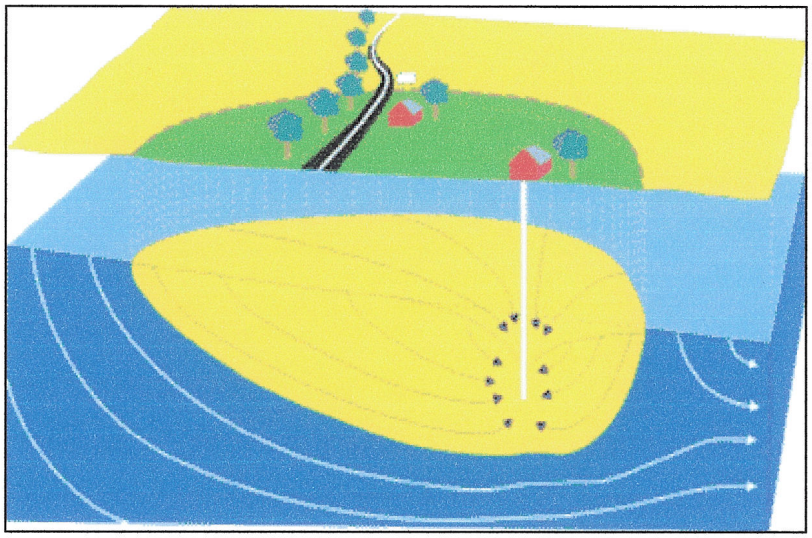
# SOURCE WATER ASSESSMENT
## for
## LAFARGE – MEDFORD QUARRY.
## CARROLL COUNTY, MD



**Prepared By**
**Water Management Administration**
**Water Supply Program**
**March 2006**

MDE

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# SUMMARY

The Maryland Department of the Environment's (MDE's) Water Supply Program (WSP) has conducted a Source Water Assessment for Medford Quarry (owned and operated by Lafarge) located near Westminster in Carroll County, Maryland. This report delineates the area that contributes water to the drinking water wells, identifies potential sources of contamination within the area and determines the susceptibility of the water supply to contamination. Recommendations for protecting the water supply conclude the report.

The source of the plant's potable water supply is the Wakefield Marble, an unconfined aquifer. The system uses two wells to obtain its drinking water supply. The Wellhead Protection Area was delineated using by the WSP using EPA-approved methods.

Point sources of contamination were identified within and near the assessment area from field inspections and MDE databases. The Maryland Department of Planning's 2002 land use map for Carroll County was used to identify non-point sources of contamination. Maps showing location of the wells, potential sources of contamination, and land use are included at the end of this report.

The susceptibility analysis is based on a review of existing water quality data for the water system, the presence of potential sources of contamination, in the assessment area, well integrity and the inherent vulnerability of the aquifer. The water sources are susceptible to contamination by nitrates, but not to volatile organic compounds, synthetic compounds, or to other organic compounds. The water supply's susceptibility to microbiological contaminants cannot be determined due to lack of raw water bacteriological data.

## INTRODUCTION

The Water Supply Program has conducted a Source Water Assessment for Medford Quarry (owned and operated by Lafarge), which is located near Westminster in Carroll County, Maryland. The facility operates its own water treatment plants and uses two wells. One well supplies the office/shop while the other well supplies a scale house.

As defined as part of Maryland's Source Water Assessment Plan (SWAP), "large systems" are community and non-community water systems that have water appropriation and use permits with average annual appropriation permit exceeding 10,000 gpd. Medford Quarry's water appropriation and use permit allows for an average annual water use of 1,360,000 gpd, however, most of the water is used for quarry dewatering, dust control, cooling water and process water. The plant has 43 employees and average annual water use for potable and sanitary uses is about 850 to 900 gpd. Water from the wells is occasionally used for dust control and washing vehicles.

## HYDROGEOLOGY

Medford Quarry is located in the Piedmont Physiographic Province. The quarry is underlain by carbonate rocks, which contain typical karst features such as sinkholes and large springs. Recharge to the aquifer occurs via precipitation percolating through soils, through seepage beneath stream channels and direct flow into sinkholes. Ground water is stored in joints, fractures, solution channels and caverns. The aquifers are unconfined and poorly protected from surface contamination.

Medford Quarry obtains its water supply from the Wakefield Marble, which is one of the most productive aquifers in Carroll County. The formation is described as "...closely folded white finely crystalline marble consisting of calcite or dolomite, with few impurities." Solution cavities are common in the Wakefield Marble. Most of it weathers to a reddish-brown residual clay.

Dye trace studies have documented a connection between Copps Branch and Pit 1, the northern pit. In the area between Copps Branch and the quarry, many of the fractures appear to trend from northeast to southwest. These fractures are believed to be the source of the connection between Copps Branch and the quarry because solution features and hydrologic conduits tend to form along major fracture zones. In the immediate vicinity of the quarry pit, shallow ground water flow is toward the pit. The water supply wells for the quarry are located southeast of the pits near the contact between the Wakefield Marble and the Sams Creek Metabasalt. The available well log does not document limestone. Ground water flow in the immediate vicinity of the wells is likely northwest toward Turkeyfoot Run.

