

C 1 36849

SEQUENCE NO. (MDE USE ONLY)

STATE OF MARYLAND WELL COMPLETION REPORT

THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.

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

FILL IN THIS FORM COMPLETELY PLEASE TYPE

COUNTY NUMBER 13

ST/CO USE ONLY DATE RECEIVED

DATE WELL COMPLETED

Depth of Well

PERMIT NO. FROM "PERMIT TO DRILL WELL"

OWNER Murbach Randall WELL SITE ADDRESS 4016 Macalpine Road TOWN Ellicott City SUBDIVISION SECTION LOT 126

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 TO check if water bearing Sand & gravel m dense to silt tr mica Rock, hard gravel, brown water @ 180' 5gpm Installed 1-25" closed top geothermal

GROUTING RECORD WELL HAS BEEN GROUTED (Circle Appropriate Box) TYPE OF GROUTING MATERIAL (Circle one) CEMENT CM BENTONITE CLAY BC NO. OF BAGS 20 NO. OF POUNDS 1,000 GALLONS OF WATER 500 DEPTH OF GROUT SEAL (to nearest foot) from 0 to 320 ft. CASING RECORD MAIN CASING TYPE Nominal diameter top (main) casing (nearest inch)! Total depth of main casing (nearest foot) OTHER CASING (if used) diameter inch depth (feet) from to SCREEN RECORD screen type or open hole (insert appropriate code below) ST STEEL BR BRASS PL PLASTIC HO OPEN HOLE OT OTHER

PUMPING TEST HOURS PUMPED (nearest hour) N/A PUMPING RATE (gal. per min.) N/A METHOD USED TO MEASURE PUMPING RATE N/A WATER LEVEL (distance from land surface) BEFORE PUMPING 80 ft. WHEN PUMPING N/A TYPE OF PUMP USED (for test) A air P piston T turbine C centrifugal R rotary O other J jet S submersible

NUMBER OF UNSUCCESSFUL WELLS: 0 WELL HYDROFRACTURED YES Y NO N

C 2 DEPTH (nearest ft.) 1 2 3 4 5 6 7 8 9 11 15 17 21 23 24 25 30 32 36 38 39 41 45 47 51 SLOT SIZE 1 2 3 DIAMETER OF SCREEN (NEAREST INCH) from to GRAVEL PACK IF WELL DRILLED WAS FLOWING WELL INSERT F IN BOX 68

PUMP INSTALLED DRILLER INSTALLED PUMP YES NO IF DRILLER INSTALLS PUMP, THIS SECTION MUST BE COMPLETED FOR ALL WELLS. TYPE OF PUMP INSTALLED PLACE (A,C,J,P,R,S,T,O) IN BOX 29 CAPACITY: GALLONS PER MINUTE (to nearest gallon) N/A PUMP HORSE POWER N/A PUMP COLUMN LENGTH (nearest ft.) N/A CASING HEIGHT (circle appropriate box and enter casing height) + above LAND SURFACE - below 3 (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 26.04.04 "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 LIC. NO. 1 MWD 5671 DRILLERS SIGNATURE (MUST MATCH SIGNATURE ON APPLICATION) LIC. NO. 1 D

MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER) T (E.R.O.S.) W Q

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

TELESCOPE CASING LOG INDICATOR OTHER DATA

LATITUDE 39.262019 LONGITUDE 76.830510 (DEFAULT COORD. WGS 84)

Pursuant to §10-624 of the State Govt. Article of the Maryland Code personal info. requested on this form is used in processing this form pursuant to COMAR 26.04.04. Failure to provide the info. may result in this form not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment is subject to the Maryland Public Information Act. This form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or state law.

B 1	SEQUENCE NO. (MDE USE ONLY) 43385	STATE OF MARYLAND APPLICATION FOR PERMIT TO DRILL WELL 559750 please type	STATE PERMIT NUMBER HO - 15 - 0308 70 fill in this form completely 79
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Date Received (APA) 9/10/16

OWNER INFORMATION

8 MM DD YY 13
 15 Last Name Murbach Owner First Name Randall 34
 36 Street or RFD 4010 Macalpine Road 55
 57 Town Ellicott City, MD 21042-5305 76 State 72 Zip 76

B 3 LOCATION OF WELL

8 COUNTY Howard County 21

23 SUBDIVISION _____ 42

SECTION 44 46 LOT 126 48 50

52 NEAREST TOWN Ellicott City 71

DRILLER INFORMATION

Driller's Name Jeff Corron MWD 567 76 License No. 81

Firm Name Chesapeake Geosystems, Inc.

