



**Water Quality Planning Bureau**

**Downloading Data from  
the Water Quality Portal**

**Information Management and Technical Services Section  
Water Quality Planning Bureau  
Water Quality Division**

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Document History			
Revision #	Revision Date	Revised By	Notes
1.0	6/28/2018	Jolene McQuillan	Initial document development

Acronyms		
<b>Acronyms</b>	EPA	Environmental Protection Agency
	HUC	Hydraulic Unit Code
	MTDEQ	Montana Department of Environmental Quality
	NWIS	National Water Information System
	NWQMC	National Water Quality Monitoring Council
	SRS	Substance Registry System
	STORET	STOrage and RETrieval
	USGS	United States Geological Survey
	WQP	Water Quality Portal
	WQPB	Water Quality Planning Bureau
	WQX	Water Quality eXchange

## 1.0 General Information

The purpose of this document is to provide some guidance and examples on how to access data from the Water Quality Portal (WQP). The WQP is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). It serves data collected by over 400 state, federal, tribal, and local agencies.

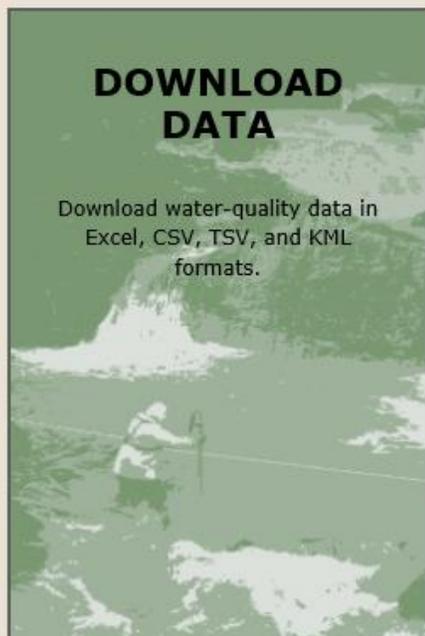
As of July 2018, the WQP has replaced the STORET Warehouse. The WQP is now the main way to publically access Montana Department of Environmental Quality's (MTDEQ) data that is stored in EPA's Water Quality eXchange (WQX) Warehouse. The WQP allows for data from STORET, WQX, and USGS's National Water Information System (NWIS) to be integrated when downloaded.

### 1.1 Water Quality Portal Guidance

In addition to the guidance found in this document, the WQP has its own user guide and frequently asked questions located at: <https://www.waterqualitydata.us/>.

## Water Quality Portal

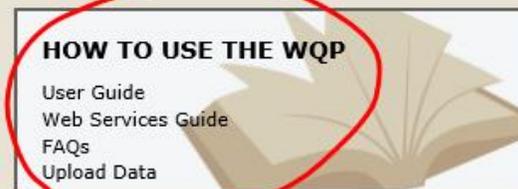
The Water Quality Portal (WQP) is a cooperative service sponsored by the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), and the National Water Quality Monitoring Council (NWQMC). It serves data collected by over 400 state, federal, tribal, and local agencies.



**DOWNLOAD DATA**

Download water-quality data in Excel, CSV, TSV, and KML formats.

The banner features a green-tinted background image of a person in a waders sampling water from a stream.



**HOW TO USE THE WQP**

- User Guide
- Web Services Guide
- FAQs
- Upload Data

The banner features a background image of an open book. The text and list are enclosed in a red hand-drawn circle.



**NATIONAL RESULTS COVERAGE**

Water-quality data in your state.

The banner features a background image of a map of the United States.



**ABOUT THE WQP**

- What is the WQP?
- Contributing organizations
- Other Water Quality Portals
- Explore WQP Sites

The banner features a background image of a bar chart with a vertical axis labeled '1,000'.

## 2.0 Portal Search Parameters

The WQP can be searched through three different search options: 1) location parameters, 2) site parameters, and 3) sampling parameters. When selecting parameters, any field left blank will cause a search for all parameters in that field. Clicking on the question marks next to the various search parameters will provide additional guidance in a pop-up box. Some of the more detailed parameters are discussed below.

