

# GEOLOGIC INFORMATION PORTAL USER GUIDE

WASHINGTON  
DIVISION OF GEOLOGY  
AND EARTH RESOURCES

October 2012

*This report has not been edited or reviewed for conformity  
with Division of Geology and Earth Resources  
standards or geologic nomenclature*



WASHINGTON STATE DEPARTMENT OF  
**Natural Resources**  
Peter Goldmark - Commissioner of Public Lands

## Contents

[Overview](#)

[Using the Toolbar](#)

[Working with the Tool Windows](#)

[Working with Layers and the Map Contents](#)

[Identifying Features on the Map](#)

[Querying Layers](#)

[Using the Draw and Measure Tool](#)

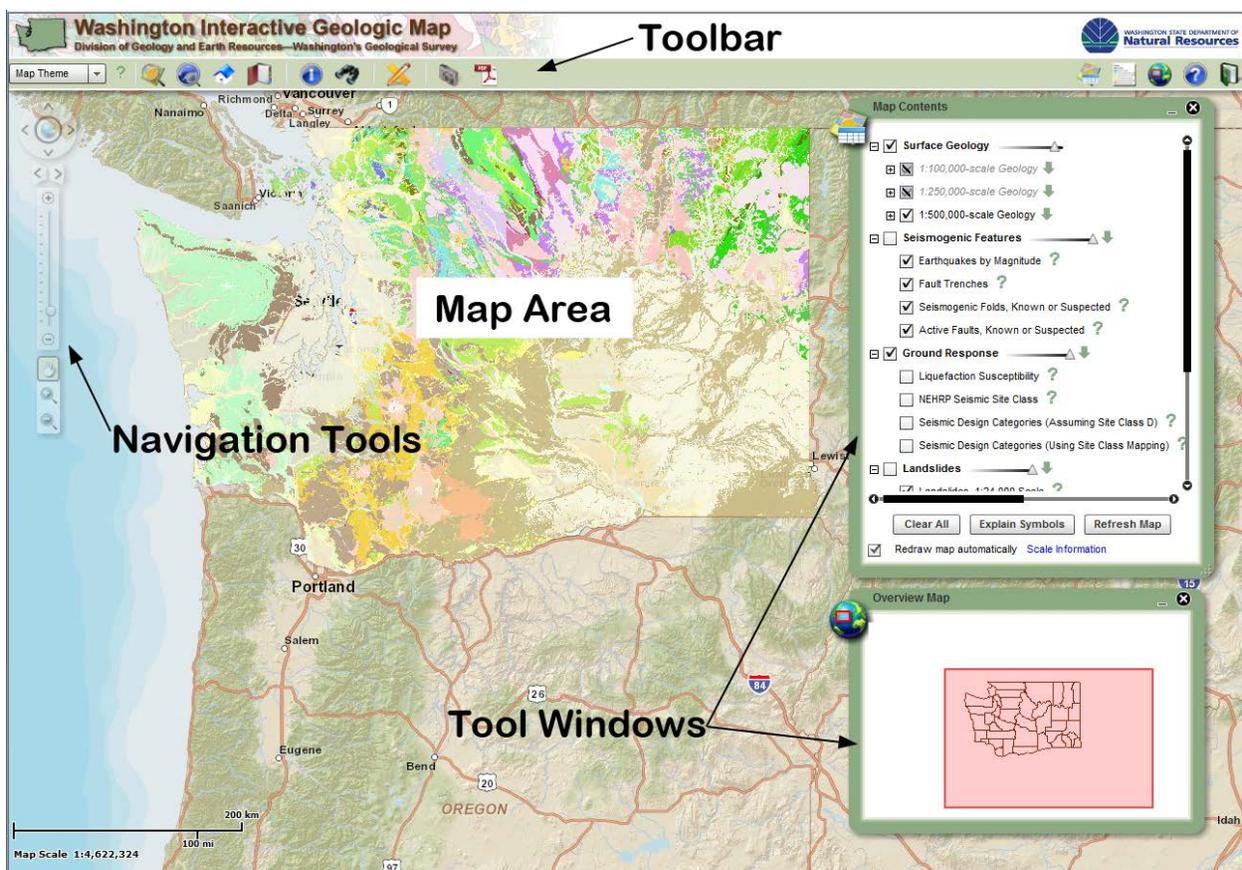
[Tips and Tricks](#)

[Still Need Help?](#)

## Overview

Interactive map applications at the Washington State Geologic Information Portal allow you to create custom maps, find more information about map features, and download some of the data displayed on the map.

