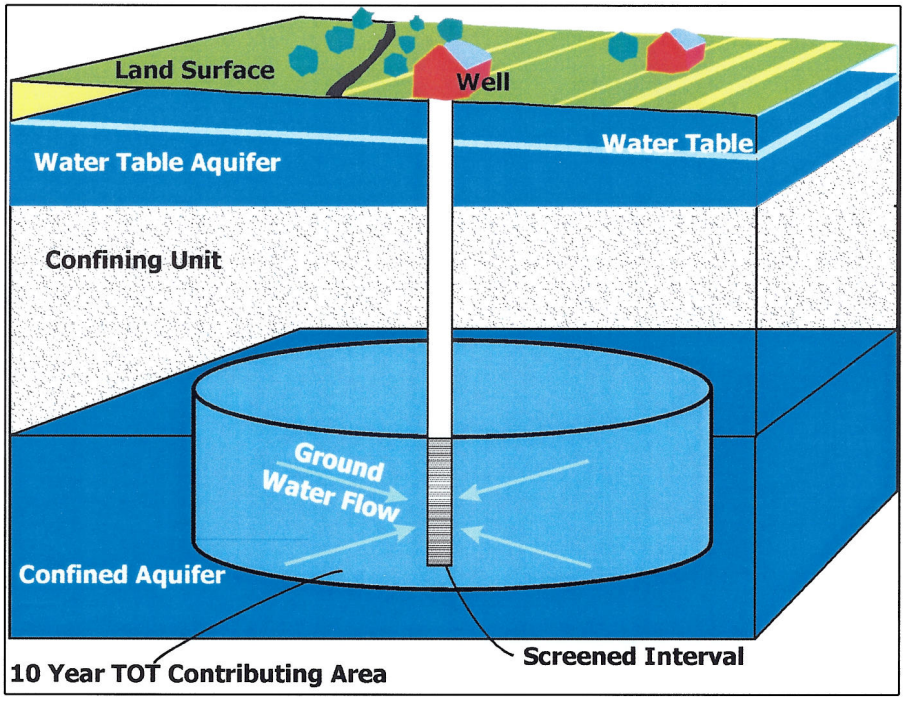
SOURCE WATER ASSESSMENT

FOR CALVERT CLIFFS, DOMINION COVE POINT LNG, AND NAVAL RESEARCH LAB NON-TRANSIENT NON-COMMUNITY WATER SYSTEMS CALVERT COUNTY, MD



Prepared By
Water Management Administration
Water Supply Program
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MDE

Robert L. Ehrlich, Jr.
Governor

Kendl P. Philbrick
Secretary

Michael S. Steele
Lt. Governor

Jonas A. Jacobson
Deputy Secretary

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Summary

The Maryland Department of the Environment's Water Supply Program (WSP) has conducted as Source Water Assessment for Calvert Cliffs Nuclear – Protected Area, Calvert Cliffs Nuclear – Office Building, Dominion Cove Point LNG, and Naval Research Lab, which are non-transient non-community water systems in Calvert County. The required components of this report as described in Maryland's Source Water Assessment Program (SWAP) are: 1) delineation of an area that contributes water to the source; 2) identification of potential sources of contamination; and, 3) determination of the susceptibility of the water supply to contamination. Recommendations for protecting the drinking water supply conclude this report.

Confined aquifers protect water supplies from contaminants originating on the land surface. All four of these non-transient water supply systems in Calvert County use confined aquifers. Ten wells supply these four non-transient systems. Through investigation of MDE records and interviewing system owners it was concluded that all of these are completed in confined aquifers. The Source Water Assessment Areas for all wells were delineated by the WSP using Environmental Protection Agency (EPA) approved methods specifically designed for each source.

Potential point sources of contamination within the assessment areas were identified from field inspections and contaminant inventory databases. The more common potential sources of contamination are on-site septic systems, ground water discharge sites, underground storage tanks, and hazardous substance generators commonly associated with commercial areas. In confined aquifer settings, sources of contaminant at the land surface are generally not a threat unless there is a pathway for direct injection into the deeper aquifer such as through unused wells or along well casings that have no grout seal. Aerial photographs showing supply wells, and spot satellite images of the wellhead protection areas are enclosed at the end of report.

The susceptibility analysis is based on a review of the existing water quality data for each water system, the presence of potential sources of contamination in the individual assessment areas, well integrity, and the inherent vulnerability of the aquifers. It was determined that only one of the non-transient systems is susceptible to contamination. Both Calvert Cliffs sites (Protected Area and Office Building) are susceptible to naturally occurring arsenic (based on the new EPA standard). All four systems were determined not to be susceptible to synthetic organic compounds, volatile organic compounds, microbiological contaminants, or other inorganic compounds. This susceptibility could change if a well is damaged from impact or if a well casing becomes corroded allowing contaminants in the surficial aquifer to enter the well.

