32, 44 p.

Nutter, L.J., and Smigaj, M.J., 1975, Harford County: ground-water information: well records, chemical quality data, and pumpage: Maryland Geological Survey Water Resources Basic Data Report No. 7, 89 p.

TABLE 1
WATER BALANCE ASSESSMENT DURING DROUGHT CONDITIONS
HARFORD COMMUNITY COLLEGE GROUNDWATER SUPPLY SYSTEM

Description	Aberdeen Hall WHPA	Joppa Hall WHPA	Susquehanna Center WHPA	Grand Total For Combined WHPAs
Acreage Within Initial WHPA Delineations	13.3	15.8	15.5	44.6
Drought (1-in-10) Ground Water				
Availability Est. (421 gpd/ac) [1]	5,591	6,648	6,521	18,760
Est. Deductions for Existence/Creation	15%	30%	35%	
of Impervious Areas	876	2,084	2,385	5,346
Maximum Potential Drought-Level				
Supply Available Within Initial WHPA in gpd.	4,967	4,863	4,430	14,260
Current Average Daily Demand in gpd [1]	1,523	3,836	6,179	11,538
As a Percentage of Drought Availability	31%	79%	139%	81%

TABLE 2
WATER BALANCE ASSESSMENT DURING NORMAL CONDITIONS
HARFORD COMMUNITY COLLEGE GROUNDWATER SUPPLY SYSTEM

Property Description	Aberdeen Hall WHPA	Joppa Hall WHPA	Susquehanna Hall WHPA	Grand Total For Combined WHPAs
Acreage Within WHPA Delineations	13	16	15	45
Average (1-in-2) Ground Water Availability Est. (800 gpd/ac)	10,624	12,632	12,392	35,648
Est. Deductions for Existence/Creation of Impervious Areas	15% 1,594	30% 3,790	35% 4,337	9,720
Current Average Daily Demand in gpd	1,523	3,836	6,179	11,538
Maximum Potential Supply Available During Average Recharge Conditions in WHPA	9,030	8,842	8,055	25,928

