WQX Data Submittal Instructions Using NodeClientLite2™

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United States Environmental Protection Agency

Office of Water

1200 Pennsylvania Avenue, NW

Washington, DC 20460

SUBMITTING WATER QUALITY DATA to WQX/STORET: SUBMISSION METHOD SELECTION INSTRUCTIONS

Monitoring ambient surface water and ground waters including beaches, rivers, lakes, bays and streams is the responsibility of states territories and tribes. Organizations, tribes and government entities have a variety of options available to them in submitting and accessing chemical, physical, biological and habitat data and associated metadata. This document overviews different options for submitting water quality data, to assist users in making their decision as to which option is best for them (Figure 1).

Water quality data can be submitted to the water quality exchange (WQX) in multiple ways:
- via Exchange Network Nodes or Node Clients (Option 2 & 3)
- via the provided WQX Web application (Options 1).

Regardless of which option you select, you will also need:
1. An EPA WQX/STORET organization ID, (e.g., 21NYBCH), Organization IDs are assigned by the EPA STORET team upon the request of the user. To obtain an Organization ID, send an email to the STORET helpdesk STORET@epa.gov, or contact the WQX help desk 1-800-424-9067.
2. An EPA NAAS account ID (usually your email address) and password. To request an NAAS account, send an email to the STORET helpdesk (see 1, above).

For a more detailed explanation of the WQX network, review the WQX Flow Configuration Documents (FCD) at: http://www.exchangenetwork.net/exchanges/water/wqx.htm
[For user support, contact 1- 800-424-9067 or STORET@epa.gov]

Figure 1.
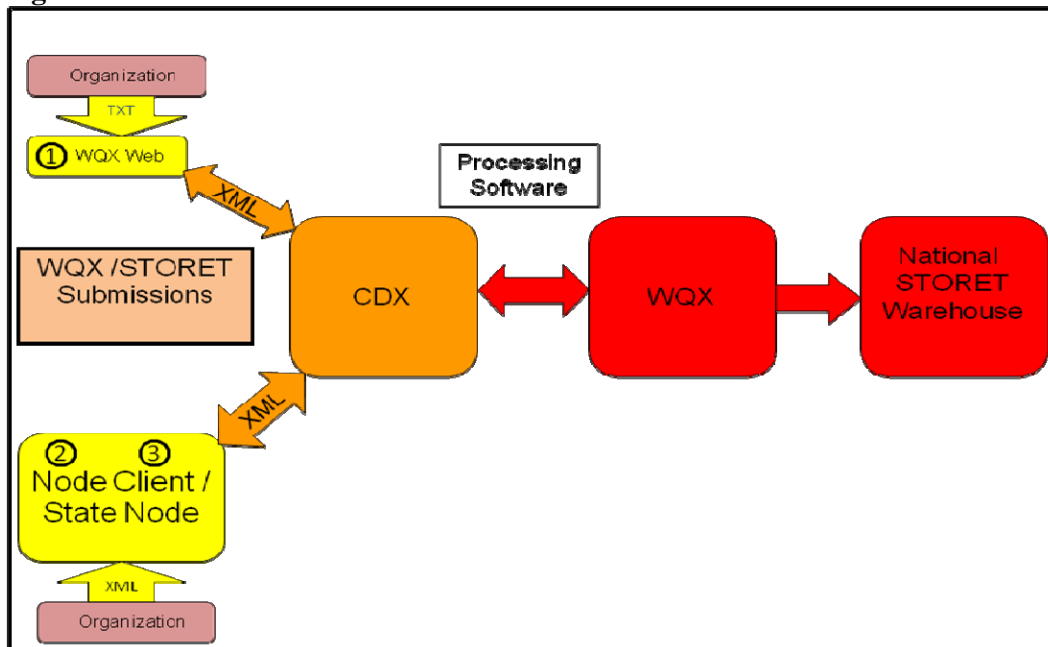
Option 1 – Using WQX Web

Unlike the other options, WQX Web converts text file submissions into XML script allowing organizations unable to generate XML script on their own to submit water quality monitoring data to the STORET Warehouse. For more information on using WQX Web, please access the following URL: http://www.epa.gov/storet/wqx/wqxweb_downloads.html.

Option 2 – Using Node Client Software

Compared to other available options, submission through the Node Client application is more suited for larger flow volumes. To use the Node Client software you will need a NAAS account associated with your Organization ID (See page 1). If you already have an Org ID and NAAS ID, download and install NodeClientLite2™ software (add icon to Desktop); e.g., from http://www.windsorsolutions.biz/nodeclient2007/ (NodeClientLite2™) **[For user support, contact** Node Support (nodehelpdesk@epacdx.net); 888-890-1995]. **For additional guidance in submitting data using node client software, please see Appendix A of this document.** *If you decide not to use a State Node or Node Client, use Option 1.*

Option 3 – Using a State Node

You can either obtain your own Node software or use a state node. **Use of a Node assumes you have a local data management system from which you can create XML**

1. Contact your state Node Administrator to determine what it would take to use your state node to submit data. For your state Node administrator's contact information see: http://www.exchangenetwork.net/progress/index.htm (in the map, click on the state).
2. If you decide to use the state Node, your Administrator will create a National Authentication & Authorization System (NAAS) account. You will need to contact the EPA to have that account associated with your CDX account, contact nodehelpdesk@epacdx.net 888-890-1995 option 2; and your WQX/STORET account (see page 1).

