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# **13. Well Records, Documentation, Reporting & Tagging**



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## CHAPTER DESCRIPTION

The reporting requirements in the **Wells Regulation** help to manage the groundwater resource and assist a person who is locating, repairing or abandoning a well. The documents provide a record of the well construction and subsurface formations which can be important in assessing spills or other environmental problems that may impair groundwater.

This chapter provides the requirements, exemptions and best management practices for:

- completing and keeping an accurate log of overburden and bedrock materials (geologic log) and field notes when constructing a well,
- completing, delivering and forwarding well records for both single wells,
- notifying the well owner or the Ministry of the Environment and Climate Change when environmental problems are identified during well construction, and
- affixing and protecting well tags.

The requirements listed in this chapter also do not apply to a person who performs an activity on a well that is exempt from the **Wells Regulation** (e.g., performing an inspection on a well). For further information see Chapter 3: *Well Contractors & Well Technicians – Licences, Responsibilities & Exemptions*.

## REGULATORY REQUIREMENTS

### RELEVANT SECTIONS – THE WELLS REGULATION

*Log and Field Notes – Section 12.1*

*Well Tags – Sections 14.11 and 22*

*Disinfection (Reporting Free Chlorine Residual) – Subsection 15(9)*

*Information – Sections 16, 16.1 and 16.2*

*Well Record (Single Well) – Section 16.3*

*Well Record (Abandonment) – Section 16.5*



## THE REQUIREMENTS – PLAINLY STATED



**The Wells Regulation requires a person constructing or abandoning a well to meet the following unless an exemption is provided in this section or Chapter 4: *Well Contractors & Well Technicians – Licences, Responsibilities & Exemptions.***

### **Overburden and Bedrock Log Requirements**

Every person constructing a well must make a log of overburden and bedrock materials and have it available at the well site for inspection.

### **Exemptions - Overburden & Bedrock Log**

The person constructing the well is exempted from the requirement to complete and keep a log of overburden and bedrock materials when:

- constructing a well by the use of a driven point,
- altering a well without deepening it, or
- only installing a pump.

The person abandoning the well is exempt from completing and keeping a log of overburden and bedrock materials for a well abandonment.



Some of the reasons for the log of overburden and bedrock materials exemption are provided in the “Log and Field Notes” section of this chapter.

### **Field Notes Requirements**

Every person constructing or abandoning a well is required to make and have available at the well site, for inspection, field notes that include an up to date record of the well construction or abandonment activities.

### **Well Tags for New Wells**

Before the structural stage of a new cased well is complete, the person constructing the well must permanently affix a well tag, issued by the Ministry, to the outside of the casing or to a permanent structure associated with the well.

The affixed tag must be visible and must not be obstructed by the well cap, other well components or by equipment associated with the well.

### **Well Tags for Alterations to Existing Wells**

#### *Well Without a Well Tag*

If an alteration (other than a minor alteration) is made to a cased well that does not have a well tag, a Ministry well tag must be obtained and affixed permanently to the outside of the casing or to a permanent structure associated with the well as described in “Well Tags for New Wells” in this Plainly Stated section.

#### *Well With a Well Tag*

During alterations to a cased well with a well tag, the well tag must be safeguarded and, if removed, it must be re-affixed permanently to the outside of the casing or to a permanent structure associated with the well upon completion of the alteration as described in “Well Tags for New Wells” in this Plainly Stated section.

#### *Replacement of Damaged Well Tag and Well Record Completion*

During an alteration, including a minor alteration, to a cased well with a well tag, if the existing well tag is broken, defaced, illegible or otherwise unusable, the person constructing the well must:

- remove the well tag and return it to the Director no later than the date that the well record is submitted to the Director (within 30 days after affixing the new well tag),
- before completing the alteration, affix a new well tag issued by the ministry as described in “Well Tags for New Wells” in this Plainly Stated section, and
- complete a well record with respect to the replacement of the well tag and submit the well record to the Director within 30 days after affixing the new well tag.

### **Well Tags – Removal during Well Abandonment**

If there is a well tag on a well that is being abandoned, the person abandoning the well, often the well owner, must ensure that the well tag is removed as the first step in the well abandonment procedure and that it is returned to the Director within 30 days after its removal.



See Chapter 15: *Abandonment: How to Plug & Seal Wells* for further information on the abandonment steps.



### Well Tags – Defacing/Removing

It is not permitted to deface, alter, conceal or obstruct a well tag.

It is not permitted to remove a well tag that is affixed to a well unless the:

- the person has the written consent from the Director,
- the well tag on the well that is being altered is broken, defaced, illegible or otherwise unusable, or
- the well is being altered or abandoned (plugged and sealed).

It is not permitted to use a well tag issued by the Ministry **except** in accordance with the **Wells Regulation**.



See Chapter 2: *Definitions & Clarifications* “Table 2-1” for the definition of “minor alteration” and “Table 2-2” for clarification of the term “routine repair”.

### Reporting Free Chlorine Residual Records

Unless exempt and before the well is used as a source of water for human consumption, the person who disinfects and tests the well water for free chlorine residual must provide the well purchaser with a written record of the test results



See Chapter 8: *Well Disinfection* for further information.

### Notification

#### *Mineralized Water*

Where a well is constructed and “mineralized water” is encountered, the person constructing the well must immediately notify the well purchaser and the owner of the land on which the well is located of the condition.

#### *Natural Gas or Other Gas*

Where a well is constructed and “natural gas” is encountered, the person constructing the well must immediately notify the well purchaser, the owner of the land on which the well is located, and the Director of the condition.



See Chapter 2: *Definitions & Clarifications* “Table 2-1” for the definition of “mineralized water” and “Table 2-2” for clarification of the term “natural gas”.

### **Information for the Well Purchaser**

#### *After Structural Stage*

Unless the well purchaser otherwise directs, on the day that the well's structural stage is complete, the person constructing the well must:

- deliver an information package from the ministry to the well purchaser,
  - provide a water sample, of at least one litre, to the well purchaser for visual examination, and
- measure the depth of the well in the presence of the well purchaser.

#### *Pump Replacement*

Unless the well purchaser otherwise directs, on the day that a pump, which includes associated equipment, is replaced in an existing well, the person installing the pump must:

- Deliver an information package from the ministry to the well purchaser.

### **Exemption - Information for the Well Purchaser**

The person constructing the well does not have to meet the Information for the Well Purchaser requirements stated above if the person is performing a "minor alteration" on the well.

### **Well Record – Constructing Wells**

On completion of a well's structural stage, the person constructing the well must:

- complete a well record for the well in full detail following the instructions and explanations on the record,
- within 14 days, deliver a copy of the well record to the well purchaser and the owner of the land on which the well is situated,
- within 30 days, forward a copy of the well record to the Director, and
- retain a copy of the well record for at least two years.

### **Exemption - Well Record for Construction**

#### *Minor Alteration or Pump Installation*

A person who performs a "minor alteration" or installs a pump in a is not required to complete and submit a well record, unless there is a damaged well tag.



The physical structure of a well is not significantly altered when a person installs a pump or performs a "minor alteration". In these cases, there is no major change to the structure of a well to be documented on a well record.



For further information on replacing a damaged well tag, see “Replacement of Damaged Well Tag and Well Record Completion” in this Plainly Stated section



See Chapter 2: *Definitions & Clarifications*, Table 2-1 for the definitions of “minor alteration” and see Table 2-3 for clarification of the term “pump.”

### **Well Record – Abandonment of Well**

When abandoning a well, the person abandoning the well, often the well owner, must:

- complete a well record for the well, in full detail, in accordance with the instructions and explanations on the record,
- within 14 days after the date on which the well construction equipment is removed from the site, deliver a copy of the well record to the owner of the land on which the well is situated, and
- within 30 days after the date on which the well construction equipment is removed from the site, forward a copy of the well record and any well tag that was removed from the well, to the Director.



