

<b>C1</b> <span style="font-size: 24pt; font-weight: bold;">48239</span> <small>(THIS NUMBER IS TO BE PUNCHED IN COLS. 3-6 ON ALL CARDS)</small>	SEQUENCE NO. (MDE USE ONLY)	<b>STATE OF MARYLAND</b> <b>WELL COMPLETION REPORT</b> FILL IN THIS FORM COMPLETELY PLEASE TYPE	THIS REPORT MUST BE SUBMITTED WITHIN 45 DAYS AFTER WELL IS COMPLETED.  COUNTY NUMBER <span style="font-size: 24pt;">13</span>
ST/CO USE ONLY DATE Received <span style="font-size: 18pt;">12/11/17</span>	DATE WELL COMPLETED <span style="font-size: 18pt;">10/10/2016</span>	Depth of Well <span style="font-size: 24pt;">480</span> <small>(TO NEAREST FOOT)</small>	PERMIT NO. FROM "PERMIT TO DRILL WELL" <span style="font-size: 24pt;">OK</span> <span style="font-size: 18pt;">12/26/17 SC</span> <span style="font-size: 24pt;">HO-15-0299</span>
OWNER <span style="font-size: 18pt;">Phillips Mathew</span> WELL SITE ADDRESS <span style="font-size: 18pt;">3677 Reservoir Road</span> SUBDIVISION _____		TOWN <span style="font-size: 18pt;">Fulton, MD</span> SECTION <span style="font-size: 18pt;">21</span> LOT <span style="font-size: 18pt;">3</span>	COUNTY NUMBER <span style="font-size: 24pt;">13</span>

<b>WELL LOG</b> Not required for driven wells  STATE THE KIND OF FORMATIONS PENETRATED, THEIR COLOR, DEPTH, THICKNESS AND IF WATER BEARING	<b>GROUTING RECORD</b> WELL HAS BEEN GROUTED (Circle Appropriate Box) TYPE OF GROUTING MATERIAL (Circle one) CEMENT <span style="font-size: 18pt;">CM</span> BENTONITE CLAY <span style="font-size: 18pt;">BC</span> NO. OF BAGS <span style="font-size: 18pt;">24</span> NO. OF POUNDS <span style="font-size: 18pt;">7,200</span> GALLONS OF WATER <span style="font-size: 18pt;">600</span> DEPTH OF GROUT SEAL (to nearest foot) from <span style="font-size: 18pt;">3</span> ft. to <span style="font-size: 18pt;">480</span> ft. <small>(enter 0 if from surface)</small>																																																																																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">DESCRIPTION (Use additional sheets if needed)</th> <th colspan="2">FEET</th> <th rowspan="2">check if water bearing</th> </tr> <tr> <th>FROM</th> <th>TO</th> </tr> </thead> <tbody> <tr> <td>Silty sand, trace of mica, dry medium stiff</td> <td>0</td> <td>20</td> <td></td> </tr> <tr> <td>Weathered Rock Brown, gray medium hard</td> <td>20</td> <td>45</td> <td></td> </tr> <tr> <td>Rock hard gray</td> <td>45</td> <td>480</td> <td>✓</td> </tr> <tr> <td>Water @ 380' 2gpm</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Installed 1.25" Closed loop geothermal</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	DESCRIPTION (Use additional sheets if needed)	FEET		check if water bearing	FROM	TO	Silty sand, trace of mica, dry medium stiff	0	20		Weathered Rock Brown, gray medium hard	20	45		Rock hard gray	45	480	✓	Water @ 380' 2gpm				Installed 1.25" Closed loop geothermal				<b>CASING RECORD</b> casing types insert appropriate code below <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><b>ST</b> STEEL</td> <td style="text-align: center;"><b>CO</b> CONCRETE</td> </tr> <tr> <td style="text-align: center;"><b>PL</b> PLASTIC</td> <td style="text-align: center;"><b>OT</b> OTHER</td> </tr> </table> MAIN CASING TYPE _____ Nominal diameter top (main) casing (nearest inch) _____ Total depth of main casing (nearest foot) _____ 60 61 63 64 66 70	<b>ST</b> STEEL	<b>CO</b> CONCRETE	<b>PL</b> PLASTIC	<b>OT</b> OTHER																																																																						
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NUMBER OF UNSUCCESSFUL WELLS: <span style="font-size: 18pt;">0</span>	<b>OTHER CASING (if used)</b> diameter inch _____ depth (feet) from _____ to _____ EACH CASING _____																																																																																																				
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CIRCLE APPROPRIATE LETTER <b>A</b> A WELL WAS ABANDONED AND SEALED WHEN THIS WELL WAS COMPLETED <b>E</b> ELECTRIC LOG OBTAINED <b>P</b> 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.	<b>DEPTH (nearest ft.)</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td> </tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100		
DRILLERS LIC. NO. <span style="font-size: 18pt;">MWD 567</span> DRILLERS SIGNATURE <span style="font-size: 18pt;">[Signature]</span> <small>(MUST MATCH SIGNATURE ON APPLICATION)</small>  LIC. NO. <span style="font-size: 18pt;">D</span>	<b>DIAMETER OF SCREEN</b> 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 from _____ to _____																																																																																																				
SITE SUPERVISOR (sign. of driller or journeyman responsible for sitework if different from permittee)	<b>MDE USE ONLY (NOT TO BE FILLED IN BY DRILLER)</b> T _____ (E.R.O.S.) W Q _____  TELESCOPE CASING _____ LOG INDICATOR _____ OTHER DATA _____																																																																																																				