INTRODUCTION

The Water Supply Program (WSP) has conducted a Source Water Assessment for Calvert Cliffs Nuclear – Protected Area, Calvert Cliffs Nuclear – Office Building, Dominion Cove Point LNG, and Naval Research Lab, which are non-transient non-community water systems in Calvert County (Figure 1). The Calvert Cliffs Nuclear sites were assessed as one site in this report. As defined in Maryland's Source Water Assessment Plan (SWAP), a non-transient non-community water system is any non-community water system that regularly serves at least twenty-five (25) of the same individuals over six months per year. Some good examples of non-transient water systems include schools, large businesses, and shopping malls.

Calvert County is located in Southern Maryland and lies on the western shore of the Chesapeake Bay. It is bound by Anne Arundel County to the north and by the Patuxent River on the west. Based on July 2001 data, the total population of Calvert County is 88,000 persons (Md. Assoc. of Counties, 2005/2006). Table 7 shows the population served by the four systems. The County lies within the Atlantic Coastal Plain Physiographic Province. The Coastal Plain, geologically the youngest province in Maryland and covers nearly half of the State and consists entirely of unconsolidated sediments. All four of the non-transient non-community water systems in Calvert County covered in this report obtain their water supply from wells of various diameter and depth. All of the wells serving these systems are completed in confined aquifers. For the purpose of this report, depth of well, lithology, and nitrate data were used to determine whether the wells are in confined or unconfined aquifers. An accurate determination of the aquifer type is very important in determining the shape of the wellhead protection area (WHPA) or source water assessment area (SWAA).

WELL INFORMATION

Well information for each system was obtained from the Water Supply Program's database, owner interviews, site visits, well completion reports, sanitary survey inspection reports, and published reports. A total of ten wells are used by the four systems assessed in this report. The well tag number, which provides vital well information, was found for nine of the ten wells. From the well tag information, ground water appropriation data, and nitrate sampling data it was concluded that all the wells are completed in confined aquifers. Four of the wells were drilled after 1973 and should comply with Maryland's well construction regulations for grouting and casing. A review of the available well completion report data for the other six wells drilled between 1953-1972 indicates that three of the wells were at least partially grouted. The remaining three wells that were drilled prior to 1973, when current regulations went into effect, may not meet the current construction standards. Table 1 contains a summary of well information.

Accurate well location information was needed to delineate the contribution areas for the Calvert County non-transient system wells. This was obtained by using a global positioning system (GPS) unit at the ten well locations. GPS coordinates were not obtained for one well, as the well could not be definitively located at the site. The data was then differentially corrected to increase the exactness of the information for each location. If a well was inside a building a GPS point was taken outside the building and the offset distance was measured.

Based on site visits, all of the wells were in good condition and appeared to be regularly maintained, sealed, and protected to insure integrity.

HYDROGEOLOGY

Calvert County is located in Southern Maryland and is underlain by unconsolidated sediments of the Coastal Plain Physiographic Province. This province is characterized by low topography due to the underlying horizontal layers of unconsolidated clastic sediments that are Lower Cretaceous to recent in age and thicken to the southeast. The four non-transient non-community water systems included in this report draw water from the Aquia aquifer, which is one of the most widely utilized aquifers in Calvert County. This aquifer has have been studied considerably and hydrologic, lithologic, and geochemical data is available in several Maryland Geological Survey Reports (1977, 1979, 1983, 1984, 1988, 1996, 2003). A geologic section from Northern Calvert County to Southern St. Mary's County showing the hydrogeologic units beneath Calvert County is shown in Figure 2 (Kapple and Hansen, 1976). Note that the deeper aquifers are overlain by confining clay units of low permeability that may inhibit the infiltration of contaminants from the land surface. The descriptive material below is summarized from these reports.

Ground water flows through pores between gravel, sand, and silt grins in unconsolidated sedimentary aquifers. Confined aquifers are those formations that are overlain by a confining layer consisting of clay or fine silt. This confining layer allows very little water to travel vertically through it. Unconfined aquifers are those formations that do not have a continuous confining layer above them. Unconfined aquifers are also known as water table aquifers. Precipitation that falls on the ground surface infiltrates directly into the unconfined aquifer in a relatively short period of time. The unconsolidated sediment formations store a large quantity of ground water.