See the “Well Record Information” section of this chapter for further clarification on the term “person constructing the well”. See the “Alterations,” section of this Chapter (page 33) of this chapter and see Chapter 11: *Maintenance and Repair*, “Requirements for Repairs and Alterations on Existing Wells” section for clarification of the term “alteration” and “minor alteration”. See Chapter 2: *Definitions and Clarifications*, “Table 2-1” for definition and clarification of the terms “well’s structural stage” and “minor alteration”.

### **RELEVANT STANDARDS**

ASTM Standard D5434 - 09 – “Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock” (DOI: 10.1520/D5434-09)<sup>1</sup>

## KEY CONCEPTS

### LOG AND FIELD NOTES

Every person constructing or abandoning a well is required to keep, and have available at the well site for inspection, field notes that include an up-to-date record of the construction activities. In many cases, a log of overburden and bedrock materials is also required.

Keeping accurate field notes is important for the following reasons:

- To complete the well record. The information transposed onto the well record may be used by the water well industry and environmental consultants seeking information on groundwater resources in an area (see “Well Record and Well Tag” section below).
- To document construction activities, field conditions, incidents and subsurface information prior to the completion of the well record.

### WELL RECORD & WELL TAG

Well records provide construction and general water quantity and quality information. The well tag is a unique identifier that links the well in the field with the well record. Well records and tags are a notification system for use by the province, consultants, contractors and current or future well owners to:

- provide information on the groundwater and geology of an area, including:
  - groundwater availability,
  - general idea of depth to water,
  - possible flowing well conditions, and
- provide information on well construction in an area to help well technicians anticipate equipment needs and estimated costs,
- help to protect well owners and contractors from being open to enforcement action by the Ministry or civil action between parties,
- provide information to manage the groundwater resources,
- provide information for consultants and regulators on groundwater quality and quantity issues in an area,
- provide information on the location of wells and their construction details in case of spills, and
- assist in locating existing wells when purchasing a new property to ensure they are properly maintained or abandoned (plugged and sealed).

Information from well records is compiled at the Ministry. Together, with other databases and geographical information systems (GIS), the information provides an overview of groundwater and aquifers in Ontario, including:

- types of construction, uses and locations of wells in the province,
- areas where natural gas, mineralized water or flowing wells occur,
- patterns, such as areas of natural gas and flowing wells, and
- location of low and high-yield aquifers.

## NOTIFICATION

The **Wells Regulation** does not require testing of water quality or gas during the construction of a well. Testing is typically completed after the well is ready to be put into operation by the well owner, an agent representing the well owner, or by another person.

If a person constructing a well identifies a gas or water quality issue, there may be an obligation on the person to report the issue. For example, the person constructing the well must immediately notify the well purchaser and the owner of the land on which the well is located if natural gas or mineralized water is encountered to:

- protect drinking water supplies,
- protect the environment and property,
- protect health and safety, and
- take additional precautions (e.g., equipment to remove or treat).

When a well is being constructed and natural gas is encountered, the person constructing the well must also immediately notify the Director (e.g., Spills Action Centre 1-800 268- 6060) of the condition.

## LOG AND FIELD NOTES



Unless otherwise exempt, a person constructing a well is required to make a log of overburden and bedrock materials and field notes that include an up-to-date record of the construction or abandonment of the well during construction or abandonment of a well.

A log of the overburden and bedrock is not required if the person is:

- constructing a well by the use of a driven point,
- altering a well without deepening it,
- installing a pump (including associated equipment and alterations necessary to install the equipment), or
- abandoning a well.

Making visual observations of a formation is difficult when constructing a well by the use of a driven point. Also, as observations of subsurface formations were documented during the initial construction of a well, little information would be gained regarding subsurface formations when installing equipment or making most other alterations to an existing well.



See Chapter 2: *Definitions & Clarifications*, Table 2-1 for the definition of the term “construct” and “pump” and Table 2-2 for clarification of the terms “well abandonment” and “driven point/use of a driven point”.



The field notes and, when required, the log of overburden and bedrock materials must be available for inspection at the well site during construction or abandonment of a well.

The person constructing the well should collect representative samples at measured depths and at intervals that will show the complete geological character of the hole. For example, formation samples could be collected at 1.5 m (5') intervals and at every change in formation materials. The log field notes should document the:

- Changes in formation materials including the top and bottom of each material/unit encountered,
- Observed characteristics of each formation unit,
- Depth to groundwater, water quality and gas observations,
- Materials and equipment used at the site and in the well, and
- Location information.



Table 5-6 (Particle Sizes for Overburden Material) in Chapter 5: *Constructing, Casing and Covering the Well* can be used as an aid to describing overburden material.



The person working at the abandonment of a well can assist the person abandoning the well, often the well owner, in completing the field notes. For clarification of the term “person abandoning the well” see the note in the “General Notes on Well Record Delivery” section of this chapter.



### **Best Management Practice – Additional Logging Activities**

Hole logs, sampling logs and water level logs should be carefully kept and detailed. Properly kept and detailed logs help document construction activities, field conditions, incidents and subsurface information. The information can assist in:

- completing a well record accurately,
- completing a log prepared for various hydrogeological or geotechnical reports,
- offering assistance for dispute resolution, and
- supplementing the information on the well record form to assist in addressing problems associated with the well.





## WELL RECORD EXEMPTION

There are exemptions for the completion of a well record for certain types of activities that involve water supply wells. The circumstances when a well record is not necessary are described in this section.

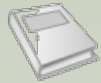
A person who performs a “minor alteration” or installs a pump in a well is not required to complete and submit a well record, unless there is a damaged well tag. The physical structure of a well is not significantly altered when a person installs a pump or performs a “minor alteration”. In these cases, there is no major change to the structure of a well to be documented on a well record.



For further information on when to complete a well record for a damaged well tag, see “Replacement of Damaged Well Tag and Well Record Completion” in the “Plainly Stated” section of this chapter and the “Broken, Defaced, Illegible or Unusable Well Tags” section in this chapter.



For further information on the terms “minor alteration”, “pump” and “well’s structural stage completion” see Chapter 2: *Definitions & Clarification*, Table 2-1.



### Best Management Practice – Completing and Submitting a Well Record in Special Cases

There are cases where the person constructing the well is required to affix a well tag to a well, but is not required to complete a well record. In the following instances, a well record should be completed and submitted:

- When a well tag is required to be affixed in the course of installing a pump.

The additional well records will help to:

- link and locate tagged wells in the field to well records,
- capture more information on wells, groundwater and geology for the Ministry’s water well database, and
- identify potential pathways for contamination.

## WELL RECORD INFORMATION

Unless exempt, a well will typically have multiple well records during its life. For example, a well could have a well record for construction, another if the well is altered and a third when it is abandoned.

### WHEN TO COMPLETE A WELL RECORD FOR A WELL



Unless otherwise exempt, the person constructing the well must complete and submit a separate well record for a single well for the following well construction activities:

- New well construction
- Making an alteration to a well other than a minor alteration or installing a pump. This includes a well that was part of a group of wells that was originally reported on one well record, also known as a well cluster
- Making a minor alteration to a well or installing a pump in or on a well where the well tag is broken, defaced, illegible or otherwise unusable



Unless otherwise exempt, the person abandoning the well, often the well owner, must complete and submit a separate well record for the proper abandonment of a single well.



See the “General Notes on Well Record Delivery” section in this chapter for further clarification on the term “person abandoning the well”. See Chapter 15: *Abandonment: How to Plug & Seal Wells* for information on proper well abandonment.



For further information on the terms “minor alteration”, “pump” and “well’s structural stage completion” see Chapter 2: *Definitions & Clarification*, Table 2-1. See the “Well Record Exemption” section in this chapter for further information on exemptions.

## CONSIDERATIONS WHEN COMPLETING THE WELL RECORD

A person who is required to complete a well record must follow the instructions on the well record. The instructions for completing the well record after construction or abandonment of a single well are found on the back of the well record form. The well record includes instructions on how to observe and report the formation's texture (grain size), colour, hardness of the formations and other observations. See Figure 13-2 to Figure 13-14 for further information.