## WELL INFORMATION

Well information for the system was obtained from the Water Supply Program's database, site visits, well completion reports and sanitary survey inspection reports. The

facility is served by two potable supply wells that are listed in Table 1. The wells and treatment serving the office/shop building and the scale house are regulated under the Safe Drinking Water Act as they serve more than 25 persons on a regular basis. A copy of the well completion report for the shop well is included in the Appendix. No information about the age or construction of the scale house well is available.

**TABLE 1. WELL INVENTORY**

| WELL # | PERMIT # | TOTAL DEPTH | CASING DEPTH | YEAR DRILLED | COMMENTS |
|---|---|---|---|---|---|
| 1 | | | | | Scale House Well |
| 2 | CL812281 | 200' | 65' | 1985 | Shop well |

## SOURCE WATER ASSESSMENT AREA DELINEATION

For ground water systems, a Wellhead Protection Area (WHPA) is considered to be the source water assessment for the system. As defined by Maryland's SWAP, the wellhead protection area for a public water system whose wells are completed in fractured crystalline rock is the drainage area that contributes water to the wells. Both wells are located between upgradient of the quarry pits. Ground water flow in the vicinity of the wells may have been altered by the quarry pits, which are 300 to 350 feet deep with a combined surface area of 75 acres. The current water appropriation and use permit allows an annual average withdrawal of 1.36 mgd, however, most of the water appropriated is dewatering of the quarry pit, dust suppression and process water. Water withdrawn from the wells (used for drinking water, dust suppression and process water) accounts for less than 1% of the appropriation. Actual potable and sanitary use by the 100 employees is estimated to be about 900 gpd. Figure 2 shows the 202-acre Wellhead Protection Area (WHPA) that was delineated, which is more than adequate to meet the daily average ground water usage for this system.

## POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination can be classified as either point or non-point sources. Examples of point sources are underground storage tanks, ground and surface water discharges, landfills, animal feeding operations, and ground water contamination sites. These sites are usually associated with commercial or industrial facilities that use chemicals that may, if handled inappropriately, contaminate ground water via a discrete point location. Non-point sources are associated with land use practices, such as use of pesticides, fertilizer, animal wastes or septic systems, that lead to ground water contamination over a larger area.

No point sources of contamination that were identified within the assessment area from either field inspections and from MDE Water and Waste Management databases. The closest sources are an underground storage tank and industrial discharges by Lafarge itself. Figure 2 shows potential sources of contamination near the WHPA.

The Maryland Department of Planning's 2002 land use map for Carroll County was used to identify non-point sources of contamination (Figure 3). Four land use categories

were identified within the delineated WHPA (Table 2). The predominant land use within the WHPA is extractive. There is also a significant amount of cropland in the WHPA.

**TABLE 2. LAND USE SUMMARY FOR THE WELLHEAD PROTECTION AREA**

| Land Use Categories | Total Area (acres) | Percentage of WHPA |
|---|---|---|
| Extractive | 75.4 | 37.3 |
| Cropland | 63.3 | 31.3 |
| Forest | 44.5 | 22.0 |
| Low Density Residential | 19.0 | 9.4 |

A review of Maryland Department Planning's Carroll 2003 Sewer Map shows no planned service for the entire WHPA.

## WATER QUALITY DATA

Water quality data from the Water Supply Program's (WSP) database was reviewed for Safe Water Drinking Act (SWDA) contaminants. In accordance with Maryland's SWAP, data submitted by the owner/operator of the system was compared with the Maximum Contaminant Levels (MCLs). If monitoring data is greater than 50% of the MCL, the assessment will describe the typical sources of that contaminant and locate the possible sources of the contaminant for this site. At Medford Quarry, the drinking water is not treated.

Inorganic Compounds (IOCs)

From 1993 to 2005, nitrate has been measured 40 times in the scale house well and 30 times in the shop well. Nitrate has been detected in every sample and most samples exceeded 50% of the MCL (Table 3). Nitrate has not been measured above the MCL since April 1998. Figure 4 shows a decrease in nitrate levels over time. Nitrite has also been detected, but not in quantities greater than 50% of the mcl.