Aquia Aquifer (125B)

The Aquia aquifer is the most widely used source of water in Calvert County, by both community water systems and non-transient non-community water systems, due to its accessibility in the northern half of the County, its high transmissivity, and its relatively good water quality. The top of the Aquia aquifer in Calvert County ranges from 125 feet below sea level near the northern tip of the county to approximately 450 feet below sea level at the southern end of the county near Solomons Island. The Aquia is overlain by the Nanjemoy formation, which acts as a leaky confining unit, and is between 100 and 200 feet thick, depending on the geographic location. The Aquia is composed of fine to medium-grained sands, of varying composition but are generally quartz and glauconite rich with calcite

cementation. Shell material is more abundant in the upper portion of the aquifer. Transmissivity values, as determined by aquifer tests, range from 900 to 1300 ft^2/day, and tend to be highest in the northernmost portions of the county

SOURCE WATER ASSESSMENT AREA DELINEATION

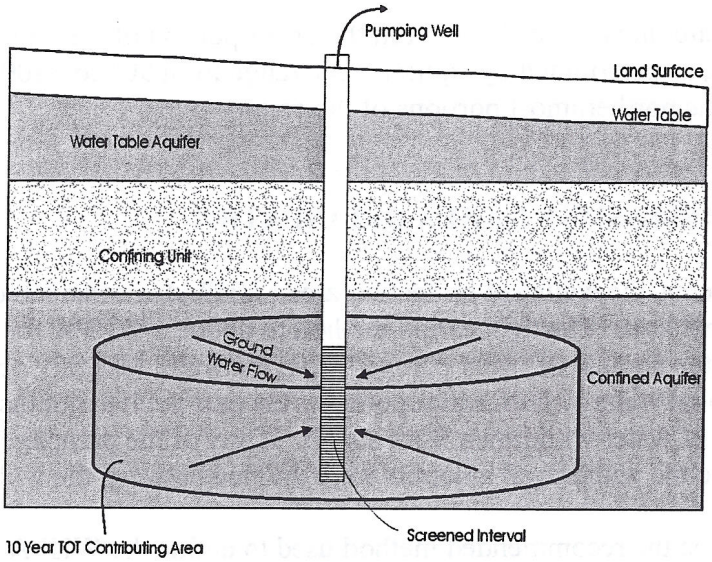
For ground water systems, the wellhead protection area (WHPA) is considered to be the source water assessment area. The delineation method to define a WHPA for a well varies with aquifer type and the amount of water pumped from the well. Monthly operation reports (MORs) and semi-annual water withdrawal reports for the past twelve months were used to determine the amount of water withdrawn from a well. If any of the pumpage data for the system was incomplete the withdrawal amounts were divided between the wells.

The "Florida Method" is the recommended method used to define the WHPA for confined wells pumping more than 10,000 gpd (MDE, 1991). The area is a radial zone of transport within the aquifer and is based on a 10-year time-of-travel, the pumping rate and the screened interval(s) of the well(s) include in the WHPA, and the porosity of the aquifer (see illustration below for conceptual model). The Florida Method is a modification of Darcy's Law for radial flow to a well and the WHPA's were calculated using the following volumetric equation:

$$r = \sqrt{\frac{Qt}{\pi n H}}$$

where: r = calculated fixed radius (ft)
Q = pumping rate of well (ft^3 / yr)
t = time of travel in years (yr)
n = aquifer porosity (dimensionless)
H = length of well screen (ft)

The circle shown in the figure below represents the aquifer zone of transport in the subsurface as illustrated below.



Conceptual illustration of a zone of transport for a confined aquifer

Pumping rates were obtained from the permitted allocation in the water appropriation permit. A conservative estimate of porosity (n) of 25% was used for each of the aquifers based on published reports. The lengths of well screens (H) were obtained from well completion reports. In the instance that a well had multiple screens, the sum of the individual screen lengths was used. The circles represent the aquifer zone of transport in the subsurface as illustrated above.

Using these parameters the radius was calculated with the above equation for the WHPA delineation for the four water systems (Table 2). The calculated distance for two of the water systems was less than 600 feet. In these cases, a default radius of 600 feet was used.

POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination are classified into two types. The first type is point source contamination. Some examples of point source contamination are leaking underground storage tanks, landfills, ground water discharge permits, feed lots, large scale feeding operations, and known ground water contamination sites. These sites are generally associated with commercial or industrial facilities that use chemical substances that may, if inappropriately handled, contaminate ground water via a discrete point location. The second type of potential sources of contamination is non-point sources. Non-point sources are associated with certain land use practices such as pesticide and herbicide applications, land application of sludge or animal wastes, and row-crop

farming, all of which may lead to ground water contamination over a large are. On-site septic systems are often referred to as non-point pollution as they are the means for sewage treatment and discharge for areas not served by public sewerage collections systems.