<b>PUMPING TEST</b> HOURS PUMPED (nearest hour) <span style="font-size: 18pt;">N/A</span> PUMPING RATE (gal. per min.) <span style="font-size: 18pt;">N/A</span> METHOD USED TO MEASURE PUMPING RATE <span style="font-size: 18pt;">N/A</span> WATER LEVEL (distance from land surface) BEFORE PUMPING <span style="font-size: 18pt;">200</span> ft. WHEN PUMPING <span style="font-size: 18pt;">N/A</span> ft. TYPE OF PUMP USED (for test) <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><b>A</b> air</td> <td style="text-align: center;"><b>P</b> piston</td> <td style="text-align: center;"><b>T</b> turbine</td> </tr> <tr> <td style="text-align: center;"><b>C</b> centrifugal</td> <td style="text-align: center;"><b>R</b> rotary</td> <td style="text-align: center;"><b>O</b> other (describe below)</td> </tr> <tr> <td style="text-align: center;"><b>J</b> jet</td> <td style="text-align: center;"><b>S</b> submersible</td> <td></td> </tr> </table>	<b>A</b> air	<b>P</b> piston	<b>T</b> turbine	<b>C</b> centrifugal	<b>R</b> rotary	<b>O</b> other (describe below)	<b>J</b> jet	<b>S</b> submersible		<b>PUMP INSTALLED</b> DRILLER INSTALLED PUMP (CIRCLE) (YES OR NO) YES <span style="font-size: 18pt;">NO</span> 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. <span style="font-size: 18pt;">29</span> CAPACITY: GALLONS PER MINUTE (to nearest gallon) <span style="font-size: 18pt;">31</span> <span style="font-size: 18pt;">36</span> PUMP HORSE POWER <span style="font-size: 18pt;">37</span> <span style="font-size: 18pt;">41</span> PUMP COLUMN LENGTH (nearest ft.) <span style="font-size: 18pt;">43</span> <span style="font-size: 18pt;">47</span> CASING HEIGHT (circle appropriate box and enter casing height) + above } LAND SURFACE - below } <span style="font-size: 18pt;">3</span> (nearest foot) 50 51
<b>A</b> air	<b>P</b> piston	<b>T</b> turbine								
<b>C</b> centrifugal	<b>R</b> rotary	<b>O</b> other (describe below)								
<b>J</b> jet	<b>S</b> submersible									
LATITUDE <span style="font-size: 18pt;">39.133814</span> LONGITUDE <span style="font-size: 18pt;">76.949627</span> (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.										

