2002 NEI for Point Sources: Integration of HAPs and CAPs

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ABSTRACT

The Environmental Protection Agency (EPA) compiles the National Emission Inventory (NEI) for criteria air pollutants (CAPs) and hazardous air pollutants (HAPs). Title I, Section 110 of the CAA requires states to submit emission inventories for CAPs as part of their State Implementation Plans. The NEI for HAPs is compiled to determine if Clean Air Act (CAA) programs are successful in reducing emissions and human health and environmental risk due to HAP emissions.

The NEI contains estimates of facility-specific CAP and HAP emissions, along with their source-specific parameters necessary for modeling such as location and facility characteristics (stack height, exit velocity, temperature, etc.). Complete source category coverage is needed; the NEI contains estimates of emissions from stationary point and nonpoint and mobile source categories. Point source categories include major and area sources as defined in section 112 of the CAA. Nonpoint source categories include area sources and other stationary sources that may be more appropriately addressed by other programs rather than through regulations developed under certain air toxic provisions (sections 112 or 129) in the CAA. Mobile source categories include onroad and nonroad categories. Previous versions of the NEI maintained separate databases for CAPs and HAPs. The 2002 NEI will contain merged CAP and HAP data.

Data in the point source NEI are provided by state and local agencies, tribes, industry, and EPA's Emission Standards Division; obtained from the Toxic Release Inventory (TRI) and 2001 CAP point source inventory; and developed by EPA (utility CAP estimates). Because of the multiple data sources, the compilation of the 2002 NEI requires many steps. Key processing activities include submittal of 2002 inventory data by state and local agencies, tribes, EPA, and industry; blending/merging of data from multiple data sources; augmentation of blended data for missing data elements; quality assurance/quality control (QA/QC) of the data; preparation of draft NEI for external review; incorporation of external review comments; and preparation of final NEI.

The first step in merging CAP and HAP data in the 2002 point source NEI is the integration of HAP and CAP facilities. This paper briefly discusses the compilation of the 2002 NEI, and presents the methodology that will be used to integrate CAP and HAP point sources.

INTRODUCTION

Emission inventories are critical for the efforts of state, local, and federal agencies to attain and maintain National Ambient Air Quality Standards that EPA has established for CAPs. Title 1, Section 110 of the Clean Air Act (CAA) requires states to submit emission inventories for CAPs as part of their State Implementation Plans (SIPs). The 1990 CAA Amendments established new periodic emission inventory preparation requirements for CAPs. In June 2002, the EPA promulgated the Consolidated Emissions Reporting Rule (CERR) to simplify reporting, offer options for data collection and exchange, and unify reporting dates for CAPs by state and local agencies and tribes. Using CAP emission inventory data reported by state and local agencies and tribes, the EPA compiles the National Emissions Inventory (NEI) for CAPs. The NEI for CAPs includes point, nonpoint,, and mobile source estimates of CAP emissions. The NEI for CAPs is compiled annually, and is used in modeling to analyze potential regulations.

Title I, Section 112 of the CAA Amendments of 1990 requires that the EPA promulgate standards that require Maximum Achievable Control Technology (MACT) for sources emitting hazardous air pollutants (HAPs). In order to determine if the MACT program and other CAA programs are successful in reducing emissions and human health and environmental risk due to HAPs emissions, EPA compiles the NEI for HAPs. The NEI for HAPs was formerly known as the National Toxics Inventory (NTI). The NEI for HAPs includes point major and area, nonpoint area and other, and mobile source estimates of emissions. This requires national surveys of stationary major and area source facilities including MACT source categories emitting HAPs and an estimate of emissions associated therewith. Compiled every three years, the 1990 NTI, 1996 NTI and 1999 NEI for HAPs are currently available.

The EPA's Emission Factor and Inventory Group (EFIG) is currently developing the 2002 NEI. For the first time, our goal is to compile a merged NEI for CAPs and HAPs. A number of steps are involved in the development of the NEI. For the 2002 NEI, the key step is blending and merging the data from different sources to yield an integrated CAP and HAP point source inventory. This paper summarizes the steps that EFIG will take to compile the 2002 NEI point source inventory.

