United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
MD-14

EPA-454/R-97-004g
July 1997

EPA

EIIP Volume VII

Data Management Procedures

U.S. Environmental Protection Agency
Region 5, Library (PL-12J)
77 West Jackson Boulevard, 12th Floor
Chicago, IL 60604-3590

OCR-38-13340

PREFACE

As a result of the more prominent role given to emission inventories in the 1990 Clean Air Act Amendments (CAAA), inventories are receiving heightened priority and resources from the U.S. Environmental Protection Agency (EPA), state/local agencies, and industry. More than accountings of emission sources, inventory data are now providing the prime basis for operating permit fee systems, State Implementation Plan (SIP) development (including attainment strategy demonstrations), regional air quality dispersion modeling assessments, and control strategy development. This new emphasis on the use of emissions data will require significantly increased effort by state/local agencies to provide adequate, accurate, and transferrable information to meet various agency and regional program needs.

Existing emission inventory data collection, calculation, management, and reporting procedures are not sufficient or of high enough quality to meet all of these needs into the next century. To address these concerns, the Emission Inventory Improvement Program (EIIP) was created. The EIIP is a jointly sponsored endeavor of the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials (STAPPA/ALAPCO) and the U.S. EPA, and is an outgrowth of recommendations put forth by the Standing Air Emissions Work Group (SAEWG) of STAPPA/ALAPCO. The EIIP Steering Committee and technical committees are composed of state/local agency, EPA, industry, consultant, and academic representatives. In general, technical committee participation is open to anyone.

The EIIP is defined as a program to develop and use standard procedures to collect, calculate, store, and report emissions data. Its ultimate goal is to provide cost-effective, reliable, and consistent inventories through the achievement of the following objectives:

- Produce a coordinated system of data measurement/calculation methods as a guide for estimating current and future source emissions;
- Produce consistent quality assurance/quality control (QA/QC) procedures applicable to all phases of all inventory programs;
- Improve the EPA/state/local agency/industry system of data collection, reporting, and transfer; and
- Produce an integrated source data reporting procedure that consolidates the many current reporting requirements;

EIIP goals and objectives are being addressed through the production of seven guidance and methodology volumes. These seven are:

- Volume I: Introduction and Use of EIIP Guidance for Emissions Inventory Development
- Volume II: Point Sources Preferred and Alternative Methods
- Volume III: Area Sources Preferred and Alternative Methods
- Volume IV: Mobile Sources Preferred and Alternative Methods
- Volume V: Biogenics Sources Preferred and Alternative Methods
- Volume VI: Quality Assurance Procedures
- Volume VII: Data Management Procedures

The purpose of each volume is to evaluate the existing guidance on emissions estimation techniques, and, where applicable, to identify the preferred and alternative emission estimation procedures. Another important objective in each volume is to identify gaps in existing methods, and to recommend activities necessary to fill the gaps. The preferred and alternative method findings are summarized in clear, consistent procedures so that both experienced and entry-level inventory personnel can execute them with a reasonable amount of time and effort. Sufficiently detailed references are provided to enable the reader to identify any supplementary information. Users should note that the number of source categories or topics covered in any volume is constantly expanding as a function of EIIP implementation and availability of new information.

It is anticipated that the EIIP materials will become the guidance standard for the emission inventory community. For this reason, the production of EIIP volumes will be a dynamic, iterative process where documents are updated over time as better data and scientific understanding support improved estimation, QA, and data management methods. The number of individual source categories addressed by the guidance will grow as well over time. The EIIP welcomes input and suggestion from all groups and individuals on how the volumes could be improved.

PROTOTYPE VERSION EIIP EDI IMPLEMENTATION GUIDELINE (FOR AIR EMISSION MODELING DATA)

Prototype Version
Draft

April 1997

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Prepared for:
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SECTION 1 — INTRODUCTION

1.1 Purpose of Guideline

This implementation guideline is provided by the U.S. Environmental Protection Agency (herein referred to as USEPA) Emission Inventory Improvement Program (EIIP). This guideline specifically supports the Phase I goals of the EIIP Electronic Data Interchange (EDI) project.

This phase of the EIIP EDI project is a prototype. It is not a pilot or a production EDI system. A prototype system differs from a pilot and production system in a number of ways. The pilot is geared toward immediate evolution into a production environment. A production system fully supports the routine exchange of business information between trading partners. The prototype is a proof-of-concept step that is initiated to demonstrate the basic performance of the EDI and supporting systems. The prototype does not take into account many of the issues that must be addressed for a pilot and/or production system. This guideline is includes information that directly applicable to a pilot environment. Although the document is intended to support the initial, prototype effort, an understanding of the more developed, pilot-oriented information is important for future activities.

This Implementation Guideline provides trading partners with an outline for the implementation of EDI for the submission of air emission modeling information to the USEPA Emission Factor and Inventory Group. It also provides the information necessary to understand the general EDI goals of the EIIP and USEPA, provide an overview of the EIIP EDI project, and communicate the general information needed for the prototype.

1.2 Scope and Applicability

As this phase of the EIIP EDI project is a prototype and does not address all the components/issues of a pilot or production system, actual implementation is somewhat simplified. However, for the prototype to be effective, it must highlight those areas that will be required for future expansion of the project.

The scope and applicability of the Implementation Guideline encompass all aspects of implementing an EDI system that supports the reporting of air emission modeling information as defined by the EIIP initiative. Specific reference is made where the prototype implementation diverges from typical pilot/production system requirements.

In order to provide a comprehensive reference document, including EDI implementation requirements of the USEPA, the EIIP guideline is written to include information specified in the USEPA EDI Implementation Guideline. Although this implementation guideline contains guidance regarding the USEPA's implementation of EDI, more information about the USEPA

EDI perspective or other EDI projects within the USEPA may be found in the USEPA EDI Implementation Guideline dated September 23, 1994.

1.2.1 Project Overview

The Clean Air Act Amendments (CAAA) require that many State and Local agencies collect emission inventory data as a basis for planning and demonstrating attainment with National Ambient Air Quality Standards (NAAQS). Emission inventories are a basic component to air quality modeling and other air pollution management analyses which are used to demonstrate that proposed air pollution control strategies are sufficient to attain the State and Federal air quality standards. The availability of emissions data is of primary importance to support urban and regional air quality attainment demonstration, emission control strategy development, emissions trading, regulatory and economic impact analyses, geographic and satellite information systems, and scientific research. These data are essential to the infrastructure in managing environmental air pollution at the Local, State, Regional and Federal levels.

The Emission Inventory Improvement Program was formed as a joint effort of State and Local air agencies and USEPA for the purpose of improving the quality of the emissions data collected, and the way the data is transferred and shared among users. The EIIP Data Management Committee (DMC) is responsible for developing and implementing a common data transfer format, and for facilitating data sharing within the emission inventory/modeling community.

The USEPA published its *Policy on Electronic Reporting* (FRL-3815-4, vol. 55, no. 146, July 30, 1990), endorsing an approach commonly known as EDI for electronic reporting of environmental data. This policy was consistent with the anticipated government-wide mandate for EDI, published as FIPS PUB 161 (September, 1991). USEPA's *Policy on Electronic Reporting* was intended to promote electronic reporting, and a uniform USEPA approach that is compatible with current industry and Federal sector practices. The policy recommends a standards-based approach, and encourages the use of American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 standards for EDI. The DMC has adopted this approach to develop the EIIP common data transfer format for the emission inventory/modeling community.

1.2.2 EDI Objectives and Approach for EIIP

An objective of the EIIP is to implement EDI for the submission of air emission inventory and modeling information. This initiative is intended to allow data to be directly transmitted and shared between the different computer systems of trading partners. The EIIP EDI initiative is designed to allow the reporting of air emission inventory and modeling data from the following emission source areas:

Point Source

- Area Source
- Nonroad Engines and Vehicles Source
- Mobile Source
- Biogenic Source

For this phase of the project, the implementation guideline incorporates a level of detail that is appropriate for use with all five areas. Within each of the areas, several specific reporting functions (e.g., State Inventory Plan (SIP) inventories, Annual Point Source inventories, etc.) may be identified. As each function may have different ans some overlapping information, each one must have a separate, report-specific guideline. Each individual guideline will explain the use of EDI with respect to specific practices and assist in clarifying the use of the transaction set between trading partners. For Phase I of the EIIP EDI prototype project, air emission modeling data (as defined by the Environmental Council of States (ECOS)) is the intended reporting function. This implementation guideline is written to provide the details for reporting this information via EDI.

When realized, the EIIP EDI objectives will provide economies in exchanging information with internal and external partners. The EIIP has developed an approach to EDI that will benefit all participants (trading partners), including the regulated community, Federal and State environmental program offices, and other related organizations. This approach includes:

- Implement EDI using the American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 standards;
- Apply the ANSI/ASC X12 841 Specifications/Technical Information transaction set and developing the corresponding EIIP-specific convention document;
- Develop national standards for the implementation of emission inventory and modeling reporting;
- Avoid the development and proliferation of proprietary software, standards, procedures, and conventions;
- Reduce the volume and necessity of paper reporting;
- Increase the speed of reporting and analysis of the data;

- Enhance the level and effectiveness of quality control associated with reported data;
- Facilitate data sharing among partners; and
- Seek voluntary collaboration with the regulated community, Federal and State agencies, educational institutions, and support contractors.

Electronic Reporting

The U.S. Government Policy on EDI, as published in the Federal Information Processing Standards (FIPS PUB 161) became effective on September 30, 1991. Its objectives are to:

- Have Federal Agencies achieve the benefits of EDI (e.g., reduced paperwork, fewer transcription errors, faster response time for procurement and customer needs, reduced inventory requirements, more timely payment of vendors);
- Ease the electronic exchange of data by the use of standards for data formats and transmission envelopes; and
- Minimize the cost of EDI implementation by preventing duplication of effort.

Prior to implementing an EDI project, FIPS PUB 161 should be reviewed in detail. Listed below are some of the highlights.

The transmission of reports using EDI is consistent with the USEPA's electronic reporting (ER) policy. Notice of USEPA policy was published in the Federal Register, Notice No. FRL-3815-4, Volume 55, Number 146, July 30, 1990 and was entitled "USEPA's Policy on Electronic Reporting." This policy establishes a uniform USEPA approach to electronic reporting. In addition, this policy is intended to promote the adoption of electronic reporting by USEPA Program Offices and to ensure that as they implement this technology, they do so in a manner that is both consistent across the USEPA and compatible with the current electronic reporting practices in industry.

The USEPA also recently published guidance related specifically to the use of EDI. The notice of the USEPA's policy on employment of EDI was published in the September 4, 1996 Federal Register, Volume 61, Number 172, FRL-5601-4. The notice is entitled "Notice of Agency's General Policy for Accepting Filing of Environmental Reports via Electronic Data Interchange (EDI)". The notice provides an overview of the USEPA perspective for the use of EDI, the history of EDI within the USEPA, and how to use EDI for reporting to the USEPA.

1.3 Responsible Entity

EDI is a partnership that involves several individuals or functional groups within each organization. EDI is a new way for the government to conduct environmental reporting. For EDI to be successful, all who are involved must work together in an open and informed environment. With every EDI system that is implemented, including the EIIP EDI project, each organization must secure and maintain staff that fulfill the following positions/responsibilities:

The **Trading Partner** (e.g., a governmental agency, an emission source, a municipality, a corporate entity, etc.) is responsible for its EDI software and successfully communicating data to its collaborating trading partner. Communicating data includes acquiring the data, presenting it to a translator for conversion to the X12 Standard and transmitting it via a prescribed route. Each trading partner is also responsible for acquiring required software and hardware and for problem resolution with its associated trading partners.

As each trading partner is responsible for its own part of the overall EDI system, business and technical decisions must be based on the resources and needs of that organization. Each trading partner will develop their EDI system to fit their organization. Once developed, communication and cooperation will be necessary to form the essential relationships between trading partners.

In an EDI system environment, trading partners function in pairs. Although an individual organization may interact with numerous trading partners, it shares a unique, one-to-one relationship with each. Because each relationship has unique characteristics, each pair of trading partners must communicate EDI-related decisions in order to be successful.

In the case of the EIIP EDI project, the EIIP is responsible for providing the necessary Implementation Guidelines and testing assistance during the initial implementation to ensure successful delivery of the data.

The participants in the EIIP EDI prototype project consist of the following entities:

- USEPA Office of Air Quality Planning and Standards (OAQPS) Emission Factor and Inventory Group (EFIG) Emission Monitoring and Analysis Division (EMAD); and

- State/local environmental agencies responsible for air emission modeling data. The specific state trading partners involved in the EIIP prototype implementation are California Air Resources Board (CARB) and Pennsylvania Department of Environmental Protection (PADEP).

An EDI project requires the services of individuals educated in both EDI and the applications that handle the data. For the purposes of identifying the various functions involved, this publication has assigned the following titles and identified functions with those titles: Program Officer, EDI Coordinator, EDI Application Programmer and Telecommunication Coordinator. A

successful EDI implementation is dependent upon having the responsibility of the functions assigned, not the titles.

The **Program Officer** is responsible for the USEPA program interface. The Program Officer is responsible for ensuring that each project participant is in compliance with USEPA and EIIP regulations and EDI agreements, thus ensuring the integrity of the EIIP EDI transmissions.

The **EDI Coordinator** is responsible for the application program that uses the EDI data and for all problems at the application level including EDI documentation (e.g., wrong field, wrong data in field, missing fields, etc.). The Coordinator works closely with the EDI Application Programmer and may assume some of the Program Officer duties.

The **EDI Application Programmer** is responsible for developing and maintaining the interface program that bridges trading partner applications to their EDI system. The Application Programmer is also responsible for all modifications and enhancements to the EDI system. This includes the resolution of problems that may arise between the trading partners' translator software.

The **Telecommunications Coordinator** is responsible for ensuring that the services provided under the Value Added Network (VAN), or other means of communication, are compatible with the prototype EDI requirements.

1.4 Introduction to EDI

EDI is the transmission in ANSI ASC X12 syntax, of unambiguous information of business or strategic significance between computers of independent organizations. The definition can be expanded further to include the electronic transmission of business documents from the application program of one computer to the application program of another computer within the framework of a standard format. The key elements in the definition are computer-to-computer and standard format. EDI reduces costs and errors associated with a paper document environment. EDI replaces the mail delivery and reentry of documents with the electronic mailbox and the delivery of business data directly to your computer application program.

1.4.1 EDI and ANSI/ASC X12 Standards

The American National Standards Institute (ANSI) was founded in 1918 as the national coordinator of the voluntary standards system for the United States. The system meets national standards needs by marshaling the competence and cooperation of commerce and industry, standards developing organizations, and public and consumer interests. ANSI coordinates the voluntary development of national consensus standards, approves standards as American National Standards, and serves as a clearinghouse and information center for American National Standards and international standards.

In 1979 ANSI chartered a new committee, known as Accredited Standards Committee (ASC) X12, Electronic Data Interchange, to develop uniform standards for electronic interchange of business transactions. This charter permits the adoption of national standards for EDI and enables all organizations to use a single agency (ASC X12) to develop and maintain transaction set standards.

ASC X12 develops Draft Standards for Trial Use (DSTU's) and publishes the entire set as a Version/Release annually. The purpose of the Release is to put current approved draft standards into the hands of users on a more frequent schedule, to speed implementation, reflect user needs in the standards more quickly and allow the user to gain experience with the draft standards before solidifying them as American National Standards.

Draft Standards for Trial Use undergo the ANSI-required public review process approximately every three to five years. ANSI-approved, published standards, including ASC X12 DSTU's, as of May 1994 number 198 with an additional 102 draft standards that are under review.

In developing the ASC X12 series of American national standards, the ASC X12 subcommittees seek to minimize the need for users to reprogram their internal data processing systems to achieve an interchange. Consequently, the standards are structured so that computer programs can translate data from internal to external formats and vice-versa. In this way, either through internally or externally developed translation software and public-communications vendors, all sizes of firms and institutions using intelligent computational devices may benefit from the use of the standard.

Through the use of this standard, all institutions can enjoy the efficiencies of a common interchange language rather than experience the difficulties of a proliferation of methods and procedures which could occur if each institution were to impose its own formats on every other institution with which it does business.

1.5 How to Use the Implementation Guideline

These guidelines follow the recommended format specified in the "ASC X12 Guideline for Electronic Data Interchange (EDI) Implementation Guidelines", ASC X12D/90-856, approved February 1991. Chapters 1-10 of this guideline contain information necessary for trading partners to fulfill the requirements for implementing the exchange of air emission modeling data using EDI.

These sections include the EDI business background and history, as well as policy and logistic issues that should be addressed. The appendices contain a checklist on how to get started with EDI, and provide conventions of the specific X12 transaction sets needed to satisfy the EDI information requirement for transmittal of data electronically.

1.6 References

Questions, comments, and suggestions regarding this EIIP EDI Implementation Guideline may be referred to:

Ms. Lee Tooly
U.S. Environmental Protection Agency
Emission Factor and Inventory Group
EIIP Data Management Committee
Research Triangle Park, NC 27711
Telephone: (919) 541-5292

Standards publications, guidelines, and technical reports disseminate the technical and logical concepts reflected in the X12 Standards. Data Interchange Standards Association publishes a catalog of the available standards. The information available from DISA includes Part I, which is a document entitled "An Introduction to Electronic Data Interchange". Part II is also available, which is a catalog of the ANSI/ASC X12 Publications. Any general or technical questions about EDI, ASC X12 committees, or the ANSI/ASC X12 Standards, can be directed to:

Data Interchange Standards Association, Inc. (DISA)
Technical Department
1800 Diagonal Road, Suite 200
Alexandria, VA 22314-2852
Telephone: (703)548-7005

SECTION 2 — BUSINESS ISSUES

2.1 Implementation Considerations

When implementing EDI, a multitude of business and technology questions must be asked and answered. As the application of EDI technology becomes more prevalent within the USEPA and the regulated community, many of the general issues associated with EDI implementation have already been addressed. Through the efforts of the EIIP DMC and their partners, an informed, receptive support team has developed. This team understands the issues related to EDI implementation and is working to ensure the success of ANSI/ASC X12 EDI as a means to electronically transfer air emission modeling data.

Although a majority of the business issues have already been considered during the development of this EDI project, a general overview of the prominent issues is presented in the balance of this section. As this phase of the EIIP EDI project is a prototype, not all the issues are of immediate concern. However, the information provided below must be addressed as the project moves toward a production environment.

At this time, because the initial implementation is a prototype activity, many of the requirements outlined below have not been finalized. Several issues that must be addressed for a production environment will be specified based on the result of the prototype efforts. These essential areas include, but are not limited to:

- Establishment of a formal EDI committee;
- Production implementation;
- Timing of transactions;
- Modes of operation;
- Security;
- Back-up and recovery procedures; and
- Audit considerations.

2.1.1 Establishing an EDI Committee

An EDI coordinating committee should be established. It is imperative that the EDI committee have a well defined and understood mission statement for itself and the designated project teams. This committee will be the focal point and control element for direction and communication. It should include representatives from all of the involved functions such as information systems, materials management, purchasing, sales, legal, audit, etc. The EDI committee will designate Project Teams to manage segments of the total project.

Another essential role of the committee is to interface with ASC X12. Because ASC X12 is responsible for the EDI standards that are implemented, a close relationship must be maintained by the EDI committee. Not only will this relationship help ensure that the EIIP's data maintenance requests are adopted, but that the EIIP has a presence and plays a role in the overall development of the national standards.

The EIIP DMC is currently serving this function. The DMC provides subject area expertise for project reporting requirements, USEPA guidance for implementing the EDI system, management support to ensure the success of the project, and oversight of maintenance issues related to all components of the EDI system.

2.1.2 Implementation Suggestions

In developing the EIIP EDI air emission modeling project, the DMC performed rigorous analysis activities to ensure a successful approach and implementation. Although the planning and implementation of an EDI system is a complex under taking some general approach recommendations can be made:

- Talk with experienced EDI users;
- Get involved with industry associations and standards organizations;
- Determine EDI objectives;
- Gain commitment from management, business units and support groups;
- Establish an EDI Implementation Team;
- Consider the extent to which internal systems are suitable for EDI;
- Select prototype/pilot partners with experience in EDI;
- Limit the initial effort to a few partners and transactions;

- Identify appropriate products with which to start;
- Begin with partnerships where transaction volumes are high;
- Integrate EDI with existing systems;
- Review tax, audit, and legal requirements;
- Evaluate hardware/software alternatives and make selections, carefully weighing the use of PC software for data entry and high transaction volumes;
- Provide an EDI training program (including training on EDI standards) for users;
- Enlist the assistance of experienced consultants and third parties;
- Establish agreements with trading partners;
- If applicable, be sure links exist to allow transmissions to flow between third parties;
- Have frequent progress discussions with partners and assign coordinator/contact;
- Define methods to handle exceptions and problems;
- Exchange documents in parallel mode for at least several cycles before initiation of live EDI data;
- Discontinue paper documents when EDI is operational;
- Publicize EDI benefits internally;
- Expand EDI efforts by establishing trading relationships with partners of varying sizes, EDI experience, and computer sophistication;
- Pursue EDI with only those partners where it makes business sense to do so;
- Participate in EDI industry and standards activities;
- Plan for significant up-front costs;

- Resist trading partners who want to use proprietary formats; and
- Get help from marketing, purchasing and other functional groups in the development of your EDI plans and architecture.

2.1.3 EDI Cost Justification

Short- and long-term benefits should be forecast when justifying the cost involved in implementing an EDI program. Trading partners face four general cost categories related to the implementation of an EDI system. These categories include:

- Application development costs;
- Supporting encryption when required;
- Modifying applications to capture the reporting data required (including hardware and software); and
- Message costs.

The cost of application development impacts all trading partners. Typically, existing applications with which EDI will be used require some modification. Trading partners that have no existing application will certainly incur application development costs. When evaluating the cost of application development or modification, three major cost areas should be addressed:

- Modification of EDI software to access the application systems;
- Support of encryption when required; and
- Modification of applications to capture the reporting data required.

Modifying applications may also entail upgrading system hardware and software platforms. The cost of these activities vary depending upon the current system architecture versus the required environment. Translation software costs also vary depending on the hardware and translation software selected for use. Consult with EDI translation software providers to determine the costs.

Message costs are a function of the transactions implemented, number of transactions, volume, frequency of transmission, time of day transmitting, method of transmission (direct, VAN, dial-up, etc.), VAN costs, and other factors.

2.1.4 Strategy for Implementation

Information needs to be collected to develop a successful strategy for implementing an EDI project. Consider the following when planning your implementation strategy:

- Develop a business applications/trading partners matrix;
- Designate EDI business contacts;
- Obtain contact information for Value-Added Networks (VAN);
- Obtain contact information for software providers;
- Determine what partner identification scheme should be used, (e.g., DUNS number);
- Define terms of exchange and establish an agreement between trading partners; and
- Develop an overall system data flow design.

Based on the information collected from business partners, develop an overall EDI plan. Conduct meetings/conferences with trading partners to define EDI plans and dates. Consideration should be given to those trading partners capable of doing EDI and having the desire to participate.

2.1.5 Transaction Sets

Determine the applicable ANSI/ASC X12 transaction sets that will be used and the minimum data that will be necessary to satisfy the application data requirements. Determine which acknowledgments shall be used.

The EIIP implementation uses the ANSI/ASC X12 841 Specifications/Technical Information transaction set. This transaction set is mapped in detail in the EIIP EDI X12 Convention Document which is located in the Appendix D of this document.

The ANSI/ASC X12 997 Functional Acknowledgment Transaction Set is employed in a production system. The use of the Functional Acknowledgment is a requirement of the USEPA for all EDI implementations. As this phase of the project is a prototype, this transaction set will not be employed.

2.1.6 Pilot Program

As stated previously, this phase of the EIIP EDI project is a prototype which differs from a pilot in a number of ways. The pilot is geared toward immediate evolution into a production environment. The prototype is a proof-of-concept step that is initiated to demonstrate the basic performance of the EDI and supporting systems. The prototype does not take into account many of the issues that must be addressed for a pilot and/or production system. Although this implementation guideline is produced for the prototype efforts, an understanding of the pilot program is important for future activities.

A pilot program is a method of initiating EDI that provides the ability to test concepts, practices, and EDI policies. A pilot program is the initial step of a production implementation schedule. The schedule should encompass the inclusion of all applicable trading partners into the EDI system. An integral part of a pilot program is to establish test criteria. These criteria must include:

- Coding and testing the interface to in-house system(s);
- Conducting system tests with translation software and network (if used);
- Conducting system tests with the trading partners using a test data file and/or testing with live data;
- Sending sample X12 data to trading partner; and
- Initiating parallel processing.

2.1.7 Education

Regardless of whether the EDI system is in prototype, pilot, or production stages, educating internal and external personnel in EDI is vital to the success of any EDI project. User personnel should be educated as to what EDI is, what implementation entails, why the organization is implementing the standards, and what impact it may have on the current procedures. Trading partner education regarding EDI transactions and future plans can be accomplished on an individual basis or through sponsoring trading partner conferences.

2.2 Timing of Transactions

A number of timing issues to be considered and resolved with trading partners when determining the timing of transactions include:

- When the business transaction(s) will be made available to the trading partner;

- Rules for acceptance/rejection of transmissions including time stamp of the transmission;
- Retention periods for both sender and network message storage transmission;
- Timings of the transaction acknowledgment;
- Methods of handling legal holidays;
- Deadlines for submission of the information and receipt of functional acknowledgments; and
- Abilities of the existing computer systems to respond within a specific time frame.

2.3 Modes of Operation

The two modes of operation are Production and Test. Production is used when both partners agree both systems are communicating the agreed upon data for the transaction sets implemented. The test mode is used when implementing a new transaction, when making a modification to implemented transactions, or when upgrading to a new version/release. The trading partners should be aware of when the test mode will be used in order to provide assistance to each other. Identification of the mode of operation is contained in the ISA (Interchange Control Header) Position ISA15, Data Element I14. A "P" identifies production data and "T" identifies test data. Trading partner systems must have the provision to handle both production and test transaction sets.

The initial activities for the EIIP EDI project are a proof-of-concept and are considered to be a test environment. Therefore, the transactions that will be transmitted for the prototype will be designated as Test. Upon completion of the prototype further activities and decisions will be made to move to the production environment. Trading partners will be informed of the decisions and additional requirements for the Production system as appropriate.

2.4 Security

The risks inherent in the EDI process are based on the lack of paper documentation to backup the transactions. EDI involves the transmission of electronic messages, or records, that may never be converted to hard copy. Therefore, the electronic records must be able to stand alone as submission data. These records are subject to the same security requirements as are all types of USEPA data.

The EDI process must include all steps necessary to ensure that the records are authentic, are properly authorized, and are retained in a manner that will ensure the integrity of the records. Audit trails must be maintained for accountability.

The *integrity* of EDI messages is essential. Security controls must be in place to ensure that the message is not modified and that electronic records are protected from loss or destruction. In addition, if EDI messages contain sensitive or Confidential Business Information (CBI), adequate controls must be in place to protect the data from inappropriate disclosure.

The *authentication of the originator* is a critical security issue for EDI. The process must be able to ensure that the source of the message is the named originator.

Computer security plans must be developed for EDI. The resources allocated to protecting EDI systems must be based on the risk and magnitude of potential harm that could result from the loss, misuse, or inappropriate access to or modification of EDI data. Specific controls should be implemented for the following aspects of the EDI system:

Integrity - Controls, such as audit trails, access control mechanisms, and separation of duties must be in place to protect the integrity of EDI data. Controls within the EDI environment for protecting data integrity include the following techniques:

- Recalculating and verifying real totals and hash totals for critical parameters;
- Repeating messages or parts of messages rather than using only a functional acknowledgment; and
- Including unique identifier codes within each message to define each message as a separate distinct message.

Confidentiality - EDI systems processing confidential data, such as Privacy Act, CBI, or enforcement data must include access controls to restrict access to authorized personnel only. Access controls include technical controls, such as passwords or encryption, as well as procedural controls, such as restricted access to physical areas processing confidential data.

Availability - Contingency plans must be prepared to provide for continuity of operations in case of system failure or system degradation. Contingency plans should include backups on a periodic basis commensurate with the importance of the data maintained within the system. The contingency plan must also be tested periodically to ensure that it accounts for all possible threats to system and data availability.

Authentication - Authentication controls must be in place to ensure that the source of the message is the named originator. Non-repudiation should be used when authentication is a critical issue. Specific techniques for authentication include:

- Returning an acknowledgment for each message sent. A valid message will send an acknowledgment to the originator within a pre-specified time period;
- Utilizing specific log-on techniques; and
- Including secret (known only to the parties involved) reference numbers or passwords within the body of the message.

Written agreements - The use of written agreements can stipulate the specific security and authentication mechanisms to be used. When employed, they are valuable tools for ensuring communication and understanding between trading partners. If used correctly, written agreements clearly and formally state the requirements and conditions under which the trading partners will operate.

In addition, cryptographic techniques should be considered, especially for high-risk systems, to protect the confidentiality, integrity, and authentication of EDI systems.

Procedural controls can be implemented to protect the integrity, availability and confidentiality of information and systems. Procedural controls may be less expensive and easier to implement than technical controls. Procedural controls can include activities such as limiting physical access to data entry or computer areas, providing security training, creating security procedure manuals, and requiring separation of duties.

The laws and regulations mandating safeguards mandating safeguards for Federal information and information systems include:

- The Privacy Act of 1974 (P.L. 93-579);
- The Freedom of Information Act (5 U.S.C. 552);
- The Paperwork Reduction Act of 1980 (P.L. 96-511);

- The Computer Security Act of 1987 (P.L. 100-235); and
- U.S. Code, Title 18, Section 1905.

The organization that initiates an EDI system should take care to avoid making unreasonable demands of its trading partners. While the initiating trading partner may have the resources and expertise to handle an EDI system easily, this may not always be true of the other partner(s). These limitations of resources and expertise should be taken into account.

For the prototype efforts, at a minimum, the EIIP EDI trading partners will be required to support the current USEPA standards for security. The trading partner will be responsible for keeping their VAN log-on and local dial-up access numbers secure. If the trading partner suspects a security breach, it must contact the Program Coordinator immediately. USEPA, as an initiating trading partner, reserves the right to change trading partner access identification numbers (ID) and passwords at any time.

2.5 Backup and Recovery Procedures

Backup and recovery procedures are necessary to provide:

- Retransmission capabilities;
- Translator re-run capabilities;
- Minimum 24- to 48-hour immediate access backup; and
- Archive and recovery capabilities for individual EDI transactions.

The backup and recovery procedures must be thoroughly documented to allow anyone with the proper authority to access the system to retransmit data.

It will be up to each EDI partner to keep their own records and archives of EDI transactions sent and received. Either partner must have the capability to retransmit an EDI message.

The Functional Acknowledgment (997) transaction set can be used to provide a level of automation in the backup and recovery area. If the EDI system expects to receive a Functional Acknowledgment for every transaction it sends, the EDI message should be available for retransmissions until a Functional Acknowledgment corresponding to a specific EDI message is received. Once the Functional Acknowledgment is received, the original EDI message can be archived regardless of the normal archive timing.

The USEPA requires the use of the Functional Acknowledgment. The Functional Acknowledgment is used to confirm receipt of the trading partner's transmission and indicate acceptance or rejection of the transaction set by the translator. A Functional Acknowledgment is not required for a transmission of Functional Acknowledgments. Because this phase of the EIIP EDI project is a prototype effort, the Functional Acknowledgment will not be employed.

2.5.1 Disaster Recovery Considerations

Disaster recovery becomes correspondingly critical to the amount of business that is conducted through the EDI channels. Consider the consequences to you and your trading partners if you were suddenly unable to exchange transmissions for an extended period. It is unwise to assume that you can fall back on a paper-based system. Your trading partners may not be able to quickly switch from EDI messages to mailing their business transactions to you. You may not have immediate access to the resources within your organization needed to process paper transactions.

Develop a plan to deal with extreme problems, such as a total loss of a Data Center or computer system and a loss of a phone company switch station servicing your area.

2.6 Audit Considerations

One of the first questions raised when considering the use of EDI relates to its impact on controls. Without a signed document and a paper audit trail, how will one know when a transaction is valid and approved?

A major issue associated with the use of EDI relates to its impact on controls, particularly without a paper audit trail which includes hardcopy signatures. The same elements of control will exist in an EDI-based system that exists with a paper-based system. Most controls related to EDI fall into three categories: confidentially, integrity, and authenticity. *Confidentiality* is the control that allows only authorized persons access to the transactions. *Integrity* controls validations of the data. *Authenticity* is the control that ensures the receiver that the transaction received is theirs and is valid.

The following are specific examples of controls within the confidentiality, integrity, and authenticity control categories.

Confidentiality

- Encryption is a method of logically scrambling the EDI information with an encryption key and giving the key only to persons who have a right to that information. The key is an electronic code for this procedure;

- Password protection is a method used to control access to files. Passwords should be changed often for maximum effect; and

- The use of a stand-alone computer for receiving EDI transmissions controls access to the main computer. Once the EDI data is on the stand-alone computer, it can be validated and uploaded to the main computer for use in applications.

Integrity

- Communications protocols provide bit count checking;

- Every X12 transmission contains Segment, Transaction Set, and Functional Group counts. Hash Total and selective segment counts are provided by certain transactions. Functional Acknowledgments are available to confirm transaction receipt and compliance to the standard; and

- Translators provide code validation and syntax checking.

Authenticity

- Value Added Networks (VANS) validate sender/receiver identifications and passwords;

- Translator Trading Partner Profiles validate sender identification, passwords, version/release, transmission sequence, and transaction set;

- Application programs validate personal Identification Numbers (PIN) and specified data contained in the transaction set (i.e., dates, reference numbers).

SECTION 3 — LEGAL CONSIDERATIONS

3.1 General Introduction

The information outlined below is essential for a production environment and should be considered when implementing a full EDI system. As this phase of the EIIP EDI implementation is a prototype, many of the components/issues identified have not been addressed. The necessary legal considerations will be fully addressed based on results of the prototype. The primary issues that will be address include, but are not limited to:

- Record keeping;
- Authentication;
- Trading Partner Agreements;
- Third-party Agreements; and
- Laws, rules, and regulations.

The EIIP EDI project was established to support facilities that voluntarily wish to share emissions data electronically. During the prototype phase of this project all requirements currently in affect for the reporting of air emission modeling data must continue. Regulations as currently written require the forms and signatures.

Businesses require control over their contractual and regulatory correspondence. Such control includes the determination of when correspondence is transmitted, to whom it is transmitted, when it reaches the recipient, and an appraisal of the accuracy, integrity and risks of the communication. Some of the legal issues include:

- Various offer and acceptance rules;
- The propriety of EDI in lieu of hard copy documents;
- The competency of sufficiency and evidence;
- Electronic mailbox controls;
- Legal and regulatory record retention issues;
- Ownership and liabilities; and

- Various risks of transmissions.

Most commercial law has been developed without specifically addressing electronic message systems. The precise legal status of EDI transmissions is therefore unclear in many cases.

EDI has been used successfully for a considerable number of years. For many companies, legal uncertainties have not posed a substantial obstacle to the adoption of EDI. In many instances, the legal risks of using EDI, when compared to the risks associated with traditional paper-based trading systems, have been considered to be manageable. Certain legal risks have been addressed with special agreements between trading partners and the adoption of appropriate in-house policies.

It is important that new users consult with counsel throughout the EDI implementation process. This chapter provides a very brief introduction to some of the issues counsel should consider when a new user implements EDI. The full range of issues that must be dealt with, and the importance of any particular issue, will vary from one user to the next.

EDI implementation should initiate a process by the business entity of rethinking its entire records management and retention policies. The ultimate decision regarding scope and retention period of electronic records depends on the company's overall business strategy and requirements.

3.2 Record Keeping

The Phase I EIIP EDI prototype project is intended to facilitate the submission of data from State/Local Air Quality Agencies to the USEPA. The hard copy retention of forms is an individual program consideration that may be specified in regulations.

Internal control systems should be reevaluated in the context of EDI to assure responsibility for data maintenance, including audit trail, transaction reconciliation, and backup capability.

When business transactions are recorded on paper documents, businesses can store those documents as evidence of what took place. The intent of EDI is to eliminate the transmission of paper documents. Internal record keeping systems should therefore be reevaluated in the context of EDI. The ideal EDI record retention system meets the following record keeping criteria:

- Copies of all EDI transmissions must be retained;
- EDI transactions must be retained in both the original and translated format in addition to normal application file retention;
- Storage medium for EDI transactions must be determined;

- Transmission activity logs containing pertinent time information must be retained;
- All programs used in the EDI system must be retained for the life of the record retention;
- Records must be able to be retrieved in a form that can be admissible in any judicial or other proceedings; and
- Record retention periods must be established.

At this time, requirements for record have not been finalized. At a minimum, the EIIP EDI Trading Partners will be required to support the current USEPA standards for record keeping.

3.3 Authentication

Authentication refers to the establishment or verification of a claimed identity. This may be the sender or receiver associated with a message. Authentication of an EDI transaction is contained within the transaction. All EDI transactions have the ability to identify all parties involved.

It is important that the source and the integrity of data transferred between the trading partners be assured before the data is manipulated. The security and controls needed to provide a proper level of assurance is a business decision that should be based on an assessment of the risks involved. The decision to implement a Message Authentication Code (MAC) should be mutual between trading partners and stated as a requirement in the Trading Partner Agreement.

Traditionally, paper documents and signatures have been used to authenticate the data that constitute commercial transactions. Authentication of EDI transmissions requires different methods of authentication. With the implementation of any particular EDI system, users and their counsel should ask the following questions within the context of the user's particular needs:

- Will the integrity and completeness of data transferred between trading partners be adequately assured before it is relied upon?
- Will the source of a message, and the legal authority of that source, be satisfactorily verified before the message is relied upon?
- If determined necessary, will adequate records be kept to show that authenticity of messages was tested?

EDI poses no different threat from any automated system that utilizes telecommunications. The issue is automation and electronic data vs a paper-based system. EDI formats simply provide a structure to that data.

3.4 Trading Partner Agreement

Trading Partner Agreements (TPA) are an important part of any EDI system. They serve as the "interface specification" between trading partners and provide specific details of the legal agreements that define how the electronic commerce is to be conducted. Qualified legal advice is required when a TPA is drafted.

However, the TPA must be more than a legal agreement between two organizations that exchange data. Because the use of an electronic medium affects the trade relationship, TPA's are generally recognized as fundamental to the EDI trade relationship. TPA's can:

- Bolster the enforceability of electronic transactions;
- Reduce confusion and potential misunderstanding;
- Apportion liability between the trading partners;
- Define confidentiality and security obligations;
- Serve as an educational tool and implementation checklist; and
- Provide an important audit and control mechanism.

The scope and treatment of issues addressed by a TPA generally depend on:

- The nature of the anticipated transactions;
- The policies and perspectives of the trading partners;
- An assessment of the risk; and ultimately
- The issues upon which the trading partners reach agreement.

The TPA should have the following characteristics:

- Administrative efficiency;
- Simplified legal approval;
- Definiteness; and
- Certainty to expedite trade.

Appendix B contains the USEPA's generic Terms and Conditions Agreement for the use of EDI for Environmental Reporting. Although this agreement is not referred to as a trading partner agreement, it serves the same purpose. The document and other information pertinent to the use of EDI within the USEPA can be found in the notice posted in the September 4, 1996 Federal Register, Volume 61, Number 172, FRL-5601-4

For the prototype efforts, TPAs are not being initiated by the USEPA, however, as the EDI system moves into production, they should be implemented.

3.5 Third-Party Agreements

If a user employs a third party, such as a VAN, to facilitate its EDI system, the company that supplies the services will probably require that the user enter into a data communications agreement with it. Among the issues the user should consider addressing in such agreement are the following:

- A description of the services to be provided;
- The warranty by the VAN of its services;
- The liability of the VAN for a breach of the agreement or any damages resulting from the mistakes of the VAN or its employees;
- The security, confidentiality, and integrity of messages handled by the VAN;
- The responsibility of the VAN in the event of a system failure or disaster;
- The disposal of data stored by the VAN in the event of a disagreement or an interruption or termination of services;
- A description of the applicable pricing structure;
- The termination of the agreement; and
- An assumption of an independent, third-party review of the third-party vendor.

For the prototype, VANs or other third party vendors are not being employed. Therefore, as with TPA's, Third-party agreements are not being initiated by the USEPA. As the EDI system moves into production, agreements should be implemented as appropriate.

3.6 Laws, Rules, and Regulations

There is no adequate or comprehensive source of EDI law, but there are a few sources of laws, rules and regulations that users may wish to consult. They are available through the American Bar Association (ABA). Other sources may be applicable for transactions within specific markets, industries or jurisdictions.

When implementing EDI, users and their counsel should consider whether any special laws, rules or regulations apply to the users. Utilities and government contractors should carefully consider whether regulations applicable to them restrict the implementation of EDI. It is not uncommon, for example, for government regulations to require documents to be written on paper or have ink signatures.

Users should also be aware that the International Chamber of Commerce has adopted Uniform Rules of Conduct For Interchange of Trade Data by Teletransmission (UNCID). UNCID purports to set forth voluntary rules of communication by EDI users. A copy of the UNCID rules may be obtained from the ICC Publishing Corporation, 156 5th Ave., New York, New York 10010. It should be noted that ANSI X12 neither endorses nor opposes UNCID.

SECTION 4 — ENVIRONMENTS

4.1 System Architecture

The graphic description of how the software and hardware are assembled to support the needs of the user is called the system architecture. The system architecture relates primarily to the needs of the end user rather than technique or technology. The system designer, as with any other architect, must satisfy the user's requirement within the constraints of serviceability and cost.

There are three basic EDI system architectures:

Stand-alone Microcomputer: Outbound transactions are keyed into the microcomputer. Inbound transactions are transferred to an attached printer. Translation software (to/from ANSI standard) resides within the microcomputer. Communication software/hardware handles both inbound and outbound transactions.

Microcomputer/Minicomputer Front-End: The microcomputer serves as a front-end processor to the mainframe. The translation software (to/from ANSI standard) resides within the microcomputer.

Mainframe/Minicomputer: All processing is performed within the mainframe. Inbound transactions are received by the mainframe, translated, and forwarded for further processing. Outbound transactions are consolidated, translated, and transmitted. Network communications hardware/software are under the control of the mainframe.

With the addition of Value-Added Network services, you can "mix and match" the basic architectures and let the network manage the complexity of different hardware/software. The networks provide the capability of indirect communications through the use of electronic mailboxes and support code, speed, and protocol conversion. Specifics may be found in the applicable project EDI guideline.

The EIIP EDI prototype project will employ the Microcomputer/Minicomputer Front-End scenario. The data that will be transferred using the EIIP EDI X12 Specifications/Technical Information Transaction Set will reside in the database system of the sending trading partner. The EDI translation and communication software will reside on a microcomputer (PC) that is capable of interfacing with the database system. An application program interface (API) will also reside on the PC and will serve as the mechanism to extract the data to be transmitted from the database system.

To initiate the process, the trading partner will access the database system using the API. The API reformats the database output into an ANSI/ASC X12 formatted file and loads the data into the EDI translation software. The EDI translation software translates the data into the

ANSI/ASC X12 841 Specifications/Technical Information Transaction Set per the EIIP X12 EDI Convention Document. The transaction set is transmitted to the receiving trading partner.

For the EIIP EDI prototype project, communication will be performed point-to-point (refer to Section 6 for more information). Therefore, the data will be sent directly between the sending and receiving trading partners. If a VAN or other third party service were used, the data would be transmitted through the service provider to the receiving trading partner's mailbox.

For the EIIP EDI prototype project, both trading partners will have similar architectures (i.e., microcomputer/minicomputer front-end). Therefore, the EDI transmission will be received by a PC, where the data will be translated from the X12 format to one that is able to be loaded into the receiving database system. The receiving API residing on the receiving trading partner's PC is responsible for loading the transmitted data into the appropriate database system.

The following outline organizes the steps that are needed to report air emission modeling information for the EIIP EDI prototype project.

A) Air emission modeling data is collected by the trading partner and entered into their database system. It is retained until it is ready for reporting to the appropriate USEPA trading partner.

B) The trading partner initiates the EDI transmission by retrieving the data from the database system through the application program interface (API) where it reformatted for translation by the EDI translation software.

C) The EDI translation software processes the information, putting it into ANSI/ASC X12 syntax. If syntax errors are noted, the data must be corrected to eliminate the errors and the translation process is repeated until completed.

D) The EDI transmission is uploaded to the receiving trading partner over a dedicated point-to-point communication network or other means of point-to-point communication. A copy of the transmission data is maintained by the trading partner as a record.

E) The EDI transmission is retrieved by the receiving trading partner. A copy of the transmission is maintained by the trading partner as a record.

F) The receiving trading partner enters the transmission into the translation software, verifies the transmission, and translates the data. A copy of the translated data is maintained by the trading partner as a record. The ANSI/ASC X12 997 Functional Acknowledgment Transaction Set is generated by the translator and returned to the sending trading partner.

G) If retransmission is necessary due to errors, the initiating trading partner is contacted to retransmit the data. Upon receipt, the receiving trading partner begins the retrieval activities again until the transmission is completed.

H) The translated data is downloaded into the receiving database system via the receiving trading partner's API.

4.2 Application Integration

Application refers to the current functional processes which may or may not be automated. To take full advantage of EDI, the EDI solution should become part of the functional processes and not an "add-on". EDI will change the way you conduct your business. Planning for integration will reduce the impact of this change and allow a smooth transition to an environment which maximizes your return on investment.

Total integration does not have to be achieved before starting EDI, but it should be an established goal. Failure to achieve integration will result in the attainment of some short-term benefits, but the real benefits which come from increased automation will be unattainable.

For the EIIP EDI prototype project, the goal is to electronically integrate the database systems of reporting entities (e.g., USEPA Regional offices, State/local agencies, industry, etc.) currently storing air emission modeling data with a mechanism to electronically transmit the data. By doing so, the burden of manual reporting of modeling data will be reduced and the availability and quality of the data can be increased.

To achieve this end, an API will be used to electronically retrieve data from the databases that store the appropriate modeling data. The API will also reformat the data for EDI translation. The EDI translation software formats the data from the API into the ANSI/ASC X12 EDI standard format for transmission. Likewise, the reverse process will be performed by the receiving trading partner's system. Ultimately, in a full production system, each of the data management steps will be seamless to the trading partners and the air emission modeling application will be fully integrated.

4.3 Translation

Translation is the automated process of converting application data in a proprietary format to ANSI/ASC X12 Standard format for sending transactions. The process is reversed when transactions are received in the ANSI/ASC X12 formats. The core translation program uses "table driven" subroutines to generalize processing regardless of the actual application being processed. Specifications are taken by the program, depending on the data being processed and the particular tables associated with the transaction set. The ANSI/ASC X12 standard provides a specific structure for the data. It does not affect the program design or the program function. As a result, there are many commercial software packages which provide "core translation" and other related functions that are designed to support different EDI environments.

Some of the factors to be considered when deciding whether to make or to buy translation software are the efforts required for programming, maintenance, testing, incorporating upgrades to the ANSI/ASC X12 Standard, and the development of the administrative programs necessary to satisfy EDI audits. The availability of relatively inexpensive proven commercial software packages supported by a growing industry should make development unnecessary. EDI software should be managed as "system software" rather than "application software".

The EIIP EDI prototype project is using a PC-based EDI translation software package. The software supports the ANSI/ASC X12 standard that the program is implementing (the 841 Specifications/Technical Information) and provides functionality to verify ANSI/ASC X12 syntax rules, support communications, and import/export data to database systems/APIs.

