

D.C. WELL CONSTRUCTION APPLICATION FORM

DO NOT USE FOR
GEOTHERMAL WELLS

Please Fill Out As Thoroughly As Possible. Asterisks indicate where additional information is needed in the Comments Section. Attach site plan, well application schematic form, additional comments and details.

Well (hole) Owner – Property Owner:

Name(s) _____

Mailing Address _____ City, St., Zip _____

Phone (_____) _____ Email _____

Driller/Company Responsible for Drilling/Installing the Well: DCRA Business License No. _____

NAME(s) _____ License State & No. _____

Mailing Address _____ City, St., Zip _____

Phone (_____) _____ Email _____

General Well Information: Intended Well Use _____

Type of Well (circle all applicable): Monitoring/Geotechnical/Dewatering/Injection/Supply/Other*

Number of Wells _____

Are wells required as part of a regulatory action? Yes No

If Yes, identify the regulatory agency and division _____

Well Information:

Well Physical Address _____ City, St., Zip _____

Lot _____ Square _____ Topography (circle one): hilltop, flat, slope, valley, stream channel, local depression

Geology (circle one): unconsolidated/consolidated Aquifer penetrated (circle one): single/multiple
Geologic Formation (if known) _____ Aquifer name(s) (if known) _____

Drilling Method: (circle all applicable): Hollow-Stem Auger/Mud rotary/Air rotary/Sonic/Geoprobe/Other*

Will drilling fluids/muds include additives other than potable water? Yes No If yes, provide details and attach manufacturer's specifications and Materials Safety Data Sheet

Is the site potentially or known-to-be contaminated? Yes No If yes, attach details
Will Investigation Derived Waste be containerized, laboratory tested and taken offsite for proper disposal?
Yes No If no, attach disposal details. Will permanent outer casing be used to prevent aquifer cross contamination where known or suspected contamination exists? Yes No If yes or no, attach details

Will the following be placed in well?(circle all applicable): downhole pumps/liners/monitoring equipment/other*

Please attach details about well development and any other relevant information.

*Comments (add an additional sheet if necessary):

I declare that the information provided is accurate, true and complete to the best of my knowledge and belief. I agree to comply with all applicable laws and regulations of the District of Columbia.

Name (print) _____ Signature _____ Date _____

Owner

Agent for owner

Well Driller Performing Work

DDOE WELL CONSTRUCTION APPLICATION PROCESS AND WELL CONSTRUCTION REQUIREMENTS

Well¹ regulation is necessary, as a well provides a direct pathway from the surface to groundwater resources. These pathways may allow pollutants to be transferred from the ground surface, or contaminated soils or aquifers to deeper, uncontaminated resources. To protect groundwater for its beneficial uses and prevent the spread of pollution, well permits are reviewed by the District Department of the Environment as required by D.C. Law § 8-103.13a *et seq.* The following information pertains to all wells except geothermal wells.

DDOE Well Construction Application Process

For DDOE review of a well construction permit, the following documents must be completed:

- A Department of Consumer and Regulatory Affairs (DCRA) Building Permit Application obtained from DCRA and found at:
<http://www.dcrd.dc.gov/DC/DCRA/Permits/Get+a+Permit/Download+Complete+Building+Permit+Application+Package/Building+Permit+Application>
- DDOE Building Permit Application Supplemental Form - Environmental Questionnaire found at:
http://ddoe.dc.gov/ddoe/cwp/view,a,1209,q,494812,ddoeNav_GID,1486,ddoeNav_|31375|31377|.asp
- Well Construction Workplan
 - D.C. Well Construction Application Form (attached)
 - D.C. Well Application Schematic Form (attached). If applicable, use schematic for Geotechnical/Geophysical Boring (attached)
 - Site Plan

Well Construction Workplan Requirements

A Well Construction Workplan provides information for technical review and recording keeping purposes. The workplan should include the following:

- The name, address and contact information of the property owner
- The name, address, telephone number, and DC business license number of the well driller and a current copy of the well driller's state certification

¹According to Section 8-103.01 of the D.C. Water Pollution Control Act, a well is defined as: any test hole, shaft, or soil excavation created by any means including, but not limited to, drilling, coring, boring, washing, driving, digging, or jetting, for purposes including, but not limited to, locating, testing, diverting, artificially recharging, or withdrawing fluids, or for the purpose of underground injection.