Appendix A. Submitting Water Quality Data UsingNodeClient2 ™ Software

If you decide <u>not </u>to use the State node (option 3), you have the option of using the Node Client software. Regardless of which option you select, you will also need:
1. An EPA NAAS account ID (usually your email address) and password, to request an NAAS account, send an email to the STORET helpdesk (see part 3).
2. An EPA WQX organization ID, (e.g., 21NYBCH), **Organization IDs are assigned by the EPA STORET Team** upon the request of the user contact the WQX help desk (see part 3).

The STORET Helpdesk will pre-register you to the CDX Help Desk as a user for the notification flow to WQX. You will receive an e-mail from EPA CDX HELPDESK with instructions on completing your registration.
A. If you already have a CDX ID and password, the provided credentials (username and password) can be used to submit to both Node test and Node production
B. If you are new to CDX: see the following instructions

Once registered, you will be directed to https://cdx.epa.gov/SSL/CDX/login.asp where your available account profiles will be listed. Click on the link for the type of file you want to submit. You must have an Org ID to be able to submit to WQX. An Organization Identifier (Org ID) is a unique identifier to distinguish you within the WQX system and the STORET Warehouse (e.g. ALO_WQX for the Alliance For a Living Ocean or 21ARIZ_WQX for Arizona Department of Environmental Quality). To request an NAAS account, send an email to the STORET helpdesk storet@epa.gov, and provide the following information.

- the NAAS accounts that you want to have access to your Organization ID
- First name
- Middle name
- Last Name
- Prefix (Mr./Mrs./Ms)
- WQX Organization ID
- WQX Organization Name
- Mailing Address 1
- Mailing Address 2
- City
- State
- Zip/Postal Code
- E-mail Address
- Phone Number

- **NAAS accounts are assigned by Node Administrators or by the CDX Help Desk**
  For users of node clients (who don't have a Node Administrator), NAAS accounts are assigned by the CDX Help Desk on an individual basis

Accessing the NodeClientLite2™ Application

The NodeClientLite2™ application has a two way flow, allowing users to submit data (in XML format) and retrieve information from WQX i.e. documented domain values. NodeClientLite2™ also provides users with a record of their submitted data. This reference of submitted data, in addition to access to domain values, may be helpful in determining the cause of error messages. To obtain the ability to interact with WQX web services as defined in the flow configuration document (FCD http://www.exchangenetwork.net/schema/WQX/2/WQX_FCD_v2.1.pdf) follow the steps below.

Note: although the file *below is v2.0, the v1.0 domain value and transaction ID services are still supported, and this file works with both.*

Obtaining All Services Available From STORET

Make sure the NodeClientLite2™ Application is closed. On the STORET FTP site download and save (ftp://ftp.epa.gov/storet/wqx/wqxservices.xml) to the directory on your machine where the Node Client Lite Application is installed (typically C:\Program Files (x86)\ Windsor\NodeClientLite2 on Windows Vista or Windows 7). Rename the file master-data.xml. Open NodeClientLite2.

 If the Node Client Lite Application was previously installed on your desktop, please follow the following instructions to link the application with EPA's current WQX node endpoints.

1. Make sure the Node Client Lite is closed
2. Find the directory on your machine where the program is installed.
3. Find any files that end with "data.xml" and rename them to the same name but with a ".old" on the end.
4. On the STORET FTP site download and save (ftp://ftp.epa.gov/storet/wqx/wqxservices.xml) to the directory in step 2. Rename the file to master-data.xml.
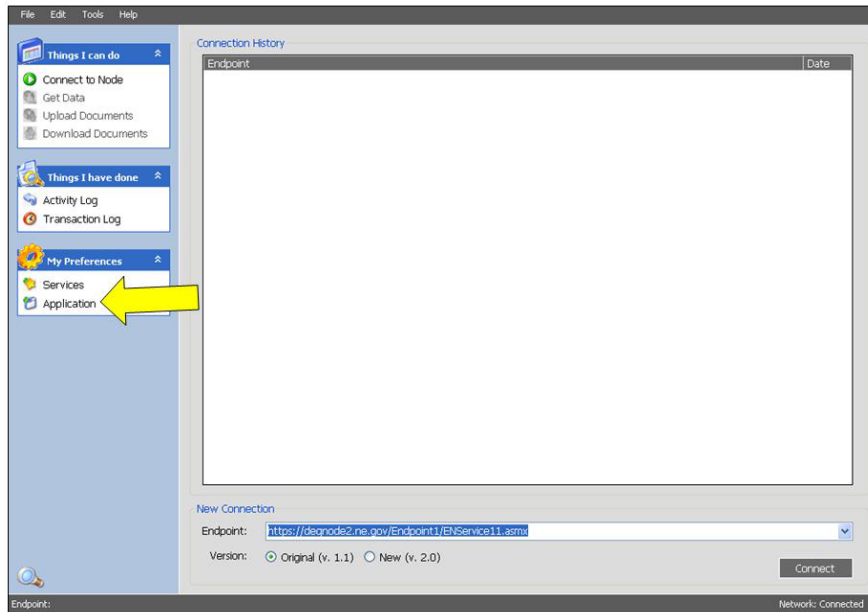5. Open NodeClientLite2.