SECTION 5 — MAINTENANCE

5.1 Maintaining Guidelines

During the prototype implementation, maintenance of this guideline, the attached EIIP X12 841 Convention Document, and the EIIP Phase I Core Data Model is the responsibility of the EIIP Data Management Committee. Questions are to be referred to:

Ms. Lee Tooly
U.S. Environmental Protection Agency
Emission Factor and Inventory Group
EIIP Data Management Committee
Research Triangle Park, NC 27711
Telephone: (919) 541-5292

5.2 Maintaining ASC X12 Standards

ANSI/ASC X12 has a standard procedure for developing new transaction sets and maintaining existing sets. Refer questions regarding the national standard to the EIIP EDI Coordinator indicated above. Should additional information be required, the question will be referred to:

Data Interchange Standards Association, Inc (DISA)
Technical Department
1800 Diagonal Road, Suite 200
Alexandria VA 22314-2852
Telephone: (703) 548-7005

5.3 Version/Release

ANSI/ASC X12 publishes a new Version/Release of the national EDI standards annually. The publication contains the new transaction sets and the maintenance approved by the ANSI/ASC X12 Committee. New Version/Releases are neither upward nor downward compatible with respect to other version/releases of the standards. The new publication may not affect current implementations. However, if it contains functionality necessary to the particular implemented project, the EIIP EDI Project Coordinator will initiate the necessary actions to notify the implementors, develop an implementation schedule, revise and distribute the implementation guidelines and convention documents and coordinate an orderly transition to the new Version/Release.

The ASC Draft Standard for Trial Use (DSTU) Version 3, Release 6 (003060) was chosen for the EIIP EDI prototype project. Support for versions other then 003060 will be handled on a case-

by-case basis and will be controlled by the EIIP EDI Project Coordinator. The EIIP DMC will retain the option of updating standards as new transaction sets and standards are approved.

SECTION 6 — COMMUNICATIONS

6.1 General Introduction

This section provides an overview of the communication options available to trading partner(s) planning to implement EDI. The section's purpose is to highlight the areas where key data communication decisions must be made. There is no single or preferred solution. Each trading partner must determine the proper approach based on current and projected transaction volumes and desired level of investment.

Communications is the transport of information in an EDI environment and may be by physical or telecommunication means. Physical means include the use of magnetic tape or courier service. Data communication means the use of a public or private telecommunications network to exchange data. Criteria to be considered when determining the communication mode for data transfer include the following:

- Distance of transport;
- Number of destinations;
- Costs;
- Delivery time frame;
- Frequency of transport;
- Security;
- Volume of transactions;
- Compatibility of media; and
- Reliability

Each exchange method should be analyzed to determine whether or not the approach meets the trading partners' communication needs. No matter which approach is selected, a contingency plan should be formulated to address the possible event of a communication failure.

Issues to consider are procedures to address system failures, transmission error recovery including establishing the maximum number of retransmission attempts, security, network response time, and error reporting.

6.2 Protocols

Protocols are a set of conventions between communicating devices. Simple protocols define only hardware configuration. More complex protocols define timings, data formats, error detection, and correction techniques.

6.2.1 EDI Data Transfer Protocol

Communication capability, security, and data integrity are communication protocol issues to be addressed by EDI trading partners.

Communication Compatibility

- Electrical Signaling
    - Signaling between communication hardware, modem communication, and channel modem;
    - Modem types; and
    - Transmission speed compatibility
- Line Control Protocol
    - Between communications software, such as asynchronous, binary synchronous, and other protocols;
    - Call establishment;
    - Data blocking and organization;
    - Acknowledgment and signaling for handshaking and error control;
    - Line turnaround procedures;

- Character synchronization; and
- Escape interrupt disconnect

- Data Transfer Protocol
  - Compatible EDI data transfer programs and techniques for managing data transfer.

Security

- EDI data going only to the intended trading partner;
- Control over access to communications and business systems;
- Identification and authorization of trading partners; and
- Authentication

Data Integrity

Data Transfer Process Integrity refers to the actions taken to prevent problems. An objective of the EDI communication system is to provide a high degree of data process integrity to:

- Minimize potential loss of data by providing intermediate safe storage, interchange authorization, retransmission approval, and mutual results commitment;
- Minimize the potential for data duplication by providing temporary data suspension; and
- Minimize the potential for situations that require human intervention by providing status retention and transfer restart capabilities.

Error detecting protocols should be considered as the minimum communication requirement for EDI. Asynchronous and binary synchronous communication protocols provide error handling techniques based on the specific implementation.

6.2.2 Transmission Protocols

Transmission or data link protocols are either character-oriented or bit-oriented.

- ***Character-oriented protocols*** use a particular code set for transmission with some of the characters in the code set reserved for control functions. Asynchronous and binary synchronous protocols are examples of character-oriented protocols.

- ***Asynchronous protocol*** is synchronized by sending and receiving Data Transmission Equipment (DTE) before each character is sent. Each character has a start and stop bit to indicate beginning and end of each character. The start and stop bits are the mechanism by which synchronization is established. Typical asynchronous communications accommodated by microcomputers are transmitted at a baud rate ranging between 300-9600 bits per second (BPS). Asynchronous accuracy is inversely proportional to the speed of the data transfer. Higher levels of accuracy can be obtained through the use of XMODEM, KERMIT, and others.

- ***Binary synchronous*** or bi-sync bit synchronization is established for a much longer duration, usually for the time it takes to transmit several thousand bits. This results in less transmission overhead but requires more complex circuitry. Typical binary synchronous communication is transmitted at a baud rate ranging between 2400-9600 BPS. Binary synchronous accuracy is not dependent on the speed of the data transfer.

- ***Bit-oriented protocols*** are independent of any particular code set and no character codes are reserved for control functions. High Level Data Link Control (HDLC) and Advanced Data Communication Control Procedures (ADCCP) are examples of this protocol. The major advantages are in speed and standardization.

6.3 Point-to-Point (Dedicated Network)

At this time, the EIIP EDI prototype project will employ the point-to-point type of communication network. A general description is provided below. The actual details for the implementation of a point-to-point network will be developed based on the prototype results.

Point-to-point or direct connect service is communication between two trading partners. Point-to-point may employ dedicated circuits, or dial circuits, or a combination of the two. The type of circuit used depends on a number of factors, two of which are volume and speed or timing of the transmissions. An EDI user that elects direct communication with trading partners must have the necessary in-house staff capable of managing the network and must address a number of issues with each individual trading partner. Some of these issues are:

- Service Levels;
- Communication Speeds;
- Transmission Modes;
- Modem Capabilities; and
- Line Protocols

Additionally, an EDI user electing to implement direct connections must be aware that not all trading partners will have similar capabilities and therefore the trading partner may by necessity elect to use a third party service.

6.4 Third Party Services

Although the EIIP EDI prototype project is not employing third party services at this time, a general overview of this type of communication service is provided below.

Third-Party Services are those utilizing switched network technology and providing value-added services. Switched networks connect and disconnect circuits as required to exchange data. The three common switched network methods are circuit switching, message switching, and packet switching.

Circuit Switching is used in public telephone systems. A circuit is dedicated between the source and destination for the duration of the transmission. The sender and receiver must be available at the same time.

Message Switching networks package the data in messages and pass the messages from switch to switch. The sender and receiver do not have to be available at the same time, since the message is stored at each intermediate step. For this reason, message switched networks are also referred to as store and forward networks.

Packet Switching is similar to message switching, but it divides the data into smaller, equal-sized pieces called packets. It takes less time to move data through the network, since large messages don't have to be stored at each intermediate switch. The reduced delay, over message switching, allows the two users to carry on a dialogue, referred to as an interactive process. In addition, the reduced delay aids transaction processing by moving the transactions to their designation quickly. The advantage of packet switching over circuit switching is that packet switching makes efficient use of the data lines. Each packet carries a destination address, so packets from multiple sources heading to different destinations can be transmitted down the same data line.

The above facilities and services may be obtained from commercial networks called Value Added-Networks (VAN) rather than developed in-house. The commercial networks provide the network management and knowledgeable staff to support your communication requirements. Commercial networks now offer more than moving data from one site to another. Services provided include mailbox service, data storage, speed and format conversion, and translation.

Not all companies have the communication facilities to accommodate the multiple communication protocols that may be used by their potential trading partners. Third-party service providers eliminate the need for a trading partner to invest heavily in communication hardware, software, and personnel. A third-party service provider allows the convenience of a single data transfer link to multiple trading partners independent of operating schedules, protocol conversion, hardware interface, and conversion requirements.

When selecting a third-party service provider, a trading partner should evaluate the service capabilities and performance offered. Issues to consider include:

- Speed of delivery;
- Dial out capabilities (e.g., auto-dial, scheduled);
- Data integrity;
- Reliability;
- Job queuing options;
- Interconnect capabilities; and
- Tracking and control reporting (audit, historical, and exception reporting)

Before data transfer begins with a third-party service, communications should be mutually defined and agreed upon. The use of third-party communications should be transparent to trading partners.

When establishing an EDI partnership, it is necessary to determine how the costs of third-party services will be apportioned. These costs are usually split equally between the trading partners. Costs associated with the use of a third-party service include:

- Start-up charges;
- Mailbox fees;

- Connect charges;
- Data storage;
- Network interconnect;
- Character charges; and
- Reports

A third party agreement between the trading partner and a telecommunications provider should be signed. Section 3.5 lists items that should be included in a third party agreement.

6.5 Network Interconnects

As with the use of third-party services, the EIIP EDI prototype project is not currently employing network interconnects. However, they should be noted as a viable means of exchanging data when each trading partner wishes to use its preferred VAN. It is the responsibility of each partner to research whether its preferred VAN has the full complement of desired interconnect capabilities with the other.

6.6 The Internet

Although not currently employed with the EIIP EDI prototype project, the Internet is type of third-party service that can be used to transmit data using EDI. The Internet can be a more cost affective means to exchange information using the ANSI/ASC X12 standards, but the level added value is reduced as compared to the use of a VAN. The Internet supports message switching and telecommunication access, but no other more robust types of messaging support. Functional issues such as audit reporting, security verification, user support, and any other system requirements must be evaluated prior to implementing the Internet as a telecommunications mechanism.

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SECTION 7 — MISCELLANEOUS

7.1 Industry Business Models

7.1.1 Introduction

The USEPA has implemented a number of ANSI/ASC X12 Transaction Sets. Selection of a transaction set is based on the specific business issue to be solved and the defined purposed of the transaction set. It is the intention of the USEPA to use national standards where they exist and to avoid developing specific purpose transaction sets.

The following is an overview of the ANSI/ASC X12 Transaction Sets used by the EIIP in the implementation of EDI.

7.1.2 Transaction Sets

The EIIP implementation currently uses the ANSI/ASC X12 841 Specification/Technical Information Transaction Set. Under other USEPA initiatives, this Transaction Set is also used by the Pennsylvania Department of Environmental Protection (PADEP), Bureau of Air Quality (BAQ) to receive air emission inventory data.

For the Phase I of the EIIP EDI prototype project, the transaction set is used to transmit air emission modeling data between reporting State Agencies and the USEPA. This implementation will be expanded in the future to include reporting from regulated industries to the State Agencies and/or USEPA Regions.

The ANSI/ASC X12 997 Functional Acknowledgment Transaction Set is also employed in a production system. The use of the Functional Acknowledgment is a requirement of the USEPA for all EDI implementations. As this phase of the project is a prototype, this transaction set will not be employed.

7.2 Related Industry Topics

Not Currently Used.

7.3 EDI Vendor References

EDI is offered as a standard interface so trading partners, software manufacturers and VANs can interact without concern for proprietary features. To achieve this, trading partners must obtain and employ the necessary and appropriate X12 translator software and communications software. These software components can be obtained from a number of sources, including: purchasing the package from a vendor for use on the trading partner's computer system, purchasing the services

of a VAN to administer the software remotely, or developing the software in-house. Before developing an in-house translator, examine the development costs and the maintenance costs. A new version/release of the ANSI/ASC X12 Standard is released annually with sub-releases available for standards approved for publication in February or in June. When updated EDI standards are available, they may or may not need to be implemented. Implementation of an updated Version/Release is governed by the enhanced business support it provides, the need for that enhanced support by the trading partners, and the desirability on the part of the trading partners to maintain previous Versions/Releases.

For the purpose of the EIIP EDI projects, trading partners shall acquire the EDI software that best meets their needs for interfacing with the USEPA Program Offices and with other trading partners they may have.

The USEPA does not recommend or endorse any vendors translation or communication software. Listings of EDI software and service vendors can be obtained through ANSI/ASC X12, EDI periodicals, and trade journals. The following provides some ideas for minimum capabilities/criteria to consider. The software should support the following specifications:

Operating System

- Support the operating platform and operating environment configuration specified by the organization.

Communications and Security

- Support the capability for sending and receiving EDI-formatted data.
- Support all connections to multiple VANs or direct connects to trading partners.
- Support multiple communications protocols including async, bisync, and X.400/X.25.
- Support the use of EDI transactions over the Internet, including appropriate security measures.

Security

- Support security options such as password, Personal Identification Number (PIN), menu and access type security.
- Provide built-in virus protection.
- Provide automatic recovery in the event of a system shutdown.

Reporting and Auditing

- Automatically verify inbound and outbound data to determine whether they are in compliance with EDI standards.
- Automatically notify user when errors occur.
- Maintain detailed history logs of all processes performed to determine error status and track processing activity.
- Provide automatic matching of audit trail reports of inbound and outbound functional acknowledgments with their associated outbound transaction set.
- Provide flexible error processing conditions and allow a variety of reports that describe and diagnose errors.
- Provide reports on document types, document numbers, control numbers, file names, error status, acknowledgment status, and transaction volume statistics based on user-selected criteria.

Data Management

- Provide the capability for an application system interface program to extract data from an application system and create fixed-length files for subsequent translation to an EDI format. The reverse is also required.
- Support manual data entry of outbound EDI data through data entry screens.
- Support batch downloads from an application interface linking the translation software to an organization's application system.
- Support flexibility in defining pre- and post-communication processes which could include interface routines, programs, and command procedures.

- Support scheduled or manual file purging.
- Support the ability to import from and export to flat file formats.
- Support the ability for inbound transactions to be printed or viewed on-line in a human readable format.
- Support the ability to archive all intermediate input and output data files.
- The software should provide a facility that monitors the use of internal business document identification numbers, such as manifest numbers, to avoid duplication.

Translation

- Support ANSI/ASC X12 standards, all current and future versions, releases and implementations and all X12 transaction sets.
- Include predefined tables of standard transactions, segments, and elements and allow copying of standard tables to create customized standards.
- Support the ability to define cross reference tables. These tables are used to reconcile codes if trading partners use different codes from recipient and/or the standard.
- Provide the capability for automatically sending and receiving Functional Acknowledgments to identify the successful receipt of information by Trading Partners and the highlighting of unacknowledged transaction sets that have been sent.
- Allow customizing of core translation and error notification scripts.

Mapping and Trading Partner Configuration

- Support automated data-mapping procedures embedded in the EDI translation software that creates fixed-length files according to the user's requirements for subsequent translation to an EDI format. The reverse process should also be provided.
- Provide for multiple conditional processing. This is the ability to use multiple data elements from a transaction set to generate a single data element for the output flat file and vice versa.

- Allow maps, profiles, and other user-defined tables are able to be migrated from one X12 version to another without having to manually reenter the information.

- Provide the facility to maintain a profile of each Trading Partner that identifies the name, Dunn &Bradstreet number, organizational identifier, phone numbers, and segments in a transaction set required by the Trading Partner.

Application System/Database

- Allow database definitions, operations, algorithms, and other processing rules to be defined through dynamic, table-driven tools. All tables should not be imbedded in code - only program functions should be in the executables.

Ease of Use

- Provide straight-forward, well-organized, intuitive user interface with a point-and-click Graphical User Interface (GUI).

- Provide table-driven utilities to modify/create transactions, trading partner data, and maps.

Support

- The software vendor should provide technical documentation, user documentation, maintenance support, help desks, tutorial packages and training support to assist the Trading Partners in the use of the translation software.

- Provide software and software upgrades as applicable and within an appropriate time frame.

Miscellaneous

- Proven track record in EDI as indicated by its use other sites and the provision of references of other users.

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SECTION 8 — GLOSSARY OF TERMS

AFS, AIRS Facility Subsystem, Federal database.

AIRS, Aerometric Information Retrieval System, Federal database.

ANSI, The American National Standards Institute (ANSI) is the national coordinator for standards in the United States.

ANSI Standard, A document published by ANSI that has been approved through the consensus process of public announcement and review. Each of these standards must have been developed by an ANSI committee and must be revisited by that committee within five years for update.

ASC X12, An abbreviation for Accredited Standards Committee (ASC) X12. It is comprised of a non-profit clearing house and coordination body for voluntary data standards activities in U.S. The purpose is to develop uniform standards for the electronic interchange of business transactions for submission to ANSI for subsequent approval and dissemination.

Authentication, A mechanism that allows the receiver of an electronic transmission to verify the sender of the integrity of the content of the transmission through the use of an electronic "key" or algorithm, which is shared by the trading partners. This is sometimes referred to as an electronic signature.

CAAA, Clean Air Act Amendments of 1990.

CFR, The Code of Federal Regulations contains the detailed regulations, written by Federal Agencies, to implement the provisions of laws passed by Congress. Regulations in the CFR are equivalent to Federal law.

Compliance Checking, A checking process that is used to ensure that a transmission complies with ASC X12 syntax rules.

Composite Data Element, One or more component data elements delimited by sub-element separators.

Condition Designator, An indicator assigned to each data element in a segment and defines how it is to be used in the segment. Data elements may be designated as Mandatory (M), Optional (O) or Relational (X). Refer to ANSI/ASC X12.22 Data Segment Directory Introduction and ANSI/ASC X12.6 Application Control Structures, paragraph 3.7.2.2 - Condition Designator.

Control Segment, A control segment has the same structure as a data segment but is used for transferring control information for grouping data segments. Examples of types of Control Segments are Loop Control Segments (LS/LE), Transaction Set Control Segments (ST/SE), Functional Group Control Segments (GS/GE), and Interchange Control Segments (ISA/IEA, TA1). Control segments are defined in ANSI/ASC X12.6 - Application Control Structures, paragraph 3.10 - Control Segment. Interchange segments are control segments and are defined in ANSI/ASC X12.5 - Interchange Control Structures. Diagrams of the segments appear in ANSI/ASC X12.22 - Data Segment Directory and are identified as 'control segment'.

Conventions, Common practices and/or interpretations of the use of the ASC X12 standards, as agreed upon by two or more trading partners. Conventions define what is included in a specific implementation of an ASC X12 standard.

Data Element, A data element can represent a qualifier, a value, or text (such as a description). Each data element is identified by a number used for reference in ANSI/ASC X12.3 - Data Element Dictionary.

Data Element Dictionary (X12.3), Defines specifications for each data element.

Data Element Length, This is the range, minimum to maximum, of the number of character positions available to represent the value of a data element. A data element may be of variable length with range from minimum to maximum, or it may be of fixed length in which the minimum is equal to the maximum.

Data Element Reference Number, Identifier assigned to each data element as a unique identifier. It is used in all segments to aid in locating the data element definitions in ANSI/ASC X12.3 - Data Element Dictionary.

Data Element Requirement Designator, A code defining the need for a data element value to appear in the segment if the segment is transmitted. The codes are mandatory (M), optional (O), or relational (X).

Data Element Separator, A unique character preceding each data element that is used to delimit data elements within a segment.

Data Element Type, A data element may be one of the following types: numeric (Nn), decimal number (R), identifier (ID), string (AN), date (DT), time (TM), binary (B), or fixed-length string (FS).

Data Model, A description of the principles of organization of a database, including data entities, attributes, relationships, and data specifications.

Delimiters, The delimiters consist of two levels of separators and a terminator. The delimiters are an integral part of the transferred data stream. Delimiters are specified in the interchange header and may not be used in a data element value elsewhere in the interchange. From highest to lowest level, the separators, and terminator are segment terminator, data element separator, and sub-element separator.

DISA, Data Interchange Standards Association. A non-profit organization which serves as the Secretariat for X12.

Direct Transmission, The exchange of data from the computer of the sending party directly to the computer of the receiving party. A third-party value added service is not used in a direct transmission.

DMC, Data Management Committee of the U.S. USEPA Emission Inventory Improvement Program responsible for the administration of issues related to air emission modeling data.

Draft Standard for Trial Use (DSTU), A document approved for publication by the full X12 committee following membership consensus and subsequent resolution of negative votes (Final Report of X12 Publications Task Group). The Draft EDI Standard for Trial Use document represents an ASC X12 approved standard for use prior to approval by ANSI.

ECOS, Environmental Council of States, air emission modeling workgroup.

EIIP, Emission Inventory Improvement Program sponsored by the USEPA to address the collection and use of air emission inventory/modeling information.

Electronic Data Interchange (EDI), The abbreviation for electronic data interchange, which is commonly defined as "the computer-to-computer exchange of business information in a standard format." An EDI transmission is a highly structured message intended for automated processing by a computer. It is meant to be machine-readable so that it doesn't require human intervention to be interpreted and understood. EDI is primarily used for intercompany communication. All references to EDI under USEPA programs refers to the utilization of ASC X12 standards.

EDI Translation, The conversion of application data to and from the ANSI/ASC X12 standard format.

EDI Translator, Computer software used to perform the conversion of application data to and from the X12 standard format.

EFIG, Emission Factor and Inventory Group of the USEPA.

Electronic Envelope, Electronic information that groups a set of transmitted documents being sent from one sender to one receiver.

Element Delimiter, A single-character that follows the segment identifier and each data element in a segment except the last.

Electronic Mailbox, The place where an EDI transmission is stored for pickup or delivery within a third-party service provider's system.

Encryption, A process of transforming clear text (data in its original, uncoded form) into ciphertext (encrypted output of a cryptographic algorithm) for security or privacy.

EMAD, Emission Monitoring and Analysis Division of the USEPA.

USEPA, The United States Environmental Protection Agency (USEPA). Established in 1970 by presidential executive order, it brings together parts of various government agencies involved with the control of pollution. Note that some State environmental authorities may be called EPA also, as in Illinois EPA.

FOIA, Freedom of Information Act.

Functional Acknowledgment, A transaction set (997) transmitted by the receiver of an EDI transmission to the sender, indicating receipt and syntactical acceptability of data transmitted according to the ANSI/ASC X12 Standards. The functional acknowledgment allows the receiving party to report back to the sending party problems encountered by the syntax analyzer as the data is interpreted. It is not intended to serve as an acknowledgment of data content.

Functional Group, One or more transaction sets bound together by a functional group header segment and a functional group trailer segment.

Functional Group Control Segments, Group delineated by the functional group header (GS segment) and the functional group trailer (GE segment). GS starts and identifies one or more related transaction sets and provides a control number and application identification information. GE defines the end of the functional group of related transaction sets and provides a count of contained transaction sets.

Guidelines, Instructions on the use of EDI. Guidelines provide additional information about conducting EDI and may provide assistance on how to implement EDI.

Interchange, The actual transfer of data between trading partners.

Interchange Control Envelope, The outer envelope that holds multiple functional group envelopes for transmission. The structure of the envelopes within the Interchange Control Envelope impacts the efficiency of the processing.

Interchange Control Segments, ISA/IEA segments identify a unique interchange being sent from one sender to one receiver.

Interchange Control Structure, The interchange header and trailer segments envelope one or more functional groups or interchange related control segments and perform the following functions: 1) defines the data element separators and the data segment terminators, 2) identifies the sender and receiver, 3) provides control information for the interchange, and 4) allows for authorization and security information. (X12.5).

Loop, A group of semantically related segments; these segments may be either bound together or not.

Loop Repeat, Maximum number of times a specified loop can be used at this location in a transaction set.

Mandatory (M), A data element/segment requirement designator that indicates that the presence of a specified data element is required.

Mapping, The process of identifying the relationship between the data elements in the standard transaction set and the data elements in the application.

Max Use, The maximum number of times a segment can be used at the location in a transaction set.

NAAQS, National Ambient Air Quality Standards.

OAQPS, Office of Air Quality Planning and Standards of the USEPA.

Optional (O), A data element/segment requirement designator that indicates that the presence of a specified data element/segment is at the option of the sending party, which can be based on the mutual agreement of the interchange parties.

Qualifier, A data element that identifies or defines a related element, set of elements, or a segment. The qualifier contains a code taken from a list of approved codes.

Relational Condition (X), A data element requirement designator that indicates that the presence of a specified data element is dependent on the value or presence of other data elements in the segment. The condition must be stated and must be computer processable. The condition

may be paired or multiple (P); required (R); exclusion (E); conditional (C); or list conditional (L).

RFP, Reasonable Further Progress is a type of air emission report.

Security, System screening that denies access to unauthorized users and protects data from unauthorized uses.

Segment, Logically related data elements in a defined sequence. A data segment consists of a segment identifier, one or more data elements each preceded by an element separator, and ending with a segment terminator. Each segment shall have a stated purpose, which should be sufficiently generic as to encourage the segment use in other transaction sets.

Segment Directory (X12.22), Provides the purposes and formats of the segments used in the construction of transaction sets. The directory lists each segment by name, purpose, identifier, the contained data elements in the specified order, and the requirement designator for each data element. A segment directory is developed to standardize permissible segments.

Segment Identifier, A unique identifier for a segment composed of a combination of two or three uppercase letters and digits. The segment identifier occupies the first character positions of the segment. The segment identifier is not a data element.

Segment Terminator, A unique character appearing at the end of a segment to indicate the termination of the segment.

SIP, State Inventory Plan is a type of air inventory report.

Standards, The technical documentation approved by ASC X12, including transaction sets, segments, data elements, codes and interchange control structures. Standards provide the structure for ASC X12.

Sub Element Separator, A unique character used to delimit the component data elements within a composite data element.

Syntax, The grammar or rules that define the structure of the EDI standards (i.e., the use of loops, qualifiers, etc.). Syntax rules are published in ANSI X12.6.

Trading Partner, The sending and/or receiving party involved in the exchange of electronic data interchange transmissions.

Trading Partner Agreement (TPA), Serves as the "interface specification" between trading partners and provides specific details of the legal agreements that define how the electronic commerce is to be conducted.

Transaction Set, A semantically meaningful unit of information exchanged between trading partners.

Transaction Set Control Segment, Delineators for the transaction set — transaction set header (ST segment) and the transaction set trailer (SE segment). The header starts and identifies the transaction set. The trailer defines the end of the transaction set and provides a count of the data segments, which includes the ST and SE segments.

Transaction Set ID, An identifier that uniquely identifies the transaction set. This identifier is the value in the first data element of the transaction set header segment.

VAN, Value Added Network. Third-party service organizations.

Version/Release, Identifies the publication of the standard being used for the generation or the interpretation of data in the X12 standard format. May be found in the Functional Group Header Segment (GS) and in the Interchange Control Header Segment (ISA), (e.g., Version 003040 means Version 3 Release 4).

X12, The ANSI committee responsible for the development and maintenance of standards for Electronic Data Interchange (EDI).

X12.5, Interchange Control Structure. This standard provides the interchange envelope of a header and trailer for the electronic interchange through a data transmission, and it provides a structure to acknowledge the receipt and processing of this envelope. X12.5 includes separate segments and data elements not in X12.22 or X12.3.

X12.6, Application Control Structure. This standard describes the control segments used to envelop loops of data segments, to envelop transaction sets, and to envelop groups of related transaction sets.

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SECTION 9 — FORMS AND DOCUMENTS

9.1 ASC X12 Transaction Sets

The EIIP EDI complies with the ASC X12 standards for Electronic Data Interchange for its Program. The EIIP Data Management Committee will support the following ASC X12 transaction sets:

- ISA/IEA, GS/GE, ST/SE Header and Trailer Formats; and
- 841 - Specifications/Technical Information

9.1.1 Header/Trailer Format

The USEPA has defined the element to be used in the Interchange Control Header/Trailer (ISA/IEA), Functional Group Control Header/Trailer (GS/GE), and the Transaction Set Header/Trailer (ST/SE) for all transmissions to and from program trading partners.

The interchange header and trailer segments envelop one or more functional groups or interchange related control segments and perform the following functions:

- Define the data element separators and data segment terminators;
- Identify the sender and receiver;
- Provide control information for the interchange; and
- Allow authorization and security information.

9.1.2 841 Specifications/Technical Information

The 841 Specifications/Technical Information Transaction Set is used to transmit air emission inventory or modeling data. More information regarding the 841 Transaction Set is located in Appendix D.

9.2 ASC X12 Documents

The following ASC X12 documents should be referenced for additional information, standard format, and implementation issues.

ASC X12 Draft Standards, Version 003 Release 060, Document Number ASC X12S/95-533 is available through:

Data Interchange Standards Association, Inc. (DISA)
1800 Diagonal Road, Suite 200
Alexandria, VA 22314-2852
Telephone: (703) 548-7005

Reference to the EIIP Phase I Core Data Model and code lists identified in the convention document are available through:

Ms. Lee Tooly
U.S. Environmental Protection Agency
Emission Factor and Inventory Group
EIIP Data Management Committee
Research Triangle Park, NC 27711
Telephone: (919) 541-5292

9.3 EIIP X12 841 Convention Document Organization and Convention-for-Use

The EIIP EDI prototype project has developed a Convention Document for use with the electronic transfer of air emissions data. The Convention Document follows the standards set by the ANSI/ASC X12 for EDI. The document includes the EIIP's implementation of the ANSI/ASC X12 841 Specifications/Technical Information transaction set.

The ANSI/ASC X12 841 Specifications/Technical Information is a complex transaction set that is based on a design concept that uses hierarchical levels. This type of organization is similar to that commonly used with organizational charts. In this type of scheme, where there is a primary level which has one or more subordinate sub-levels, which in turn may have one or more subordinate sub-levels. This transaction set is based on the same principle.

The following outlines the hierarchical levels defined by the EIIP for use in the prototype EDI:

Header (H) Data that applies to the entire modeling data set. The information includes: confidentiality indicator; inventory type; general notes, comments, and descriptions; data model version; transmission date and time; data collection period; DARS quality rating score for the transaction set; organization name(s) and location data; and contact information. The standard requires that there only be a single header per transaction set. Therefore, there will only be a single header-level, to which all other levels are subordinate.

Site/Source (4) Data that applies to the site/source for which the data is being reported. The information includes: confidentiality indicator; site identification information; geographic location pointer (actual data collected in the header-level); general

message; site/source type; Standard Industry Classification (SIC) code; number of employees; map reference data; and chemical speciation data.

By convention of the EIIP implementation, this level may be used multiple times per transaction set as long as each occurrence shares the same source type. As a result, the site/source-level will always be subordinate to a single header-level, but may have multiple physical-levels subordinate to it.

Physical (5) Data that applies to the physical unit for which the data is being reported. The information includes: confidentiality indicator; physical unit identification information; geographic location pointer (actual data collected in the header-level); general message; physical unit type; emission unit, emission release point, and control equipment information; grid/county area data; physical unit operational status, and emission path data.

By convention of the EIIP implementation, this level may be used multiple times per transaction set. As a result, the physical-level will always be subordinate to a single site/source-level, but may have multiple process-levels subordinate to it.

Process (6) Data that applies to the process for which the data is being reported. The information includes: confidentiality indicator; process identification information; general message; description of materials; emission process information; Source Classification Code (SCC); Standard Industry Classification (SIC) code; process growth factor information; operating schedule; seasonal adjustment factors; and process characteristic information.

By convention of the EIIP implementation, this level may be used multiple times per transaction set. As a result, the process-level will always be subordinate to a single physical-level, but may have multiple activity-levels subordinate to it.

Activity (C) Data that applies to the activity (throughput) for which the data is being reported. The information includes: confidentiality indicator; activity (throughput) identification information; DARS quality rating score; throughput method code; activity (throughput) schedule; seasonal adjustment factors; meteorological data; and typical day information.

By convention of the EIIP implementation, this level may be used multiple times per transaction set. As a result, the activity-level will always be subordinate to a single process-level, but may have multiple emission-levels subordinate to it.

Emission (9) Data that applies to the emission for which the data is being reported. The information includes: confidentiality indicator; emission-specific pollutant identification; control strategy information; rule effectiveness information; total capture/control efficiency data; rule penetration information; aggregate control efficiency, rule effectiveness, estimated emissions, and emission factors method codes; estimate emissions data; emission factors data; and DARS quality rating score.

By convention of the EIIP implementation, this level may be used multiple times per transaction set. As a result, the emission-level will always be subordinate to a single site/source-level, but as it is the lowest level in the hierarchy, it will never have any subordinate levels.

The hierarchical organization of the Convention Document is illustrated below, including the corresponding X12 code values that they are referenced by.

HEADER	
SITE/SOURCE-LEVEL	(HL03 = 4)
PHYSICAL-LEVEL	(HL03 = 5)
PROCESS-LEVEL	(HL03 = 6)
ACTIVITY-LEVEL	(HL03 = C)
EMISSION-LEVEL	(HL03 = 9)

Each HL segment is comprised of two to four data elements that define it. These data elements identify the individual HL segments and specify the relationships between the individual HL segments. The specific uses of each of the data elements is described below.

HL01 (Hierarchical ID Number) - This data element must contain a unique label for each occurrence of the HL segment in the air emissions modeling transaction. An HL segment is required to define each level in the hierarchial "organization". For example, in a basic modeling data set with three processes being reported for a single physical unit from a single site/source, five occurrences of the HL segment are required: one for the site/source level, one for each physical unit, and one for each physical unit's emission process. By convention, the hierarchical ID number will start with "1" for the first occurrence of the HL segment I the transaction set and increment by one for each occurrence thereafter within the same transaction set. The number will return to "1" for the next transaction set.

HL02 (Hierarchical Parent ID Number) - This data element identifies the Hierarchical ID Number of the HL segment to which it is subordinate. In our example above, the Hierarchical

Parent ID Number of each of the process-level occurrences of the HL segment will be "2", identifying the physical-level HL segment. The HL02 value for the physical-level will be "1" as the site/source HL segment is its parent. The value of HL02 for the site/source HL segment will be null because it has no parent HL segment. HL02 is mandatory for all other occurrences of the HL segment.

HL03 (Hierarchical Level Code) - This data element provides the level of detail implied by the series of segments that follow the current HL segment, up to the next occurrence of the HL segment in the transaction set. In other words, the data contained in HL03 indicates the grouping of the information at the current HL-level. For example, if HL03 is "4", it indicates the following segments in that HL-level, form a logical grouping of data relating to site/source-level information. Likewise, if HL03 is "6", it indicates that the following segments are associated with process information.

HL04 (Hierarchical Child Code) - This data element indicates whether there are subordinate (i.e., child) HL segments to the current HL segment. Use of this data element is optional. If used, a value of "0" indicates no subordinate HL segments and value of "1" indicates one or more subordinate HL segments.

The example below illustrates the relationships between the various HL segments as described.

	SITE/SOURCE-LEVEL *(HL01 = 1)* *(HL02 = blank)* *(HL03 = 4)* *(HL04 = 1)*	
	PHYSICAL-LEVEL *(HL01 = 2)* *(HL02 = 1)* *(HL03 = 5)* *(HL04 = 1)*	
PROCESS-LEVEL#1 *(HL01 = 3)* *(HL02 = 2)* *(HL03 = 6)* *(HL04 = 1 if HL follows)*	**PROCESS-LEVEL#2** *(HL01 = 4)* *(HL02 = 2)* *(HL03 = 6)* *(HL04 = 1 if HL follows)*	**PROCESS-LEVEL#3** *(HL01 = 5)* *(HL02 = 2)* *(HL03 = 6)* *(HL04 = 1 if HL follows)*

By convention, for the EIIP prototype project, a transaction set will consist of the data being reported for a single source type (e.g., point, area, nonroad, mobile, and biogenic). A transaction set can not contain data for more than one source type. Within each transaction set, data for multiple sites/sources may be reported. Likewise, multiple sets of physical unit, process, activity, and emission data, may be reported for each site/source.

If data for multiple source types must be reported, they can be submitted in the same transmission as multiple transaction sets can be included in a single transmission. However, as

stated above, each source type must be reported as a single transaction set. Refer to Section 10 for more definition of transaction set organization and use.

9.4 Cross Reference Matrix of Phase I Core Data Model vs. Modeling Data Set vs. EIIP X12 841 Convention Document

This table is a cross reference between the EIIP X12 841 Convention Document, the EIIP Phase I Core Data Model, and the modeling data set that is being implemented for the prototype effort. The table displays each data attribute specified in the data model and where the corresponding data element is located in the convention document relative to the data elements that comprise the modeling data set. As such, the cross reference indicates the location of each emissions modeling data element within the convention document. The modeling data elements that are indicated are those that are required for transmission under the prototype EDI activities. The data model entities and attributes are for reference use only.

Appendix C contains the cross reference between the Phase I Core Data Model and the EIIP X12 841 Convention Document. The table shows the location of each data model attribute within the convention document.

Cross Reference Matrix of Phase I Core Data Model vs. Modeling Data Set vs. EIIP X12 841 Convention Document

EIIP Entity	EIIP Attribute	X12 Data Element	Modeling Attribute Name	Comments
Activity/ Schedule	Start Date/Time	Activity (throughput) beginning date and time: DTM02 in LX loop (pos. 551) *and* DTM03 in LX loop *and* DTM05 in LX loop **if** HL03 = 'C' **and** DTM01 in LX loop = '196'	Average Summer Weekday Emissions	
			Annual Emissions	
			Average Summer Weekday Emissions	Each day and pollutant emission have separate instances in the Emissions entity.
			Activity Level	
Activity/ Schedule	Process Rate/ Throughput	Activity (throughput) data: MEA03 in LX loop (pos. 545) **if** HL03 = 'C' **and** MEA01 in LX loop = 'TR'	Fuel Use	
			Activity Level	

EIIP Entity	EIIP Attribute	X12 Data Element	Modeling Attribute Name	Comments
Activity/ Schedule	Unit of Measure	Activity (throughput) data: MEA04 [composite] in LX loop (pos. 545) **if** HL03 = 'C'	Activity Level	
Aggregate Controls as Applied	Total Capture/ Control Efficiency	Total capture/control efficiency: MEA03 in CID loop (pos. 741) **if** HL03 = '9' **and** CID04 in detail level = 'CE' **and** MEA01 in CID loop = 'AH'	% Control Efficiency	Each pollutant-specific control efficiency has a separate instance in the Aggregate Controls as Applied entity.
Aggregate Controls as Applied	Rule Effectiveness	Rule effectiveness: MEA03 in CID loop (pos. 741) **if** HL03 = '9' **and** CID04 in detail level = 'CE' **and** MEA01 in CID loop = 'AG'	Rule Effectiveness	
Aggregate Controls as Applied	Rule Penetration	Rule penetration: MEA03 in CID loop (pos. 741) **if** HL03 = '9' **and** CID04 in detail level = 'CE' **and** MEA01 in CID loop = 'PM'	% Rule Penetration	Each pollutant-specific control efficiency has a separate instance in the Aggregate Controls as Applied entity.
Control Equipment	Percent Control Efficiency	Percent control efficiency: MEA03 in LX loop (pos. 229) **if** HL03 = '5' **and** MEA02 in LX loop = 'COT'	Primary Control Efficiency	
			Primary and Secondary Control Devices (and additional)	Handled as separate instances of the Control Equipment entity and linked through the path entity.
Control Equipment	Device Type	Physical unit code: PID04 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP'	Control Device Code	Assume ECOS 'Control Device Code' is the 'type' of control device, not a unique identifier.
Emission Factors	Numeric Value	Emission factor data: STA02 in CID loop (pos. 751) **if** HL03 = '9' **and** CID04 in detail level = 'EF'	Emission Factor	ECOS specifies the emission factor to be in SCC units. Unit of Measure = SCC Units
			Emission Factor	

EIIP Entity	EIIP Attribute	X12 Data Element	Modeling Attribute Name	Comments
			Emission Factor	Each pollutant-specific control efficiency has a separate instance in the Emission Factor entity. Unit of Measure = lbs/ activity unit of measure.
Emission Process	SCC	Source Classification Code (SCC): PID04 in detail level (pos. 345) **if** HL03 = '6' **and** PID02 in detail level = 'SC'	Source Classification Code	
			Source Classification Code	
Emission Process	Process SIC	Standard Industry Classification Code (SIC) code: REF02 in detail level (pos. 371) **if** HL03 = '6' **and** REF01 in detail level = 'IJ'	Standard Industrial Classification Code	
			Standard Industrial Classification Code	
Emission Process	AMS Code	AIRS Area and Mobile Sources (AMS) code: PID04 in detail level (pos. 345) **if** HL03 = '6' **and** PID02 in detail level = '12'	Area Source Category Code	
Emission Process	Winter Throughput Percentage	Seasonal operational adjustment factor data: STA02 in CID loop (pos. 435) *and* DTM01 in STA loop (pos. 437) indicate winter **if** HL03 = '6' **and** CID04 in detail level = 'A' **and** STA01 in CID loop = 'ZZ'	Winter Throughput %	
			Winter Throughput %	Winter activity may be reported as a percentage of the annual activity.
Emission Process	Spring Throughput Percentage	Seasonal operational adjustment factor data: STA02 in CID loop (pos. 435) *and* DTM01 in STA loop (pos. 437) indicate spring **if** HL03 = '6' **and** CID04 in detail level = 'A' **and** STA01 in CID loop = 'ZZ'	Spring Throughput %	
			Spring Throughput %	Spring activity may be reported as a percentage of the annual activity.
Emission Process	Summer Throughput Percentage	Seasonal operational adjustment factor data: STA02 in CID loop (pos. 435) *and* DTM01 in STA loop (pos. 437) indicate summer **if** HL03 = '6' **and** CID04 in detail level = 'A' **and** STA01 in CID loop = 'ZZ'	Summer Throughput %	

EIIP Entity	EIIP Attribute	X12 Data Element	Modeling Attribute Name	Comments
			Summer Throughput %	Summer activity may be reported as a percentage of the annual activity.
Emission Process	Fall Throughput Percentage	Seasonal operational adjustment factor data: STA02 in CID loop (pos. 435) *and* DTM01 in STA loop (pos. 437) indicate fall **if** HL03 = '6' **and** CID04 in detail level = 'A' **and** STA01 in CID loop = 'ZZ'	Fall Throughput %	
			Fall Throughput %	Fall activity may be reported as a percentage of the annual activity.
Emission Process	Hours Per Day	Operating schedule data: STA03 (C00101) in CID loop (pos. 435) = 'HR' *and* STA03 (C001004) in CID loop = 'DA' *and* STA07 (C00105) in CID loop indicates '-1' **if** HL03 = '6' **and** CID04 in detail level = 'S' **and** STA01 in CID loop = '30'	Hours/day in operation	
			Hours/day in operation	
Emission Process	Days Per Week	Operating schedule data: STA03 (C00101) in CID loop (pos. 435) = 'DA' *and* STA03 (C001004) in CID loop = 'WK' *and* STA07 (C00105) in CID loop indicates '-1' **if** HL03 = '6' **and** CID04 in detail level = 'S' **and** STA01 in CID loop = '30'	Days/week in operation	
			Days/week in operation	
Emission Process	Weeks Per Year	Operating schedule data: STA03 (C00101) in CID loop (pos. 435) = 'WK' *and* STA03 (C001004) in CID loop = 'YR' **if** STA07 (C00105) in CID loop indicates '-1' **if** HL03 = '6' **and** CID04 in detail level = 'S' **and** STA01 in CID loop = '30'	Weeks/year in operation	
			Weeks/year in operation	
Emission Process	Heat Content	Heat content: STA02 in CID loop (pos. 435) **if** HL03 = '6' **and** CID04 in detail level = 'HC' **and** STA01 in CID loop = '34'	Heat Content	
Emission Process	Sulfur Content	Sulfur content: STA02 in CID loop (pos. 435) **if** HL03 = '6' **and** CID04 in detail level = 'SC' **and** STA01 in CID loop = '34'	Sulfur Content	
Emission Process	Ash Content	Ash content: STA02 in CID loop (pos. 435) **if** HL03 = '6' **and** CID04 in detail level = 'AC' **and** STA01 in CID loop = '34'	Ash Content	

EIIP Entity	EIIP Attribute	X12 Data Element	Modeling Attribute Name	Comments
Emission Release Point	Federal ID Code	Federal identifier code: SPI03 in detail level (pos. 165) **if** HL03 = '5' **and** SPI02 in detail level = 'PE'	AIRS Stack Number	
Emission Unit/ Physical Unit	Federal ID Code	Federal identifier code: SPI03 in detail level (pos. 165) **if** HL03 = '5' **and** SPI02 in detail level = 'PE'	AIRS Point ID	
Emission Unit/ Physical Unit	Design Capacity	Design capacity: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = 'VOL'	Boiler Design Capacity	
Emissions	Start Date/Time	Activity (throughput) beginning date and time: DTM02 in LX loop (pos. 551) *and* DTM03 in LX loop *and* DTM05 in LX loop **if** HL03 = 'C' **and** DTM01 in LX loop = '196' *Note: Emissions holds a child relationship to the Activity-level which contains these data.*	Year of Inventory	NOTE: Found in: RDT04 (pos. 012) **if** RDT03 = '196'
Emissions	Pollutant Code	CAS number/pollutant: SPI03 in detail level (pos. 639) **if** HL03 = '9' **and** CID04 in detail level = 'ES'	SEROAD Pollutant Code	The DMC discussed SAROAD coding and dropped it from the data model. A Pollutant Code will be used to identify pollutants in the EIIP Data Model. Each pollutant emission (Nox, VOC, CO, SO2, PM-10) has a sEparate instance in the Emissions and Emissions Factors entities.
Emissions	Numeric Value	Pollutant-specific estimated emissions data: STA02 in CID loop (pos. 751) **if** HL03 = '9' **and** CID04 in detail level = 'ES'	Average Summer Weekday Emissions	
			Average Summer Weekday Emissions	Unit of Measure = tons/day
			Annual Emissions	

EIIP Entity	EIIP Attribute	X12 Data Element	Modeling Attribute Name	Comments
			Annual Emissions	Unit of Measure = tons/year
			Peak or Hot Summer Day Emissions	
			Peak or Hot Summer Day Emissions	Unit of Measure = Maximum
			Average Summer Weekday Emissions	
			Average Summer Weekday Emissions	Each day and pollutant emission have separate instances in the Emissions entity. Unit of Measure = tons/day
Emissions	Method Code	Estimated emissions method code: REF02 in STA loop (pos. 755) **if** HL03 = '9' **and** CID04 in detail level = 'ES' **and** REF01 in STA loop = 'C3'	Estimation Method	
Geographic Coordinates	UTM Zone	Universal transverse mercator - zone: REF04 (C04006) in LX loop (pos. 079) **if** REF01 in LX loop = '6E' **and** REF02 in LX loop = '05' **and** REF04 (C04005) in LX loop = 'XW'	UTM Zone	
Geographic Coordinates	X Coordinate	Latitude: REF04 (C04004) in LX loop (pos. 079) **if** REF01 in LX loop = '6E' **and** REF02 in LX loop = '05' **and** REF04 (C04003) in LX loop = 'LQ'	Longitude or UTM Easting	
Geographic Coordinates	Y Coordinate	Longitude: REF04 (C04002) in LX loop (pos. 079) **if** REF01 in LX loop = '6E' **and** REF02 in LX loop = '05' **and** REF04 (C04001) in LX loop = 'LK'	Latitude or UTM Northing	
Geographic Location	State/Province/ Territory (FIPS)	State or province: N402 in header level (pos. 054)	State FIPS Code	
			State FIPS Code	
			State FIPS Code	

EIIP Entity	EIIP Attribute	X12 Data Element	Modeling Attribute Name	Comments
Geographic Location	County/Parish/ Reservation (FIPS)	County/parish code: REF02 in header level N1 loop (pos. 057) **if** REF01 in header level N1 loop = 'ZX'	County FIPS Code	
			County FIPS Code	
			County FIPS Code	
Geographic Location	Municipality	Municipality: N102 in header level (pos. 045) **if** N101 in header level = 'C6'	City FIPS Code	
Process Growth Factors	Initial Year	Process growth factors start year: DTM07 in LX loop (pos. 393) **if** HL03 = '6' **and** DTM01 in LX loop = '196' **and** DTM06 in LX loop = 'CY'	Annual Average Growth Rate (%)	
Process Growth Factors	Projected Year	Process growth factors projected action end date: DTM07 in LX loop (pos. 393) **if** HL03 = '6' **and** DTM01 in LX loop = '575' **and** DTM06 in LX loop = 'CY'	Annual Average Growth Rate (%)	
Process Growth Factors	Growth Factor	Process growth factor data: MEA03 in LX loop (pos. 387) **if** HL03 = '6' **and** MEA01 in LX loop = 'AG' **and**	Annual Average Growth Rate (%)	
Process Growth Factors	Growth Factor Reference	Process growth factor reference text: REF03 in LX loop (pos. 395) **if** HL03 = '6' **and** REF01 in LX loop = 'ZZ'	Origin of Growth Rate	(BEA, EGAS, Local, etc.)
Process Growth Factors	Growth Factor Units	Process growth factor data: MEA04 (C00101) in LX loop (pos. 387) **if** HL03 = '6' **and** MEA01 in LX loop = 'AG'	Annual Average Growth Rate (%)	
Site/Source	Site Name	Name: N102 in SPI loop (pos. 019) **if** HL03 = '4' **and** N101 in SPI loop = '7C'	Plant Name	
Site/Source	Physical Address	Address information: N301 in header level (pos. 051) *and* N302 in header level **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = '7C'	Plant Street Address	
Site/Source	SIC	Standard Industry Classification (SIC) code: REF02 in detail level (pos. 055) **if** HL03 = '4' **and** REF01 in detail level = 'IJ'	Standard Industrial Classification Code	

EIIP Entity	EIIP Attribute	X12 Data Element	Modeling Attribute Name	Comments
Site/Source	Federal ID Code	Federal key identifier code: SPI03 in detail level (pos. 007) **if** HL03 = '4' **and** SPI02 in detail level = 'IJ'	AIRS Plant ID	
Site/Source	Physical Zip Code	Postal code: N403 in header level (pos. 054) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = '7C'	The actual, physical ZIP code of the source	
Stack Physical Parameter	Stack Height	Height above ground: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = '5F'	Stack Height	
Stack Physical Parameter	Stack Diameter	Inside diameter: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = 'ID'	Stack Diameter	
Stack Physical Parameter	Exit Gas Temperature	Exit gas temperature: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'TE'	Stack Exit Temperature	
Stack Physical Parameter	Exit Gas Velocity	Exit gas velocity: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = 'ZZZ'	Stack Exit Velocity	
Stack Physical Parameter	Exit Gas Flow Rate	Flow rate: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = 'FR'	Stack Exit Flow Rate	
Stack Physical Parameter	Plume Height	Plume height data: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'BA'	Plume Height	

9.5 EIIP Code Tables Contained in the EIIP X12 841 Convention Document

There are three types of code lists employed in the EIIP X12 841 Convention Document. There are codes that are used as data element qualifiers. These codes are part of and defined by ANSI/ASC X12. The code values have been developed for use with all ANSI/ASC X12 standards and are maintained by the committee.

