

Washington State Department of Ecology

Environmental Assessment Program

Standard Operating Procedures for Tagging Wells

Version 1.1

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Please note that the Washington State Department of Ecology's Standard Operating Procedures (SOPs) are adapted from published methods, or developed by in-house technical and administrative experts. Their primary purpose is for internal Ecology use, although sampling and administrative SOPs may have a wider utility. Our SOPs do not supplant official published methods. Distribution of these SOPs does not constitute an endorsement of a particular procedure or method.

Any reference to specific equipment, manufacturer, or supplies is for descriptive purposes only and does not constitute an endorsement of a particular product or service by the author or by the Department of Ecology.

Although Ecology follows the SOP in most instances, there may be instances in which Ecology uses an alternative methodology, procedure, or process.

SOP Revision History

Revision Date	Rev number	Summary of changes	Sections	Reviser(s)
8/23/2016	1.1	Edits.	3.1, 3.8	M. Maggi
8/23/2016	1.1	Cover Page, footer update		Bill Kammin

Environmental Assessment Program

Standard Operating Procedure for Tagging Wells

1.0 Purpose and Scope

- 1.1 This document is the Environmental Assessment Program (EAP) Standard Operating Procedure (SOP) for tagging water wells and resource protection wells with a unique Washington State Department of Ecology (Ecology) well tag.
- 1.2 Ecology has established a well tagging and naming program to help identify all newly constructed or existing wells. The well ID program allows property owners, agencies, and groundwater scientists to positively identify a well in the field, and share data about that well in a reliable, traceable manner (see [Water Resource Program Well Tagging Requirements focus sheet](#)). Attaching a permanent, unique ID to a well facilitates a positive well match during follow-up visits.
- 1.3 Techniques for tagging in-water piezometers are independently described in Sinclair and Pitz (2010).

2.0 Applicability

- 2.1 Washington Administrative Code rules [WAC 173-160-311\(1\)](#) and [WAC 173-160-420\(5\)](#) state that all newly constructed water wells and resource protection wells in the state of Washington must be tagged by the well driller within 30 days of installation. State regulation also requires all well owners to place a well tag on every existing well they own, unless the well has been previously tagged [[WAC 173-160-311\(2\)](#)]. Uncased geotechnical soil borings and temporary environmental investigation wells are exempt from tagging requirements.
- 2.2 Many wells across Washington were installed prior to enactment of the well tagging rules, and many well owners are unaware of tagging requirements. This SOP describes the EAP standard procedures for tagging untagged wells encountered during the course of groundwater well inventories and monitoring studies.
- 2.3 This SOP assumes that permission to tag the well has been pre-arranged with the well and property owner.

3.0 Definitions

- 3.1 Ecology well tag – a small (~1⁷/₈” x 3¹/₄”), stainless steel plate stamped with a unique six character alphanumeric ID (e.g. AAB123). Well tags are typically permanently attached to the outer casing of a well.

- 3.2 Environmental investigation well - a cased hole intended or used to extract a sample or samples of groundwater, vapor, or soil from an underground formation and which is decommissioned immediately after the sample or samples are obtained. An environmental investigation well is typically installed using direct push technology or auger boring and uses the probe, stem, auger, or rod as a casing. An environmental investigation well is not a geotechnical soil boring.
- 3.3 Geotechnical soil boring – a well drilled for the purpose of obtaining soil samples or information to ascertain structural properties of the subsurface.
- 3.4 GIS – Geographic Information System
- 3.5 GPS – Global Positioning System
- 3.6 In-water piezometer – a small-diameter observation well installed directly into the sediments underlying a surface water body to monitor depth to groundwater, sediment water temperatures, sediment hydraulic properties, and/or to periodically collect groundwater or porewater quality samples.
- 3.7 Resource Protection Well - a cased boring intended or used to collect subsurface information or to determine the existence or migration of pollutants within an underground formation. Resource protection wells include monitoring wells, observation wells, piezometers, spill response wells, remediation wells, environmental investigation wells, vapor extraction wells, ground source heat pump boring, grounding wells, and instrumentation wells.
- 3.8 Supplemental well tag – a small (~1/4" x 2 1/4"), blank, stainless steel plate that can be stamped with the same well tag ID as the primary well tag. Supplementary well tags are used to help site visitors identify the well when the primary well tag is not readily visible or accessible (e.g. inside a locked pump house). Supplementary tags are typically attached in an easily visible location in the near vicinity of the well (e.g. on the outside door frame of a pump house).
- 3.9 Water Well - any excavation that is constructed when the intended use of the well is for the location, diversion, artificial recharge, observation, monitoring, dewatering or withdrawal of groundwater. Water wells include ground source heat pump borings and grounding wells