The person altering or abandoning an existing well must, as a minimum, complete the mandatory sections of the well record as stated in the instructions found on the back of the well record.

It is not necessary to complete a well record when installing a pump or performing a minor alteration, unless the well tag is broken, defaced, illegible or otherwise unusable (see “Broken, Defaced, Illegible or Unusable Well Tags,” on page 41 of this chapter).



Additional well record forms must be used if more information is required (see explanation of Page Number box in the “Completing the Well Record” section on the next page). Unless specified, all depths must be expressed from the ground surface at the time of construction.



For the purposes of this manual, which only applies to water supply wells, filling out information on two or more wells on one well record is not permitted. There are special situations for test holes and dewatering wells where one cluster well record can be completed for two or more wells but this is not covered in this manual.



If plugging and sealing a well immediately after installing the well due to a well being discontinued, then two separate well record forms that make one well record must be filled out: the first form (page 1 of 2) for the construction and the second form (page 2 of 2) for the plugging and sealing of the well.

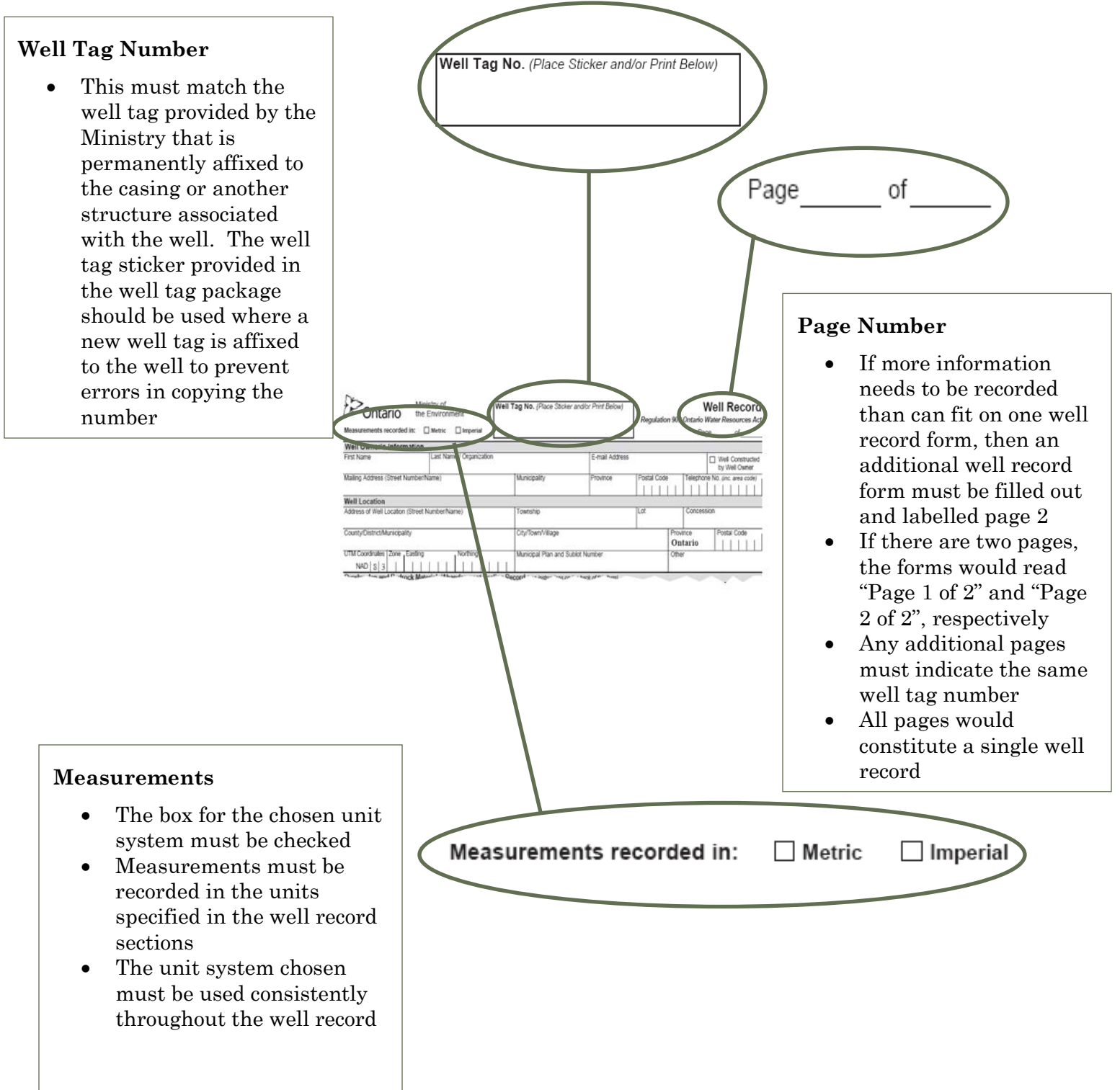
## UNITS OF MEASUREMENT

The single well record form and well record form for a “well cluster” allow for the use of Imperial units or metric units. A check box, found at the top of the well record, allows for the selection of metric or Imperial units. The unit system chosen must be used consistently throughout the well record. If a measurement is being reported in metres, it must be reported to the nearest tenth of a metre (e.g., 20.3 m).

## COMPLETING THE WELL RECORD

Figures 13-2 to 13-14 provide an explanation of how to complete a well record

**FIGURE 13-2: WELL RECORD - GENERAL INFORMATION**



**FIGURE 13-3: WELL RECORD – WELL OWNER INFORMATION**

Well Owner's Information						
First Name		Last Name / Organization		E-mail Address		<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name)			Municipality	Province	Postal Code	Telephone No. (inc. area code)

**Well Owner Information**

- All applicable sections must be completed
- This can be information on the owner of the land on which the well is located or the well purchaser
- If the well owner is an organization or company, the word “Organization” must be circled and the name of the entity must be printed in the “Last Name/Organization” field

Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered Y Y Y Y M M D D
	Date Work Completed Y Y Y Y M M D D

**Information Package**

- This section must be completed
- This section is filled out once the well is complete and the well purchaser has been provided with a copy of the Well Owner's Information package
- “Yes” can be checked off

**FIGURE 13-4: WELL RECORD – WELL CONTRACTOR AND WELL TECHNICIAN**

The image shows a portion of the Ontario Well Record form. A green oval highlights the 'Well Contractor and Well Technician Information' section, which is detailed in the adjacent table. The form includes fields for well owner details, location, and construction specifications.

Well Contractor and Well Technician Information		
Business Name of Well Contractor		Well Contractor's Licence No.
Business Address (Street Number/Name)		Municipality
Province	Postal Code	Business E-mail Address
Bus. Telephone No. (inc. area code)		Name of Well Technician (Last Name, First Name)
Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
		Y Y Y Y M M D D

**Well Contractor and Well Technician Information**

- This box provides information about the individual and company who constructed the well and must be fully completed by the person constructing the well except for the following situations:
  - If the person who constructed the well is an exempted professional who is permitted to construct wells without a licence (see Chapter 3: *Well Construction Licences: Obtaining, Maintaining & Exemptions*), the person must record his/her name in the “Name of Well Technician” box, sign the “Signature of Technician” and provide his/her company’s particulars
  - If the well was constructed by the owner of the land, a member of the person’s household or a person working without compensation for the owner of the land, the person constructing the well must record his/her name in the “Name of Well Technician” box and sign in the “Signature of Technician and/or Contractor” box. The words “Well Technician” and “Contractor” should be crossed out and the changes initialled
  - If the well was abandoned, information about the person who works at the well abandonment may be recorded in this section

**FIGURE 13-5: WELL RECORD - WELL LOCATION**

Well Location										
Address of Well Location (Street Number/Name)				Township			Lot		Concession	
County/District/Municipality				City/Town/Village				Province <b>Ontario</b>	Postal Code	
UTM Coordinates	Zone	Easting		Northing		Municipal Plan and Sublot Number			Other	
NAD	8	3								

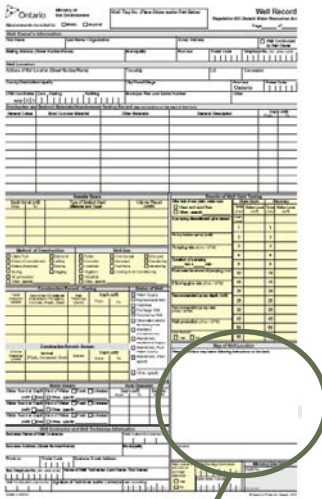
The image shows a thumbnail of the full 'Well Record' form from the Ontario Ministry of the Environment. A green callout box highlights the 'Well Location' section at the top of the form, which corresponds to the larger form shown above. The callout box also contains the text 'Well Location' and a bulleted list of requirements for recording well location information.