Address 6720 Fort Smallwood Rd. Balt.

Signature Jeff Corron Date 8/31/16

B 4 SOURCES OF DRILLING WATER

1. 4010 Macalpine Rd 11 STREET ADDRESS 30
municipal

2. _____

3. _____

ON WHICH SIDE OF ROAD (CIRCLE APPROPRIATE BOX)

NORTH
 WEST
 EAST
 SOUTH

34 102 37 DISTANCE FROM ROAD FT
 ENTER FT OR MI 38 39

TAX MAP: 0024 BLK: 0017 PARCEL 0951

B 2 WELL INFORMATION

APPROX. PUMPING RATE (GAL. PER MIN.) N/A 8 12

AVERAGE DAILY QUANTITY NEEDED (GAL. PER DAY) N/A 14 20

USE FOR WATER (CIRCLE APPROPRIATE BOX)

DOMESTIC POTABLE SUPPLY & RESIDENTIAL IRRIGATION

FARMING (LIVESTOCK WATERING & AGRICULTURAL IRRIGATION)

22 INDUSTRIAL, COMMERCIAL, DEWATERING

PUBLIC WATER SUPPLY WELL

TEST, OBSERVATION, MONITORING

OPEN LOOP GEOTHERMAL

CLOSED LOOP GEOTHERMAL 3 geo bores

NOT TO BE FILLED IN BY DRILLER HEALTH DEPARTMENT APPROVAL

Howard (13) COUNTY NAME COUNTY NO.

STATE SIGNATURE _____ INSERT S → 41

DATE ISSUED 9/13/16 CO SIGNATURE Sal G.M. EXP. DATE 9/13/17

43 MM DD YY 48

APPROXIMATE DEPTH OF WELL 320 FEET 24 28

APPROXIMATE DIAMETER OF WELL 6 INCH NEAREST

METHOD OF DRILLING (circle one)

BORED (or Augered) JETTED Jetted & DRIVEN

30 AIR-ROTary AIR-PERCussion ROTARY (Hydraulic Rotary)

37 CABLE REVERSE-ROTary DRIVE-POINT

other _____

REPLACEMENT OR DEEPEMED WELLS (CIRCLE APPROPRIATE BOX)

THIS WELL WILL NOT REPLACE AN EXISTING WELL

THIS WELL WILL REPLACE A WELL THAT WILL BE ABANDONED AND SEALED

39 THIS WELL WILL REPLACE A WELL THAT WILL BE USED AS A STANDBY-CONTACT LOCAL APPROVING AUTHORITY FOR POLICY ON STANDBY WELLS