### 2.1 Location Parameters

The location parameter section allows you to narrow your search by country, state, county, point location, or bounding box.

LOCATION

Place:

Country: All ? Within [ ] North: [ ]

State: All ? miles of South: [ ]

County: All ? Lat: [ ] East: [ ]

Long: [ ] West: [ ]

Use my location

#### 2.1.1 Point Location

This parameter can be used to search a specific distance from a point. To use this parameter, enter a latitude and longitude along with a radial distance to create a search area. The distance should be entered in miles and the coordinates should be entered in decimal degrees relative to the NAD83 datum. Longitude in the western hemisphere should be preceded with a negative sign. The following is an example for searching data within a 20 mile radius of the Billings WWTP:

Point Location: ?

Within 20

miles of

Lat: 45.80270

Long: -108.46741

Use my location

The point location parameter also has a 'Use my location' button that will enter your computer's current location into the lat/long boxes in a decimal degree format. Depending on your browser settings, you may need to agree to the use of your location.

#### 2.1.2 Bounding Box

This parameter can be used to search within a specific area. To use this parameter, enter the North and South latitudes and the East and West longitudes in the fields to create a bounding box. The coordinates should be entered in decimal degrees relative to the NAD83 datum and longitudes in the western hemisphere should be preceded with a negative sign.

## 2.2 Site Parameters

The site parameter section allows you to narrow your search by metadata that is specific to each monitoring site, including site type, organization ID, site ID, HUC, and minimum sampling activities per site. There is also an interactive map that allows the user to zoom into a location and view all upstream or downstream sites within a specific distance. This map is still in testing phase; additional information on how to use the map can be found on the WQP website.

### SITE PARAMETERS

Site Type:  ?

Organization ID:  ?

Site ID:  ?

HUC:  ?

Minimum sampling activities per site:  ?

Search Upstream and Downstream (BETA) ?



Leaflet | Powered by Esri | HERE, DeLorme, MapmyIndia, © OpenStreetM...

### 2.2.1 Site Type

A site type is a generalized location in the hydrologic cycle, or a man-made feature thought to affect the hydrologic conditions measured at a site. Select from a list of site types represented in the source databases. The available data sources are listed in parenthesis for each site type. Multiple site types may be selected.

### 2.2.2 Organization ID

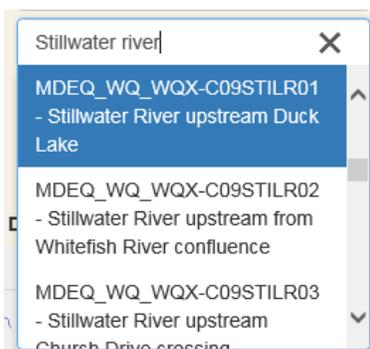
Organization IDs are designators used to identify a high-level grouping of data specific to each data source. Multiple organization IDs may be selected. MTDEQ currently has data for twelve organizations in WQX:

- **MBMG\_WQX – Montana Bureau of Mines and Geology:** This organization is for data from select projects where it was collected and managed by the Montana Bureau of Mines and Geology.
- **MDEQ\_MPDES\_WQX – MT Pollutant Discharge Elimination System:** This organization is for data associated with MPDES permits.
- **MDEQ\_REM\_WQX – Montana DEQ Remediation:** This organization is for data associated with DEQ’s Remediation Division, specifically the Clark Fork River Operable Unit and Silver Bow Creek Streamside Tailings Operable Unit monitoring.
- **MDEQ\_WQ\_WQX – Montana DEQ Water Quality Planning Bureau:** This organization is for data collected by MTDEQ’s Water Quality Planning Bureau (WQPB).
- **MONT\_DEQ\_WQX – Montana DEQ Pre-1999 Data:** This organization is a static, historic dataset with the majority of data originating from the Storease database.
- **MONT\_PPL\_WQX – Montana PPL Corporation:** This organization is for data collected by PPL Montana. The majority of data in this organization is related to Colstrip Coal-fired Electricity Generation monitoring.
- **MTNWE – Montana NorthWestern Energy:** This organization is for data collected and managed by NorthWestern Energy.
- **MTVOLWQM\_WQX – Montana Volunteer Water Quality Monitoring:** This organization is for data collected by volunteer organizations, groups, or individuals that are not operating under a DEQ approved QAPP/SAP and/or are not utilizing DEQ funding.
- **MTWTRSHD\_WQX – Montana Watershed Data:** This organization is for data collected externally from DEQ, but using grant monies such as 319 or 106 or managed under a DEQ approved QAPP/SAP.