In confined aquifer settings, sources of contamination at the land surface are generally not a threat unless there is a pathway for direct injection into the deeper aquifer such as unused wells or along well casing that are not intact or have no grout seal. Wells that are not being used or maintained will eventually corrode and provide a pathway for contaminants present in the shallow aquifers at higher-pressure heads to migrate to the deeper aquifers.

Three of the four water systems drawing water from confined aquifers had potential point sources of contamination located within their WHPAs. Only Dominion Cove Point LNG did not. Both Calvert Cliffs and Naval Research Lab are CHS generators. Spent fuel rods are stored under water in stainless steel lined concrete tanks at Calvert Cliffs. The Naval Research Lab – Chesapeake Division is listed as a CERCLIS site. For more information on the site, MDE's Water Management Administration, Federal Facilities Division, should be contacted. Potential point sources of contamination are identified if they fall within the WHPA for awareness and to ensure that the deep aquifer does not become affected by unused wells or poorly constructed wells located near the potential sources of contamination and completed in the water supply aquifer.

WATER QUALTIY DATA

Water quality data was reviewed from the Water Supply Program's (WSP) database for Safe Drinking Water Act (SDWA) contaminants. All data reported is from the finished (treated) water unless otherwise noted. The State's SWAP defines a threshold for reporting water quality data as 50% of the Maximum Contaminant Level (MCL). If a monitoring result is greater than 50% of the MCL, this report will describe the sources of such a contaminant and, if possible, locate the specific sources that are the cause of the elevated contaminant level. Table 3 summarizes the various treatment methods used at the water treatment plants for each of the six non-transient water systems.

A review of the monitoring data was conducted for each non-transient non-community water system. A summary of the water quality sampling results exceeding 50% of the Maximum Contaminant Level (MCL) is shown in Table 4.

Inorganic Compounds (IOCs)

A review of the available data shows that arsenic was the only IOC detected at or above 50% of a MCL (Table 5). Two of the water systems detected arsenic at levels equal to or greater than the MCL of 10 parts per billion (ppb). The arsenic standard was recently lowered from 50 ppb to 10 ppb by the USEPA.

Arsenic is present in ground water in Maryland's Coastal Plain due to the natural presence of this contaminant in aquifer material. The two systems reporting arsenic above 5 ppb draw water from the Aquia aquifer. A recent study of arsenic concentrations in the major aquifers of the Coastal Plain indicates that arsenic is present

at the highest concentrations in the Aquia aquifer on the Eastern Shore of Maryland (MGS, 2003). However, levels above 10 ppb are common in the Aquia in Southern Maryland as shown both in the MGS study and the monitoring data in this report. Arsenic is commonly found in the range of 2-10 ppb in the Piney Point/Nanjemoy aquifer system in Calvert County.

Radionuclides

The existing MCLs for various radionuclides do not apply to non-transient non-community water systems. Nor has a standard been proposed for non-tranisent non-community water systems.

Synthetic Organic Compounds (SOCs)

No SOCs were detected above the 50% threshold at any of the four non-transient non-community water systems.

Volatile Organic Compounds (VOCs)

No VOCs were detected at levels above 50% of the MCL at any of the four non-transient non-community water systems.

Microbiological Contaminants

Routine bacteriological samples are collected quarterly from the distribution system, as required by the Safe Drinking Water Act. This data is not likely to reflect the source water quality due to the potential of contamination in the distribution system and the use of chlorination as a treatment method for four of the seven water plants.

Total coliform bacteria are not pathogenic, but are used as an indicator organism for other disease-causing microorganisms. One of the four water systems has had positive total coliform results on three occasions, between July 2000 and November 2002. Additional sampling and/or repeat sampling at this system has shown that the contamination seems to have been addressed.

Total coliform bacteria are ubiquitous in the environment and detection could be a result of a variety of deficiencies in the water system or an indicator of poor well integrity. Loose caps or insufficient seals are common causes of coliform contamination since insects are able to crawl in the wellhead. Many of these situations are easily remedied.

SUSCEPTIBILITY ANALYSIS

The wells at all four non-transient non-community water systems reviewed in this report are in the Aquia aquifer, which is confined in Calvert County. Confined aquifers are naturally protected from land use activities at the ground surface due to the confining layers that provide a barrier for water movement from the surface into the aquifers below. This protection can be jeopardized by poorly constructed wells, wells out of use that penetrate the aquifer, or underground injection wells drilled into the aquifer.