**Table 3. Nitrate Measurements Greater Than 50% MCL**

| Date | Well #1 | Well #2 | MCL |
|---|---|---|---|
| | | | |
| 2/3/1993 | 12.7 ppm | 14.2 ppm | 10 ppm |
| 3/25/1993 | 7.38 ppm | 10.9 ppm | 10 ppm |
| 6/22/1993 | 18.3 ppm | 17.0 ppm | 10 ppm |
| 8/19/1993 | | 16.5 ppm | 10 ppm |
| 8/24/1993 | 13.4 ppm | 12.0 ppm | 10 ppm |
| 11/16/1993 | 14.3 ppm | 14.3 ppm | 10 ppm |
| 11/18/1993 | 12.5 ppm | | 10 ppm |
| 11/21/1993 | | 12.8 ppm | 10 ppm |
| 2/25/1994 | 14.9 ppm | 14.1 ppm | 10 ppm |
| 3/2/1994 | 11.0 ppm | 12.4 ppm | 10 ppm |
| 5/18/1994 | 12.9 ppm | 11.7 ppm | 10 ppm |

| | | | |
|---|---|---|---|
| 5/19/1994 | 13.6 ppm | 11.3 ppm | 10 ppm |
| 8/11/1994 | 10.1 ppm | | 10 ppm |
| 8/12/1994 | | 9.8 ppm | 10 ppm |
| 8/18/1994 | 10.2 ppm | | 10 ppm |
| 11/10/1994 | 14.8 ppm | 11.8 ppm | 10 ppm |
| 11/15/1994 | 14.0 ppm | 11.6 ppm | 10 ppm |
| 2/14/1995 | 17.2 ppm | 14.1 ppm | 10 ppm |
| 3/7/1996 | 8.1 ppm | 8.1 ppm | 10 ppm |
| 4/11/1997 | 5.9 ppm | | 10 ppm |
| 4/11/1997 | 7.6 ppm | | 10 ppm |
| 5/6/1997 | 8.9 ppm | 7.0 ppm | 10 ppm |
| 7/17/1997 | 9.9 ppm | 7.8 ppm | 10 ppm |
| 1/26/1998 | 7.8 ppm | 6.8 ppm | 10 ppm |
| 4/10/1998 | 13.2 ppm | 9.8 ppm | 10 ppm |
| 8/18/1998 | 9.0 ppm | | 10 ppm |
| 8/18/1998 | 7.0 ppm | | 10 ppm |
| 1/7/1999 | 8.0 ppm | | 10 ppm |
| 1/11/1999 | | 6.5 ppm | 10 ppm |
| 4/15/1999 | 6.8 ppm | | 10 ppm |
| 4/17/1999 | 6.8 ppm | 5.8 ppm | 10 ppm |
| 8/18/1999 | 6.6 ppm | 5.6 ppm | 10 ppm |
| 10/24/1999 | 6.1 ppm | | 10 ppm |
| 11/29/1999 | | 5.4 ppm | 10 ppm |
| 3/29/2000 | 7.3 ppm | 6.6 ppm | 10 ppm |
| 2/4/2002 | 6.9 ppm | | 10 ppm |
| 1/31/2003 | 6.4 ppm | 5.6 ppm | 10 ppm |
| 2/6/2004 | 6.1 ppm | 5.8 ppm | 10 ppm |
| 2/23/2005 | 5.4 ppm | 6.2 ppm | 10 ppm |

Volatile Organic Compounds (VOCs)

VOC's have been measured 10 times (5 times at each plant) since 1995. No VOCs were detected at either plant.

Synthetic Organic Contaminants (SOCs)

SOC's have been measured twice since 1990. No SOCs were detected.

Microbiological Contaminants

Routine bacteriological monitoring, which measures total coliform bacteria, is conducted in the finished water for each noncommunity water system on a quarterly basis. Total coliform bacteria are not pathogenic but are used as indicator-organisms for other disease-causing microorganisms. Microbiological contaminants were sampled 34 times from 1996 to 2005. None were detected. Since the wells may be constructed at least partially in marble, they are at risk of being under the influence of surface water. Special raw water bacteriological samples are scheduled to be collected under dry and wet weather conditions to examine the vulnerability of each well to protozoan organisms such as giardia and cryptosporidium. The results will be used to determine whether the wells are vulnerable to contamination by these organisms.

## SUSCEPTIBILITY ANALYSIS

The wells serving Medford Quarry are completed in the Wakefield Marble, an unconfined aquifer. Wells completed in unconfined marble aquifers are generally more susceptible to contamination from surface sources. Therefore, managing this area to minimize the risk to the supply and continued routine monitoring of the contaminants is essential in assuring a safe drinking water supply. The susceptibility of source water to contamination is 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) aquifer conditions. The susceptibility of the quarry's water supply to various contaminants is shown in Table 4.

Inorganic Compounds (IOCs)

Nitrate was the only IOC to exceed 50% of the MCL. Much of the WHPA is in an area used for cropland and for low-density residential using septic systems. All are possible sources of nitrate. The quarry wells are susceptible to nitrates, but not to other inorganic compounds.

Volatile Organic Compounds (VOC's)

No VOC's greater than 50% MCL have been reported in the WHPA. Medford Quarry's water supply is not considered susceptible to VOCs.

Synthetic Organic Compounds (SOC's)

No SOC's greater than 50% MCL have been reported in the WHPA. Medford Quarry's water supply is not considered susceptible to VOCs.

Microbiological Contaminants

Although no bacteria have been detected, it has not been determined whether the quarry wells are under the influence of surface water. Until this is determined, the system's susceptibility to microbiological contaminants cannot be determined.