4.0 Personnel Qualifications/Responsibilities

- 4.1 Personnel conducting well-related field work must comply with the requirements of the EAP Safety Manual (Ecology, 2016). A working knowledge of the guidelines and precautions presented in Chapter 1 (General Field Work) and the ‘Groundwater Sampling and Water-level Measurements’ and ‘Hazardous Waste Sites’ sections of Chapter 2 is expected.

5.0 Equipment, Reagents, and Supplies

5.1 Tagging Equipment

- 5.1.1 Standard state well tags (1 $\frac{7}{8}$ " x 3 $\frac{1}{4}$ "); additional well tags can be obtained from the Ecology Water Resource Program well drilling coordinators (headquarters or regional office)
- 5.1.2 Supplemental state well tags (1 $\frac{1}{4}$ " x 2 $\frac{1}{4}$ ") and tag stamp kit; additional supplemental tags can be obtained from the Ecology Water Resource Program well drilling coordinators (headquarters or regional office)
- 5.1.3 Band-It[®] Bantam Hand Tool (Part No. C07569)
- 5.1.4 Band-It[®] $\frac{3}{8}$ " 201 stainless steel banding buckles (Part No. C25399)
- 5.1.5 Band-It[®] $\frac{3}{8}$ " 201 Stainless steel banding strap (Part No. C20399)
- 5.1.6 Pliers
- 5.1.7 Hammer
- 5.1.8 Philips screwdrivers, various sizes
- 5.1.9 Flathead screwdrivers, various sizes
- 5.1.10 Tin snips
- 5.1.11 Nails and stainless steel or galvanized wood screws (various sizes)
- 5.1.12 Concrete anchors and epoxy adhesive
- 5.1.13 UV-resistant heavy duty zip ties
- 5.1.14 Stainless steel hose clamps, various sizes

5.2 Miscellaneous Equipment

- 5.2.1 Pens, pencils
- 5.2.2 Well tagging forms
- 5.2.3 GPS unit and batteries

6.0 Summary of Procedure

- 6.1 For above-ground well completions, permanently attaching a standard-sized (1 $\frac{7}{8}$ " x 3 $\frac{1}{4}$ ") well tag directly to the outer casing of a well with a banding tool and steel band (or equivalent) is the preferred method for tagging wells.¹
- 6.2 For resource protection wells where the well casing (typically PVC plastic) is enclosed inside of a larger-diameter, above-ground protective outer casing, the well tag should be permanently attached to the outside of the outer casing in order to remain visible.
- 6.3 For wells completed below ground (e.g. inside of a flush-mount vault or equivalent enclosed space), the well tag should be attached directly to the well casing in a manner that still allows the tag to be easily read. To make the ID of the well readily available to site visitors, the well should ideally be further identified by stamping the tag ID, or attaching a supplemental tag with the ID, to the outside of the vault or chamber.

¹ If necessary, a stainless steel hose clamping strap or heavy duty UV resistant zip tie can be used in lieu of a standard steel band, although a standard band and locking buckle are probably more secure over the long term.

- 6.4 Alternative tagging methods should be used only in cases where direct attachment of the tag to the well casing or protective casing is not possible.
- 6.5 The procedures described below are specific to a Band-It® brand Bantam banding tool (Figure 1). Follow manufacturer’s instructions if using a different brand of banding equipment.