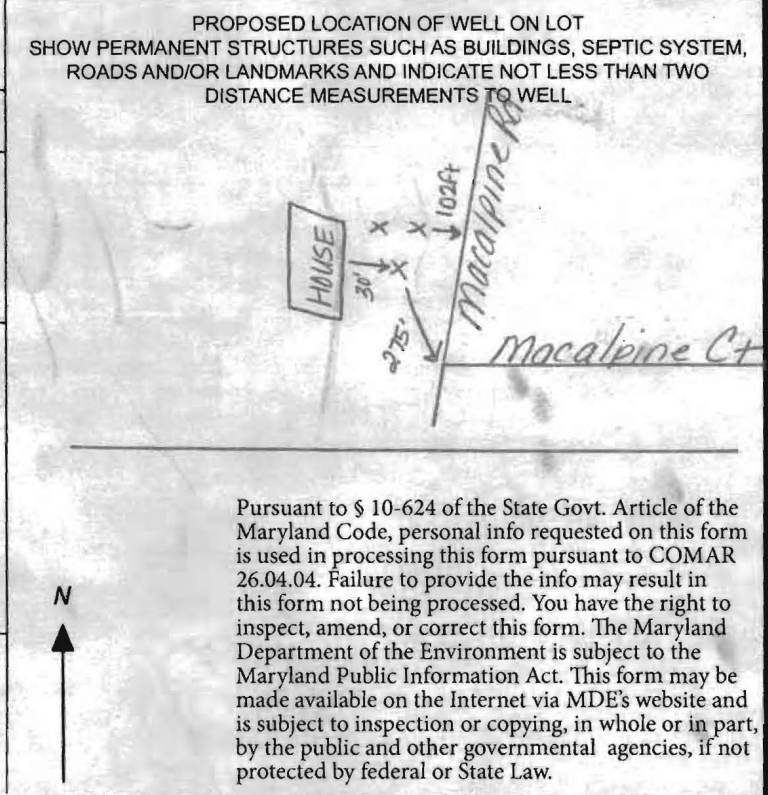
THIS WELL WILL DEEPEM AN EXISTING WELL

PERMIT NUMBER OF WELL TO BE REPLACED OR DEEPEMED (IF AVAILABLE) 41 _____ 52

Not to be filled in by driller (MDE OR COUNTY USE ONLY)

APPROX. PERMIT NUMBER _____ G _____

PERMIT No. HO - 15 - 0308
70 71 72 73 74 75 76 77 78 79



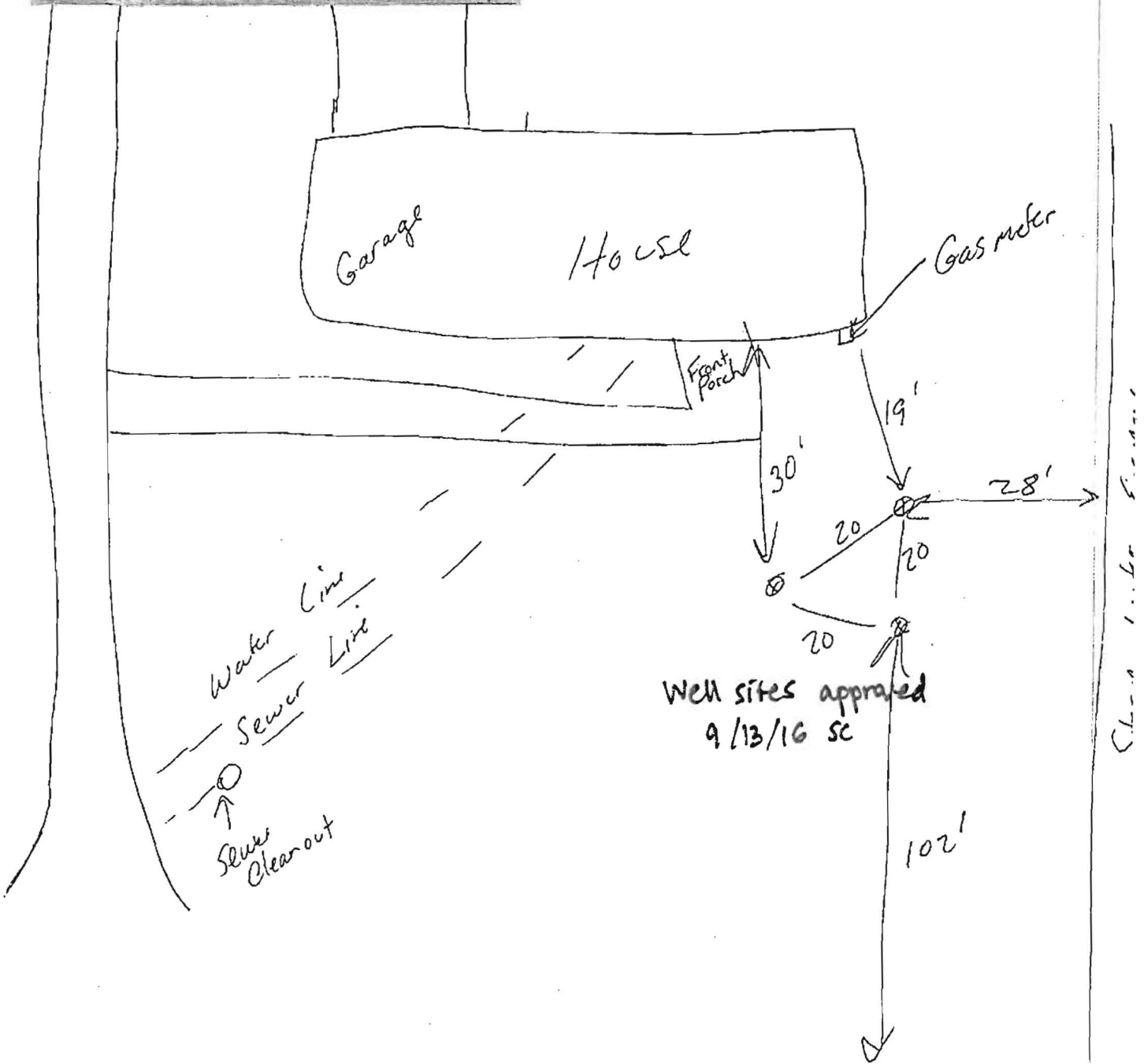
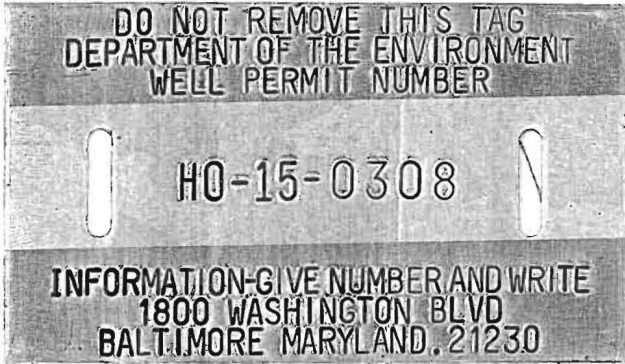
SPECIAL CONDITIONS