Contaminants like radionuclides and metals (e.g. arsenic and iron) are naturally occurring in the confined aquifers and can reach concentrations that pose a risk to a water supply. It is much less likely that contaminants at the land surface would be found in wells drilled into confined aquifers.

Confined aquifers are recharged very slowly from the water stored in the confining unit above and from precipitation that infiltrates into the formation where it reaches the ground surface. Generally, water stored in confined aquifers has traveled great distances from it origin at the ground surface. Likewise, the travel time of a contaminant through the very low permeability confining layers above the confined aquifers would take many thousands of years.

The susceptibility of the source water to contamination is determined for each group of contaminants based on the following criteria: 1) the presence of natural and anthropogenic contaminant sources within the WHPA; 2) water quality data; 3) well integrity; and 4) the aquifer conditions. The susceptibility analysis is summarized for each water system in Table 6.

The susceptibility analysis of each system was based on current conditions and sample results. If changes occur within the WHPA or sample results for a system change, the system's susceptibility could change. Some common changes that may occur resulting in changes to a well's susceptibility are land use changes within the WHPA, an underground storage tank starts to leak, the well becomes damaged, or changes in uses of local wells completed in the same aquifer.

Inorganic Compound (IOCs)

The source of inorganic compounds can be either the aquifer material or from human activity. Due to the confined nature of the aquifers, these contaminants are unlikely to originate from the land surface. Arsenic levels reported in the Aquia aquifer are consistent with naturally occurring levels measured in the aquifer in other areas of the State.

Arsenic is present in three of the four non-transient non-community water systems assessed in this report at 50% of the MCL. The source of the arsenic in these water supplies is the natural occurrence and mobility of this contaminant in the aquifer material. A recent study of the occurrence of arsenic in Coastal Plain aquifers indicates that the ground water arsenic concentrations that range between non-detectable and 14 ppb in the

Aquia aquifer in Calvert County (MGS, 2003). The data has not been fully interpreted, but it does not seem to be related to any geochemical indices such as pH or specific conductance. The concentration of arsenic in ground water of these aquifers may simply be dependent on the amount of arsenic in the aquifer at certain locations. The two systems at Calvert Cliffs (Protected Area and Office Building) **are susceptible** to this contaminant. Since arsenic levels are variable within the aquifer, the susceptibility determination is based on the actual levels measured for each water system.

Naval Research Lab – Chesapeake Division and Dominion Cove Point LNG did not detect arsenic at levels exceeding 50% of the MCL and were determined to **not be susceptible** to arsenic or other inorganic compounds. The Calvert Cliffs facilities **are not susceptible** to other inorganic compounds.

Synthetic Organic Compounds (SOCs)

No SOCs were detected above the 50% threshold at any of the four non-transient non-community water systems.

Based on the above analysis, the water supply drawn from confined aquifers for the four non-transient non-community water systems **are not susceptible** to SOC contamination.

Volatile Organic Compounds (VOCs)

No VOCs were detected above the 50% threshold at any of the four non-transient non-community water systems.

Due to the naturally protected characteristics of the confined aquifers, the water quality data, and the lack of potential sources of contamination in the aquifers, the water supply drawn from confined aquifers for the four non-transient non-community water systems **are not susceptible** to VOC contamination.

Microbiological Contaminants

Raw water monitoring for microbiological contaminants is not required of water systems in confined aquifers because they are considered naturally protected from sources of pathogens at the land surface. Due to the confined nature of the aquifers and the condition of the wells the water supplies **are not susceptible** to microbiological contaminants.

SUMMARY AND RECOMMENDATIONS FOR PROTECTING WATER SUPPLIES

With the information contained in this report, the individual non-transient systems in Calvert County are in a position to protect their water supplies by staying aware of the areas delineated for source water protection. Specific management recommendations for consideration are listed below. The following recommendations are intended for individual water systems.

Monitoring

Systems should continue to monitor for all required Safe Drinking Water Act contaminants. Annual raw water bacteriological testing is a good check on well integrity. Those whose arsenic concentrations exceed the new lower standard of 0.010 ppm should consider locating water in a different aquifer with acceptable water quality, where possible.

Contaminant Source Inventory Updates

Conduct a survey of the WHPA and inventory any potential sources of contamination, including unused wells that may not have been included in this report. Keep records of new development within the WHPA and new potential sources of contamination that may be associated with the new use.