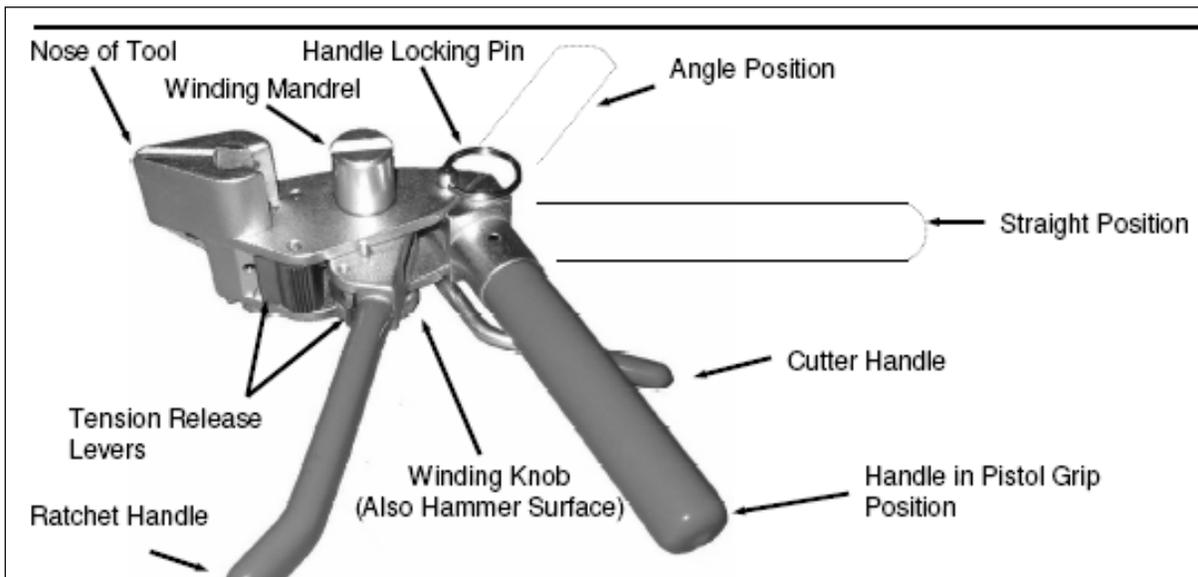


Figure 1. Well Banding tool (figure from Band-It® Bantam Hand Tool Operating Instructions Manual)

- 6.6 Procedures for Attaching an Ecology Well Tag with a Banding Tool
 - 6.6.1 Set the handle of the banding tool to the ‘pistol grip’ position (Figure 1). Pull the handle locking pin if you need to reposition the handle, and then re-insert the pin.
 - 6.6.2 Pre-cut a working length of band from a band roll. Cut a length of stainless steel band long enough to loosely wrap around the casing of the well you’re tagging. Approximately 24” inches is usually enough to band a standard 6” diameter well casing; for wells with a different diameter, cut a piece of banding approximately 8” longer than the circumference of the well . To cut the band place it at the proper position in the banding tool cutter nose and pull the cutter handle until the band is snipped (Figure 2). Tin snips can alternatively be used to cut the banding.



Figure 2. Cutting the banding to length

- 6.6.3 Slide a new, unique Ecology well tag onto the stainless steel band you cut off. Position the tag approximately 6” from the end of the band (Figure 3). The band should run behind the well tag, not over the front. The end goal is to position the tag on the well casing so that it can be easily read once installed. If necessary, adjust the position of the tag on the casing before tightening. In some cases (e.g. below-ground deployments in dimly lit tight quarters), it may be best to mount the tag upside down to make it easier to read.



Figure 3. Adding the well tag

- 6.6.4 Slide a locking buckle onto the band, about 1” past the end of the band. It’s important to have the two locking tangs facing away from the well casing, with the buckle teeth facing towards the well tag (Figure 4). Fold the extra band behind the buckle, and crimp the fold tight with a pair of pliers. This holds the buckle in place.