- **OCC – Otter Creek Coal:** This organization is for data associated with the Otter Creek watershed, specifically with the Otter Creek Coal area.
- **R8MONTWQ – EPA Region 8:** This organization is for data collected under EPA Region 8 projects. The EPA Montana office is the "owner" of this organization.
- **TSWQC\_WQX – Tri-State Water Quality Council:** This organization is for data collected under the direction of the Tri-State Water Quality Council (TSWQC). It includes the Clark Fork River Monitoring project that has continued after the TSWQC disbanded.

### 2.2.3 Site ID

A site ID is a designator used to describe the unique name, number, or code assigned to a particular monitoring location. Site IDs are case-sensitive and should be entered in the following format: AGENCY-STATION NUMBER. Multiple site IDs may be selected, or entered and separated by semicolons. The field can be used to search by site name or by site ID. For example, to search for Stillwater River sites, type "Stillwater" and a list of sites will appear, or type "C09STILR" for a list of sites that contain that ID. No wild cards are necessary when searching.



### 2.2.4 HUC

A HUC is a federal code used to identify the hydrologic unit of the monitoring location to the cataloging unit level of precision. Full hydraulic unit codes (HUCs) or partial HUCs using trailing wildcards may be entered. More than one HUC may be entered, separated by semicolons. HUC is often the best way to pull data for a particular stream or area.

## 2.3 Sampling Parameters

The sampling parameter section allows you to narrow your search by metadata that is specific to each sample, including sample media, characteristic/parameter code, project ID, minimum results per site, date range, and by assemblage and taxonomic name for biological samples.

**SAMPLING PARAMETERS**

Sample Media:	<input type="text" value="All"/>	<input type="button" value="?"/>
Characteristic Group:	<input type="text" value="All"/>	<input type="button" value="?"/>
Characteristics:	<input type="text" value="All"/>	<input type="button" value="?"/>
Project ID:	<input type="text" value="All"/>	<input type="button" value="?"/>
Parameter Code: (NWIS ONLY)	<input type="text"/>	<input type="button" value="?"/>
Minimum results per site:	<input type="text"/>	<input type="button" value="?"/>
Date range - from:	<input type="text" value="mm-dd-yyyy"/>	to: <input type="text" value="mm-dd-yyyy"/>
Biological sampling parameters:	<input type="button" value="?"/>	
Assemblage:	<input type="text" value="All"/>	<input type="button" value="?"/>
Taxonomic Name:	<input type="text" value="All"/>	<input type="button" value="?"/>

### 2.3.1 Characteristic Group

A characteristic group, such as 'Nutrient', can be selected from the drop-down list. Multiple characteristic groups may be selected. A complete listing of which characteristics belong to the groups can be seen on the NWIS Parameter help page: <http://help.waterdata.usgs.gov/codes-and-parameters/parameters>.

### 2.3.2 Characteristics and Parameter Codes

Characteristic names identify different types of environmental measurements, sometimes referred to as parameters. The names are derived from the EPA Substance Registry System (SRS): <http://iaspub.epa.gov/sor-internet/registry/substreg/home/overview/home.do>. USGS uses parameter codes for the same purpose and has associated most parameter codes to SRS names: [http://www.waterqualitydata.us/public\\_srsnames.jsp](http://www.waterqualitydata.us/public_srsnames.jsp). Multiple characteristics may be selected.