TABLE 3

NITRATE BALANCE ASSESSMENTS

HARFORD COMMUNITY COLLEGE GROUNDWATER SUPPLY SYSTEM

Computational Sequence		Aberdeen Hall WHPA	Susquehanna Hall WHPA	Grand Total For Combined Areas	Campus Hills WHPA Component	Comments
1	Acreage Within Initial WHPA Delineations (acres)	13	15	29	75	See Figure 1 for map of delineated areas.
2	Average (1-in-2) Net Ground Water Availability Est. (800 gpd/ac)	9,030	8,055	17,085	51,945	Based on a hydrograph separation of Winters Run streamflow data (Dingman and Ferguson, 1956)
3	Average Daily Withdrawal (gpd)	1,523	6,179	7,702	11,750	From 1998 flowmeter records provided by HCC (Appendix A).
4A	Est. Deduction for Extrabasinal Discharges by Design (gpd)	-	2,757	2,757		Sum of Learning Resource Center (1,542 gpd), Hays House (11 employees x 50 gpd/person), and Thomas Run Park (665 gpd).
4B	Est. Deduction for 25% Water Leakage in gpd	381	1,545	1,926	2,938	ALWI assumes that wastewater flows are 75% of water production rates due to leakage and other factors. HCC data do not contradict this assumption.
4C	Est. Addition for Extrabasinal Nitrate Sources in gpd	-	240	240	4,067	ALWI conservatively assumes that the future discharges from the Fallston Hall reserve area will enter the Susquehanna WHPA. Fallston data from Appendix A
4D	Est. Deduction for Partial Extrabasinal Flow, in gpd, of Shallow Groundwater Downgradient and Out of WHPA	20% 228	70% 1,482	1 1,711	25% 3,220	Percentages are based on ALWI's hydrogeologic judgment and experience, governed in part by (1) the preferred northeast to southwest orientation of local and regional fractures; (2) the distance between upgradient wells and downgradient drainfields; (3) relative topographic slope in the drainfield areas; and (4) existing nitrate concentrations in the influent waters.
5	Est. Recirculating Wastewater Discharge Within WHPA in gpd	914	635	- 1,549	9,660	The sum of Row Nos. 3 Plus 4c, less the sum of Row Nos. 4A, 4B. And 4D
6	Daily Nitrate Mass Loading Estimate in mg/day	138,349	96,165	234,515	1,462,467	Row 5, multiplied by an undiluted effluent nitrate concentration of 40 mg/l and by a conversion factor of 3.785 liters per gallon
7	Remaining Available Groundwater for Dilution in gpd (Original Recharge Less Extrabasinal Losses)	8,802	3,816		48,725	Row No. 2, after subtracting extrabasinal transport (the sum of Row Nos. 4A and 4D)
8	Predicted Nitrate-Nitrogen Concentrations (mg/l)	4.2	6.7	4.2 - 6.7	7.9	Because both water and wastewater use in the Aberdeen and Susquehanna WHPAs represent existing conditions, ideally the resultant nitrate concentrations would mirror existing conditions. Likely certain input parameters, particualrly for Susquehanna Hall, remain too conservative.
9	Observed Nitrate-Nitrogen Concentrations (mg/l)	3.9 - 4.3	2.0 - 3.4	2.0 - 4.3	4 - 5	See Appendix D
10	Predicted Nitrate-Nitrogen Concentrations (mg/l); Sensitivity Test No. 1 (WHPAs larger or smaller by 20%)	3.4 - 5.2	4.7 - 9.5	4.7 - 9.5	6.5 - 10.1	Some hydrogeologic rationale exists for enlarging the Susquehanna Center WHPA. A testing and monitoring program is suggested for confirmation. Otherwise, these data suggest the possibility of future, elevated nitrate concentrations.
11	Predicted Nitrate-Nitrogen Concentrations (mg/l); Sensitivity Test No. 2 (Recirculation Less or More by 20%)	3.2 - 5.1	2.5 - 10	2.5 - 10	6.1 - 9.5	Hydrogeologic testing is suggested to confirm the degree of wastewater circulation within the Susquehanna Center WHPA. Also, as a precaution the future Fallston drainfield could be relocated outside the WHPA for a nitrate loading savings of 1.0 mg/l.

Appendix A
Delineating Wellhead Protection Areas in Fractured Bedrock Aquifers
Description of Methodology

The Maryland Department of the Environment (MDE) Source Water Assessment Guidance Document (1999) recommends the use of water balance estimates, fracture trace analysis and topographic and geologic mapping criteria to delineate wellhead protection areas (WHPAs) in fractured bedrock aquifers of the Piedmont physiographic province.

WATER BALANCE ANALYSIS

ALWI estimated respective average (800 gallons per day per acre [gpd/ac]) and drought (440 gpd/ac) unit recharge rates from the hydrographic separation analysis prepared by Dingman and Ferguson (1956) for the Little Gunpowder Falls drainage basin. This is the closest drainage basin for which prior, peer-reviewed water budget data exists. On a well-by-well basis, ALWI then corrected these unit rates for impervious areas estimated within each initial WHPA (Table 1).

Relatively little is known about well capacities or individual usage rates. HCC records reflect an annual average consumption of roughly 11,000 gpd in 1998 (Appendix E). HCC holds a water appropriation permit for 20,000 gpd and interprets the existing MDE Water Appropriation Permit allocation of 20,000 gpd as indicative of 100% growth allowance in future water demand. Table 1 indicates that the safe yield of these wells is unlikely to exceed 15,000 gpd and may be less if the full recharge capacities of their respective capture areas are not exploited. Accordingly, ALWI cautions against assuming the availability of reserve capacity for the following reasons:

1. **Allocation May Not Reflect Availability** - The present MDE Water Appropriation Permit allocation was predicated on unknown criteria and may date from an era prior to current allocation policy that ties allocation to demonstrated capacity, among other things. MDE has long asserted that it can reduce an existing allocation for any reason allowable under applicable regulations, including the inability to demonstrate the capacity.

2. **Wells May Not Have Been Tested** - No data was furnished to ALWI from which the maximum sustainable yields of the three existing wells may be estimated. Independent, long-term pumping tests are the best means for estimating sustainable yields but no such pumping test data exists. Therefore, the reserve capacity of the existing wellfield remains unknown and should not be assumed merely because an allocation presently exists.