**TABLE 4. SUSCEPTIBILITY CHART**

| CONTAMINANT TYPE | Are Contaminant Sources present in the WHPA? | Are Contaminants detected in WQ samples at 50% of the MCL? | Is Well Integrity a Factor? | Is the Aquifer Vulnerable? | Is the System Susceptible to the Contaminant? |
|---|---|---|---|---|---|
| Inorganic Compounds | YES | YES | NO | YES | YES |
| Volatile Organic Compounds | NO | NO | NO | NO | NO |
| Synthetic Organic Compounds | NO | NO | NO | NO | NO |
| Microbiological Contaminants | YES | POSSIBLY | POSSIBLY | YES | YES |

## MANAGEMENT OF THE SOURCE WATER ASSESSMENT AREA

The wells serving Medford Quarry appear to be in good condition. Recommendations for better protecting the water supply are listed below:

- It is not know whether the wells are under the influence of surface water. The appropriate water quality testing is being scheduled by a laboratory under contract with MDE.
- No data is available about the age or construction of the scale house well. It might be possible to send a camera of other probes down the well to determine depth, construction and location of major fractures.
- There are several monitoring wells on the property. If it is decided to stop monitoring one, it should be abandoned according to State regulations.
- Abandon all wells that are not in use according to State regulations.
- Continue monitoring for VOCs, IOCs, and SOCs in accordance with MDE's requirements.
- Any increase in pumpage, addition of new wells to the system or expansion of the quarry pit may require extension of the WHPA. The system is required to contact the Water Supply Program when an increase in pumpage is applied for or when new wells are being considered.

## REFERENCES


1. Hilleary, J.T. & J. M. Weigle, 1981, Carroll County Ground-Water Information: Well Records, Spring Records, and Chemical Quality Data; Water Resources Basic Report No. 10, 251p.

2. Maryland Department of the Environment, Water Supply Program, 1999, Maryland's Source Water Assessment Plan, 36p.

3. Mauersburg, J.S., 1997, Geologic Report Zone of Dewatering Influence Redland Genstar, Inc Medford Quarry, Maryland Department of the Environment, Water Management Administration, Minerals, Oil & Gas Division, 32p.

4. Meyer, G. & R. M. Beall, 1958, The Water Resources of Carroll and Frederick Counties, Maryland Geological Survey Bulletin 22, 344 p.