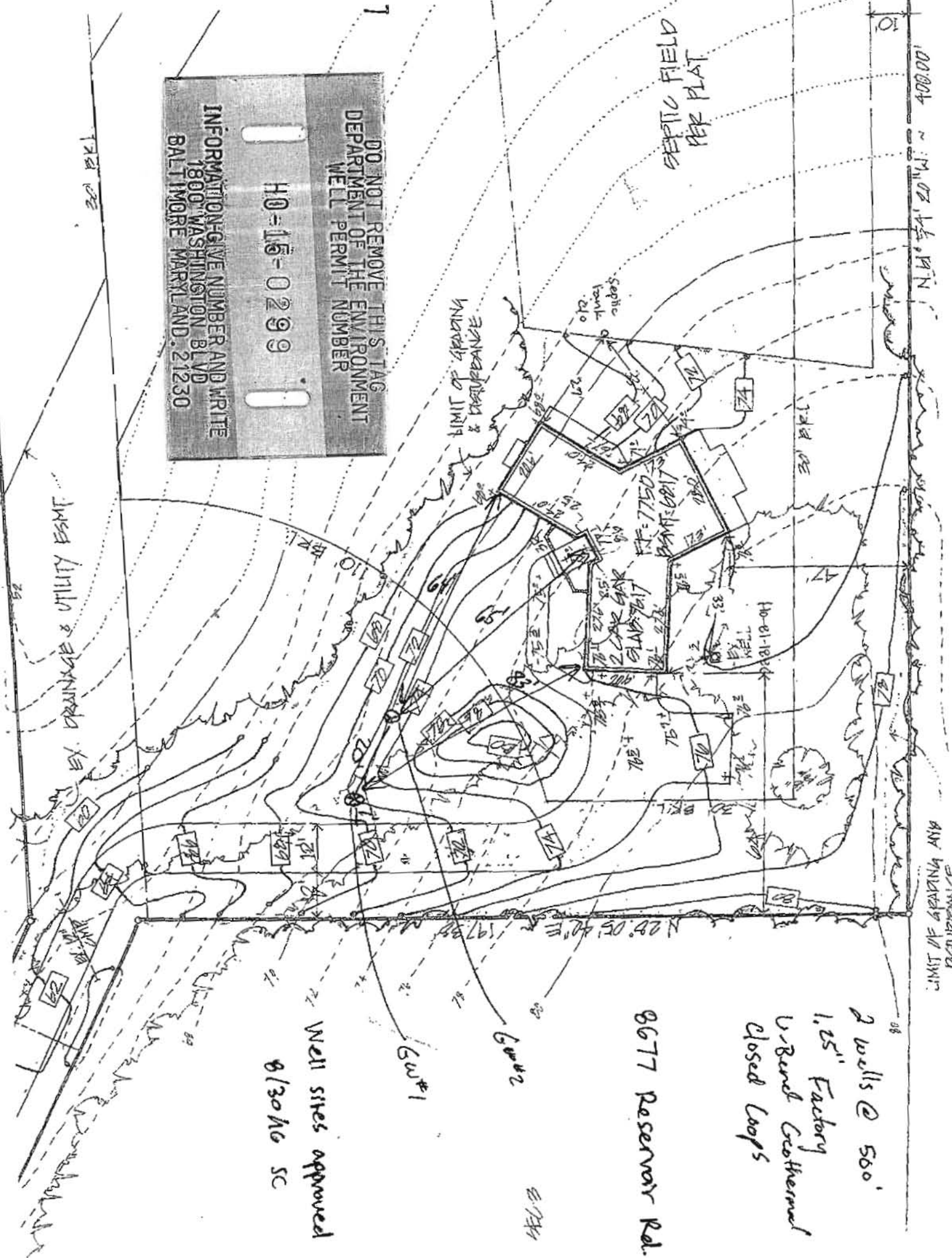
LIMIT OF GRADING ANY  
DISTANCE

2 wells @ 560'  
1.25" Factory  
U-Bend Geothermal  
closed loops

8677 Reservoir Rd.

HO-16-0299

INFORMATION-GIVE NUMBER AND WRITE  
1800 WASHINGTON BLVD  
BALTIMORE MARYLAND 21230



# WELL SCHEMATIC FORM

GROUND SURFACE

PERMANENT  
OUTER  
CASING

CONFINING UNIT

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

DIAMETER OF TUBES

MATERIAL

SHAPE AND LENGTH

TUBE CONNECTION METHOD

TUBE CONNECTION MATERIAL

LOOP PIPE CASING (regular, single loop)

MATERIAL HDPE?