Absent pumping test data to the contrary, the drought-level recharge estimates in Table 1 may be used as rough, maximum estimates of future supply potentials from each WHPA.

Fracture Trace Analysis

ALWI used prior fracture trace analyses performed of the Campus Hills water service area and available now as public domain information to assist in delineating the three on-campus WHPAs. Fracture traces are the linear surface manifestation of deeper, near-vertical subsurface fracturing. Fracture traces are visible on aerial photographs as aligned stream valleys, topographic drainage swales, soil tone contrasts, wetlands, springs, seeps and distinctive vegetative changes. These aligned features potentially represent the surface expressions of subsurface zones with more deeply weathered rock and enhanced groundwater flow.

ALWI did not identify likely fracture traces near any of the wells or within any of the WHPAs, though the Susquehanna Center well's WHPA is located near several fracture traces that extend northeastward. Some of these fractures extend toward a proposed new Campus Hills production well. For conservatism, ALWI based its WHPA delineations on topographic and water balance considerations, alone, without additional modification due to fracture trace presence. Capture of water from areas beyond WHPA delineated boundaries, if any, would more likely be from areas southwest and northeast of the wells, than from areas northwest and southeast of the wells. ALWI bases this opinion on the general regional orientation of fractures observable with the above-described methods.

Post-it® Fax Note 7672

To Tom McKelvey		From Steve Garey	
Co./Dept. WBCAI		Co. HCC	
		Bel Air, MD	
Fax # 324-4100		Fax # 410/836-4392	Phone # 410/836-4156
# of pages 4	Today's Date 26 Jan 99	Time 11:10	

Here are copies of Water testing

MARTEL

Sensible Scientific Solutions

Certificate of Analysis

Martel Lab Number: 53881

Log Identification: D-53881

Sampling by Martel.
P.O. Number: 93000000375
Project Identification: June 1998 Water Sampling at Aberdeen, Joppa,
& Susquehanna Halls

Harford Community College
401 Thomas Run Road
Bel Air, Maryland 21015
ATTENTION: Mr. Steve Garcy

June 9, 1998

CLIENT IDENTIFICATION: HARCOMM

ANALYTICAL PARAMETER	METHOD	RESULT	UNITS
LOG IDENTIFICATION: D-53881			
DATE RECEIVED: 06/02/98			
SAMPLE ID: 1DW. Joppa MR/ Grab			
SAMPLING DATE: 06/02/98 TIME: 13:30			
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	<0.02	mg/l
SAMPLE ID: 2DW. Aberdeen MR/ Grab			
SAMPLING DATE: 06/02/98 TIME: 13:40			
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	<0.02	mg/l
SAMPLE ID: 3DW. Susquehanna MR/ Grab			
SAMPLING DATE: 06/02/98 TIME: 13:50			
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	<0.02	mg/l
Nitrate Nitrogen-Electrode (DW)	SM 4500D	2.0	mg/l

MARTEL

Sensible Scientific Solutions

Certificate of Analysis

Friday, December 11, 1998

Prepared expressly for:

Harford Community College
401 Thomas Run Road

Bel Air, Maryland 21015

Attention: Mr. Steve Garey

Report for Lab No: 57383.
Sampling by Martel.
P.O. Number: PC99000000023
Project Identification: Monthly Drinking Water Sampling and Analysis at Aberdeen and Susquehanna Halls, 12/98.

MARTEL NO.		CLIENT SAMPLE IDENTIFICATION	Sample Date/Time
57383	0001DW	1DW. Susq. MR Rt. Sink	12/01/98 10:15

Compound	Test Value	Test Unit	Method	Analysis Date/Time/Initial
Total Coliform Bacteria by Colilert	<1	org/100ml	SM 9223	12/01/98 14:20 CJH
Chlorine (total residual)	<0.02	mg/l	EPA 330.5	12/01/98 10:15 CM

MARTEL NO.		CLIENT SAMPLE IDENTIFICATION	Sample Date/Time
57383	0002DW	2DW. Aberdeen MR Rt. Sink	12/01/98 10:27