The second type of code list consists of those codes that are used by the EIIP by reference (e.g., Standard Industry Classification (SIC) code, Dun & Bradstreet number, Chemical Abstract Service (CAS) Registry Number, etc.). These codes are used by the air emission programs implementing the Convention Document, but are maintained by a specific outside organization (not ANSI/ASC X12). Therefore, the values for these codes would be obtained from the responsible organizations.

The final type of code list, the type contained in this table, are those that are developed by the EIIP and are physically contained in the Convention Document. These are codes are not related to the ANSI/ASC X12 standards and are not administered by outside organizations. They are identified and used to meet specific air emission inventory/modeling needs. These codes are maintained by, and can be obtained from, the EIIP.

This table presents the EIIP code lists as they are used in the Convention Document. Within the ANSI/ASC X12 standards, each code (identified as "ID") has a preceding qualifier. This qualifier indicates the type/source of the code. For example, the source type of Point Source (code 01) is qualified by Source Type (code 06). Both the code and its related qualifier are detailed in this table. Additionally, the data element number, as specified in the standard, and the position location are included to ensure accurate reference. As the other types of codes are administered by other organizations and clearly referenced within the Convention Document, they are not detailed in this table.

Note: Code IDs indicated in parentheses are the values found in this version of the Convention Document that must be changed due to conflict with other code values. The Code IDs preceding them, although not found in the document, should be applied in their place

EIIP Code Tables Contained in the EIIP X12 841 Convention Document

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
header - 009	128	17	127	01	Level 1 (EIIP Phase I)
				02	Level 2 (EIIP Phase II)
				03	Level 3 (EIIP Phase III)
header - 009	128	17	791	EMIS	Annual stationary major source inventory data submittal
				EPA	USEPA required data submittal
				EPARFP	Reasonable Further Progress(RFP) inventory data
				EPASIP	Base year State Implementation Plan(SIP) inventory data submittal

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				LOC	Data submittal between local and state agency
				NON	Nonattainment modeling data submittal
				PLAN	Planning inventory (e.g., seasonal) data submittal
				REGION	Regional area modeling data submittal
				SPEC	Special data submittal
				SUBNON	Sub-nonattainment area modeling data submittal
				SUPER	Super-regional area modeling data submittal
header - 054	309	RG	310	03MOD	Ozone Moderate
				03OTR	Ozone Transport Region
				CO	Carbon Monoxide
				03EXT	Ozone extreme
				03MAR	Ozone marginal
				03SER	Ozone serious
				03SEV1	Ozone severe 1
				03SEV2	Ozone severe 2
				03UNC	Ozone unclassified
				PM10	Particulate Matter 10
				PM25	Particulate Matter 2.5
header - 057	128	6E	127	01	Static Grid
				02	Line
				03	Point
				04	Polygon
detail - 055	128	06	127	01	Point Source
				02	Area Source
				03	Mobile Source
				04	Biogenic Source
				05	Nonroad Engines and Vehicles Source
detail - 055	128	T7	127	GEO	Geogenic
				LIGHT	Lightning

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				SOIL	Soil
				VEG	Vegetation
detail - 079	128	6E	127	05	Dynamic Grid
				06	Projection System Name
detail -093	559	EP	751	MONO	Monoterpines
				OVOC	Other Volatile Organic Compounds
				VOC	Volatile Organic Compounds
detail - 187	750	PP	751	01	Stack
				02	Control Unit
				03	Emission Unit
				04	Storage Tank
				05	Vehicle Group
				06	Process
				07	Flare
				08	Equipment Leak Fugitives
				09	Loading
				10	Cooling Towers
				11	Incinerators
				12	Accidental Release/Upset
				13	Start up/Shut Down
				14	Wastewater
				15	Area
				16	Other
detail - 225	235	ZZ	234	CO	Carbon monoxide
				HC	Hydrocarbons
				ISO	Isoprene
				MONO	Monoterpines
				NMHC	Nonmethane hydrocarbons
				NMOC	Nonmethane organic compounds
				NMOG	Nonmethane organic gases
				NO	Nitric oxide

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				NOX	Nitrogen oxides
				NOY	Nitrogen oxides plus secondary compounds
				OVOC	Other volatile organic compounds
				PB	Lead
				PM	Particulate matter
				PM10	Particulate matter >= 10
				PM25	Particulate matter >= 2.5
				ROG	Reactive organic gases
				SOX	Sulfer oxides
				TOG	Total organic gases
				VOC	Volitile organic compounds
detail - 237	128	ZZ	127	A	Operating
				B	Under Construction
				C	Under Modification
				D	Mothballed
				E	Closed - Dismantled/Removed From Site
				F	Closed - Remaining On Site
detail - 409	559	EP	751	AC	Ash Content
				HC	Heat Content
				OF (A)	Seasonal Operating Adjustment Factor
				OS (S)	Operating Schedule
				SC	Sulfer Content
				T	Maximum Actual Throughput
detail - 439 and detail - 597	128	72	127	01	Ozone Season
				02	Peak Ozone Season
				03	CO Season
				04	Peak CO Season
				05	Particulate Matter Season
				06	Modeling Episode

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
detail - 439 and detail - 553	128	PG	127	ABR	Abrasive
				ABSP	ABS Polymer
				ACEAL	Acetaldehyde
				ACID	Acid
				ACIDFN	Acid Final
				ACIDPR	Acid Pure
				ACRNL	Acrylonitrile
				ACROL	Acrolein
				ADH	Adhesive
				ADN	ADN
				ADPN	Adipronitrile
				AGNT	Agent
				ALLY	Alloy
				ALMA	Alumina
				ALMO	Aluminum Molten
				AMM	Ammonia
				ANILN	Aniline
				ASB	Asbestos
				ASP	Asphalt
				ASPSL	Asphalt Shingle
				BATT	Batteries
				BAUX	Bauxite
				BEAN	Beans
				BEANGR	Beans Green
				BEETRW	Beets Raw
				BNZN	Benzene
				BOD	Bodies
				BORD	Board
				BRED	Bread
				BRIK	Brick

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				BUTDN	Butadiene
				BUTDN13	1.3-Butadiene
				CAD	Cadmium
				CAN	Cans
				CAPLM	Caprolactam
				CAR	Car(s)
				CARTOT	Cargo Total
				CAST	Castings
				CATL	Catalyst
				CBLK	Carbon Black
				CC14	CC14
				CEM	Cement
				CFC133	CFC-133
				CHAR	Charcoal
				CHRMORE	Chromite Ore
				CHXN	Cyclohexene
				CIG	Cigarettes
				CL	Chlorine
				CLAY	Clay
				CLBNZ	Chlorobenzene(s)
				CLFRM	Chloroform
				CLMET	Chloromethane(s)
				CLNK	Clinker
				CLOT	Clothes
				COAL	Coal
				COALSTG	Coal Storage
				COAT	Coating
				COKE	Coke
				COKEFR	Coke Free
				COKERW	Coke Raw
				CON	Concrete

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				COPLY	Copolymer
				CORE	Cores
				COREOL	Core Oil
				COTT	Cotton
				COW	Cattle
				CTET	Carbon Tetrachloride
				CU	Copper
				CULL	Cullet
				CUM	Cumene
				CURR	Current
				CUSC	Copper Scrap
				DBZF	Dibenzofuran
				DCB	1,4-Dichlorobenzene
				DCE	1,2-Dichloroethane
				DIST	Distance
				DMF	DMF
				DMTP	Dimethyl Terephthalate
				DRAN	Drains
				DRUM	Drums
				EAFDT	EFA Dust
				EDC	EDC
				EDCVC	EDC-VC
				ELEC	Electricity
				ELECRD	Electrode
				ENER	Energy
				EPCH	Epichlorohydrin
				ETCSOL	Etching Solution
				ETH	Ethylene
				ETHBNZ	Ethylbenzene
				ETHBST	Ethylbenzene/Styrene
				ETHCL	Ethyl Chloride

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				ETHDB	Ethylene Dibromide
				ETHDC	Ethylene Dichloride
				ETHOX	Ethylene Oxide
				EXP	Exposed
				EXTFC	Extractor Feed Cake
				FABR	Fabric
				FDNHCO	Feed NaHCO3 Dry
				FEED	Feed
				FEEDDR	Feed Dry
				FEEDFR	Feed Fresh
				FEEDMT	Feed Material
				FELTST	Felt Saturated
				FERT	Fertilizer
				FIBR	Fiber
				FISH	Fish
				FISHML	Fish Meal
				FISHRW	Fish Raw
				FISHSC	Fish Scrap
				FLC1112	Florocarbon 11/12
				FLC22	Florocarbon 22
				FLSP	Fluorspar
				FORM	Formaldehyde
				FORM37	37% Formaldehyde
				FRMGS	Ferromanganese
				FRSH	Fresh
				FUEL	Fuel
				GAS	Gas
				GLSS	Glass
				GLSSBD	Glass Beaded
				GLYET	Glycol Ethers
				GRAD	Graders

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				GRIT	Grit
				GRN	Grain
				GYPCR	Gypsum Crude
				HAMB	Hamburger
				HCL	Hydrochloric Acid
				HEATIN	Heat Input
				HXCBNZ	Hexachlorobenzene
				HYC	Hydrocarbons Total
				INK	Ink
				IRON	Iron
				LAB	LAB
				LEAD	Lead
				LEADOX	Lead Oxide
				LIME	Lime
				LIMHYD	Lime Hydrated
				LIMSTN	Limestone
				LOG	Logs
				MATL	Material
				MATLRW	Material Raw
				MCBNZ	Monochlorobenzene
				MEAL	Meal
				MEAT	Meat
				MERC	Mercury
				METL	Metal
				METLHT	Metal Hot
				METLSPR	Metal Sprayed
				MLCAHD	Meleic Anhydride
				MTHCFRM	Methyl Chloroform
				MTHCHL	Methylene Chloride
				MTHCLFR	Methylene Chloride Fresh
				NAPT	Naphthalene

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				NEOP	Neoprene
				NICK	Nickel
				NITELST	Nitrile Elastomer
				NTRBZN	Nitrobenzene
				OCRSL	O-Cresol
				OIL	Oil
				ORE	Ore
				ORECON	Ore Concentrated
				OVRBUR	Overburden
				P205	P205
				PAINT	Paint
				PAPR	Paper
				PCB	PCB
				PCE	PCE
				PCECC	PCE & CC14
				PCETCE	PCE & TCE
				PCETH	Perchloroethlyene
				PCETHFR	Perchloroethlyene Fresh
				PCPHNL	Pentachlorophenol
				PELLT	Pellets
				PEST	Pesticide
				PHNL	Phenol
				PHSGN	Phosgene
				PHSPH	Phosphate
				PHSPHRK	Phosphate Rock
				PHSPRS	Phosphorous
				PIGIRN	Pig Iron
				PIGMNT	Pigment
				PILE	Pile
				PIPE	Pipe
				PIPECST	Pipe Cast

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				PLCANHD	Phthalic Anhydride
				PLSTC	Plastic
				PLYWD38	Plywood 3/8 Inch
				PM	PM
				POLVNL	Polyvinal
				POLY	Polymer
				POM	POM
				PROD	Product
				PRODDR	Product Dry
				PRODFN	Product Finished
				PRODSA	Product Surface Area
				PRPLYN	Proplyene
				PULP	Pulp
				PULPABD	Pulp Air-Dried Bleached
				PULPADU	Pulp Air-Dried Unbleached
				RAYN	Rayon
				REF	Refinery
				RESD	Residues/Skimmings
				RESN	Resin
				RESNPA	Resin Polyester/Alkyd
				RESNTN	Resin Thinned
				ROCK	Rock
				SALT	Salt
				SAND	Sand
				SAWDST	Sawdust
				SBR	SBR
				SCMNGS	Silicomanganese
				SCRP	Scrap
				SCRPRS	Scrapers
				SEAL	Seals
				SHOT	Shot

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				SINT	Sinter
				SLAG	Slag
				SLBLKL	Solids Black Liquor
				SLDG	Sludge
				SLDGDR	Sludge Dried
				SOLNCT	Solution Coating
				SOLNFRM	Solution 37% Formaldehyde
				SOLV	Solvent
				SOLVCT	Solvent Coating
				SOLVFR	Solvent Fresh
				SOLVIN	Solvent in Ink
				SOLVMU	Solvent Make-Up
				SOLVRC	Solvent Reclaimed
				SOLVTN	Solvent Thinned
				SOUR	Sour Gas
				STEL	Steel
				STELSP	Steel Specialty
				STM	Steam
				STON	Stone
				STOR	Storage
				STRCH	Starch
				STYR	Styrene
				SULF	Sulfer 100%
				SULFAC	Sulfuric Acid
				SUMP	Sump
				SURF	Surface
				TCBZN	1,2,4-Trichlorobenzene
				TECLN	Trichloroethylene
				TECLNFR	Trichloroethylene Fresh
				TCEN	1,1,1-Trichlorothane
				TDI	TDI

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				TETHLD	Tetraethyl Lead
				TIRE	Tires
				TNT	TNT
				TOLN	Toluene
				TONE	Toner
				TOPSL	Topsoil
				TPLCAC	Terephthalic Acid Crude
				TRCKHL	Trucks Haul
				UREA	Urea
				VAC	Vacuum
				VEHCL	Vehicles Light/Medium
				VNLC	Vinyl Chloride
				VNLCM	Vinyl Chloride Monomer
				VNLDC	Vinyldiene Chloride
				WATCO	Water Cooling
				WAX	Wax
				WFR	Wafers/Chips
				WFRBRD	Waferboard
				WOOD	Wood
				WOODDF	Wood Dry Flakes
				WOODDR	Wood Dried
				WSTE	Waste
				WSTWTR	Wastewater
				XLN	Xylene(s)
				XLNM	m-Xylene
				XLNO	o-Xylene
				XLNT	Xylene(s) Total
				ZINC	Zinc
				ZINCOX	Zinc Oxide
detail - 439 and detail - 553	128	SU	127	ADD	Added

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				APPL	Applied
				AREA	Area
				BAKE	Baked
				BLOW	Blown
				BURN	Burned
				CAP	Capicity
				CAST	Cast
				CHAR	Charbroiled
				CHRG	Charge(d)
				CLND	Cleaned
				COAT	Coated
				CONS	Consumed
				CRSH	Crushed
				DGRS	Degreased
				DRIL	Drilled
				DRY	Dried
				EMIT	Emitted
				FEDD	Fed into Dryer
				FEED	Feed
				GIN	Ginned
				GRAN	Granulated
				HAND	Handled
				IAD	In Adhesive Applied
				ICT	In Coating
				IINF	In Influent
				IINK	In Ink
				INOC	Inoculated
				INPT	Input
				IOPP	In Operation
				LEAK	Leaked
				LIQK	Liquified

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				LOAD	Loaded
				MELT	Melted
				MILL	Milled
				MINE	Mined
				MIX	Mixed
				OPRG	Operating
				PICK	Picked
				PLAT	Plated
				PRDT	Product
				PROC	Processed
				PROD	Produced
				PRODCAP	Production Capacity
				PUMP	Pumped
				RECD	Received
				REDU	Reduced
				REMD	Removed
				ROAS	Roasted
				SAW	Sawed
				SHIP	Shipped
				SHPRCD	Shipped or Received
				SMOK	Smoked
				SPUN	Spun
				STOR	Storage
				STRP	Stripped
				TRFD	Transferred
				THRU	Throughput
				TPRT	Transported
				TRAV	Traveled
				TRTD	Treated
				UNLD	Unloaded
				USED	Used

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
detail - 553	128	IX	127	01	Calculated based on physical principles
				02	Estimated based on expert judgement
				03	Calculated based on manufacturer-specified throughput capacity
				04	Calculated based on direct continuous measurement of an activity surrogate
				05	Calculated based on direct intermittent measurement of an activity
				06	New construction, not yet operational. Emissions are zero.
				07	Operations ceased. Emissions are zero.
				08	Calculated based on modeling activity
				09	Derived from Highway Performance Monitoring System (HPMS) data
				10	Derived from census data
				11	Derived from trade association/industry group data
				12	State agency generated data
				13	Local agency generated data
				14	Federal agency generated data
				15	Proprietary database
				16	Based on survey results
				17	Calculated based on statistical method
detail - 567	559	EP	751	AF (A)	Season Adjustment (Throughput) Adjustment Factor
				AS (S)	Activity (Throughput) Schedule
				M	Meteorological
detail - 595	1250	UN	1251	01	
				02	
				03	
				04	
				05	
				06	
				07	

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
detail - 639	128	I9	127	CO	Carbon Monoxide
				HC	Hydrocarbons
				ISO	Isoprene
				MONO	Monoterpines
				NMHC	Nonmethane hydrocarbons
				NMOC	Nonmethane organic compounds
				NMOG	Nonmethane organic gases
				NO	Nitric oxide
				NOX	Nitrogen oxides
				NOY	Nitrogen oxides plus secondary compounds
				OVOC	Other volatile organic compounds
				PB	Lead
				PM	Particulate matter
				PM10	Particulate matter >= 10
				PM25	Particulate matter >= 2.5
				ROG	Reactive organic gases
				SOX	Sulfer oxides
				TOG	Total organic gases
				VOC	Volatile organic compounds
detail - 661	559	EP	751	04	Site/Source
				05	Physical
				06	Process
detail - 725	559	EP	751	CE	Aggregate Control Information
				EF	Emission Factor
				ES	Estimated Emissions
detail - 729	559	EP	751	C	Controlled
				U	Uncontrolled
detail - 745	128	ZZ	127	AA (A)	Area Source Questionnaire
				CC (C)	Direct Calculation of emissions by solvent use; all solvents emitted in time period
				DD (D)	80% - Default value

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				EE (E)	Source in compliance due to irreversible process that eliminates solvent use
				HH (H)	90% - Default - enhance monitoring
				LL (L)	Local category-specific rule effectiveness factor - not USEPA regulated
				MM (M)	Continuous emission factor
				NN (N)	Source not subject to regulation
				PP (P)	Point Source Questionnaire
				SS (S)	USEPA Single Source Category Determination Protocol Study
				UU (U)	Uncontrolled emission
detail - 745 and detail - 755	128	C3	127	01	Calculated based on source test or other emission measurement
				02	Calculated based on material balance using engineering knowledge of the process
				03	Calculated based on best guess/engineering judgement
				04	Calculated based on vendor emission factor specification
				05	Calculated based on ratio in order to measure pollutant
				06	Calculated based on pilot bench study
				07	State Stack Test
				08	State Material Balance
				09	State Efficiency of Control Device
				10	Company Material Balance
				11	Company Efficiency of Control Device
				12	Continuous Emission Monitoring
detail - 755	128	6E	127	13	Calculated based on AP-42 emission factor
				14	Calculated based on state/local emission factor
				15	New construction, not yet operational - emissions are zero
				16	Operations ceased - emissions are zero

Position Reference	Qualifier Element	Qualifier ID	Data Element	Code ID	Code Definition
				17	Calculated based on FIRE emission factor
				18	Calculated based on user-supplied emission factor
				19	Calculated based on USEPA specification factor
				20	Calculated based on state/local Specification factor
				21	Calculated based on trade association emission factor
				22	CO Stack Test Approved by State
				23	Other CO Stack Test Approved by State
				24	State Factor Used by State
				25	State VOC Calculation
				26	Company SCC Factor
				27	Company VOC Calculation
				28	Other miscellaneous emission method code
detail - 755	128	D0	127	A	AIRS Rating A
				B	AIRS Rating B
				C	AIRS Rating C
				D	AIRS Rating D
				E	AIRS Rating E
				F	AIRS Rating F

SECTION 10 — AGENCY CONVENTIONS, INTERCHANGE CONTROL & TRANSACTION SETS

10.1 Introduction

Section 10 contains the descriptions of the information used in the Interchange Header (ISA), Interchange Trailer (IEA), Group Start (GS), Group End (GE), and the control segments.

To help understand how the standards work, it is useful to begin by defining some terminology and explaining some of the components that make electronic communications possible. It is important to note that in the transaction set implementation guidelines all text shown in italics is an EIIP convention. Non-italicized text contain definitions and comments directly from the X12 standards.

A "*transaction set*" is the term used in business data interchange to describe the electronic transmission of a single document (purchase order, Emission Statement, shipping notice, etc.) between one organization's computer and the computer of the other trading partner. The data included in a transaction set conveys the same information as a conventional printed document.

A *transaction set* generally but not always, consists of three areas - Header or Table 1, Detail or Table 2, and a Summary or Table 3. The *Header Area* contains information that is of an administrative nature and pertains to the entire document (document dates, identities, names of contacts, etc.). The *Detail Area* is used to convey the actual business transaction such as quantities, prices, items. Data in the Detail Area overrides equivalent Header Area data (i.e. if a contact is specified in the Header and another contact is specified with a single item, the second contact takes priority). The *Summary Area* contains control information and may contain other data that relates to the entire transaction.

Transaction sets are a collection of a series of segments. A *segment* is a group of data used to convey a logical grouping of data. The data within a segment are contained within data elements.

Please note that in the design of Composite Data Elements, sub-elements are still referred to as elements.

EDI transmissions are created from information extracted from internal information systems, translated into ASC X12 format and punctuated with control characters. Quantity, unit of measure, unit price, catalogue number is typical purchase order or invoice information. In an invoice transaction the information becomes a segment of five data elements grouped in a specific sequence as follows:

IT1 Quantity*Unit of Measure Code*Unit Price** Product Service Qualifier*Product/Service Identification N/L**

The ANSI/ASC X12 format requires each element be separated by an element separator and the last element be followed by a segment terminator. Graphic representations of the control characters usually use the asterisk as a element separator, N/L as the segment terminator and a colon(:) as a sub-element separator.

The segment in an actual transmission would appear as:

IT11*CA*1.08**CT*141151 N/L**

In the ANSI/ASC X12 code list "CA" is the unit of measure code for case, and "CT is the product identification qualifier for carton.

The following list identifies terms associated with data segments and provides references to codes and terms used in the X12 standard. The actual transmission does not include all of the listed items as only the segment identifier characters, the values for each data element, the data element separators and the segment terminator characters are transmitted.

Segment Identifier, Two or three characters assigned to identify the segment. The identifier occupies the first character positions of the segment.

Data Element Reference Number, A number assigned to the data element to provide a reference to the ASC X12 Data Dictionary which defines specifications for each data element.

Data Element Reference Designator, A structured code assigned to each data element in a segment to indicate its unique position in the segment. It is composed of the segment identifier and its sequential position within the segment.

Data Element Name, This is the name assigned to the data element in the ASC X12 Data Dictionary.

Attributes, Each data element has three ASC X12 attributes: element usage or Condition Designator, data element type, and Minimum/Maximum length.

Condition Designator

M - Mandatory
The element is required to appear in the segment.

O - Optional

Appearance of the data element is at the option of the sending party or is based on the mutual agreement of the trading partners.

X - Relational

Condition that may exist between two or more data elements based on the presence or absence of one of the data elements. Additional codes are used to identify the condition i.e. P - Paired or Multiple, R - Required, E - Exclusion, C - Conditional, or L - list Conditional. Refer to the X12 Standards Manual, Introduction to X12.22 Segment Directory.

Data Element Type

ID Identifier

The data element must always contain a value from a predefined list of values that is maintained by X12 or by other bodies that are recognized by X12 and identified by reference in Appendix A in the Data Element Dictionary. The value is left justified. Trailing spaces should be suppressed.

AN String

Alpha-numeric sequence of characters containing at least one non-space character. The significant characters must be left justified. Leading spaces, if used are assumed to be significant characters. Trailing spaces should be suppressed.

FS Fixed Length String

A sequence of any letters, spaces, and/or special characters with spaces filled, if necessary, to satisfy minimum length.

DT Date

The format is YYMMDD where YY is the Year, MM is the month and DD is the day of the month.

TM Time

Values for a time-type data element are in the HHMMSSd..d format expressed using the 24-hour clock. HH expresses the hour (00-23), MM expresses the minute (00-59), SS the seconds (00-59), and d..d is the numeric expression of decimal seconds.

Nn Numeric
Numeric data element where N indicates a numeric and "n" indicates the decimal places to the right of a fixed, implied decimal point. The decimal point is not transmitted in the character stream. If the max length of the data element was five position and the Type was N2, the values sent would always have two decimal positions; an N0 would contain no decimal positions.

R Decimal
A numeric data element where the decimal point is optional for integer values, but required for fractional values. Leading zeros should be suppressed unless necessary to satisfy a minimum length requirement. The decimal point and the minus sign when transmitted are not counted when determining the length of the data element value. If the max length of the data element was three positions, the following represent the values that could be sent: NNN, .NNN, N.NN, NN.N, -N.NN, etc.

B Binary
Any sequence of octets ranging in value from binary 00000000 to binary 11111111. Binary may only exist in the BIN Segment.

Minimum/Maximum, This is the range, minimum to maximum, of the number of character positions available to represent the data element value. It may be of variable length with a minimum to maximum, or it may be of fixed length in which the minimum is equal to the maximum.

10.2 X12 EDI Transmission Control Structure

The X12 Transmission is a hierarchical structure of headers and trailers to allow transaction sets of different types to be transmitted in the same transmission and allows the data to be separated or segregated logically for easy interpretation and internal routing by the receiver.

Transaction sets begin with an ST segment and end with an SE segment. Multiple transaction sets of the same functional group are transmitted together beginning such a group with a GS (Group Start) and ending with a GE (Group End) segment. One or more functional groups are bound together for transmission within an interchange envelope that starts with an ISA segment and ends with an IEA segment. There are other segments available for Security and Interconnect control when using the services of third party communications providers (e.g., VAN).

The *interchange control structure* is the interchange envelope consisting of a Header (ISA) and a Trailer (IEA) for the electronic interchange through a data transmission, and provides a structure to acknowledge the receipt and processing of the envelope.

The ISA and the IEA envelope one or more functional groups or interchange-related control segments and perform the following functions:

- Define the segment terminator, and the element and sub-element separators;
- Identify the sender and receiver;
- Provide control information for the interchange; and
- Allow for authorization and security information.

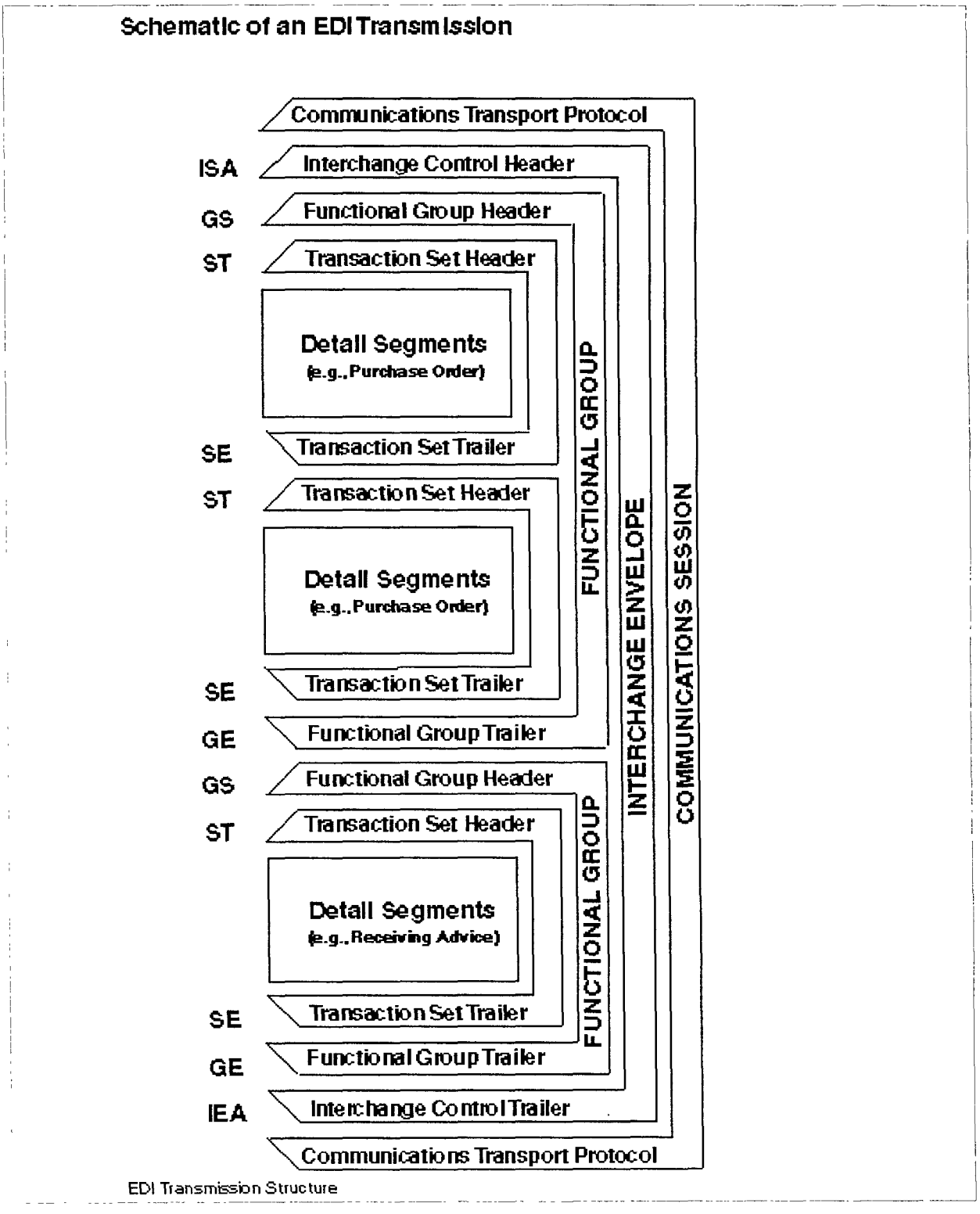
The GS and GE envelope transactions sets of the same type. Each type of transaction is contained in a separate Functional Group to allow the receiver to parse the information to the appropriate application. The GS segment provides the identity of the Version and Release of the standard used to create the transaction. Both the GS and the GE provide control information to ensure the validity of the interchange.

Every transaction set begins with an ST (Transaction Start) segment and is ended with a GE (Group End) segment.

Translators normally strip off the ISA/IEA and GS/GE segments during translation. It is the responsibility of the trading partners to make provisions to archive the transmissions before and after translation to satisfy EDI Audit Requirements.

The structures of the transaction set and functional group headers and trailers are found in the Segment Directory. The structures of the interchange control header and trailer are found in the Interchange Control Structure Standard (ANSI/ASC X12.5-1989).

See the following EDI Transmission schematic. The schematic illustrates a typical format for electronically transmitting a series of diverse business transactions.


Schematic of an EDI Transmission
Communications Transport Protocol
ISA
Interchange Control Header
GS
Functional Group Header
ST
Transaction Set Header
Detail Segments
(e.g., Purchase Order)
SE
Transaction Set Trailer
ST
Transaction Set Header
Detail Segments
(e.g., Purchase Order)
SE
Transaction Set Trailer
GE
Functional Group Trailer
GS
Functional Group Header
ST
Transaction Set Header
Detail Segments
(e.g., Receiving Advice)
SE
Transaction Set Trailer
GE
Functional Group Trailer
IEA
Interchange Control Trailer
Communications Transport Protocol
FUNCTIONAL GROUP
FUNCTIONAL GROUP
INTERCHANGE ENVELOPE
COMMUNICATIONS SESSION
EDI Transmission Structure

10.2.1 Control Segments

ICS Interchange Control Structures

Functional Group ID=

Introduction:

The purpose of this standard is to define the control structures for the electronic interchange of one or more encoded business transactions including the EDI (Electronic Data Interchange) encoded transactions of Accredited Standards Committee X12. This standard provides the interchange envelope of a header and trailer for the electronic interchange through a data transmission, and it provides a structure to acknowledge the receipt and processing of this envelope.

Notes:

The functional group is not an interchange component of this standard but appears here to establish positioning for the functional groups.

The following symbols are found in the convention:
>> indicates a required element
X indicates an element not used

	Pos. No.	Seg. ID	Name	Req. Des.	Max.Use	Loop Repeat	Notes and Comments
	010	ISA	Interchange Control Header	M	1		
Not Used	020	TA1	Interchange Acknowledgment	O	1		
	030	GS	Functional Group Header	O	1		
	040	GE	Functional Group Trailer	O	1		
	050	IEA	Interchange Control Trailer	M	1		

Segment: **ISA** **Interchange Control Header**
Position: 010
Loop:
Level:
Usage: Mandatory
Max Use: 1
Purpose: To start and identify an interchange of zero or more functional groups and interchange-related control segments
Syntax Notes:
Semantic Notes:
Comments:
Notes: The value of the data element separator, the sub-element separator, and the segment terminator for all the segments following the ISA that begins the transmission through the IEA that completes the transmission are established in the ISA. Byte 4, following the three bytes that comprise the "ISA" identification of this header, is used to separate the remaining elements in this and all succeeding data elements through the end of the IEA. This implementation guide uses the asterisk (*) as the graphic representation of the data element separator. The sub-element separator is established in data element I15. It is also the sub-element separator through the end of the IEA. This implementation guideline uses the colon (:) as the graphic representation of the sub-element separator. The value at the last position of the ISA establishes the segment terminator for the communication through the end of the IEA. The ISA consists of fixed length fields, therefore the segment terminator is byte 106 or the first byte after data element ISA16.

The control characters selected as the segment separator, sub-element separators and the segment terminators must be characters that will not be data characters within the communication. Acceptable characters, in hexadecimal notation are HEX 04, HEX 0D, HEX 4F, HEX 1C, or HEX 15.

Example:
ISA*00*xxxxxxxxxx*00*xxxxxxxxxx*01*123456789xxxxxx*90*057949910002Pxx*95 0704*2300*U*00304*000000789*0*P*:N/L

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	ISA01	I01	**Authorization Information Qualifier**	**M ID 2/2**
			Code to identify the type of information in the Authorization Information	
			00 No Authorization Information Present (No Meaningful Information in I02)	
			03 Additional Data Identification	
>>	ISA02	I02	**Authorization Information**	**M AN 10/10**
			Information used for additional identification or authorization of the interchange sender or the data in the interchange; the type of information is set by the Authorization Information Qualifier (I01)	

This element is fixed field length. It must be space filled.

>>	**ISA03**	**I03**	**Security Information Qualifier**	**M**	**ID**	**2/2**
			Code to identify the type of information in the Security Information			
			00 No Security Information Present (No Meaningful Information in I04)			
>>	**ISA04**	**I04**	**Security Information**	**M**	**AN**	**10/10**
			This is used for identifying the security information about the interchange sender or the data in the interchange; the type of information is set by the Security Information Qualifier (I03)			
			This element is fixed length. It must be space filled.			
>>	**ISA05**	**I05**	**Interchange ID Qualifier**	**M**	**ID**	**2/2**
			Qualifier to designate the system/method of code structure used to designate the sender or receiver ID element being qualified			
			01 Duns (Dun & Bradstreet)			
>>	**ISA06**	**I06**	**Interchange Sender ID**	**M**	**AN**	**15/15**
			Identification code published by the sender for other parties to use as the receiver ID to route data to them; the sender always codes this value in the sender ID element			
>>	**ISA07**	**I05**	**Interchange ID Qualifier**	**M**	**ID**	**2/2**
			Qualifier to designate the system/method of code structure used to designate the sender or receiver ID element being qualified			
			01 Duns (Dun & Bradstreet)			
>>	**ISA08**	**I07**	**Interchange Receiver ID**	**M**	**AN**	**15/15**
			Identification code published by the receiver of the data; When sending, it is used by the sender as their sending ID, thus other parties sending to them will use this as a receiving ID to route data to them			
>>	**ISA09**	**I08**	**Interchange Date**	**M**	**DT**	**6/6**
			Date of the interchange			
>>	**ISA10**	**I09**	**Interchange Time**	**M**	**TM**	**4/4**
			Time of the interchange			
>>	**ISA11**	**I10**	**Interchange Control Standards Identifier**	**M**	**ID**	**1/1**
			Code to identify the agency responsible for the control standard used by the message that is enclosed by the interchange header and trailer			
			U U.S. EDI Community of ASC X12, TDCC, and UCS			
>>	**ISA12**	**I11**	**Interchange Control Version Number**	**M**	**ID**	**5/5**
			This version number covers the interchange control segments			
			It does not establish the Version/Release for the transactions which follow. That Version/Release is established by the GS (Functional Group Header) preceding the transactions.			
			00304 Draft Standard for Trial Use Approved for Publication by ASC X12 Procedures Review Board.			

>>	**ISA13**	**I12**	**Interchange Control Number**	**M**	**N0**	**9/9**

A control number assigned by the interchange sender

Together with the sender ID it uniquely identifies the interchange data to the receiver. It is suggested that the sender, receiver, and all third parties be able to maintain an audit trail or interchanges using this number. The number is suggested to start with 000000001 and be incremented by 1 for each subsequent ISA between the sender and receiver. It must match the number in IEA02.

>>	**ISA14**	**I13**	**Acknowledgment Requested**	**M**	**ID**	**1/1**

Code sent by the sender to request an interchange acknowledgment (TA1)

1	Interchange Acknowledgment Requested

>>	**ISA15**	**I14**	**Test Indicator**	**M**	**ID**	**1/1**

Code to indicate whether data enclosed by this interchange envelope is test or production

P	Production Data
T	Test Data

>>	**ISA16**	**I15**	**Component Element Separator**	**M**	**AN**	**1/1**

This field provides the delimiter used to separate component data elements within a composite data structure; this value must be different than the data element separator and the segment terminator

ISA16 is followed by a character that will establish the segment terminator for the communication through the end of the IEA. Refer to the notes at the beginning of this segment.

Segment: **GS** **Functional Group Header**
Position: 030
Loop:
Level:
Usage: Optional
Max Use: 1
Purpose: To indicate the beginning of a functional group and to provide control information
Syntax Notes:
Semantic Notes:
Comments:
Notes: The GS segment establishes the Version/Release for the transaction sets between it and the GE (Group End) segment.

Example: GS*123456789*873186902*940115*2300*1*X*003041 N/L

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	GS01	479	**Functional Identifier Code** Code identifying a group of application related transaction sets FA Functional Acknowledgment (997) SP Specifications/Technical Information (841)	M	ID	2/2
>>	GS02	142	**Application Sender's Code** Code identifying party sending transmission; codes agreed to by trading partners	M	AN	2/15
>>	GS03	124	**Application Receiver's Code** Code identifying party receiving transmission. Codes agreed to by trading partners	M	AN	2/15
>>	GS04	373	**Date** Date (YYMMDD) Date sender generated a functional group of transaction sets.	M	DT	6/6
>>	GS05	337	**Time** Time expressed in 24-hour clock time as follows: HHMM, or HHMMSS, or HHMMSSD, or HHMMSSDD, where H = hours (00-23), M = minutes (00-59), S = integer seconds (00-59) and DD = decimal seconds; decimal seconds are expressed as follows: D = tenths (0-9) and DD = hundredths (00-99) Time (HHMM) when the sender generated a functional group of transaction sets (local time at sender's location).	M	TM	4/6
>>	GS06	28	**Group Control Number** Assigned number originated and maintained by the sender Start with 000000001 and increment by 1 for each subsequent GS in the communication. This is an assigned number originated and maintained by the sender.	M	N0	1/9

>>	**GS07**	**455**	**Responsible Agency Code**	**M**	**ID**	**½**

Code used in conjunction with Data Element 480 to identify the issuer of the standard

X	Accredited Standards Committee X12

>>	**GS08**	**480**	**Version / Release / Industry Identifier Code**	**M**	**AN**	**1/12**

Code indicating the version, release, subrelease, and industry identifier of the EDI standard being used, including the GS and GE segments; if code in DE455 in GS segment is X, then in DE 480 positions 1-3 are the version number; positions 4-6 are the release and subrelease, level of the version; and positions 7-12 are the industry or trade association identifiers (optionally assigned by user); if code in DE455 in GS segment is T, then other formats are allowed

The release used for the EIIP is 003060.

003060	Draft Standards Approved for Publication by ASC X12 Procedures Review Board

Segment: **GE** **Functional Group Trailer**
Position: 040
Loop:
Level:
Usage: Optional
Max Use: 1
Purpose: To indicate the end of a functional group and to provide control information
Syntax Notes:
Semantic Notes:
Comments:
Notes: Example: GE*9*1 N/L

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	**GE01**	**97**	**Number of Transaction Sets Included** Total number of transaction sets included in the functional group or interchange (transmission) group terminated by the trailer containing this data element	**M**	**N0**	**1/6**
>>	**GE02**	**28**	**Group Control Number** Assigned number originated and maintained by the sender	**M**	**N0**	**1/9**

Segment: **IEA** **Interchange Control Trailer**
Position: 050
Loop:
Level:
Usage: Mandatory
Max Use: 1
Purpose: To define the end of an interchange of zero or more functional groups and interchange-related control segments
Syntax Notes:
Semantic Notes:
Comments:
Notes: Example: IEA*000000789 N/L

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	IEA01	I16	**Number of Included Functional Groups** A count of the number of functional groups included in an interchange	M	N0	1/5
>>	IEA02	I12	**Interchange Control Number** A control number assigned by the interchange sender Together with the sender ID, it uniquely identifies the interchange data to the receiver. It is suggested that the sender, receiver, and all third parties be able to maintain an audit trail of interchanges using this number. This number must agree with the number in ISA12.	M	N0	9/9

APPENDIX A — GETTING STARTED WITH EDI

(Check List)

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How To Get Started With Electronic Data Interchange (EDI)

This is a check list for implementing EDI for the Emission Inventory Improvement Program EDI prototype project. Although it is intended for use with the prototype efforts, the content is geared toward a pilot environment. As a result some information provided may not be necessary for prototype performance. EDI is the computer-to-computer (application-to-application) interchange of pre-designated message types in standardized formats. The purpose of the EIIP EDI prototype project is to address the task of electronically transferring air emission modeling data between interested parties.

Check List for Prototype Participants

1. Start Up

   Contact the EIIP DMC to get materials and set up a schedule. Materials include the EIIP EDI Implementation Guideline and information about EDI software.

2. Orientation Meeting/Communication

   Meet/communicate with the EDI coordinator for an orientation of the project activities. The meeting will give an overview of EDI and specific instructions on how to obtain and use the materials provided.

3. Equipment Setup

   To operate the EDI translator system being used for the prototype efforts (Supply Tech's STX PC-based translation software), it is recommended that your microcomputer have the following configuration:

   80386 PC-compatible
   16 or 20 MHZ processor
   150 K conventional and 1.012 extended available RAM
   60-80 Megabyte Hard Drive
   PC-DOS or MS-DOS, version 3.3 or higher
   EGA video adapter card with EGA monitor
   Asynchronous or bisynchronous modem *(if applied)*
   132-column printer

   In addition, you must have access to a data line *(if applied)*. Most EDI systems are stand-alone, but the software may be configured to run on a Local Area Network (LAN) and use LAN modems.

4. Installation

Install software and test communication facilities *(if applied)*. The EDI coordinator will provide assistance if needed.

5. Test Transmissions

Enter and transmit several emission modeling transactions to assure that the process works correctly.

6. Operations Mode

Once you are assured that the transmissions are reliable, begin to send real air emission modeling data to your trading partner. The USEPA will maintain a database of air emission modeling data. All regulatory reporting that is currently performed in a hard copy format must continue as required..

7. Evaluation

Evaluate the effort for reliability, data accuracy and time savings.

Check List for USEPA Program Offices

1. Feasibility Analysis

Initial analysis is important to the success of the EDI implementation. The following issues should be considered before starting the implementation.

- Funding
- Level of interest in the reporting community
- Regulatory language - determine legal applicability of electronic submission
- Information systems support - determine effort needed to manage emission modeling data. Identify the applicable in-house applications and develop an interface to the EDI translation software. If no system already exists, consider building or buying software to manage the data.

2. Select Prototype Participants

Identify good candidates for prototype participation. The EDI coordinator can contact them and introduce them to the prototype.

3. Set up EDI Hardware and Software

The EDI coordinator will provide and set up the EDI software, establish a communication service *(if applied)*, and provide technical support for the Program Office. This may require some coordination with internal information systems. The Regional or State Program Office should have access to a microcomputer, and become familiar with using the EDI software.

4. EDI Orientation

Each prototype participant should attend an orientation meeting to introduce them to the technology and give them specific instructions for using the prototype system. The EDI coordinator will conduct the meeting.

5. Test Reception

The EDI coordinator will test your EDI system by receiving several emission modeling transmissions from the same or another system. Transmissions must be received reliably before the pilot participants start transmitting.

6. Organize Air Emission Modeling Data

Become familiar with a tool for managing emission modeling data. This is software developed in-house, purchased, or provided by the EDI coordinator. Make sure you can at least add, remove, find and view emission modeling records from the database.

7. Schedule Participants

The EDI coordinator will setup a schedule with the pilot participants. For each pilot participant, schedule a time to:

- Do a test transmission
- Begin sending "live" transmissions

8. Receive Test Air Emission Modeling Data

The EDI coordinator will assist each prototype participant in setting up and testing their EDI system. Once a prototype sight has EDI equipment set up and configured, they

should create several "dummy" transmissions and attempt to send them via EDI. At the receiving end, these test transmissions can be received and verified.