- **NOTE:** The nomenclature for EPA and USGS characteristics, while similar, are not identical. For example, the EPA lists each dissolved oxygen characteristic while the USGS classifies dissolved oxygen under "oxygen". Consequently, users interested in retrieving dissolved oxygen data from both databases must select "dissolved oxygen" from STORET and "oxygen" from NWIS. Also, small differences in naming conventions may cause identical characteristics to be listed under different names or names that are formatted differently. When narrowing your data export by Characteristic Names, it's important to know exactly what you are looking for. In the majority of situations, it's better to not filter by Characteristic. Extra results can always be removed from the export once it has been downloaded.

## 3.0 Export Options

After search parameters are selected, the WQP provides a selection of exports and file formats to choose from. For exporting physical/chemistry data, the 'Sample results (physical/chemical metadata)' download is recommended. For exporting biology data, the 'Sample results (biological metadata)' download is recommended.

### 3.1 Data Downloads

A brief explanation on the various data downloads is below. A detailed list of what fields are included in each download can be found at: [https://www.waterqualitydata.us/portal\\_userguide/](https://www.waterqualitydata.us/portal_userguide/).

- **Site data only:** This download contains site metadata for all unique site IDs associated with the search parameters, such as site name, type, HUC, and coordinates.
- **Project data:** This download contains project metadata for all unique project IDs associated with the search parameters. This download also includes a 'Project File URL' field that will allow you to access any files associated with the project, such as QAPPs and SAPs. Enter the provided URL into a web browser and all available project documents will be automatically downloaded.
- **Project Monitoring Location Weighting data:** This download contains metadata associated with probability weighting for projects and monitoring locations. MTDEQ does not submit this type of data to WQX.
- **Sample results (physical/chemical metadata):** This download contains all results associated with the search parameters, but focuses on physical/chemical metadata fields. This export will still contain biological results, but the only biological metadata fields included are taxon name and tissue anatomy.
- **Sample results (biological metadata):** This download contains all results associated with the search parameters, but focuses on biological metadata fields. This export will still contain physical/chemical results, but has numerous biological-specific fields.
- **Sample results (narrow):** This download contains minimal data from parts of the WQX data model that are not in the "Result" section of WQX. Any project, site, and activity metadata would need to be linked to this download from other data downloads.
- **Sampling Activity:** This download contains activity metadata for all unique activity IDs associated with the search parameters.
- **Sampling Activity Metrics:** This download contains activity metric results, including metric type, value, and citation. MTDEQ does not currently submit this type of data to WQX.
- **Result Detection Quantitation Limit Data:** This download contains all available result detection limits associated with the search parameter results. There can be multiple detection limits per result, but all the sample result downloads only allow one limit to be reported. This download can be linked to the other sample result downloads by activity ID or result ID. When a result has multiple detection limits, the following priority list determines which one to report in the main 'sample results' downloads (only those used by MTDEQ are included in this list):
  - 1) Lower Reporting Limit
  - 2) Method Detection Limit
  - 3) Upper Quantitation Limit

### 3.2 File Formats

There are four different formats data can be exported in, some depend on what data download is selected.

- **Comma-separated:** File format is comma-separated columns in an Excel file (.csv).
- **Tab-separated:** File format is tab-separated columns in a tab-separated values file (.tsv). This file can be opened in various programs, including Excel and Access.
- **MS Excel 2007+:** File format is a Microsoft Excel worksheet in an .xlsx file that is compatible with Excel 2007 or greater. Excel 2007 and later have a limit of 1,048,576 rows.
- **KML:** File format is Keyhole Markup Language compatible with Google Earth and other GIS tools. This option is only available with the 'Site data only' download.

## 4.0 Download Tutorial

This section will walk through the actual steps involved in downloading data from the WQP. For the following example, we want all mercury and selenium results since 2010 found in the Columbia region's Stillwater HUC, 17010210. Often the best way to do a download is by HUC, and narrow down your results in Excel afterwards. It is easier to delete unnecessary columns and rows from Excel than run multiple downloads and merge all the results.