The application window consists of four main parts:



## Map Area

This is the main area of the application window, and displays a map according to what area you have zoomed to and what layers you have turned on in the Table of Contents.

## Navigation Tools

Navigation Tools allow you to zoom, pan, scale, and return to full, previously-seen extents. For more information on navigation tools, please see [Navigating the Map Display](#).

## Toolbar

The toolbar contains several tools to help you find the map area you want and find out more information about particular map features. For more information on the toolbar, please see [Using the Toolbar](#).

## Tool Windows

Some of the tools on the toolbar bring up small windows on the right side of the application window, which allow you to perform various functions such as choosing tool options and modifying the map display. The Table of Contents and the Overview Map windows display by default; others can be brought up by clicking the associated tool on the toolbar. For more information on using the tool windows, please see [Working with the Tool Windows](#).

[<Back to Top>](#)

## Navigating the Map Display

As seen in the graphic below, you can navigate around the portal map display by using the tools provided in the navigation tool cluster that floats in the map display. The navigation tool cluster display is faded out unless you hover the cursor over the navigation tools. The zoom in and zoom out tools work by clicking on a location in the map display and expanding the zoom area extent box to the desired extent while holding down the left mouse button. Double-clicking the pan tool in the map area re-centers the map on the location double-clicked. The 360° pan tool allows you to zoom NW, NE, SW, and SE in addition to N, W, S, and E.

The portal works by caching the map layers at a number of predefined scales. Therefore, the map does not often display at scales considered to be typical (for example, 1:24,000 or 1:500,000, etc.), nor can the predefined scales be changed by the user (sorry!). The cached scale values can be viewed by left-clicking and holding down mouse button on the sliding scale adjustor button.



## Using the Toolbar

The toolbar allows you to interact with the map using various tools. To use a tool in the toolbar, click on the tool you want to use. Some tools do an action immediately upon clicking the toolbar, while others require that you then click on the map; see the instructions below for using each individual tool. The results of using a tool depend on the tool. The map appearance may change, such as zooming in or out, or results may appear in a pop-up window, such as with the Identify tool.

### Toolbar - Left Side



Select the map theme you wish to view from this drop-down menu. Changing the map theme changes what layers are shown by default. Eight themes are currently available. (1) Washington Interactive Geologic Map, (2) Landslides in Washington State, (3) Tsunami Evacuation Map, (4) Lahar Hazards, (5) Geothermal Resources of Washington, (6) Subsurface Geology Information System, (7) Earth Resource Permit Locations, and (8) Washington State Coal Mine Map Collection. The  icon next to the Map Theme list provides a detailed description of each map theme.



#### Zoom by Geographic Area

To zoom to a particular geographic area (such as a particular county, township, section, 7.5-minute quadrangle, or 30- by 60-minute quadrangle), click the tool to display a pop-up window. Select the type of area you want to zoom to from the drop-down list and then select the particular area from the additional drop-down list(s) that appear.



#### Zoom to Lat/Long

To zoom to specific latitude and longitude coordinates, click the tool to display a pop-up window. You may enter coordinates in decimal degrees; degrees and decimal minutes; or degrees, minutes, and decimal seconds.



#### Locate Address

To locate and zoom to an address, click the tool to display a pop-up window. Enter an address (or part of an address), and the map will zoom to that address.



#### Spatial Bookmarks

Clicking the Spatial Bookmarks icon opens a dialog box that allows the user to create bookmarked extents of their mapped area of interest, and to save them to their system for future use in the Geologic Information Portal, or to send them by email.



#### Identify

To display more information about a feature displayed on the map, click this tool, and then click on the feature of interest. A small marker is added to the map and a pop-up window displays more information about the feature(s) you clicked on. See [Identifying Features on the Map](#) for more information on how to use the identification information.