Compound	Test Value	Test Unit	Method	Analysis Date/Time/Initial
Total Coliform Bacteria by Colilert	<1	org/100ml	SM 9223	12/01/98 14:20 CJH
Chlorine (total residual)	<0.02	mg/l	EPA 330.5	12/01/98 10:27 CM

MARTEL

Certificate of Analysis

Sensible Scientific Solutions

Monday, November 9, 1998

Prepared expressly for:

Harford Community College
401 Thomas Run Road

Bel Air, Maryland 21015

Attention: Mr. Steve Garey

Report for Lab No: 56919.
Sampling by Martel.
P.O. Number: PC99000000023
Project Identification: Monthly Drinking Water Sampling and Analysis at Susquehanna and Joppa Halls, 11/98.

MARTEL NO.		CLIENT SAMPLE IDENTIFICATION	Sample Date/Time
56919	0001DW	1DW. Susquehanna Mens Room-Rt. Sink	11/03/98 11:20

Compound	Test Value	Test Unit	Method	Detection Limit	Analysis Date/Time/Initial
Total Coliform Bacteria by Colilert	<1	org/100ml	SM 9223		11/03/98 17:15 CJH
Chlorine (total residual)	<0.02	mg/l	EPA 330.5		11/03/98 11:20 TF

MARTEL NO.		CLIENT SAMPLE IDENTIFICATION	Sample Date/Time
56919	0002DW	2DW. Joppa Mens Room-Rt. Sink	11/03/98 11:34

Compound	Test Value	Test Unit	Method	Detection Limit	Analysis Date/Time/Initial
Total Coliform Bacteria by Colilert	<1	org/100ml	SM 9223		11/03/98 17:15 CJH
Chlorine (total residual)	<0.02	mg/l	EPA 330.5		11/03/98 11:34 TF

MARTEL

Sensible Scientific Solutions

Certificate of Analysis

Wednesday, January 13, 1999

Prepared expressly for:

Harford Community College
401 Thomas Run Road

Bel Air, Maryland 21015

Attention: Mr. Steve Garey
Report for Lab No: 57993.
Sampling by Martel.
P.O. Number: PC99000000023
Project Identification: Monthly Drinking Water Sampling and Analysis at Aberdeen and Joppa Halls, 1/99.

MARTEL NO.		CLIENT SAMPLE IDENTIFICATION	Sample Date/Time
57993	0001DW	1DW. Aberdeen MR R Sink	01/07/99 13:15

Compound	Test Value	Test Unit	Method	Analysis Date/Time/Initial
Total Coliform Bacteria by Colilert	<1	org/100ml	SM 9223	01/07/99 14:35 CJH
Chlorine (total residual)	<0.02	mg/l	EPA 330.5	01/07/99 13:15 GPM

MARTEL NO.		CLIENT SAMPLE IDENTIFICATION	Sample Date/Time
57993	0002DW	2DW. Joppa MR Sink	01/07/99 13:27

Compound	Test Value	Test Unit	Method	Analysis Date/Time/Initial
Total Coliform Bacteria by Colilert	<1	org/100ml	SM 9223	01/07/99 14:35 CJH
Chlorine (total residual)	<0.02	mg/l	EPA 330.5	01/07/99 13:27 GPM

FEB-01-1999 15:20 HCC CAMPUS SRVS/PURCHSING 410 836 4392 P.01

To TOM McKELVEY
Company LURCOMM
Location
Fax # 324-4100 Telephone #
Comments TOM, ADDITIONAL NITRATE TESTING YOU REQUESTED.

From STEVE CAREY
Company H.C.C.
Location
Dept. Charge
Fax # 836-4392 Telephone # 836-4156
Original Disposition: ☐ Destroy ☐ Return ☐ Call for pickup

Pages 4 Time 3:25 WBCM

1-28-1999 11:08AM FROM MARTEL 4102821064 P.2

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Certificate of Analysis

Martel Lab Number: 51074

Log Identification: D-51074

Sampling by Martel.
Project Identification: January 1998 Water Sampling at Aberdeen and Joppa Malls.