9. Receive Operational Air Emission Modeling Data

Once a prototype participant's system is set up and tested, they may begin to send real emission modeling data. At this point, it is unnecessary for both the trading partner and States to be in contact during the routine transmissions.

10. Evaluation

Evaluate the process of electronic submission for reliability, data accuracy and time savings.

APPENDIX B — EPA'S GENERIC TERMS AND CONDITIONS AGREEMENT

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This appendix is the generic EPA Terms and Conditions Agreement for the use of EDI for Environmental Reporting. It is an excerpt from the September 4, 1996 Federal Register Notice, Volume 61, Number 172, FRL-5601-4.

Notice of Agency's General Policy for Accepting Filing of Environmental Reports via Electronic Data Interchange (EDI)

AGENCY: Environmental Protection Agency.

ACTION: Interim final notice.

II. TEXT OF EPA GENERIC TERMS AND CONDITIONS AGREEMENTS MODEL

Scope:

Use of this generic Terms and Conditions Agreement (TCA) model applies when EPA requires certification and/or authentication by the Submitter of a report. Where neither certification or authentication is required but use of a TCA is desired by EPA, the Agency may modify this TCA to eliminate unnecessary paragraphs. The model TCA is designed to promote consistency in implementing EDI by Program Offices within the Agency.

Model:

EPA Generic Terms and Conditions Agreement (TCA) Model for Submission of Environmental Reports via Electronic Data Interchange (EDI)

THIS ELECTRONIC DATA INTERCHANGE TERMS AND CONDITIONS AGREEMENT (the "Agreement"), by and between the United States Environmental Protection Agency ("EPA"), 401 M St., SW, Washington, D.C., a federal governmental agency, and reporting party ("Submitter") who has signed and returned the Terms and Conditions Agreement (TCA) Memorandum, included in today's notice referenced above, is effective on the date on which EPA issues the initial PIN(s), in response to receipt and acceptance of Submitter's signed TCA Memorandum. (When a program is not using a PIN system, some other determinant for the effective date will be specified in the program-specific notice.) Or, in the case where PIN is not required, as otherwise noted in the program-specific notice.

1. Recitals.

The intent of this agreement is to create legally binding obligations upon the parties using EDI and to ensure that (a) use of any electronic functional equivalent of documents referenced or exchanged under this agreement shall be deemed an acceptable practice in the ordinary course of Submitter-to-EPA environmental reporting and (b) such electronic

records shall be admissible as evidence on the same basis as paper documents. The parties intend to be legally bound by them.

2. Validity and Enforceability.

2.1 This Agreement has been executed by the parties to evidence their mutual intent to create binding regulatory reporting documents using electronic transmission and receipt of such records.

2.2 Any records properly communicated pursuant to this Agreement shall be considered to be a "writing" or "in writing"; and any such records which contain or to which there is affixed, a Signature, as defined by para. 6 of this Agreement, ("Signed Documents") shall be deemed for all purposes (a) to have been "signed" and (b) to constitute an "original" when printed from electronic files or records established and maintained in the normal course of business.

2.3 The conduct of the parties pursuant to this Agreement, including the use of Signed Records properly communicated pursuant to the Agreement, shall, for all legal purposes, evidence a course of dealing and a course of performance accepted by the parties in furtherance of this Agreement.

2.4 The Submitter agrees not to contest the validity or enforceability of Signed Documents under the provisions of any applicable law relating to whether certain agreements are to be in writing or signed by the party to be bound thereby. Signed Documents, if introduced as evidence on paper in any judicial, arbitration, mediation or administrative proceedings, will be admissible as between the parties to the same extent and under the same conditions as other business records originated and maintained in documentary form. Neither party shall contest the admissibility of copies of the Signed Documents under the Federal Rules of Evidence as inadmissible or in violation of either the business records exception of the rule on hearsay, or the best evidence rule, or on the basis that the Signed Documents were not originated or maintained in documentary (paper) form.

3. Receipt.

A Document shall be deemed to have been properly received by EPA when it is accessible to EPA, can be fully processed by the translator at EPA's Receipt Computer, and is syntactically correct to applicable EDI standards. No Document shall satisfy any reporting requirement or be of any legal effect until it is received.

4. Verification.

Upon receipt of any Document, the receiving party shall promptly and properly transmit a functional acknowledgment in return within "x" business day of receipt to verify that the Document has been received. If a positive functional acknowledgment is not received in return for a Document, the party initially transmitting the Document shall be responsible for re-sending the Document. The number of days shall depend on specific program needs and will be specified in the Program-Specific Notice or related documents (e.g., Implementation Guideline, TCA).

5. Date of Receipt.

EPA will consider an electronically filed report received when it can be fully processed by the translator at the EPA's receipt computer, i.e., when the document is retrievable from the electronic mailbox by EPA, syntactically conforms to applicable EDI standards, and is able to be successfully translated by EPA. A positive functional acknowledgment indicating no syntactical errors will constitute conclusive evidence that EPA has properly received a report and will establish the "Received Date".

6. Re-transmission.

If the Submitter does not receive a functional acknowledgment promptly after its transmission to the EPA, then the Submitter must re-send the document and follow any recovery procedures stated in the applicable EPA EDI Implementation Guidelines. "Promptly" shall be determined by each program-specific EDI application and defined in the program-specific notice or related documents (e.g., Implementation Guideline, TCA). The Submitter must retransmit any document within "X" days of receiving a re-transmission request by EPA. Likewise, EPA will re-send any transmission originated by EPA at the Submitter's request. The number of days shall depend on specific program needs and will be specified in the Program-Specific Notice or related documents (e.g., Implementation Guideline, TCA).

7. Inability to Transmit.

Circumstances, both foreseeable and unforeseeable, may prevent a reporting party from conducting EDI. Nevertheless, no Submitter will be excused from the requirement to file reports with the Agency by the appropriate regulatory deadline. If a party is unable to electronically file a required report by such deadline, it must submit a paper report on forms required by the applicable regulation.

8. Signature.

The Submitter shall adopt as its signature an electronic identification consisting of symbols (i.e., the Personal Identification Number (PIN) which is affixed to or contained

in each Document transmitted by the Submitter ("Signature"). The Submitter agrees that any such Signature affixed to or contained in any transmitted Document shall be sufficient to verify such party originated and possessed the requisite authority both to originate the transaction and to verify the accuracy of the content of the document at the time of transmittal. Unless otherwise specified in the TCA, affixing the Personal Identification Number (PIN) issued to the Submitter by EPA to any transmitted Document constitutes a valid Signature. The Submitter expressly agrees that it will sign each and every report it submits by using its PIN(s) (or other electronic identification, if provided for in the TCA), and that the use of the PIN(s) (or other electronic identification, if provided for in the TCA) constitutes certification of the truth and accuracy, upon penalty of perjury (or other program specific requirement), of the information contained in each such report.

9. Definitions.

Whenever used in this Agreement or any documents incorporated into this Agreement by reference, the following terms shall be defined as follows:

9.1 Compromise. When the PIN is intentionally or unintentionally disclosed to individuals and organizations who are not authorized to know or use the PIN.

9.2 Data. Facts or descriptions of facts.

9.3 Document/Record. Information that is inscribed on a tangible medium or that is stored in an electronic or other medium and is retrievable in perceivable form.

9.4 Electronic Agent. A computer program designed, selected or programmed by a party to initiate or respond to electronic messages or performances without review by an individual. An electronic agent acts within the scope of its agency if its performance is consistent with the functions intended by the party who utilizes the electronic agent.

9.5 Electronic Message/Transaction. A record generated or communicated by electronic, optical or other analogous means for transmission from one information system to another. The term includes electronic data interchange and electronic mail.

9.6 Functional Acknowledgment. Is the sending of a 997 transaction set (under ANSI ASC X12 Standards) indicating the results of the translator's syntactical analysis of the electronically submitted file. A positive acknowledgment indicates that the syntax of the submitted file conforms to the standard and can be processed by the translator. A negative acknowledgment indicates nonconformance to the standards.

9.7 Guidelines. Federal Register Notice and EPA Implementation Guidelines.

9.8 Message. Data structured in accordance with the protocol specified in the Guidelines and transmitted electronically between the parties and relating to a Transaction.

9.9 Personal Identification Number (PIN). Assigned by EPA, each PIN will consist of a sequence of alpha-numeric characters.

9.10. Receive/Receipt. To take delivery of a record or information. An electronic record or information is received when it enters an information processing system in a form capable of being processed by that system if the recipient has designated that information system for the purpose of receiving such records or information.

9.11 Date of Receipt. EPA will consider an electronically filed report received when it is accessible to the receiver (i.e., EPA) at its receipt computer. Upon receipt of any report, EPA will promptly submit a functional acknowledgment in return. A positive functional acknowledgment indicating no syntactical errors will constitute conclusive evidence that EPA has properly received a report and will establish the "Received Date". No document shall satisfy any reporting requirement until it is received.

9.12 Report. The report required by _____ (Program-specific notice will insert applicable regulatory/statutory cite for program-specific report).

9.13 Signed. For the purposes of EDI, a transaction is "signed" if it includes a symbol and/or action that is adopted or performed by a party or its electronic agent with the present intent to authenticate or manifest assent to a record, a performance, or a message. Actions or symbols adopted or performed by an electronic agent serve to authenticate with present intent a record or message on behalf of a party if the party designed, programmed or selected the electronic agent with an intent that the agent produce the result and the electronic agent performs in a manner consistent with its intended programming. That a record or message is signed is conclusively presumed as a matter of law if the parties agreed to an authentication procedure and the symbol or action taken complies with that procedure. Otherwise, that a document is signed may be proved in any manner including by a showing that a procedure existed by which a party must of necessity have taken an action or executed a symbol in order to have proceeded further in the use or processing of the information.

9.14 Transaction. Any communication made or transaction carried out and identified as the communication or transaction to which a Message refers including but not limited to the filing of a specific report.

9.15 Transmission Log. Must be retained by all parties using EDI for reporting purposes. The Transmission Log includes the date, time, destination address and telephone number, and a copy of the file transmitted; it also documents the persons who had access to the

Submitter's system during the creation of the files and during their transmission. The Submitter shall create an official Transmission Log of all transactions and maintain it without any modification. Each Submitter shall designate one or more qualified individuals with appropriate authority to certify the accuracy and completeness of the Transmission Log and this designation shall be retained as part of the records. Each Submitter shall also maintain records concerning the assignment and revocation of PINs, as discussed elsewhere in this notice.

9.16 Transaction set. (Cite for specific program).

9.17 User Manual. (Cite, if any).

9.18 Writing. Any document properly transmitted pursuant to this Agreement shall be considered to be a "writing" or "in writing". For the purpose of interpreting federal statutes, "writing" is defined to include 'printing and typewriting and reproductions of visual symbols by photographing, multi graphing, mimeographing, manifolding, or otherwise'. Although the terms of contracts formed using EDI are stored in a different manner than those of paper and ink contracts, they ultimately take the form of visual symbols . . . . it is sensible to interpret federal law in a manner to accommodate technological advancements . . . . It is evident that EDI technology had not been conceived nor, probably, was even anticipated at the times section 1501 and the statutory definition of "writing" were enacted. Nevertheless, we conclude that, given the legislative history of section 1501 and the expansive definition of writing, section 1501 and 1 U.S.C. Section 1 encompass EDI technology." U.S. Comptroller General decision, "Use of Electronic Data Interchange Technology to Create Valid Obligations," File: B-245714 (13 December 1991).

9.19 Other Definitions. (As required, additional Definitions may be included in Program-specific TCAs.)

10. EDI Transaction Parameters.

Each party may electronically transmit to or receive from the other party any of the transaction sets listed in the Appendix and transaction sets which by agreement are added to the Appendix (collectively referred to as "Documents" or "Reports"). All Documents/Reports shall be transmitted in accordance with the standards set forth herein and in the Appendix. Appendix(es) are hereby incorporated herein by reference. Any transmission of data which is not a Document/Report (i.e., which is not one of the specified transaction sets) shall have no force or effect between the parties.

10.1 Implementation Guidelines. All Documents/Reports transmitted between the parties shall strictly adhere to published Accredited Standards Committee (ASC) X12 standards for

Electronic Data Interchange (EDI) and shall comply with data conventions and implementation guidelines set forth in this Agreement and Federal Register notice ("Guidelines") and all modifications of the Guidelines.

10.2 Modifications of Standards. Whenever EPA intends to upgrade to a new version and release of the ASC X12 standard or modify the Guidelines, EPA shall give notice of its intent and shall establish a conversion date. The Submitter shall have a minimum of sixty (60) days from the conversion date to upgrade to the new standard. EPA can discontinue support of the previous standard no sooner than ninety (90) days after the conversion date. These dates may vary with specific program requirements. These dates may vary with specific program requirements.

11. System and Operation Expenses.

Each party, at its own expense, shall provide and maintain the equipment, software, services and testing necessary to effectively and reliably transmit and receive Documents.

12. Security.

The parties shall take reasonable actions to implement and maintain security procedures necessary to ensure the protection of transmissions against the risk of unauthorized access, alteration, loss or destruction including, but not limited to those set forth (in Appendix A, in guidelines set forth in F.R., etc.).

12.1 Creation of PIN. Where EPA requires certification to insure the authenticity of electronically submitted documents, EPA will generally require the Submitter to use a PIN assigned by EPA. If EPA agrees to enter into a trading partner relationship with a Submitter, EPA will assign PIN(s) upon receipt and receipt by EPA of the Submitter's signed TCA. EPA will mail the PIN(s) directly to each authorized representative(s) identified in the PIN request. The Agency will issue a new PIN at the written request, on company letterhead, of a responsible corporate officer of the submitter. In addition, EPA will change PINs where Submitters undergo personnel changes that affect the identity of their authorized representatives, or where there is evidence of compromise. Depending on the reporting cycle, EPA will then cancel such authorized representative's individual PIN before the next reporting cycle to which the PIN applies, or no later than fourteen (14) business days of receiving such notice, whichever comes first.

12.2 Protection of PIN. Each party must protect the security of its PIN(s) from compromise and shall take all necessary steps to prevent its loss, disclosure, modification, or unauthorized use. The Submitter shall notify EPA immediately if it has reason to believe the security of any PIN(s) has been compromised and must request a change. If EPA has reason to believe that PIN security has been compromised, the Agency will consult with

the Submitter and initiate PIN changes where necessary. Also, the Submitter is responsible for immediately notifying EPA (in writing and on company letterhead and signed by an authorized corporate officer) of termination of employment, or reassignment, of any authorized representative, and of any new or newly assigned employee(s) who will act as authorized representative(s).

12.3 Access Control. (If required, additional program-specific measures to control access to the transmitted files.)

12.4 Confidentiality. (If Applicable, program-specific clause.) The submitter may claim as confidential information submitted to EPA pursuant to this agreement. In order to assert a claim of confidentiality, the Submitter must mark the response CONFIDENTIAL BUSINESS INFORMATION or with a similar designation, and must clearly specify which information in the Document is so claimed. (The program may wish to insert here specific instructions for asserting confidentiality claims for electronic submissions.) Information so designated will be disclosed by EPA only to the extent allowed by, and by means of, the procedures set forth in, 40 CFR Part 2. If the Submitter fails to claim the information as confidential in accordance with the provisions of this paragraph, 10.4, the information may be available to the public without further notice.

12.5 Other Specific Security Requirements. (If required, other program-specific measures.)

13. Misdirected and Corrupted Transmissions.

If EPA has reason to believe that a Message is not intended for EPA or is corrupted, EPA shall notify the Submitter and shall delete from EPA's system the information contained in such Message (where allowed by applicable law) but not the record of its receipt. Where there is evidence that a Message has been corrupted or if any Message is identified or capable of being identified as incorrect, EPA shall notify the Submitter and it shall be re-transmitted by the Submitter as soon as practicable with a clear indication that it is a corrected Message. (Dependent on circumstances, corresponding requirement may be needed if EPA will be sending messages.)

14. Communications Connections.

Unless otherwise stipulated in program-specific notice, documents shall be transmitted electronically to each party through a third party service provider ("Provider"), designated in the program-specific Implementation Guidelines, who shall be considered the designated provider. The Submitter may transmit through EPA's designated Provider or through a third party service provider of their choice. In either case, the Submitter assumes all risks associated with their interaction with third party service providers. Upon written consent of EPA, at Submitter's own expense and at sender's own risk, documents

may be electronically transmitted to EPA directly. EPA will specify procedures for doing so. Upon thirty days advance notice EPA may change its third party service providers.

14.1 Third-Party Service Provider Fees. (Apportionment of the following fees: (could be incorporated by reference from guidelines, appendix etc.)) EPA does not foresee clause 12.1 being included in it's TCA during the Interim Policy Phase and is uncertain if such provisions will be included in future TCAs.

14.2 Third-Party Service Provider Liability Apportionment. Each party shall be responsible for ensuring the correctness of its transmission except as otherwise provided in this Agreement.

14.3 Records Transmitted Through Provider. The parties agree that either of them may have access to Providers' copies of the records, at the expense of the requesting party.

15. Record Retention and Storage.

15.1 Transmission Log. The Transmission Log shall be maintained by the Submitter without any modification for as long as required for the paper record (Specific program must insert applicable regulations). The Submitter shall designate one or more individuals with appropriate authority to certify the accuracy and completeness of the Transmission Log.

15.2 Record Retention. Nothing herein is intended to release the Submitter from or waive any requirement of law applicable to the Submitter pertaining to record or document retention, or to create new or additional requirements for retention of records or documents except as specifically noted herein or in the Appendix(es). Sender shall retain all records, regardless of the medium on which they are recorded, used in the derivation of the Documents/Reports or information therein transmitted pursuant to this Agreement for the period which would be required for functionally equivalent paper records.

16. Conflicting Terms and Conditions.

This Agreement and all appendices attached constitute the entire agreement between the parties. As the parties develop additional capabilities respecting EDI, additional addenda may be added to this Agreement. EPA will publish notice of new Addenda appending this Agreement and their effective date in the Federal Register. Upon the effective date, each Addendum shall be appended to this Agreement. If the Submitter does not agree to specified changes in the terms and conditions of this Agreement, as provided in the newly published Addenda, the Submitter must notify EPA in accordance with paragraph 15 below. In the absence of such notification, each addendum shall be appended to this Agreement and the date published in the Federal Register notice shall be the effective date.

17. Termination.

This Agreement shall remain in effect until terminated by either party with not less than 30 days prior written notice, which notice shall specify the effective date of termination; provided, however, that any termination shall not affect the respective obligations or rights of the parties arising under any Documents or otherwise under this Agreement prior to the effective date of termination. Termination of this Agreement shall not affect any action required to complete or implement Messages which are sent prior to such termination. Emergency temporary termination of computer connections may be made to protect data from illegal access or other incidental damage.

18. Survivability.

Notwithstanding termination for any reason, Clauses #2 (Validity and Enforceability), #10 (Security), #13 (Record Retention and Storage), #21 (Governing Law), #22 (Choice of Language), and #23 (Dispute Resolution) shall survive termination of this Agreement.

19. Assignability.

This Agreement is for the benefit of, and shall be binding upon, the Submitter and their respective successors and assigns.

20. Severability.

Any provision of this Agreement which is determined to be invalid or unenforceable will be ineffective to the extent of such determination without invalidating the remaining provisions of this Agreement or affecting the validity or enforceability of such remaining provisions.

21. Notice.

All notices or other forms of notification, request or instruction required to be given by a party to any other party under paragraphs 10, 14, and 15 of this Agreement shall be delivered by hand, or sent by first class post or other recognized carrier to the address of the addressee as set out in this Agreement or to such other address as the addressee may from time to time have notified for the purpose of this clause, or sent by electronic means of message transmission producing hard copy read-out including telex and facsimile, or published in the Federal Register notice, and shall be deemed to have been received:

- if sent by electronic means: at the time of transmission if transmitted during business hours of the receiving instrument and if not during business hours, one

hour after the commencement of the next working day following the day transmission;

- if sent by first-class post or recognized carrier: 3 business days after posting exclusive of the day of posting;

- if delivered by hand: on the day of delivery.

Notwithstanding the above, EPA may at its discretion provide notices under paragraphs 7.2, 13, and 17 of this Agreement via publication in the Federal Register. Notice shall be deemed to be received on the day of publication of the Federal Register notice.

Notice address for EPA follows: USEPA, _____.

22. Inability to File Reports via EDI.

No party shall be liable for any failure to perform its obligations in connection with any EDI Transaction or any EDI Document, where such failure results from any act or cause beyond such party's control which prevents such party from transmitting or receiving any Documents via EDI, except that the Submitter is nonetheless required to submit records or information required by law via other means, as provided by applicable law and within the time period provided by such law.

23. Governing Law.

This Agreement shall be governed by and interpreted in accordance with the Federal laws of the United States.

24. Choice of Language.

(Optional Program-specific application clause) The parties have requested that this Agreement and all Documents and other communications transmitted via the EDI Network or otherwise delivered with respect to this Agreement be expressed in the English language. (Should include translation.)

25. Dispute Resolution.

All disputes, differences, disagreements, and/or claims between the parties arising under or relating to this agreement that are not resolved by negotiation and that the parties cannot agree to submit for arbitration or other procedure for the resolution of disputes, shall be subject to the jurisdiction of U.S. Courts.

26. Entire Agreement.

This Agreement (and the Implementation Guide and Appendix) constitute the complete agreement of the parties relating to the matters specified in this Agreement and supersede all prior representations or agreements, whether oral or written, with respect to such matters. No oral modification or waiver of any of the provisions of this Agreement shall be binding on either party. As the Partners develop additional capabilities respecting EDI, additional Addenda may be added to this Agreement. EPA does not intend to change guidelines without just cause or without consulting industry, however, as a practical matter it is too cumbersome to obtain formal agreements from each Submitter when technical or procedural changes are required, particularly to the Implementation Guidelines. Therefore, EPA will publish notice of new Addenda appending this Agreement and their effective date in the Federal Register. Upon the effective date, each Addendum shall be appended to this Agreement.

This Agreement is for the benefit of, and shall be binding upon, the parties and their respective successors and assigns.

(To be signed by the Delegated Authority in specific EPA Office)

Dated: _____

_____

_____
Name of Delegated Authority
Title of Delegated Authority

III. MODEL OF EPA TERMS AND CONDITIONS AGREEMENT MEMORANDUM

Program-specific notices will contain the memorandum, similar to this model agreement memorandum, which the Submitter will sign and return to EPA. The program-specific TCA will stipulate what actions will constitute acceptance by EPA of a Submitter's signed and returned agreement memorandum and the effective date of the agreement.

APPENDIX C — CROSS REFERENCE MATRIX OF PHASE I CORE DATA MODEL vs. EIIP X12 841 CONVENTION DOCUMENT

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This table is a cross reference between the EIIP X12 841 Convention Document and the EIIP Phase I Core Data Model. The table displays each data entity and data attribute specified in the data model and where the corresponding data element is located in the convention document. The data model entities and attributes are for reference use only.

EIIP Entity	EIIP Attribute	X12 Data Element
Activity/Schedule	Start Date/Time	Activity (throughput) beginning date and time: DTM02 in LX loop (pos. 551) *and* DTM03 in LX loop *and* DTM05 in LX loop **if** HL03 = 'C' **and** DTM01 in LX loop = '196'
Activity/Schedule	Process Rate/Throughput	Activity (throughput) data: MEA03 in LX loop (pos. 545) **if** HL03 = 'C' **and** MEA01 in LX loop = 'TR'
Activity/Schedule	Confidentiality Indicator	Confidentiality indicator: SPI01 in detail level (pos. 481) **if** HL03 = 'C'
Activity/Schedule	Maximum Throughput	Maximum throughput: MEA06 in LX loop (pos. 545) **if** HL03 = 'C' **and** MEA02 in LX loop = 'TR'
Activity/Schedule	End Date/Time	Activity (throughput) end date and time: DTM02 in LX loop (pos. 551) *and* DTM03 in LX loop *and* DTM05 in LX loop **if** HL03 = 'C' **and** DTM01 in LX loop = '197'
Activity/Schedule	Throughput Method Code	Throughput method code: REF02 in LX loop (pos. 553) *and* REF03 in LX loop **if** HL03 = 'C' **and** REF01 in LX loop = 'IX'
Activity/Schedule	Reliability Indicator	DARS quality rating score: REF02 in LX loop (pos. 553) **if** HL03 = 'C' **and** REF01 in LX loop = 'D0'
Activity/Schedule	Unit of Measure	Activity (throughput) data: MEA04 [composite] in LX loop (pos. 545) **if** HL03 = 'C'
Aggregate Controls as Applied	Pollutant Code	CAS number/pollutant: SPI03 in detail level (pos. 639) **if** HL03 = '9' **and** CID04 in detail level = 'CE'
Aggregate Controls as Applied	Total Capture/Control Efficiency	Total capture/control efficiency: MEA03 in CID loop (pos. 741) **if** HL03 = '9' **and** CID04 in detail level = 'CE' **and** MEA01 in CID loop = 'AH'

EIIP Entity	EIIP Attribute	X12 Data Element
Aggregate Controls as Applied	Rule Effectiveness	Rule effectiveness: MEA03 in CID loop (pos. 741) **if** HL03 = '9' **and** CID04 in detail level = 'CE' **and** MEA01 in CID loop = 'AG'
Aggregate Controls as Applied	Rule Penetration	Rule penetration: MEA03 in CID loop (pos. 741) **if** HL03 = '9' **and** CID04 in detail level = 'CE' **and** MEA01 in CID loop = 'PM'
Aggregate Controls as Applied	Rule Effectiveness Method Code	Regulation identifier for rule effectiveness: REF02 in MEA loop (pos. 745) **if** HL03 = '9' **and** CID04 in detail level = 'CE' **and** MEA01 in CID loop = 'AG' **and** REF01 in MEA loop = 'ZZ'
Control Equipment	Pollutant Code	CAS Number/Pollutant code: LIN03 in LX loop (pos. 225) **if** HL03 = '5'
Control Equipment	Percent Capture Efficiency	Percent capture efficiency: MEA03 in LX loop (pos. 229) **if** HL03 = '5' **and** MEA02 in LX loop = 'IGR'
Control Equipment	Percent Control Efficiency	Percent control efficiency: MEA03 in LX loop (pos. 229) **if** HL03 = '5' **and** MEA02 in LX loop = 'COT'
Control Equipment	Device Type	Physical unit code: PID04 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP'
Control Equipment	Method Code	Currently no mapping - to be include in future version of convention document
Control Equipment	Description	Description: PID05 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP' **and** PID04 in detail level = '02'
Control Equipment	Capacity	Volume: MEA03 in LX loop (pos. 229) **if** HL03 = '5' **and** PID04 in detail level = '02' **and** MEA02 in LX loop = 'VOL'
Control Equipment	Capacity Units	Control unit data: MEA04 (C00101) in LX loop (pos. 229) **if** HL03 = '5' **and** PID04 in detail level = '02' **and** MEA02 in LX loop = 'VOL'

EIIP Entity	EIIP Attribute	X12 Data Element
Control Equipment	Status	Operational status: REF02 in LX loop (pos. 237) **if** HL03 = '5' **and** PID04 in detail level = '02' **and** REF01 in LX loop = 'ZZ'
Control Strategy	Rule/Regulation Name	Control strategy description: MSG01 in SPI loop (pos. 655) **if** HL03 = '9'
Control Strategy	Permit Requirements	Control strategy description: MSG01 in SPI loop (pos. 655) **if** HL03 = '9'
Control Strategy	Geographic ID Code	Place of occurrence - identification code: N104 in header level (pos. 045) **if** HL03 = '5' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' *Note: Control Strategy holds a child relationship to the Physical-level which contains these data.*
Defined Areas	Geographic ID Code	Place of occurrence - identification code: N104 in header level (pos. 045)
Defined Areas	Nonattainment Area Code	Nonattainment area data: N406 in header level (pos. 054) **if** N405 in header level = 'RG'
Defined Areas	Area Name	Place of occurrence: N102 in header level N1 loop (Pos. 045)
Dynamic Grid	Geographic ID Code	Place of occurrence - identification code: N104 in header level (pos. 045) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93'
Dynamic Grid	Grid ID	Dynamic grid: REF03 in LX loop (pos. 079) **if** HL03 = '4' **and** REF01 in LX loop = '6E' **and** REF02 in LX loop = '05'
Dynamic Grid	Number of X Cells	Dynamic grid data: MEA03 in LX loop (pos. 071) **if** HL03 = '4' **and** MEA01 in LX loop = 'PO' **and** MEA02 in LX loop = 'WD'
Dynamic Grid	X Cell Size	Dynamic grid data: MEA03 in LX loop (pos. 071) **if** HL03 = '4' **and** MEA01 in LX loop = 'PO' **and** MEA02 in LX loop = 'WD'

EIIP Entity	EIIP Attribute	X12 Data Element
Dynamic Grid	Number of Y Cells	Dynamic grid data: MEA03 in LX loop (pos. 071) **if** HL03 = '4' **and** MEA01 in LX loop = 'PO' **and** MEA02 in LX loop = 'HT'
Dynamic Grid	Y Cell Size	Dynamic grid data: MEA03 in LX loop (pos. 071) **if** HL03 = '4' **and** MEA01 in LX loop = 'PO' **and** MEA02 in LX loop = 'HT'
Dynamic Grid	Projection System Name	Projection system name: REF03 in LX loop (pos. 079) **if** HL03 = '4' **and** REF01 in LX loop = '6E' **and** REF02 in LX loop = '06'
Emission Factors	Start Date/Time	Activity (throughput) beginning date and time: DTM02 in LX loop (pos. 551) *and* DTM03 in LX loop *and* DTM05 in LX loop **if** HL03 = 'C' **and** DTM01 in LX loop = '196' *Note: Emission Factors holds a child relationship to Activity-level which contains these data.*
Emission Factors	End Date/Time	Activity (throughput) end date and time: DTM02 in LX loop (pos. 551) *and* DTM03 in LX loop *and* DTM05 in LX loop **if** HL03 = 'C' **and** DTM01 in LX loop = '197' *Note: Emission Factors holds a child relationship to Activity-level which contains these data.*
Emission Factors	Pollutant Code	Pollutant: SPI03 in detail level (pos. 639) **if** HL03 = '9' **and** CID04 in detail level = 'EF'
Emission Factors	Factor Type Code	No mapping - to be removed from model
Emission Factors	Numeric Value	Emission factor data: STA02 in CID loop (pos. 751) **if** HL03 = '9' **and** CID04 in detail level = 'EF'
Emission Factors	Unit of Measure	Emission factor data: STA03 (C00101) in CID loop (pos. 751) **if** HL03 = '9' **and** CID04 in detail level = 'EF'
Emission Factors	Material	Activity (throughput) product: REF02 in LX loop (pos. 553) **if** HL03 = 'C' **and** REF01 in the LX loop = 'PG' *Note: Emission Factors holds a child relationship to Activity-level which contains these data.*

EIIP Entity	EIIP Attribute	X12 Data Element
Emission Factors	Calculation Method	Emission factor method code: REF02 in STA loop (pos. 755) **if** HL03 = '9' **and** CID04 in detail level = 'EF' **and** REF01 in STA loop = 'C3'
Emission Factors	Control Status	Emission factor control type: TMD03 in CID loop (pos. 729) **if** HL03 = '9' **and** CID04 in detail level = 'EF'
Emission Factors	Reliability Indicator	DARS quality rating score: REF02 in STA loop (pos. 755) **if** HL03 = '9' **and** CID04 in detail level = 'EF' REF01 in STA loop = 'D0'
Emission Process	Start Date/Time	Operating schedule beginning date: DTM02 in STA loop (pos. 437) **if** HL03 = '6' **and** DTM01 in LX loop = '196'
Emission Process	Description	Process identifier comments/description: SPI05 in detail level (pos. 323) **if** HL03 = '6'
Emission Process	SCC	Source Classification Code (SCC): PID04 in detail level (pos. 345) **if** HL03 = '6' **and** PID02 in detail level = 'SC'
Emission Process	Process SIC	Standard Industry Classification Code (SIC) code: REF02 in detail level (pos. 371) **if** HL03 = '6' **and** REF01 in detail level = 'IJ'
Emission Process	Material	Process product: REF02 in STA loop (pos. 439) **if** HL03 = '6' **and** REF01 in STA loop = 'PG'
Emission Process	Material Description	Material description: MSG01 in SPI loop (pos. 339) **if** HL03 = '6'
Emission Process	Federal ID Code	Federal identification code for a process: SPI03 in detail level (pos. 323) **if** HL03 = '6' **and** SPI02 in detail level = 'PE'
Emission Process	End Date/Time	Operating schedule date: DTM02 in STA loop (pos. 437) **if** HL03 = '6' **and** DTM01 in LX loop = '197'
Emission Process	AMS Code	AIRS Area and Mobile Sources (AMS) code: PID04 in detail level (pos. 345) **if** HL03 = '6' **and** PID02 in detail level = '12'

EIIP Entity	EIIP Attribute	X12 Data Element
Emission Process	Winter Throughput Percentage	Seasonal operational adjustment factor data: STA02 in CID loop (pos. 435) *and* DTM01 in STA loop (pos. 437) indicate winter **if** HL03 = '6' **and** CID04 in detail level = 'A' **and** STA01 in CID loop = 'ZZ'
Emission Process	Spring Throughput Percentage	Seasonal operational adjustment factor data: STA02 in CID loop (pos. 435) *and* DTM01 in STA loop (pos. 437) indicate spring **if** HL03 = '6' **and** CID04 in detail level = 'A' **and** STA01 in CID loop = 'ZZ'
Emission Process	Summer Throughput Percentage	Seasonal operational adjustment factor data: STA02 in CID loop (pos. 435) *and* DTM01 in STA loop (pos. 437) indicate summer **if** HL03 = '6' **and** CID04 in detail level = 'A' **and** STA01 in CID loop = 'ZZ'
Emission Process	Fall Throughput Percentage	Seasonal operational adjustment factor data: STA02 in CID loop (pos. 435) *and* DTM01 in STA loop (pos. 437) indicate fall **if** HL03 = '6' **and** CID04 in detail level = 'A' **and** STA01 in CID loop = 'ZZ'
Emission Process	Hours Per Day	Operating schedule data: STA03 (C00101) in CID loop (pos. 435) = 'HR' *and* STA03 (C001004) in CID loop = 'DA' *and* STA07 (C00105) in CID loop indicates '-1' **if** HL03 = '6' **and** CID04 in detail level = 'S' **and** STA01 in CID loop = '30'
Emission Process	Days Per Week	Operating schedule data: STA03 (C00101) in CID loop (pos. 435) = 'DA' *and* STA03 (C001004) in CID loop = 'WK' *and* STA07 (C00105) in CID loop indicates '-1' **if** HL03 = '6' **and** CID04 in detail level = 'S' **and** STA01 in CID loop = '30'
Emission Process	Weeks Per Year	Operating schedule data: STA03 (C00101) in CID loop (pos. 435) = 'WK' *and* STA03 (C001004) in CID loop = 'YR' **if** STA07 (C00105) in CID loop indicates '-1' **if** HL03 = '6' **and** CID04 in detail level = 'S' **and** STA01 in CID loop = '30'
Emission Process	Hours Per Year	Operating schedule data: STA03 (C00101) in CID loop (pos. 435) = 'HR' *and* STA03 (C001004) in CID loop = 'YR' **if** STA07 (C00105) in CID loop indicates '-1' **if** HL03 = '6' **and** CID04 in detail level = 'S' **and** STA01 in CID loop = '30'

EIIP Entity	EIIP Attribute	X12 Data Element
Emission Process	Maximum Actual Throughput	Maximum actual throughput: STA02 in CID loop (pos. 435) **if** HL03 = '6' **and** CID04 in detail level = 'T' **and** STA01 in CID loop = '34'
Emission Process	Heat Content	Heat content: STA02 in CID loop (pos. 435) **if** HL03 = '6' **and** CID04 in detail level = 'HC' **and** STA01 in CID loop = '34'
Emission Process	Sulfur Content	Sulfur content: STA02 in CID loop (pos. 435) **if** HL03 = '6' **and** CID04 in detail level = 'SC' **and** STA01 in CID loop = '34'
Emission Process	Ash Content	Ash content: STA02 in CID loop (pos. 435) **if** HL03 = '6' **and** CID04 in detail level = 'AC' **and** STA01 in CID loop = '34'
Emission Release Point	Emission Release Point Type	Physical unit code: PID04 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP'
Emission Release Point	Federal ID Code	Federal identifier code: SPI03 in detail level (pos. 165) **if** HL03 = '5' **and** SPI02 in detail level = 'PE'
Emission Release Point	Status	Operational status: REF02 in LX loop (pos. 237) **if** HL03 = '5' **and** REF01 in LX loop = 'ZZ'
Emission Unit/Physical Unit	Federal ID Code	Federal identifier code: SPI03 in detail level (pos. 165) **if** HL03 = '5' **and** SPI02 in detail level = 'PE'
Emission Unit/Physical Unit	Description	Description: PID05 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP' **and** PID04 in detail level = '03'
Emission Unit/Physical Unit	Emission Unit Type Code	Physical unit code: PID04 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP'
Emission Unit/Physical Unit	Number of Units	Number of units: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'CT'

EIIP Entity	EIIP Attribute	X12 Data Element
Emission Unit/Physical Unit	Confidentiality Indicator	Confidentiality indicator SPI01 in detail level (pos. 165) **if** HL03 = '5'
Emission Unit/Physical Unit	Date Installed/Modified	Time period associated with operational status: DTM02 in LX loop (pos. 235) *and* DTM05 in LX loop **if** HL03 = '5' **and** DTM01 in LX loop = '169' **and** REF01 in LX loop = 'ZZ' **and** REF02 in LX loop has a value
Emission Unit/Physical Unit	Rule Applicability	Currently no mapping - to be include in future version of convention document
Emission Unit/Physical Unit	Design Capacity	Design capacity: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = 'VOL'
Emission Unit/Physical Unit	Capacity Units	Design capacity data: MEA04 (C00101) in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' MEA02 in PID loop = 'VOL'
Emission Unit/Physical Unit	State/Local Emission Unit ID Code	State identification code/description: SPI03 in detail level (pos. 165) **if** HL03 = '5' **and** SPI02 in detail level = 'G5' and Local identification code/description: SPI03 in detail level (pos. 165) **if** HL03 = '5' **and** SPI02 in detail level = 'WF'
Emission Unit/Physical Unit	Status	Operational status: REF02 in LX loop (pos. 237) **if** HL03 = '5' **and** PID04 in detail level = '03' **and** REF01 in LX loop = 'ZZ'
Emissions	Start Date/Time	Activity (throughput) beginning date and time: DTM02 in LX loop (pos. 551) *and* DTM03 in LX loop *and* DTM05 in LX loop **if** HL03 = 'C' **and** DTM01 in LX loop = '196' *Note: Emissions holds a child relationship to the Activity-level which contains these data.*
Emissions	Pollutant Code	CAS number/pollutant: SPI03 in detail level (pos. 639) **if** HL03 = '9' **and** CID04 in detail level = 'ES'

EIIP Entity	EIIP Attribute	X12 Data Element
Emissions	Emission Type	Type of estimated emission measurement: STA01 in CID loop (pos. 751) *and/or* STA07 in CID loop *and/or* STA08 in CID loop **if** HL03 = '9' **and** CID04 in detail level = 'ES'
Emissions	Numeric Value	Pollutant-specific estimated emissions data: STA02 in CID loop (pos. 751) **if** HL03 = '9' **and** CID04 in detail level = 'ES'
Emissions	Unit of Measure	Pollutant-specific estimated emissions data: STA03 [composite] in CID loop (pos. 751) **if** HL03 = '9' **and** CID04 in detail level = 'ES'
Emissions	Method Code	Estimated emissions method code: REF02 in STA loop (pos. 755) **if** HL03 = '9' **and** CID04 in detail level = 'ES' **and** REF01 in STA loop = 'C3'
Emissions	Reliability Indicator	DARS quality rating score: REF02 in STA loop (pos. 755) **if** HL03 = '9' **and** CID04 in detail level = 'ES' **and** REF01 in STA loop = 'D0'
Emissions	End Date	Activity (throughput) end date and time: DTM02 in LX loop (pos. 551) *and* DTM03 in LX loop *and* DTM05 in LX loop **if** HL03 = 'C' **and** DTM01 in LX loop = '197' *Note: Emissions holds a child relationship to the Activity-level which contains these data.*
Geographic Coordinates	Sequence Number	Dynamic grid cell: MEA03 in LX loop (pos. 071) *and* MEA04 [composite] in LX loop = 'EA' **if** HL03 = '4' **and** MEA01 in LX loop = 'PO'
Geographic Coordinates	Geographic ID Code	Place of occurrence - identification code: N104 in header level (pos. 045)
Geographic Coordinates	XY Coordinate Type	Dynamic grid coordinate: REF04 [composite] in LX loop (pos. 079) **if** REF01 in LX loop = '6E' **and** REF02 in LX loop = '05' *Note: Coordinate type specified by qualifier employed.*
Geographic Coordinates	UTM Zone	Universal transverse mercator - zone: REF04 (C04006) in LX loop (pos. 079) **if** REF01 in LX loop = '6E' **and** REF02 in LX loop = '05' **and** REF04 (C04005) in LX loop = 'XW'

EIIP Entity	EIIP Attribute	X12 Data Element
Geographic Coordinates	X Coordinate	Latitude: REF04 (C04004) in LX loop (pos. 079) **if** REF01 in LX loop = '6E' **and** REF02 in LX loop = '05' **and** REF04 (C04003) in LX loop = 'LQ'
Geographic Coordinates	Y Coordinate	Longitude: REF04 (C04002) in LX loop (pos. 079) **if** REF01 in LX loop = '6E' **and** REF02 in LX loop = '05' **and** REF04 (C04001) in LX loop = 'LK'
Geographic Coordinates	Elevation	Currently no mapping - to be include in future version of convention document
Geographic Location	Geographic ID Code	Place of occurrence - identification code: N104 in header level (pos. 045)
Geographic Location	Country	Country code: N404 in header level (pos. 054)
Geographic Location	EPA Region	EPA Region: N406 in header level (pos. 054) **if** N405 in header level = 'RJ'
Geographic Location	State/Province/Territory (FIPS)	State or province: N402 in header level (pos. 054)
Geographic Location	County/Parish/Reservation (FIPS)	County/parish code: REF02 in header level N1 loop (pos. 057) **if** REF01 in header level N1 loop = 'ZX'
Geographic Location	Air Basin	Air basin data: REF02 in header level N1 loop (pos. 057) **if** REF01 in header level N1 loop = 'ZZ'
Geographic Location	Municipality	Municipality: N102 in header level (pos. 045) **if** N101 in header level = 'C6'
Geographic Location	Grid ID	Projection system name: REF03 in LX loop (pos. 079) **if** REF01 in LX loop = '6E' **and** REF02 in LX loop = '06'
Geographic Location	i Cell	Currently no mapping - to be include in future version of convention document
Geographic Location	j Cell	Currently no mapping - to be include in future version of convention document
Geographic Location	Air Quality Control Region	Currently no mapping - to be include in future version of convention document
Geographic Location	City	City name: N401 in header level (pos. 054) N405 = 'FI'
Geographic Location	Highway Link/TAZ ID	Highway link/TAZ ID: REF02 in header level N1 loop (pos. 057) **if** REF01 in header level N1 loop = 'WH'

EIIP Entity	EIIP Attribute	X12 Data Element
Meteorology	Geographic ID Code	Place of occurrence - identification code: N104 in header level (pos. 045) **if** HL03 = '5' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' *Note: Meteorology holds a child relationship to the Physical-level which contains these data.*
Meteorology	Start Date/Time	Meteorological parameter beginning date and time: DTM02 in MEA loop (pos. 585) *and* DTM03 in MEA loop *and* DTM05 in MEA loop **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** DTM01 in MEA loop = '196'
Meteorology	End Date/Time	Meteorological parameter end date and time: DTM02 in MEA loop (pos. 585) *and* DTM03 in MEA loop *and* DTM05 in MEA loop **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** DTM01 in MEA loop = '197'
Meteorology	Wind Speed	Wind speed: MEA03 in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'R7'
Meteorology	Wind Speed Units	Wind speed data: MEA04 (C00101) in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'R7'
Meteorology	Ambient Temperature	Temperature: MEA03 in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'TC'
Meteorology	Temperature Units	Temperature data: MEA04 (C00101) in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'TC'
Meteorology	Cloud Cover (fraction)	Cloud cover: MEA03 in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'ZZZ'

EIIP Entity	EIIP Attribute	X12 Data Element
Meteorology	Humidity	Relative humidity: MEA03 in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'RA'
Meteorology	Humidity Units	Relative humidity data: MEA04 (C00101) in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'RA'
Meteorology	Diurnal Temperature Change	Diurnal temperature change: MEA03 in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'AD'
Meteorology	Visible Radiation	Visible radiation: MEA03 in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'BR'
Meteorology	Visible Radiation Units	Visible radiation data: MEA04 (C00101) in CID loop (pos. 583) **if** HL03 = 'C' **and** CID04 in detail level = 'M' **and** MEA01 in CID loop = 'EN' **and** MEA02 in CID loop = 'BR'
Path	Origin Type	Physical unit code: PID04 in detail level (pos. 187) **if** HL03 = '5' **and** MEA02 in LX loop = 'DIS' **and** REF01 in LX loop = '5M' **and** REF02 in LX loop has a value **and** PID02 in detail level = 'PP'
Path	Destination Type	Physical unit code: PID04 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP' *Note: Path is defined by identifying the physical unit in an emission path which immediately precedes the unit being reported in the current iteration of the loop. Therefore, the destination of the path is equivalent to the physical unit being reported in the current iteration of the loop.*
Path	Percent Flow from Origin	Path split data: MEA03 in LX loop (pos. 229) **if** HL03 = '5' **and** MEA02 in LX loop = 'DIS' **and**

EIIP Entity	EIIP Attribute	X12 Data Element
Process Growth Factors	Initial Year	Process growth factors start year: DTM07 in LX loop (pos. 393) **if** HL03 = '6' **and** DTM01 in LX loop = '196' **and** DTM06 in LX loop = 'CY'
Process Growth Factors	Projected Year	Process growth factors projected action end date: DTM07 in LX loop (pos. 393) **if** HL03 = '6' **and** DTM01 in LX loop = '575' **and** DTM06 in LX loop = 'CY'
Process Growth Factors	Growth Factor	Process growth factor data: MEA03 in LX loop (pos. 387) **if** HL03 = '6' **and** MEA01 in LX loop = 'AG' **and**
Process Growth Factors	Growth Factor Reference	Process growth factor reference text: REF03 in LX loop (pos. 395) **if** HL03 = '6' **and** REF01 in LX loop = 'ZZ'
Process Growth Factors	Control Factor	Currently no mapping - to be include in future version of convention document
Process Growth Factors	Growth Factor Units	Process growth factor data: MEA04 (C00101) in LX loop (pos. 387) **if** HL03 = '6' **and** MEA01 in LX loop = 'AG'
Site/Source	Geographic ID Code	Place of occurrence - identification code: N104 in header level (pos. 045) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93'
Site/Source	Site Name	Name: N102 in SPI loop (pos. 019) **if** HL03 = '4' **and** N101 in SPI loop = '7C'
Site/Source	Physical Address	Address information: N301 in header level (pos. 051) *and* N302 in header level **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = '7C'

EIIP Entity	EIIP Attribute	X12 Data Element
Site/Source	Mailing Address	Address information: N301 in header level (pos. 051) *and* N302 in header level **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'FE'
Site/Source	Parent Company	Parent company: N102 in header level (pos. 045) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'B4'
Site/Source	Parent Company Mailing Address	Address information: N301 in header level (pos. 051) *and* N302 in header level **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'B4'
Site/Source	Inventory Contact Name	Preparer: PER02 in header level (pos. 060) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'P1' **and** PER01 in header level = 'PI'
Site/Source	Inventory Contact Phone Number	Communication number: PER04 in header level (pos. 060) *or* PER06 in header level **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'P1' **and** PER01 in header level = 'PI' **and** PER03 in header level = 'TE' *or* PER05 in header level = 'TE'

EIIP Entity	EIIP Attribute	X12 Data Element
Site/Source	Inventory Contact Fax Number	Communication number: PER04 in header level (pos. 060) *or* PER06 in header level **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'P1' **and** PER01 in header level = 'PI' **and** PER03 in header level = 'FX' *or* PER05 in header level = 'FX'
Site/Source	Inventory Contact E-mail Address	Communication number: PER04 in header level (pos. 060) *or* PER06 in header level **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'P1' **and** PER01 in header level = 'PI' **and** PER03 in header level = 'EM' *or* PER05 in header level = 'EM'
Site/Source	Owner	Owner: N102 in header level (pos. 045) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'HA'
Site/Source	SIC	Standard Industry Classification (SIC) code: REF02 in detail level (pos. 055) **if** HL03 = '4' **and** REF01 in detail level = 'IJ'
Site/Source	Number of Employees	Numbers of employees: MEA03 in LX loop (pos. 071) **if** HL03 = '4' **and** MEA01 in LX loop = 'CT'
Site/Source	Description	Comments for a site/source: SPI05 in detail level (pos. 007) **if** HL03 = '4' **and** SPI02 in detail level = 'IX'
Site/Source	Federal ID Code	Federal key identifier code: SPI03 in detail level (pos. 007) **if** HL03 = '4' **and** SPI02 in detail level = 'IJ'
Site/Source	Federal ID Code #2	Federal identification code: SPI03 in detail level (pos. 007) **if** HL03 = '4' **and** SPI02 in detail level = 'PE'

EIIP Entity	EIIP Attribute	X12 Data Element
Site/Source	ORIS Utility Plant Code	ORIS utility plant code: SPI03 in detail level (pos. 007) **if** HL03 = '4' **and** SPI02 in detail level = 'ZZ'
Site/Source	Source Type	Source type code: REF02 in detail level (pos. 055) **if** REF01 in detail level = '06'
Site/Source	Jurisdiction	Jurisdiction: N102 in header level (pos. 045) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = 'JU'
Site/Source	State/Local ID Code	State identification code/description: SPI03 in detail level (pos. 007) **if** HL03 = '4' **and** SPI02 in detail level = 'G5' and Local identification code/description: SPI03 in detail level (pos. 007) **if** HL03 = '4' **and** SPI02 in detail level = 'WF'
Site/Source	Physical Zip Code	Postal code: N403 in header level (pos. 054) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = '7C'
Site/Source	Census Block ID	Census block: REF02 in header level N1 loop (pos. 057) **if** HL03 = '4' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93' **and** N101 in header level = '7C' REF01 in header level N1 loop = 'ZV'
Speciation Profiles	Pollutant #1 Code	Chemical mechanism: CID04 in detail level (pos. 093) **if** HL03 = '4'
Speciation Profiles	Pollutant #2 Name	Chemical surrogate: REF03 in detail level (pos. 113) **if** HL03 = '4' **and** REF01 in detail level = 'I9'
Speciation Profiles	Pollutant #2 Code	Chemical surrogate: REF01 in detail level (pos. 113) **if** HL03 = '4'

EIIP Entity	EIIP Attribute	X12 Data Element
Speciation Profiles	Numeric Value	Chemical surrogate data: MEA03 in detail level (pos. 109) **if** HL03 = '4' **and** REF01 in detail level = 'I9'
Speciation Profiles	Unit of Measure	Chemical surrogate data: MEA04 (C00101) in detail level (pos. 109) **if** HL03 = '4' **and** REF01 in detail level = 'I9'
Stack Physical Parameter	Emission Release Point Type	Physical unit code: PID04 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP'
Stack Physical Parameter	Description	Description: PID05 in detail level (pos. 187) **if** HL03 = '5' **and** PID02 in detail level = 'PP' **and** PID04 in detail level = '01'
Stack Physical Parameter	Stack Height	Height above ground: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = '5F'
Stack Physical Parameter	Stack Diameter	Inside diameter: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = 'ID'
Stack Physical Parameters	Geographic ID Code	Place of occurrence - identification code: N104 in header level (pos. 045) **if** HL03 = '5' **and** N101 in SPI loop = '7C' **and** N103 in SPI loop = '93' **and** N104 in SPI loop = N104 in header level **and** N103 in header level = '93'
Stack Physical Parameter	Exit Gas Temperature	Exit gas temperature: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'TE'
Stack Physical Parameter	Exit Gas Velocity	Exit gas velocity: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = 'ZZZ'
Stack Physical Parameter	Exit Gas Flow Rate	Flow rate: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'PD' **and** MEA02 in PID loop = 'FR'

EIIP Entity	EIIP Attribute	X12 Data Element
Stack Physical Parameter	Plume Height	Plume height data: MEA03 in PID loop (pos. 193) **if** HL03 = '5' **and** MEA01 in PID loop = 'BA'
Stack Physical Parameter	Height Above Terrain	Currently no mapping - to be include in future version of convention document

The following table details those EIIP Attributes indicated in the EIIP Core Data Model as being unique identifiers (UID). These elements are intended for use in developing relationships between various EIIP Entities. They are not intended for specific use in the design or development of a database system. However, the structure represented by them must be accounted for in the system in order to maintain the integrity of the entity relationships. The X12 data elements that are correspond are provided for reference to the data model attributes only.