**Well Location**

- It is important to accurately record the location the well. Inaccurate location information on the well record can lead to problems locating the well in the field. Location information includes the following:
  - Street number/name, city/town/village must be provided if available
  - Original geographic township, concession and lot must be reported if the well is located in an area where such information exists
  - Fire locator number may also be recorded in the “Other” box
  - UTM Coordinates must be recorded using a GPS unit
  - Municipal plan and subplot numbers may be provided if available
  - Current county or district/amalgamated municipality or township, if reported, should be entered under “County/District/Municipality.” For example, in the County of Frontenac/Township of South Frontenac, the Township of South Frontenac is the amalgamated township. If the townships were amalgamated, the old and new township names should be included, if known

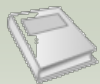
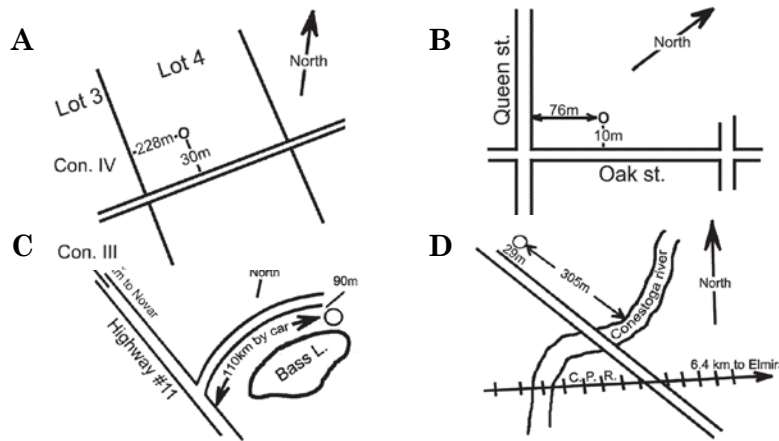


**FIGURE 13-6: WELL RECORD - MAP OF SINGLE WELL LOCATION**



**Map of Well Location**

- A map showing all property boundaries must be provided. At least two measurements sufficient to locate the well in relation to fixed points must be provided. For example:
  - In rural areas, one distance should be taken from a road and other from either a road or a township lot line (example A, below)
  - In a village, town or city, both distances should be taken from named streets (example B)
  - In areas where it is difficult to obtain lot and concession numbers, sufficient information should be supplied in the diagram so that the well can be related to a known unit such as a main highway, railway, or municipality (examples C and D)
- Detailed drawings can be provided as attachments on paper no larger than the size of the well record (8.5” by 14”)
- A North arrow must be included on the diagram.
- The “Comment” box may be used to record any additional information such as the elevation of the well. It is also an appropriate location to state whether or not hydrofracturing or blasting was done at the time of construction (see the BMP on this page)
- The “Comment” box is also an appropriate place to reference the original well tag when a well tag is replaced and original well record number for an alteration
- It is important to review the directions given on the back of the well record

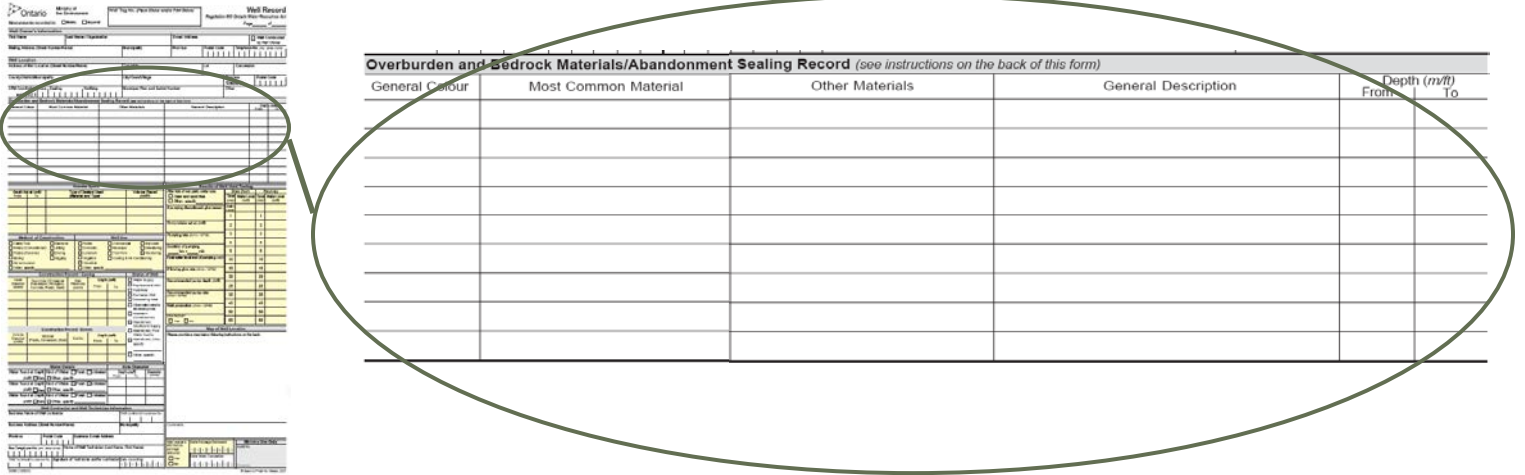


**Best Management Practice – Compiling Details about Hydrofracturing or Blasting Techniques**

If hydrofracturing or blasting techniques were used, the person completing the well record should provide details on a separate sheet. The sheet should be attached to the well record and copies of the attachment should be included with each copy of the well record.



**FIGURE 13-7: WELL RECORD - OVERBURDEN AND BEDROCK MATERIALS / ABANDONMENT SEALING RECORD**



**Overburden and Bedrock Materials/ Abandonment Sealing Record**

- If a person is plugging and sealing a well, the abandonment details must be recorded in this section. The type of abandonment barrier (sealant) used must be indicated in the “General Description” column and the depth of sealant must be indicated in the “Depth” column
- If a person is constructing a well:
  - For each formation encountered during construction, words chosen from the lists provided on the back of the well record that best describe the formation on the basis of general colour, most common material, other materials and general description of the formation must be used
  - Instructions are found on the back of the well record and shown below

General Colours		Materials					General Descriptions		
White	Yellow	Fill	Silt	Top Soil	Coarse Sand	Slate	Loose	Cemented	Previously Dug or Bored
Grey	Brown	Muck	Gravel	Limestone	Dolomite	Quartzite	Porous	Layered	Previously Drilled
Blue	Red	Peat	Stones	Fine Sand	Shale	Granite	Dense	Soft	Wood Fragments
Green	Black	Clay	Boulders	Medium Sand	Sandstone	Greenstone	Packed	Hard	

Clay: Composed of very fine particles. Forms dense hard lumps or clods when dry and a very elastic putty-like mass when wet. It can be rolled between fingers to form a long, flexible ribbon.

Silt: Grain size, midway between sand and clay. It may form clods which, when broken, feel soft and floury. When moist, it will form a cast that can be handled freely without breaking. Rolled between thumb and finger, it will not “ribbon” but will give a broken appearance.