Harford Community College
401 Thomas Run Road
Bel Air, Maryland 21015
ATTENTION: Mr. Steve Carey

January 13, 1998

CLIENT IDENTIFICATION: HARCOMM

ANALYTICAL PARAMETER	METHOD	RESULT	UNITS
LOG IDENTIFICATION: D-51074			
DATE RECEIVED: 01/06/98			
SAMPLE ID: 1DW. Aberdeen Men's Room Rt. Sink			
SAMPLING DATE: 01/06/98 TIME: 09:25			
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	0.02	mg/l
Nitrate-Nitrite Nitrogen	EPA 353.1	3.9	mg/l
SAMPLE ID: 2DW. Joppa Men's Room Rt. Sink			
SAMPLING DATE: 01/06/98 TIME: 09:45			
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	0.02	mg/l
Nitrate-Nitrite Nitrogen	EPA 353.1	3.7	mg/l

1029 Cromwell Bridge Road, Baltimore, Maryland 21286
PH 410-825-7790 FAX 410-821-1064 EMAIL: mmm@martelusa.com

MARTEL *Sensible Scientific Solutions*

Certificate of Analysis

Martel Lab Number: 53881

Log Identification: D-53881

Sampling by Martel.
P.O. Number: 98000000375
Project Identification: June 1998 Water Sampling at Aberdeen, Joppa, & Susquehanna Halls

Harford Community College
401 Thomas Run Road
Bel Air, Maryland 21015
ATTENTION: Mr. Steve Garey

June 9, 1998

CLIENT IDENTIFICATION: HARCOMM

ANALYTICAL PARAMETER	METHOD	RESULT	UNITS
LOG IDENTIFICATION: D-53881			
DATE RECEIVED: 06/02/98			
SAMPLE ID: 1DW. Joppa MR/ Grab			
SAMPLING DATE: 06/02/98 TIME: 13:30			
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	<0.02	mg/l
SAMPLE ID: 2DW. Aberdeen MR/ Grab			
SAMPLING DATE: 06/02/98 TIME: 13:40			
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	<0.02	mg/l
SAMPLE ID: 3DW. Susquahanna MR/ Grab			
SAMPLING DATE: 06/02/98 TIME: 13:50			
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	<0.02	mg/l
Nitrate Nitrogen-Electrode (DW)	SM 4500D	2.0	mg/l

1025 Cromwell Bridge Road · Baltimore, Maryland 21286
PH 410-825-7790 FAX 410-821-1054 EMAIL: martel@martelabs.com

1438 Sangamon Avenue • Springfield, Illinois 62702 • [illegible]-522-0009 FAX: 217-522-2119

Certificate of Laboratory Analysis

Martel Lab Number: 45527

Log Identification: D-45527

Sampling by Martel.
Project Identification: ~~January~~ 1997 With Nitrate Sampling

Harford Community College
401 Thomas Run Road
Bel Air, Maryland 21015
ATTENTION: Mr. Don Shrader

February 11, 1997

CLIENT IDENTIFICATION: HARCOMM

ANALYTICAL PARAMETER	METHOD	RESULT	UNITS
LOG IDENTIFICATION: D-45527			
DATE RECEIVED: 02/04/97			
SAMPLE ID: 1DW. Joppa Hall Men's Room, grab			
SAMPLING DATE: 02/04/97 TIME: 12:30			
Nitrate Nitrogen-Electrode (DW)	SM 4500D	5.5	mg/l
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	<0.02	mg/l
SAMPLE ID: 2DW. Susquehanna Hall Men's Room, grab			
SAMPLING DATE: 02/04/97 TIME: 12:00			
Nitrate Nitrogen-Electrode (DW)	SM 4500D	3.4	mg/l
Total Coliform Bacteria by Colilert	SM 9223	<1	org/100ml
Chlorine (total residual)	EPA 330.5	<0.02	mg/l
SAMPLE ID: 3DW. Aberdeen Hall Men's Room, grab			
SAMPLING DATE: 02/04/97 TIME: 12:10			
Nitrate Nitrogen-Electrode (DW)	SM 4500D	4.3	mg/l