Table of Unique Identifiers Specified in the EIIP Data Model

EIIP Attribute	X12 Data Element
Process UID	Hierarchical ID number: HL02 in detail level (pos. 319) **if** HL03 = '6' *Note: Activity/Schedule holds a child relationship to the Process-level which contains these data.*
Site UID	Hierarchical ID number: HL02 in detail level (pos. 003) **if** HL03 = '4' *Note: Activity/Schedule holds a child relationship to the Site/Source-level which contains these data.*
Unit UID	Hierarchical ID number: HL02 in detail level (pos. 161) **if** HL03 = '5' *Note: Activity/Schedule holds a child relationship to the Physical-level which contains these data.*
Control Strategy UID	Hierarchical ID number: HL02 in detail level of the level indicated **if** HL03 = '9' **and** PID04 in detail level (pos. 661) has a value **and** HL03 of the level indicated has a value *Note: The value in HL02 equals the HL iteration tp which the strategy is applied.*
Control Equipment UID	Hierarchical ID number: HL02 in detail level (pos. 161) **if** HL03 = '5'
Emission Release Point UID	Hierarchical ID number: HL02 in detail level (pos. 161) **if** HL03 = '5'

EIIP Attribute	X12 Data Element
Origin UID	Hierarchical ID number: HL02 in detail level (pos. 161) **if** HL03 = '5' *Note: The value in HL02 equals the HL iteration which contains the intended origin. Path is defined by identifying the physical unit in an emission path which immediately precedes the unit being reported in the current iteration of the loop. Therefore, the destination of the path is equivalent to the physical unit being reported in the current iteration of the loop.*
Destination UID	Hierarchical ID number: HL02 in detail level (pos. 161) **if** HL03 = '5' *Note: The value in HL02 equals the HL iteration which is being reported (i.e., the destination). Path is defined by identifying the physical unit in an emission path which immediately precedes the unit being reported in the current iteration of the loop. Therefore, the destination of the path is equivalent to the physical unit being reported in the current iteration of the loop.*

APPENDIX D — EIIP X12 841 CONVENTION DOCUMENT

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841 Specifications/Technical Information

Functional Group ID=SP

Introduction:

This Draft Standard for Trial Use contains the format and establishes the data contents of the Specifications/Technical Information Transaction Set (841) for use within the context of an Electronic Data Interchange (EDI) environment. The transaction set can be used to transmit or request specifications or technical information between trading partners. It can be used to transmit engineering change and engineering change requests. It can also be used to allow EDI trading partners the ability to exchange a complete or partial technical description of a product, process, service, etc. over the same path as any other EDI transaction. The detail area can include graphic, text, parametric, tabular, image, spectral, or audio data. A transmission includes identification information to assist the receiver in interpreting and utilizing the information included in the transaction. Further action as a consequence of the receipt and initial processing of the specification or other technical data may or may not require human intervention. The transmission and receipt of the data may require private agreement between the trading partners to automate the receipt of the data. The total transaction must be in the general form of all ASC X12 transactions so that an EDI computer system will be able to automatically recognize it as a Specification/Technical Information Transaction Set and pass it on for processing of the data itself. The transaction set is not media dependent. The detail area of the Specification/Technical Information Transaction Set provides a structure which allows for the exchange of a variety of specification information. For example, if the transaction contains information describing a complete assembly, it would be necessary to include the assembly model, the models for each of the individual parts, and the associated specifications. In the case of a process it may be necessary to transmit the specification of the product along with the specifications of the process and raw materials. This transaction set can also be linked to other transaction sets. This transaction set is not limited to a specific transmission protocol and uses other standards as applicable where they do not conflict with these requirements for specification transaction.

Heading:

Pos. No.	Seg. ID	Name	Req. Des.	Max.Use	Loop Repeat	Notes and Comments
003	ST	Transaction Set Header	M	1		
		LOOP ID - SPI			>1	
009	SPI	Specification Identifier	M	1		
012	RDT	Revision Date/Time	O	>1		
015	NTE	Note/Special Instruction	O	>1		
		LOOP ID - REF			>1	
030	REF	Reference Identification	O	1		
		LOOP ID - N1			>1	
045	N1	Name	O	1		
048	N2	Additional Name Information	O	2		
051	N3	Address Information	O	2		
054	N4	Geographic Location	O	1		
057	REF	Reference Identification	O	>1		
060	PER	Administrative Communications Contact	O	>1		

Detail:

Pos. No.	Seg. ID	Name	Req. Des.	Max.Use	Loop Repeat	Notes and Comments
		LOOP ID - HL			>1	
003	HL	Hierarchical Level	M	1		n1
		LOOP ID - SPI			>1	
007	SPI	Specification Identifier	O	1		c1
019	N1	Name	O	>1		
023	MSG	Message Text	O	>1		
		LOOP ID - REF			>1	
055	REF	Reference Identification	O	1		
		LOOP ID - LX			>1	
065	LX	Assigned Number	O	1		
071	MEA	Measurements	M	>1		
079	REF	Reference Identification	O	>1		
		LOOP ID - CID			>1	
093	CID	Characteristic/Class ID	O	1		c2
097	TMD	Test Method	O	>1		
		LOOP ID - MEA			>1	
109	MEA	Measurements	O	1		
113	REF	Reference Identification	O	>1		
		LOOP ID - HL			>1	
161	HL	Hierarchical Level	M	1		
		LOOP ID - SPI			>1	
165	SPI	Specification Identifier	O	1		
177	N1	Name	O	>1		
181	MSG	Message Text	O	>1		
		LOOP ID - PID			>1	
187	PID	Product/Item Description	O	1		
193	MEA	Measurements	O	>1		
		LOOP ID - LX			>1	
223	LX	Assigned Number	O	1		
225	LIN	Item Identification	O	1		
229	MEA	Measurements	M	>1		
235	DTM	Date/Time Reference	O	>1		
237	REF	Reference Identification	O	>1		
		LOOP ID - HL			>1	
319	HL	Hierarchical Level	M	1		
		LOOP ID - SPI			>1	
323	SPI	Specification Identifier	O	1		
339	MSG	Message Text	O	>1		
		LOOP ID - PID			>1	

345	PID	Product/Item Description	O	1
		LOOP ID - REF		>1
371	REF	Reference Identification	O	1
		LOOP ID - LX		>1
381	LX	Assigned Number	O	1
387	MEA	Measurements	M	>1
393	DTM	Date/Time Reference	O	>1
395	REF	Reference Identification	O	>1
		LOOP ID - CID		>1
409	CID	Characteristic/Class ID	O	1
		LOOP ID - STA		>1
435	STA	Statistics	O	1
437	DTM	Date/Time Reference	O	>1
439	REF	Reference Identification	O	>1
		LOOP ID - HL		>1
477	HL	Hierarchical Level	M	1
		LOOP ID - SPI		>1
481	SPI	Specification Identifier	O	1
		LOOP ID - LX		>1
539	LX	Assigned Number	O	1
545	MEA	Measurements	M	>1
551	DTM	Date/Time Reference	O	>1
553	REF	Reference Identification	O	>1
		LOOP ID - CID		>1
567	CID	Characteristic/Class ID	O	1
		LOOP ID - MEA		>1
583	MEA	Measurements	O	1
585	DTM	Date/Time Reference	O	>1
		LOOP ID - STA		>1
593	STA	Statistics	O	1
595	DTM	Date/Time Reference	O	>1
597	REF	Reference Identification	O	>1
		LOOP ID - HL		>1
635	HL	Hierarchical Level	M	1
		LOOP ID - SPI		>1
639	SPI	Specification Identifier	O	1
655	MSG	Message Text	O	>1
		LOOP ID - PID		>1
661	PID	Product/Item Description	O	1
		LOOP ID - CID		>1
725	CID	Characteristic/Class ID	O	1
729	TMD	Test Method	O	>1
		LOOP ID - MEA		>1

741	MEA	Measurements	O	1
745	REF	Reference Identification	O	>1
		LOOP ID - STA		>1
751	STA	Statistics	O	1
755	REF	Reference Identification	O	>1

Summary:

Pos. No.	Seg. ID	Name	Req. Des.	Max.Use	Loop Repeat	Notes and Comments
003	SE	Transaction Set Trailer	M	1		

Transaction Set Notes

1. To be meaningful, at least one of the SPI, PID, REF, MEA, EFI or CID loops must be present with each occurrence of the HL loop.

Transaction Set Comments

1. The HL segment may be used to define the hierarchical relationship of product-related specifications reported in the associated HL loop. Product-related specifications may refer to the product in its entirety or to subunits of the product. For example, if the top level refers to an assembly, the second-level HL segment may refer to parts or subassemblies of the top assembly. This pattern may be repeated as often as required.
2. The CID segment may be used to define either a general class of properties, such as physical properties, or an individual property within a class. The CID loop allows the user the ability to define specifications such as the properties of the item or class, the environmental conditions under which the specifications apply, the test methods to be used, and other parameters related to properties within the current HL hierarchical level.

Segment: **ST** Transaction Set Header
Position: 003
Loop:
Level: Heading
Usage: Mandatory
Max Use: 1
Purpose: To indicate the start of a transaction set and to assign a control number
Syntax Notes:
Semantic Notes: 1 The transaction set identifier (ST01) used by the translation routines of the interchange partners to select the appropriate transaction set definition (e.g., 810 selects the Invoice Transaction Set).
Comments:
Notes: 1. This level/loop (header) provides data associated with the entire transaction set (or those data referenced within the transaction set), including:

- confidentiality indicator
- inventory type
- general comments
- general descriptions
- data model version
- transmission date and time
- data collection period
- general notes
- DARS data quality score associated with the transaction set
- organization name
- location
- map coordinates
- contact data

2. Loop (segments ST, SPI, RDT, NTE, REF, N1, N2, N3, N4, REF, PER) Example:

ST*841*0001~
SPI*90*17*01**EPA*I*00~
RDT**196*960101~
RDT**197*961231~
RDT*TI*I097*970401*1237~
NTE*RPI*Requested by Jan Doe of Scientific Answers Corporation~
REF*DQS*025~
N1*RI*Smith, Jones, Johnson, Murphy, and *1*123456789~
N2*Doe, CE~
N3*P.O. Box 369*Main Street~
N4*Hometown*VT*36363*USA*RI*I~
PER**PI*Carol Murphy*TE*800 333 3699*FX*669 333 3693~
<841 transaction set identified as 0001 transmitting an original transmission of a government non-classified transaction set using EIIP phase I format for a proposed inventory required by the EPA; inventory start date of January 1, 96, inventory end date December 31, 96, transaction set creation date April 1, 97 at 12:37pm; inventory requested by Jan Doe; the data reported has a DARS data quality score of .025; name 1 (over 35 characters) and of the organization that is transmitting the transaction set and the name of the inventory preparer >

3. Segment Example:

ST*841*0001~

< 841 transaction set identified as 0001 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	ST01	143	**Transaction Set Identifier Code** Code uniquely identifying a Transaction Set 841 X12.51 Specifications/Technical Information	M	ID	3/3
>>	ST02	329	**Transaction Set Control Number** Identifying control number that must be unique within the transaction set functional group assigned by the originator for a transaction set	M	AN	4/9

Segment: **SPI** Specification Identifier
Position: 009
Loop: SPI
Level: Heading
Usage: Mandatory
Max Use: 1
Purpose: To provide a description of the included specification or technical data items
Syntax Notes: 1 If either SPI02 or SPI03 is present, then the other is required.
Semantic Notes:
Comments:
Notes: 1. This loop provides the following information:

- confidentiality indicator
- inventory type
- general comments
- general descriptions
- data model version
- transmission date and time
- data collection period
- general notes

2. This segment provides the confidentiality indicator, inventory type, general comments, or general descriptions that apply to the entire transaction set.

3. This loop must be applied at least one (1) time to provide SPI02 code 17.

4. The symbol "??" indicates a code value that is to be assigned in a future version/release of the X12 standard.

5. Loop (segments SPI, RDT, NTE) Example:

```
SPI*90*17*01**EPA*1*00~
RDT**196*960101~
RDT**197*961231~
RDT*RB*1097*970401*1237~
NTE*RIE*Requested by Jan Doe of Scientific Answers Corporation
<original transmission of a government non-classified transaction set using EIIP phase I format for a proposed inventory required by the EPA; inventory start date of January 1, 96; inventory end date December 31, 96; transaction set creation date April 1, 97 at 12:37pm; inventory requested by Jan Doe>
```

6. Segment Example:

```
SPI*90*17*01**EPA*1*00~
<original transmission of a government non-classified transaction set using EIIP phase I format for a proposed inventory required by the EPA>
```

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	SPI01	786	**Security Level Code** Code indicating the level of confidentiality assigned by the sender to the information following 1. This element contains the confidentiality indicator associated with the data	M ID 2/2

in the entire transaction set. Select one from the following list:

00	Company Non-Classified
02	Company Confidential
90	Government Non-Classified
92	Government Confidential

SPI02 **128** **Reference Identification Qualifier** **X ID 2/3**

Code qualifying the Reference Identification

1. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list:

17	Client Reporting Category
	Code assigned by the client to categorize participants for reporting requirements
	Indicates the applicable EIIP phase
IX	Item Number
	Indicates general comments
PE	Plant Number
	Indicates general descriptions

SPI03 **127** **Reference Identification** **X AN 1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. When SPI02 is "IX" or "PE", this element contains a reference number associated with a specific entry in SPI05.

2. When SPI02 is "17", this element contains an EIIP phase (level of detail) code. Select one from the following list:

01	Level 1 (EIIP Phase I)
02	Level 2 (EIIP Phase II)
03	Level 3 (EIIP Phase III)

SPI05 **791** **Entity Purpose** **O AN 1/80**

The reason for the existence of the data item specified by the electronic data item independent of its presence in an EDI transaction

1. When SPI02 is "IX" or "PE", this element contains the entry associated with SPI03.

2. When SPI02 is "17", this element contains an inventory type code. Select one from the following list:

EMIS	Annual stationary major source inventory data submittal
EPA	EPA required data submittal
EPARFP	Reasonable Further Progress (RFP) inventory data submittal
EPASIP	Base year State Implementation Plan (SIP) inventory data submittal
LOC	Data submittal between local and state agency
NON	Nonattainment modeling data submittal
PLAN	Planning inventory (e.g., seasonal) data submittal
REGION	Regional area modeling data submittal
SPEC	Special data submittal
SUBNON	Sub-nonattainment area modeling data submittal
SUPER	Super-regional area modeling data submittal

SPI06 **792** **Entity Status Code** **O ID 1/1**

Code indicating the current status of the data item specified by the electronic data item

?? Conditional

1. This element does not apply with BIOGENIC SOURCE reporting.
2. This element only applies when SPI02 is "17".
3. When SPI02 is "17" this element must contain an inventory status code. Select one from the following list:

A	Approved Version
J	Proposed A specification that has yet to be accepted or approved by both trading partners
Z	Mutually Defined The status of submission is mutually defined between the sending and receiving parties.

SPI07 **353** **Transaction Set Purpose Code** **O** **ID** **2/2**

Code identifying purpose of transaction set

1. This element only applies when SPI02 is "17".
2. When SPI02 is "17" this element must contain a transaction set purpose code. Select one from the following list:

00	Original
05	Replace 1. This code indicates that this transaction set will be used to replace existing inventory source information after review by the receiving party. All applicable site source information must be included in the replacement transaction set.

SPI12 **554** **Assigned Number** **O** **N0** **1/6**

Number assigned for differentiation within a transaction set

1. This element contains a unique report number that differentiates this submittal from all others. This element is applied at the discretion of the trading p

Segment: **RDT** **Revision Date/Time**
Position: 012
Loop: SPI
Level: Heading
Usage: Optional
Max Use: >1
Purpose: To specify the revision level of the electronic data item
Syntax Notes:
1 If RDT01 is present, then RDT02 is required.
2 If RDT06 is present, then RDT05 is required.
3 If RDT03 is present, then at least one of RDT04 or RDT05 is required.
Semantic Notes:
Comments:
Notes:
1. This segment provides information about the data model version, data collection period dates, and transmission date and time.

2. This segment must be applied three (3) times for each transaction set: to provide the creation date and time of the transmission (RDT03 is "097"); the beginning date of the data collection (RDT03 is "196"); and the end date of the data collection (RDT03 is "197").

3. Segment Example (examples of all three required iterations):

RDT***196*960101~
< inventory start date of January 1, 96 >

RDT***197*961231~
< inventory end date of December 31, 96 >

RDT*H*1*097*970401*1237~
< data model version is 1 and the transaction set was created on April 1, 97 at 12:37pm >

Data Element Summary

Ref. Des.	Data Element	Name	Attributes		
RDT01	**795**	**Revision Level Code**	**O**	**ID**	**1/1**
		Code indicating the revision or engineering change level of the data items referred to by the specification number			
		1. This element indicates that this segment contains the EIIP data model version number to which this transaction set applies.			
		H Version Level			
RDT02	**796**	**Revision Value**	**X**	**AN**	**1/30**
		Revision or engineering change level of the data items referred to by the specification number			
		1. This element contains the value associated with RDT01.			
RDT03	**374**	**Date/Time Qualifier**	**O**	**ID**	**3/3**
		Code specifying type of date or time, or both date and time			
		1. This element indicates time periods associated with this transaction set and the data being reported. Select one from the following list:			
		097 Transaction Creation			
		196 Start			
		197 End			
RDT04	**373**	**Date**	**X**	**DT**	**6/6**

Date (YYMMDD)

1. **This element contains the value associated with the code specified in RDT03.**

RDT05	**337**	**Time**	**X**	**TM**	**4/8**

Time expressed in 24-hour clock time as follows: HHMM, or HHMMSS, or HHMMSSD, or HHMMSSDD, where H = hours (00-23), M = minutes (00-59), S = integer seconds (00-59) and DD = decimal seconds; decimal seconds are expressed as follows: D = tenths (0-9) and DD = hundredths (00-99)

1. **This element only applies when RDT03 is "097".**

2. **When RDT03 is "097", this element contains the time this transaction was created.**

Segment: **NTE** Note/Special Instruction
Position: 015
Loop: SPI
Level: Heading
Usage: Optional
Max Use: >1
Purpose: To transmit information in a free-form format, if necessary, for comment or special instruction
Syntax Notes:
Semantic Notes:
Comments: 1 The NTE segment permits free-form information/data which, under ANSI X12 standard implementations, is not machine processable. The use of the NTE segment should therefore be avoided, if at all possible, in an automated environment.
Notes: 1. This segment provides general notes for the entire transaction set.

2. Segment Example:

NTE*RPT*Request by Jan Doe of Scientific Answers Corporation
< report remarks indicating the party requesting this transaction set >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
	NTE01	363	**Note Reference Code** Code identifying the functional area or purpose for which the note applies 1. This element indicates special notes pertaining to this transaction set RPT Report Remarks	**O ID 3/3**
>>	NTE02	352	**Description** A free-form description to clarify the related data elements and their content 1. This element contains the entry associated with NTE01	**M AN 1/80**

Segment: **REF** **Reference Identification**
Position: 030
Loop: REF
Level: Heading
Usage: Optional
Max Use: 1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This loop/segment does not apply with BIOGENIC SOURCE reporting.
2. This loop/segment provides the DARS data quality score associated with the data/inventory being reported within this transaction set.
3. Loop/Segment Example:
REF*D0**025~
< DARS data quality score of 025 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element indicates the DARS data quality score associated with the data/inventory being reported within this transaction set. D0 Data Reliability Code	M	ID	2/3
	REF03	352	**Description** A free-form description to clarify the related data elements and their content 1. This element contains the value associated with REF01.	X	AN	1/80

Segment: **N1** **Name**
Position: 045
Loop: N1
Level: Heading
Usage: Optional
Max Use: 1
Purpose: To identify a party by type of organization, name, and code
Syntax Notes:
1 If either N103 or N104 is present, then the other is required.
2 At least one of N102 or N103 is required.

Semantic Notes:
Comments:
1 This segment, used alone, provides the most efficient method of providing organizational identification. To obtain this efficiency the "ID Code" (N104) must provide a key to the table maintained by the transaction processing party.
2 N105 and N106 further define the type of entity in N101.

Notes:
1. This loop provides the following information:

- organization name,
- location,
- map coordinates,
- contact data.

2. This segment provides name of and location identification code for the [illegible] associated with data found throughout the transaction set.

3. This loop must be applied at least two (2) times for each transaction set to provide the transmitting party (N101 = "RL") and the receiving party (N101 = "PW").

4. If a specific location is being provided (N103 = "76"), this loop must be applied at least one (1) time for each set of geographic coordinates.

5. The information in N104 (location identification code) directly matches the information in the N104 contained within a specific HL loop at another level of the transaction set.

6. This segment is used by POINT SOURCE only. The use of the N1 loop allows the description of specific locations by use of emission release points.

7. This segment pertains to AREA, NONROAD, MOBILE, and BIOGENIC SOURCES only. The use of the N1 loop allows the description of specific source locations.

8. Loop segments N1, N2, N3, N4, REF, PER) Example:

N1*76*99*12345~
REF*GE*03*LK-54 LQ-63~
< geographic data for a point at a longitude of 54 degrees and a latitude of 63 degrees referred to in HL5 - physical level of the transaction set >

N1*RL*Smith, Jones, Johnson, Murphy, and *T*12345678~
N2*Doe, CE~
N3*P.O. Box 369*Main Street~
N4*Hometown*VT*36363*USA*RJ*I~
PER*P1*Carol Murphy*TE*800 333 3699*FX*669 333 3693~
< name (over 35 characters) and of the organization that is transmitting the transaction set and the name of the inventory preparer >

9. Segment Example:

N1*RL*Smith, Jones, Johnson, Murphy, and *1*123456789~
< name (over 35 characters) and DUNS number an organization that is transmitting the transaction set >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	N101	98	**Entity Identifier Code**	M ID 2/2

Code identifying an organizational entity, a physical location, or an individual

1. Codes "FE" and "HA" apply with POINT SOURCE reporting only.

2. This element indicates the name of the location/party being transmitted with this iteration of the loop. Select one from the following list:

7C	Place of Occurrence Indicates the geographic location information associated with data contained at various levels within the transaction set.
B4	Parent Company The organizational entity which, by virtue of organization, ownership, and/or management, exercises control over a subordinate but separate business entity Indicates the parent company of the location/party indicated as a site.
C6	Municipality Indicates the municipality associated with the data related to the entire transaction set.
FE	Mail Address Indicates the mailing address of the location/party indicated as a site. 1. This code applies with POINT SOURCE reporting only.
HA	Owner Indicates the owner of the location/party indicated as a site. 1. This code applies with POINT SOURCE reporting only.
JU	Jurisdiction Indicates the secondary jurisdiction agency associated with the data related to the entire transaction set
P1	Preparer The firm, organization, or individual who determines the tax liability from information supplied by the taxpayer Indicates the name of the firm (pertains to Point Source only), organization, or individual who prepares the inventory data for submission.
RC	Receiving Location Indicates the party receiving the data within this

transaction set

RL Reporting Location

Indicates the party responsible for the data within this transaction set

UX Base Jurisdiction

Indicates the primary jurisdiction agency associated with the data related to the entire transaction set

N102	**93**	**Name**	**X**	**AN**	**1/35**

Free-form name

1. This element contains the entry associated with code specified in N101.

N103	**66**	**Identification Code Qualifier**	**X**	**ID**	**1/2**

Code designating the system/method of code structure used for Identification Code (67)

1. This element indicates the identification code associated with N102. Select one from the following list:

1 D-U-N-S Number, Dun & Bradstreet

93 Code assigned by the organization originating the transaction set

Indicates a code identifying a specific location associated with data found within this transaction set

1. When N101 [illegible] levels of this transaction set [illegible] associated location

N104	**67**	**Identification Code**	**X**	**AN**	**2/20**

Code identifying a party or other code

1. This element contains the value associated with the code specified in N103.
2. The information in this element directly [illegible] N104 contained within a specific Hierarchical [illegible]

Segment: **N2** **Additional Name Information**
Position: 048
Loop: N1
Level: Heading
Usage: Optional
Max Use: 2
Purpose: To specify additional names or those longer than 35 characters in length
Syntax Notes:
Semantic Notes:
Comments:
Notes: 1. This segment provides additional characters to continue the location/party entry specified in N102 (prior segment).

2. Segment Example:

N2*Doe, CE
< continuation of the name of an organization >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	N201	93	Name Free-form name	M	AN	1/35
	N202	93	Name Free-form name	O	AN	1/35

Segment: **N3** **Address Information**
Position: 051
Loop: N1
Level: Heading
Usage: Optional
Max Use: 2
Purpose: To specify the location of the named party
Syntax Notes:
Semantic Notes:
Comments:
Notes: 1. This segment provides the street address associated with entry specified in N1 (prior segment).

2. Segment Example:

N3*P.O. Box 369*Main Street~
< street address of an organization >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	N301	166	**Address Information** Address information	M	AN	1/35
	N302	166	**Address Information** Address information	O	AN	1/35

Segment: **N4** **Geographic Location**
Position: 054
Loop: N1
Level: Heading
Usage: Optional
Max Use: 1
Purpose: To specify the geographic place of the named party
Syntax Notes: 1 If N406 is present, then N405 is required.
Semantic Notes:
Comments: 1 A combination of either N401 through N404, or N405 and N406 may be adequate to specify a location.
2 N402 is required only if city name (N401) is in the USA or Canada.
Notes: 1. This segment provides the city, state, etc. information associated with the entry specified in N1 (prior segment).

2. Segment Example:

N4*Hometown*VT*36363*USA*RJ*I~
< city, state, zip code, country, location identifier, for a site in EPA Region I >

Data Element Summary

Ref. Des.	Data Element	Name	Attributes		
N401	19	**City Name** Free-form text for city name 1. This element contains the city associated with the entry specified in N1 (prior segment).	O	AN	2/30
N402	156	**State or Province Code** Code (Standard State/Province) as defined by appropriate government agency 1. This element contains the state/province associated with the entry specified in N1 (prior segment).	O	ID	2/2
N403	116	**Postal Code** Code defining international postal zone code excluding punctuation and blanks (zip code for United States) 1. This element contains the zip code associated with the entry specified in N1 (prior segment).	O	ID	3/15
N404	26	**Country Code** Code identifying the country 1. This element contains the country associated with the entry specified in N1 (prior segment).	O	ID	2/3
N405	309	**Location Qualifier** Code identifying type of location 1. This element indicates a special designation code associated with the entry specified in N1 (prior segment). Select one from the following list: FI Federal Information Processing Standards (FIPS) 55 (Named Populated Places) MS Metropolitan Sampling Area (MSA) Region Code RG Region Code Qualifies a code that identifies a geographic area where transportation rates apply Indicates nonattainment area data.	X	ID	1/2

1. This code does not apply with BIOGENIC SOURCE reporting.

	RJ	Region
		A geographical section of the country
		Indicates an EPA Region (Regions I - X)

N406	**310**	**Location Identifier**	**O**	**AN**	**1/30**

Code which identifies a specific location

1. This element does not apply with BIOGENIC SOURCE reporting.
2. This element contains the value associated with the code specified in N405.
3. When N405 is "RG", this element contains a nonattainment area code.

Select one from the following list:

03MOD	Ozone moderate
03OTR	Ozone Transport Region
CO	Carbon Monoxide
O3EXT	Ozone extreme
O3MAR	Ozone marginal
O3SER	Ozone serious
O3SEV1	Ozone severe 1
O3SEV2	Ozone severe 2
O3UNC	Ozone unclassified
PM10	Particulate Matter 10
PM25	Particulate Matter 2.5

Segment: **REF** **Reference Identification**
Position: 057
Loop: N1
Level: Heading
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This segment provides the map-specific information associated with the entry specified in N102 (prior segment).

2. When REF01 is "6E", the appropriate combinations of REF04 C04001, C04002, C04003, C04004, C04005, and C04006 must be applied.

3. Segment Example:

REF*6E*03**LK:54:LQ:63~
< geographic data for a point at a longitude of 63 degrees and a latitude of 54 degrees >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. When "6E" is applied, the appropriate combinations of REF04 C04001, C04002, C04003, C04004, C04005, and C04006 must be applied. 2. This element indicates the type of map data associated with the entry specified in N102 (prior segment) being transmitted with this iteration of the loop. Select one from the following list: 6E Map Reference 6J Census Tract UQ Section Number The number corresponding to a section within a township and range UU Township Number WH Master Reference Link Indicates highway link/Transportation Assessment Zone (TAZ) ZV Block Number assigned by a regulatory agency which describes a producing oil or gas offshore area Indicates Census Block data ZX County Code Indicates a County/Parish code ZZ Mutually Defined Indicates Air Basin data	**M ID 2/3**

	REF02	127	**Reference Identification**	X	AN	1/30

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains the value associated with the code specified in REF01.

2. When REF01 is "6E", this element contains a map reference code. Select one from the following list:

01	Static Grid
	Indicates data related to a static grid that is specifically defined and unchanging with respect to its application
02	Line
03	Point
04	Polygon

	REF03	352	**Description**	X	AN	1/80

A free-form description to clarify the related data elements and their content

1. This element only applies when REF01 is "6E" and REF02 is "01" or when REF01 is "WH".

2. When REF01 is "6E" and REF02 is "01", this element contains the mapping convention used to identify a map reference.

3. When REF01 is "WH", this element contains the mapping convention used to identify a highway link/Transportation Assessment Zone (TAZ).

	REF04	C040	**Reference Identifier**	O		

To identify one or more reference numbers or identification numbers as specified by the Reference Qualifier

1. This composite only applies when REF01 is "6E".

2. When REF01 is "6E", this composite provides map coordinate data.

>>	C04001	128	**Reference Identification Qualifier**	M	ID	2/3

Code qualifying the Reference Identification

1. This element indicates a vertically oriented map coordinate. Select one from the following list:

JN	Multiple Listing Service Map Y Coordinate
	1. When this code is applied, REF04 C04003 code "JM" must be applied.
LK	Longitude expressed in Degrees, Minutes and Seconds
	1. When this code is applied, REF04 C04003 code "LO" must be applied.
XU	Universal Transverse Mercator - North
	1. When this code is applied, REF04 C04003 code "XV" must be applied and REF04 C04005 code "XWA" may be applied.

>>	C04002	127	**Reference Identification**	M	AN	1/30

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains the map coordinate associated with the code specified in C04001.

	C04003	128	**Reference Identification Qualifier**	X	ID	2/3

Code qualifying the Reference Identification

1. This element indicates a horizontally oriented map coordinate. Select one

from the following list:

JM	Multiple Listing Service Map X Coordinate
	1. When this code is applied, REF04 C04001 code "JN" must be applied.
LQ	Latitude Expressed in Degrees, Minutes and Seconds
	1. When this code is applied, REF04 C04001 code "LK" must be applied.
XV	Universal Transverse Mercator - East
	1. When this code is applied, REF04 C04001 code "XU" must be applied and REF04 C04005 code "XW" may be applied.

C04004 127 Reference Identification X AN 1/30

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains the map coordinate associated with the code specified in C04003.

C04005 128 Reference Identification Qualifier X ID 2/3

Code qualifying the Reference Identification

1. This element indicates a specific map zone.

XW	Universal Transverse Mercator - Zone
	1. When this code is applied, REF04 C04001 code "XU" must be applied and REF04 C04003 code "XW" must also be applied.

C04006 127 Reference Identification X AN 1/30

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains the map zone associated with C04005.

Segment: **PER** **Administrative Communications Contact**
Position: 060
Loop: N1
Level: Heading
Usage: Optional
Max Use: >1
Purpose: To identify a person or office to whom administrative communications should be directed
Syntax Notes:
1 If either PER03 or PER04 is present, then the other is required.
2 If either PER05 or PER06 is present, then the other is required.
3 If either PER07 or PER08 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This segment provides information associated with a contact person associated with the entry specified in N102 (prior segment).
2. There may be more than one contact per location. This segment must be applied one (1) time for each individual being reported.
3. The symbol "??" indicates a code value that is to be assigned in a future version/release of the X12 standard.
4. Segment Example:
PER*PI*Carol Murphy*TE*800*333*3699*FX*669*333*3693~
< name of a contact person with telephone and facsimile numbers >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	PER01	366	**Contact Function Code** Code identifying the major duty or responsibility of the person or group named ?? Corporate Contact ?? Firm Plant Contact ?? Inspection Contact ?? Permit Contact 1. This element indicates the scope of responsibility of contact person being reported as it pertains to this transaction set. Select one from the following list: PI Preparer A firm, organization, or individual who determines the tax liability from information supplied by the taxpayer Indicates the name of the individual to be contacted regarding the data being reported	**M ID 2/2**
	PER02	93	**Name** Free-form name 1. This element contains the entry associated with the code specified in PER01.	**O AN 1/35**
	PER03	365	**Communication Number Qualifier** Code identifying the type of communication number 1. This element indicates a communication number associated with PER02. Select one from the following list: AP Alternate Telephone	**X ID 2/2**

		EM	Electronic Mail		
		EX	Telephone Extension		
		FX	Facsimile		
		TE	Telephone		
PER04	**364**	**Communication Number**		**X**	**AN 1/80**
		Complete communications number including country or area code when applicable			
		1. This element contains the value associated with the code specified in PER03.			
PER05	**365**	**Communication Number Qualifier**		**X**	**ID 2/2**
		Code identifying the type of communication number			
		1. This element indicates a second communication number associated with PER02. Select one from the following list.			
		AP	Alternate Telephone		
		EM	Electronic Mail		
		EX	Telephone Extension		
		FX	Facsimile		
		TE	Telephone		
PER06	**364**	**Communication Number**		**X**	**AN 1/80**
		Complete communications number including country or area code when applicable			
		1. This element contains the value associated with the code specified in PER05.			

Segment: **HL** **Hierarchical Level**
Position: 003
Loop: HL
Level: Detail
Usage: Mandatory
Max Use: 1
Purpose: To identify dependencies among and the content of hierarchically related groups of data segments
Syntax Notes:
Semantic Notes:
Comments:

1 The HL segment is used to identify levels of detail information using a hierarchical structure, such as relating line-item data to shipment data, and packaging data to line-item data.
2 HL01 shall contain a unique alphanumeric number for each occurrence of the HL segment in the transaction set. For example, HL01 could be used to indicate the number of occurrences of the HL segment, in which case the value of HL01 would be "1" for the initial HL segment and would be incremented by one in each subsequent HL segment within the transaction.
3 HL02 identifies the hierarchical ID number of the HL segment to which the current HL segment is subordinate.
4 HL03 indicates the context of the series of segments following the current HL segment up to the next occurrence of an HL segment in the transaction. For example, HL03 is used to indicate that subsequent segments in the HL loop form a logical grouping of data referring to shipment, order, or item-level information.
5 HL04 indicates whether or not there are subordinate (or child) HL segments related to the current HL segment.

Notes:

1. This level/loop (HL4) provides site/source-level data, including:

- confidentiality indicator
- site identification information
- geographic location pointer
- general message
- site/source type
- Standard Industry Classification (SIC) code
- number of employees (point source only)
- map reference (area, nonroad, and biogenic source only)
- chemical mechanism data (biogenic only)
- chemical surrogate data (biogenic only)

2. This loop must be applied one (1) time for each site/source.

3. This note pertains to POINT SOURCE only. "Site" is used throughout this loop to indicate the source of an emission.

4. This note pertains to AREA, NONROAD, MOBILE, and BIOGENIC SOURCE only. "Source" is used throughout this loop to indicate the source of an emission.

5. Loop (segments HL, SPI, N1, MSG, REF, LX, MEA, REF, CID, TMD, MEA, REF)
Example:

```
HL*01**4*1~
SPI*00*WF*X123**Steel production~
REF*06*01~
REF*IJ*33~
```

LX*1~
MEA*CT**500*IE~
< company sending non-classified information has a local identification number of X123, produces steel, is a point source with a SIC code of 33, and employs 500 people >

6. Segment Example:

HL*01**4*1~
< first HL loop iteration of this transaction set that contains site/source-level information and has subordinate loops >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	HL01	628	**Hierarchical ID Number**	M	AN	1/12
			A unique number assigned by the sender to identify a particular data segment in a hierarchical structure			
			1: This element contains a unique number used to identify the iteration of the HL loop.			
>>	HL03	735	**Hierarchical Level Code**	M	ID	1/2
			Code defining the characteristic of a level in a hierarchical structure			
			1: This element indicates that this level of the transaction set contains site/source-level data.			
			4 Group			
			Code identifying a group of charges on the bill			
			Indicates site/source-level data			
	HL04	736	**Hierarchical Child Code**	O	ID	1/1
			Code indicating whether if there are hierarchical child data segments subordinate to the level being described			
			1 Additional Subordinate HL Data Segment in This Hierarchical Structure			

Segment: **SPI** **Specification Identifier**
Position: 007
Loop: SPI
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To provide a description of the included specification or technical data items
Syntax Notes: 1 If either SPI02 or SPI03 is present, then the other is required.
Semantic Notes:
Comments:
Notes: 1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This loop provides the following information:

- confidentiality indicator
- site identification information
- geographic location pointer
- general message

3. This segment provides the confidentiality indicator for the entire level data and site identification information.

4. Loop (segments SPI, NT, MSG) is used

SPI*00*WF*X123*Steel production~
N1*7C**93*123~
MSG*This is a new location~
< company sending non-classified information for the facility identification number of X123 >
a location fully detailed in the header and a message indicating that the location is new >

5. Segment Example:

SPI*00*WF*X123*Steel production~
< company sending non-classified information for the facility identification number of X123 >
and produces steel >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	SPI01	786	**Security Level Code** Code indicating the level of confidentiality assigned by the sender to the information following 1. This element contains the confidentiality indicator associated with the data in this loop/level. Select one from the following list: 00 Company Non-Classified 02 Company Confidential 90 Government Non-Classified 92 Government Confidential	**M ID 2/2**
	SPI02	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. Codes "II", "G5", and "PE" apply with POINT SOURCE reporting only. 2. This element indicates the type of site/source identifier information being	**X ID 2/3**

reported with this iteration of the loop. Select one from the following list:

1J	Facility ID Number
	Indicates the Federal key identifier code for a site 1. This code applies with POINT SOURCE reporting only.
G5	Provider Site Number
	A unique code identifying the provider's specific department or office location for internal routing of electronic claims
	Indicates the state identification code/description for a site 1. This code applies with POINT SOURCE reporting only.
IX	Item Number
	Indicates comments for a site/source
PE	Plant Number
	Indicates the Federal identification code for a site description 1. This code applies with POINT SOURCE reporting only.
WF	Locally Assigned Control Number
	Indicates the local identification code/description for a site/source
ZZ	Mutually Defined
	Indicates the Office of Regulatory Information Systems (ORIS) utility plant code

SPI03	**127**	**Reference Identification**	**X**	**AN**	**1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. When SPI02 is "1J" or "PE", this element contains the appropriate code value.
2. When SPI02 is "IX", this element contains a number associated with a specific entry in SPI05.
3. When SPI02 is "G5" or "WF", this element may contain either a number associated with a specific entry in SPI05, or the appropriate code value.

SPI05	**791**	**Entity Purpose**	**O**	**AN**	**1/80**

The reason for the existence of the data item specified by the electronic data item independent of its presence in an EDI transaction

1. When SPI02 is "G5", "IX", or "WF", this element contains the entry associated with the identification number in SPI03.

Segment: **N1** **Name**
Position: 019
Loop: SPI
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To identify a party by type of organization, name, and code
Syntax Notes:
1 If either N103 or N104 is present, then the other is required.
2 At least one of N102 or N103 is required.

Semantic Notes:
Comments:
1 This segment, used alone, provides the most efficient method of providing organizational identification. To obtain this efficiency the "ID Code" (N104) must provide a key to the table maintained by the transaction processing party.
2 N105 and N106 further define the type of entity in N101.

Notes:
1. This segment (elements N103 and N104) provides a pointer the N1 loop in the header to provide site-specific geographic information.
2. The information in N104 directly matches the information in the N104 element contained within the header N1 loop.
3. Segment Example:
N1*7C**93*123
<location fully detailed in the header with a pointer/identifier number of 123 which corresponds to the same number in the header N1 loop, N104 element>

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	N101	98	**Entity Identifier Code** Code identifying an organizational entity, a physical location, or an individual 1. This element indicates the geographic location information associated with data contained at this level of the transaction set. 7C Place of Occurrence	M	ID	2/2
	N102	93	**Name** Free-form name 1. This element contains the entry associated with N101.	X	AN	1/35
	N103	66	**Identification Code Qualifier** Code designating the system/method of code structure used for Identification Code (67) 1. This element points to the header N1 segment indicating an identification code associated with a specific location/party. 93 Code assigned by the organization originating the transaction set	X	ID	1/2
	N104	67	**Identification Code** Code identifying a party or other code 1. This element points to the header N1 segment containing an identification code associated with a specific location/party. The information in this element directly matches the information in the N104 contained within the header N1 loop.	X	AN	2/20

Segment: **MSG** **Message Text**
Position: 023
Loop: SPI
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To provide a free form format that would allow the transmission of text information
Syntax Notes:
Semantic Notes:
Comments: 1 MSG02 is not related to the specific characteristics of a printer, but identifies top of page, advance a line, etc.
Notes: 1. This segment provides a site/source-level message.

2. Segment Example:

MSG*This is a new location~
< message indicating that the location is new >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	MSG01	933	Free-Form Message Text Free-form message text	M	AN	1/264

Segment: **REF** **Reference Identification**
Position: 055
Loop: REF
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This loop/segment provides site/source type information and Standard Industry Classification (SIC) codes.

2. Loop/Segment Example:

REF*06*01~
< source type that is a point source >

REF*06*04**T7:VEG~
< source type that is a biogenic source with a source category of vegetation >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list:	M ID 2/3
			06 System Number A unique number assigned by the manufacturer to identify the initial computer system sold to the customer Indicates the source type to which the data pertains. IJ Standard Industry Classification (SIC) Code	
	REF02	127	**Reference Identification** Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier 1. This element contains the value associated with the code specified in REF01. 2. When REF01 is "06", this element contains the source type code. Select one from the following list:	X AN 1/30
			01 Point Source 02 Area Source 03 Mobile Source 04 Biogenic Source 05 Nonroad Engines and Vehicles Source	
	REF04	C040	**Reference Identifier** To identify one or more reference numbers or identification numbers as specified by the Reference Qualifier 1. This composite is applied with BIOGENIC SOURCE reporting only.	O

2. This composite is only applied when REF02 is "04".

3. When REF02 is "04", this composite provides a biogenic source category.

>>	C04001	128	**Reference Identification Qualifier** Code qualifying the Reference Identification	M	ID	2/3

1. This element indicates a biogenic source category.

T7	Affected Subsystem Code **Indicates a biogenic source category**

>>	C04002	127	**Reference Identification** Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier	M	AN	1/30

1. This element contains the code associated with C04001. Select one from the following list:

GEO	Geogenic
LIGHT	Lightning
SOIL	Soil
VEG	Vegetation

Segment: **LX** **Assigned Number**
Position: 065
Loop: LX
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To reference a line number in a transaction set
Syntax Notes:
Semantic Notes:
Comments:
Notes:

1. This loop/segment is applied with POINT, AREA, NONROAD, and BIOGENIC SOURCE reporting only.

2. This loop provides the following information:

- number of employees (point source only);
- map reference (area, nonroad, and biogenic source only).