DIAMETER

LENGTH

GROUT

MATERIAL

PERMEABILITY

WATER / GROUT RATIO

PERCENT SOLIDS

TREMI GROUTED FROM  
BOTTOM OF BOREHOLE?

USING A POSITIVE  
DISPLACEMENT PUMP?

DEPTH TO THE BOTTOM OF  
HOLE

DIAMETER OF BOREHOLE

YES ☒ NO ☐

1.25"  
500

Bentonite

24 / 50

YES ☒ NO ☐

YES ☒ NO ☐

500

6"

WELL ADDRESS 8677

Reservoir Rd  
Fulton Md

LOT NUMBER:

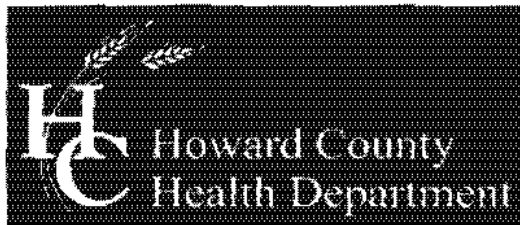
SQUARE NUMBER:

WELL OWNER:

Julie Phillips

OWNER ADDRESS:

8677 Reservoir  
Rd Fulton Md



**Bureau of Environmental Health**

8930 Stanford Blvd, Columbia, MD 21045  
Main: 410-313-2640 | Fax: 410-313-2648  
TDD 410-313-2323 | Toll Free 1-866-313-6300  
[www.hchealth.org](http://www.hchealth.org)

Maura J. Rossman, M.D., Health Officer

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***MEMORANDUM***

DATE: August 30, 2016

TO: Chesapeake Geosystems, Inc.  
Jeff Corron (MWD 567)

FROM: Sarah Collins, L.E.H.S. SEC  
Howard County Health Department

RE: 8677 Reservoir Road geothermal wells

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The proposed geothermal wells at 8677 Reservoir Road are in close proximity to a stream that feeds into the Patuxent River. Drill cuttings must be contained on site and any discharge to the stream may require a discharge permit from Maryland Department of the Environment (MDE).

Chesapeake Geosystems, Inc. must notify the Health Department of the date(s) of drilling. A representative from MDE Compliance Program may be on site to confirm that drill cuttings are contained.

Cc: Punam Tyagi, MDE Compliance Program  
John Boris, MDE Geologist Program Consultant  
File