HARFORD
COMMUNITY COLLEGE
9804100(

CALCULATION OF NITROGEN BALANCE

Nitrogen Mass Balance Developed by J. E. Stone (7)

$$W = [(4.43\ C + a(P-ET) - cP] / [(y-a) - y(d + n)]$$

Where:

W = allowable wastewater loading (inch/yr).
C = removal of nitrogen by crop (lb/acre-year), =0
a = allowable nitrogen concentration in percolate (mg/l), =10
P = infiltration due to precipitation (inch/yr), =15
ET= potential evapotranspiration (inch/yr), =0
c = concentration of nitrogen in precipitation (mg/l), =0.5
y = concentration of N in wastewater (mg/l), = 60 (~~40 mg/l~~)
d = fraction of N denitrified, =0
n = fraction of N volatilized as ammonia, =0

$$W = [(4.43\ (0) + 10(15 - 0) - 0.5(15)]/[(60-10) - 60\ (0)]$$

$$W = 142.5 / 50 = 2.85 \text{ inch/yr}$$

Average sewage flow (Q) generated from a home with three bedrooms = 225 gpd or 82,125 gal/yr. Since one (1) acre-inch equals 27,150 gallons, 82,125 gal/yr equals 3.03 acre-inch/yr

Area required (A) = Q/W = 3.03 acre-inch/yr / 2.85 inch per year

A = 1.06 acres, i.e. area within property lines should be 1.06 acres or greater.

- MDE
- SCS
- WEATHER DATA
- MARYLAND AGRICULTURAL EXTENSION

ftp.

Whitney, Bailey, Cox & Magnani
Consulting Engineers

WBCM No. 98041001

Sheet No. _____ of _____

By B.ICENOGLE Subject HARFORD COMMUNITY COLLEGE

Date 10·26·98 Chk ____ Date ____ NITROGEN BALANCE

BUILDING	SEWAGE FLOW GAL/MONTH
DAYCARE	18,255.83
JOPPA	636694.17
FALLSTON	11,175
EDGEWOOD	11,618.92
MARYLAND HALL	17,865.30
BOOK STORE	
ABERDEEN HALL	60080.33
BEL AIR HALL	
HAVRE de GRACE	
BARN	
HAYSHEIGHE HOUSE	15,000 460
FACULTY HOUSE	15,000
CHESAPEAKE CENTER	100,000
SUSQUEHANNA CENTER	104091.7
BALL FIELD LOCKER ROOMS	50,000
LEARNING RESOURCE CENTER	51,616
TOTAL FLOW	500531.95 GALLONS/MONTH

NOTE: THE ESTIMATED SEWAGE FLOW IS MUCH HIGHER THAN THE SEMI ANNUAL GROUNDWATER WITHDRAW READINGS. SEE ATTACHED SHEETS

$$500531.95 \text{ GAL/MONTH} \times \frac{12 \text{ MONTHS}}{1 \text{ YEAR}} \times \frac{\text{ACRE INCH}}{27150 \text{ GAL}} = 221.23 \frac{\text{ACRE INCH}}{\text{YEAR}}$$

$$221.23 \frac{\text{ACRE INCH}}{\text{YEAR}} \times \frac{\text{YEAR}}{2.85 \text{ INCHES}} = 77.62 \times 78 \text{ ACRES}$$

AREA WITHIN PROPERTY LINES SHOULD BE 78 ACRES OR GREATER. THE TOTAL AREA OF HARFORD COMMUNITY COLLEGE IS 202.86 ACRES. THE BALANCE OF NITROGEN IN THE SOIL SHOULD NOT BE A PROBLEM.