# FIGURES

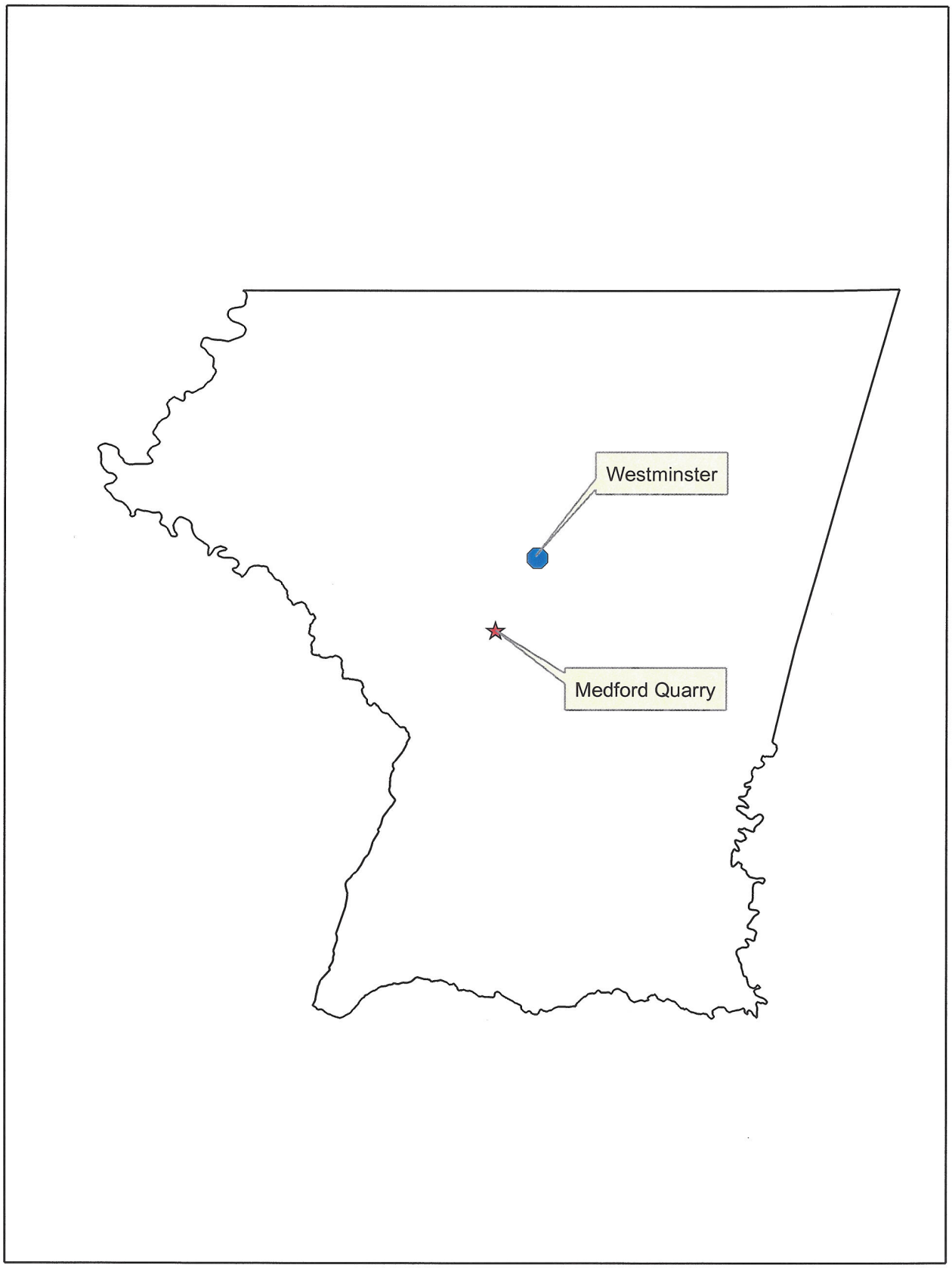



Figure 1. Location Map

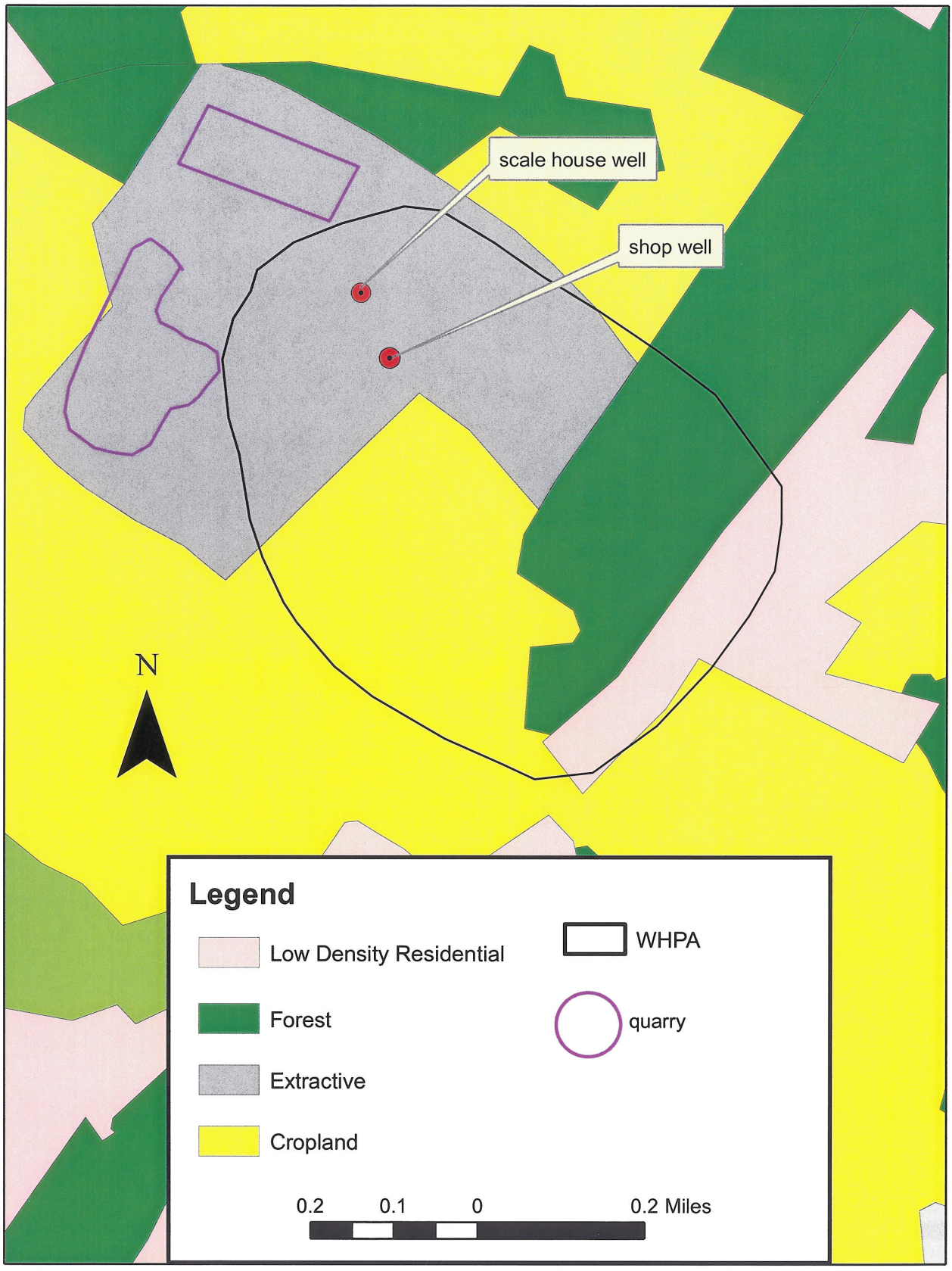
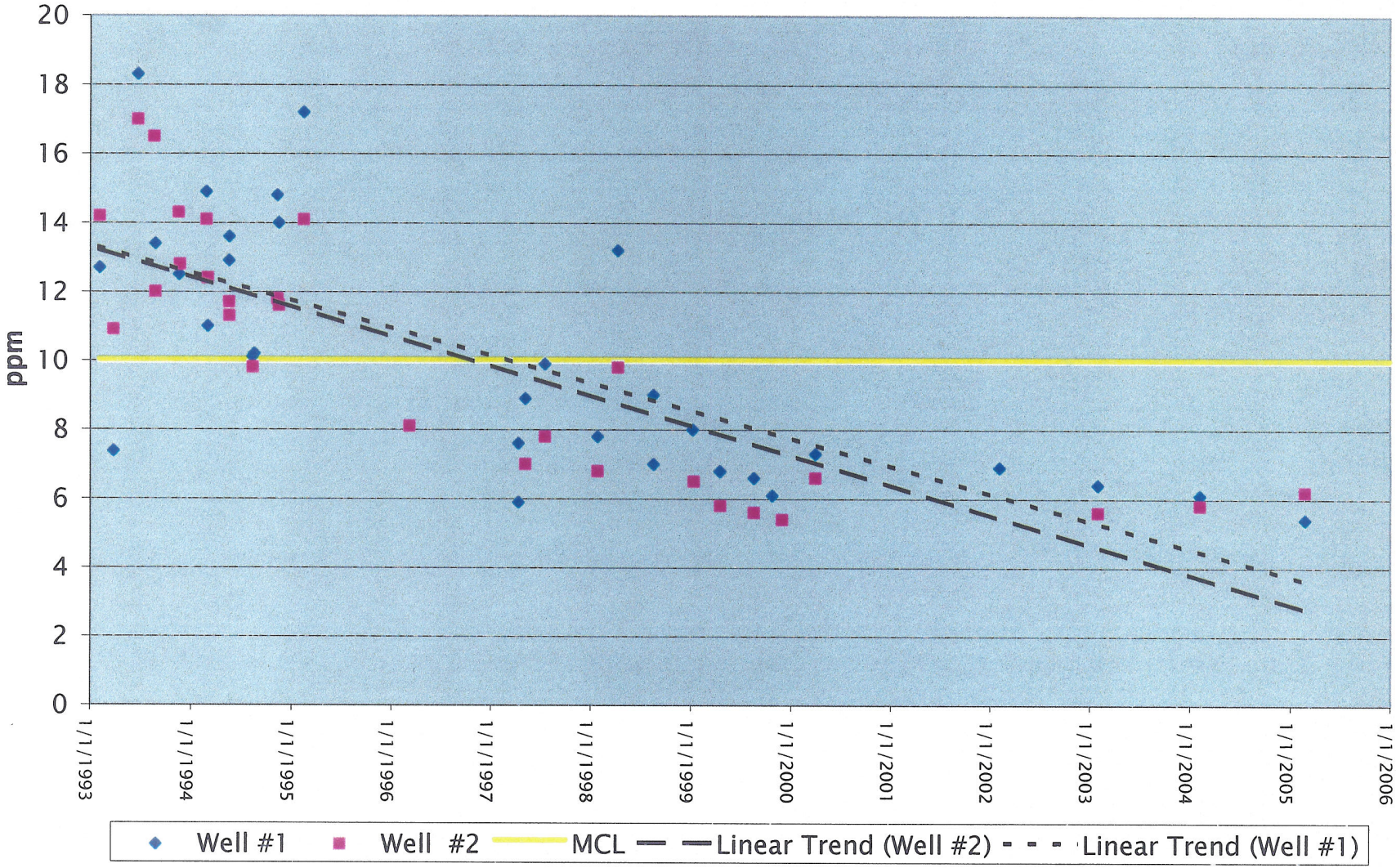



Figure 3. Land Uses

**Figure 4. Historical Nitrate Levels**



# APPENDIX

B 1 | 9878 | SEQUENCE NO. (OEP USE ONLY)
(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

# STATE OF MARYLAND
# APPLICATION FOR PERMIT TO DRILL WELL
please print or type

C L - 8 1 - 2 2 8 1
fill in this form completely

Date Received 11-6-80

## OWNER INFORMATION
GENSTAR STONE PRODUCTS
Last Name / Owner / First Name
P O BOX 501
Street or RFD
HUNT VALLEY MD 21031
Town / State / Zip