Sand: Grains are loose and granular and may be seen and felt readily. Squeezed in the hand when dry, it falls apart when the pressure is released. Squeezed when moist, it will form a cast that will crumble when touched. Should be listed as fine, medium or coarse.

Gravel: Rock fragments greater than 0.3 cm in diameter.

- An example of a completed section is provided below and found on the back of the well record:

General Colours	Most Common Material	Other Materials	General Descriptions	Depth	
				From	To
Brown	Top Soil			0	0.6
Grey	Coarse Sand	Gravel, Silt	Loose, Wood Fragments	0.6	13.0
Blue	Clay	Silt, Stones	Dense	13.0	25.0
Brown	Fine Sand	Clay		25.0	31.0

**FIGURE 13-8: WELL RECORD - WELL USE**

The image shows a portion of the Ontario Well Record form. The 'Well Use' section is highlighted with a green oval. The form includes fields for Well Owner's Information, Well Location, and Well Construction. The 'Well Use' section contains a grid of checkboxes for various well uses: Public, Commercial, Not used, Domestic, Municipal, Dewatering, Livestock, Test Hole, Monitoring, Irrigation, Cooling & Air Conditioning, Industrial, and Other, specify.

Well Use		
<input type="checkbox"/> Public	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal	<input type="checkbox"/> Dewatering
<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole	<input type="checkbox"/> Monitoring
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning	
<input type="checkbox"/> Industrial		
<input type="checkbox"/> Other, specify _____		

**Well Use**

- “Well use” means the intended purpose at the time of construction
- **Public** – e.g., school, religious organization, town hall, recreation centre, campground, trailer park
- **Domestic** – for private residential homes
- **Livestock** – used for farms and feed lots
- **Irrigation** – used for agricultural activities, golf courses and greenhouses
- **Industrial** – factories using water for industrial purposes but not incorporation into a food product or mineral exploration
- **Commercial** – e.g., car wash, snow making, restaurant, bottled water or other beverage making
- **Municipal** – water supply for cities and towns
- **Cooling & Air Conditioning** – e.g., an open or closed loop earth energy system (heat pump)
- **Not used** – constructed for some purpose, not being used and will be maintained for future use. A second box must be checked to indicate the intended use
- For the purposes of test holes and dewatering wells the following will apply:
  - **Test Hole** – a well that is made to test or to obtain information in respect of groundwater or an aquifer and is not intended as a source of water for agriculture or human consumption
  - **Dewatering** – a well that is not used or intended for use as a source of water for agriculture or human consumption and that is made to lower or control the level of groundwater in the area of the well, or to remove materials that may be in the groundwater
  - **Monitoring** – a well that is made to test or to obtain information in respect of groundwater or an aquifer and is not intended as a source of water for agriculture or human consumption
  - **Other** – e.g., communal such as water supply that serves a small rural sub-division
- In the situation where a test hole or dewatering well for a sub-division is then going to be used as a domestic water supply, all boxes that apply should be checked (original and future purposes)
- For the purposes of the **Wells Regulation** and the well record completion, “Test Hole” and “Monitoring” are synonymous

**FIGURE 13-9: WELL RECORD - METHOD OF WELL CONSTRUCTION & STATUS OF WELL**

The image shows a portion of the Ontario Well Record form. Two callouts are present:

- Method of Construction:** A callout box highlights the 'Method of Construction' section of the form, which includes checkboxes for Cable Tool, Rotary (Conventional), Rotary (Reverse), Boring, Air percussion, Other, Diamond, Jetting, Driving, and Digging.
- Status of Well:** A callout box highlights the 'Status of Well' section, which includes checkboxes for Water Supply, Replacement Well, Test Hole, Recharge Well, Dewatering Well, Observation and/or Monitoring Hole, Alteration (Construction), Abandoned, Insufficient Supply, Abandoned, Poor Water Quality, Abandoned, other, specify, and Other, specify.

Method of Construction	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging
<input type="checkbox"/> Air percussion	
<input type="checkbox"/> Other, <i>specify</i> _____	

**Status of Well**


- This section is used to identify the status of the well at the time of completion. All boxes that apply should be checked

**Method of Construction**

- The construction method used is identified by checking the appropriate box or boxes if more than one system is used (e.g., rotary conventional and air percussion). If the method used is not part of the list, the “Other, *specify*” box must be checked and the method must be described (e.g.,sonic or direct push)

FIGURE 13-10: WELL RECORD - CONSTRUCTION RECORD - CASING

- ### Construction Record - Casing
- Material means type of manufactured material used to make the casing
  - An interval without casing must be reported as “open hole”
  - Wall thickness means minimum or nominal wall thickness
  - A new line should be filled in for every change in casing (e.g., material, inside diameter or wall thickness) or open hole diameter
  - All depths must be expressed from the ground surface at the time of construction. The amount of casing above the ground surface should be expressed with “+”. For example, a contractor installs casing +0.6 m above the ground surface and extends the casing to 7 m below the ground surface
  - Joint and packer depths from ground surface should be recorded (see the best management practice below)



### Best Management Practice – Recording Joint and Packer Locations

Casing joint and packer locations (depths) from ground surface should be recorded in the “Construction Record – Casing” box of the well record.

**FIGURE 13-11: WELL RECORD - CONSTRUCTION RECORD – WELL SCREEN AND HOLE DIAMETER**

Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To

- Construction Record - Screen**
- Material can also include pre-packed well screens and unsealed concrete tiles or other material installed in a well to filter out particulate matter
  - Slot number as provided by the manufacturer must be recorded
  - Depth includes top of riser pipe, if applicable
  - All depths must be expressed from the ground surface at the time of construction

Hole Diameter		
Depth (m/ft)	Diameter (cm/in)	
	From	To

- Hole Diameter**
- The diameter and depth of the hole must be recorded using the measurement unit system chosen at the top of the well record (metric or Imperial)
  - The depth of the hole relative to the ground surface must be recorded





FIGURE 13-13: WELL RECORD - WATER DETAILS

Water Details	
Water found at Depth (m/ft) <input type="checkbox"/> Gas	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Other, specify _____
Water found at Depth (m/ft) <input type="checkbox"/> Gas	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Other, specify _____
Water found at Depth (m/ft) <input type="checkbox"/> Gas	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Other, specify _____

**Water Details**

- The distance from the ground surface to the water bearing formation(s), or horizon(s), where water is found must be recorded. Also, if naturally occurring or other gas is found then it must be recorded
- The same measurement unit system chosen at the top of the well record (metric or Imperial) must be used consistently
- The correct box for the type of water found must be checked:
  - “Fresh water” means that there are no taste, odour or colour issues with the well water in the field (Field testing equipment should be used instead of tasting well water to avoid drinking potentially contaminated or non-potable water)
  - “Other” could include mineralized water (see definition in Chapter 2: *Definitions & Clarifications*, Table 2-1)
- If gas is encountered, the Ministry of the Environment and Climate Change must be contacted (see “Notifications” section in this chapter)

FIGURE 13-14: WELL RECORD - WELL YIELD

**Results of Well Yield Testing**

After test of well yield, water was:  
 Clear and sand free  
 Other, specify \_\_\_\_\_

	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Disinfected?  
 Yes  No

**Disinfected?**

- Typically will be “yes” for water supply wells unless exempted such as a flowing well

**Results of Well Yield Testing (Static Level Box)**

- When a static water level measurement is required, it must be recorded in the “static level” box in this section
- See Chapter 11: *Yield Test* for information on testing the yield of the water in a well



## WELL RECORD DELIVERY

### NEW WELL CONSTRUCTION - WELL RECORD DELIVERY



A copy of the completed well record must be delivered by the person constructing the well to the well purchaser and land owner within 14 days after the date on which the well's structural stage is complete.



A copy of the completed well record must be forwarded by the person constructing the well to the Ministry at the Wells Help Desk, Ministry of the Environment and Climate Change, 125 Resources Road, Toronto Ontario M9P 3V6 within 30 days after the date on which the well's structural stage is complete.