You should now have all of the WQX services.

Inserting Your Username and Password Into NodeClientLite2™
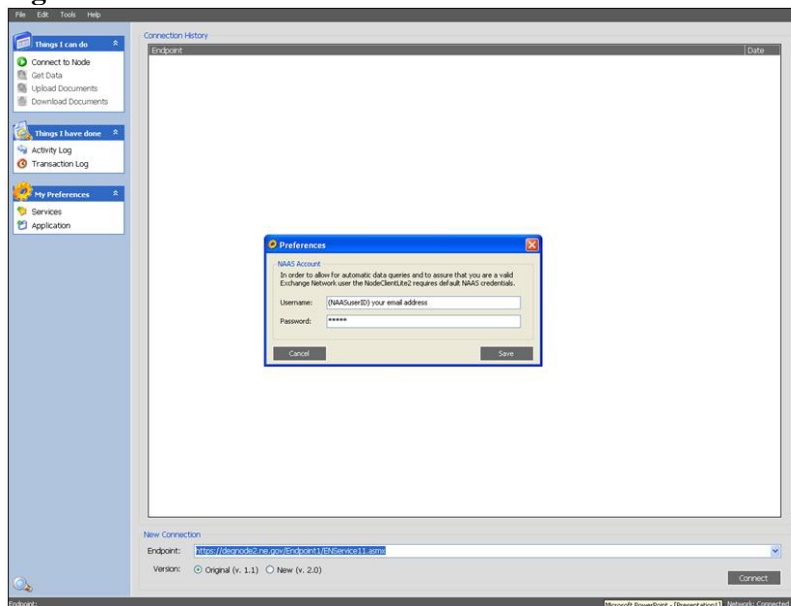
Step 1. Use your NAAS ID and password to log in.

To log into the NodeClientLite2™ application, under *My Preferences* select *Application* (**Figure 3**)*.*

Figure 2.

Enter your credentials and select *save* (**figure 4).**

Figure 3.

Step 2. Connect to WQX through CDX.

In the upper left hand corner, under **Things I can do** of the application, note that *Connect To Node* is in bold text, signifying an active option, while *Get Data*, *Upload Documents* and *Download Documents* are in grey text signifying inactive options **(Figure 5)**. The node is not connected to an endpoint if these options are inactive, meaning data cannot be submitted or received.

Figure 4.
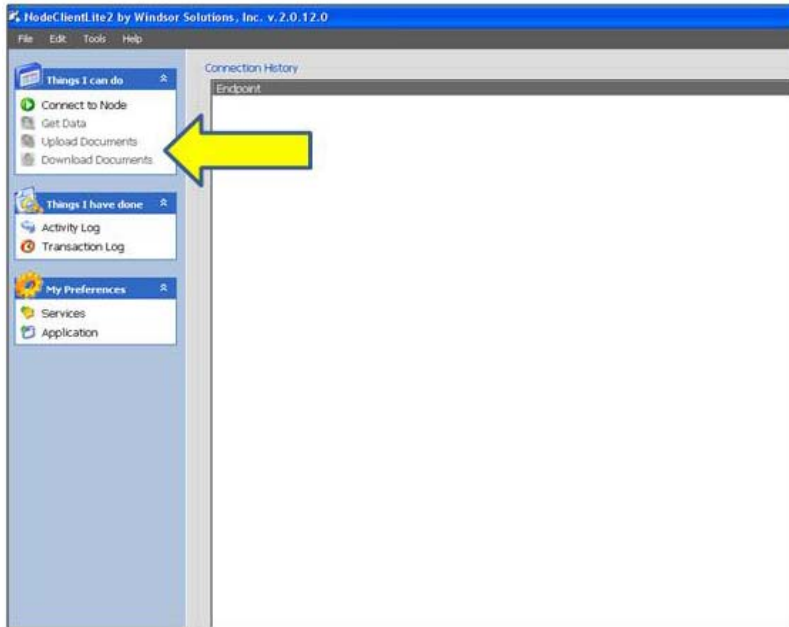
You can obtain the appropriate endpoint to submit and receive data by accessing the exchange network page. For more information about endpoints see the provided link http://www.exchangenetworkwiki.com/wiki/index.php/Node_Endpoints_at_U.S._EPA's_Central_Data_Exchange.

After accessing *U.S. EPA's Central Data Exchange* page, under *Node Endpoints* you will find a section titled *Water Quality Exchange* (Figure 6). Under the *Water Quality Exchange* section are links labeled *Node 2.0 Test, Node 2.0 Production, Node 1.1 Test* and *Node 1.1 Production*. Both the 1.1 and 2.0 versions are options for you to use, however this tutorial will use the 1.1 version.

