**Sample Exchange Network Project Goals, Outputs, and Outcomes**

**Goals**

1. **Emissions Inventory System (EIS) & Greenhouse Gas (GHG) Data Flows**

Freedonia DEP has been sending NEI data to EPA using the Exchange Network. However, as EPA moves to a new database, called the Emissions Inventory System, this data flow will need to be upgraded to meet the new schema, CERS.

Freedonia requires Title V facilities to provide Greenhouse Gas (GHG) data to the state, unless they are providing data directly to The Climate Registry (TCR). Currently three Freedonia companies have agreed to supply data to TCR. The remainder of the Title V facilities must supply GHG data to Freedonia DEP annually using the same online system as NEI data. This system is called the **Permitting and Air Reporting System of Freedonia (PARSOF)**.

 1.1. **Map EIS & GHG data elements** to the CERS XML Schema.

This includes detailed analysis and specifications for transferring data from PARSOF to CERS schema.

 1.2. Implement the **production EIS data flow**. This includes:

* Develop the Extract, Transform and Load (ETL) process to load PARSOF data to staging tables
* Develop an EIS node plug-in to transfer the data from the staging tables to XML
* Configure the node data flow
* Test the data flow and perform quality assessment

 1.3. Implement the **GHG data flow** to production.

Repeat step 1.2 with minor adaptations for GHG data.

 1.4. Improve **GIS Locations** for emission points from Title V facilities, including preparation of geospatial metadata for the Latitude/Longitude Data Standard and meeting EPA’s minimum accuracy of 25 meters for most points. This will improve the accuracy of data in both EIS and GHG.

This includes obtaining and entering locations and stack parameters for approximately 9,500 emission points into the PARSOF database. Some of these data will need to be transformed from the Breeze modeling software, and some obtained from paper maps and checked against aerial photos. Also, if time allows, other locations and associated web applications for environmental assessment/integration may be improved.

1.5. Add **application module** to the Facility Explorer web application **to allow easy access to emission point locations** and associated data. This will be used to evaluate emission rates of surrounding major facilities within a given radius of a proposed construction project.

This is a required assessment under the Prevention of Significant Deterioration (PSD) permitting program.

Currently when a construction project is proposed, the applicant contacts DEP who then queries the database for nearby sites, and manually finds the emission point data for each site to send to the applicant. The proposed web application module will allow the applicant to run a simple query themselves, thus obtaining the data immediately, and eliminating the need for DEP staff to find data.

The proposed application module includes programming to load the emission point locations as sub-entities into Freedonia’s Environmental Facilities Database (EFD) warehouse, request the search, do the GIS query, retrieve needed report data from EFD and PARSOF, and build the report using SQL Reporting Services. The report will include:

* **facility** name, address, and plant ID;
* permitted or potential facility-wide **emission rates** in tons per year for: SO2, NOx, CO, Pb, PM10, and (if available) PM2.5;
* a list of **emission point locations** with XY coordinates in UTM;
* permitted or potential **emission rates** and the most recent two years of actual emissions for each emission point for: SO2, NOx, CO, Pb, PM10, and (if available) PM2.5; and
* **stack parameters**, including stack ID, height, diameter, temperature, flow rate, emission point type, bypass stack (Y/N), and obstructed (Y/N).

2. **Water Quality Exchange (WQX) Flow**

The replacement database for STORET, AWQMS (Ambient Water Quality Management System) is being developed by several states and Region 8, including Illinois, Minnesota, Utah, the National Park Service, and possibly Alaska. Freedonia is planning to implement this database to replace Freedonia STORET as the state database.

2.1. **Map** the data elements to the XML Schema. This includes detailed analysis and specifications for t ransferring data from the state database to WQX schema.

2.2. **Implement** the data flow to CDX (EPA’s Node). This includes:

* adapt the 4.1 WQX Windsor node plug-in to transfer the data from the state database to XML;
* set up and configure the node; and
* test the data flow and perform quality assessment.

2.3. **Document the flow implementation** for use by other states using AWQMS and the same type of Node. Illinois and Minnesota use a Windsor .NET node. Other agencies have also mentioned the possibility of using the Windsor Node by the time this is implemented. Freedonia DEP will develop the documentation and provide any applicable code to these other agencies for streamlined implementation.

2.4. Publish a **web service** that will allow applications to pull water quality monitoring data. This web service will allow applications to query water quality monitoring data from the state’s database. Initial plans are for at least two staging tables which can be populated using an automated DTS/SSIS or other script.

At a minimum, the staging tables should include the following elements and any other required elements in the WQX schema.

The output will be in WQX standard XML and include all elements in the staging tables. This grant will focus on making this work with Freedonia data. However, this can be extended later in two ways:

* add data to Freedonia’s staging tables from other sources, such as USGS, the Freedonia Pesticide Monitoring database (FPEST), and raw water samples from the Safe Drinking Water Information System (SDWIS). This will allow applications to pull easily pull monitoring data from a variety of sources; or
* share the code and documentation with other states using AWQMS.