A completed well record must be kept by the person constructing the well for at least two years.

### ALTERATIONS - WELL RECORD DELIVERY



A copy of the completed well record must be delivered by the person constructing (altering) the well to the well purchaser and land owner within 14 days after the date on which the well's structural stage is complete.



A copy of the completed well record must be forwarded by the person constructing (altering) the well to the Ministry at the Wells Help Desk, Ministry of the Environment and Climate Change, 125 Resources Road, Toronto Ontario M9P 3V6 within 30 days after the date on which the well's structural stage is complete.



A completed well record must be kept by the person constructing the well for at least two years.



Generally, a well record is not required to be completed for a minor alteration or the installation of a pump. If a well tag is broken, defaced, illegible or otherwise unusable, however, a well record is required to be completed with respect to the required replacement of the well tag, even during a minor alteration. See the “Broken, Defaced, Illegible or Unusable Well Tag” section later in this chapter for further information on the well tag replacement and the well record completion and submission requirements in this case.



Further information on the “well's structural stage completion”, “minor alteration” and “pump” can be found in Chapter 2: *Definitions & Clarifications*, Table 2-1. The term minor alteration is also discussed in the “Well Tags” section in this chapter.

## ABANDONMENT – WELL RECORD DELIVERY



On completion of the abandonment of a well, the person abandoning the well, often the well owner, must:

- within 14 days after the date on which the well construction equipment is removed from the site, deliver a copy of the well record to the owner of the land on which the well is situated; and
- within 30 days after the date on which the well construction equipment is removed from the site, forward a copy of the well record and any well tag that was removed from the well, to the Director.



See Chapter 15: *Abandonment: How to Plug & Seal Wells* for information on proper well abandonment.

### GENERAL NOTES ON WELL RECORD DELIVERY



Well records are forwarded to the Director c/o the Wells Help Desk, Ministry of the Environment and Climate Change, 125 Resources Road, Toronto Ontario M9P 3V6.



Examples of well construction equipment include: a grout pump, a tremie pipe, casing removal equipment such as a cutter or torch, a drilling rig, a boring rig, an excavator, a pump truck and drive point equipment.



The person abandoning the well is considered:

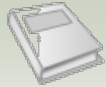
- The person constructing a well when the well has been discontinued prior to the completion of the well's structural stage and it must be immediately abandoned
- The well purchaser for a dry well that must be immediately abandoned
- The well owner for a well that must be immediately abandoned because it produces “mineralized water” or water that is not potable.
- The well owner for a well that must be immediately abandoned because it:
  - is not in use or being maintained for future use as a well
  - contains natural gas or other gas and the gas is not managed in a way that prevents any potential hazard
  - permits the movement of materials including natural gas and contaminants and the movement may impair the quality of any waters
  - is constructed in contravention of the **Wells Regulation** requirements for location, methods, materials or standards and measures taken to rectify the problem have failed



For information on when to abandon a well, see Chapter 14: *Abandonment: When to Plug & Seal Wells*.

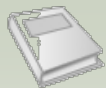
## WELL RECORD COPIES

The following best management practices have been developed to ensure well records are provided to the various parties and properly kept and stored.



### **Best Management Practice – Keeping Well Record**

Any well record for construction, alteration or abandonment should be kept longer than the 2 years required as this assists in responding to future enquiries regarding the well or other wells in the area.



### **Best Management Practice – Extra Well Record Copies**

If there are an insufficient number of true copies of the well record (e.g., if the well purchaser and owner of the land are different), the person completing the well record should provide the original well records to the owner of the land and the Ministry and provide a photocopy, or scanned copy, of both sides of the well record and any attachments to the well purchaser to meet the well record submission requirements. The person completing the well record should certify any extra copies of the well record at the time of well construction.



### **Best Management Practice – Make Extra Copies of the Well Record**

It is important that the well owner make additional copies of the well record and keep the copies in a location where they can be easily found, such as one or more of the following:

- Beside the pumping equipment
- With mortgage papers
- Land property survey
- In a safety deposit box
- Properly filed at the business' head office
- Electronically scanned and stored in a computer storage device and filed with other important papers

It is also recommended that all well records for wells, including the abandoned wells, be provided when the property is transferred to a new owner. The new well owner will then have knowledge of the location and status of the wells on the property to prevent:

- well damage from any new excavations or building on the property, and
- well contamination from any new source of contaminants constructed or placed near a well.

## WELL TAGS

The well tag is a unique identifier that links one well(s) in the field with the well record.

**FIGURE 13-15: SAMPLE WELL TAG**



### WELL TAGS FOR A WELL



Before the structural stage of a new cased well is completed, the person constructing the well must permanently affix a well tag, issued by the Ministry, to the outside of the casing or to a permanent structure associated with the well. The affixed tag must be visible and must not be obstructed by the well cap, other well components or by equipment associated with the well.



If an alteration, other than a minor alteration, is made to a cased well without a well tag, the person making the alteration must obtain and affix a Ministry well tag, as described above, before the alteration is completed.



A permanent structure associated with the well can include a protective well cover or flush-mounted well pit (vault), for example.



The Ministry provides a well tag sticker with each new well tag. The sticker has the same number or code as the well tag.



To link the well in the field with the well record, the person constructing (altering) the well must:

- place the well tag sticker for the new tag on the well record completed for the alteration or
- copy and record the alphanumeric code from the well tag on the well record completed for the alteration

In order to reduce the risk of transcription errors, it is recommended to use the well tag sticker, if available.



The **Wells Regulation** defines a “minor alteration” as any of the following:

- routine repair or maintenance,
- the installation of monitoring, sampling or testing equipment used to test the yield of the well or the aquifer,
- the installation of a pump in a test hole, or
- the installation of a well cap or watertight well cover



#### **Best Management Practice – Completing Well Record When Affixing a Well Tag**

A well record should be completed and submitted to ensure that the well in the field is linked to the well record when a well tag is affixed as a result of installing a pump and associated pumping equipment or altering the well to accommodate the pump or associated pumping equipment.



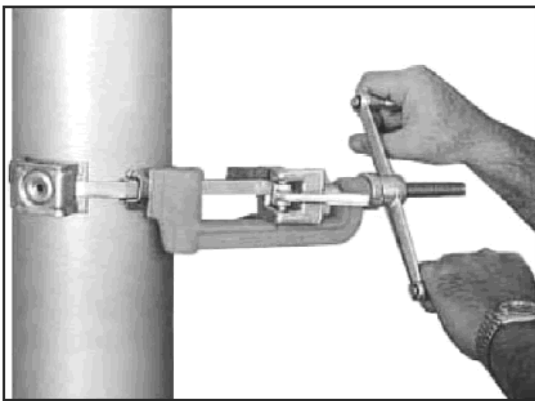
See the "Broken, Defaced, Illegible or Unusable Well Tags" section in this chapter for further requirements on replacing a well tag when conducting a minor alteration to a well.

## HOW TO ATTACH THE WELL TAG TO THE CASING

If the well tag is to be permanently affixed to the well casing, it is preferable to use a stainless steel strap. If strapping is not feasible, the tag may be tack welded into place. Strapping and welding rods made of stainless steel are essential to prevent corrosion. The well tag can also be lag bolted or screwed into concrete, affixed to a metal bracket, or affixed using a clamping gear.

If a strap is used, it should be placed through the slots in the tag, wrapped around the casing and crimped tight with a strapping tool. If tack welding, the four corners of the tag should be welded to the casing using stainless steel welding rods. If lagging or screwing is the selected method, the drill holes should not fully penetrate through the well casing. This would compromise the casing integrity.

**FIGURE 13-16: ATTACHING THE WELL TAG TO THE CASING**



The diagram shows a strapping tool used to affix metal straps and a well tag to a well. See description in the above text. Figure 13-17 shows the well tag affixed to the well using the metal strapping.