EDR-Site Report™

HARFORD COMMUNITY COLLEGE
401 THOMAS RUN RD
BEL AIR, MD 21014

Inquiry Number: 360055.1s

April 19, 1999

Environmental Data Resources, Inc.
an edr company

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06490

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

The EDR-Site Report™ is a comprehensive presentation of government filings on a facility identified in a search of over 4 million government records from more than 600 federal, state and local environmental databases. The report is divided into three sections:

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

SECTION 1: FACILITY SUMMARY

FACILITY AREA	FACILITY 1 HARFORD COMMUNITY COLLEGE 401 THOMAS RUN RD BEL AIR, MD 21014 EDR ID #1000230090 EPA #MDD074924333
WASTE MANAGEMENT Facility generates hazardous waste (RCRIS)	YES - p4
Facility treats, stores, or disposes of hazardous waste on-site (RCRIS/TSDF)	NO
Facility has received Notices of Violations (RCRIS/VIOL)	NO
Facility has been subject to RCRA administrative actions (RAATS)	NO
Facility has been subject to corrective actions (CORRACTS)	NO
Facility handles PCBs (PADS)	NO
Facility uses radioactive materials (MLTS)	NO
Facility manages registered aboveground storage tanks (AST)	NO
Facility manages registered underground storage tanks (UST)	YES - p5
Facility has reported leaking underground storage tank incidents (LUST)	NO
Facility has reported emergency releases to the soil (ERNS)	NO
Facility has reported hazardous material incidents to DOT (HMIRS)	NO
WASTE DISPOSAL Facility is a Superfund Site (NPL)	NO
Facility is not a Superfund Site but has a known or suspect abandoned, inactive or uncontrolled hazardous waste site (CERCLIS)	NO
Facility has a reported Superfund Lien on it (LIENS)	NO
Facility is listed as a state hazardous waste site (SHWS)	NO
Facility has disposed of solid waste on-site (SWF/LF)	NO
MULTIMEDIA Facility uses toxic chemicals and has notified EPA under SARA Title III, Section 313 (TRIS)	NO
Facility manufactures or imports toxic chemicals on the TSCA list (TSCA)	NO
Facility has enforcement actions under FIFRA, TSCA or EPCRA (FTTS)	NO
Facility is listed in EPA's index system (FINDS)	YES - p6
Facility is listed in a county/local unique database (LOCAL)	NO
POTENTIAL SUPERFUND LIABILITY Facility has a list of potentially responsible parties PRP	NO
TOTAL (YES)	3

SECTION 2: FACILITY DETAIL REPORTS

...Continued...

MULTIMEDIA

Facility is listed in EPA's index system

DATABASE: Facility Index System (FINDS)

HARFORD COMMUNITY COLLEGE
401 THOMAS RUN RD
BEL AIR, MD 21014
EDR ID #1000230090

This site is listed in the Federal FINDS database. The FINDS database may contain references to records from government databases included elsewhere in the report. Please note: the FINDS database may also contain references to out of date records formerly associated with the site.

EPA-ID:	MDD0-7492-4333
EPA Records Indicate Facility Is Listed In:	AIRS Facility System
System ID:	MD0871071
Facility Name:	HARFORD COMMUNITY COLLEGE
Facility Address:	401 THOMAS RUN ROAD BEL AIR, MD 21014

EPA-ID:	MDD0-7492-4333
EPA Records Indicate Facility Is Listed In:	Resource Conservation Recovery Act Information System
System ID:	MDD074924333
Facility Name:	HARFORD COMMUNITY COLLEGE
Facility Address:	401 THOMAS RUN RD BEL AIR, MD 21014

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

To maintain currency of the following federal, state and local databases, EDR contacts the appropriate government agency on a monthly or quarterly basis as required.

Elapsed ASTM days: Provides confirmation that this report meets or exceeds the 90-day updating requirement for databases included in ASTM E1527-97.

WASTE MANAGEMENT

RCRIS: Resource Conservation and Recovery Information System
Source: EPA/NTIS
Telephone: 800-424-9346
Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Date of Government Version: 01/04/1999
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/31/1999
Date of Next Scheduled Update: 05/10/1999

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/1995
Database Release Frequency: Biennially
Date of Last EDR Contact: 03/25/1999
Date of Next Scheduled Update: 06/21/1999

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 03/15/1999
Date of Next Scheduled Update: 06/14/1999

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/01/1998
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/16/1999
Date of Next Scheduled Update: 06/14/1999

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-260-3936
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 09/22/1997
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/05/1999
Date of Next Scheduled Update: 05/17/1999

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 12/08/1998
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/02/1999
Date of Next Scheduled Update: 05/31/1999

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

MD AST: Permitted Aboveground Storage Tanks
Source: Department of The Environment
Telephone: 410-631-3386
Registered Aboveground Storage Tanks.