<b>B 1</b> <div style="font-size: 24pt; font-weight: bold; margin-top: 10px;">43390</div>	SEQUENCE NO. (MDE USE ONLY) <div style="font-size: 24pt; font-weight: bold; margin-top: 10px;">43390</div>	<b>STATE OF MARYLAND</b> <b>APPLICATION FOR PERMIT TO DRILL WELL</b> please type <div style="font-size: 24pt; font-weight: bold; margin-top: 10px;">558839</div>	STATE PERMIT NUMBER <div style="font-size: 24pt; font-weight: bold; margin-top: 10px;">HO-15-0299</div>
<b>OWNER INFORMATION</b> Date Received (APA) <u>08/24/16</u> 8 MM DD YY 13 <u>Phillips Matthew</u> 15 Last Name Owner First Name 34 <u>8677 Reservoir Road</u> 36 Street or RFD 55 <u>Fulton Maryland 20759</u> 57 Town 70 State 72 Zip 76		<b>B 3 LOCATION OF WELL</b> <u>Howard County</u> 8 COUNTY 21 23 SUBDIVISION 42 SECTION <u>44</u> 46 LOT <u>3</u> 48 50 <u>Fulton</u> 52 NEAREST TOWN 71	
<b>DRILLER INFORMATION</b> <u>Jeff Corron</u> <u>M-WD 5167</u> Driller's Name 76 License No. 81 <u>Chesapeake Geosystems Inc.</u> Firm Name <u>6720 Fort Smallwood Rd Balt.</u> Address <u>Jeff Corron</u> <u>8/18/16</u> Signature Date		<b>B 4 SOURCES OF DRILLING WATER</b> 1. <u>municipal</u> 2. 3. <div style="margin-top: 20px;"> <u>8677 Reservoir Rd</u>          11 STREET ADDRESS 30          ON WHICH SIDE OF ROAD          (CIRCLE APPROPRIATE BOX)  <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">             NORTH N WEST W SOUTH S EAST E           </div> <div style="text-align: center;">             34 <u>480</u> 37              DISTANCE FROM ROAD              ENTER FT OR MI 38 39           </div> </div>         TAX MAP: <u>45</u> BLK: <u>17</u> PARCEL <u>7</u> </div>	
<b>B 2 WELL INFORMATION</b> APPROX. PUMPING RATE (GAL. PER MIN.) <u>N/A</u> 8 12 AVERAGE DAILY QUANTITY NEEDED (GAL. PER DAY) <u>N/A</u> 14 20		<b>NOT TO BE FILLED IN BY DRILLER HEALTH DEPARTMENT APPROVAL</b> <u>Howard</u> (13) COUNTY NAME COUNTY NO. STATE SIGNATURE INSERT S → DATE ISSUED <u>8/30/16</u> 43 MM DD YY 48 <u>Sah Cull</u> <u>8/30/17</u> CO SIGNATURE EXP. DATE DON: <u>9/30/16</u> (KW) DOG: <u>9/30/16</u> (KW)	
<b>USE FOR WATER (CIRCLE APPROPRIATE BOX)</b> <input type="checkbox"/> DOMESTIC POTABLE SUPPLY & RESIDENTIAL IRRIGATION <input type="checkbox"/> FARMING (LIVESTOCK WATERING & AGRICULTURAL IRRIGATION) <input checked="" type="checkbox"/> INDUSTRIAL, COMMERCIAL, DEWATERING <input type="checkbox"/> PUBLIC WATER SUPPLY WELL <input type="checkbox"/> TEST, OBSERVATION, MONITORING <input type="checkbox"/> OPEN LOOP GEOTHERMAL <input checked="" type="checkbox"/> CLOSED LOOP GEOTHERMAL <div style="margin-top: 10px; font-size: 18pt;">2 bores</div>		<b>PROPOSED LOCATION OF WELL ON LOT</b> SHOW PERMANENT STRUCTURES SUCH AS BUILDINGS, SEPTIC SYSTEM, ROADS AND/OR LANDMARKS AND INDICATE NOT LESS THAN TWO DISTANCE MEASUREMENTS TO WELL <div style="margin-top: 20px;"> </div>	
APPROXIMATE DEPTH OF WELL <u>500</u> FEET 24 28 APPROXIMATE DIAMETER OF WELL <u>6</u> INCH 30 37		<b>METHOD OF DRILLING (circle one)</b> BORED (or Augered) JETTED Jetted & DRIVEN 30 AIR-ROTARY AIR-PERCussion ROTARY (Hydraulic Rotary) 37 CABLE REVerse-ROTary Drive-POINT other	
<b>REPLACEMENT OR DEEPEINED WELLS</b> (CIRCLE APPROPRIATE BOX) <input checked="" type="checkbox"/> THIS WELL WILL NOT REPLACE AN EXISTING WELL <input type="checkbox"/> THIS WELL WILL REPLACE A WELL THAT WILL BE ABANDONED AND SEALED <input type="checkbox"/> THIS WELL WILL REPLACE A WELL THAT WILL BE USED AS A STANDBY-CONTACT LOCAL APPROVING AUTHORITY FOR POLICY ON STANDBY WELLS <input type="checkbox"/> THIS WELL WILL DEEPEIN AN EXISTING WELL PERMIT NUMBER OF WELL TO BE REPLACED OR DEEPEINED (IF AVAILABLE) 41 52		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>Not to be filled in by driller (MDE OR COUNTY USE ONLY)</b> APPROP. PERMIT NUMBER <u>G</u> PERMIT No. <u>HO-15-0299</u> 70 71 72 73 74 75 76 77 78 79			
<b>SPECIAL CONDITIONS</b> NOTE: APPROVING AUTHORITIES SHOULD USE SEPARATE SHEET IF NEEDED. <div style="margin-top: 10px; font-size: 18pt;">See attached memo.</div> <div style="margin-top: 10px; font-size: 24pt; font-weight: bold;">39.133814 - 76.949627</div>			