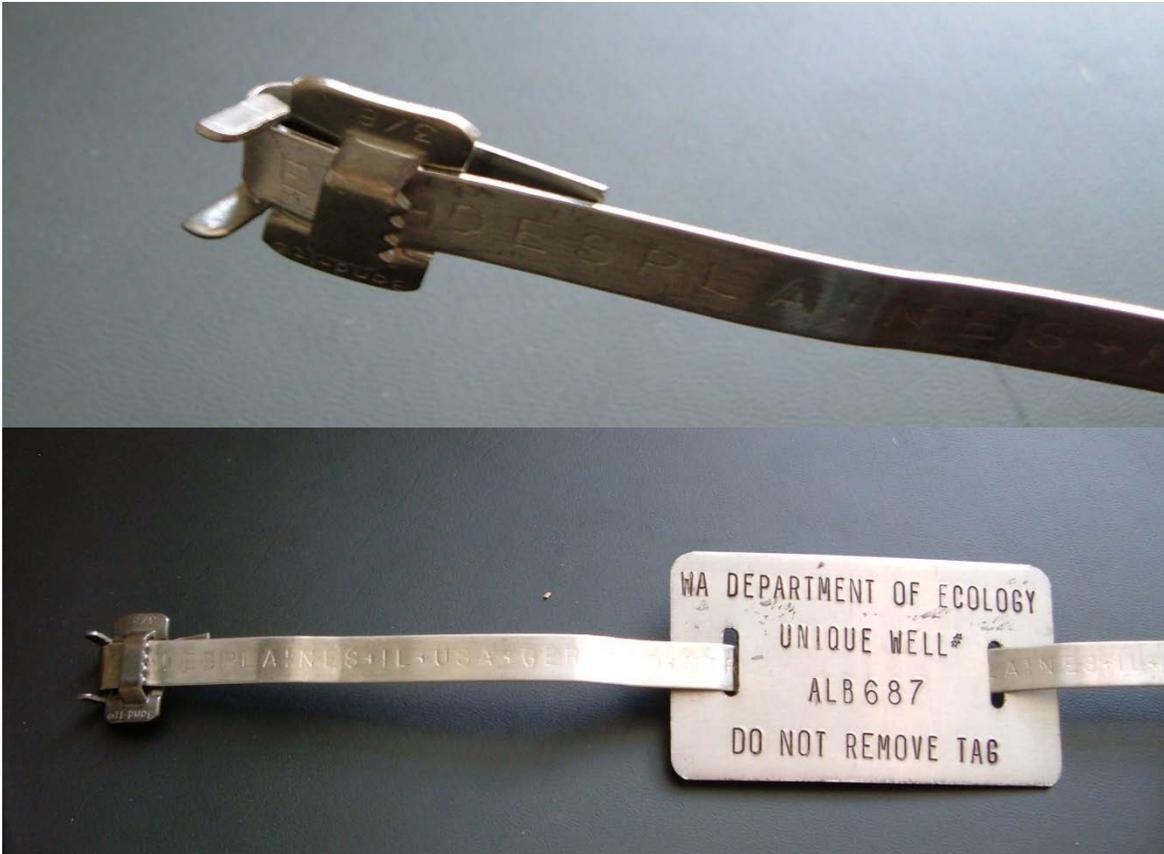


Figure 4. Attaching the locking buckle

- 6.6.5 Wrap the band, buckle, and tag assembly around the well casing. Feed the free end of the band through the buckle, and pull the loose end so that the band is hand-snug around the casing (Figure 5). Ensure that the well tag is positioned in a manner that will be easily visible after installation.



Figure 5. Wrapping the band around the well casing

- 6.6.6 Feed the free end of the steel band into the banding tool. Slide the band through the slot on the cutter nose and into the slot on the winding mandrel. Push the banding tool's nose as close up against the buckle as you can. There should be enough band through the winding mandrel for the band to "catch" when wound (Figure 6).