Well Inspection/Maintenance

Work with the County Health Department to ensure that there are no unused wells within the WHPA. An improperly abandoned well can be a potential source of contamination to the aquifer. All unused wells must be abandoned and seal as per State well construction regulations.

Water operation personnel should have a program for periodic inspections and maintenance of the supply wells and backup wells to ensure their integrity and protect the aquifer from contamination.

Wells drilled prior to 1973 that do not meet current construction standards should be upgraded to protect them from contamination associated with poor or outdated construction.

Two-piece insect-proof well caps should be installed onto wells that have one-piece caps.

Changes in Use

The system is required to notify the MDE Water Supply Program if new wells are to be added or an increase in water usage is proposed. An increase in use or the addition of new wells may require revisions to the WHPA.

References

Maryland Association of Counties, Directory of County Officials – 2005/2006, 53 pp.

Maryland Department of the Environment (MDE), Water Supply Program, 1999, Maryland's Source Water Assessment Plan.

Maryland Department of Natural Resources (DNR), 1987, The Quantity and Natural Quality of Ground Water in Maryland: DNR Water Resources Administration.

Maryland Geological Survey Report of Investigations No. 38, 1983, by Chapelle, F.H. and D.D. Drummond, Hydrogeology, Digital Simulation, and Geochemistry of the Aquia and Piney Point-Nanjemoy Aquifer System in Southern Maryland, 100 pp.

Maryland Geological Survey Interim Report, 2003, Summary of Ground-Water Arsenic Concentrations in Major Aquifers of the Maryland Coastal Plain, 23 pp.

U.S. Environmental Protection Agency (EPA), 1991, Wellhead Protection Strategies for Confined – Aquifer Settings: Office of Ground Water and Drinking Water, EPA/570/9-91-008, p. 168.

Maryland Geological Survey Report of Investigations No. 38, 1983, by Chapelle, F.H. and D.D. Drummond, Hydrogeology, Digital Simulation, and Geochemistry of the Aquia and Piney Point-Nanjemoy Aquifer System in Southern Maryland, 100 pp.

Maryland Geological Survey Interim Report, 2003, Summary of Ground-Water Arsenic Concentrations in Major Aquifers of the Maryland Coastal Plain, 23 pp.

U.S. Environmental Protection Agency (EPA), 1991, Wellhead Protection Strategies for Confined – Aquifer Settings: Office of Ground Water and Drinking Water, EPA/570/9-91-008, p. 168.

Other Sources of Data

Water Appropriation and User Permits
MDE Water Supply Program (PDWIS) Database
MDE Waste Management Sites Database
2005 AEexpress Photo Index
Department of Natural Resources Digital Orthophoto Quarter Quadrangles
USGS Topographic 7.5 Minute Quadrangles
ADC Maps of Calvert County
SpecPrint Tax Maps of Calvert County
Maryland Department of Assessments and Taxation Real Property Database

TABLES

Table 1. Well Information for the Calvert County Non-Transient Non-Community Water Systems

PWSID	System Name	Plant ID	Source ID	Well Tag ID	Well Depth	Casing Depth	Completion Date	Hydro Unit	Aquifer	Aquifer Type	Ground Water Appropriation	Avg GPD
0040019	NAVAL RESEARCH LAB., CHESAPEAKE BAY DIV.	01	01	CA012070 aka CACc041	540	520	9/18/1953	125B	AQUIA	C	CA1994G004	30000
		02	02	CACc040	524	500		125B	AQUIA	C		
1040002	CALVERT CLIFFS NUCLEAR - PROTECTED AREA	01	01	CA700063	640	520	1/7/1970	125B	AQUIA	C	CA1969G010	450000
		01	02	CA720041	607	493	10/26/1971	125B	AQUIA	C		
		01	03		0	0		125B	AQUIA	C		
1040055	CALVERT CLIFFS NUCLEAR - OFFICE BUILDING	01	01	CA734435	608	525	11/18/1982	125B	AQUIA	C		
		01	02	CA734436	621	520	10/13/1982	125B	AQUIA	C		
1040077	DOMINION COVE POINT LNG	01	01	CA730082	658	648	11/29/1972	125B	AQUIA	C	CA1973G014	32000
		02	02	CA730439	703	20	10/12/1974	125B	AQUIA	C		
		02	03	CA730440	700	586	10/17/1974	125B	AQUIA	C		