#### Query Layers

To find features in a layer that meet certain criteria, click this tool to display a pop-up window. The window allows you to specify the criteria to be met; results are presented in a table, where you can click on individual results to zoom to the associated map feature. For more help using the Query Layers tool, please see [Querying Layers](#).



#### Draw and Measure

To add points, lines, polygons, or text to the map display, click on this tool to display a pop-up window. On the window, select the tool for what you would like to add to the map. If you would also like for the tool to provide you with measurements of the object you draw, make sure the "Show Measurements with Graphics" box is checked; this function is handy for identifying the latitude and longitude of a point on the map. You can delete objects that you have drawn by right-clicking on the object, and selecting Clear. Please note that any objects you draw on the map are only temporary, and will be erased when you close the interactive map application. For more help using the Draw and Measure tool, please see Using the [Draw and Measure Tool](#).



#### Download Georeferenced Map Snapshot

To save an image of the current map view, click the tool. On the window that is

displayed, click the button to download a zip file containing an image of the map view (including any graphics you have drawn). This image is accompanied by a "world file" (ending in .jpgw) and a geographic reference file (ending in .aux.xml), both of which contain information on the geographic location and projection of the downloaded image to allow geographic information system (GIS) software to display the image in its correct geographic location. If you are using ESRI ArcGIS software, ArcMap will automatically read the projection file if it is in the same directory as the image; if you are using another GIS software, you can use a text editor to open and read the projection file; you would then manually enter the projection for the image in your software.



#### Create PDF for Printing

To save a PDF file of the current map view, click the tool. On the window that is displayed, you may specify the title of the map document, whether or not to include a location/overview map, and which layers' symbols you want included in the legend. Clicking "Create Print Page" then produces a PDF that you can print and/or save to your computer.

#### Toolbar - Right Side



#### Map Contents

Clicking this tool will display the map's table of contents, which shows all of the layers that can be displayed in the map. For more information on the table of contents, please see [Working with Layers and the Map Contents](#).



#### Map Legend

Clicking this tool will display the map's legend, which explains all of the colors and symbols appearing in the current map display.



#### Overview Map

Clicking this tool will display a small window showing the entire map extent, including a red box indicating the current map view. You may center the main map area on a different area by dragging the red box on the overview map.



#### About the Mapping Application

Clicking this tool will display a window with an overview description of the interactive map application, links a quick-reference tool index, and the downloadable PDF of the complete Geologic Information Portal User's Guide that you are reading now.



#### Geology Dictionary

Clicking this tool will open a website that provides definitions for geologic terms; this can be useful if you come across unfamiliar geologic terms when using the interactive map.

[<Back to Top>](#)

## Working with the Tool Windows

Tool windows appear as floating pop-up boxes inside of the map area. Once a tool window is on the screen, you can move it around by dragging the frame of the window. A few more things you can do, using the icons in the upper right corner of the tool window:

-  Clicking this icon will minimize the tool window, collapsing it down to show the tool icon and only as much of the title bar that can display on the minimized window area. This is useful if you need to see more of the map area, but don't want to close the tool window completely. To re-expand the tool window, click on the pictorial icon that appears in the tool window title bar.
-  Close a tool window by clicking this icon.

If you see scroll bars along the bottom and right sides of a tool window, be sure to click and drag the black bars (or click the arrows at either end of each scroll bar) to view additional information in the tool window.

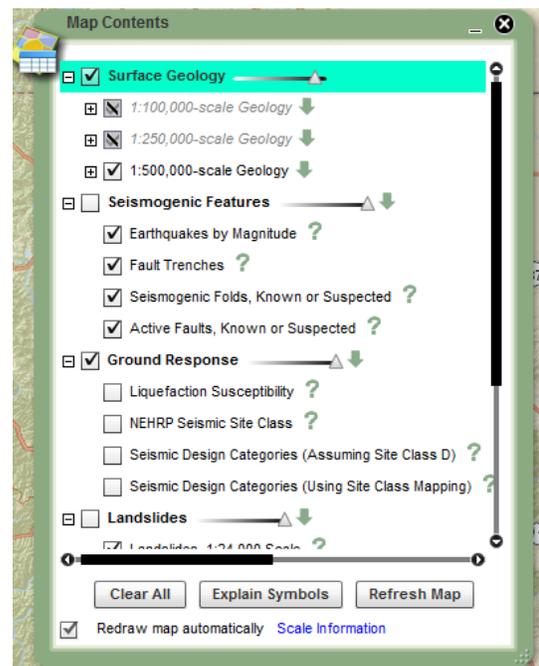
When the map application starts, the Map Contents window shows on the screen by default; other tool windows can be brought up by clicking the associated tool on the toolbar. For more information on the Map Contents, please see [Working with Layers and the Map Contents](#).