3. This segment is an X12 syntactical requirement only.

4. Loop (segments LX, MEA, REF) Example:

LX*01~
MEA*CT**500*IE~
< 500 persons (employees) >

LX*01~
MEA*PO*HT*10*DD~
MEA*PO*WD*15*DD~
REF*6E*01**LK:54:LQ:63~
< biogenic dynamic grid reference with a grid start point at 54 degrees longitude and 63 degrees latitude and a grid measurement of 10 degrees along the Y axis and 15 degrees along the X axis >

5. Segment Example:

LX*01~
< first iteration of this LX loop within this transaction set >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	LX01	554	**Assigned Number** Number assigned for differentiation within a transaction set	M	N0	1/6

Segment: **MEA** **Measurements**
Position: 071
Loop: LX
Level: Detail
Usage: Mandatory
Max Use: >1
Purpose: To specify physical measurements or counts, including dimensions, tolerances, variances, and weights (See Figures Appendix for example of use of C001)
Syntax Notes:
1 If MEA05 is present, then MEA04 is required.
2 If MEA06 is present, then MEA04 is required.
3 Only one of MEA08 or MEA03 may be present.
4 If MEA07 is present, then at least one of MEA03 MEA05 or MEA06 is required.
5 At least one of MEA03 MEA05 MEA06 or MEA08 is required.
Semantic Notes:
1 MEA04 defines the unit of measure for MEA03, MEA05, and MEA06.
Comments:
1 When citing dimensional tolerances, any measurement requiring a sign (+ or -), or any measurement where a positive (+) value cannot be assumed, use MEA05 as the negative (-) value and MEA06 as the positive (+) value.
Notes:
1. This segment is applied with POINT, AREA, NONROAD, and BIOGENIC SOURCE reporting only.

2. This note pertains to POINT SOURCE only. This segment provides the number of employees for the site.

3. This note pertains to AREA, NONROAD, and BIOGENIC SOURCE only. This segment provides map reference data for dynamic grids.

4. Segment Example:
MEA*CT**500*IE~
< 500 persons (employees) >
MEA*PO**10*DD~
MEA*PO*WD*15*DD~
< biogenic dynamic grid reference with a grid measurement of 10 degrees along the Y axis and 15 degrees along the X axis >

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
MEA01	737	**Measurement Reference ID Code**	**O ID 2/2**
		Code identifying the broad category to which a measurement applies	
		1. This segment indicates the type of information being reported with this iteration of the loop. Select one from the following list.	
		CT Counts	
		Indicates the number of employees at a site. 1. This code is applied to POINT SOURCE reporting only.	
		PO Position	
		Indicates data related to a dynamic grid which has a changeable definition and changes with respect to its application.	

1. This code is applied to AREA, NONROAD, and BIOGENIC SOURCE reporting only.

	MEA02	738	**Measurement Qualifier**	O	ID	1/3

Code identifying a specific product or process characteristic to which a measurement applies

1. This element is applied with AREA, NONROAD, and BIOGENIC SOURCE reporting only.

2. When MEA01 is "PO", this element indicates the direction associated with a map reference measurement. Select one from the following list:

HT	Height
	Corresponds with the Y axis.
WD	Width
	Corresponds with the X axis.

	MEA03	739	**Measurement Value**	X	R	1/20

The value of the measurement

1. This note pertains to POINT SOURCE only. This element contains the value associated with MEA01.

2. This note pertains to AREA, NONROAD, and BIOGENIC SOURCE. This element contains the value associated with MEA02.

	MEA04	C001	**Composite Unit of Measure**	X	

To identify a composite unit of measure (See Figures Appendix for examples of use)

1. This composite provides the unit of measure associated with MEA03.

>>	C00101	355	**Unit or Basis for Measurement Code**	M	ID	2/2

Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken

1. Code IE applies with POINT SOURCE reporting only.

2. This element contains the unit of measure associated with MEA03. Select one from the following list:

03	Seconds
DD	Degree
DH	Miles
DK	Kilometers
EA	Each
	Indicates one (1) cell in a dynamic grid.
IE	Person
	Indicates the number of employees. 1. This code is applied with POINT SOURCE reporting only.
MJ	Minutes

Segment: **REF** **Reference Identification**
Position: 079
Loop: LX
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This segment applies with AREA, NONROAD, and BIOGENIC SOURCE reporting only.

2. This segment provides map reference data (grid start point) and projection system name associated with dynamic grids as specified in the MEA01 (prior segment) code is "PO".

3. When REF01 is "6E", the appropriate combinations of REF04 C04001, C04002, C04003, C04004, C04005, and C04006 must be applied.

4. Segment Example:

REF*6E*01**LK:54:LQ:63~
< biogenic dynamic grid reference with a grid start point at 54 degrees longitude and 63 degrees latitude>

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	**REF01**	**128**	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element indicates map reference data. 2. When "6E" is applied, the appropriate combinations of REF04 C04001, C04002, C04003, C04004, C04005, and C04006 must be applied. 6E Map Reference	**M ID 2/3**
	REF02	**127**	**Reference Identification** Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier 1. This element contains the value associated with REF01. 05 Dynamic Grid Indicates data related to a dynamic grid which has a changeable definition and changes with respect to its application. 06 Projection System Name	**X AN 1/30**
	REF03	**352**	**Description** A free-form description to clarify the related data elements and their content 1. This element contains the naming convention associated with the code specified in REF02.	**X AN 1/80**
	REF04	**C040**	**Reference Identifier**	**O**

To identify one or more reference numbers or identification numbers as specified by the Reference Qualifier

1. This composite is only applied when REF02 is "05".

2. This composite provides map coordinate data associated with REF01.

>> **C04001** **128** **Reference Identification Qualifier** **M ID 2/3**

Code qualifying the Reference Identification

1. This element indicates a vertically oriented map coordinate.

JN	Multiple Listing Service Map Y Coordinate
	1. When this code is applied, REF04 C04003 code "JM" must be applied.
LK	Longitude expressed in Degrees, Minutes and Seconds
	1. When this code is applied, REF04 C04003 code "LQ" must be applied.
XU	Universal Transverse Mercator - North
	1. When this code is applied, REF04 C04003 code "XV" must be applied and REF04 C04005 code "XW" may be applied.

>> **C04002** **127** **Reference Identification** **M AN 1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains the map coordinate associated with the code specified in C04001.

C04003 **128** **Reference Identification Qualifier** **X ID 2/3**

Code qualifying the Reference Identification

1. This element indicates a horizontally oriented map coordinate.

JM	Multiple Listing Service Map X Coordinate
	1. When this code is applied, REF04 C04001 code "JN" must be applied.
LQ	Latitude Expressed in Degrees, Minutes and Seconds
	1. When this code is applied, REF04 C04001 code "LK" must be applied.
XV	Universal Transverse Mercator - East
	1. When this code is applied, REF04 C04001 code "XU" must be applied and REF04 C04005 code "XW" may be applied.

C04004 **127** **Reference Identification** **X AN 1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains the map coordinate associated with the code specified in C04003.

C04005 **128** **Reference Identification Qualifier** **X ID 2/3**

Code qualifying the Reference Identification

1. This element indicates a specific map zone.

XW	Universal Transverse Mercator - Zone
	1. When this code is applied, REF04 C04001 code "XU" must be applied and REF04 C04003 code "XV" must also be applied.

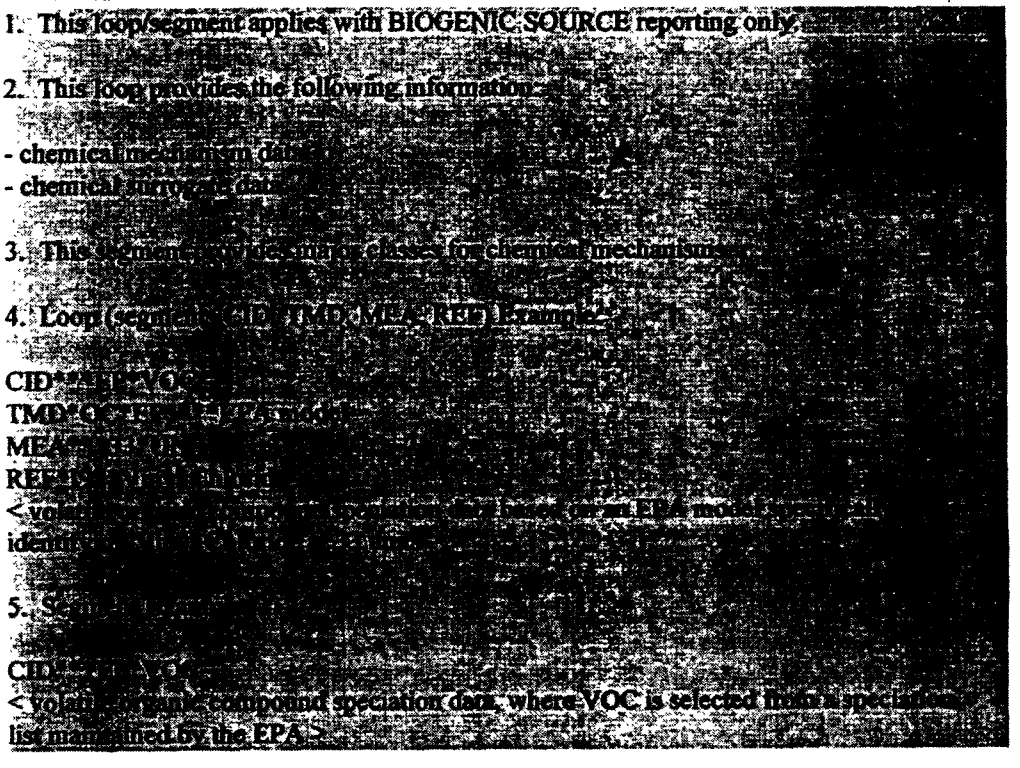
C04006 **127** **Reference Identification** **X AN 1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains the map zone associated with C04005.

Segment: **CID** **Characteristic/Class ID**
Position: 093
Loop: CID
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify the general class or specific characteristic upon which test results are being reported or are to be taken
Syntax Notes:
1 If CID06 is present, then both CID03 and CID04 are required.
2 If CID07 is present, then at least one of CID04 or CID05 is required.
3 If either CID03 or CID04 is present, then the other is required.
4 At least one of CID01 CID02 CID04 or CID05 is required.
Semantic Notes:
Comments:
1 CID06 specifies the individual code list of the agency specified in CID03.
2 CID07 refers to whether or not the characteristic identified in CID04 or CID05 or both is affected by the product change. If it is affected, the value is "Y". A value of "N" is used when it is known that it will not be affected. Any other value indicates it is indeterminate.

Notes:



Data Element Summary

Ref. Des.	Data Element	Name	Attributes
CID03	559	**Agency Qualifier Code** Code identifying the agency assigning the code values 1. This element identifies the agency maintaining the code values applied with this segment. EP United States Environmental Protection Agency (EPA)	X ID 2/2
CID04	751	**Product Description Code** A code from an industry code list which provides specific data about a product characteristic	X AN 1/12

1. This element indicates the major class of chemical mechanism being reported.

MONO	Monoterpines
OVOC	Other Volatile Organic Compounds
VOC	Volatile Organic Compounds

CID05 352 Description X AN 1/80

A free-form description to clarify the related data elements and their content

1. This element contains a description of any major chemical mechanism not supplied in CID04.

Segment: **TMD** **Test Method**
Position: 097
Loop: CID
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To describe the nature of the test performed
Syntax Notes:
1 If TMD09 is present, then TMD02 is required.
2 If either TMD02 or TMD03 is present, then the other is required.
Semantic Notes:
1 TMD07 is the date of the test method as assigned by the issuing organization.
2 TMD08 is the document revision number.
Comments:
1 TMD09 specifies the individual code list of the agency specified in TMD02.
Notes:
1. This segment applies with BIOGENIC SOURCE reporting only.

2. This segment provides chemical mechanism version information associated with the chemical mechanism information specified in the CID segment (prior segment).

3. Segment Example:

TMD*OC*EP****EPA model
< chemical mechanism/speciation data based on an EPA model >
EPA model is obtained from a list maintained by the EPA

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
TMD01	750	**Product/Process Characteristic Code** Code identifying the general class of a product or process characteristic 1. This element indicates the version of the chemical mechanism information being provided. OC Options Indicates the version of the chemical mechanism	**O ID 2/3**
TMD06	352	**Description** A free-form description to clarify the related data elements and their content 1. This element contains a textual description of the information associated with TMD01.	**O AN 1/80**

Segment: **MEA** **Measurements**
Position: 109
Loop: MEA
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify physical measurements or counts, including dimensions, tolerances, variances, and weights (See Figures Appendix for example of use of C001)
Syntax Notes:
1 If MEA05 is present, then MEA04 is required.
2 If MEA06 is present, then MEA04 is required.
3 Only one of MEA08 or MEA03 may be present.
4 If MEA07 is present, then at least one of MEA03 MEA05 or MEA06 is required.
5 At least one of MEA03 MEA05 MEA06 or MEA08 is required.
Semantic Notes:
1 MEA04 defines the unit of measure for MEA03, MEA05, and MEA06.
Comments:
1 When citing dimensional tolerances, any measurement requiring a sign (+ or -), or any measurement where a positive (+) value cannot be assumed, use MEA05 as the negative (-) value and MEA06 as the positive (+) value.
Notes:
1. This loop/segment applies with BIOGENIC SOURCE reporting only.

2. This loop provides chemical surrogate data.

3. This segment provides chemical surrogate values associated with the chemical surrogate information specified in the REF segment (following segment).

4. Loop (segments MEA, REF) Example:

MEA***33*UN~
REF*I9**Vinyl Chloride~
< chemical surrogate Vinyl Chloride has a value of 33 units as it is associated with a specific chemical speciation model >

4. Segment Example:

MEA***33*UN~
< chemical surrogate associated with a chemical speciation model with a value of 33 units >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
	MEA03	739	**Measurement Value** The value of the measurement 1. This element contains the value associated with REF03 (following segment).	X	R	1/20
	MEA04	C001	**Composite Unit of Measure** To identify a composite unit of measure (See Figures Appendix for examples of use) 1. This composite provides the unit of measure associated with MEA03.	X		
>>	C00101	355	**Unit or Basis for Measurement Code** Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken 1. This element provides the unit of measure associated with MEA03. UN Unit	M	ID	2/2

Segment: **REF** **Reference Identification**
Position: 113
Loop: MEA
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes: 1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes: 1. This segment applies with BIOGENIC SOURCE reporting only.
2. This segment provides chemical surrogate classes associated with the chemical mechanism information specified in the CID segment (prior segment).
3. Segment Example:
REF*I9**Vinyl Chloride
<chemical surrogate>Vinyl Chloride</

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element indicates a pollutant code identifying a chemical surrogate. I9 Pollutant	M ID 2/3
	REF03	352	**Description** A free-form description to clarify the related data elements and their content 1. This element contains the description of pollutant code	X AN 1/80

Segment: **HL** **Hierarchical Level**
Position: 161
Loop: HL
Level: Detail
Usage: Mandatory
Max Use: 1
Purpose: To identify dependencies among and the content of hierarchically related groups of data segments
Syntax Notes:
Semantic Notes:
Comments:

1 The HL segment is used to identify levels of detail information using a hierarchical structure, such as relating line-item data to shipment data, and packaging data to line-item data.
2 HL01 shall contain a unique alphanumeric number for each occurrence of the HL segment in the transaction set. For example, HL01 could be used to indicate the number of occurrences of the HL segment, in which case the value of HL01 would be "1" for the initial HL segment and would be incremented by one in each subsequent HL segment within the transaction.
3 HL02 identifies the hierarchical ID number of the HL segment to which the current HL segment is subordinate.
4 HL03 indicates the context of the series of segments following the current HL segment up to the next occurrence of an HL segment in the transaction. For example, HL03 is used to indicate that subsequent segments in the HL loop form a logical grouping of data referring to shipment, order, or item-level information.
5 HL04 indicates whether or not there are subordinate (or child) HL segments related to the current HL segment.

Notes:

1. This level/loop (HL5) provides physical-level data, including:

- confidentiality indicator
- physical unit identification information
- geographic location pointer
- physical-level message
- physical unit type
- emission unit (point source only)
- emission release point (point source only)
- control equipment physical parameter data (point, area, and nonroad source only)
- grid/county area data (biogenic source only)
- pollution-specific control unit information (point source only)
- control unit characteristics (point, area, and nonroad source only)
- physical unit operational status (point source only)
- emission path data (point, area, and nonroad source only)

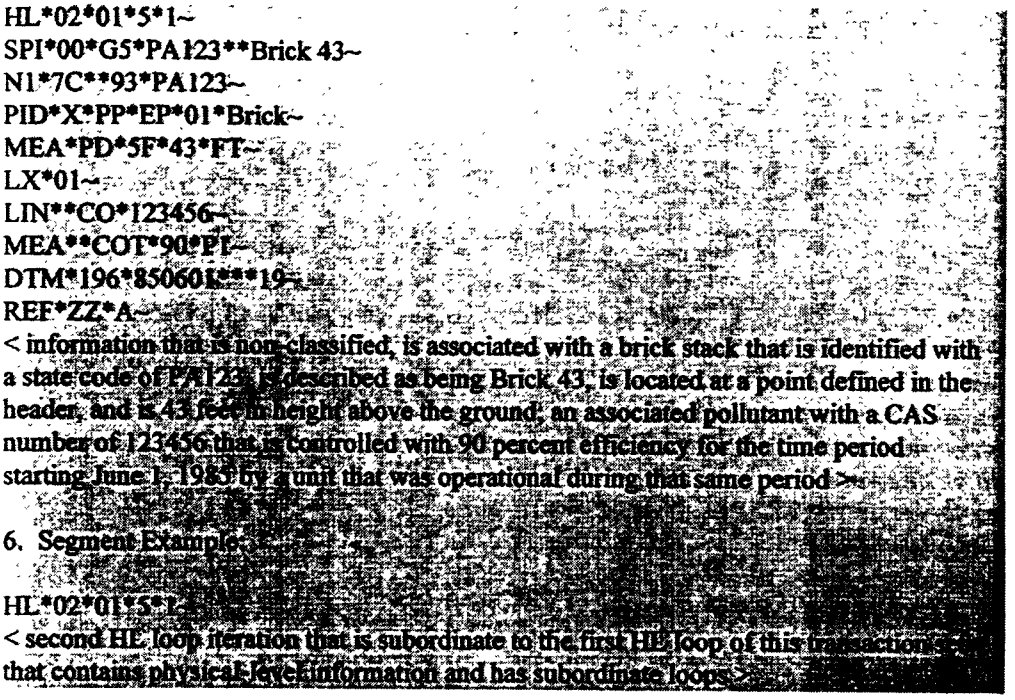
2. This loop must be applied one (1) time for each physical unit.

3. This note pertains to POINT SOURCE only. Examples of physical-level data are emission release point, control device, emission unit, etc.

4. This note pertains to AREA, NONROAD, MOBILE, AND BIOGENIC SOURCE only. Examples of physical-level data are geographic subdivision (grid cell), county, subcounty, highway link, etc.

5. Loop (segments HL, SPI, N1, MSG, PID, MEA, LX, LIN, MEA, DTM, REF)

Example:



HL*02*01*5*1~
SPI*00*G5*PA123**Brick 43~
N1*7C**93*PA123~
PID*X*PP*EP*01*Brick~
MEA*PD*5F*43*FT~
LX*01~
LIN**CO*123456~
MEA**COT*90*PT~
DTM*196*850601***19~
REF*ZZ*A~
< information that is non-classified, is associated with a brick stack that is identified with a state code of PA123, is described as being Brick 43, is located at a point defined in the header, and is 43 feet in height above the ground, an associated pollutant with a CAS number of 123456 that is controlled with 90 percent efficiency for the time period starting June 1, 1985 by a unit that was operational during that same period >~

6. Segment Example:

HL*02*01*5*1~
< second HL loop iteration that is subordinate to the first HL loop of this transaction that contains physical-level information and has subordinate loops >~

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	HL01	628	**Hierarchical ID Number**	**M AN 1/12**
			A unique number assigned by the sender to identify a particular data segment in a hierarchical structure	
			1 - This element contains a unique number used to identify the iteration of an HL loop	
	HL02	734	**Hierarchical Parent ID Number**	**O AN 1/12**
			Identification number of the next higher hierarchical data segment that the data segment being described is subordinate to	
			1 - This element indicates that this level of the transaction set points to the HL loop level containing the HL03 code 43 for site/source-level data	
>>	HL03	735	**Hierarchical Level Code**	**M ID 1/2**
			Code defining the characteristic of a level in a hierarchical structure	
			1 - This element indicates that this level of the transaction set contains physical-level data	
			5 Category	
			Code identifying the sub-division of the group	
			Indicates physical-level data	
	HL04	736	**Hierarchical Child Code**	**O ID 1/1**
			Code indicating whether if there are hierarchical child data segments subordinate to the level being described	
			1 Additional Subordinate HL Data Segment in This Hierarchical Structure	

Segment: **SPI** Specification Identifier
Position: 165
Loop: SPI
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To provide a description of the included specification or technical data items
Syntax Notes: 1 If either SPI02 or SPI03 is present, then the other is required.
Semantic Notes:
Comments:
Notes: 1. This loop provides the following information:

- confidentiality indicator
- physical unit identification information
- geographic location pointer
- physical-level message

2. This segment provides the confidentiality indicator for physical-level data and physical unit identification information.

3. This segment must be applied at least one (1) time.

4. Loop (segments SPI, N1, MSG) Example:

SPI*00*G5*PA123**Brick 43~
N1*7C**93*PA123~
MSG*This stack is equipped with a prototype control device.~
< information that is non-classified, is associated with an emission release point that is identified with a state code of PA123, is described as being Brick 43, has a specific, located at a point defined in the header, and is using a new control technology >

5. Segment Example:

SPI*00*G5*PA123**Brick 43~
< information that is non-classified, is associated with an emission release point that is identified with a state code of PA123 and is described as being Brick 43 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	SPI01	786	**Security Level Code**	**M ID 2/2**
			Code indicating the level of confidentiality assigned by the sender to the information following	
			1. This element contains the confidentiality indicator associated with the data in this loop/level. Select one from the following list:	
			00 Company Non-Classified	
			02 Company Confidential	
			90 Government Non-Classified	
			92 Government Confidential	
	SPI02	128	**Reference Identification Qualifier**	**X ID 2/3**
			Code qualifying the Reference Identification	
			1. This element applies with POINT SOURCE reporting only.	

2. This element indicates the type of physical unit identifier being reported with this iteration of the loop. Select one from the following list:

G5	Provider Site Number
	A unique code identifying the provider's specific department or office location for internal routing of electronic claims
	Indicates the state identification code/description for an emission release point
IX	Item Number
	Indicates comments for a physical unit
PE	Plant Number
	Indicates the Federal identification code for an emission release point
WF	Locally Assigned Control Number
	Indicates the local identification code/description for an emission release point

SPI03 **127** **Reference Identification** **X** **AN** **1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element applies with POINT SOURCE reporting only.
2. When SPI02 is G5, this element contains the unique code associated with a specific entity in SPI04 for the appropriate code value.
3. When SPI02 is IX, this element contains the number associated with a specific entity in SPI04.
4. When SPI02 is PE, this element contains the appropriate code value.

SPI05 **791** **Entity Purpose** **O** **AN** **1/80**

The reason for the existence of the data item specified by the electronic data item independent of its presence in an EDI transaction

1. This element applies with POINT SOURCE reporting only.
2. When SPI02 is G5, this element contains the unique code associated with a specific entity in SPI04.

Segment: **N1** **Name**
Position: 177
Loop: SPI
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To identify a party by type of organization, name, and code
Syntax Notes: 1 If either N103 or N104 is present, then the other is required.
2 At least one of N102 or N103 is required.
Semantic Notes:
Comments: 1 This segment, used alone, provides the most efficient method of providing organizational identification. To obtain this efficiency the "ID Code" (N104) must provide a key to the table maintained by the transaction processing party.
2 N105 and N106 further define the type of entity in N101.
Notes: **1. This segment (elements N103 and N104) provides a pointer to the N1 loop in the header to provide physical-level geographic information.**

2. The information in N104 directly matches the information in the N104 segment contained within the header N1 loop.

3. Segment Example:

N1*7C93*PA123~**
< location fully detailed in the header with a pointer/identifier number of PA123 which corresponds to the same number in the header N1 loop, N104 element >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	N101	98	**Entity Identifier Code**	**M**	**ID**	**2/2**
			Code identifying an organizational entity, a physical location, or an individual			
			1. This element indicates the geographic location information associated with data contained at this level of the transaction set.			
			7C Place of Occurrence			
	N102	93	**Name**	**X**	**AN**	**1/35**
			Free-form name			
			1. This element contains the entry associated with N101.			
	N103	66	**Identification Code Qualifier**	**X**	**ID**	**1/2**
			Code designating the system/method of code structure used for Identification Code (67)			
			1. This element points to the header N1 segment indicating an identification code associated with a specific location/party.			
			93 Code assigned by the organization originating the transaction set			
	N104	67	**Identification Code**	**X**	**AN**	**2/20**
			Code identifying a party or other code			
			1. This element points to the header N1 segment containing an identification code associated with a specific location/party. The information in this element directly matches the information in the N104 contained within the header N1 loop.			

Segment: **MSG** **Message Text**
Position: 181
Loop: SPI
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To provide a free form format that would allow the transmission of text information
Syntax Notes:
Semantic Notes:
Comments: 1 MSG02 is not related to the specific characteristics of a printer, but identifies top of page, advance a line, etc.
Notes: 1. This segment provides a physical-level message.

2. Segment Example:

MSG*This stack is equipped with a prototype control device.~
<message indicating that the emission point is using a new control technology>~

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	MSG01	933	Free-Form Message Text Free-form message text	M AN 1/264

Segment: **PID** **Product/Item Description**
Position: 187
Loop: PID
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To describe a product or process in coded or free-form format
Syntax Notes:
1 If PID04 is present, then PID03 is required.
2 If PID07 is present, then PID03 is required.
3 If PID08 is present, then PID03 is required.
4 At least one of PID04 or PID05 is required.
Semantic Notes:
1 Use PID03 to indicate the organization that publishes the code list being referred to.
2 PID04 should be used for industry-specific product description codes.
3 PID08 describes the physical characteristics of the product identified in PID04. A ``Y" indicates that the specified attribute applies to this item. A ``N" indicates it does not apply. Any other value is indeterminate.
Comments:
1 If PID01 = ``F", then PID05 is used. If PID01 = ``S", then PID04 is used. If PID01 = ``X", then both PID04 and PID05 are used.
2 Use PID06 when necessary to refer to the product surface or layer being described in the segment.
3 PID07 specifies the individual code list of the agency specified in PID03.
Notes:
1. This loop provides the following information:

- physical unit type
- emission unit (point source only)
- emission release point (point source only)
- control equipment physical parameter data (point, area, and nonroad source only)
- grid/county area data (area, nonroad, mobile, and biogenic source only)

2. This segment provides physical unit type.

3. Loop (segments PID, MEA) Example:

PID*X*PP*EP*01*Brick~
MEA*PD*5E*43*FT~
< structured format data about a physical unit that is a stack that is reported as being brick and having physical dimensions of 43 feet in height above the ground >

4. Segment Example:

PID*X*PP*EP*01*Brick~
< structured format data about a physical unit that is a stack (selected from a list maintained by the EPA) that is reported to be being brick >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	PID01	349	**Item Description Type** Code indicating the format of a description 1. This element indicates the format the identification of physical unit type is being presented in. Select one from the following list: S Structured (From Industry Code List) X Semi-structured (Code and Text)	M ID 1/1

PID02	**750**	**Product/Process Characteristic Code**	**O**	**ID**	**2/3**

Code identifying the general class of a product or process characteristic

1. This element indicates physical unit type information.

PP	Process/Production Unit

PID03	**559**	**Agency Qualifier Code**	**X**	**ID**	**2/2**

Code identifying the agency assigning the code values

1. This element identifies the agency maintaining the code values applied with this segment.

EP	United States Environmental Protection Agency (EPA)

PID04	**751**	**Product Description Code**	**X**	**AN**	**1/12**

A code from an industry code list which provides specific data about a product characteristic

1. Code "15" applies with AREA, NONROAD, MOBILE, and BIOGENIC SOURCE reporting only.

2. This note pertains to AREA, NONROAD, MOBILE, and BIOGENIC SOURCE only. When using this element, only code "15" may be applied.

3. This element contains a physical unit code associated with PID02. Select one from the following list.

01	Stack
02	Control Unit
03	Emission Unit
04	Storage Tank
05	Vehicle Group
06	Process
07	Flare
08	Equipment Leak Fugitives
09	Loading
10	Cooling Towers
11	Incinerators
12	Accidental Release/Upset
13	Start Up/Shut Down
14	Wastewater
15	Area
	1. This code applies with AREA, NONROAD, MOBILE, and BIOGENIC SOURCE reporting only.
16	Other

PID05	**352**	**Description**	**X**	**AN**	**1/80**

A free-form description to clarify the related data elements and their content

1. This element contains a textual description associated with the code specified in PID04.

Segment: **MEA** **Measurements**
Position: 193
Loop: PID
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify physical measurements or counts, including dimensions, tolerances, variances, and weights (See Figures Appendix for example of use of C001)
Syntax Notes:
1 If MEA05 is present, then MEA04 is required.
2 If MEA06 is present, then MEA04 is required.
3 Only one of MEA08 or MEA03 may be present.
4 If MEA07 is present, then at least one of MEA03 MEA05 or MEA06 is required.
5 At least one of MEA03 MEA05 MEA06 or MEA08 is required.
Semantic Notes:
1 MEA04 defines the unit of measure for MEA03, MEA05, and MEA06.
Comments:
1 When citing dimensional tolerances, any measurement requiring a sign (+ or -), or any measurement where a positive (+) value cannot be assumed, use MEA05 as the negative (-) value and MEA06 as the positive (+) value.
Notes:
1. This note pertains to POINT, AREA, and NONROAD SOURCE only. This segment provides emission unit, emission release point, and control equipment physical parameter/specification data associated with the entry specified in the PID segment (prior segment).

2. This note pertains to AREA, NONROAD, MOBILE, and BIOGENIC SOURCE only. This segment provides grid or county area data associated with the entry specified in the PID segment (prior segment).

3. Segment Example:

MEA*PD*5E*43*FT~
< physical dimensions indicating 43 feet in height above the ground >

Data Element Summary

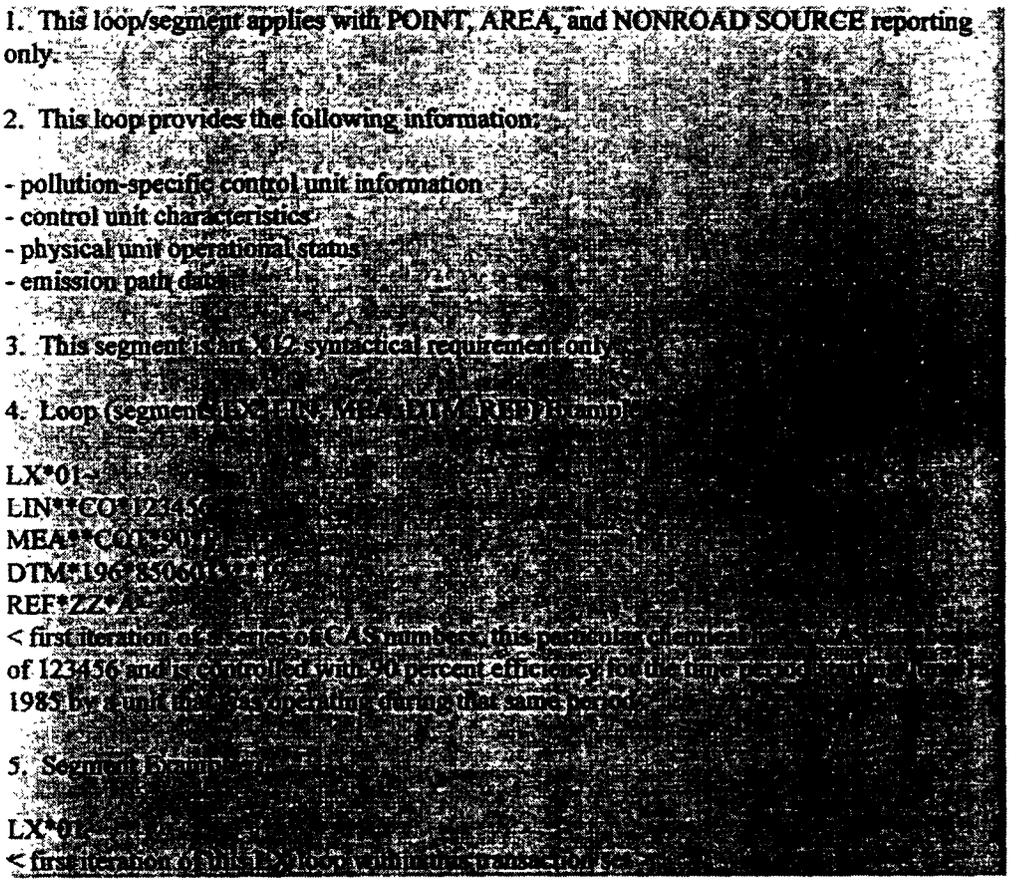
Ref. Des.	Data Element	Name	Attributes
MEA01	737	**Measurement Reference ID Code** Code identifying the broad category to which a measurement applies 1. This note pertains to AREA, NONROAD, MOBILE, and BIOGENIC SOURCE only. When applying this element, only code "PD" may be applied. 2. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list: BA Base Point Indicates plume height data. CT Counts Indicates the number of units being reported as a single emission unit. PD Physical Dimensions 1. When being applied with POINT, AREA, and NONROAD SOURCE reporting, this code is defined as indicating the physical dimensions of the unit. 2. When being applied with AREA, NONROAD, MOBILE, and BIOGENIC SOURCE reporting, this	O ID 2/2

code is defined as indicating grid or county area data.

			TE	Temperature		
				Indicates exit gas temperature		
	MEA02	738	**Measurement Qualifier**		O ID	1/3
			Code identifying a specific product or process characteristic to which a measurement applies			
			1. This note pertains to AREA, NONROAD, MOBILE, and BIOGENIC SOURCE only. When applying this element, code "M4" may only be applied.			
			2. This element indicates the type of measurement being reported with this iteration of the loop. Select one from the following list:			
				5F	Height Above Ground	
				FR	Flow Rate	
				ID	Inside Diameter	
				M4	Area	
				PRL	Product Level	
				Indicates maximum rated throughput		
				VOL	Volume	
				Indicates design capacity		
				ZZZ	Mutually Defined	
				Indicates utility rating		
	MEA03	739	**Measurement Value**		X R	1/20
			The value of the measurement			
			1. This element contains the value associated with MEA02.			
	MEA04	C001	**Composite Unit of Measure**		X	
			To identify a composite unit of measure (See Figures Appendix for examples of use)			
			1. This composite provides the unit of measure associated with MEA03.			
>>	C00101	355	**Unit or Basis for Measurement Code**		M ID	2/2
			Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken			
			1. Code "EA" applies with POINT SOURCE reporting only.			
			2. When EDB element C00101 is only code from each code source units may be applied.			
			3. This element contains the unit of measure associated with MEA03. Select one from the following list:			
				2L	Cubic Feet Per Minute	
					Rate of flow	
				4I	Meters Per Second	
					Measure of linear speed	
				8U	Square Kilometer	
				EA	Each	
				Units used to report number of emission units.		
				1. This code applies with POINT SOURCE reporting only.		
				FA	Fahrenheit	
				FS	Feet Per Second	

	Measure of linear speed
FT	Foot
HQ	Hectare
PI	Percent
SM	Square Meter

Segment: **LX** Assigned Number
Position: 223
Loop: LX
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To reference a line number in a transaction set
Syntax Notes:
Semantic Notes:
Comments:
Notes:



Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	LX01	554	**Assigned Number** Number assigned for differentiation within a transaction set	M	N0	1/6

Segment: **LIN** **Item Identification**
Position: 225
Loop: LX
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify basic item identification data
Syntax Notes:
1 If either LIN04 or LIN05 is present, then the other is required.
2 If either LIN06 or LIN07 is present, then the other is required.
3 If either LIN08 or LIN09 is present, then the other is required.
4 If either LIN10 or LIN11 is present, then the other is required.
5 If either LIN12 or LIN13 is present, then the other is required.
6 If either LIN14 or LIN15 is present, then the other is required.
7 If either LIN16 or LIN17 is present, then the other is required.
8 If either LIN18 or LIN19 is present, then the other is required.
9 If either LIN20 or LIN21 is present, then the other is required.
10 If either LIN22 or LIN23 is present, then the other is required.
11 If either LIN24 or LIN25 is present, then the other is required.
12 If either LIN26 or LIN27 is present, then the other is required.
13 If either LIN28 or LIN29 is present, then the other is required.
14 If either LIN30 or LIN31 is present, then the other is required.
Semantic Notes:
1 LIN01 is the line item identification
Comments:
1 See the Data Dictionary for a complete list of ID's.
2 LIN02 through LIN31 provide for fifteen (15) different product/service ID's for each item. For Example: Case, Color, Drawing No., UPC No., ISBN No., Model No., SKU.

Notes:
1. This segment applies with POINT, AREA, and NONROAD SOURCE reporting only.

2. This segment provides pollutant-specific information associated with a control unit specified in the PID segment (prior segment).

3. Segment Example:

LIN**CO*123456~**
< CAS number is 123456>

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
	LIN01	350	**Assigned Identification**	**O**	**AN**	**1/20**
			Alphanumeric characters assigned for differentiation within a transaction set			
			1. This element contains a unique report number that differentiates this submission from others. This element is applied at the discretion of the trading partner.			
>>	LIN02	235	**Product/Service ID Qualifier**	**M**	**ID**	**2/2**
			Code identifying the type/source of the descriptive number used in Product/Service ID (234)			
			1. This element indicates the identifier for a specific pollutant associated with a control unit.			
			CO Chemical Abstract Service (CAS) Registry Number			
			ZZ Mutually Defined			
			Indicates Pollutant Code			
>>	LIN03	234	**Product/Service ID**	**M**	**AN**	**1/40**

Identifying number for a product or service

1. **When LIN02 is "CO", this element contains a Chemical Abstract Service (CAS) number.**

2. **When LIN02 is "ZZ", this element contains a pollutant code. Select one from the following list:**

CO	Carbon monoxide
HC	Hydrocarbons
ISO	Isoprene
MONO	Monoterpines
NMHC	Nonmethane hydrocarbons
NMOC	Nonmethane organic compounds
NMOG	Nonmethane organic gases
NO	Nitric oxide
NOX	Nitrogen oxides
NOY	Nitrogen oxides plus secondary compounds
OVOC	Other volatile organic compounds
PB	Lead
PM	Particulate matter
PM10	Particulate matter >= 10
PM25	Particulate matter >= 2.5
ROG	Reactive organic gases
SOX	Sulfur oxides
TOG	Total organic gases
VOC	Volatile organic compounds

Segment: **MEA** **Measurements**
Position: 229
Loop: LX
Level: Detail
Usage: Mandatory
Max Use: >1
Purpose: To specify physical measurements or counts, including dimensions, tolerances, variances, and weights (See Figures Appendix for example of use of C001)
Syntax Notes:
1 If MEA05 is present, then MEA04 is required.
2 If MEA06 is present, then MEA04 is required.
3 Only one of MEA08 or MEA03 may be present.
4 If MEA07 is present, then at least one of MEA03 MEA05 or MEA06 is required.
5 At least one of MEA03 MEA05 MEA06 or MEA08 is required.
Semantic Notes:
1 MEA04 defines the unit of measure for MEA03, MEA05, and MEA06.
Comments:
1 When citing dimensional tolerances, any measurement requiring a sign (+ or -), or any measurement where a positive (+) value cannot be assumed, use MEA05 as the negative (-) value and MEA06 as the positive (+) value.
Notes:
1. This segment applies with POINT, AREA, and NONROAD SOURCE reporting only.

2. This segment provides the characteristics of a control unit specified in the PID segment (prior segment).

3. Segment Example:

MEA**COT*90*P1~
< control efficiency of 90 percent >

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
MEA02	738	**Measurement Qualifier** Code identifying a specific product or process characteristic to which a measurement applies 1. This element indicates the control unit characteristic being reported with this iteration of the loop. Select one from the following list:	O ID 1/3
		COT Content The amount of specified material contained Indicates percent control efficiency data.	
		DIS Dispersion The ease with which one substance mixes with another Indicates path split data.	
		FR Flow Rate Indicates stack velocity.	
		IGR Input Gas Rate Volume of gas input during a 24-hour test period Indicates percent capture efficiency data.	
		VOL Volume Indicates capacity data when used to describe control unit.	
MEA03	739	**Measurement Value** The value of the measurement	X R 1/20

1. This element contains the value associated with MEA02.

	MEA04	C001	Composite Unit of Measure	X		

To identify a composite unit of measure (See Figures Appendix for examples of use)

1. This composite provides the unit of measure associated with MEA03.

>>	C00101	355	Unit or Basis for Measurement Code	M	ID	2/2

Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken

1. This element contains the unit of measure associated with MEA03. Select one from the following list.

2I	British Thermal Units (BTUs) Per Hour British thermal units per hour
2L	Cubic Feet Per Minute Rate of flow
4I	Meters Per Second Measure of linear speed
4U	Pounds Per Hour Rate of flow
4W	Ton Per Hour Rate of flow
BR	Barrel
BY	British Thermal Unit (BTU)
CE	Centigrade, Celsius
CF	Cubic Feet
EA	Each
FA	Fahrenheit
FS	Feet Per Second Measure of linear speed
FT	Foot
GA	Gallon
HM	Miles Per Hour
HR	Hours
HT	Half Hour
MR	Meter
P1	Percent
SF	Square Foot
T6	Thousand Gallons

Segment: **DTM** Date/Time Reference
Position: 235
Loop: LX
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify pertinent dates and times
Syntax Notes: 1 If either DTM06 or DTM07 is present, then the other is required.
2 At least one of DTM02 DTM03 or DTM06 is required.
Semantic Notes:
Comments:
Notes: 1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides the time period associated with operational status of a physical unit specified in the PID segment (prior segment).

3. Segment Example:

DTM*196*850601***19~
< time period starting June 1, 1985 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	DTM01	374	**Date/Time Qualifier** Code specifying type of date or time, or both date and time 1. This element indicates the date on which a specified control unit operational status initially became effective. 196 Start	M	ID	3/3
	DTM02	373	**Date** Date (YYMMDD) 1. This element contains the date value associated with DTM01.	X	DT	6/6
	DTM05	624	**Century** The first two characters in the designation of the year (CCYY) 1. This element contains the hundred year designation associated with the date in DTM02.	O	N0	2/2

Segment: **REF** **Reference Identification**
Position: 237
Loop: LX
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This segment does not apply with BIOGENIC SOURCE reporting.
2. This segment provides the operational status of a physical unit and emission path data specified in the PID segment (prior segment).
3. Segment Example:
REF*ZZ*A~
<unit is operational>

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list:	M ID 2/3
			5M Previous Sequence Indicates the HL01 identifier at which the data flow for a given emission path originates.	
			ZZ Mutually Defined Indicates physical unit operational status.	
	REF02	127	**Reference Identification** Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier 1. When MEA02 (prior segment) is "DIS" and REF01 is "5M", this element contains the HL01 identifier at which the data flow for a given path originates. 2. When REF01 is "ZZ", this element indicates the operational status of a physical unit. Select one from the following list:	X AN 1/30
			A Operating	
			B Under Construction	
			C Under Modification	
			D Mothballed Indicates that a unit is currently permanently non-operational with the possibility of reuse.	
			E Closed - Dismantled/Removed From Site Indicates that a unit dismantled and removed from the site with no possibility of reuse.	
			F Closed - Remaining On Site	

Indicates that a unit remains on site with no possibility of reuse

REF03	**352**	**Description**	**X**	**AN**	**1/80**

A free-form description to clarify the related data elements and their content

1. **This element contains a textual description associated with REF02.**

Segment: **HL** **Hierarchical Level**
Position: 319
Loop: HL
Level: Detail
Usage: Mandatory
Max Use: 1
Purpose: To identify dependencies among and the content of hierarchically related groups of data segments
Syntax Notes:
Semantic Notes:
Comments:

1 The HL segment is used to identify levels of detail information using a hierarchical structure, such as relating line-item data to shipment data, and packaging data to line-item data.
2 HL01 shall contain a unique alphanumeric number for each occurrence of the HL segment in the transaction set. For example, HL01 could be used to indicate the number of occurrences of the HL segment, in which case the value of HL01 would be "1" for the initial HL segment and would be incremented by one in each subsequent HL segment within the transaction.
3 HL02 identifies the hierarchical ID number of the HL segment to which the current HL segment is subordinate.
4 HL03 indicates the context of the series of segments following the current HL segment up to the next occurrence of an HL segment in the transaction. For example, HL03 is used to indicate that subsequent segments in the HL loop form a logical grouping of data referring to shipment, order, or item-level information.
5 HL04 indicates whether or not there are subordinate (or child) HL segments related to the current HL segment.

Notes:

1. This loop does not apply with BIOGENIC SOURCE reporting. For BIOGENIC SOURCE reporting, proceed to next HL loop (HLC).

2. This level/loop (HL6) provides process-level data, including:

- confidentiality indicator
- process identification information
- process-level message and/or materials and materials description (point source only)
- emission process information (SCC, AMS, and ASCT codes)
- Standard Industry Classification (SIC) codes
- process growth factor information
- process operating schedule
- seasonal operation adjustment factor information
- operating schedule line item information
- process characteristic information

3. This loop must be applied one (1) time for each emissions process.

4. Loop (segments HL, SPI, MSG, PID, REF, LX, MEA, DTM, REF, CID, STA, DTM, REF) Example:

```
HL*10*02*6*1~
SPI*00*2I*1234567~
PID*S*SC*EP*Z234~
REF*LI*33~
LX*01~
MEA*AG**10*P1~
DTM*196*****CY*1997~
```

TECHNICAL REPORT DATA

(PLEASE READ INSTRUCTIONS ON THE REVERSE BEFORE COMPLETING)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-454/R-97-004g		

4. TITLE AND SUBTITLE	5. REPORT DATE
Emission Inventory Improvement Program Data Management Procedures Preferred And Alternative Methods	7/25/97
	6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)	8. PERFORMING ORGANIZATION REPORT NO.
Emission Inventory Improvement Program Data Management Committee	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT NO.
U.S. Environmental Protection Agency Office Of Air Quality Planning And Standards (MD-14) Research Triangle Park, NC 27711	11. CONTRACT/GRANT NO. 68-D2-0160

12. SPONSORING AGENCY NAME AND ADDRESS	13. TYPE OF REPORT AND PERIOD COVERED
Office Of Air Quality Planning And Standards, Office Of Air And Radiation, U. S. Environmental Protection Agency Research Triangle Park, NC 27111	Technical
	14. SPONSORING AGENCY CODE EPA/200/04

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Emission Inventory Improvement Program (EIIP) was established in 1993 to promote the development and use of standard procedures for collecting, calculating, storing, reporting, and sharing air emissions data. The EIIP is designed to promote the development of emission inventories that have targeted quality objectives, are cost-effective, and contain reliable and accessible data for end users. To this end, the EIIP is developing inventory guidance and materials which will be available to states and local agencies, the regulated community, the public and the EPA.