DESCRIPTION OF METHODOLOGY

Development of the 2002 NEI involves:

1. Collecting and logging CAP and HAP inventory data from state, local agencies and tribes, EPA, industry and other inventories;
2. Checking the collected data for referential integrity and other format errors, and correcting these errors;
3. Conducting quality control (QC) on latitudes/longitudes and stack parameters and augmenting missing or bad data;
4. Blending and merging data from different sources into a compiled inventory;
5. Augmenting the CAP particulate matter (PM) and volatile organic compound (VOC) estimates; and
6. Assigning MACT codes to emission processes and data ratings to emission estimates.

Data Collection

The draft 2002 NEI for CAPs and HAPs will be compiled from multiple data sets. These include the following sources:

- State and local agency and tribal data submitted to EPA
- Industry data submitted to EPA

- 2002 Toxic Release Inventory (TRI) data[1]
- MACT and residual risk inventory data supplied by EPA
- Utility electric generating units (EGU) data[2]
- 2002 NEI for CAPs, version 032004prelim[3]
- 1999 NEI for HAPs point source data[4]

During the data collection phase, we will obtain, log, and summarize all of the data received from these sources in a tracking database that records: geographic coverage, pollutant coverage, format of data, and number of records. The tracking database will also log (among other things) contact name, agency and state, file type, data type (point, area, mobile), and pollutant type (HAP or CAP).

We will convert all inventory data into NEI Input Format (NIF). This includes TRI, MACT, and EGU data. We have previously converted the TRI and other non-NIF data, and have established procedures for these transformations.

QA of Referential Integrity and Format Errors

In this phase, we will conduct QC for referential integrity and format errors on the files obtained, summarize the errors found, and report back to the data provider on our findings. We run a standard set of queries on each file to detect referential integrity errors, duplicates and other format and content errors. Generally, we find that after running a battery of tests on a file, we have at least one or two issues that the data provider must help us resolve. We track these errors and communications on a QA/QC form, through e-mails, and in a phone log. We use these tracking mechanisms to ensure the transparency and reproducibility of the process. This is a requirement of the Office of Management and Budget's (OMB) Information Quality Guidelines (IQG), but also generally helps us establish an "electronic trail" for each estimate. This is useful when questions arise during the review process regarding the origin of an estimate.

We developed this process by systematically listing the desired outputs and questions we need to answer (e.g., what needs to be in our feedback reports to the data provider?, what details need to be in the inventory documentation? etc.) and then created the QA/QC process and tracking database that could satisfy these requirements. The overall goal is to handle each file as few times as possible and collect information regarding each file using a standardized method. This approach allows us to automate the Format QC summary for each individual data provider and reduce the overall burden of reporting and review.

QC and Augmentation of Location Coordinates

Since the NEI needs to be a model-ready inventory, it is important that each emission release point has correct latitude/longitude coordinate pairs. The location of a facility in the inventory determines to which model grid cell the emissions from that facility will go in the air quality modeling. Without proper coordinates, air quality models will give incorrect results. In this phase, we will follow the methodology outlined in the *NEI Quality Assurance and Data Augmentation Steps for Point Sources* report[5] to replace missing or bad coordinate pairs.

The QC of location coordinates is a multi-step process. The first step is to make sure that all of the emission release points associated with one facility are within a reasonable distance of one another. If one or more points is more than 3 kilometers (km) from the other points at the facility, it is replaced by a site average. The next step uses geographic information system (GIS) overlays to evaluate each coordinate pair with respect to its county boundary. Coordinates that are more than 10 km outside the county boundary are replaced. The

bad coordinate pair is replaced using a hierarchy of sources which includes 1) other valid points at the same facility, 2) geocoding software[6] 3) the EPA's Facility Registry System (FRS) database[7] and 4) county centroids.

This will be the first QC review of the latitude/longitude pairs associated with all facilities in the various data sets comprising the 2002 NEI, so we will need to check all coordinate pairs. As this database will contain both HAP and CAP facilities, it will be much larger than previous sets evaluated in the past (before integration of the NEI CAP and HAP facilities). The assignment of good coordinates is also critical to the blend-merge process discussed below. Thus, the first step in this QC process will be a critical evaluation of our GIS process. This includes, but is not limited to, reviewing and/or upgrading the GIS software and overlays used to plot the points and involving a second GIS reviewer in the loop to verify a sampling of results. The overall goal is to produce the best possible results in the most efficient manner.