[<Back to Top>](#)

## Working with Layers and the Map Contents

The Map Contents appears on the right side of the map area, and shows all of the map layers available for view. A map layer is a type of data shown on the map, such as geologic polygons, faults, a street map, or a satellite image. You use the Map Contents to turn on and off layers, access a description of each layer, adjust layer transparency, and download data (where available).

Map layers are organized into groups. Each group has a plus or minus button next to it, which allows you to display or hide the list of map layers within that group. A check box next to each group and layer name indicates whether the group or layer is currently turned on. You can click the check box next to a group or layer name to turn the group or layer on or off. Be aware that in order for a layer to display on the map, both the layer and the group it is in must be turned on.



Next to each layer group is a slider  that controls the transparency of the group's layers on the map display. This can be handy if you are viewing layers from multiple groups at one time, and need for a layer to be semi-transparent in order to see a layer beneath it.

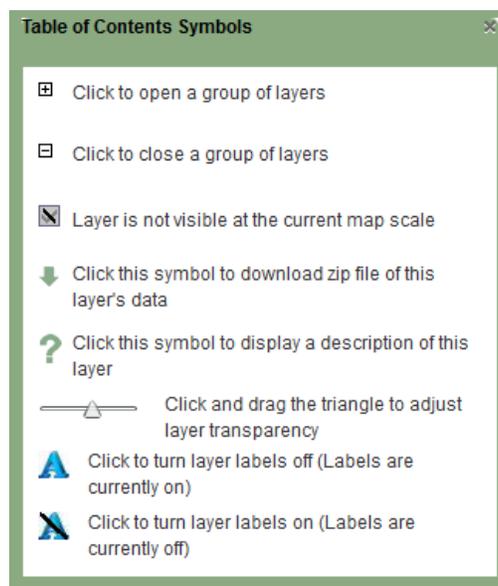
Normally, when you turn a layer on or off, the map redraws automatically to reflect the changes in layer visibility. However, if you prefer, you can uncheck the "Redraw map automatically" option, and the map will only redraw when you click the "Refresh Map" button.

Some layers may not be visible at the current map scale (zoom level). These layers are called 'scale dependent'. The names of layers that are not visible at the current map scale display in gray italics. You may need to zoom the map in or out to see a particular layer displayed, even if its check box is checked to draw. For information on the scale dependency for all available layers, click the "Scale Information" link in the lower right corner of the Map Contents.

If a layer has an arrow  next to the name, you can click on the arrow to download a data file for that layer for use in your geographic information system. Please note that each data file contains the data and metadata only (points, lines, or polygons, with associated attributes and metadata), and does not include symbology. You will need to apply your own symbology within your geographic information system.

To find out more about a layer, click the question mark  next to the layer name. This will bring up a brief description of the layer's purpose and content.

A quick view of the Map Contents icon functions is found by clicking on the "Explain Symbols" button at the bottom of the Map Contents window. It will bring up the following pop-up symbols index:

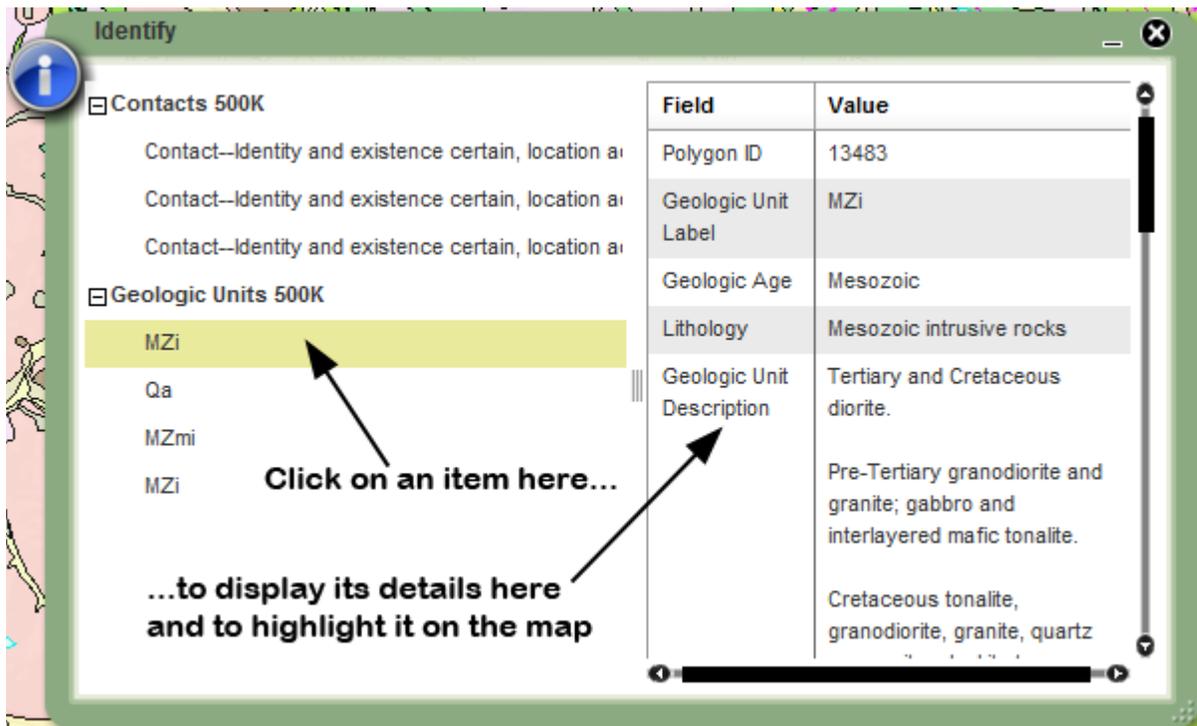


[<Back to Top>](#)

## Identifying Features on the Map

(Please note: Two of the map themes - Subsurface Geology Information System and Washington State Coal Mine Map Collection - have specialized Identify tools. Please see [Identifying Features in the Subsurface Geology Information System](#) and [Identifying Features in the Washington State Coal Mine Map Collection](#).)

If you want to get more information about a feature on the map, you can do so using the Identify tool. To identify a feature, click the Identify button  on the toolbar, then click on the feature you want to identify. A pop-up window will display the names of layers containing features at (or very near) the location you clicked, and a list of identified features in each layer. Clicking on an item in the list will highlight the feature on the map and cause the details on the selected feature to appear on the right side of the pop-up window. Note that the tool will identify features only in layers that are currently visible in the map view.