Date of Government Version: 02/01/1999
Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/16/1999
Date of Next Scheduled Update: 04/19/1999

MD UST: Registered Underground Storage Tank List
Source: Department of the Environment
Telephone: 410-631-3433
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/21/1996
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/17/1999
Date of Next Scheduled Update: 05/17/1999

MD LUST: Recovery Sites
Source: Department of the Environment
Telephone: 410-631-3433
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 03/01/1999
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 02/22/1999
Date of Next Scheduled Update: 05/24/1999

ERNS: Emergency Response Notification System
Source: EPA/NTIS
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/1998
Database Release Frequency: Quarterly

Date of Last EDR Contact: 01/04/1999
Date of Next Scheduled Update: 05/03/1999

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4526
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/1997
Database Release Frequency: Annually

Date of Last EDR Contact: 03/24/1999
Date of Next Scheduled Update: 04/26/1999

WASTE DISPOSAL

NPL: National Priority List
Source: EPA
Telephone: 703-603-8852
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC).

Date of Government Version: 01/19/1999
Date Made Active at EDR: 02/19/1999
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 02/08/1999
Elapsed ASTM Days: 11
Date of Last EDR Contact: 02/08/1999

DELISTED NPL: NPL Deletions
Source: EPA
Telephone: 703-603-8769
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/19/1999
Date Made Active at EDR: 02/19/1999
Database Release Frequency: N/A

Date of Data Arrival at EDR: 02/08/1999
Elapsed ASTM Days: 11
Date of Last EDR Contact: 02/08/1999

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 11/10/1998
Date Made Active at EDR: 01/29/1999
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/29/1998
Elapsed ASTM Days: 31
Date of Last EDR Contact: 03/03/1999

CERCLIS-NFRAP: No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 11/10/1998
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/03/1999
Date of Next Scheduled Update: 05/31/1999

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 205-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Made Active at EDR: 03/30/1994
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 02/02/1994
Elapsed ASTM Days: 56
Date of Last EDR Contact: 02/22/1998

MD SHWS: Notice of Potential Hazardous Waste Sites
Source: Department of the Environment
Telephone: 410-631-3440
State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 03/01/1999
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/08/1999
Date of Next Scheduled Update: 06/14/1999

MD SWF/LF: Permitted Solid Waste Disposal Facilities
Source: Department of the Environment
Telephone: 410-631-3364
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 01/05/1999
Database Release Frequency: Annually
Date of Last EDR Contact: 02/24/1999
Date of Next Scheduled Update: 04/26/1999

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

MULTIMEDIA

TRIS: Toxic Chemical Release Inventory System
Source: EPA/NTIS
Telephone: 202-260-1531
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/1995
Database Release Frequency: Annually

Date of Last EDR Contact: 04/01/1999
Date of Next Scheduled Update: 06/28/1999

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-1444
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/1994
Database Release Frequency: Annually

Date of Last EDR Contact: 03/17/1999
Date of Next Scheduled Update: 06/14/1999

FTTS: Fifra / Tsca Tracking System
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-260-7864
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act) over the previous five years. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 02/24/1999
Database Release Frequency: Quarterly

Date of Last EDR Contact: 02/02/1999
Date of Next Scheduled Update: 05/03/1999

FTTS INSP: Fifra/TSCA Tracking System/National Compliance Database (FTTS/NCDB)
Source: EPA
Telephone: 202-564-2501

Date of Government Version: 02/02/1999
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/25/1999
Date of Next Scheduled Update: 06/28/1999

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA/NTIS
Telephone: Not reported
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 01/08/1999
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/16/1999
Date of Next Scheduled Update: 07/12/1999

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. (C) Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

...Continued...

POTENTIAL SUPERFUND LIABILITY

SETS: Site Enforcement Tracking System
Source: EPA/NTIS
Telephone: 202-260-8718
SETS list the potentially responsible parties (PRPs) recorded by EPA (in SETS) at Superfund sites.
To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 11/01/1997
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/12/1999
Date of Next Scheduled Update: 07/12/1999