## ATTACHING WELL TAGS IN VARIOUS SCENARIOS

### SCENARIO # 1: THE CASING OF THE WELL EXTENDS ABOVE GRADE AND THE PUMP IS NOT POSITIONED OVER THE CASING

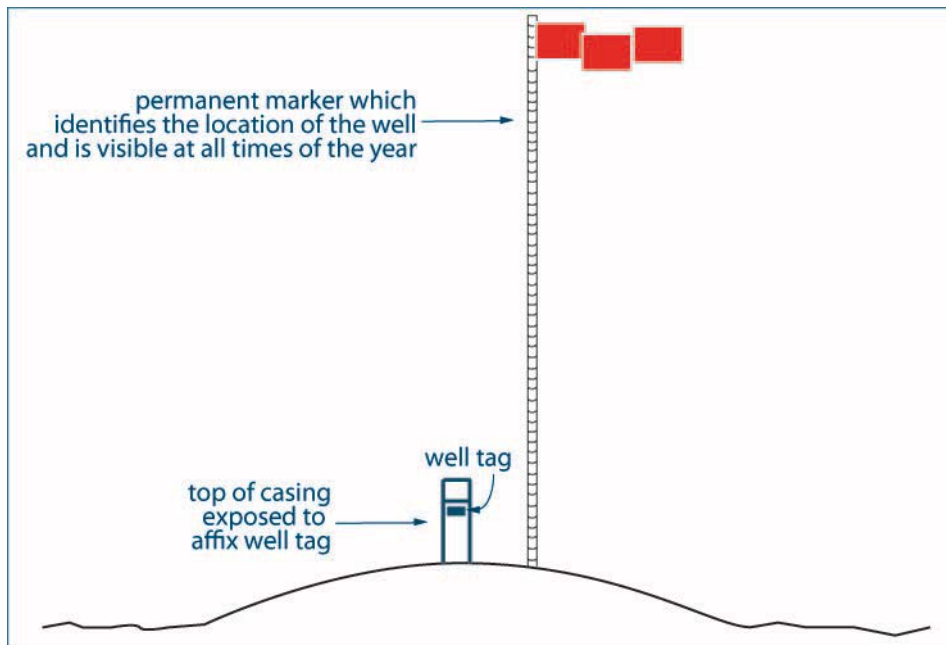
This scenario would include wells with a submersible pump or jet pump. The tag is affixed around the casing with a stainless steel strap (see Figure 13-16 for strapping tool) or, if strapping is not possible, the tag is welded into place with stainless steel rods or lag bolted/screwed into the concrete casing (Figure 13-18). In the case of a driven point well, when the casing is not higher than 40 cm above the ground level, a highly visible marker is also required to be placed near the well (see Figure 13-19).

**FIGURE 13-17: EXAMPLE OF PROPERLY ATTACHED WELL TAG**



**FIGURE 13-18: THREADED SCREWS ATTACHING WELL TAG TO CONCRETE CASING**



**FIGURE 13-19: WELL TAG AFFIXED TO A DRIVEN POINT WELL****SCENARIO # 2: THE CASING STICKS UP AND THE PUMP IS LOCATED DIRECTLY OVER THE CASING****FIGURE 13-20: WELL TAG ON EQUIPMENT ASSOCIATED WITH THE WELL AS CLOSE AS POSSIBLE TO THE CASING**

This scenario would include wells with a vertical turbine pump, or another type of pump positioned directly over the casing. Some methods of affixing the well tag include setting/screwing or lag bolting the well tag into the concrete well slab as close as possible to the casing. The well tag must remain visible and protected from wear and tear.





### SCENARIO # 3: THE PUMP AND CASING ARE LOCATED IN A PUMP HOUSE

#### FIGURE 13-21: INSIDE PUMP HOUSE WITH VISIBLE WELL TAG ON ASSOCIATED WELL EQUIPMENT

The presence of a well house does not affect the placement of the well tag. The tag location depends on whether the pump is positioned directly over or offset from the casing. The directions in Scenario #1 or #2 should be followed, whichever is appropriate. In addition, the well owner is encouraged to post a sign on the outside of the pump house, either next to the door or on the door, indicating the well tag number.



### BROKEN, DEFACED, ILLEGIBLE OR UNUSABLE WELL TAGS



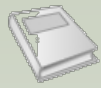
A person conducting an alteration, including a minor alteration, on a well with a well tag that is broken, defaced, illegible or otherwise unusable must:

- remove the well tag and return it to the Director,
- obtain a new well tag from the Ministry and, before the alteration is completed, permanently affix the well tag to the outside of the casing or to a permanent structure associated with the well, at a point where the well tag will be visible and will not be obstructed by the well cap, by other components of the well or by equipment associated with the well, and
- within 30 days after the new well tag is affixed to the casing, complete a well record with respect to the replacement of the well tag and forward a copy of the well record and the original well tag to the Director.



#### **Best Management Practice – Referencing the Original Well Tag Number**

When a well tag is replaced, the new well record for the replacement of a well tag should reference the original well tag number if it is available.



### Best Management Practice – Completing Well Record When Replacing a Damaged Well Tag

When filling out a well record for the replacement of a damaged well tag in the course of a minor alteration the person altering the well should:

- provide as much information as possible on the Ministry well record form in addition to information relating to the replacement of the well tag, and
- provide the well record to the well owner and well purchaser

If legible, the old well tag number should be indicated on the well record. The person performing the alteration should provide a copy of the well record to the well purchaser and the land owner. Well owners will therefore be informed that their well tag has been changed and possess all well records for their well. In these cases, the requirements related to forwarding the well record to the Ministry apply.

**FIGURE 13-22: BEFORE - WELL TAG MUST BE REPLACED**

**FIGURE 13-23: AFTER - WELL TAG REPLACED**



Figure 13-22 and Figure 13-23 show the before and after of a broken well tag that was replaced when a minor alteration (e.g., well cap removal) was made to the well. In this case, the well cap and conduit pipe were also upgraded to remove a pathway for foreign materials to enter the well.

## SAFEGUARDING THE WELL TAG



During alterations to a cased well with a well tag, the well tag must be safeguarded and, if removed, it must be re-affixed permanently to the outside of the casing or to a permanent structure associated with the well, upon completion of the alteration.

## WELL TAG RESTRICTIONS

To help locate and identify a well with a well tag in the field, the **Wells Regulation** provides the following well tag requirements that all persons must adhere to.



It is not permitted to deface, alter, conceal or obstruct a well tag.



It is not permitted to remove a well tag that is affixed to a well or a structure associated with the well unless:

- the person has the written consent from the Director,
- the well tag on the well that is being altered is broken, defaced, illegible or otherwise unusable, or
- the well is being altered or properly abandoned (plugged and sealed)



It is not permitted to use a well tag issued by the Ministry except in accordance with the **Wells Regulation**.



If no alteration to a well takes place, a person must not affix a Ministry issued well tag to the well or a structure associated with the well as this is not a permitted use of the well tag under the **Wells Regulation**. In other words, to identify unaltered existing wells in the field a person should use unique field numbers and must not use well tags.

## NOTIFICATIONS

The **Wells Regulation** does not require testing of water quality or gas during the construction of a well. Testing is typically completed after the well is ready to be put into operation by the well owner, an agent representing the well owner, or by another person. Advice and best management practices on safety considerations and identifying contaminants including gas are provided to persons constructing wells in Chapter 5: *Constructing the Hole, Casing & Covering Well*. If a person constructing a well identifies a gas or water quality issue; however, then there may be an obligation on the person to report the issue.

## NATURAL GAS



When natural gas is encountered, the person constructing the well must immediately notify the well purchaser, the owner of the land on which the well is located and the Director.

For further information on natural gas, see Chapter 2: *Definitions & Clarifications*, Table 2-3.

To report an observation of natural gas, the person could use the information in the “Best Management Practice - Encountering Contamination, Mineralized Groundwater or Gas” in this section.

## MINERALIZED WATER



If a person constructing a water supply well (e.g., drinking water well) notices mineralized water, the person must notify the well purchaser and the owner of the land on which the well is situated that the condition exists.