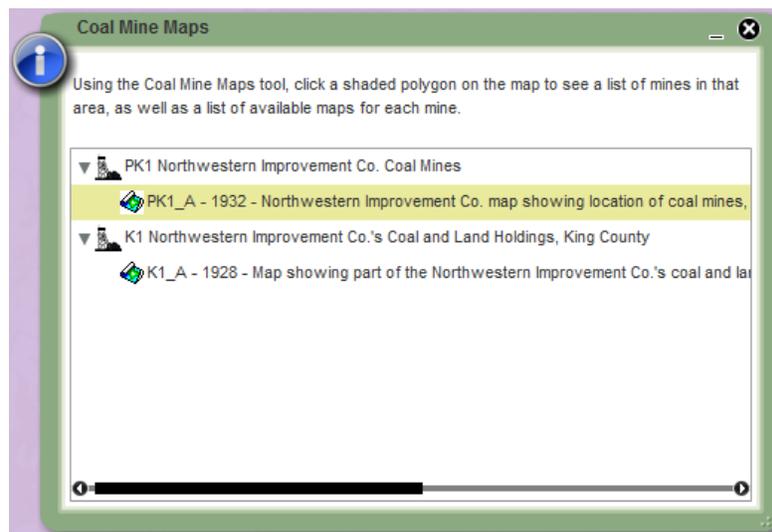


 **Identifying Features in the Subsurface Geology Information System**  
In addition to the standard Identify tool, the Subsurface Geology Information System map theme has an additional customized Identify tool that provides information on the geologic layers encountered beneath the surface at the point locations displayed on the map. (This tool only works on the Subsurface Points layer; use the standard Identify tool for all other layers). To begin using the customized Identify tool in this map theme, click on the Identify icon with a purple diamond on the toolbar; the Subsurface Data tool window will appear, but it will

not yet display any data. Once you use the tool to click on a point feature on the map, the Subsurface Data tool window will show the information for each point at (or very near) the location you clicked. A red “X” will appear over the selected point. The tool window only shows one point at a time; to see the data for other points at or near the location you clicked, use the Next Point and Previous Point buttons (only visible when more than one point is found). Be sure to use the scroll bar at the right side of the tool window to see more information, including the geologic layers beneath the point location.

### Identifying Features in the Washington State Coal Mine Map Collection

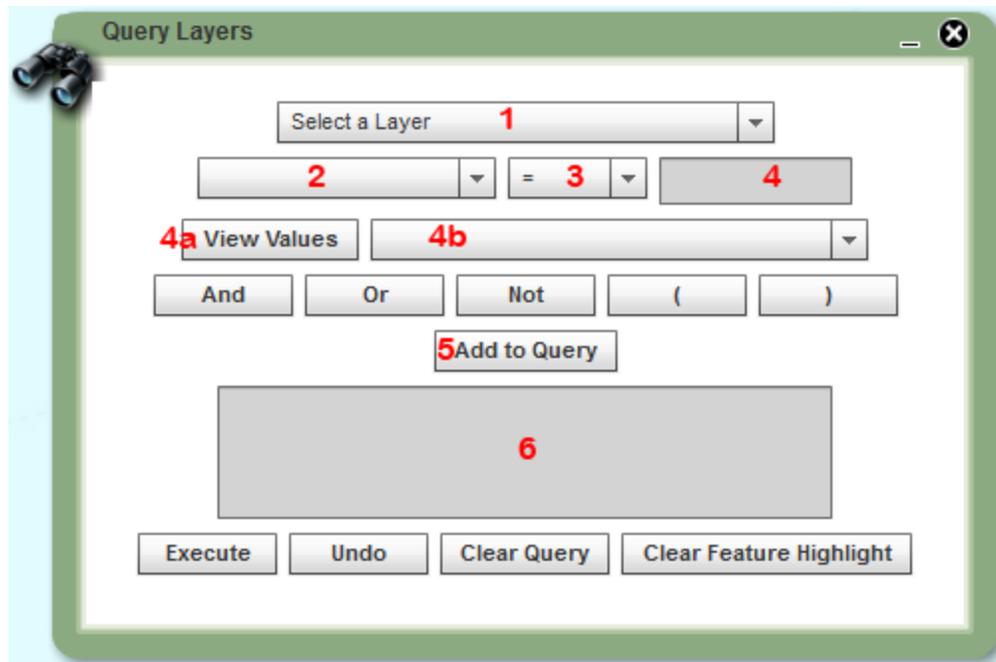
To begin using the Identify tool in this map theme, click on the Identify icon  on the toolbar; the Coal Mine Maps tool window will appear, but it will not yet display any data. Once you use the Identify tool to click on a polygon on the map, the Coal Mine Maps window will show a list of mine areas that are included (either wholly or in part) within any polygons that overlap the location you clicked. Underneath the name of each mine area is a listing of the coal mine maps available for that mine area. Clicking on an individual map in the list will bring up a PDF file of the actual map in a new window, which you can view, print, and/or save to your computer.