## LOCATION OF WELL
B 3
CARROLL
County
Subdivision
SECTION ____ LOT ____
WESTMINSTER
Nearest Town
MILES FROM TOWN (enter 0 if in town) 3.7 M

## DRILLER INFORMATION
Sandy B Cochran 1120
Driller's Name / License No.
S. EDGAR HARR SONS CORP
Firm Name
10417 Falls Rd Cockeysville 21030
Address
Signature 6-7-85 Date

B 4
DIRECTION OF WELL FROM TOWN (CIRCLE BOX)
N NW NE W TOWN E SW SE S

HEDFORD ROAD
NEAR WHAT ROAD
ON WHICH SIDE OF ROAD (CIRCLE APPROPRIATE BOX)
NORTH NW NE WEST EAST SW SE SOUTH
1000
DISTANCE FROM ROAD
ENTER FT or MI F

B 2
## WELL INFORMATION
APPROX. PUMPING RATE (GAL. PER MIN.) 5
AVERAGE DAILY QUANTITY NEEDED (GAL. PER DAY) 750

## USE FOR WATER (CIRCLE APPROPRIATE BOX)
H HOME (SINGLE OR DOUBLE HOUSEHOLD UNIT ONLY)
F FARMING (LIVESTOCK WATERING & AGRICULTURAL IRRIGATION)
I INDUSTRIAL, COMMERCIAL, STATE AND FEDERAL GOV. OTHER (REQUIRES APPROPRIATION PERMIT)
P PUBLIC OR PRIVATE WATER COMPANY (REQUIRES APPROPRIATION PERMIT AND STATE HEALTH DEPARTMENT APPROVAL)
T TEST, OBSERVATION, MONITORING (MAY REQUIRE APPROPRIATION PERMIT)

APPROXIMATE DEPTH OF WELL 120 FEET

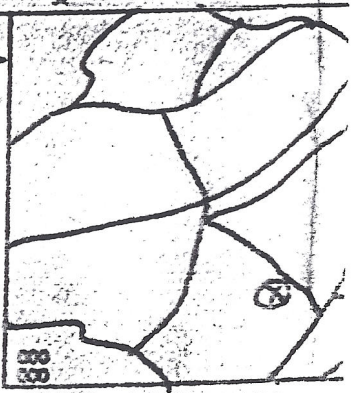
APPROXIMATE DIAMETER OF WELL 6 NEAREST INCH

## METHOD OF DRILLING (circle one)
BORED (or Augered) JETTED Jetted & DRIVEN
AIR-ROTary AIR-PERcussion ROTARY (Hydraulic Rotary)
CABLE REVerse-ROTary DRive-POINT
other

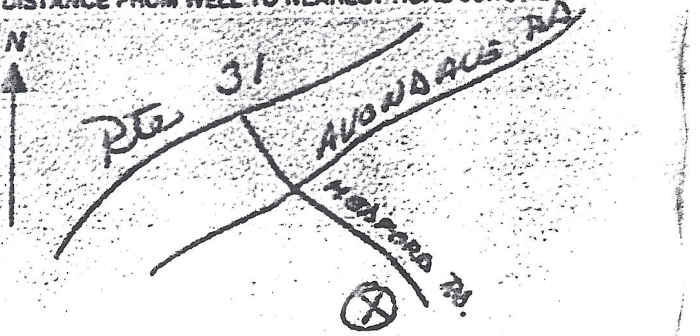
## REPLACEMENT OR DEEPENED WELLS
(CIRCLE APPROPRIATE BOX)
N THIS WELL WILL NOT REPLACE AN EXISTING WELL
Y THIS WELL WILL REPLACE A WELL THAT WILL BE ABANDONED AND SEALED
S THIS WELL WILL REPLACE A WELL THAT WILL BE USED AS A STANDBY
D THIS WELL WILL DEEPEN AN EXISTING WELL
PERMIT NUMBER OF WELL TO BE REPLACED OR DEEPENED (IF AVAILABLE)

NOT TO BE FILLED IN BY DRILLER
HEALTH DEPARTMENT APPROVAL
27188
CARROLL
COUNTY NAME / COUNTY NO.
OEP SIGNATURE / STATE HEALTH INSERT S
DATE ISSUED 07 08 86
CO SIGNATURE 01-08-86 EXP. DATE
NORTH GRID 4 [illegible] 0 0 0 EAST GRID 0 [illegible] 0 0 0

SHOW MAJOR FEATURES OF BOX & LOCATE WELL WITH AN X
SOURCES OF DRILLING WATER
1.
2.
3.
WRITE THE BOX NUMBER FROM THE MAP HERE
E 780
N 620



DRAW A SKETCH BELOW SHOWING LOCATION OF WELL IN RELATION TO NEARBY TOWNS AND ROADS AND GIVE DISTANCE FROM WELL TO NEAREST ROAD JUNCTION




*Not to be filled in by driller (OEP USE ONLY)*
APPROP. PERMIT NUMBER CL80GAP005
FORCE [illegible] WRITE INITIALS IN BOX PERMIT No. CL-81-2281