Data Blending and Merging

In this phase, the different point source inventory data sets will be combined into one inventory. This is a complex task which entails matching facilities among the different source databases and removing duplicated facilities and pollutants according to a prescribed hierarchy. This phase also includes assigning a data rating to each emissions record, augmenting VOC and PM data, reviewing HAP groups (e.g., mercury and compounds) for duplication, assigning MACT codes, and creating summary files for in-depth review.

The blending/merging and augmentation of data cannot begin until all of the data sources are corrected, NIF-formatted, and compiled. As the deadline for state, local, and tribal agency submittals is June 1, 2004, the TRI database will be released in the summer of 2004, and the receipt dates for ESD MACT data are unknown, we expect to have a very short window for compiling, merging and augmenting the data. To best distribute the workload, we have set up and are testing routines (hereafter referred to as modules) for many of the individual subtasks to be completed in this phase. We will execute these modules after the inventory is compiled from the separate data sources (see Figure 1).

Facility Matching

Prior to any blend-merging, we must match the facilities from the multiple data sources and assign common IDs to facilities found in one or more datasets. In preparation for the compilation of the integrated 2002 NEI, we created a crosswalk of NEI HAP and CAP facilities from the 1999 NEI. We built this crosswalk by first matching HAP and CAP facilities to one another and assigning unique identifiers to every facility in this crosswalk - the NEI Facility ID. Facilities found in both the HAP and CAP inventories share the same NEI Facility ID. Finally, we added the Office of Environmental Information (OEI's) Facility Registry System (FRS) ID and the Office of the Regulatory Information System (ORIS) ID for electric generating units (EGUs) to the crosswalk. A complete description of this table, which includes, IDs, names, addresses and other locational data can be found in Table 1.

The 1999 HAP-CAP crosswalk will be used as a starting point to assign NEI Facility IDs to newly submitted 2002 HAP and CAP data. The NEI Facility ID must be assigned to facility records submitted from different data sources in order to detect duplicate estimates among any of these sources. Merged IDs will be critical to blending HAP and criteria emissions from different data sources and for augmenting criteria VOC and PM emissions using VOC and PM estimates from the HAP inventory.

In preparing the crosswalk, a computer algorithm was used to find the "best" matches between HAP

and CAP facilities. The program first matched facilities based on the following parameters: state and county FIPS, facility name, address, and latitude/longitude coordinate pairs, only assigning a common ID to two facilities if they matched exactly on all of these parameters. It then looked for additional high probability matches by again matching on all of these same parameters with the exception of latitude/longitude coordinate pairs. In this case, the program searched first for coordinate pairs within .001 of a degree of one another. If no match was found, the program interactively relaxed this condition looking for additional matches until it reached an upper bound of coordinates that were 0.1 degrees apart. Finally, for the remaining unmatched facilities, the algorithm stripped out punctuation and leading/trailing spaces, dropped insignificant punctuation (e.g.,: _ - * @), and standardized corporate tags, from the facility name. Additional searches using these standardized names included matching on similar name, similar address and exact locational coordinates; and similar name, similar address and similar locational coordinates (again the difference between coordinate pairs was varied between .001 degree and 0.1 degree). Finally, the algorithm generated candidate lists of potential matches for manual review. A number of these lists were generated by using an artificial intelligence technique called heuristic fuzzy pattern-matching to match facility names with small typographical differences.

These included:

1) Fuzzy name & address/coordinates but different county;
2) First 5 letters of name same & same address/coordinates;
3) Different name but same address/coordinates;
4) Fuzzy name & coordinates but different address; and
5) Same name & state/county but no address/coordinates

Finally we reviewed the crosswalk using manual methods and simple queries. Often, we researched a company and its locations, acquisition history and name changes on the internet. These web searches helped us detect closures, matches, and facilities that were incorrectly assigned the same ID. While preparing the HAP-CAP crosswalk, we also reviewed each set of IDs for duplicates internal to each inventory and re-assigned IDs as necessary.

Module 1: Merging and Blending

We have developed detailed specifications for blending and merging multiple data sets. The merger needs to be simple, reproducible, transparent, and give precedence to state, local, and tribal-provided data. Our first step was to develop a clear plan as to which sets take precedence and on what level the merger should occur (e.g., facility, county, process).