- Intended well use, e.g., monitoring, geothermal, dewatering, soil gas, geotechnical, etc.
- Site topography and geologic information (if known)
- The proposed well construction methods including drilling methods and procedures, and drilling fluids to be used
- A description of the proposed well construction activity, well construction materials and equipment to be used, plans for handling, testing, and disposing of investigation-derived waste and any other information specific to the proposed well construction activity
- A description of any equipment or materials that shall or may be placed in the well such as, pumps, pipes, loops or liners, or any operations that may impact water quantity or quality
- Details of any contamination on the site (attach any relevant reports)
- Details of steps that will be taken to prevent any cross-contamination between boreholes, if applicable
- Details of steps that will be taken to prevent cross-contamination between groundwater aquifers, if applicable
- A well design diagram or schematic detailing how the well will be constructed (use DDOE Well Application Schematic Form)
- A site map, figure, plat, or plan depicting the geographical location of the well within the property boundaries and any setback distances from contamination sources. The site map, figure, plat, or plan shall contain compass directions, a scale bar, and a key or legend. (No hand drawn figures or handwritten notes on figures will be accepted.)
- Well construction schedule to allow DDOE inspectors to be onsite during activities
- Any other relevant details

General Requirements for Well Construction

The following general requirements should be noted in designing the workplan:

A well shall be grouted as soon as possible but not later than twenty four (24) hours after the well casing has been set in place unless otherwise permitted in writing from DDOE WQD. If construction activities halt before the well is grouted, the open annular space shall be covered and protected from contamination from any source, including surface water drainage, and the well casing capped.

All investigation-derived wastes due to well construction, operation, maintenance or abandonment from sites known to be contaminated or potentially contaminated shall be containerized and tested for appropriate disposal.

Discharges of any liquids or investigation-derived wastes generated during well construction, operation or maintenance, including but not limited to decontamination water, well development water, purge water, dewatering effluent, drilling fluids or mud slurries are not allowed into a stormwater sewer or surface water body without obtaining prior written approval from the

Department and any necessary District and federal government permits. Permits and approvals must be secured prior to beginning well construction.

Disturbed soils should not be used as backfill or place disturbed soils on the ground if contamination may leach from the soils into ground water or if soil analytical testing show that the chemical concentrations exceed the Department's soil quality standards. Soils that may leach contamination into ground water or do not meet the soil quality standards of the Department shall be removed from the site to an appropriate US Environmental Protection Agency-approved disposal facility.

Well drilling muds should not be mixed with additives that contain hazardous substances or oils. Water should be obtained from a potable water source.

Plastic well casing shall be made of polyvinylchloride (PVC) material with Standard Dimension Ratio (the ratio of the outside diameter to the casing wall thickness) of twenty-one (21) or higher.

The maximum depth limits for plastic well casings with Standard Dimension Ratio of twenty-one (21) shall be one hundred fifty (150) feet.

Steel casing shall be used for a well constructed in crystalline rocks, unless prior written approval is granted by the Department. Steel well casing with diameter up to and including a nominal size of six (6) inches shall be at least Schedule 40. For a well larger than six (6) inches in diameter the minimum wall thickness of the casing is 0.280 inches unless prior written approval is granted by the Department.

For a permanent well, the well annulus shall extend at least 1.5 inches from the well casing to the borehole wall. Well casing shall consist of new, undamaged pipe material meeting appropriate ASTM standards for the intended well use. Casing lengths shall be threaded together, not glued. Bentonite cement grout (60:40) shall be used to fill the annular space between the well casing and the borehole wall to the top of a low permeability seal. The low permeability seal shall extend down to the top of the well filter pack and be comprised of at least two (2) feet of bentonite slurry or fully hydrated medium-sized bentonite chips. Only clean, organic-free sand shall be used for a filter pack. The filter pack shall extend two to three feet above the well screen. Only machine-manufactured well screens shall be used. The screens shall be strong enough to meet the intended well use and securely attached to the well casing. The screen slot size shall be selected to inhibit fines from entering the well screen. A fitting shall be provided to close the bottom of the well screen and to cap, plug or otherwise close the bottom of the well.

A locking, waterproof well cap shall be inserted on top of the casing and used to prevent liquids and gases from entering or escaping the well. The cap shall be installed and tightened according to the manufacturer's instructions to ensure a tight fitting seal. An expansion cap shall be checked for stripping, wear or damage each time the well is accessed and shall be replaced if faulty.

The top of a well shall be protected from damage, infiltration of surface water or entry of pollutants or vermin. A well head shall not be flush mounted in low lying areas prone to flooding. Flush mounted wells shall have a cast iron, watertight manhole cover and be encased in a cement pad (2 ft x 2 ft) domed or sloped to promote drainage away from the manhole cover. The top of the casing shall extend approximately six (6) inches above the top of the soil removed around the borehole and no more than six (6) inches below the top of the manhole cover. The top of the casing and the well cap shall be surrounded by a steel vault reaching the top of the concrete pad and embedded at least one (1) foot into the ground. The steel vault shall terminate three (3) inches above the top of the bentonite cement grout surrounding the well casing. Stickups shall have protective steel casing with a locking cover.