You must make one successful test submission from your endpoint, through Node Test before being permitted to submit through Node Production.
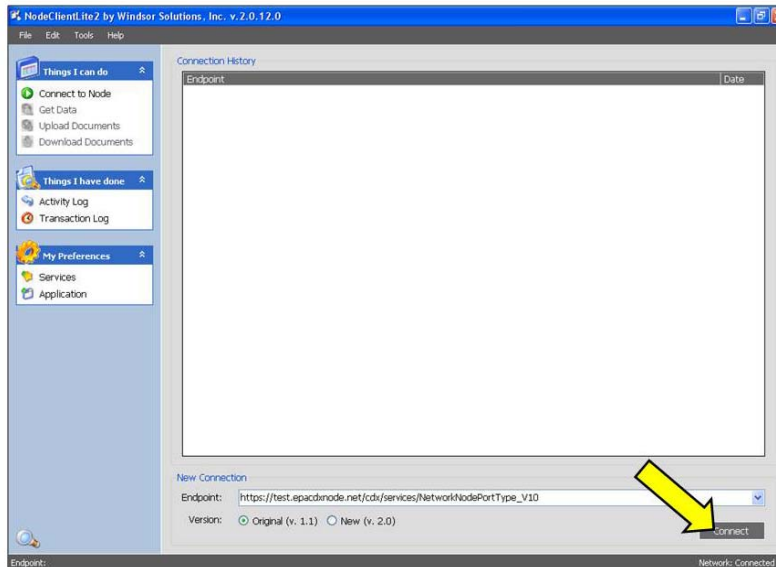
Figure 5.
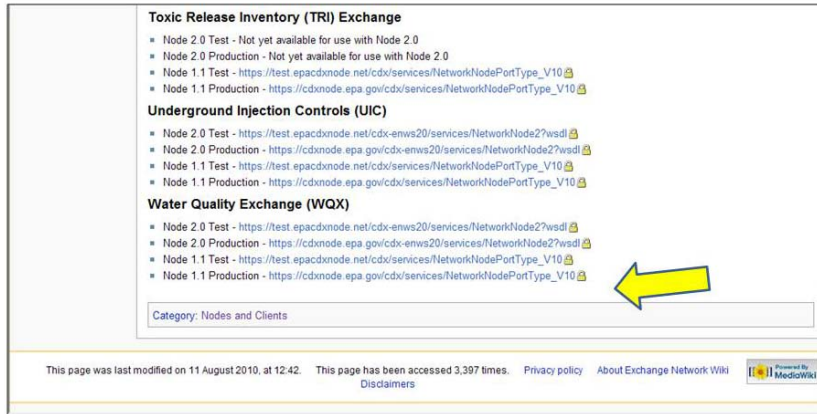
Step 3. Obtaining a Test connection endpoint.

To connect your node to the EPA node, locate the ***New Connection Pane*** in the window. Ensure that the correct version is selected (in this case Original ((v1.1) is used) and enter the test endpoint for Node 1.1 (https://test.epacdxnode.net/cdx/services/NetworkNodePortType_V10) provided by the exchange network page (http://www.exchangenetworkwiki.com/wiki/index.php/Node_Endpoints_at_U.S._EPA's_Central_Data_Exchange).

Click ***Connect*** (Figure 7).

Figure 6.

Trouble shooting

[If you get an "Unable to Authenticate" error (Figure 8) - in the **My Preferences** screen, open *Application*, go to the remote IP tab and switch from the windsorsolutions URL to the whatsmyip.org URL. While there, make sure check box "***Always authenticate against NAAS is NOT checked***". Click "**Save**" and return to retry to connect]. For further assistance regarding connection issues, contact the Node help desk [(nodehelpdesk@epacdx.net); 888-890-1995] or the WQX help desk STORET@epa.gov 1-800- 424-9067.

Figure 7.
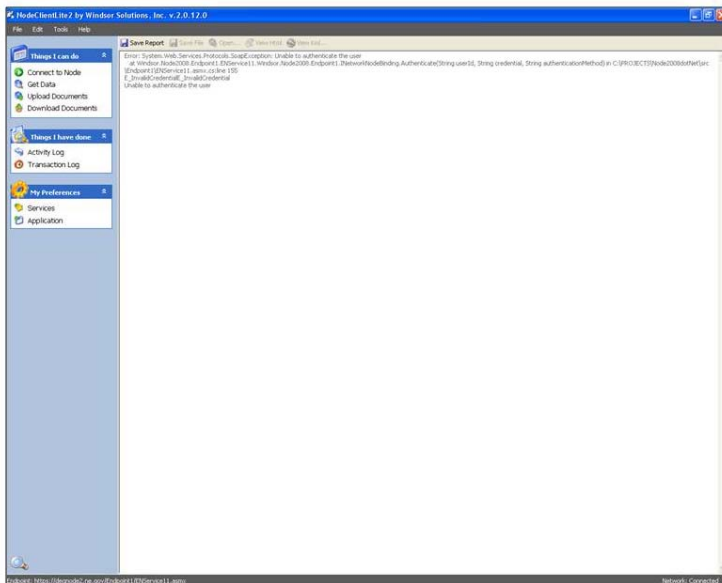
With a successful test connection, the request data page will appear. Notice that all options in the *Things I can do* box are now available with a successful test submission (Figure 9).