Figure 6. Threading the banding tool

- 6.6.7 Squeeze the ratchet handle to gradually wind in the steel band through the nose and around the winding mandrel, tightening the band around the casing as you proceed (Figure 7). As the band tightens, the well tag will start to bend to the curve of the casing. Avoid over-tightening the band to the point that the band can break. Tighten the band enough to bend and snug the tag against the casing, but no more.



Figure 7. Tightening the band

- 6.6.8 Once you've completely tightened the band (with the well tag lying flush around the curve of the casing, and the band snugly wrapped around the casing with no up or down slide), roll the banding tool to the left (or right – depending on which end you started at) as far as it will go (Figure 8).



Figure 8. Rolling the banding tool

- 6.6.9 Hold the tool in position and grab the cutting handle and pull to cut the band. The tool will leave about 1½” of extra band sticking out past the buckle (Figure 9).



Figure 9. Cutting the band

- 6.6.10 Use a hammer to fold over the extra band sticking out past the buckle (Figure 10 A), and then hammer the locking tangs over the fold to flatten the entire lock (Figure 10 B).



Figure 10 A. Locking the band



Figure 10 B. – Folding the clamp tangs

- 6.6.11 Use a flathead screwdriver to pop out the excess steel band wrapped around the winding mandrel of the banding tool.

- 6.6.12 Complete the appropriate well tagging documentation (see Section 7.0).

6.7 Alternative Tagging Methods

- 6.7.1 If the space around the well casing is too limited to using the banding tool, the well tag may be attached to the casing using alternative attachment straps such as heavy duty UV-resistant zip ties or stainless steel hose clamps.
- 6.7.2 If for any reason the well casing (or protective casing) is not exposed, is difficult to directly access, or can't be securely tagged in a manner that would be visible to future site visitors, the well tag should be securely attached to the next most permanent feature associated with the well (e.g. the concrete pad surrounding the well, a distribution line permanently attached to the casing, the wall of the well house etc.). In these cases attach the tag in a visible, aboveground location, as close to the well casing as practical. Permanently secure the tag as necessary with nails, screws, bands, anchors, or adhesives.
- 6.7.3 If the well casing is enclosed in a locked or sealed environment where the attached tag isn't readily visible to a site visitor (for example a domestic supply well housed in a locked well house, or a resource protection well completed inside a bolted, flush-mount monument), best practice is to attach a second, supplemental tag in a visible location near the well.
- 6.7.4 Supplemental tags are smaller versions ($\frac{1}{4}$ " x $2\frac{1}{4}$ ") of the standard well tag that can be stamped with the same 6-character alphanumeric ID as the primary tag you've attached to the well (Figure 11). Supplemental tags should be permanently attached in a location close to the well that is readily visible to future site visitors (for example on the outside door frame of a locked well house, on the top plate of a flush mount well monument). Supplemental tags can be attached using nails, screws, bands, anchors, or adhesives as necessary.



Figure 11 – Example supplemental tag and stamping kit

7.0 Records Management

7.1 If you are tagging a well that you have positively matched to an existing well log report, then complete and submit an Ecology **Well Tagging Form** (see example Figure A-1 in Appendix A) to the Ecology Water Resources Program drilling coordinator's office (headquarters or regional)². Be sure to attach and submit a copy of the existing well log with the form. The on-line [Washington State Well Log System](#) is the best resource for locating a well log.

7.1.1 In addition to documenting the ID and location of the new well tag, the **Well Tagging Form** provides a way to record refined X, Y, and Z (land surface elevation) coordinates for the well. Well coordinates can be initially determined in the field using a GPS unit, map, or orthophoto, then refined in the office using Ecology's Environmental Information Management (EIM) system map service tools³. Make sure to record the datum(s) of the coordinates on the form.

² Check the EAP Groundwater Assessment Sharepoint site for the most current electronic version of all well tagging forms, or obtain hardcopies from a Water Resources Program well drilling coordinator.

³ The EIM system has a map service tool that will calculate the elevation of any X/Y position in the state. The elevation value is derived from the most accurate digital elevation model available for that position. See: [EIM Map Search Service](#).