Temporary wells shall be abandoned within 30 days of being constructed, unless otherwise authorized in writing by DDOE WQD.

Wells (including borings) shall be constructed, maintained, operated and abandoned in a manner to prevent contamination of ground water resources and cross-contamination of ground water aquifers. If contamination is known or suspected to be present, permanent outer casing shall be used, such that the casing shall extend ten (10) feet into the top of the confining unit in unconsolidated sediments or to the top of bedrock, if bedrock is encountered first. Casing material shall be selected based upon on the type of contamination (organic vs. inorganic) and contaminant concentrations.

Screening of more than one aquifer shall not be allowed. A well which derives water from an unconsolidated aquifer shall be equipped with a well screen that shall limit the entrance of sediment material into the well following well development.

Except for consolidated formations, a low permeability seal comprised of bentonite slurry or fully hydrated, medium-sized bentonite chips that is at least two (2) feet thick shall be placed above the well filter pack. The bentonite layer shall be followed by fully hydrated grout comprised of a bentonite or a sodium bentonite-cement mixture (60:40) to the appropriate height to prevent surface water from infiltrating the well.

Grouting materials shall consist of the following:

- Cement - Only cement grout is to be used in consolidated formations:
 - The annular space may be filled with neat Portland or quick setting (hi-early) cement in a ratio of not over six (6) gallons of water per ninety-four (94) pound sack of cement or as otherwise authorized by the Department following a written request and justification;
 - Sodium-based bentonite clay may be added to the cement grout in an amount not to exceed five (5) pounds per ninety-four (94) pound sack of cement; and
 - When adding bentonite clay to Portland cement grout, additional water shall be allowed at a rate of one (1) to two (2) gallons of water to one (1) pound of bentonite; or

- Bentonite clay – Sodium-based bentonite clay may be used to fill the annular space in both the confined and unconfined unconsolidated sand and gravel aquifers. Where sodium-based bentonite clay is being used in this manner:
 - The clay shall be used in a ratio of at least two (2) pounds of sodium-based bentonite per one (1) gallon of water to create a low permeability seal or according to the manufacturer’s specifications; and
 - Bentonite clay shall not be used where it comes in contact with groundwater with a pH below five (5.0) or having a total dissolved solids content greater than one thousand (1,000) milligrams per liter (mg/L), or according to the manufacturer’s specifications.

DDOE Well Completion Reporting

Within 60 days of installation, the well owner or duly designated agent shall submit the attached Well Completion Form, along with any additional information asked for on the form to: DDOE WQD, Ground Water Protection Program, 1200 First Street NE, 5th Floor, Washington, DC 20002

- D.C. Well Construction Completion Form (Attach boring logs, site plan, Well Completion Schematic Form and any additional comments)

DDOE Well Abandonment Workplan

To abandon a well (including a borehole) in the District, submit a well abandonment workplan to DDOE WQD for approval. If a well is to be abandoned within 30 days of its construction, abandonment details may be included as a section in the Well Construction Application Workplan or submitted separately for DDOE review and approval. This workplan should include:

- The name, address and contact information of the property owner
- Location of the well (provide address and show location on a site plan)
- Well permit number (if known)
- Date well was installed (if known)
- Type of well and well use
- Number of wells being abandoned
- Well identification number
- Reason why the well is being abandoned
- Details of an investigation of the well to ensure that no obstructions exist that will interfere with the filling and sealing process.
- Steps to check that any obstructions such as pumps, lines, monitoring equipment and appurtenant structures, including terminal structures and any well casing are removed. If

removal of the well casing is not possible, the casing should be ripped or perforated to ensure that the well casing and annular space or voids are filled with sealing or filling materials.