Figure8.
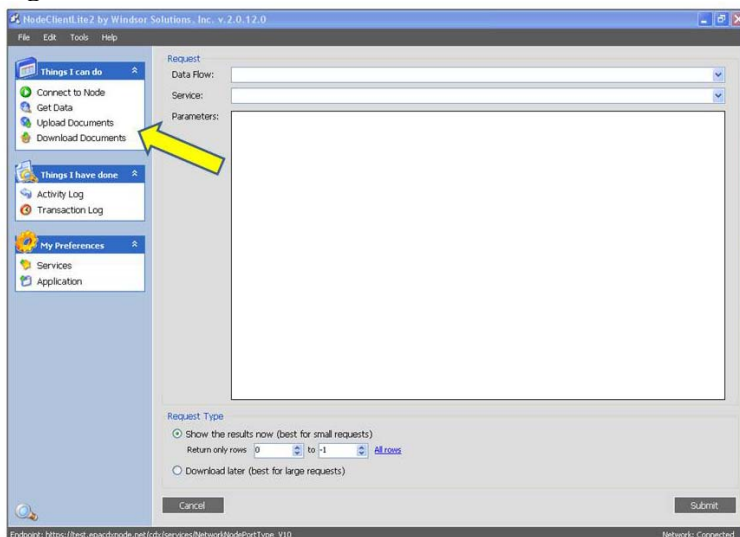
Step 4. Submit a Test XML file

1. In left panel, under *Things I Can Do*, click "*Upload Documents*".
2. In the **Upload Documents(s)** panel, in the *Data Flow* field, select *WQX* from the dropdown list.
3. If the *Transaction ID* is prepopulated, delete its contents.
4. click "*Add* ".
5. A test XML is provided at the following site http://www.exchangenetwork.net/exchanges/water/wqx.htm. Download the example XML file and save it to your hard drive.
6. Select your test XML file(s) from your directories (.zip or .xml); the address will appear in "Selected File(s)" window (Figure 10).

Figure 9.
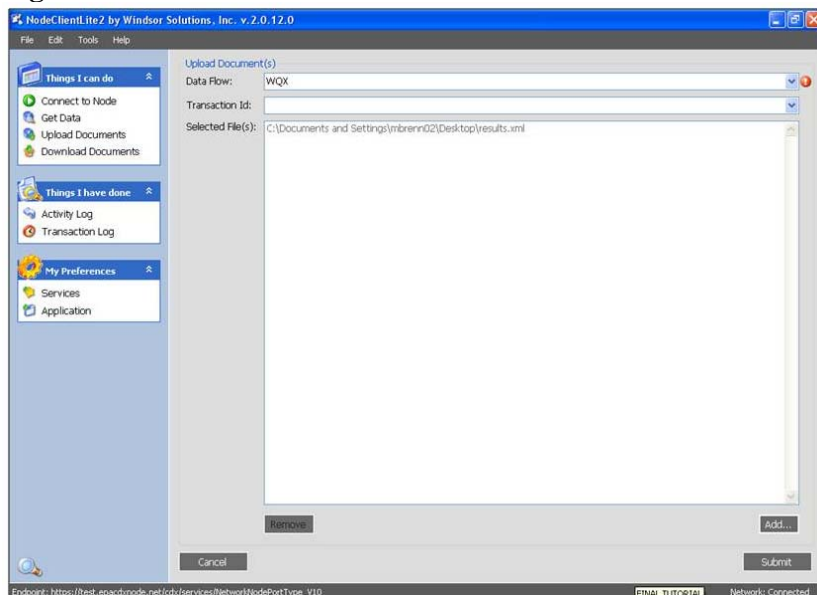
7. click "*Submit*".
8. **Correct any errors encountered (CDX validation and WQX rules).** Users will receive an email to their NAAS account providing details on either a completed submission or a failed submission. Please refer to the following links for guidance on CDX validation (http://water.epa.gov/grants_funding/beachgrants/upload/2008_10_01_beaches_grants_datausers_2008_BeachesNotificationCorrections20081001.pdf) and WQX rules (http://www.exchangenetwork.net/schema/WQX/2/WQX_FCD_v2.1.pdf).

9. With a successful test submission, you should get "***Document Submission Results***" as well as an email to your associated NAAS account informing you of a successfully submitted file (Figure 11).

Figure 10.
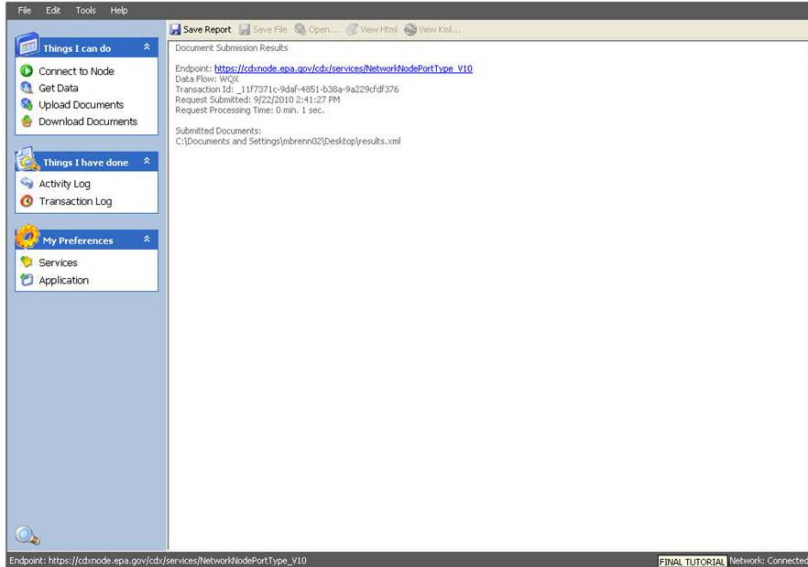
Example email from a completed WQX Submission

```
Your WQX submission, transaction ID [_7d8b8110-02c1-4c9b-8cec-520bef2e458e], has been processed.
The process status is COMPLETED.
The process report, with the document name [Notify_ASEPA Beach Monitoring Data Q2 FY2010.xml.xml]
and the document type of [XML] is ready to be downloaded.
```