CONDITIONS

ORIGINAL

(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)

FILL IN THIS FORM COMPLETELY
PLEASE PRINT OR TYPE

COUNTY NUMBER 27188

DATE Received 4 1995

DATE WELL COMPLETED 08/16/95

Depth of Well 200 (TO NEAREST FOOT)

PERMIT NO. FROM "PERMIT TO DRILL WELL" CL-81-2281

OWNER GEMSTAR STONE PRODUCTS

STREET OR RFD last name EXEC. PLAZA IV first name TOWN HUNT VALLEY 21031

SUBDIVISION SECTION LOT

## WELL LOG
Not required for driven wells

STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING

| DESCRIPTION (Use additional sheets if needed) | FEET FROM | FEET TO | Check if water bearing |
|---|---|---|---|
| OVERBURDEN | 0 | 5 | |
| BROWN SAND | 5 | 65 | |
| SERPINTINE | 65 | 200 | X |
| WELL #1 - 500' DRY | | | |
| WELL #2 - 600' DRY | | | |
| (BACKFILLED) | | | |

## GROUTING RECORD
WELL HAS BEEN GROUTED (Circle Appropriate Box) (Y) N
TYPE OF GROUTING MATERIAL
CEMENT CM BENTONITE CLAY BC
NO. OF BAGS 6 NO. OF POUNDS 600
GALLONS OF WATER 36
DEPTH OF GROUT SEAL (to nearest foot)
from 0 ft. to 65 ft.
(enter 0 if from surface)

## CASING RECORD
casing types insert appropriate code below
ST STEEL, CO CONCRETE, PL PLASTIC, OT OTHER

| MAIN CASING TYPE | Nominal diameter top (main) casing (nearest inch) | Total depth of main casing (nearest foot) |
|---|---|---|
| ST | 6 | 65 |

OTHER CASING (if used)

| EACH CASING | diameter inch | depth (feet) from | to |
|---|---|---|---|
| | | | |
| | | | |

## SCREEN RECORD
screen type or open hole insert appropriate code below
ST STEEL, BR BRASS BRONZE, HO OPEN HOLE, PL PLASTIC, OT OTHER

C 2

| EACH SCREEN | DEPTH (nearest ft.) | |
|---|---|---|
| 1 | 40 | 65 / 200 |
| 2 | | |
| 3 | | |

SLOT SIZE 1 ____ 2 ____ 3 ____
DIAMETER OF SCREEN ____ (NEAREST INCH)

GRAVEL PACK from ____ to ____
IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

OEP USE ONLY (NOT TO BE FILLED IN BY DRILLER)
T TELESCOPE CASING
(E.R.O.S.) LOG INDICATOR
WO OTHER DATA

C 3

## PUMPING TEST
HOURS PUMPED (nearest hour) 3
PUMPING RATE (gal. per min. to nearest gal.) 20 est
METHOD USED TO MEASURE PUMPING RATE AIR
WATER LEVEL (distance from land surface)
BEFORE PUMPING 40
WHEN PUMPING 180'

TYPE OF PUMP USED (for test)
(A) air, P piston, T turbine, C centrifugal, R rotary, O other (describe below), J jet, S submersible

## PUMP INSTALLED
DRILLER WILL INSTALL PUMP (CIRCLE) (YES or NO) YES (NO)
IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS EXCEPT HOME USE
TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX - SEE ABOVE:
CAPACITY: GALLONS PER MINUTE (to nearest gallon)
PUMP HORSE POWER
PUMP COLUMN LENGTH (nearest ft.)
CASING HEIGHT (circle appropriate box and enter casing height)
(+) above, (-) below LAND SURFACE (nearest foot)

CIRCLE APPROPRIATE LETTER
A A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED
E ELECTRIC LOG OBTAINED
P TEST WELL CONVERTED TO PRODUCTION WELL

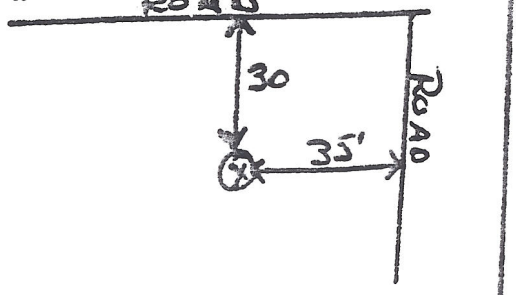
I HEREBY CERTIFY THAT THIS WELL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH COMAR 10.17.13 "WELL CONSTRUCTION" AND IN CONFORMANCE WITH ALL CONDITIONS STATED IN THE ABOVE CAPTIONED PERMIT, AND THAT THE INFORMATION PRESENTED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

DRILLERS IDENT. NO. 120

DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION)

SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)

## LOCATION OF WELL ON LOT
SHOW PERMANENT STRUCTURE SUCH AS BUILDING, SEPTIC TANKS, AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCES (MEASUREMENTS TO WELL)




ORIGINAL