NOTE APPROVING AUTHORITIES SHOULD USE SEPARATE SHEET IF NEEDED-

39.262 019 - 76.830 510

4010 MacAlpine Rd.

3 wells @ 320'
1.25" Closed Loop
Geothermal
factory U-Bend



Street

Collins, Sarah

From: Tiffany Gray <tgray@chesapeakegeo.com>
Sent: Tuesday, September 13, 2016 8:53 AM
To: Collins, Sarah
Cc: Wesley Wolfe (wwolfe@geowelldrilling.com)
Subject: RE: 4010 MacAlpine Road well permit - CGI#16066

Sara:

The material of the sewer line is cast iron.

If you have any questions or need additional information, please feel free to contact me.

Tiffany Gray

Chesapeake Geosystems, Inc.
6720 Fort Smallwood Road
Baltimore, MD 21226
(410) 789-5020 phone
(410) 789-5029 fax
TGray@chesapeakegeo.com

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From: Wesley Wolfe [<mailto:wwolfe@geowelldrilling.com>]
Sent: Tuesday, September 13, 2016 8:51 AM
To: Tiffany Gray <tgray@chesapeakegeo.com>
Subject: RE: 4010 MacAlpine Road well permit - CGI#16066

Cast iron

From: Tiffany Gray [<mailto:tgray@chesapeakegeo.com>]
Sent: Tuesday, September 13, 2016 8:49 AM
To: Wesley Wolfe (wwolfe@geowelldrilling.com) <wwolfe@geowelldrilling.com>
Cc: Lisa Blanchet <lblanchet@chesapeakegeo.com>
Subject: FW: 4010 MacAlpine Road well permit - CGI#16066

Wes:

Please see the email below from Sara at Howard County regarding the sewer line material for the following project:

CGI# 16066

Randall Murbach
4010 Macalpine Road
Ellicott City, MD 21042-5325
Howard County

If you have any questions or need additional information, please feel free to contact me.

Tiffany Gray
Chesapeake Geosystems, Inc.
6720 Fort Smallwood Road
Baltimore, MD 21226
(410) 789-5020 phone
(410) 789-5029 fax
TGray@chesapeakegeo.com

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From: Collins, Sarah [<mailto:SCollins@howardcountymd.gov>]
Sent: Tuesday, September 13, 2016 8:01 AM
To: Tiffany Gray <tgray@chesapeakegeo.com>
Subject: 4010 MacAlpine Road well permit

Hi Tiffany,

I have a geothermal well permit for 4010 MacAlphine road in Ellicott City. Can I get confirmation of the material of the sewer line? The proposed geothermal wells are less than 50' away; the material of the sewer line must be cast iron, Sch 40 PVC, or HDPE to qualify for the 10' setback from a geothermal bore.