Example email from a failed WQX submission

```
Your WQX submission, transaction ID [_ee7d7b8b-edda-4f66-a7af-c4dfc3e6213f], has been processed.
The process status is FAILED.
The process report, with the document name [Notify_ASEPA Beach Monitoring Data Q2 FY2010.xml.xml]
and the document type of [XML] is ready to be downloaded.
```

Submitting Data Through Production

Once you receive an email confirming the one time successful test submission, you are able to submit to production. If you signed up for a NAAS account, your test username and password are most likely your production user name and password.

You can obtain the appropriate production endpoint to submit and receive data by accessing the exchange network page http://www.exchangenetworkwiki.com/wiki/index.php/Node_Endpoints_at_U.S._EPA's_Central_Data_Exchange.

If your test username and password does not work, you can obtain a Production password from helpdesk@epacdx.net 888-890-1995; then use the production connection for Node 1.1: https://cdxnode.epa.gov/cdx/services/NetworkNodePortType_V10.

Version 1.0 of the WQX provides the means for partners to share the following types of data:

- The physical conditions in the environment at the time of a site visit;
- The chemical and bacteriological make-up of the water sampled;
- Chemical analyses of fish tissue collected.

Version 2.0 of the WQX expands on WQX v1.0 and provides the means for partners to share all v1.0 data types as well as the following:

- Biological Taxon Abundance data, including population census, frequency class, group summaries, and individual results;
- Toxicity data;
- Habitat Assessment scores and their related metric scores;
- Biological Index scores and their related metric scores.

I. To Obtain Data

1. In left pane, in the **Things I Can Do** box, click on *Get Data*
2. In the **Request** pane, in the *Data Flow* box, use the dropdown option to select *WQX* (last one; Figure 12).
3. **Example 1: Get Transaction History by Parameters**
   In the *Service* box, select *WQX.GetTransactionHistoryByParameters_v1.0*
   a. The Node Client Lite application allows users to specify data by parameters. One or more parameters can be entered for queries. Parameters can be filtered for begin/end dates (right click on icons), Transaction ID, or Org ID e.g.: Orgid [WQXTEST]
   b. In the *Request Type* pane at the bottom of the application, users are able to select their desired output form. Click *Submit.*

Figure 11.
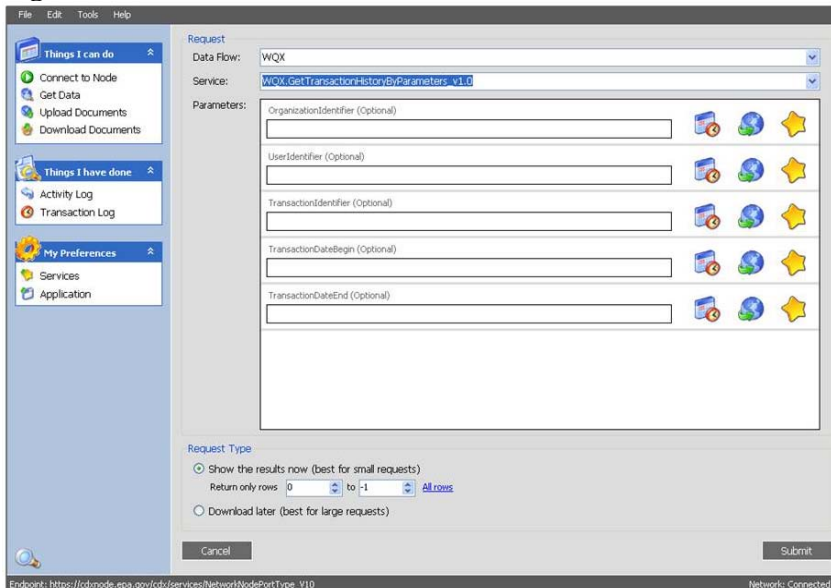
d. In *Data Request Results* pane the location of your file will be provided. The file name will be based on: YEAR/MONTH/DAY/HOUR/MINUTE/SECOND, e.g. C:\2007\08\30\12\49\54.
e. Go to the location on your hard drive where the files were downloaded to open folder and view files.
f. Open transaction file, find most recent at bottom, copy transaction id; e.g. 14fd9e21-c495-4c7f-a309-f3dd522b97bc.
g. See the instructions under III (To Download Data) for guidance on downloading files.