Volume VII presents preferred and alternative methods for managing, reporting, and exchanging emissions data.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI FIELD/GROUP
Air Emisisons Air Pollution Emission Inventory Inventory Guidance	Air Pollution Control Emission Inventory Guidance	

18. DISTRIBUTION STATEMENT		21. NO. OF PAGES
		455
		22. PRICE

Feedback from prior demonstrations to the EIIP/DMC will be used to refine a demonstration approach.

The output that will be generated by this task consists of the following:

- A demonstration of the integrated prototype to users specified by DOPO

No specific resource requirements have been identified for this task.

2.1.4 Support Technology Transfer

Technical summary reports will be provided as deemed necessary by the DOPO throughout this project.

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A proposed approach to the prototype demonstration will be reviewed by the DOPO before scripting the demonstration and assembling presentation materials. The demonstration may be limited to presentation materials only or a partial demonstration of the software combined with presentation materials. For example, the software demonstration could be limited to data transfer starting with an EDI X12 file that has been received. If the DOPO desires a full demonstration of the software, a sending side participant may need to be specified and arrangements made for them to participate in the send side of the demonstration on a specified date.

2.1.3.2 Develop Demonstration/Presentation Materials

A script enumerating the steps of the demonstration will be compiled and refined through dry runs to produce a polished presentation. After a presentation approach is devised, effective presentation materials will be assembled.

The output that will be generated by this task consists of the following:

- Demonstration Script And Presentation Materials

2.1.3.3 Perform prototype demonstration for DMC

All aspects of the data transfer prototype will be demonstrated to the Data Management Committee to show the feasibility of an integrated system.

The output that will be generated by this task consists of the following:

- A professionally executed demonstration of the prototype.

No specific resource requirements have been identified for this task.

2.1.3.4 Modify Demonstration/Presentation Materials based upon input from DMC

The first demonstration of the prototype will, undoubtedly, reveal improvements that can be made in the presentation. Input from prototype demonstration to the Data Management Committee will be used to improve the presentation before demonstrating to agencies outside of the EPA.

The output that will be generated by this task consists of the following:

- Revised Demonstration/Presentation Materials

No specific resource requirements have been identified for this task.

2.1.3.5 Perform prototype demonstration to outside users

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
API Design	Electronic	TPMC	7/22/97
Test Plan	Hardcopy	TPMC	7/22/97

2.1.2.7 Integrate the Data Transfer Prototype Components

If components need to be tightly coupled, they will be integrated before proceeding with integrated testing. An integrated approach will allow the transmission of the same data through all stages of the transfer prototype. This will also enable a comparison of data in the sending and receiving databases.

2.1.2.8 Perform Integrated Testing for the Data Transfer Prototype

Comprehensive testing will be carried out according to the test plan. This includes, but is not limited to, the following items:

- Validation of Data File Stream Extracted from Pilot Partner(s) Database in the organization specified by the ADF File specification.
- Validation of EDI X12 Code After Translation.
- Validation of ASCII File Contents After ADF Compliant Translation at EPA/EFIG.
- Validation of EIIP Prototype Database Contents After Loading.
- Validation of Source-to-Receiver Data Transfer.

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
Completed Test Plan	Hardcopy	TPMC	8/25/97

2.1.3 Demonstrate Prototype

The task addresses the demonstration of all aspects of the prototype to interested parties. Focus will begin within the EIIP so that the demonstration can be refined before presentation to outside agencies.

2.1.3.1 Review prototype with DOPO

- State EDI Translator Configuration Report

No specific resource requirements have been identified for this task.

2.1.2.6.2 Design PADER Application Program Interface

DynCorp and TPMC will work with PADER to design an API which generates an ASCII file from PADER's database that will be passed to the translator in a format consistent with the ADF specifications. DynCorp will provide EDI expertise while TPMC will concentrate on the database aspects of the design. TPMC's portion of the task consists primarily in determining how to unload data from PADER's database into a file that conforms to the ADF specifications. This may have to be a two step process if the software which must be used to extract the data from the database does not provide enough control over the form of the extracted data. It is anticipated that PADER will make a very significant contribution to completing this task. This has been taken into account in the current schedule. TPMC may need read access to PADER's database or a local example database with the same structure in order to participate in developing and testing the software that will extract the data.

The output that will be generated by this task consists of the following:

- PADER Application Interface

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
Prototype Architectural Design (Portion describing PADER's environment)	Hardcopy	TPMC	7/7/97
ADF specification	Hardcopy	DynCorp	7/7/97
Read access to PADER's Database or another database of similar structure.	Electronic	Penn.	7/7/97 (optional)

2.1.2.6.3 Code And Test PADER's Application Program Interface

The PADER API will be coded according to specifications. The code will be tested according to TPMC's test plan.

The output that will be generated by this task consists of the following:

- Completed test report(s).
- Operational Application Program Interface

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
API Design	Hardcopy	TPMC	6/3/97
Test Plan	Hardcopy	TPMC	6/10/97

2.1.2.5.5 Build EPA's Viewer for Data Received

The queries developed for the prototype database demonstration may satisfy the need for a tool to enable users to browse through loaded test data. If not, they can be augmented by expanding existing queries or adding additional queries to whatever query tool was chosen.

- Queries tailored for loaded data.

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
SQL*Net for the client workstation	Electronic	TPMC	Complete
Oracle ODBC driver	Electronic	TPMC	Complete
Oracle Data Browser, Microsoft Access, or other third-party ad hoc query tools	Electronic	TPMC and/or EFIG	6/16/97 (optional)

2.1.2.6 Develop PADER's Data Transfer (Send) Prototype Components

This process should be very similar to the development of CARB's Data Transfer Components. Lessons learned from the CARB transfer prototype should reduce the amount of time needed to perform some tasks. The process of unloading of data from PADER's database will not benefit as much from lessons learned during the CARB prototype transmission if the databases are dissimilar (i.e., different database types and/or data storage methods).

2.1.2.6.1 Install EDI Translator And Transmission Software for PADER

The mapped EDI translator must be installed and configured as per PADER's operating system and telecommunications environment. Transmission software must also be installed. The same translator mapping will be used by all participants.

The output that will be generated by this task consists of the following:

2.1.2.5.2 Install EDI translator and transmission software for EPA

The mapped EDI translator must be installed and configured as per EPA's operating system and telecommunications environment. Transmission software must also be installed. The same translator mapping will be used by all participants.

The output that will be generated by this task consists of the following:

- EPA EDI Translator Configuration Report

No specific resource requirements have been identified for this task.

2.1.2.5.3 Design EPA's Application Program Interface

Design of the application program interface will be done as a joint venture between DynCorp and TPMC with TPMC having the lead coordination and development role. The application will read the required data from an EIIP EDI X12 format, convert it to an ASCII file according the ADF, and load the data into the prototype database. DynCorp will provide EDI expertise while TPMC will provide database loading expertise. The output that will be generated by this task consists of the following:

- EPA Application Interface Design

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
ADF specification	Hardcopy	TPMC	5/20/97

2.1.2.5.4 Code EPA's Application Program Interface

The API that creates a data file based on the ADF specifications and loads it into the EIIP prototype database application interface at EPA will be coded according to specifications. This may actually consist of two separate programs. One program is needed to create the data file using the ADF. The other program will load the data file into the prototype database. The code will be tested according to TPMC's test plan.

The outputs that will be generated by this task consist of the following:

- Test notes
- Operational EPA Application Interface

2.1.2.4.4 Code And Test CARB's Application Program Interface

The CARB API will be coded according to specifications. The code will be tested according to TPMC's test plan.

The output that will be generated by this task consists of the following:

- Completed test report(s)
- Operational Application Program Interface

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
ADF specification	Hardcopy	DynCorp	4/3/97
Read access to CARB's Database or another database of similar structure	Electronic	DynCorp	4/3/97 (optional)
Test Plan	Hardcopy	TPMC	4/10/97

2.1.2.5 Develop EPA's Data Transfer (Receiver) Prototype Components

This task consists of designing, building, configuring, and testing translation and interface software to:

- Define an ADF file format.
- Translate an X12.841 transaction containing emissions inventory data into an ASCII data file as per ADF file format.
- Load the ASCII data file contents into the EIIP prototype database located at EPA/EFIG.

2.1.2.5.1 Design ADF file for EDI translation

DynCorp will design an ADF file format suitable for generating a file which the prototype API can load into the EIIP prototype database.

The output that will be generated by this task consists of the following:

- A completed ADF file design specification (DynCorp)

No specific resource requirements have been identified for this task.

No specific resource requirements have been identified for this task.

2.1.2.4.2 Install EDI Translator And Transmission Software for CARB

The mapped EDI translator must be installed and configured as per CARB's operating system and telecommunications environment. Transmission software must also be installed. The same translator mapping will be used by all participants.

The output that will be generated by this task consists of the following:

- State EDI Translator Configuration Report

No specific resource requirements have been identified for this task.

2.1.2.4.3 Design CARB's Application Program Interface

DynCorp and TPMC will work with CARB to design an API which generates an ASCII file from CARB's database that will be passed to the translator in a format consistent with the ADF specifications. DynCorp will provide EDI expertise while TPMC will concentrate on the database aspects of the design. TPMC's portion of the task consists primarily in determining how to unload data from CARB's database into a file that conforms to the ADF specifications. This may have to be a two step process if the software which must be used to extract the data from the database does not provide enough control over the form of the extracted data. It is anticipated that CARB will make a very significant contribution to completing this task. This has been taken into account in the current schedule. TPMC may need read access to CARB's database or a local example database with the same structure in order to participate in developing and testing the software that will extract the data.

The output that will be generated by this task consists of the following:

CARB Application Interface Design

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
Prototype Architectural Design (Portion describing CARB's environment)	Hardcopy	TPMC	3/17/97
ADF specification	Hardcopy	DynCorp	3/17/97
Read access to CARB's Database or another database of similar structure	Hardcopy	CARB	3/17/97

listed in the following table indicate when the software will need to be installed. The translator software must first be configured (mapped) before it can be installed.

Resource	Format	Provided By	Date Required
Transmission software for CARB	Electronic	Pilot Participant	5/12/97
EDI translator software for CARB	Electronic	DOPO/DynCorp	5/12/97
Database software from CARB	Electronic	CARB	4/1/97 (Optional)
Transmission software for EPA/EFIG	Electronic	DOPO	6/30/97
EDI translator software for EPA/EFIG	Electronic	DOPO/DynCorp	6/30/97
Transmission software for PADER	Electronic	Pilot Participant	8/14/97
EDI translator software for PADER	Electronic	DOPO/DynCorp	8/14/97
Database software from PADER	Electronic	Penn.	5/1/97 (Optional)
Microsoft C++ compiler	Electronic	EFIG	5/12/97 (Optional)
List of additional software needed	Hardcopy	TPMC	3/5/97 (Optional)

2.1.2.4 Develop CARB's Data Transfer (Send) Prototype Components

This task consists of designing, building, configuring, and testing translation and interface software to:

- Extract data from the state database into an ADF compliant ASCII file.
- Translate the ASCII file into an X12.841 transaction suitable for transmission via the translator.

2.1.2.4.1 Design ADF file for EDI translation

DynCorp will design an ADF file format that will document the format that the data stream must be in to communicate the data in a manner that is consistent with the Convention Document and translator.

The outputs that will be generated by this task consist of the following:

- A completed ADF file design specification. (DynCorp)

ASCII file send side	ASCII file receive side	Translator, ADF, and Transmission Software	Automated[1]
Pilot Database	EIIP Prototype DB	All of above	Manual

[1]The feasibility of this depends on how the translator is implemented.

Another aspect of the test strategy that is important is keeping track of the state (versioning) of various software modules. Although an elaborate configuration management scheme is not appropriate for this project, a systematic approach to storing of modules and versions will be applied to facilitate efficient correction of problems detected during testing. It is sometimes more effective to revert to a previous version when "fixes" to the software introduce perplexing anomalies. A systematic approach to storing versions ensures that the previous versions are available if this situation should arise.

DynCorp will assist TPMC in the development of the test strategy.

The output that will be generated by this task consists of the following:

- An outline of the test strategy with a summary description of the testing approach.

No specific resource requirements have been identified for this task.

2.1.2.2.2 Create Test Plan

Once more detail is available about the operating systems and types of software that will be used in the prototype, a more specific plan can be written that enumerates the steps needed to implement the test strategy in particular environments. To some extent, the operating systems and application software packages dictate the best approach to validation techniques. Tools which can be used to automate validation may also be identified.

The output that will be generated by this task consists of the following:

- A Detailed Testing Plan/Checklist

2.1.2.3 Obtain and install required software

It may be necessary to obtain additional software needed to support the prototype development. Whether additional software is needed should become apparent when the architectural design has been completed and the early stages of the API design has begun. TPMC will provide to the DOPO a list of the additional software needed. The software listed below will be provided either by the DOPO or purchased through ODCs if needed. The dates

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
List of available translators (including those held by the states and local agencies)	Hardcopy	DynCorp	Completed
Infrastructure information from EPA	Hardcopy	TPMC/DOPO	3/17/97
Infrastructure information from CARB	Hardcopy	TPMC/CARB	3/17/97
Infrastructure information from PADER	Hardcopy	TPMC/PADER	3/17/97
Documentation on the business process(es) to be prototyped	Hardcopy	DOPO	Completed

2.1.2.2 Develop Test Plan

A systematic test plan is needed to insure that no data corruption occurs at any point in the path from the sending database to the receiving database. Testing should also identify software failures such as core dumps, General Protection Faults, infinite loops, or annoying user interface idiosyncracies.

2.1.2.2.1 Identify Test Strategy

The transfer of data occurs in several steps like links in a chain. Since a problem in any link in the chain affects the integrity of the whole chain, each link should be tested individually. If data from the source and destination database compare well, it indicates that data transfer at each link was successful. If the source and destination data does not compare favorably, the problem(s) cannot be pinpointed without the application of some sort of validation technique for each data transfer. Therefore, a means will be devised to verify that data is accurately transferred for each of the steps in the table below.

From	To	Transfer Mechanism	Means
Pilot Database	ADF compliant ASCII file	Dependent on database	Manual
ADF compliant ASCII File	X12	X12 Translator and ADF File	Manual
X12 (send)	X12 (receive)	Transmission Software	Manual
X12	ADF compliant ASCII file	X12 Translator and ADF File	Manual
ADF compliant ASCII File	EIIP Prototype DB	SQL*Loader	Manual

No specific resource requirements have been identified for this task.

2.1.2.1.5 Map Transmission Translator

The translator must be mapped to be consistent (i.e. reflect) the Convention Document. This will be done once the Convention Document is complete. The translator vendor, Supply Tech, will do the work which will take approximately four weeks. This work will be performed concurrently with other tasks. The same mapping (called an overlay) will be used by all participants.

2.1.2.1.6 Develop Prototype Architectural Design

After the pilot participant(s) and the business process(es) to be prototyped have been identified it will be possible to define the architectural design for the prototype. The architectural design will take into consideration the existing information technology infrastructure for the pilot participant(s) and EPA/EFIG. TPMC will conduct a survey to analyze the computing platforms, software environment, and telecommunications capabilities for each pilot participant to determine the architecture that will most effectively allow integration with the EPA/EFIG infrastructure and support the goals of the data transfer method prototype. An architecture design document will be created that describes the architecture of each pilot participant site and EPA/EFIG. The document will also describe the proposed telecommunication links between each of the pilot participant sites and EPA/EFIG. Any additional resources that are needed to implement the architectural design will be described in the design document. However, it is expected that the architectural design will focus on using existing infrastructure wherever possible.

The output that will be generated by this task consists of the following:

- The architectural design documentation for the prototype

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
List of available translators (including those held by the states and local agencies)	Hardcopy	DynCorp	Completed

2.1.2.1.3 Identify Inventory Type(s) to be Prototyped

There are several types of inventory transactions that provide information that is incorporated into the emissions inventory database. The major types of emissions inventory data are Point Source, Area Source, Mobile Source and Biogenic Source. Some examples of the transactions that require the submittal of these source inventory types are:

- State Implementation Plans (SIP)
- Annual Inventories
- Modeling Inventories

The output of this task is the identification of the inventory type(s) to be prototyped.(DOPO)

This task is completed. Data transfer will be demonstrated for the emission inventory data needed for regional air quality modeling as specified by ECOS.

2.1.2.1.4 Submit Prototype Version of the EIIP EDI X12 Convention Document and Implementation Guideline

The EIIP's EDI Implementation Guideline will serve as a guide for parties who wish to electronically submit their emission data to the EPA, or others that accept the EIIP EDI data format. The document will be developed by DynCorp. The Implementation Guideline will incorporate the Convention Document as an appendix. It will be finished approximately two weeks after the Convention Document. The Convention Document will be a technical guide that will be used to map the translator. The Implementation Guideline will also provide a crosswalk that enables the reader to locate each attribute in the EIIP data model and the corresponding location in the Convention Document. The Implementation Guideline will specify business rules which apply to the data transfer (i.e., rules for modeling inventory data). This will affect how the API is designed.

The output that will be generated by this task consists of the following:

- EIIP Draft EDI Convention Document for Prototype (2/18/97 DynCorp)
- EIIP Draft EDI Implementation Guideline for Prototype (3/3/97 DynCorp)
- EIIP EDI Implementation Guideline for Prototype (3/17/97 DynCorp)

2.1.2.1.1 Identify Available EDI Translators

The goal of this task is to identify any EDI translators that are available to be used for the purpose of this data transfer method prototype with minimal cost to EFIG and EIIP/DMC. Other workgroups within the EPA might have a translator that is not being used and may be borrowed for this prototype on a temporary basis. Some vendors may also provide an evaluation copy of their EDI translator product for use with the prototype. Another alternative is to select pilot participant(s) that have an EDI translator and are willing to allow it to be utilized as part of their participation in the demonstration project. If no EDI translators are located then it will be necessary to purchase the needed translator(s) to complete the prototype demonstration. It is understood that DynCorp will work with the DOPO under a separate Delivery Order (ITAS-008) to provide this information.

The output that will be generated by this task consists of the following:

- A list of available EDI translators that are available for use with this prototype. (DynCorp)

This task is completed. The translator which will be used is STX by SupplyTech.

No specific resource requirements have been identified for this task.

2.1.2.1.2 Identify Pilot Participants

One of the goals of the prototype demonstration is to include one or two states or local agencies from the EIIP user community as pilot participants in the prototype development and demonstration. The selected participants should have a working knowledge of EDI and how it is being applied to this data transfer method prototype. The DOPO will select the participant(s) based upon information that is gathered by this task. An example of the criteria that will be used for pilot participant selection includes a working knowledge of EDI and available resources (equipment, software, and staff) that can be committed to the prototype.

The output that will be generated by this task consists of the following:

- The names of one or two pilot participants.

This task has been completed. The two pilot participants are PADER and the California Air Resource Board (CARB).

2.1.1.18 Modify the database design and "viewer"

After TPMC has received feedback from the EFIG and Pechan users, we will return to the appropriate point in this action plan to modify the database design and/or "viewer." Depending upon the complexity of the modification(s) it might be necessary to repeat one or more of the previous tasks. Simple modifications might only require a memo describing the changes to be issued to the users and then evaluating any feedback the users provide. Major changes may require additional design review and training sessions to be held.

This task will attain successful completion when no modifications have been identified by the EFIG and Pechan users during the previous task (Get feedback from EFIG/Pechan about database design and "viewer"). At that time, TPMC will provide an export of the logical and physical database design from the Oracle Designer/2000 so that EFIG/Pechan will have it for any future modifications.

The output generated by this task consists of the following:

- Export of the logical and physical database design from Designer/2000.

No additional resource requirements have been identified for this task.

2.1.2 Develop Data Transfer Prototype

This task consists of integrating the various components, modules and manual procedures that are needed to perform data transfers for the EIIP EDI X12 datasets within the scope of this Delivery Order. The scope of the data transfer prototype encompasses the retrieval of a specified dataset from the pilot partner(s) database, translation of that data into the EDI X12 standard dataset, transmission of the EDI X12 dataset to EPA/EFIG over available telecommunication links, translation of the data back out of the transmitted EDI X12 dataset, and loading of the data into the EIIP prototype database.

2.1.2.1 Finalize Detailed Design

There are several steps that must be completed before the data transfer prototype design can be considered finalized. These steps define the structure under which the prototype must operate to successfully demonstrate the data transfer method.

database design as part of the training session. It is anticipated that all of the EFIG and Pechan users will be trained during a single half-day session.

The outputs generated by this task consists of the following:

- List of tables/columns and their descriptions
- Relational database theory notes

No resource requirements have been identified for this task.

2.1.1.16 Provide training on the prototype demonstration "viewer"

TPMC will provide training on the use of the "viewer" to the EFIG and Pechan staff. Training will consist of how to use the "viewer" for running the "canned" queries and how to use the "viewer" for creating their own ad-hoc queries. A list of the "canned" queries and a brief description of each will be prepared for the training session by TPMC. It is anticipated that all of the EFIG and Pechan users will be trained during a single half-day session.

The outputs generated by this task consists of the following:

- List of "canned" queries

No resource requirements have been identified for this task.

2.1.1.17 Get feedback from EFIG/Pechan about database design and "viewer"

After the EFIG and Pechan users are trained on the database design and the use of the "viewer," they will use the "viewer" to evaluate the database design and ensure that it satisfies their functional requirements. A follow-up meeting with the EFIG and Pechan users will be held to discuss their experiences with the "viewer" and the prototype database. All suggestions will be discussed by the group to determine whether they should be implemented in the database design or "canned queries." It may also be determined that another "viewer" or different "canned queries" would be more appropriate for evaluating the prototype.

The output from this task will be a list of database and "viewer" modifications that should be implemented.

No additional resource requirements have been identified for this task.

Successful completion of this task is attained after the "viewer" and all of the canned queries are verified to execute properly. There are no formal outputs created by this task.

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
Additional client workstation for testing	n/a	TPMC	4/28/97
Oracle Data Browser, Microsoft Access, or other third-party ad hoc query tools	Electronic	TPMC and/or EFIG	4/28/97 (optional)

2.1.1.14 Install "viewer" at EFIG/Pechan for prototype demonstration purposes

The "viewer" and "canned" queries are installed on EFIG and Pechan workstations and/or servers during this task. TPMC will assist the EPA/EFIG and Pechan desktop support staff with the initial installation and help to resolve any installation problems that may arise. TPMC will provide an installation disk(s) that contains the "canned" queries and any scripts or procedures needed to install the queries. EFIG/Pechan must provide the appropriate "viewer" for installation on (or accessible from) each of the targeted workstations.

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
"Canned" query installation disk(s)	Electronic	TPMC	4/29/97
Oracle Data Browser, Microsoft Access or other third-party ad hoc query tool for each targeted workstation	Electronic	EFIG/Pechan	4/29/97 (optional)
Oracle SQL*Net for each targeted workstation	Electronic	EFIG/Pechan	4/29/97

2.1.1.15 Provide database design training to EFIG/Pechan

TPMC will provide training on the database design to the EFIG and Pechan staff. Training will consist of learning how the database is organized and how it can be used to formulate ad-hoc queries with the "viewer." A list of the database tables and columns will be prepared for the training session by TPMC. A brief description of each table and column will also be included in the list. TPMC is prepared to review relational database theory in relation to the prototype

It should be noted that performance evaluation of this prototype may not accurately reflect the performance provided by a production database that has a significantly larger volume of data. However, the procedures developed for evaluating the performance can be used by EFIG/Pechan in the future as additional data is loaded into the database.

The output from this task consists of the following:

- Performance and operation evaluation procedures document

No resource requirements have been identified for this task.

2.1.1.12 Develop a "viewer" for prototype demonstration purposes

The "viewer" is essentially a tool that can be used to look at the database structure and the actual data content. It is anticipated that a commercial-off-the-shelf (COTS) application, such as Microsoft Access or Oracle Data Browser, will be used as the viewer. The development will consist of creating a limited number of "canned" queries that can be used by EFIG and Pechan staff to view the data content. The EFIG and Pechan staff can then use the "viewer" to generate their own queries to evaluate the database design.

The output that will be generated by this task consists of the following:

- A limited number of "canned" queries for the selected "viewer"

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
SQL*Net for the client workstation	Electronic	TPMC	4/17/97
Oracle ODBC driver	Electronic	TPMC	4/17/97 (optional)
Oracle Data Browser, Microsoft Access or other third-party ad hoc query tools	Electronic	TPMC and/or EFIG	4/17/97 (optional)

2.1.1.13 Test the prototype demonstration "viewer"

This task consists of formally testing the "viewer" to ensure that it will operate successfully after installation at EFIG/Pechan. The "viewer" application and all of the "canned" queries will be installed on a workstation where they had not previously been installed. The "viewer" and queries will then be tested to make sure that they will work after being properly installed.

user accounts for EFIG and Pechan staff prior to prototype installation. The Oracle access privileges will need to be granted to the users by the Application Administrator soon after the prototype is installed.

Once the prototype database is installed on the EPA/EFIG Database Server, the EFIG/Pechan staff can evaluate database design by performing queries against the data that has been loaded. Additional resources such as the Oracle Open Data Base Connectivity (ODBC) driver or the Oracle Data Browser may be needed to support the prototype database review process performed by the EFIG/Pechan staff. Other third-party tools, such as Lotus, Microsoft Access, and Crystal reports may also be used to review the database.

The output that will be generated by this task consists of the following:

- Prototype database installed on EPA/EFIG server

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
Oracle Relational Database Management System at EPA/EFIG	Electronic	EFIG	Completed
Application Administrator at EPA/EFIG	n/a	EFIG	5/9/97
SQL*Net for all client workstations	Electronic	EFIG	5/9/97
Oracle ODBC driver	Electronic	TPMC	5/9/97 (optional)
Oracle Data Browser, Microsoft Access or other third-party ad hoc query tools	Electronic	EFIG	5/9/97 (optional)

2.1.1.11 Define user requirements for database performance and operations

Part of the evaluation of the prototype database design is an evaluation of whether the database satisfies user requirements for performance and operations. This task consists of identifying the performance and operational requirements that will be used to evaluate the prototype database. These requirements may have been identified during the previous task (Conduct a requirements gathering workshop for the NET database) but are reviewed and refined during this task. One or more meetings may be needed to define the performance/operational requirements, identify the evaluation criteria, and select the measurement tools. The results of the meetings will be a document describing the procedures for evaluating the performance and operational aspects of the database.

Any discrepancies and errors that occur during the loading process will be documented and resolved before successful completion of the task can be attained. We will specifically be looking for problems involving referential integrity with the base (or reference) tables, conflicts with unique identifiers and inconsistencies with data values.

The plans, scripts, procedures, and programs will be modified to reflect any corrections that were made due to errors that were encountered.

The outputs that will be generated by this task consist of the following:

- Loaded prototype database
- NET dataset loading plan
- AIRS-AFS dataset loading plan
- SQL*Loader scripts and control files (optional)
- SQL*Plus scripts (optional)
- C/C++ programs (optional)
- PL/SQL procedures (optional)
- Prototype database load summary report

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
EIIP Phase I Data Model To Prototype Database Correspondence Report	Hardcopy/ Electronic	TPMC	5/2/97
NET Database To Prototype Database Correspondence Report	Hardcopy/ Electronic	TPMC	5/2/97
AIRS-AFS Dataset To Prototype Database Correspondence Report	Hardcopy/ Electronic	TPMC	5/2/97

2.1.1.10 Move the prototype database to an EPA/EFIG Oracle Database Server

Moving the prototype database to the EPA/EFIG Oracle Database Server will put the database on a server where the EFIG/Pechan staff can effectively perform an evaluation of the prototype. Prior to moving the prototype database, EFIG must have the infrastructure in place to support the database. The required infrastructure includes the availability of an Oracle Database Server (system and RDBMS kernel), sufficient disk space, network connection, and Oracle SQL*Net. An Application Administrator should also be available that can perform tasks such as creating Oracle user accounts, tuning database performance, backing up the database, and importing the prototype database provided by TPMC. The Oracle database server must be installed before the prototype database can be moved. The Application Administrator should also have created

- Create Status Quality Control Report
- Invalid Database Objects Quality Control Report
- Package/Procedure Quality Control Report
- Database Table and Index Size Estimates Report

In addition to the reports listed above, the physical database will be created as a product of this task. The database will be created on an Oracle database server located at the TPMC facilities and will be available for on-line review by the EFIG/Pechan staff. However, since no data will be loaded into the database as part of this task, any review would be limited to the physical structure of the database.

No resource requirements were identified for this task.

2.1.1.8 Get feedback from EFIG/Pechan on database design

Review sessions will be held with EFIG and Pechan staff to discuss the physical prototype database created during the previous task by TPMC. Appropriate reports will be generated from Designer/2000 and distributed to the review team prior to meeting. TPMC will describe the physical database structure in detail during this working session. Completion of this task will be attained when the EFIG/Pechan staffs accept the physical database. Any problems, discrepancies, or omissions that are identified during the review session will be corrected in the logical data model and/or the physical database design. A modified physical database will be created and additional review sessions will be held as needed. Advancement to the next task, where the physical database is built, will not occur until the logical data model is approved.

The outputs that will be generated by this task consist of modified entity-relationship diagrams and reports that will be used to update the Designer/2000 data dictionary. New reports and diagrams will be generated from Designer/2000 as needed.

No specific resource requirements have been identified for this task.

2.1.1.9 Load formatted dataset(s) that have been mapped into the prototype database

This task consists of loading of the NET and AIRS-AFS data into the prototype database. The EIIP formatted dataset will not be available until the design phase of EPA's Application Program Interface (API) that is discussed in the section of this document entitled "Develop Data Transfer Prototype." The loading plans, scripts, and procedures will be developed for each of the databases during this task. The correspondence reports from the mapping process will be used as a guide in creating the loading software.

2.1.1.6.3 Map AIRS-AFS formatted dataset into physical prototype database

This task follows the same process as the previous task where the EIIP and NET datasets were mapped to the prototype database. However, in this task we will be mapping the AIRS-AFS formatted dataset to the prototype database. The AIRS-AFS dataset is considered to be a single submittal (containing multiple records) from one state.

The outputs that will be generated by this task consist of the following:

- AIRS-AFS dataset to Prototype Database Correspondence Report

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
AIRS-AFS dataset documentation	Hardcopy	EFIG, IMG/ITPID	Completed

2.1.1.7 Build the physical prototype database

After approval of the logical data model by EFIG and Pechan, TPMC will proceed with building the physical database. This process follows the data mapping described above because the source of the data will determine the field lengths of attributes that must be defined in the prototype database. Oracle's Designer/2000 will be used to build the physical prototype database. Tables, columns, constraints, primary keys, foreign keys, and indexes will be created within the data dictionary. SQL scripts that can be used to create the database will be generated from the Designer/2000 data dictionary after the TPMC analyst has completed the physical database design.

Several outputs will be generated by this task that will be used by EFIG, Pechan, and TPMC staff in subsequent tasks to review the physical database design. Some examples of the outputs that can be generated by the Designer/2000 as products of this task include:

- Database Definition Report
- Sequence Definition Report
- Cluster Definition Report
- File, Record, and Field Definition Report
- File Definition Report
- File and Field Definitions for a Given Record Report
- Tablespace Definition Report
- Rollback Segment Report
- Storage Parameters Report
- Database Objects Report

The following three sections are described sequentially but will actually be performed concurrently as they are all interrelated.

2.1.1.6.1 Map EIIP formatted dataset into physical prototype database

The primary benefit in mapping the EIIP dataset into the physical prototype database is that the EIIP Phase I Data Model document will provide a general guide for determining the location of individual attributes within the entities of the prototype data model. Field lengths for the attributes will be determined by other mappings.

The outputs that will be generated by this task consist of the following:

- EIIP Phase I Data Model to Prototype Database Correspondence Report

The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
EIIP Phase I Data Model	Hardcopy	ERG	Completed

2.1.1.6.2 Map current NET (Foxpro) dataset into physical prototype database

This task is similar to the previous task where the EIIP dataset was mapped to the prototype database. However, in this task we will be mapping the NET (Foxpro) dataset to the prototype database. The NET dataset is considered to be one year of emissions inventory data and the supporting data that is contained in the Foxpro file sets.

The outputs that will be generated by this task consists of the following:

- NET Database to Prototype Database Correspondence Report

The resources that are required to complete this task are shown in the table below. It may be necessary to have a copy of Foxpro supplied to TPMC if it is determined that we need to use it for viewing/manipulation of the dataset prior to exporting it for loading into the prototype database.

Resource	Format	Provided By	Date Required
QUICKREPTS User's Manual for NET database	Hardcopy	ERG	Completed
NET software and sample dataset	Electronic	EFIG/Pechan	Completed

The data mapping will also help the analyst determine the most effective method for actually loading the datasets into the physical prototype database and provide the basis for the dataset loading plan. The plan includes the sequence of events that must be followed in order to satisfy the referential integrity rules (constraints) that are enforced by the database. For example, it is necessary to create a site in the database before any point source emission data values can be loaded for a site.

The results of the mapping process will help to define the best method for loading the dataset into the prototype database. For example, it may be beneficial to create a table in the database which mirrors the dataset to be loaded. The original dataset can then be loaded into the "temporary table" in the database and then SQL*Plus scripts can be used to transfer selected information from the "temporary table" into the prototype tables. Another method may be to use Oracle's SQL*Loader utility to load directly into the prototype database tables. A third alternative is to write a C/C++ program that uses Oracle's Pro*C precompiler product for accessing the prototype database. The final alternative is to develop a PL/SQL procedure that reads the original ASCII dataset and loads the data into the prototype database.

Three differing datasets have been selected to be mapped into the physical prototype database. The datasets selected are:

- EIIP EDI X12 standard formatted dataset
- Current NET dataset
- AIRS-AFS dataset

EIIP EDI X12 standard formatted dataset. Mapping this dataset is essential for demonstration of the prototype and evaluation of the results. Once the mapping is complete for the datasets received by EFIG it is applicable for the entire EIIP user community. However, each EIIP user will most likely need to map their database to the source dataset format.

Current NET dataset. Mapping the NET (Foxpro) dataset provides the opportunity for migrating the existing NET database into a prototype database that supports both emissions inventory data submitted by the EIIP user community and the NET database analysis and reporting activities performed by EFIG and Pechan.

AIRS-AFS dataset. Mapping this dataset demonstrates that data submitted to AIRS-AFS by states and local agencies can be loaded into the physical prototype database. Subsequently, a single repository for all national emissions inventory data can be demonstrated by this prototype.

The resources that are required to complete this task are shown in the table below. TPMC already has in place the UNIX servers, Oracle Relational Database Management System (RDBMS), and Designer/2000 tools that are needed.

Resource	Format	Provided By	Date Required
Oracle Designer/2000 software	Electronic	TPMC	Completed
Oracle Relational Database Management System	Electronic	TPMC	Completed
UNIX Server	n/a	TPMC	Completed

2.1.1.5 Conduct review session on logical data model with EFIG/Pechan

A review session will be held with EFIG and Pechan staff to discuss the logical data model designed by TPMC. Appropriate reports will be generated from Designer/2000 and distributed to the review team prior to meeting. TPMC will describe the proposed logical data model in detail during this working session. Modifications to the EIIP/DMC Data Model which were required to satisfy the requirements of the NET database will be highlighted. Completion of this task will be attained when the EFIG/Pechan staffs accept the logical data model design. Any problems, discrepancies, or omissions that are identified during the review session will be corrected in the logical data model; additional review sessions will be held as needed. Advancement to the next task, where the physical database is built, will not occur until the logical data model is approved.

The outputs that will be generated by this task consist of modified entity-relationship diagrams and reports that will be used to update the Designer/2000 data dictionary. New reports and diagrams will be generated from Designer/2000 as needed.

No specific resource requirements have been identified for this task.

2.1.1.6 Map selected datasets into the physical prototype database

The process of mapping a dataset to the physical prototype database requires each source field in the dataset to be analyzed and a plan designed for transferring the field into the proper tables and columns in the prototype database. Analysis of each dataset field and how it correlates to the prototype database will identify whether any type of data conversion, expansion, or truncation must be performed. This process will proceed the building of the prototype database because the data lengths of the source fields will determine the lengths of the individual fields in the prototype database. This level of detail is not addressed by the EIIP Phase I Data Model document. Each field length in the prototype database will usually be the largest common denominator of the source fields that map into it.

2.1.1.3 Conduct a requirements gathering workshop for the NET database

A requirements gathering workshop is needed to identify new requirements for the NET database that Pechan will implement in the new user interface. New application requirements typically require modification to a database design to effectively implement the requirement. Multiple workshops may be needed to finalize a functional specification that documents the functionality of the new application.

The TPMC analyst should participate in the workshop(s) to gain a better understanding of the user requirements. A copy of the generated functional specifications is also needed for analysis to ensure that the database design allows the Pechan staff to implement the functional requirements.

There are no formal outputs from this task; however, the analyst should create some notes and document any questions/responses that are generated during the review process.

2.1.1.4 Define logical data model for the prototype database

After the TPMC analyst obtains the needed information from the data model reviews and functional specifications, the logical data model for the NET prototype database will be defined. The analyst will use Oracle's Designer/2000 CASE tool to define the logical model. This tool supports full life cycle development of the database design from analysis through implementation of the physical database. The analyst will document the business rules, processes, and notes on the design in the Designer/2000 data dictionary. This information will be useful for subsequent modifications to the design after evaluation of the prototype database.

Several outputs will be generated by this task that will be used by EFIG, Pechan, and TPMC staff in subsequent tasks. Some examples of the outputs that can be generated by the Designer/2000 as products of this task include:

- Entity-Relationship Diagram
- Entity Model Information Report
- Entities and their Descriptions Report
- Entity Definition Report
- Attribute Definition Report
- Unique Identifiers for an Entity Report
- Relationships Report
- Quality Checking of Relationships Report
- Attributes in a Domain Report
- System Glossary Report

requested copies of any revisions/updates to the EIIP Phase I Data Model document, the updates may not be incorporated into the prototype database if they are received beyond a critical point in the logical database design. However, the updates not implemented in the prototype database will be documented in the Approach Study to reflect the need to modify the database design based upon the data model refinements made by the DMC and ERG.

Resource	Format	Provided By	Date Required
Latest version of the EIIP Phase I Data Model document	Hardcopy	EFIG	Completed
Revisions/updates to the EIIP Phase I Data Model document	Hardcopy	EFIG	Ongoing

2.1.1.2.2 Review logical NET (Foxpro) database created by Pechan

Following review of the EIIP Data Model, the NET database created by Pechan staff will be reviewed from a logical design and physical implementation perspective. The knowledge base of the Pechan staff in regards to the existing NET database and their review of the EIIP Data Model will enhance our analysis of the two models and insure that the NET database requirements are reflected in the prototype database.

The TPMC analyst will need any available documentation for the existing NET database for review purposes. The analyst will also need to meet with Pechan staff to clarify any questions and compare the design with the EIIP Data Model. Any available documentation for the NET application, such as functional specifications or user manuals, is also needed so that the functional requirements can be reviewed for consideration in the prototype database design.

There are no formal outputs from this task; however, the analyst should create some notes and document any questions/responses that are generated during the review process. The resources that are required to complete this task are shown in the table below.

Resource	Format	Provided By	Date Required
QUICREPTS User's Manual for NET database	Hardcopy or Electronic	EFIG/Pechan	Completed

Systems design is used to create database definitions, business rules and procedures, screen prototypes, and workflow definitions. Logical and physical database schemas, GUI style preferences, application menu structure definitions, module data usage, screen prototypes, report prototypes, and stored procedures are typically defined during systems design. Data diagrams provide complete database designs. Module structure diagrams identify the functionality the system will present to the users and how the modules are arranged to support their tasks. Module data diagrams specify the internal structure of individual modules and are used to support rapid prototyping of screens and reports.

System generation is used to build databases and applications from information contained in the repository. Database objects, screens, and reports can all be generated from the information recorded by the other modeling/design tools. Preferences and templates can be specified prior to generation to allow a custom and consistent application to be developed.

The CASE modeling/design tools described above will be used at appropriate times during the various phases of the system development life cycle. The diagrams and reports that can be generated from the repository will be used as supporting information for many of the deliverables that are created during each phase.

2.1.1.2 Review logical data models

The logical data model that is being created by EIIP/DMC and the existing logical data model for the NET database must be reviewed to gain an understanding of the data requirements and data relationships that exist in both of the models. The process of reviewing the two logical models will allow TPMC to identify requirements in each model, recognize differences between the two models, and begin the process of blending the two data models together. Details about the logical review of the data models are described in the following two sub-tasks.

2.1.1.2.1 Review EIIP logical data model created by EIIP/DMC

The first step in developing the prototype database requires a review of the EIIP logical data model to gain an understanding of the logical design. The logical model has been created by the EIIP/DMC through contractual support from Eastern Research Group (ERG). This task consists of reviewing the EIIP Phase I Data Model document from an analytical perspective to identify database requirements that will effect the physical database design. There may be a need to interact with ERG staff to clarify some data model questions to insure that we have a clear understanding of why some design decisions were made and can effectively convert the data model into a physical database design.

There are no formal outputs from this task; however, the analyst should create some notes and document any questions/responses that are generated during the review process. The resources that are required to complete this task are shown in the table below. Although we have

Rapid Application Development (RAD) becomes a viable option within the life cycle methodology when CASE tools are used. A RAD methodology requires extensive user input throughout the development and generates iterative working versions of application components to provide a basis for end-user review and approval. This iterative development approach with end-user review allows design flaws to be identified earlier in the process, can be used to sell users and management on new concepts, and results in reducing the costs and time for system development.

The CASE tool used must be repository based and must be team-oriented. When the CASE tool is repository based the developers are able to reuse each other's work and share common definitions. This sharing and reuse supports rapid development and consistency within the system. Without a shared repository, effective reuse and sharing is impossible and consistency and quality checking is much more difficult and time consuming. A team-oriented CASE tool allows sharing where it is useful, provides a secure environment for work-in-progress, supports repository browsing for component reuse, and maintains accurate documentation for the next developer who needs to use a component.

CASE tools typically support process modeling, systems modeling, systems design, and systems generation. Each modeling/design phase is used to create and refine information that describes the system and is stored in the repository. For example, organization units, processes, data flows, entities, relationships, business rules (constraints), and system development guidelines are all contained within the repository. Once in the repository, they can be used to create the database, forms, reports and database trigger, and stored procedure logic.

Process modeling is used to graphically model business processes that are performed to create or add some kind of value for the customers or end-users. Each business process has well-defined start and end points that are associated with an end-user. The models are usually developed in a hierarchical arrangement, with major processes at the top and each having a number of sub-processes. The process models help one understand what currently happens and ensure that all of the identified processes are implemented in the system. The models can also be used as a focus for people to agree on changing a process.

Systems modeling is used to create graphical function hierarchy diagrams, dataflow diagrams, and entity-relationship diagrams. The function hierarchy diagrams are used to decompose the business functions and show how the functions use data. The dataflow diagrams are used to show functions, datastores, data flows and external datastores or functions. Dataflow diagrams can be used to identify data dependencies, system components, and the context of the project. The entity-relationship diagram identifies the information needs of the organization, the properties (attributes) of the information, and the relationships among the various types of information.

2 Technical Approach

This section of the Action Plan describes the technical approach that will be used to attain the desired results of the delivery order. The tasks and sub-tasks required to attain the desired results are described in detail in the following sub-sections.

2.1 Task Descriptions for Delivery Order Execution

The major tasks that must be performed are described in detail in subsequent sub-sections.

2.1.1 Develop Prototype Database

This task addresses the development of the prototype database based upon the logical data model defined by the EIIP/DMC and the NET database design. Within this major task the logical database will be designed, the physical database will be built, and selected datasets will be loaded into the database for evaluation purposes. Additional modifications to the prototype database may be made after evaluation by EPA/EFIG.

The following sections give an explanation of the database development methodology and a description of each sub-task required to complete this major task.

2.1.1.1 Methodology

Computer-Aided Software Engineering (CASE) tools are used within the software development life cycle with the goal of improving the efficiency of the development effort. Improvements are typically obtained in the form of:

- Productivity gains
- Quality improvements
- Increased maintainability
- Reusability benefits
- Overall consistency

Productivity gains are realized through reduced development labor which usually also reduces the elapsed time frame of the development project. The other improvements reduce the effort required to support the system throughout its useful life. The proper use of CASE makes the system easier to maintain and enhance the system, as well as making it easier to integrate with other systems. One of the major benefits of a CASE tool is its ability to perform an impact analysis prior to making any modifications.

by the EIIP. The infrastructure requirements and the general responsibilities of the EIIP user community will be delineated in the approach study.

Provide Technology Transfer. This major task involves providing a technical summary of the EIIP data transfer prototype results. The technical summary will be used by the EIIP/DMC as a "lessons learned" document. Presentation materials that will be used by the DMC in the EIIP technical transfer meetings will also be prepared as part of this task.

The major tasks just summarized and their individual sub-tasks are described in detail in subsequent sections of this Action Plan.

retrieve data from the repository at the source and transmit it to the receiver(s). The transmission will be in the EIIP data transfer format (for example, EDI X12).

The major tasks that must be performed during the execution of this project are:

- Develop a prototype database.
- Develop a prototype for electronic transmission of the EIIP formatted datasets (EDI X12 standard) between pilot partners.
- Demonstrate the integrated electronic transmission and database prototypes to the EIIP/DMC user community for evaluation.
- Develop an approach study.
- Provide technology transfer.

Develop a prototype database. This major task consists of designing and developing a prototype database that is based upon the EIIP/DMC logical data model and the NET database design. The prototype database will serve as the repository for EIIP formatted datasets that are electronically submitted by pilot partners for the purposes of this database. The prototype database will also serve as a model for the next-generation NET database which supports EFIG reporting activities for emissions data.

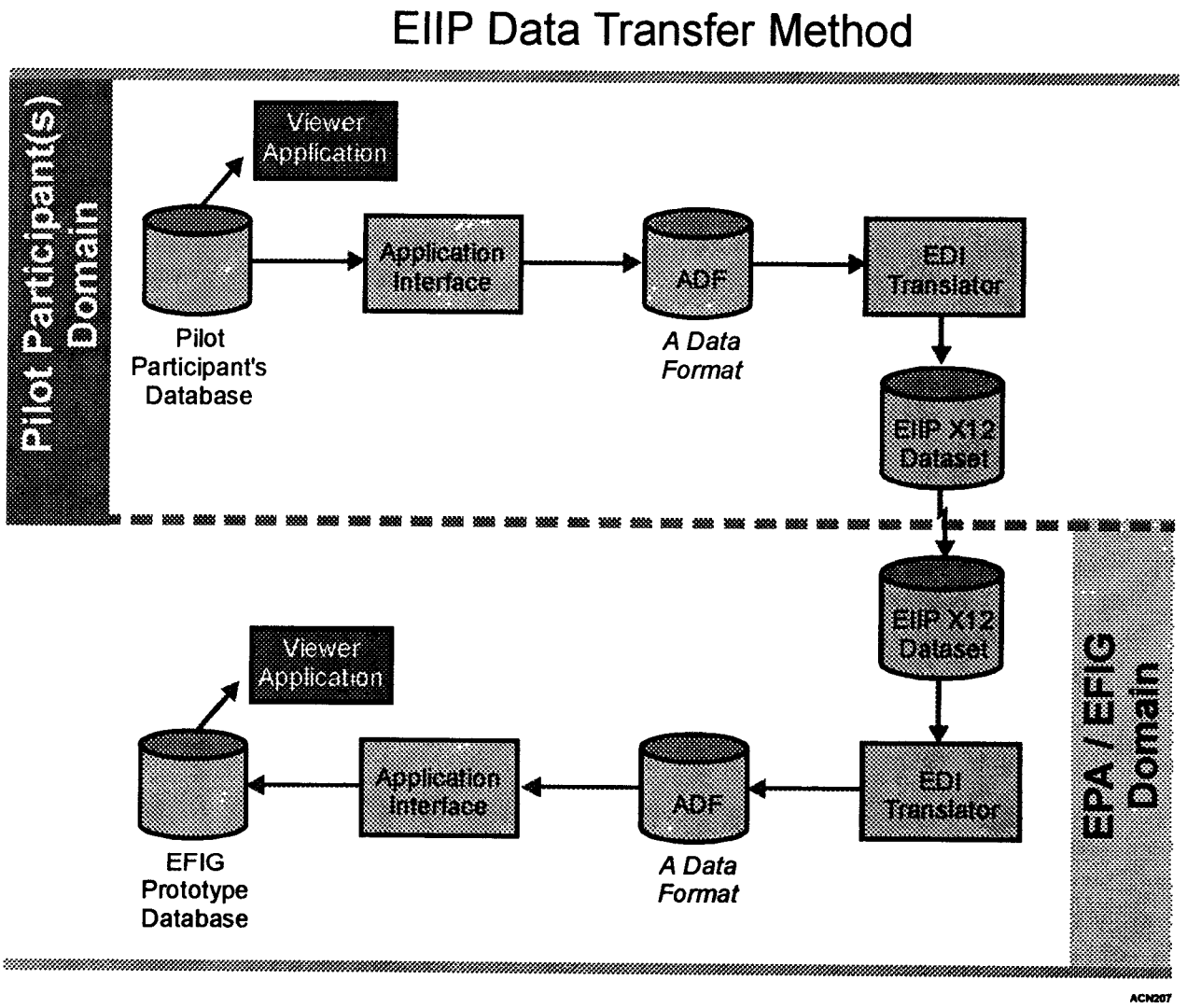
Develop a prototype for electronic transmission of the EIIP formatted datasets (EDI X12 standard) between pilot partners. This major task consists of integrating multiple components (modules) and manual procedures that demonstrate the viability of electronic transmission of EIIP EDI X12 formatted datasets from one or more pilot partners (for example, CARB and PADER) to EFIG. The scope of the prototype includes extraction of data from the pilot partners database, translation of the data into an EIIP X.12 standard dataset, transmission of the dataset to EFIG, translation of the data back out of the X.12 dataset, and loading of the data into the prototype database.