- A description of how any waste materials from the abandoned well or wastes generated during well abandonment will be collected and disposed of in accordance with Federal and District laws and regulations.
- Details of the grouting procedure. The well should be tremie-grouted in one continuous operation using a bentonite slurry mix (at least 2 pounds bentonite powder to 1 gallon of water) from the bottom of the well upward. Note the following requirements:
 - A well in an unconsolidated formation without nearby known or suspected contamination, penetrating an unconfined aquifer shall be abandoned by placing sealing material from the bottom of the well to at least two feet below ground surface. Suitable materials shall be used to create a final, neat cover similar to that of the surrounding area.
 - A well in a consolidated formation shall be filled by placing gravel in the water producing zones, and cement bentonite grout in the non-producing zones to at least two feet of the ground surface. Suitable materials shall be used to create a final, neat cover similar to that of the surrounding area. A suitable packer shall be placed between the gravel and the sealing material.
 - A well penetrating a confined and multiple aquifer formation shall be abandoned by placing sealing materials throughout the confining horizon. Sealing material shall be placed in the water producing zone(s), except in a consolidated formation with known or suspected contamination where only gravel fill with suitable packer shall be used.
 - In a multiple aquifer well, the well shall be filled and sealed in such a way that exchange of water from one aquifer to another is prevented and all fluids are permanently confined to the specific strata in which they were first encountered.
- Procedures of how the well abandonment will be completed at ground surface. Note: The use of coal tar pavement products is banned in the District of Columbia.
- Well abandonment schedule to allow DDOE inspectors to be onsite during activities

DDOE Well Abandonment Reporting

A well owner or the duly designated agent shall submit a Well Abandonment Report within 60 days of abandonment to: DDOE WQD, Ground Water Protection Program, 1200 First Street NE, 5th Floor, Washington, DC 20002. The well abandonment report should include:

- The D.C. Well Abandonment Form (see attachment)
- A table providing details of the wells being abandoned at the site and any remaining wells (see attachment)
- A site map drawn to scale with a compass rose, property lines, building footprints and the nearest street intersection showing the locations of all on-site wells including those that were abandoned
- Photographs showing the abandonment procedure and

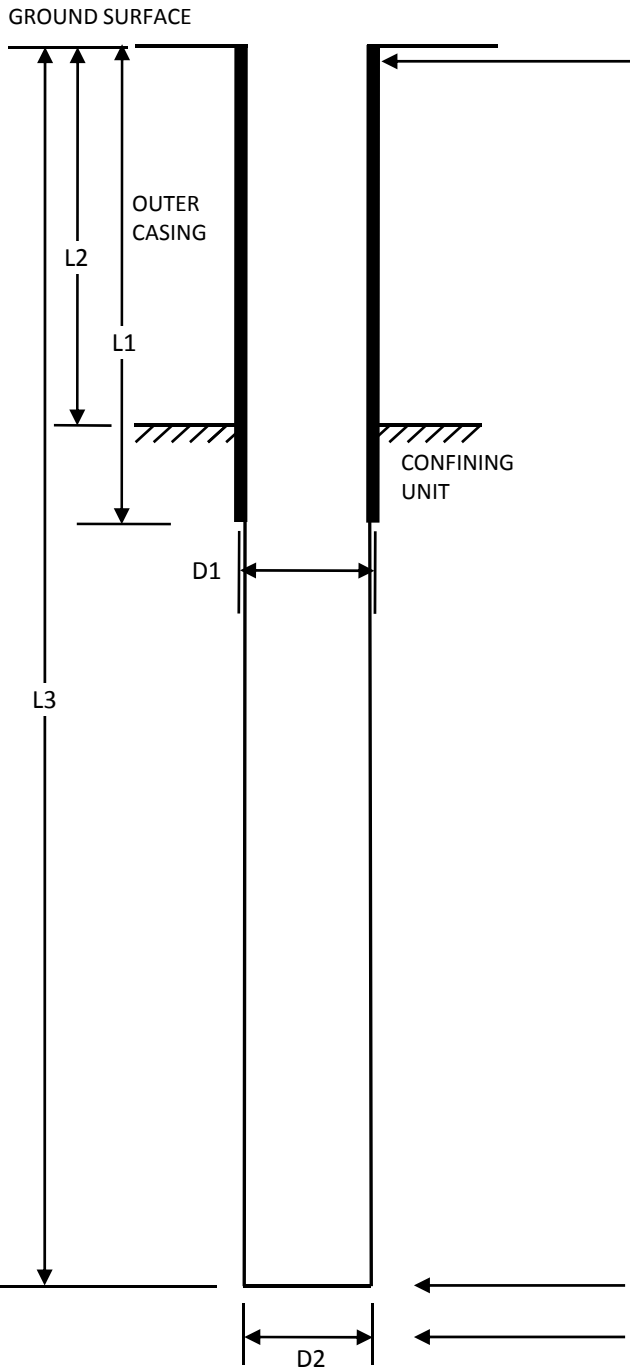
D.C. WELL PERMITTING PROCESS AND CONSTRUCTION REQUIREMENTS

- Any additional comments

DDOE WELL APPLICATION SCHEMATIC

Geotechnical / Geophysical Boring Confining Unit

Check one: Application As-Built



OUTER CASING (USE IF AREA IS CONTAMINATED)

MATERIAL

DIAMETER (D1) (inches)

LENGTH (L1) (feet)

DEPTH TO TOP OF CONFINING UNIT (L2) (feet)

WILL WELL BE OPEN MORE THAN 24 CONSECUTIVE HOURS?