4. **Example 2: Get DomainValuesbyElementName_v.1.0**
     Note: the "WQX Flow Configuration" document contains the list of domain values documented in WQX.

   a. In the *Service* box, select **WQX. Get DomainValuesbyElementName_v.1.0.**
   b. Specify element name (optional), e.g. "characteristic" and select submit. see 3.b-3.g. Additional services users may request or query data from the WQX database include:

   – GetProjectByParameters_v2.0
   – GetMonitoringLocationByParameters_v2.0
   – GetActivityByParameters_v2.0
   – GetActivityGroupByParameters_v2.0
   – GetBiologicalHabitatIndexByParameters_v2.0
   – GetResultByParameters_v2.0
   – GetDomainValueByElementName_v1.0 and _v2.0
   – GetTransactionHistoryByParameters_v1.0 and _v2.0

• All data submitted via WQX and WQX Web are placed in the STORET Warehouse

II. To Upload Data

1. In left panel, in the *Things I Can Do*, box click *Upload* (**Figure 13**)

Figure 12.
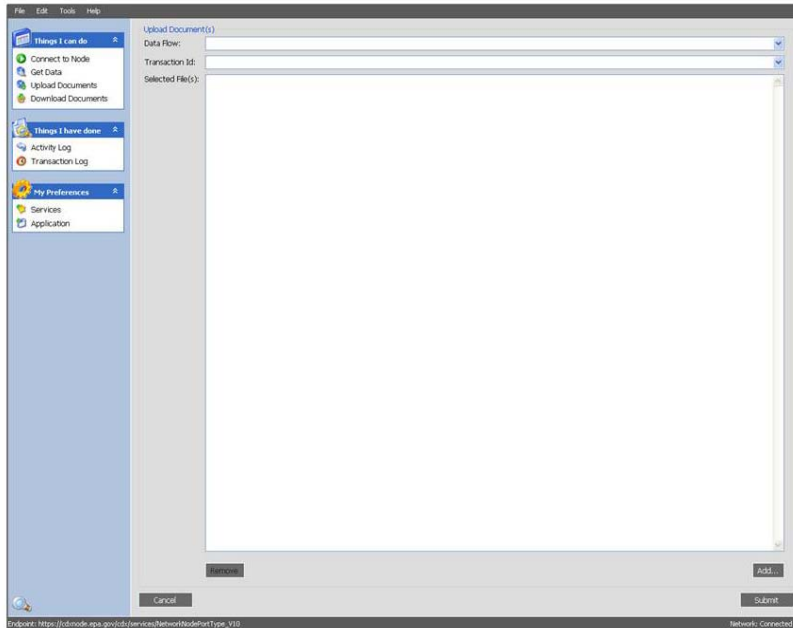
2. Under the **Upload Documents** Panel, In the *Data Flow* box, select *WQX* from the dropdown menu.
3. If the *transaction ID* box is pre-populated, delete its contents.

4. Click "*Add* ".

5. Select file(s) from your directories (.zip or .xml); address will appear in "**Selected File(s)**" window.

6. Click "**Submit**", to receive a message titled "**Document Submission Results**"
    a. verify information.
    b. block and copy transaction code (use <Ctrl C>)
    e.g. `14fd9e21-c495-4c7f-a309-f3dd522b97bc` .

7. Go to III. To Download Data

III. To Download Data

1. In left panel in the **Things I can Do** box click *Get Data* (Figure 14).

Figure 13.
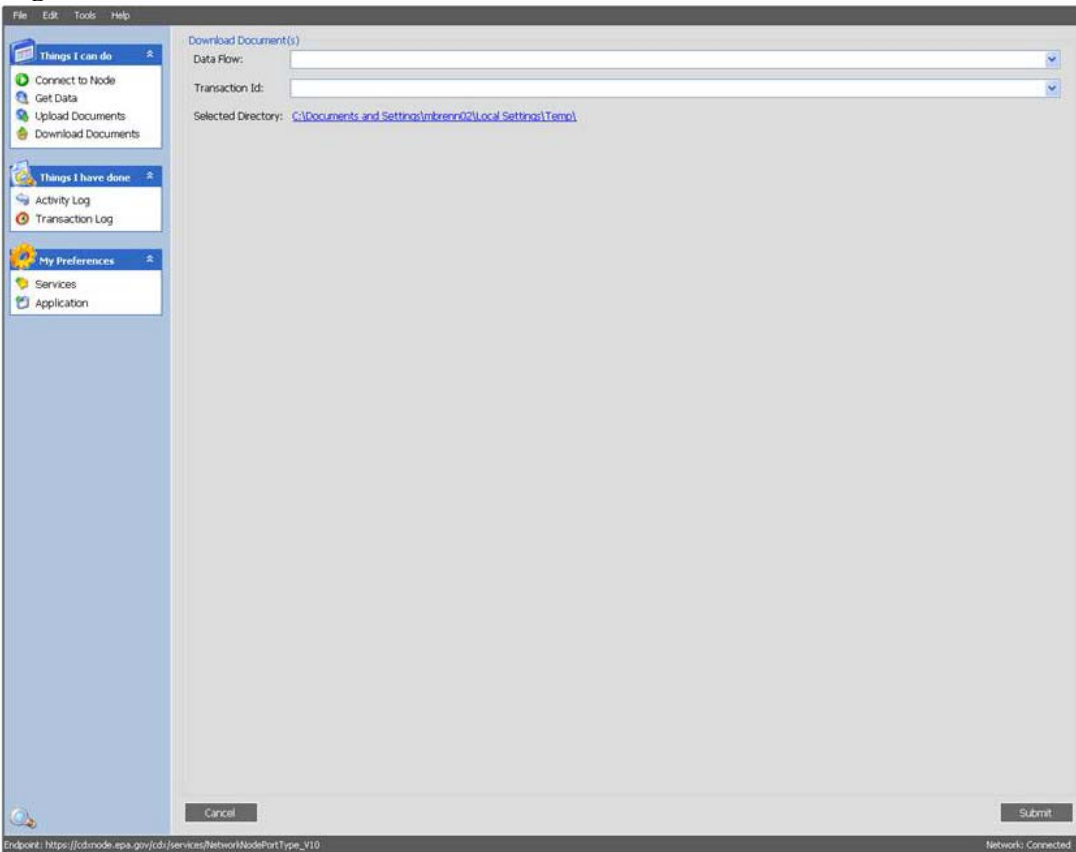
2. Under the **Download** panel, in the *Data Flow* box select *WQX.*