[<Back to Top>](#)

### Querying Layers

The Query Layers tool allows you to find all features in a layer that meet a certain set of criteria that you specify. For those familiar with GIS software, this is equivalent to the "Select by Attribute" function. Selecting the Query Layers tool on the toolbar will bring up a window that allows you to specify the criteria for features to be found. Instructions for using this window:



- The first step is to select the layer that you wish to query in the first drop-down box (1). Note that the Query Layers tool can only query one layer at a time.
- Once you have selected the layer of interest, the fields drop-down box (2) will be filled out with the fields available in the selected layer; choose the field you wish to query in this drop-down box. Note that it may take a moment or two for the field list to appear in this box.
- Next, select a logical operator (3). This operator is used to create an expression for comparing the value that you specify in the attribute value box (4) to the attributes of the features in the selected layer to determine which features match your selection criteria. For features for which the expression results in an answer of "true", the feature is returned in the query results; for features for which the expression results in an answer of "false", the feature is not returned in the results. Available operators are: = (equals), <> (is not equal to), < (is less than), > (is greater than), <= (is less than or equal to), >= (is greater than or equal to), and LIKE. The 'LIKE' operator allows you to use wildcards in the attribute value box, to find features that contain a particular sequence of characters somewhere in the specified field (more on this below).
- After selecting an operator, you will need to specify the attribute value (4) that will be compared to the feature attributes in the selected layer. You can do this in one of two ways:
  - Type the value directly in the attribute value box (4). If the value you are entering is a string (text), use single quotes around the value (for example, 'Qgd'). This is the method you will probably use if you want to use the 'LIKE' operator, since you will probably be searching for only part of the value of a field; the wildcard character is the percent sign (%). For example, if you want to find all features in the Geologic Units 250K layer that contain the word "argillite" anywhere in the field, your expression would look like this: Geologic Unit Description LIKE

'%argillite%'. (Include the single quotes!)

OR:

- Allow the tool to show you what values are present in the selected field, so you can select the desired value from a drop-down box. To do this, click the View Values' button (4a). Doing this will cause the entire list of values present in the selected field to be shown in the values drop-down box (4b); selecting a value in this dropdown will cause the value to be automatically entered in the attribute value box (4). Note that it may take a moment or two for the value list to appear in the drop-down box.
- Once you have created a complete expression containing a field name, operator, and attribute value, you must click the Add to Query button (5) to add the expression to the query box (6).
- If you need to further refine your query, you can add more expressions, each separated by AND, OR, or NOT (these can be inserted using the buttons above the Add to Query button).
- Once your complete query is entered into the query box (6), click the Execute Query button. The features matching your query criteria will be highlighted on the map, and a results table will pop up providing details on each feature. Note that the query may take a few moments, particularly if your query is complex and/or the layer you are querying contains a large number of features. Selecting a feature in the results table will zoom the map view to that feature and highlight it in yellow.

#### Things to note about the query layers tool

- The Query Layers tool will not return more than 1000 features at a time.
- Once you have formed a query expression, make sure you click the Add to Query button to add the expression to the query box before clicking Execute Query. The query will only operate on what is in the query box/ anything in the field, operator, or attribute value boxes will be ignored if it hasn't been added to the query box.
- The query is *case sensitive*, meaning that it will only look for values that are capitalized exactly like the value you enter. So, in the "argillite" example above, the query would find instances of "argillite", but not "Argillite" (which might occur at the beginning of a sentence); in this case, your query might look like this: Geologic Unit Description LIKE '%argillite%' OR Geologic Unit Description LIKE '%Argillite%'.

#### Query Examples

Example 1—Find all polygons in the Geologic Units 500K layer that contain alluvium:

- Geologic Unit Description LIKE '%alluvium%' OR Geologic Unit Description LIKE '%Alluvium%'

Example 2—Find all oil and gas wells drilled in King and Snohomish Counties:

- County Name = 'King' OR County Name = 'Snohomish'

Example 3—Find all permitted surface mines in Thurston and Pierce Counties that produce clay:

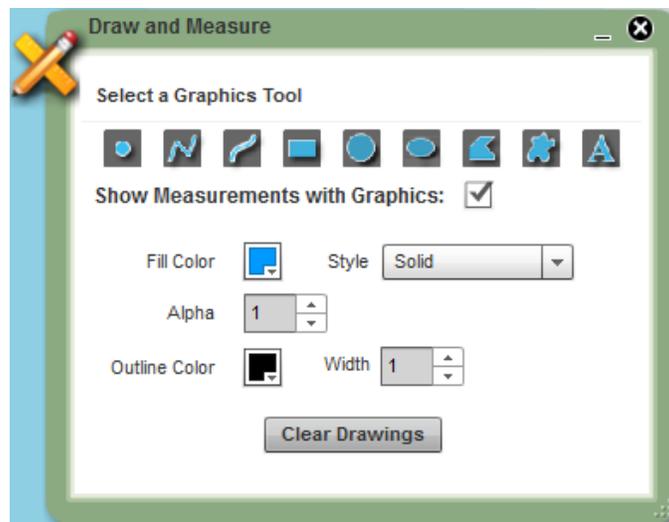
- (County = 'Thurston' OR County = 'Pierce') AND Commodity = 'Clay'

[<Back to Top>](#)

### Using the Draw and Measure Tool

This tool allows you to draw points, lines, and polygons, while at the same time allowing you the option of measuring those objects as you draw them. It also allows you to add text to the map. Please note that any objects you draw on the map are temporary; they will disappear if you close or reload the interactive map application. However, the objects will not disappear if you simply change map themes (using the Map Theme drop-down on the toolbar).

Clicking Draw and Measure on the toolbar will bring up a window showing all of the available drawing tools.



The “Clear Drawings” button is only visible after you have drawn something on the map. Clicking on this button clears all drawing and annotation you have made. If you wish to clear only certain elements, right-click on each individual element and choose “Clear” to delete it from the map.

“Alpha” controls the transparency of the shape you are drawing on a scale of 0 to 1, where 0 is completely transparent and 1 is opaque.

-  Add Point—Select this tool, and click once on the map to add a point. To use this tool to find out the coordinates of a location, make sure "Show Measurements with Graphics" is checked.

-  Add Line—Select this tool, click once on the map to begin the line, then proceed to click once on the map for each subsequent node/vertex you want on your line. Double-click where you want to end the line.
-  Trace a Freehand Line—Select this tool, click and hold your mouse button on the map, and drag your mouse (while still holding down the mouse button) to draw a line. Release the mouse button when you are finished drawing.
-  Add Rectangle—Select this tool, click and hold your mouse button on the map where you want one corner of the rectangle, and drag your mouse (while still holding down the mouse button) to where you want the opposite corner of the rectangle. Release the mouse button when you are finished.
-  Add Circle—Select this tool, click and hold your mouse button on the map where you want to center the circle, and drag your mouse (while still holding down the mouse button) to create a circle of your desired size. Release the mouse button when you are finished.
-  Add Ellipse—Select this tool, click and hold your mouse button on the map where you want to center the ellipse, and drag your mouse (while still holding down the mouse button) to create an ellipse of your desired size. Release the mouse button when you are finished.
-  Add Polygon—Select this tool, click once on the map to begin the polygon, then proceed to click once on the map for each subsequent node/vertex you want on your polygon boundary. Double-click where you want to end the polygon.
-  Trace a Freehand Polygon—Select this tool, click and hold your mouse button on the map, and drag your mouse (while still holding down the mouse button) to draw a polygon. Release the mouse button when you are finished drawing.
-  Add Text—Select this tool and click once on the map where you want to place text; type to insert text at the blinking cursor.

Show Measurements with Graphics—If this is checked, when you finish drawing an object (other than text), a table will appear giving the measurements for the object.

[<Back to Top>](#)

### Tips and Tricks

- If you want to move from one area of the map to another, it may be faster to zoom to full extent and use the Zoom In tool on the area you want, rather than using the Pan tool to drag the map.
- If the map or any of the tools have trouble loading, try restarting the application (by clicking "Refresh" on your browser), or try closing and restarting your browser. If the

problem persists, try deleting cookies and temporary internet files (see the help for your particular browser for instructions), and then closing and restarting your browser.

### Still Need Help?

If you still need help using our interactive maps, or have a comment or question, please contact us at [geology-portal@dnr.wa.gov](mailto:geology-portal@dnr.wa.gov).

[<Back to Top>](#)