Table 2. Parameters Used for the Wellhead Protection Area Delineations

PWSID	System Name	Source ID	Avg GPD	Well pumpage (Q) in ft^3/yr	Screened interval in feet (H)	Aquifer	Calculated radius for WHPA in feet (r)	Acreage of WHPA	Comments on WHPA
0040019	NAVAL RESEARCH LAB., CHESAPEAKE BAY DIV.	01	15000*	731,898	20	AQUIA	682.6	57.6	
		02	15000*	731,898	24	AQUIA	623.1		
1040002	CALVERT CLIFFS NUCLEAR - PROTECTED AREA	01	225000	1610088	117	AQUIA	1093.1	209.4	r = 1093 ft used for all three wells in protected area
		02	225000	1610088	124	AQUIA	1061.8		
		03	225000	878278		AQUIA			
1040055	CALVERT CLIFFS NUCLEAR - OFFICE BUILDING	01	450000	1463796	88	AQUIA	265.7		r = 600 ft used for two wells serving office bldg
		02	450000	1463796	101	AQUIA	248.0		
1040077	DOMINION COVE POINT LNG	01	32000	-	10	AQUIA	-	74.9	r = 600 ft used
		02	32000	1561382	110	AQUIA	425.1		
		03	32000	1561382	120	AQUIA	407.0		

Table 3. Calvert County Non-Transient Non-Community Water Systems Treatment Methods

PWSID	System Name	Plant ID	Treatment Method	Reason for Treatment
40019	NAVAL RESEARCH LAB., CHESAPEAKE BAY DIV.	1	GASEOUS CHLORINATION, POST	DISINFECTION
		2	GASEOUS CHLORINATION, POST	DISINFECTION
		3	NO TREATMENT	
1040002	CALVERT CLIFFS NUCLEAR - PROTECTED AREA	1	HYPOCHLORINATION, PRE	DISINFECTION
1040055	CALVERT CLIFFS NUCLEAR - OFFICE BUILDING	1	HYPOCHLORINATION, PRE	DISINFECTION
1040077	DOMINION COVE POINT LNG,	1	NO TREATMENT	
		2	NO TREATMENT	

Table 4. Summary of Water Quality Samples for Calvert County Non-Transient Non-Community Water Systems.

PWSID	PWS_NAME	PLANT ID	IOCs		SOCs		VOCs		Radionuclides	
			No. of Samples Collected	No. of samples > 50% MCL	No. of Samples Collected	No. of samples > 50% MCL	No. of Samples Collected	No. of samples > 50% MCL	No. of Samples Collected	No. of samples > 50% MCL
0040019	NAVAL RESEARCH LAB., CHESAPEAKE BAY DIV.	01	18	1	-	-	7	-	1	-
		02	14	-	-	-	6	-	1	-
1040002	CALVERT CLIFFS NUCLEAR – PROTECTED AREA	01	20	9	5	-	12	-	-	-
		02	-	-	-	-	-	-	-	-
1040055	CALVERT CLIFFS NUCLEAR – OFFICE BUILDING	01	19	7	5	-	12	-	-	-
1040077	DOMINION COVE POINT LNG	01	4	-	1	-	5	-	-	-
		02	4	-	1	-	5	-	-	-

Table 5. Regulated Inorganic Compounds (IOCs) Exceeding 50% of the MCL

PWSID	System Name	Plant ID	Contaminant Name	MCL	Sample Date	Result
1040002	CALVERT CLIFFS NUCLEAR - PROTECTED AREA	1	ARSENIC	0.01	17-Dec-98	0.01
					30-Dec-98	0.013
					6-Aug-01	0.006
					12-Jul-04	0.014
					26-Jul-04	0.014
					7-Feb-05	0.013
					19-Apr-05	0.013
					9-Aug-05	0.014
					13-Oct-05	0.013
1040055	CALVERT CLIFFS NUCLEAR - OFFICE BUILDING	1	ARSENIC	0.01	6-Aug-01	0.006
					12-Jul-04	0.013
					26-Jul-04	0.013
					7-Feb-05	0.013
					19-Apr-05	0.0085
					9-Aug-05	0.014
					13-Oct-05	0.013

Table 6. Susceptibility Analysis Summary

PWSID	SYSTEM NAME	Is the Water System Susceptible to....					
		Inorganic Compounds (except arsenic)	Arsenic	Radionuclides	Volatile Organic Compounds	Synthetic Organic Compounds	Microbiological Contaminants
0040019	NAVAL RESEARCH LAB., CHESAPEAKE BAY DIV.	NO	NO	NO	NO	NO	NO
1040002	CALVERT CLIFFS NUCLEAR - PROTECTED AREA	NO	YES	NO	NO	NO	NO
1040055	CALVERT CLIFFS NUCLEAR - OFFICE BUILDING	NO	YES	NO	NO	NO	NO
1040077	DOMINION COVE POINT LNG	NO	NO	NO	NO	NO	NO