3. In the *Transaction ID* box, paste your desired transaction ID,e.g., `14fd9e21-c495-4c7f-a309-f3dd522b97bc` .

4. Select the directory where file will be download to.

5. Click "Submit".

6. In **Document Download** pane, below is an example of provided download files
 file://C:\20070830124954\BackEndDistribution_a6e0ead0-840d-42d5-98b2-4ddc2730e81f.zip
 file://C:\20070830124954\Notify_WQX_valid_file.xml.xml
 file://C:\20070830124954\ProcessingReport.zip
 file://C:\20070830124954\Validation Results
 file://C:\20070830124954\WQX_valid_file.xml

7. Files are saved to folder with name based on:
   YEAR\MONTH\DAY\HOUR\MINUTE\SECOND, e.g. C:\2007\08\30\12\49\54 (.zip)

8. Review the Processing Report file to see if there is an error message at bottom of the
   report. This error message can be used to fix the file.

   a. verify information
   b. block and copy transaction code (use <Ctrl C>)
   e.g. 14fd9e21-c495-4c7f-a309-f3dd522b97bc

   Additional support for data users is provided below.
   http://water.epa.gov/grants_funding/beachgrants/datausers_index.cfm

Error Corrections

If you get an error status from your submission, wait for an email to be sent to the email address
associated with your account. *Note the "Edit Load Summary" and "Edit Error Details" reports
will not return results in the test environment).*

1. If you get an email that lists no specific data records in error, this means that
    WQX was not able to successfully open and read your file, and there was
    probably an XML formatting error. After reviewing your XML file to confirm the
    formatting is correct, notify CDX of the issue.
2. If you do get a count or list of data records in error, this probably means that the
    XML was read correctly and there were data quality issues, which are explained
    on pg 17 (**Fixing Data Quality Issues/ Formatting Data Submissions
    According To The WQX Structure**). Note the email will only list the first 50 or
    so errors. This may also mean that required XML elements were missing or
    superfluous ones were included or a format allowed by the schema is not allowed
    by WQX (since shared elements are re-used, sometimes WQX actually has a
    stricter limit on a format than the schema). Be aware that the error list will refer
    to data elements by the target system record and field names as listed in their
    respective columns i.e. columns G and H of the spreadsheet and not by the XML
    tag names.

Note: *If you get errors in the data, the data will remain in the WQX "staging" space and conflict
with new incoming data for the same monitoring locations and times. You can either try again
with different data or clean out the data in the staging space. Contact the CDX help desk if
assistance is needed in cleaning out the data in the staging space.*

Fixing Data Quality Issues /Formatting Data Submissions According To The WQX Structure

The largest challenge for users of WQX is mapping their water monitoring data to the WQX schema business rules and domain values. If the file does not pass CDX validation, it does not continue on to WQX for processing. The WQX processing software checks that files conform to WQX data element formats, business rules and domain values.

- Key Domain Value Lists:
    - Characteristics
        - WQX standardizes on the EPA Substance Registry System (SRS) for chemical names
        - WQX will maintain candidate names if a chemical name has not been vetted through SRS
    - Taxa Names
        - WQX standardizes on the Integrated Taxonomic Information System (ITIS) for taxa names and rank
        - May need to roll up to lowest ITIS rank name
        - Monitoring program working with ITIS system for updates
    - Please contact us for new requests
- The CDX node performs validation that the submitted XML is well formed

More detailed information on WQX structure and flow can be found at the following URL

http://www.exchangenetwork.net/schema/WQX/2/WQX_FCD_v2.1.pdf

Once a file is submitted using the production link, users can download the following:

- Original XML file submitted
- CDX validation report
- CDX notification file reporting status as either completed or failed
- WQX processing report summarizing the inserted/updated/deleted data and any encountered errors