The information is important to allow for the determination of the type of treatment system that may be needed, the potential for mineralized water to impair other fresh groundwater zones and whether a written consent from the Director to not abandon the well is necessary.

## INFORMATION FOR WELL PURCHASER



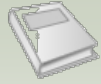
Unless the well purchaser otherwise directs, on the day that the structural stage is complete, the person constructing the well, other than a minor alteration, must:

- deliver an information package from the Ministry to the well purchaser,
- provide a water sample, of at least one litre, to the well purchaser for visual examination, and
- measure the depth of the well in the presence of the well purchaser.

Unless the well purchaser otherwise directs, on the day that a pump (which includes associated equipment) is replaced in an existing well, the person installing the pump must:

- deliver an information package from the Ministry to the well purchaser.

Before the well is used as a source of water for human consumption, the person who disinfects and tests the well water for free chlorine residual must provide the well purchaser with a written record of the test results (see Chapter 8: *Well Disinfection*).



### Best Management Practice – Informing the Well Owner of Nearby Sources of Contamination

The well owner should be immediately informed if it becomes known that the existing well is located on or near a source of contamination (see Chapter 4: *Siting the Well*).



### Best Management Practice – Reporting Detection of Colour, Odour or Other Problems

In addition to the requirement to record observed water quality problems on the well record, detection of colour, odour or other problems with the well water should be reported to the well purchaser and land owner, and the observations should be recorded on the well record. To protect all parties, a written copy of the notification of water problems should be provided to the well purchaser and land owner. A copy of the written notification should also be retained.



It is important to use field testing equipment instead of tasting well water to avoid drinking potentially contaminated or non-potable water.



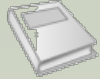
### Best Management Practice – Educating the Well Owner

The well owner has responsibilities under the **Wells Regulation** for every well on his/her property. In some cases, this may be the well owner's first well and the well owner may not know how to maintain the well and protect the water supply. The person constructing the well should explain the following to the well owner using plain language:

- How to care for a well
- The requirements for maintaining and abandoning the well
- The construction details, water quantity, water quality and other sections of the well record (for new wells or altered wells)
- The next steps such as pump installation (for new wells)
- The importance of reviewing the Ministry information package about wells
- The importance of keeping the well accessible for future maintenance
- Any other information, including the **Wells Regulation** and relevant internet websites



If unexpected problems with water quality or a gas, which is not considered natural gas, are observed during well construction or abandonment, the person completing the work should consider the following best management practice.



### **Best Management Practice – Encountering Contamination, Mineralized Groundwater or Gas**

If unexpected contamination or gas is encountered in the construction (including alteration) of the well, the person who is working at the well should stop work immediately to reduce serious dangers to the site crew, well owner and the environment.

To meet the obligation of reporting natural gas to the Director, the person constructing the well should contact the Ministry of the Environment and Climate Change through the Ministry's Spills Action Centre (SAC) at 1-800-268-6060. The SAC is available to take calls 24 hours a day, 365 days a year and alerts various Ministry organizations including the Director. In addition, the local fire department should be contacted.

Unexpected contamination or gas<sup>1</sup> that is encountered in a well should be reported to the well owner and SAC or the Ministry of the Environment and Climate Change local district office (see Resources at the end of this manual for contact information).

The Ministry can offer assistance and notify other agencies to help reduce serious dangers to the site crew, well owner and the environment.

If water quality problems associated with the groundwater (e.g., turbidity), other than "mineralized water" are observed, the person who is working at the well should immediately inform the well purchaser and the owner of the land on which the well is situated. This information can be used to determine if the water quality issues could: cause any impairment to other waters, affect sample results, treatment systems, or impact the well and other equipment associated with the well (e.g., corrosive groundwater on casing).

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<sup>1</sup> This applies to gases that are not considered naturally occurring gases

# TOOLS

**FIGURE 13-24: EXAMPLE OF THE FRONT PAGE OF A LOG**

<b>LOG</b>			MEASUREMENT RECORDED IN:		
NAME OF WELL TECHNICIAN _____ DATE WORK COMPLETE (YY/MM/DD) _____			METRIC <input type="checkbox"/> IMPERIAL <input type="checkbox"/>		
<b>Well Owner and Location Information:</b>					
FIRST NAME		LAST NAME	ADDRESS OF WELL LOCATION (STREET NAME AND NUMBER)		
TOWNSHIP	LOT	CONCESSION	COUNTY/ DIST/ MUNIC	CITY/ TOWN/ VILLAGE	
NAD 83					
ZONE	EASTING	NORTHING			
<b>Geo - Log:</b>					
COLOURS: WHITE, GREY, BLUE, GREEN, YELLOW, BROWN, RED, BLACK					
MATERIALS: FILL, MUCK, PEAT, CLAY, SILT, GRAVEL, STONES, BOULDERS, TOP SOIL, LIMESTONE, FINE SAND, MEDIUM SAND, COARSE SAND, DOLOMITE, SHALE, SANDSTONE, SLATE, QUARTZITE, GRANITE, GREENSTONE					
GENERAL DESCRIPTION: LOOSE, POROUS, DENSE, PACKED, CEMENTED, LAYERED, SOFT, HARD, PREVIOUSLY DUG OR BORED, PREVIOUSLY DRILLED, WOOD FRAGMENTS					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GEN. DESCRIPTION	COMMENTS	DEPTH (m/ft) FROM TO

**FIGURE 13-25: EXAMPLE OF THE BACK PAGE OF A LOG**

Map of Well Location:				Results of Well Yield Testing:					
		After test of well yield, <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other _____ IF PUMPING DISCONTINUED, GIVE REASON _____		DRAWDOWN (cm/in) TIME (MIN.)      WATER LEVEL		RECOVERY (cm/in) TIME (MIN.)      WATER LEVEL			
		PUMP INTAKE SET AT (m/ft) _____  PUMPING RATE (l/min / GPM) _____  DURATION OF PUMPING _____ HRS + _____ MIN		STATIC LEVEL 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 10 _____ 15 _____ 20 _____ 25 _____ 30 _____ 40 _____ 50 _____ 60 _____		1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 10 _____ 15 _____ 20 _____ 25 _____ 30 _____ 40 _____ 50 _____ 60 _____			
		FINAL WATER LEVEL END OF PUMPING (m/ft) _____  DISINFECTED: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<b>Construction Record - Screen</b>					
LOT/CONCESSION NUMBERS NOT KNOWN		OUTSIDE DIAM. (cm/ in) _____		MATERIAL _____		SLOT # _____		DEPTH (m/ft) FROM   TO	
<b>Water Details:</b> WATER FOUND AT DEPTH _____ (m/ft) <input type="checkbox"/> GAS      KIND OF WATER FRESH/UNTESTED/OTHER WATER FOUND AT DEPTH _____ (m/ft) <input type="checkbox"/> GAS      KIND OF WATER FRESH/UNFRESH/OTHER WATER FOUND AT DEPTH _____ (m/ft) <input type="checkbox"/> GAS      KIND OF WATER FRESH/UNFRESH/OTHER		<b>Hole Diameter:</b> DEPTH (m/ft) FROM      TO      DIAM. (cm/in)		<b>Construction Record - Casing:</b>					
<b>Annular Space:</b> DEPTH (m/ft)      FROM      NO. BAGS TO      MATERIAL      PLACED		WELL OWNER'S INFO PACKAGE DELIVERED YES _____ NO _____ DATE PACKAGE DELIVERED (YY/MM/DD) _____/_____/_____.		LENGTHS OF CASING BROUGHT TO JOB SITE (m/ ft) _____ _____ _____		INSIDE DIAM. (cm/ in)      OPEN HOLE OR MATERIAL      WALL THICKNESS      DEPTH (m/ft) FROM   TO			
				LENGTHS OF CASING INSTALLED IN WELL (m/ft) _____ _____ _____					



Figure 13-24 and Figure 13-25 can be photocopied front to back and used in the field.