- 1) Go to the Water Quality Portal: <https://www.waterqualitydata.us/>.
- 2) Select 'Download Data'.
- 3) In the Site Parameters section, type '17010210' in the HUC field.
- 4) In the Sampling Parameters section, type 'mercury' in the Characteristics field. As you type, a drop-down list will appear and the matching characteristic names will appear. Click on 'Mercury (NWIS, STORET)'.



A screenshot of a search dropdown menu. The input field contains the text 'mercury'. The dropdown list shows three options: 'Mercury (NWIS, STORET)' (highlighted in blue), and 'Methylmercury(1+) (NWIS, STORET)'.

- 5) After you click off the Characteristics field, 'Mercury' should be listed as a search parameter.



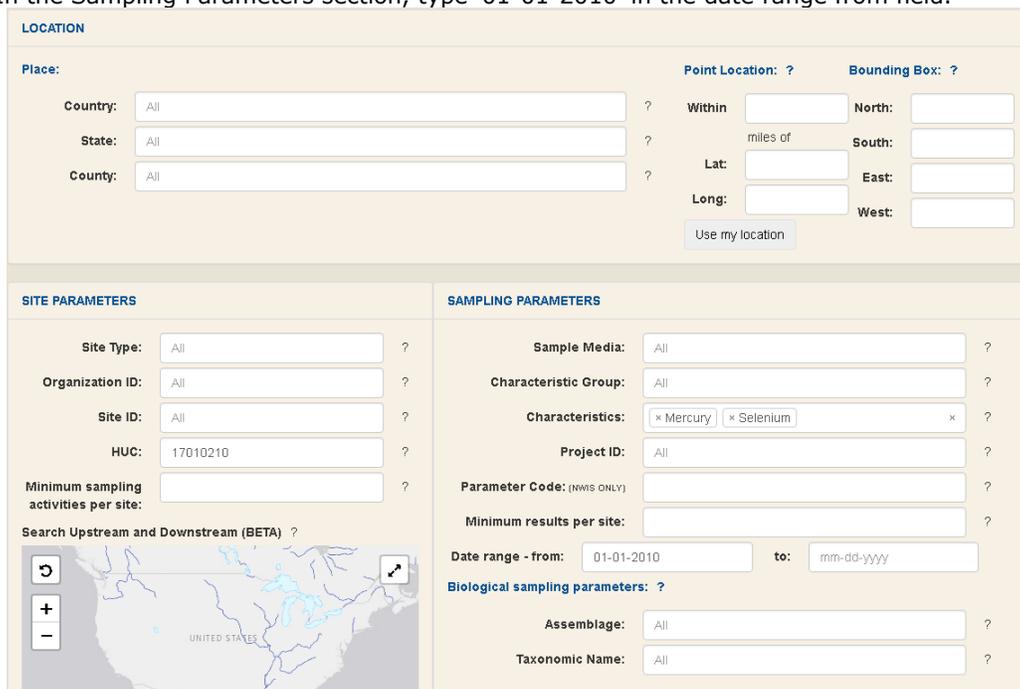
A screenshot of a search parameter field. The field contains a tag with the text 'Mercury' and a close button (x).

- 6) Click the Characteristics field again and type 'selenium'. Click on 'Selenium (NWIS, STORET)' from the drop-down list and click out of the Characteristics field. Both 'Mercury' and 'Selenium' should now be listed as search parameters.



A screenshot of a search parameter field. The field contains two tags: 'Mercury' and 'Selenium', each with a close button (x).

- 7) In the Sampling Parameters section, type '01-01-2010' in the date range from field.