The blend-merge phase is one of the most difficult in the creation of the inventory. It not only involves matching facilities among the multiple source data sets and assigning them common identifiers (IDs), it also involves finding and removing overlapping pollutants where the same facility is presented by one or more sources. It entails assessing if facilities or pollutants are missing and attempting to augment these gaps. In the past, we merged HAP data sources according to the following hierarchy: local agency or tribe; state; ESD or MACT; industry; TRI; and prior NEI year data. For a particular facility, we selected the HAP estimate from the source with the highest rank and deleted the other sources. Blending and merging is complicated by the fact that different sources provide data on different detail levels, and it is not always clear if pollutants that are provided for the same facility by two different data sources represent the same processes. For example, TRI provides pollutant data at the facility level, while many states provide data at the SCC or process level. If the state provided data are chosen over TRI, it is possible that emissions for process-pollutant combinations not in the state database are lost.

We will follow the data source hierarchy as described above, but will make exceptions to this hierarchy when one source has provided higher quality data than another. For example, if a submitter supplies estimates derived from original source test data, these data are given preference over other sources. In the past, these exceptions have included:

- EPA's large and small municipal waste combustor (MWC) data
- EPA's mercury data for coal-fired utility boilers
- 4,4'-Methylenediphenyl Diisocyanate (MDI) data from trade association
- Office of Solid Waste's (OSW) hazardous waste incineration data

The merging process also includes a step in which we review the compiled inventory for overlap between individual HAPs and HAP compound groups. For example, one source may submit combined emissions for mercury and compounds, while another may submit individual estimates for particulate divalent mercury, gaseous divalent mercury, and elemental gaseous mercury. If both sets of estimates are retained, then some emissions are duplicated. In the past, we have treated this as an additional step in the blend-merge process. Estimates were compared on a facility-HAP compound group basis, and the highest ranked estimate was retained. Here rank depended upon both the data source and the specificity of the compound, with the data source as the most important factor in the ranking. It is important to note that there are some HAP groups that are difficult to merge because of the number of individual compounds within a group. These groups include dioxins, furans, and polycyclic organic matter (POM).

In the past, we also attempted to assess data gaps--missing facilities, missing pollutants, and missing source categories--by comparing the new data to a prior inventory. Where a gap was found, we supplemented the new inventory with data from the prior inventory. This leads to potential errors, however, as it is possible that a facility closed completely or eliminated one or more processes in the intervening years. To prevent such errors in the 2002 NEI, we plan to compare older "gapfilling" datasets with the 2002 TRI to screen out any facilities that are not in TRI and presumably are closed.

Module 2: Augmentation of PM and VOC and QC

Since the CAP and HAP inventories are being handled in an integrated fashion for the first time, we now have the opportunity to compare VOC and PM emissions data with PM-HAP and VOC-HAP data. If there are VOC-HAP or PM-HAP emissions, but no VOC or PM CAP data, then the inventory can be augmented using the reported HAP-VOC and HAP-PM emissions.

We propose the following approach for augmenting PM and VOC data:

- Apply the PM or HAP precursor flag (now stored in the NEI pollutant lookup table) to each HAP in the 2002 database;

- Use the PM or VOC precursor flag to sum total PM and VOC emissions per facility; and

- Compare VOC-HAP and PM-HAP facility totals with VOC and PM facility totals.

We plan to evaluate the results and augment as follows:

1) If VOC = 0 and VOC-HAP > 0.
   Create a new emissions record for "augmented" VOC. Set VOC-aug = VOC-HAP

emissions. Indicate augmentation flag (VOC-aug) in the data source field. This assumes all VOC are VOC-HAP.

2) If VOC > 0 but < VOC-HAP.
If the sum of VOC-HAP are more than 20% greater than reported VOC, then we will compile a list of these facilities with their emissions data for further QC. It is not known at this time if we will be able to resolve the discrepancy.

3) If VOC > VOC-HAP.
No action necessary. Assume VOC includes all VOC-HAP emissions, plus additional non-HAP VOCs.

The procedure for augmenting PM will be similar to the one outlined for VOC. In this case, we will compare HAP-PM emissions to PM-primary (PM-PRI) emissions.