YES* NO

If yes, how will open annular space be covered and protected?

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WILL WELL BE ABANDONDED ACCORDING TO WELL ABANDONMENT REQUIREMENTS, SECTION 8 IN DDOE WELL CONSTRUCTION REQUIREMENTS?

YES NO

WHAT TYPE OF GROUT AND GROUT:WATER RATIOS WILL BE USED?

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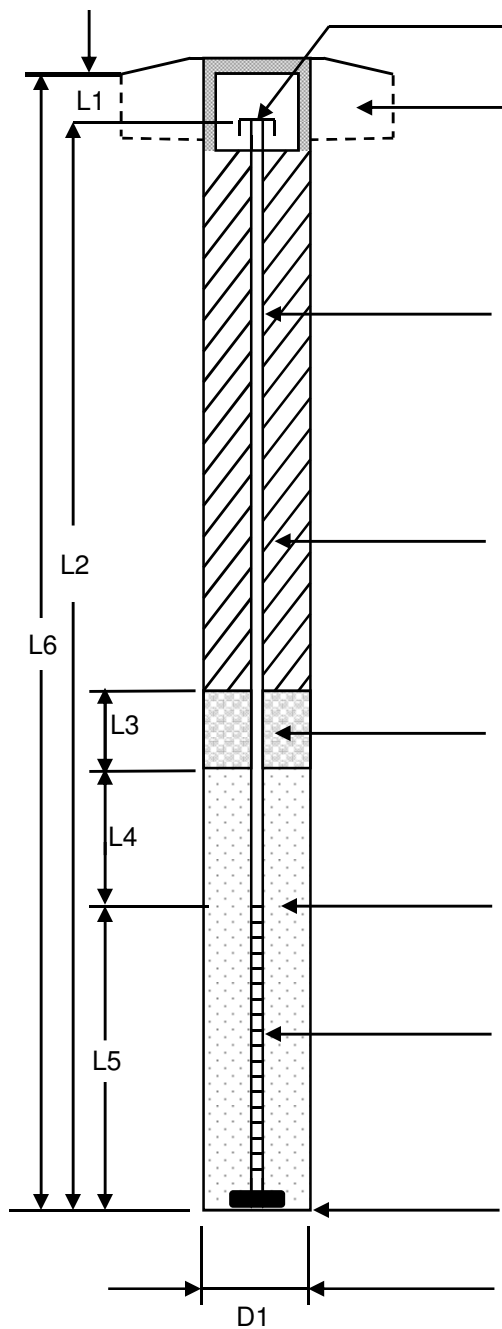
DEPTH TO THE BOTTOM OF HOLE (L3) (feet)

DIAMETER OF BOREHOLE (D2) (inches)

Rev. 05-17-12

WELL ID(S): _____	WELL OWNER: _____
WELL ADDRESS: _____	OWNER ADDRESS: _____
LOT NUMBER: _____	SIGNATURE: _____
SQUARE NUMBER: _____	

D.C. WELL APPLICATION SCHEMATIC FORM



LOCKABLE CAP

PROTECTIVE CASING AND CONCRETE PAD
 TOP OF CASING TO GROUND SURFACE (L1) (inches)
 PAD DIMENSIONS
 HEIGHT ABOVE GROUND

WELL CASING
 MATERIAL
 INTERNAL DIAMETER (inches)
 JOINT TYPE
 LENGTH (L2) (Feet)

GROUT AROUND CASING
 MATERIAL
 MIX RATIO OF SOLIDS
 MIX RATIO SOLIDS:WATER

LOW PERMEABILITY SEAL
 MATERIAL
 HEIGHT ABOVE FILTER PACK (L3) (Feet)

FILTER PACK
 TYPE OF FILTER
 HEIGHT ABOVE SCREEN (L4) (Feet)

WELL SCREEN
 SCREEN MATERIAL
 LENGTH (L5) (Feet)
 SLOT SIZE

DEPTH TO THE BOTTOM OF WELL (L6) (Feet)

DIAMETER OF BOREHOLE (D1) (inches)

WELL ANNULUS (inches)

APPLICATION DATE: _____ WELL ID NUMBER: _____ WELL ADDRESS: _____ _____ LOT NUMBER: _____ SQUARE NUMBER: _____	WELL OWNER: _____ _____ OWNER ADDRESS: _____ _____ _____
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