Thank you,
Sarah

Sarah Collins, L.E.H.S.
Environmental Health Specialist
Howard County Health Department
Bureau of Environmental Health
SCollins@howardcountymd.gov
410-313-6287

WELL SCHEMATIC FORM

PERMANENT OUTER CASING (if area contaminated)
 MATERIAL _____
 DIAMETER _____
 LENGTH _____
 DEPTH INTO CONFINING UNIT _____

TUBE CASING (if not regular, single loop)
 ATTACH HORIZONTAL SCHEMATIC
 NUMBER OF TUBES PER BOREHOLE 2
 DIAMETER OF TUBES 1.25"
 MATERIAL HDPE
 SHAPE AND LENGTH _____
 TUBE CONNECTION METHOD Fusion
 TUBE CONNECTION MATERIAL HDPE

LOOP PIPE CASING (regular, single loop)
 MATERIAL HDPE? YES NO
 DIAMETER 1.25"
 LENGTH 325'

GROUT
 MATERIAL Bentonite / Thermex
 PERMEABILITY _____
 WATER / GROUT RATIO 24 / 50
 PERCENT SOLIDS _____
 TREMIE GROUTED FROM BOTTOM OF BOREHOLE? YES NO
 USING A POSITIVE DISPLACEMENT PUMP? YES NO

DEPTH TO THE BOTTOM OF HOLE 320'
 DIAMETER OF BOREHOLE 6"

WELL ADDRESS <u>4010 Macalpine Rd</u> <u>Ellicott City Md</u>	WELL OWNER: <u>Randy Murbach</u>	
LOT NUMBER: _____ SQUARE NUMBER: _____	OWNER ADDRESS: <u>4010 Macalpine Rd</u> <u>Ellicott City Md</u>	



WELL DRILLING SOLUTIONS
 GEOTHERMAL, WELL AND PUMP

A division of Chesapeake Geosystems, Inc.

Headquarters: 6720 Ft. Smallwood Road, Baltimore, MD 21226
 Western Office: 1824C Ridge Road, Westminster, MD 21157
 410-861-5534

August 18, 2016

Murbach Residence / Geothermal Closed Loop System

Below is our quote for the above referenced project. A detailed summary of each item listed is provided on the following pages.

Service	Estimated cost
Drilling Permit Acquisition	\$250
Drilling, Loop Installation and Grouting	\$10,556
Trenching and Loop Connection	\$4,000
Flush and Fill of System	\$1,500
TOTAL	\$16,306

Additional Services	Estimated cost	Initial
Air eliminator and expansion tank	\$400	
Supply and remove filter bag	\$1,000	Included

Payment Terms

Amount	Due Upon
\$4,500	Contract execution
\$10,306	Completion of drilling and grouting
\$1,500	Completion of flush and fill

- * Deposit due at contract execution
- * Each payment is due within 30 days of invoice date
- * If Additional Services are contracted, item amount will be added to the final invoice.
- * Please make checks payable to **Well Drilling Solutions** and mail to 6720 Ft. Smallwood Road, Baltimore, MD 21226.

Customer

Well Drilling Solutions

Signature:

Jose Rodriguez
 JOSE RODRIGUEZ

Signature:

Wesley Wolke
 Wesley Wolke

Name (Printed):

Name (Printed):

Date:

8/29/2016

Date:

8-29-2016

Customer Name	Randy Murbach
Site Address	4010 Macalpine Rd Ellicott City Md
Client Name	AB Chelini, Co. LLC
Client Address	5110 Roanoke Place Suite 104 College Park, Maryland 20740

Geothermal Closed Loop System

Drilling Permit Acquisition – Complete the permit process with the appropriate County and/or City departments to acquire the necessary drilling permit(s). It is the responsibility of the customer to supply the scaled property plat or approved sediment control plan required for this permit process within 5 days of signing the Service Contract.

Project Site Evaluation – One week prior to mobilization to ensure access

Geothermal Well Drilling – Drill (3) 310' wells (930' total bore depth) using a truck-mounted drill rig. Install (3) 1.25" geothermal loops, inclusive of six-inch PVC casing through overburden and up to 80' steel casing per well, closed loops and bentonite grout. Public utility members via Miss Utility will be notified. Private utility mark out will be the responsibility of others. **Private Utilities include but are not limited to Irrigation lines, Domestic water lines, Sewer Lines and feeders, down spout lines, Sump pump lines, Light Fixtures, Auxiliary electric and any other unknowns.**

Exterior Connection – Trenching, ground loop fusion, backfill, penetration of wall foundation for geothermal piping. Construct 1.5" reverse return manifold. All trenches to be compacted with excavator and put back to rough grade.