Table 7. Population Served by Calvert County Non-Transient Non-Community Water Systems

PWSID	System Name	Population Served
0040019	NAVAL RESEARCH LAB., CHESAPEAKE BAY DIV.	200
1040002	CALVERT CLIFFS NUCLEAR - PROTECTED AREA	545
1040055	CALVERT CLIFFS NUCLEAR - OFFICE BUILDING	420
1040077	DOMINION COVE POINT LNG	55

FIGURES

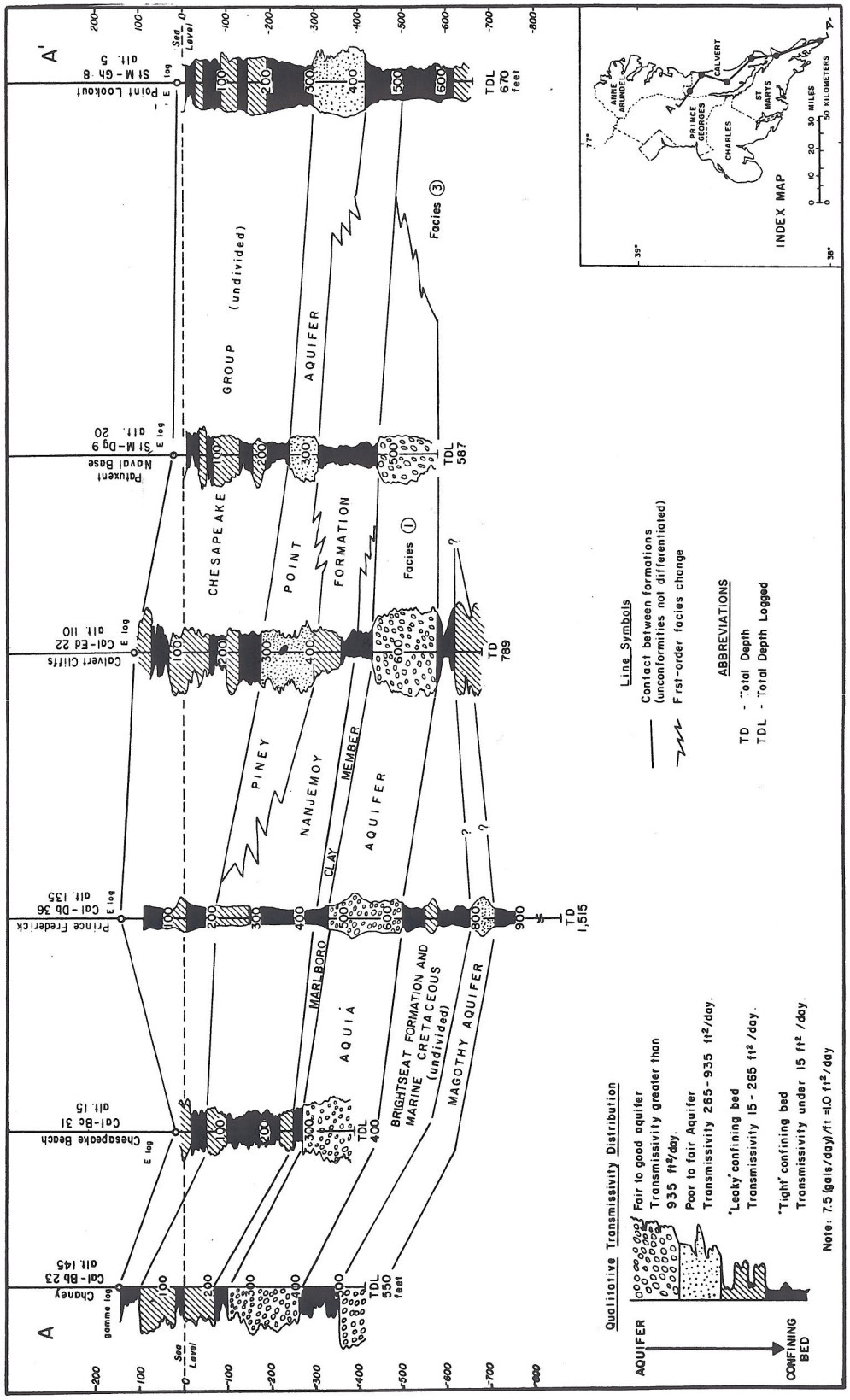


Figure 2 Geologic Section from Northern Calvert County to Southern St. Mary's County (Kapple and Hansen, 1976)