Module 3: MACT Assignment

We use a systematic procedure to assign MACT codes at the process level. As this process may end up associating some non-MACT facilities with MACT codes, the data user should be aware of how these codes are assigned and make their own judgment regarding MACT facilities. A facility may simply have the characteristics of a given source category and may not be truly subject to MACT. The best, most reliable MACT codes are assigned to data provided by ESD lead engineers and/or assigned by state and local submitters of the data. These records are flagged as "ESD-based" and "State-Based" in the "MACT Flag" field. Next, MACT codes are assigned based on Source Category Codes (SCC) and finally Standard Industrial Classification (SIC) codes using SCC and SIC code default lookup tables developed by EFIG and ESD. For the 2002 NEI, we have added the 70 area source categories that will be evaluated for the development of the section 112(k) area source standards.[8] The "MACT" codes assigned to the section 112(k) area source categories were developed in consultation with staff from the Emission Standards Division (ESD). In some cases a MACT and area source category may share the same name and code. To distinguish between MACT and area source standards, we will populate the MACT compliance field with a code of "03" to indicate a process subject to area standards.

Module 4: Data Rating

We will develop a simplified rating scheme so that a score can be assigned to each NEI point source estimate to give reviewers some sense of the reliability of an emission estimate. This enhances the transparency of the data and also satisfies requirements of EPA's IQG and Data Standards. This rating scheme will consider the following factors in assigning a score:

1. ***Completeness of data*** - Has the submitter provided enough information to enable the reviewer to repeat the calculation, assess emission factors and/or calculation methods? The NIF fields that provide this information are:

    - Actual throughput;
    - Throughput unit numerator;
    - EM Reliability indicator;
    - Factor Numeric Value;
    - Factor Unit Numerator;

- Factor Unit Denominator;
- Emission Calculation Method; and
- EF Reliability Indicator.

2. ***Emission Calculation Method*** - Estimates based on continuous monitoring should receive higher scores than data based on less accurate methods, e.g., "engineering judgment."

3. ***Age of data*** - In some cases, we have an emissions estimate from an earlier year, not the current inventory year. Having "old" data is preferred to having a data gap. However, a 1999 estimate should have a lower rating than a 2002 estimate.

4. ***Qualitative Information*** - We have additional information with respect to several submittals that is not reflected in the database (e.g., MWC estimates from EPA are based on source testing). We might also want to consider breadth of data, i.e, did the source of this estimate provide a large number of pollutants relative to other sources for this category? For example, does EPA refinery data have more HAPs per facility than data provided by other sources (state and local agencies, TRI and industry)?

5. ***Specificity of Data*** - An estimate which provides process level emissions is better than aggregated facility level emissions. Another example can be made for PM. State provided data for PM_{10}-PRI and $PM_{2.5}$-PRI are assigned a higher rating than EPA-augmented data.

We will devise a simple method for assigning each score based on the attributes listed above. This scoring should be kept simple and easy to replicate. We do not want to put undo importance on this score, as many of the fields listed above may be blank. However, it may help us make better decisions as to which data point to retain when we have multiple estimates for the same facility. It may also help us understand which source categories need improvement.

We will have to assign some relative weighting to the factors listed above to determine the overall score. For example, one simple method would be to give an estimate a high score ("5") if it satisfies certain of the requirements listed above (e.g., source test data with high completeness), but to subtract points if the data are old or fails to fulfill other attributes. Our first step will be to evaluate the list above, make sure it represents the attributes we want to measure, and then come up with a matrix of possible scoring scenarios. The final scoring system should be simple, clear, and easy to program.

Module 5: Creation of Summary Files

Three data summaries will be created in this last module. The first is a Facility Data Source Summary file. This file contains facility emissions for each source of data, and the value selected in the draft 2002 NEI. This is an outgrowth of the blend/merge process and will be integrated into Module 1. Thus, when a routine is developed to select a data point over another, an output of the routine will be a table that records the chosen data point and the "rejected" data point and its sources.

The second summary is a list of facilities with defaulted location coordinates. The third summary is a source category emissions file containing records with the following data fields: Federal Information Processing Standards (FIPS) codes, pollutant codes, MACT codes, North American Industry Classification System (NAICs), SCCs and emissions. These are non-complex outputs, and can be readily generated after all data compilation is complete.

These summaries will be used by EPA in its internal QA/QC of the data prior to releasing the data for public review.