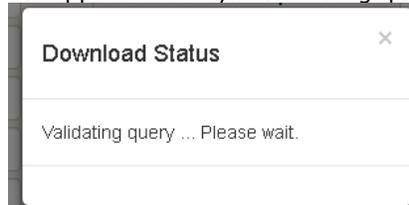
A screenshot of the Water Quality Portal search interface. The interface is divided into several sections:

- LOCATION**: Includes fields for Country, State, and County (all set to 'All'). It also has fields for Point Location (Within, Lat, Long) and Bounding Box (North, South, East, West). A 'Use my location' button is present.
- SITE PARAMETERS**: Includes fields for Site Type, Organization ID, Site ID, HUC (set to '17010210'), and Minimum sampling activities per site. There is also a 'Search Upstream and Downstream (BETA)' button and a map of the United States.
- SAMPLING PARAMETERS**: Includes fields for Sample Media, Characteristic Group, Characteristics (set to 'Mercury' and 'Selenium'), Project ID, Parameter Code (NWIS ONLY), Minimum results per site, Date range (from '01-01-2010' to 'mm-dd-yyyy'), Biological sampling parameters, Assemblage, and Taxonomic Name.

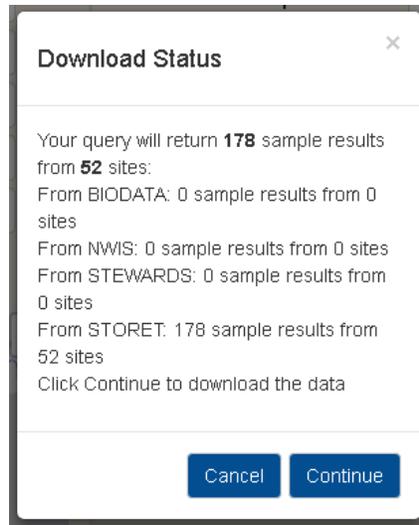
- 8) In the Data Download section, select the radio button next to 'Sample results (physical/chemical metadata)' and next to 'MS Excel 2007+'.

The screenshot shows a form with two columns of radio button options. The left column is titled "Select data to download:" and includes options: "Site data only", "Project data", "Project Monitoring Location Weighting data", "Sample results (physical/chemical metadata)" (which is selected), "Sample results (biological metadata)", "Sample results (narrow)", "Sampling Activity", "Sampling Activity Metrics", and "Result Detection Quantitation Limit Data". The right column is titled "File format:" and includes options: "Comma-separated", "Tab-separated", "MS Excel 2007+" (which is selected), and "KML (Keyhole Markup Language)". Below these options is an orange "DOWNLOAD" button.

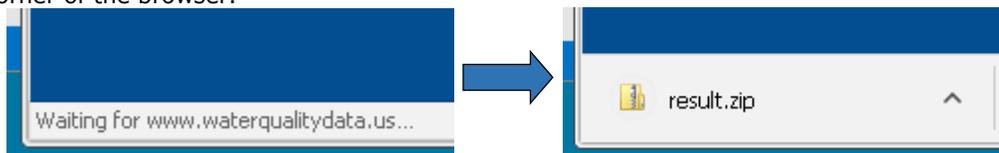
- 9) Click 'Download'. A window will appear that says "Validating query...Please wait".



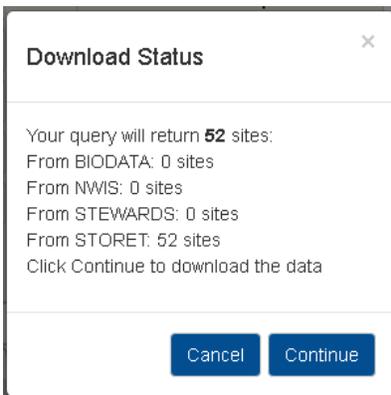
- 10) The amount of time it takes to run the download will depend on the search parameters selected, but it generally takes less than a minute. After the download runs, the window will indicate how many records were found.



- 11) Select 'Continue' to download the Excel file to your computer. How and where the file is downloaded will depend on what browser you are using. In Chrome, the file may appear near the bottom left corner of the browser.



- 12) If the download contains all the data you need, stop here. If you would like additional site information, such as site name and coordinates, continue with the following two steps.
- 13) Without changing any search parameters, select the radio button next to 'Site data only' and click 'Download'. The same window will appear that says "Validating query...Please wait" and the total record count will show.



- 14) Select 'Continue' to download the Excel file to your computer.