7.2 If tagging a well that does not have an existing well log report, complete and submit an Ecology **Well Report for an Existing Well** form (see example Figure A-2 in Appendix A) to the Ecology Water Resources Program drilling coordinator's office (headquarters or regional).

7.2.1 The **Well Report for an Existing Well** form provides a way to record those details about a well that you can determine in the field (e.g. X,Y and Z coordinates, current well use, uppermost casing diameter and material type, total well depth, static water level, etc.). *You should be sure you have made every reasonable effort to locate an existing well log before you decide to submit a **Well Report for an Existing Well** form.* Always search the [Washington State Well Log System](#) to determine if you can find an existing log before submitting this form. Local health departments or local well drilling companies may also have copies of wells logs that have not been submitted to Ecology.

8.0 **Quality Control and Quality Assurance Section**

8.1 Make sure not to damage or disturb the integrity of the well seal when attaching a well tag.

8.2 Upon return from the field, refine, verify, and record the well location coordinates using GIS software tools. Remember to record the coordinates and datum(s) on the well tagging form.

8.3 Complete and submit the appropriate well tag documentation to the Ecology Water Resources Program drilling coordinator (headquarters or regional).

8.4 All future observations and measurements about the newly tagged well should reference the tag ID. The well ID should be used as the unique location ID in the Ecology Environmental Information Management (EIM) system.

9.0 **Safety**

9.1 Field personnel tagging wells should follow protocols described in the Environmental Assessment Program Safety Manual (Ecology 2016). A working knowledge of sections 'Groundwater Sampling and Water-Level Measurements' and 'Hazardous Waste Sites' in Chapter 2 is expected.

9.2 All EA Program field staff who work on hazardous waste site are required to complete and maintain certification in First Aid/CPR and the 40-hour Hazardous Materials Safety and Health Training.

10.0 References

- 10.1 Sinclair, K. and Pitz, C.F., 2010, Standard Operating Procedure for installing, measuring, and decommissioning hand-driven in-water piezometers. Washington State Department of Ecology, Environmental Assessment Program, EAP061, Version 2.1. <http://www.ecy.wa.gov/programs/eap/quality.html>

- 10.2 Washington State Department of Ecology, Environmental Assessment Program, 2015 Safety Manual.

Appendix A – Example Forms

The forms presented in this appendix are for example purposes only. Check the EAP Groundwater Assessment Sharepoint site for the most current electronic version of all well tagging forms, or obtain hardcopies from a Water Resources Program well drilling coordinator.

Figure A-1. Example Well Tagging Form



Well Tagging Form

Unique Well ID Tag Number: _____

Use this form ONLY if an WELL REPORT IS FOUND
(Attach the original well report to this form)

If a water well report is not available, please complete a "Water Well Report for an Existing Well" form. This form is available at Ecology's headquarters office by calling 360-407-6650 or e-mail mbru461@ecy.wa.gov.

Well Ownership, If Different From Well Report

First name	Last name	
Street Address		
City	State	Zip Code

Location of Well, If Different From Well Report
*Section, Township and Range are REQUIRED *

Well Address					
City			County		
¼ - ¼	¼	Section	Township N	Range	<input type="checkbox"/> EWM or (check one) <input type="checkbox"/> WWWM
Latitude	Degrees	Minutes	Seconds		
Longitude	Degrees	Minutes	Seconds		

Elevation at land surface _____ feet meters (check one)

Well Characteristics

Location of Well Identification Tag

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Scale 1:24,000 (1" = 2,000')

Indicate the location of the well within the Section by drawing a dot at that point

Section _____

Comments

Figure A-2. Example Water Well Report for an Existing Well



WATER WELL REPORT

FOR AN EXISTING WELL

INSTRUCTIONS:
Use this form if an original water well report was NEVER filed or is MISSING from Ecology records.
YOUR WELL MUST BE PROPERLY TAGGED PRIOR TO SUBMITTING THIS FORM. Please fill in all blanks as completely as possible. If information is not known leave blank. After completing, mail the original form to: WA State Department of Ecology, PO Box 47600, Olympia, WA, 98504-7600, ATTN: Marian Bruner.