Interior Connection – HDPE pipe Fusion, Neat piping, Construct interior manifold, PT ports and install ball valves for isolating, Insulate pipe with Armaflex insulation. Flush with 80/20. Water/ethanol mix

Pressure Test – Pressure test of all HDPE piping with a documented statement and an as built drawing

Water & Sediment Control - No wastewater will be removed from site. Erosion and sediment control measures may include but are not limited to silt fencing, straw bales and silt filter bags. If other measures are needed for water containment during drilling process, a change order will be applied.

Conditions - All work will take place during normal business hours of 8:00AM – 5:00PM. Work will commence within ten business days of receiving the required drilling permit(s).

Parts & Labor Warranty - All workmanship is guaranteed for five (5) years from the date of installation.

If you would like to discuss items in this quote, or if you need any additional information, please call me personally at 240 446 4063

Thank you for giving us the opportunity to bid for your business!

Sincerely,
Wesley Wolfe

Standard Terms and Conditions

1. **Scope of Work** – This includes only the materials and services specifically stated in the Service Estimate. Items that will be assumed to be by homeowners or another contractor/consultant hired by homeowners unless specifically stated in the Service Estimate include, but are not limited to, the following:
 - Availability of on-site water for drilling operations
 - Availability of secure staging area for equipment and supplies
 - Site discharge provisions for drilling operations
 - Landscaping, erosion/sediment controls and restoration provisions beyond those listed aboveAny changes to the Scope of Work occurring after acceptance of this Service Agreement shall be agreed upon in writing by both parties to this contract as an addendum to this contract prior to execution of the work.
2. **Site Conditions** – In delivering the Service Estimate and entering thereafter into a contractual arrangement, WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc. assumes no responsibility for existing site conditions and any private utilities, liabilities, costs, claims, suits, expenses, penalties or demands that may result from. In addition, should the scope of services expand or require alternative techniques not stated in our proposal form due to the existing site conditions, WELL DRILLING on behalf of Chesapeake Geosystems, Inc. shall have the right to offer additional pricing or decline to quote accordingly and the CUSTOMER shall have the right to accept or reject such proposals. Where trenching is required, rock excavation and dewatering are not included unless specifically stated as such in the Service Estimate. WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc., will properly notify public utility members for location of underground utilities in public right-of-ways. All location of utilities on private property will be by homeowners or another contractor/consultant hired by homeowners, WELL DRILLING SOLUTIONS ON behalf of Chesapeake Geosystems, Inc., will bear no responsibility for damage or costs associated with such utilities on private property unless they are clearly marked by homeowners or another contractor/consultant hired by homeowners.
3. **Health and Safety** – WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc. will strive to execute its work in compliance with all laws, orders, rules and regulations with respect to health and safety. Site specific Health & Safety Plans, if required, shall be provided by homeowners or another contractor/consultant hired by homeowners. Unless stated otherwise in the Service Estimate, it is assumed that all work is to be performed in Level D protection. Level upgrades will require additional compensation.
4. **Hazardous Materials** – Prior to commencing work, WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc. management personnel shall be informed of all known wastes or hazardous materials to be encountered on site in the execution of the work covered by this contract. All waste handling, disposal and transportation costs shall be “by others”. In addition, any air monitoring for hazardous substances shall be by homeowners or another contractor/consultant hired by homeowners.
5. **Insurance** – WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc. OR SUBCONTRACTOR ON SITE will maintain General Liability, Automobile Liability, Excess Liability and Worker’s Compensation and Employer’s Liability coverage and at the limits shown on its standard Certificate of Insurance (available upon request) during the term of this contract. Broader coverage (i.e.: Pollution Liability) and higher limits will be quoted on request. Unless specifically stated otherwise, nothing in this contract shall constitute a waiver of the right to subrogation.
6. **Liability/Indemnification** – WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc. shall indemnify and hold harmless the Customer from and against any and all liabilities arising from negligence by WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc.’s employees in the performance of this contract. The Customer shall indemnify and hold harmless WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc. and its agents and employees from and against any and all liabilities arising from negligence by their Customer, including the Customer’s family, guests, and other occupants, and any other contractors and their agent and employees working on the site in connection with this contract.
7. **Quality** – WELL DRILLING SOLUTIONS on behalf of Chesapeake Geosystems, Inc. agrees to perform all work and furnish all materials in conformance with the contract documents and generally accepted industry practices/standards.