QC and Augmentation of Stack Parameters

The last phase in developing the 2002 point source NEI will involve reviewing the site and process stack parameters, and replacing missing or erroneous parameters following the methodology outlined in the EFIG's QA augmentation report.[5]

Our stack augmentation methodology evaluates parameters for both fugitive and stack emission release points. If the height associated with a fugitive emission release point is outside a given range, all of the parameters associated with the emission release point are replaced with a set of defaults. Otherwise, the height is retained, and the remaining parameters are replaced with the set of defaults. Parameters associated with stack emissions release point must all be non-null, fall within the boundaries of a set of ranges, and be internally consistent (i.e., satisfy the stack flow equation). Additionally, the height must be non-null and less than the diameter. If the stack parameters fail any one of these conditions, they are replaced with either SCC, SIC, national defaults, and/or calculated values according to detailed procedures outlined in the augmentation memorandum.

NEI Schedule

One of the biggest challenges of the integrated 2002 NEI will be producing a consolidated inventory in less time than allocated for prior inventories. In the interests of shortening the production cycle there will only be ONE data submittal and ONE data review period for the 2002 inventory. The process begins June 1, 2004 with the submittal of state/local and tribal data and ends 18th months later with the release of the final NEI on December 31, 2002. As outlined in the NEI Preparation Plan[9] these are the significant project milestones:

- June 1, 2004 – State, local, tribal data submittals due
- February 1, 2005 – Draft 2002 NEI posted for review
- May 1, 2005 – Comments due on Draft
- December 31, 2005 – Final 2002 NEI

CONCLUSIONS

This paper gave an overview of the initial steps involved in the development of an integrated HAP and CAP 2002 NEI. EFIG is preparing an integrated inventory for the first time and this will present new challenges. EFIG must process, compile, and merge multiple data sources without creating duplicate estimates. It must also augment critical data elements essential to the modeling of the data in air quality models such as latitude/longitudes and stack parameters.

Initial steps include systemically checking the data for referential integrity errors, format and content errors (e.g., incorrect pollutant codes) and providing rapid feedback to the state/local and tribal data providers so that corrections can be made in a timely manner. After all of the individual databases have been corrected, EFIG will assign NEI Facility IDs to all facilities. Next EFIG will blend/merge, augment, assign ratings, and summarize the data. New steps include augmenting criteria estimates for PM and VOC where a PM-HAP or VOC-HAP estimate is present, but a corresponding criteria record is not. In the 2002 NEI, codes indicating

area source and MACT standards will be applied, based on user comments and SIC and SCC defaults.

State and local agencies and tribes can assist the process by completing key data elements such as physical address, locational coordinates, MACT code, SICs, SCCs and other identifying information. The SIC codes and SCCs are used to assign MACT codes, augment stack parameters, and speciate metallic compounds for modeling purposes. When these codes are incorrect or incomplete, we may assign incorrect default values or non-specific default values in place of better, more applicable ones. When additional important information is known regarding a source that does not correspond to one of the NIF data elements, data submitters should communicate this information directly to EPA. These issues could include: 1) indicating that a unit is temporarily, but not permanently shutdown; 2) noting that a facility was shutdown in 1999 and should not be brought back into the 2002 during gapfilling; or 3) assigning a qualitative rating to estimates in the data submittal.

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KEY WORDS

Point Source Inventory
National Emissions Inventory

Criteria Pollutant
Hazardous Air Pollutant

Table 1. Data elements 1999 NEI HAP - CAP crosswalk.

State/County FIPS
Tribal Code
1999 NEI for CAPs Facility ID
1999 NEI for HAPs Facility ID
1999 NEI Merged ID (NEI Facility ID)
1999 NEI for CAPs site name
1999 NEI for HAPs site name
1999 NEI for merged name
1999 NEI for CAPs address
1999 NEI for HAPs address
1999 NEI for merged address
1999 NEI for CAPs site latitude and longitude
1999 NEI for HAPs site latitude and longitude
1999 NEI for merged site latitude and longitude
1999 NEI for CAPs primary SIC Code/NAICs code
1999 NEI for HAPs primary SIC Code/NAICs code
1999 NEI for merged SIC Code/NAICs code
2002 EGU ORIS Facility Code
FRS ID
FRS name
FRS address
FRS latitude/longitude
FRS State/County FIPs
Historical Names for Facility and Ownership
Dun and Bradstreet Number (if available)
Latitude and Longitude EPA data standard fields

Figure 1. Conceptual overview of integration plan for 2002 NEI