<p>CURRENT USE: <input type="checkbox"/> Domestic <input type="checkbox"/> Industrial <input type="checkbox"/> Municipal <input type="checkbox"/> DeWater <input type="checkbox"/> Irrigation <input type="checkbox"/> Test Well <input type="checkbox"/> Other _____</p> <p>DIMENSIONS: Diameter of well _____ inches. Depth of completed well _____ ft. if known.</p> <p>CONSTRUCTION DETAILS Liner installed <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Type: <input type="checkbox"/> PVC <input type="checkbox"/> Steel <input type="checkbox"/> Concrete Liner <input type="checkbox"/> Other <input type="checkbox"/> Unknown</p> <p>Perforations <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown SIZE of perfs _____ in by _____ in and no. of perfs _____ from _____ ft to _____ ft.</p> <p>Screens: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown MF's name _____ Type: <input type="checkbox"/> Stainless Steel <input type="checkbox"/> PVC <input type="checkbox"/> Other _____ Diam. _____ Slot Size _____ from _____ ft to _____ ft.</p> <p>Gravel/Filter Packed: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown Materials paced from _____ ft to _____ ft.</p> <p>Surface Seal: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown: If know, to what depth _____ ft Materials used if known: _____ <input type="checkbox"/> Bentonite <input type="checkbox"/> Cement</p> <p>PUMP: <input type="checkbox"/> Yes <input type="checkbox"/> No Mfr's Name _____ Type: _____ H.P. _____</p> <p>WATER LEVELS: Land-surface elevation above mean sea level _____ ft. Static Level _____ ft. below top of casing Date measured _____ Artesian pressure _____ lbs. per square inch Date measured _____ Well head has cap? <input type="checkbox"/> Yes <input type="checkbox"/> No Shut off valve? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>WELL TESTS: Drawdown is amount water level is lowered below static level. Was a pump test made? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, attach copy <input type="checkbox"/> Unknown Yield: _____ gal./min with _____ ft drawdown after _____ hrs</p>	<p>Unique Ecology Well ID Tag No. _____</p> <p>Water Right? If yes, attach copy <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Property Owner Name _____</p> <p>Well Street Address _____</p> <p>City _____ County: _____</p> <p>Tax Parcel No. _____</p> <p>LOCATION An accurate location of your well is very important. The Township, Range, Section and 1/4, 1/4 can be found on your legal description or through your county assessor's office.</p> <p>Sec _____ Twn _____ R _____ EWM or WWM <i>Circle one</i></p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <tr><td>D</td><td>C</td><td>B</td><td>A</td></tr> <tr><td>E</td><td>F</td><td>G</td><td>H</td></tr> <tr><td>M</td><td>L</td><td>K</td><td>J</td></tr> <tr><td>N</td><td>P</td><td>Q</td><td>R</td></tr> </table> <p style="font-size: small;">This square represents one section of land, which is approx. 640 acres. Within this section, circle the letter that best represents the location of the well within this section.</p> <p>Latitude/Longitude Note: Section, Township, Range still REQUIRED Lat Deg _____ Lat Min/Sect _____ Long Deg _____ Long Min/Sect _____ <input type="checkbox"/> GPS <input type="checkbox"/> Survey <input type="checkbox"/> Topographic Map <input type="checkbox"/> Computer Generated</p> <p>Additional Information, if available: <input type="checkbox"/> Location marked on topographic map (please attach) <input type="checkbox"/> Location marked on air photo (please attach)</p>	D	C	B	A	E	F	G	H	M	L	K	J	N	P	Q	R
D	C	B	A														
E	F	G	H														
M	L	K	J														
N	P	Q	R														

CERTIFICATION: The information reported above is true to the best of my knowledge and belief.

Driller Engineer Property Owner Other

Name _____ Drilling Company _____

Signature _____ Address of person completing this form: _____

Driller License No. _____

Date Signed _____ City, State, Zip _____

Original - Ecology Ecology is an Equal Opportunity Employer.