Demonstrate the integrated electronic transmission and database prototypes to the EIIP/DMC user community for evaluation. This major task provides the EIIP/DMC user community with the opportunity to review and evaluate the results of the prototype in regards to the electronic transmission of EIIP inventory datasets using the EDI X12 standard. The demonstration will be comprehensive enough to illustrate clearly all of the steps required to effectively perform an electronic transmission of an EIIP/DMC EDI X12 standard dataset from a pilot participant (for example, CARB and PADER) to EFIG. The demonstration will include extraction of data from the pilot participant(s) database and the loading of the data into the EFIG prototype database after being electronically transmitted as an X.12 standard dataset.

Develop an Approach Study. This major task consists of documenting the actions required to expand the data transfer method demonstrated by the prototype to the entire EIIP user community. The approach study will be structured as an implementation plan for consideration

transfers can be effectively implemented based upon the results of the prototype demonstrations.

The anticipated scope of the prototype is shown diagrammatically in the figure below.



At each location the same basic architecture will be provided by the prototype. A viewer program to display the data in the local format will be used. An application interface to convert the data to/from the recommended data model subset for transmission will be developed. The transferred data will be held in an Oracle relational database designed according to the EIIP data model. A transmission program (for example, ProComm, Crosstalk, FTP or Mosaic) will

1 Project Description

This section of the Action Plan provides a basis for understanding the project in regards to the background, purpose, and scope of the project.

1.1 Project Background

The Clean Air Act Amendments of 1990 (CAAA) require that many States collect emission inventory data that is an essential part of the infrastructure in managing environmental air pollution at the local, state, regional, and federal levels. This has caused emissions inventory data needs to be shared among many users for air quality modeling and the development of air pollution control strategies. The Emissions Inventory Improvement Program (EIIP) is a joint effort of state and local air agencies together with the EPA for the purpose of improving the quality of the emissions data that is collected, as well as improving the way the data is transferred and shared among users. The Data Management Committee (DMC) of the EIIP is currently developing a standard data transfer format and will recommend a protocol for electronic transmission of the inventory data within the user community.

It is these recommendations and data transfer standards being developed by the DMC that this Delivery Order will demonstrate and assess. The prototype developed by this Delivery Order will demonstrate the feasibility and practicality of the recommendations as well as provide the documentation on how the data transfer protocol works. The Delivery Order team will also develop an Approach Study to assess the impact in manpower, cost, and technological resources necessary to implement the recommendations within the emission inventory user community.

1.2 Project Scope and Purpose

The purpose of the project is to develop a prototype that tests the use of Electronic Data Interchange (EDI) data transfer technology for exchanging emission inventory information among trading partners. The prototype being developed under this Delivery Order consists of integrating multiple components (modules) and manual procedures that demonstrate the viability of electronic transmission of EIIP EDI X12 formatted datasets from one or more pilot partners (for example, Pennsylvania Department of Environmental Resources (PADER) and California Air Resources Board (CARB)) to EPA/EFIG. The scope of the prototype includes extraction of data from the pilot partner(s) database into a data file compliant to A Data Format (ADF) file specifications, translation of the data file via the ADF into an EIIP EDI X12 standard dataset, transmission of the dataset to EPA/EFIG, translation of the data out of the X12 dataset into a second data file using a second ADF, and loading of the data from the second data file into the prototype database. The project will also document how the data

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PROTYPE DEMONSTRATION FOR DATA TRANSFER METHOD WITH APPROACH STUDY

Final Action Plan

March 1997

Prepared by:
Technology Planning & Management Corporation
DynCorp Information & Engineering Technology

Prepared for:
Data Management Committee
Emission Inventory Improvement Program

day rebuttal ballot (Step 8).

7. If the DM is provided to the subcommittee, it is evaluated and modified for return to X12J, where the DM is submitted to the voting membership for a 45-day rebuttal ballot (Step 8).

8. The voting membership votes on the 45-day rebuttal ballot. If the DM is approved, it is included in the next version/release of the standard. If it is disapproved or invalid, the DM is returned to the subcommittee for distribution to the voting membership. All DMs which are continuing disapprovals are discussed at an open forum at the next triennial general meeting (Step 9).

9. If, after the open forum, the DM maintains more than 10% continuing disapproval votes, it is returned to Step 2. If it has less than 10%, it is included in the next version/release of the standard.

APPENDIX B
X12 DATA MAINTENANCE PROCESS

The ANSI/ASC X12 standards are updated three times a year (February, June, and October), following general membership meetings. New versions/releases of the standard are issued and published in paper form annually. There are interim releases issued in electronic form following the February and June updates.

Any changes (DMs) to ANSI ASC X12 Transaction Sets, data segments, data elements or code lists must be submitted to the X12 committee for evaluation and membership approval before being included in the standard. The process for DMs is detailed in the *ASC Standing Document 2: Operating Manual*. A condensed version of the steps is as follows:

1. Each DM is submitted to Data Interchange Standards Association (DISA), which assigns the request to X12J subcommittee (Technical Assessment).

2. Technical Assessment reviews the DM with respect to the current ANSI ASC X12 syntax and design rules. The DM can be accepted or referred to another subcommittee at the request of that subcommittee. If the DM is accepted, it moves to Step 5.

3. The subcommittee reviews the DM at the next triennial meeting. At the meeting, the subcommittee may approve the DM; approve the DM with modifications; table the DM until the next triennial meeting; or disapprove the DM. If the DM is accepted or accepted with modifications, it moves to Step 4. If it is disapproved, the submitter of the DM is notified.

4. All DMs and associated actions are reviewed by Technical Assessment at the same triennial meeting in manner similar to Step 2. During the acceptance review, the committee may modify a DM or send it to a subcommittee for review and modification. If the DM is approved, it is submitted to the general membership for voting on the 90-day ballot (Step 5). If it is disapproved, the submitter of the DM is notified.

5. On the 90-day ballot, the general membership votes on those DMs found by Technical Assessment to be acceptable for voting. The vote can result in an approval, disapproval, or invalid (if fewer than 20% votes are returned or more than 33 1/3% votes indicate disapproval). If the DM is approved, it is included in the next version/release of the standard. If it is disapproved or invalid, it moves to Step 6.

6. Technical Assessment reviews the ballot and determines whether modifications to the DM are required. If the DM is disapproved, it is returned to the responsible subcommittee (Step 7). If the vote was invalid it may be submitted to the voting membership for a 45-

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X12 standards and the convention document.

EPA, The abbreviation for the United States Environmental Protection Agency. Established in 1970 by presidential executive order, it brings together parts of various government agencies involved with the control of pollution. Note that some state environmental authorities may be called EPA also, as in Illinois EPA.

Implementation Guideline, Instructions on the use of EDI for an individual business use of EDI. Guidelines provide additional information about conducting EDI and may provide assistance on how to implement EDI.

Standards, The technical documentation approved by ASC X12, including transaction sets, segments, data elements, codes and interchange control structures. Standards provide the structure for ASC X12.

Syntax, The grammar or rules that define the structure of the X12 standards (i.e., the use of loops, qualifiers, etc.). Syntax rules are published in ANSI/ASC X12.6.

Third-Party Agreement, A legal agreement between the EDI trading partner and the third-party service provider.

Third-Party Services, Organizations that provide value-added communication/transmission services. Also see VAN.

Trading Partner, The sending and/or receiving party involved in the exchange of electronic data interchange transmissions.

Trading Partner Agreement (TPA), Serves as the "interface specification" between trading partners and provides specific details of the legal agreements that define how the electronic commerce is to be conducted.

Transaction Set, A semantically meaningful unit of information exchanged between trading partners.

VAN, The abbreviation for Value-Added Network. Also see Third-Party Services.

Version/Release, Identifies the publication of the standard being used for the generation or the interpretation of data in the X12 standard format (e.g., Version 003040 means Version 3 Release 4).

Data Model, A description of the principles of organization of a database, including data entities, attributes, relationships, and data specifications.

Data Set, The grouping of data that is being exchanged between the automated systems of trading partners via EDI.

DISA, The abbreviation for the Data Interchange Standards Association. A non-profit organization which serves as the Secretariat for X12.

DM, The abbreviation for a Data Maintenance Request. A formalized procedure by which proposed changes to the existing X12 standards are presented for ANSI/ASC X12 committee consensus and adoption into the standard.

DMC, The abbreviation for the Data Management Committee of the U.S. EPA Emission Inventory Improvement Program responsible for the administration of issues related to air emission modeling data.

EIIP, The abbreviation for the Emission Inventory Improvement Program sponsored by the EPA to address the collection and use of air emission inventory/modeling information.

EDI, The abbreviation for electronic data interchange. Commonly defined as "the computer-to-computer exchange of business information in a standard format." An EDI transmission is a highly structured message intended for automated processing by a computer. It is meant to be machine-readable so that it doesn't require human intervention to be interpreted and understood. EDI is primarily used for intercompany communication. All references to EDI under U.S. EPA programs refers to the utilization of ASC X12 standards.

EDI Translation, The conversion of application data to and from the X12 standard format.

EDI Translator, Computer software used to perform the conversion of application data to and from the X12 standard format.

EDI Translator Configuration, The activity of inputting trading partner and EDI system specifications into the EDI Translation Software. This process provides the translator with essential information needed for translation and transmission of data. This information is often documented in the Implementation Guideline and/or the Trading Partner Agreement.

EDI Translator Overlay, The computer code designed in the EDI translator which reflects the requirements of the convention document and is consistent with the ASC X12 standards. It functions to translate the data set to or from the required X12 format.

EDI Translator Overlay Mapping, The development of the overlay within the EDI translation software in accordance with the requirements of the translator characteristics, the ASC

APPENDIX A
GLOSSARY

ADF, The abbreviation for A Data Format. A textual description, usually in the form of a table, that specifies the structure and data content of the flat file that is the input to or output from the EDI translator. It is a technical document that is use in designing the application program interface between the EDI translation software and the database system.

ANSI, The abbreviation for the American National Standards Institute (ANSI). The national coordinator for standards in the United States.

API, The abbreviation for the application program interface (API). A computer program that functions between the EDI translation software and the database system associated with the data being exchanged.

ASC X12, The abbreviation for Accredited Standards Committee (ASC) X12. It is comprised of a non-profit clearing house and coordination body for voluntary data standards activities in U.S. The purpose is to develop uniform standards for the electronic interchange of business transactions for submission to ANSI for subsequent approval and dissemination. X12 is the subcommittee responsible for the development and maintenance of standards for Electronic Data Interchange (EDI).

Communications, The transport of information in an EDI environment that may be by physical (i.e., magnetic tape or courier service) or telecommunication (i.e., public or private telecommunications system) means.

Convention Document, Common practices and/or interpretations of the use of the ASC X12 standards, as agreed upon by two or more trading partners. Conventions define what is included in a specific implementation of an ASC X12 standard.

Convention Document Mapping, The development of the convention document by selecting the appropriate X12 structures for implementation in accordance with the requirements of the ASC X12 standards and the business process.

Database System, In this usage, it is the automated data storage mechanism (i.e., database, spreadsheet, etc.) for data being exchanged within an EDI system. Also referred to as Automated System.

Data Element, A data element can represent a qualifier, a value, or text (such as a description).

for the EIIP EDI project include the EPA, state and local agencies, and industries related to air emission reporting.

The communication between trading partners is often formalized through the use of Trading Partner Agreements (TPAs), memorada of understanding, and/or conventions of use. These agreements serve as the "interface specification" between trading partners and provide specific details of the legal agreements that define how the electronic commerce is to be conducted. Qualified legal advice is required when a TPA is drafted.

The TPA must be more than a legal agreement between two organizations that exchange data. Because the use of an electronic medium affects the trade relationship, TPAs are generally recognized as fundamental to the EDI trade relationship. TPAs can bolster the use of the EDI system, ensure the validity of the transmissions, open communication, define legal considerations, and help educate partners.

As with the use of a third-party agreement, the TPA is a legal document that must be maintained in accordance with changes to the business processes and requirements, trading partner relationships, and the EDI system. To facilitate this maintenance, individuals knowledgeable in the various aspects of the EDI systems should be involved, as should the support of legal staff.

Before data transfer begins with a third-party service, communications should be mutually defined and agreed upon. The use of third-party communications should be transparent to trading partners. To assist in this transparency, when establishing an EDI partnership, it is necessary to determine how the costs of third-party services will be apportioned. These costs are usually split equally between the trading partners. Costs associated with the use of a third-party service often include:

- Start-up charges;
- Mailbox fees;
- Connect charges;
- Data storage;
- Network interconnect;
- Character charges; and
- Management reports.

When employing a third-party service provider to facilitate its EDI system, certain contractual agreements should be made. These agreements are typically made in the form of a third-party, or data communications, agreement. Among the general issues that the agreement might include are: specific services to be provided; warranties by the VAN; the liability of the VAN; security, confidentiality, and integrity of messages handled by the VAN; system failure or disaster; applicable pricing structure; and termination of the agreement.

As the implementation of the EDI system changes, the requirements for EDI communications may as well. Changes including fluctuation in the number of transaction sets being transmitted, level of activity, security needs, cost effectiveness, and a host of other business and EDI-related needs can affect the communications being used. If a point-to-point type of communication is being used, its maintenance should be the responsibility of an individual experienced in telecommunications.

If a VAN is being employed, changes to the EDI system affect more than just the physical communications lines. Although the maintenance of communications lines is not a direct concern, the third-party agreement that was entered into upon initiating the communications relationship will have to be maintained. The maintenance of this component should involve not only staff familiar with the specific EDI implementation, but legal support as well.

TRADING PARTNERS

Trading partners, or those organizations with which business information is exchanged, are perhaps the most important aspect of a functional EDI system. Without solid relationships with other organizations, the exchange of information via EDI can not be optimized. Trading partners must be identified who are willing and able to use EDI. Once identified, these relationships must be formalized and maintained. Open communication between trading partners with respect to EDI capabilities, information requirements, and business needs is essential. The trading partners

the trading partners' communication needs. No matter which approach is selected, a contingency plan should be formulated to address the possible event of a communication failure.

The EDI communication system includes the determination and use of EDI data transfer protocols and transmission protocols. Protocols are a set of conventions between communicating devices. Simple protocols define only hardware configuration. More complex protocols define timings, data formats, error detection, and correction techniques. In the case of EDI data transfer protocols, issues related to communication capabilities, security, and data integrity, must be addressed. Transmission protocols pose more technical issues as they specify the type of transmission that will occur. Transmission protocols include: character-oriented, asynchronous, binary, and bit-oriented protocols.

EDI communications can be accomplished in two manners, point-to-point or through the use of a third-party service provider. Point-to-point or direct connect service is communication between two trading partners. Point-to-point may employ dedicated circuits, or dial circuits, or a combination of the two. The type of circuit used depends on a number of factors, two of which are volume and speed or timing of the transmissions.

An EDI user that elects direct communication with trading partners must have the necessary in-house staff capable of managing the network and must address a number of issues with each individual trading partner. Some of these issues include: service levels; communication speeds; transmission modes; modem capabilities; and line protocols. Additionally, an EDI user electing to implement direct connections must be aware that not all trading partners have similar capabilities, and therefore may, by necessity, elect to use a third-party service.

Third-party services use switched network technology and provide value-added services. Switched networks connect and disconnect circuits as required to exchange data. The three common switched network methods are circuit switching, message switching, and packet switching.

Such facilities and services may be obtained from commercial networks called Value-Added Networks (VANs) rather than being developed in-house. The commercial networks provide network management and knowledgeable staff to support an organization's communication requirements. Commercial networks now offer more than moving data from one site to another. Services provided include mailbox service, data storage, speed and format conversion, and translation.

Not all companies have the communication facilities to accommodate the multiple communication protocols that may be used by their potential trading partners. Third-party service providers eliminate the need for a trading partner to invest heavily in communication hardware, software, and personnel. A third-party service provider allows the convenience of a single data transfer link to multiple trading partners independent of operating schedules, protocol conversion, hardware interface, and conversion requirements. The Internet can also be considered a third-party service. It is, however, a limited value-added network as it only provides data transfer capabilities.

documented and communicated to the party responsible for the API.

In addition, if the data or their organization within the database system changes, modifications to the convention document may be necessary. If the data or data relationships are affected by enhancements to the database system, and therefore the convention document, all components related to the EDI system may require maintenance. The actual level of maintenance varies from occurrence to occurrence, but the maintenance of the database system must be recognized as a significant source of maintenance.

SYSTEM HARDWARE

In order for the EDI system to function optimally, it must be supported by the appropriate computer hardware infrastructure. Whether the EDI system is functioning on a stand alone workstation, a networked PC, or a mainframe system, the associated hardware must be maintained and upgraded to accommodate the EDI transmissions. The data storage devises and media, telecommunication pieces (i.e., modems), and other hardware components must be accounted for in the general maintenance of the EDI system. As with many other aspects of the system, the level of maintenance varies widely based on the organization's environment and implementation. Regardless of the complexity of the maintenance, it typically requires specific expertise and should be the responsibility of the appropriate technical staff.

COMMUNICATIONS

Communications is the transport of information in an EDI environment and may be performed by physical or telecommunication means. Physical communication includes the use of magnetic tape and/or courier service. Telecommunication includes the use of a public or private telecommunications network. There is no single or preferred solution. Each trading partner must determine the proper approach based on current and projected transaction volumes and desired level of investment. Criteria to be considered when determining the communication mode of data transfer may include:

- Distance of transport;
- Number of destinations;
- Associated costs;
- Delivery time frame;
- Frequency of transport;
- Security;
- Volume of transactions;
- Compatibility of media; and
- Overall reliability.

Each communication method should be analyzed to determine whether or not the approach meets

An important function of the API is to enforce the data requirements and rules detailed in the implementation guideline. The API is the component of the EDI system that manages the data being transmitted within the context of the business process. As the EIIP EDI X12 Convention Document contains other inventory types and therefore necessitates the creation of an implementation guideline for each, an API may need to be developed for each as well.

Similar to accounting for the requirements of the data associated with a specific inventory type, if any level of quality assurance or data validation is to occur, the necessary functionality must be included in the API. Generally, the quality assurance functions are directly related to rules specified in the convention document; however, if additional levels of data validation or quality assurance are necessary, they must be included at this point in the EDI process.

As each EDI system has at least two trading partners involved with each EDI transaction, there are also two APIs. For the sender function, the API accesses the data set(s) containing the data to be transferred, performs the required data management/quality assurance, creates a flat file as defined by the ADF, and then transfers the data, in the ADF format, to the EDI translator. The initial function of the API is to access the appropriate data set(s). As a result, because the translator must be programmed to provide interaction with the data set(s), the architecture of the data set(s) must be identified and incorporated into the design of the API.

Upon receipt, the reverse process takes place. The API first retrieves the flat file from the translator (both the sender and the receiver have individual translators). This flat file is structured according to the ADF appropriate for the receiving translator. The data in the flat file is then structured to allow updating of the application data set(s). Also at this point, the data is processed according to any quality assurance or data validation that is required by the receiver. The output of the receiving API is an updated application data set.

The API is the component of the EDI system that is most dependant upon the rest of the system. The convention document, the implementation guideline, the ADF, the translator, and the database system all have an impact on the API. As a result, the maintenance of this piece of software can be demanding. Changes to any of the processes, documentation, or components of the EDI system may force the API software to be changed. The scope of the maintenance for the API varies widely depending upon the source and significance of the change being imposed. In the case of the API, as with any other software components, an individual with expertise in software development should be employed for this maintenance.

DATABASE SYSTEM

The database system associated with the EDI system also plays a role in the maintenance of the EDI system. Although much of the EDI system is designed to be relatively independent of the database system, changes to it can affect the API directly. Because the API bridges the database system and the EDI translation software, any modifications to the database system must be

expands. Similarly, this sort of information is found in the implementation guideline. Therefore, revisions to the implementation guideline may generate some maintenance to the translator configuration. Like maintaining the overlay, updates of this nature should be performed by an individual skilled with the translation software.

A DATA FORMAT

A data format (ADF) is a textual description, usually in the form of a table, that specifies the structure and data content of the flat file that is the input to, or output from, the EDI translator. As each EDI translator has unique requirements in order to operate, it is required that the data being received by, or output from, it be in the appropriate structure. As discussed previously, a primary function of the application program interface (API) is to ensure that the data flat file meets the structure described in the ADF requirements. The API developer relies on the structure and data specified in the ADF to program the API. At a minimum, the developer is provided with the following information:

- Application field name;
- ADF field name/structure;
- Data type;
- Data field length;
- Number of field occurrences; and
- Any comments, descriptions, or X12 positions that are applicable.

Depending upon the EDI translation software being used, this information may be automatically generated as a function of the translator.

The ADF communicates the data requirements for the EDI system and is therefore based on the convention document and implementation guideline. This being the case, changes to either of these documents may introduce changes to the ADF. The ADF should be maintained by an individual that is versed in the specifications of the convention document and implementation guideline and is familiar with the data structure requirements of the translation software. This person is typically the EDI support technician.

APPLICATION PROGRAM INTERFACE

The application program interface (API) is a computer program that functions between the EDI translator and the data set that is being transferred. A primary function of the API is to process the flat file of the data as specified by the ADF. To accomplish this, the API is designed to, at a minimum, ensure that the data elements and formats required by ANSI/ASC X12, the convention document, and the implementation guideline are present and in the correct order and format for proper translation.

communication of the EIIP data requirements. The convention document is the "blue print" for the overlay.

The scope of the mapping effort is in direct relation to the content and complexity of the convention document on which it is based, the data structure that is inherent to the translator, and the mapping utilities, if any, that are included with the translator.

The data requirements of the translator also affect other software-related EDI components. These requirements impact the development of a data format (ADF) and subsequently the application program interface, which are explained later in this section. The program structure often necessitates the inclusion of data elements and/or data formats that are not part of the X12 standards, but are necessary for the performance of the translator. As the accommodation of the ADF is an essential function of the API, the translator structure also impacts the development of the API.

Because the translator overlay corresponds to the convention document, its maintenance is directly related to convention document maintenance activities. Any adjustment to the convention document, must also be made to the overlay. As such, the changes must be communicated to the party responsible for the overlay, typically the technical EDI support staff. The level of effort associated with maintaining the overlay is dependant upon the magnitude of the changes and the update functions of the translation software. In all cases, the responsibility for actually updating the overlay should be with an individual familiar with the translation software.

EDI Translator Configuration

Once the overlay is created, the translator is configured for the specific trading partner that will be using it. As with previous activities, the characteristics of the translator have a direct effect on how it is configured; however, this step also takes into account the characteristics of the user environment. More highly functional translators provide intuitive configuration features, but all translators must be configured to some extent. The configuration of the translator generally includes, but is not limited to, specifying within the software the following information:

- The system environment on which the translator will function;
- The type of telecommunication (e.g., modem type) that will be used to transmit the data;
- The EDI interchange information; and
- Trading partner information including, trading partner organization names, log-on identifiers (IDs), and other pertinent information for the trading partners that the translator will connect with.

This type of information would have to be modified with each change in trading partners. As a result, routine maintenance to this part of the translation software is necessary as the EDI system

essential step in the EDI system because it is the X12 standard format that allows the data to be communicated between dissimilar automated systems. Each EDI transmission system is comprised of two EDI translators, one at the sender's end to translate the data into X12 format and one at the receiver's end to retranslate the data from X12 format to the format necessary for their system.

The characteristics of individual EDI translators vary widely. Some translators are designed to perform on a personal computer (PC) platform, while others operate from a minicomputer or mainframe environment. There are also differences in the telecommunication options that translators will accommodate. Many of the translators are more "user friendly" than others, providing easier transaction set mapping utilities. Each type of translator also has a different internal program structure which affects the development of other components of the EDI system.

A final important aspect of the EDI translation software is the actual functionality of the translator. Less complex translators simply translate the data into X12 format, while others with enhanced functions, perform edits for compliance with X12 syntax and semantics. Most all translators provide some form of automated verification feature which checks for proper structure (as specified by the translator) and X12 syntax requirements during translation. Based on the verification, varied error messages are generated to indicate discrepancies in the data being transferred. It must be noted that the EDI Translator does not perform quality assurance or validation of the data for completeness or correctness with respect to the user's application. This function must be performed with the application program interface.

The maintenance required for EDI translation software is dependant upon the specific translator being employed. Because the characteristics of each translator vary, maintenance levels also vary. However, certain maintenance points are common to all software, such as license renewal, version updates, support agreements, etc. Maintenance of the software may also be impacted by the maintenance of the environment on which it operates (i.e., server upgrades, operating platform changes, etc.). All of these issues are typically the responsibility of the information systems technical staff that is supporting the EDI system.

EDI TRANSLATOR OVERLAY

Upon the selection of the translator, an overlay is created by mapping the specifications of the convention document and the implementation guideline into the translator software. The requirements from the convention document specify transaction set-specific information (e.g., data elements, data types, data format, etc.), and the implementation guideline requirements include transmission-specific information (e.g., trading partners, transmission timing, location identification, etc.). The translator software is pre-programmed to accommodate the various transaction set standards developed by ANSI/ASC X12. In the case of the EIIP EDI project, the 841 Transaction Set contained in the translation software is customized to the specifications detailed in the EIIP EDI X12 Convention Document. As the overlay is the electronic equivalent of the convention document, it is the primary tool that ensures the consistent electronic

- Background about ANSI/ASC X12;
- Discussion about the use, and issues related (i.e., points of contact, security, and roles and responsibilities, etc.) to EDI implementation; and
- How to employ the convention document within the context of the business process.

This later role is essential because it communicates information between the trading partners (i.e., sender and receiver) that is critical for effective data usage. With respect to a given business process, the implementation guideline describes the type of data being transmitted, the format of the data, and rules by which the data are applied (e.g., mandatory fields, number of iterations, viable codes, etc.). Although some of this information is also detailed in the convention document, the implementation guideline provides application context and usage rules to the data.

An implementation guideline is developed for each business process supported by the convention document. In the case of the EIIP EDI project, the convention document is designed to transfer data for 11 inventory types. As a result, a minimum of 11 separate implementation guidelines must exist. As the EIIP EDI X12 Convention Document is built to provide flexibility in the types of data able to be transferred, use of it without specific implementation guidelines to provide context would limit the usefulness of the data transferred.

Like most of the EDI system documentation, the implementation guideline must be updated to support changes to the program's activities. Because the guideline provides so much essential information to the trading partners, it must be maintained to reflect all information that has a direct impact on the EDI implementation. The EIIP EDI Implementation Guideline must be updated to reflect changes in the data requirements (i.e., changes to inventory reporting requirements) and overall EDI implementation (i.e., security, points of contact, responsibility, etc.). In addition to the content of the guideline itself, its appendices must also be maintained. As the EIIP EDI X12 Convention Document is a major component of the implementation guideline, the maintenance of both documents are related and essential.

Because the EIIP EDI Implementation Guideline is a document that integrates several aspects of the EDI system, its maintenance becomes the responsibility of a number of parties. Typically, the individuals who developed the implementation guideline are responsible for ensuring its maintenance. As it contains information about the program's requirements, the program coordinator must play a role and, with the convention document as an attachment, the party responsible for technical EDI support/development must also be included in maintaining the guideline.

EDI TRANSLATION SOFTWARE

The EDI translator is a software program that converts the data being transferred into, or from, a format specified by ANSI/ASC X12 for transmission between the trading partners. This is an

critical. In order for the convention document to be viable (as it directly reflects the data model), the data model must be accurate and timely with respect to business process (i.e., air emission inventory) requirements. Maintenance of the data model includes routine analysis of the model relative to the program's data and data relationship requirements. Updates to the data model must be performed in a consistent manner and be well documented for use with convention document development activities. Any changes to the data model will be incorporated into the EIIP EDI X12 Convention Document for implementation.

In addition to the data model, any other process-related documentation must also be maintained. These documents may include, coding conventions, forms/data sheets, reporting requirements/regulations, educational papers, project overviews, system descriptions — any document that defines some aspect of the business process.

The program administrator is responsible for the maintenance of these documents because they are associated with the overall program. In the case of the EIIP, the DMC is responsible for the maintenance and documentation of the Phase I EIIP Data Model and other program/ process-related information.

IMPLEMENTATION GUIDELINE

The EIIP EDI Implementation Guideline is a textual document that describes, in business terms, the use of the EIIP EDI X12 Convention Document for the exchange of data under a specified emission source type and inventory type (e.g., Base Year State Implementation Plan Inventory, Reasonable Further Progress Inventory, etc.). The guideline is based on the *EPA EDI Implementation Guideline*, the specifications in the EIIP EDI X12 Convention Document, and most importantly, the reporting rules related to the individual process to which the EDI system is employed.

The EIIP EDI Implementation Guideline was developed through the cooperative efforts of individuals knowledgeable in X12 standards and the EIIP EDI X12 Convention Document, and those individuals with in-depth knowledge of the reporting and data requirements of the business process for which the guideline is being written. These process champions serve the most important role in the development of the guidance. They are responsible for identifying the processes with which the EDI system will be interfaced and providing information about the data specifically associated with the process. In many cases, the business process is directly based on a specific form, report, or data file. When this is the case, the implementation guideline is designed to reflect the content of the applicable form, report, or data file.

An implementation guideline includes, but is not limited to, the following information:

- Background about the EDI project to which it pertains;
- A general description of EDI;

performs its intended role, stays aligned with other electronic commerce initiatives within the organization, is an asset, expands to meet the demands of the business and technology, and provides a basis for future efficiencies.

Similarly, business issues that may impact the EDI system must also be identified, analyzed, and managed/maintained. Because EDI serves a specific business process, it is subject to change based on the dynamics of that business. This can often be a very vulnerable position when the EDI system is being relied upon to exchange mission critical information or to support other essential business needs. The EDI system must be attuned to, and work harmoniously with, the business (and related issues) it supports. As such, the system must be maintained in a manner that takes business issues into account and attempts to adapt to the issues before it is forced to merely react.

The maintenance of management support and business issues is the responsibility of everyone who is involved with the EDI system. The system only functions optimally when it is fully integrated and maintained. As such, any party responsible for a given component has an impact on the maintenance of management support and other business issues. Although this is a team approach, management support is often the ultimate responsibility of the EDI program administration or the individual(s) who actually manage the overall project. These individuals are typically the primary interface with other organizational management. As a result, this individual(s) must stay informed about the status of each EDI component, future development plans, and any issues that may affect the EDI system and/or higher level management support.

DATA MODEL/PROCESS DOCUMENTATION

The Phase I EIIP Data Model details the data elements and their interrelationships as identified by the EIIP Data Management Committee (DMC). The data model is the foundation of the EIIP EDI data transfer activities and is essential for directing the prototype activities.

The data model is driven by the practical knowledge of the DMC participants regarding programattic reporting requirements, processes, and associated data. The content of the data model addresses the most widely used or relevant reporting requirements of the major emission sources (point, area, mobile, and biogenic).

Each of the four emission source data models provides a graphical representation of the data domains, their relationships, and an associated data dictionary. The dictionary contains the data elements, the description of each data element as applied to the EIIP, the type of data that is valid for each element, the entity in which the individual elements are applied, the element's domain (if applicable), and an indication of the relationship of each element to the table structure (e.g., foreign key, required attribute, etc.).

Because the data model is a foundation piece for the whole EDI system, its maintenance is

5
EDI SYSTEM COMPONENTS

OVERVIEW OF EDI SYSTEM COMPONENT MAINTENANCE ISSUES

A production EDI system is comprised of several integrated components. These components include:

- Management Support
- Data Model
- X12 Transaction Set
- Convention Document
- Implementation Guideline
- EDI Translation Software
- A Data Format
- Application Program Interface
- Database System
- System Hardware
- Communications
- Trading Partners

Each plays an integral role in enabling the electronic transfer of data between the automated systems of trading partners. This section provides a general overview of each of the primary EDI components and briefly outlines their function and maintenance requirements. The information provided is focused specifically on its relationship to the EDI system. Many of the components may require maintenance outside of that which is necessary for the functioning of the EDI system. These elements are not specifically discussed.

MANAGEMENT SUPPORT/BUSINESS ISSUES

Management support is an essential component of a successful EDI system. In order for a system to be initiated, implemented, and maintained, it must be viewed as an asset by an organization's management. Management support for an EDI system often provides specification of the business processes that will employ EDI, initial and ongoing financial investment, direction regarding the implementation of the EDI system, decision making related to information systems, and the development of trading partner relationships. Although these are only a few of the roles that management and its support may play in an EDI system, they are certainly essential.

Management support is the first and underlying component to every aspect of the EDI system and therefore its maintenance is of utmost importance. Steps must be taken to ensure the continued support of management. Maintenance of this support involves ensuring that the EDI system

understanding of both facets.

An equally significant maintenance issue, that is more directly under the control of the EIIP, is related to changes in the program itself. As the EIIP evolves, the modifications to the data exchange needs must be mapped into the EIIP EDI X12 Convention Document. This mapping activity is performed by analyzing the appropriate version/release of the X12 Transaction Set to identify the necessary data structure(s) needed relative to the business process. For example, the EIIP is currently employing the ASC X12 841 Transaction Set version/release 3060 for exchanging air emission inventory data. If this data transfer application were to change (e.g., add data attributes) the convention document would have to change accordingly (e.g., add X12 data elements).

Once the ASC X12 data structures are identified, the convention document is updated in accordance with the specifications of the standard (transaction set). If data needs are identified that are not currently present in the standard, the DM process describe in Section 3 would be pursued. Through this process, the data structures needed by the program may be added to the national standard. Upon adoption by ASC X12, those structures could then be added to the EIIP EDI X12 Convention Document.

Similarly, the EIIP EDI X12 Convention Document contains many code lists which are unique to the emission inventory application and the EIIP implementation. As such, the codes are not maintained by ANSI/ASC X12. To avoid confusion during implementation, it is imperative that the EIIP codes are maintained in a consistent and controlled manner so that all users of the EIIP EDI X12 Convention Document apply the same codes with their data. This is another major maintenance facet that impacts the convention document and could affect other EIIP documents, such as the data model.

In summary, the activities associated with maintaining the EDI convention document include:

- Map the selected transaction set relative to the intended implementation;
- Monitor changes in the business process relative to the transaction set and update the convention document accordingly;
- Monitor changes in the transaction set relative to the business process and update the convention document accordingly; and
- Maintain programmatic code lists (i.e., not X12-related codes) to ensure accuracy of data.

4
CONVENTION DOCUMENT

EDI CONVENTION DOCUMENT MAINTENANCE ISSUES

The EIIP EDI X12 Convention Document is the textual representation of the X12 Transaction Set being employed with the EIIP EDI project. The document is a subset of the ANSI/ASC X12 841-Specifications/Technical Information Transaction Set. The subset is designed based on the requirements detailed in the Phase I EIIP Data Model and complies with all X12 design rules. The convention document is the basis for all EDI implementations under the EIIP EDI project and is essential for directing the program's EDI prototype effort.

The convention document development effort was completed through the cooperative efforts of individuals knowledgeable in X12 standards/procedures and champions of the specific emission source models and the information included with the Phase I EIIP Data Model. The convention document is a single document that encompasses each four of the four defined emission sources (point, area, mobile, and biogenic). It contains all of the transaction set components required by X12 (e.g., loops, segments, elements, usage notes, etc.), all data elements and related attributes specified in the data model, notes that highlight differences in transaction set components (i.e., semantics of data with respect to usage for multiple emission source reporting), and examples of data structure with respect to the transaction set architecture.

The EIIP EDI X12 Convention Document is directly linked to the X12 standard on which it is based. Therefore, its maintenance is related to changes to the transaction set. As indicated at the end of Section 3, the EIIP must evaluate each version/release of the X12 Transaction Set to determine whether it contains changes that should be included in the program's implementation. These changes are ultimately driven by ASC X12 and will have a varied in impact to the EIIP. If it is determined that the changes to the standard are significant enough, the program would decide to upgrade to the new version/release.

If the decision is made to upgrade to the next version/release, as the content/requirements of the X12 Transaction Set changes, so must the convention document. Although the EIIP EDI X12 Convention Document is developed by, and subject to, the management decisions of the EIIP, it must always remain consistent with the corresponding version release of the X12 841 Transaction Set on which it is based. This is essential because the convention document is the cornerstone technical document for the other components of the EDI system, including the EDI translator, the implementation guideline, application program interface, and other system documentation.

As with transaction set maintenance, convention document maintenance is usually the responsibility of the program's EDI coordinator or equivalent. Because this function brings together knowledge of X12 and the program's business needs, the responsible party must have an

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- Monitor changes in the business process relative to the transaction set; and
- Monitor changes in the transaction set relative to the business process.

structures have been necessary. These modifications have been developed and submitted in a manner consistent with the X12 guidelines. To help ensure that the needs of the program are realized, EIIP representatives presented the DMs to ASC X12. Attendance at the committee meetings provides additional emphasis on the need for the requested changes. This personal involvement in the DM process is often essential to ensure the timely adoption of DMs.

As the EIIP EDI project matures and its scope expands, additional modifications to the transaction set are likely. If future releases/versions of the 841 Transaction Set do not support the structures or codes needed for the EIIP implementation, further DMs will be necessary. The awareness of the transaction set relative to the dynamic needs of the program and the subsequent modification activities constitute a major maintenance factor.

In general, the significant issues related to the maintenance of the ANSI/ASC X12 841 Transaction Set that are driven by the EIIP include: understanding the standards and the business needs, identifying the changes in both, submitting the necessary DMs in accordance with X12 guidance, and personally representing the program. The responsibility for these maintenance issues is typically associated with the program's EDI coordinator or other party that is versed in X12 and the business needs of the EIIP.

A second major category of transaction set maintenance issues are those changes that are imposed by the gradual evolution of the standard itself. Just as the EIIP submits DMs to ASC X12, other users of the 841 Transaction Set do the same. The combined affect of the DMs results in overall enhancement of the transaction set.

As alluded to above, attention must be paid to each version/release of the ANSI/ASC X12 841 Transaction Set. As each version may include changes that may be necessary for the EIIP's implementation, the program must be aware of the content of each standard. Once the changes have been identified, they should be evaluated to determine whether to adopt that version/release (i.e., upgrade) for use with the program.

It is not required that the EIIP EDI program upgrade with each version/release of the X12 standards. The decision must be based on the scope of the changes included in the version/release and whether they provide functionality that is required for optimal use with the EIIP EDI system. Although these changes may impact the program's implementation in varying amounts, their possible impact poses a significant maintenance concern. The EIIP EDI project is currently using version/release 3060. However with the adoption of the DMs requested, the program will upgrade to the next full version/release.

In summary, the activities associated with maintaining the ANSI/ASC X12 EDI standards include:

- Identify the appropriate transaction set relative to the intended implementation;
- Identify the necessary enhancements (if necessary) to the standard;
- Present the proposed changes in the manner specified by ASC X12 for DMs;
- Represent the DMs, in person, at the ASC X12 meeting to help ensure adoption;

3
ANSI/ASC X12 TRANSACTION SETS

ANSI/ASC X12 EDI STANDARDS MAINTENANCE ISSUES

The ANSI/ASC X12 Transaction Set is the standard that allows automated systems to exchange data. As mentioned above, the transaction sets are maintained by the subcommittees of the ASC X12. Within these committees new standards (transaction sets) are developed, current standards are modified, and the rules by which the standards are implemented are maintained. As the transaction sets are administered by ANSI/ASC X12, individual users can not directly change the standards. The development and evolution of transaction sets is initiated at the request of an individual implementer, such as the EIIP, but actual adoption is the ultimate responsibility of the ASC X12. The standards modification process and the impact that it has on the EIIP EDI project are described below.

The modification of ANSI/ASC X12 standards impacts the EIIP EDI implementation in two significant ways. The first type are changes that are driven by EIIP's use of the standard. In order to develop a standard that optimally supports the data requirements of the EIIP, certain modifications to the existing ANSI/ASC X12 841- Specifications/Technical Information Transaction Set were necessary. These changes were recorded and presented to ASC X12 as data maintenance (DM) requests. A data maintenance request is a formalized procedure by which proposed changes to the existing X12 standards are presented for ASC X12 committee consensus and adoption into the standard.

The overall process by which the standards are developed, and DMs are approved, is performed in accordance with strict guidelines and is often complex and time consuming. The nature of the standards development and modification process adds to the scope of transaction set maintenance.

The process by which a standard is reviewed by ASC X12 is detailed in Appendix B. This evaluation process and the subsequent changes to the X12 standards have a profound impact on the maintenance of the transaction set being used with the EIIP EDI project. Therefore, the detailed description provides important insights for the EIIP implementation.

The minimum time to accomplish any change to the ANSI/ASC X12 standard is nine months. All DMs associated with the transaction set being used by the EIIP EDI project will be assessed in accordance with the X12 procedures. This includes any DMs to modify the ANSI/ASC X12 841 Transaction Set segments, data elements, code lists, or syntax/usage rules that are currently specified by the standard.

The EIIP EDI project has already required modifications to the 841 Transaction Set. Through the EIIP EDI project, additional data element qualifier codes, units of measure, and even X12

Transaction Set. This transaction set was selected because it is designed to exchange technical information and therefore, the structure and syntax of the standard enables the air emission inventory data required by the project to be transferred.

EDI CONVENTION DOCUMENTS

When an organization implements an EDI solution to exchange business-related data, a number of components critical to the EDI system must be secured. Along with obtaining the necessary technology (e.g., computer hardware, software, and telecommunications), the organization must apply the appropriate ANSI/ASC X12 Transaction Set for their business needs. As stated above, each standard (transaction set) is designed to support a specific type of data. Therefore, it is essential that a transaction set be selected that appropriately corresponds with the business application.

Once an transaction set has been selected, it is analyzed and mapped to the individual data element requirements specified by the organization's business systems (e.g., EIIP application for transferring air emission inventory data). The mapping activity generally entails analyzing the data requirements of the business application using a structured techniques (i.e., data modeling and/or data flow analysis) and identifying the appropriate location within the transaction set where the data requirements can be supported. Mapping is performed in accordance with strict use and syntax rules specified by ANSI/ASC X12.

The result of this effort is an EDI convention document. This document details technical, X12-related information as it pertains to the particular business use. It specifies the required X12 data structures, use and syntax rules, and important user notes that must be applied when exchanging data using the organization's EDI system. The convention document differs from the transaction set on which it is based in that it contains only those standards-based data structures that are required to perform the business function and meet the standard syntax rules.

The EIIP has developed the EIIP EDI X12 Convention Document, based on the ANSI/ASC X12 841 Transaction Set, for the exchange of air emission inventory data. The design of the document is consistent with X12 rules and contains the data structures specified and/or required by the X12 standards and the Phase I EIIP Data Model.

The ANSI/ASC X12 standards are the foundation of the EIIP EDI solution and the EDI convention document is the definitive application of those standards to the program's business needs. Due to the nature of both components, the complexity of their development, and their importance to the implementation of an EDI system, their maintenance is essential. Sections 3 and 4 provide EIIP trading partners with information about the general issues related to maintaining the ANSI/ASC X12 841 - Specifications/Technical Information Transaction Set and the EIIP X12 EDI Convention Document.

2
EDI STANDARDS

EDI STANDARDS OVERVIEW

Electronic Data Interchange is the automated communication of business-related data between trading partners. As each trading partner organization has a different information system architecture, it is typical for data to be stored as unique, proprietary data sets. The differences between the systems make exchanging information difficult. This communication of data between dissimilar automated systems, that otherwise can not interact, is accomplished through the use of a standard EDI data format.

The national EDI standards are approved for use by the American National Standards Institute (ANSI) and are developed by ANSI/Accredited Standards Committee (ASC) X12. The membership of ASC X12 is comprised of a host of technical, trade, consumer, and professional organizations and individuals. ASC X12 is responsible for maintaining the various X12 standards and developing new national EDI standards.

The maintenance and development of the X12 standards is performed in a manner that ensures their integrity, and, as the membership is made up of EDI users, that the standards meet the specific business-related data transfer needs. Through this process, hundreds of standards are available for use, each able to meet specific and unique business applications.

The process of standards development, modification, and enhancement is based on strict analysis and consensus by the various ASC X12 committees. To ensure that each standard meets its intended use and the rules required for standards development, the activities associated with their administration are intensive and complex. Although the process is structured and often time consuming, this level of rigor helps ensure that business data is transferred in a consistent manner between trading partners when ANSI/ASC X12 standards are used.

ANSI/ASC X12 TRANSACTION SETS

The ANSI/ASC X12 standards are organized into transaction sets. The transaction set is the standard that is used to exchange business data and, as such, it is the unit of information that is communicated between trading partners. Each transaction set has a unique and significant structure of loops, data segments, and data elements that are designed to work in a manner that meets specific data transfer needs. Each transaction set has a general purpose for use. This intended use and the associated structure defines the transaction set.

The EIIP EDI project employs the ANSI/ASC X12 841 - Specifications/Technical Information

EIIP BACKGROUND

The Emission Inventory Improvement Program (EIIP) is a joint effort of state and local air quality monitoring agencies and the United States Environmental Protection Agency (EPA). The program is organized for the purpose of improving the quality of the emissions data collected and the way the data is transferred and shared among users. The EIIP Data Management Committee (DMC) is responsible for developing and testing a common data transfer format that can facilitate data sharing within the emission inventory community.

The DMC has developed the *EIIP Phase I Core Data Model* to help facilitate the transfer of data within the emission inventory community. The data model organizes the four unique and different perspectives of point, area, mobile, and biogenic source components. The final data model is the basis for developing a standard data transfer format for use among industry, state and local agencies, EPA and other organizations to share emission inventory data. The DMC is developing and applying Electronic Data Interchange (EDI) as the data transfer format for the program.

1
INTRODUCTION

INTRODUCTION

Electronic Data Interchange (EDI) is the automated flow of business information between the computer systems of trading partner organizations. In order to successfully perform EDI, a specialized system must be developed. Through necessity, the system is comprised of a number of essential, interrelated components. Each of these key components must be well developed and work in harmony to accomplish the organization's goals. The characteristics of the system and its components are based on, and must directly support, the specific needs and goals of the implementing organization.

Developing a production EDI system can be a complex undertaking. Aside from the issues that impact all system development efforts (i.e., organizational issues, financial concerns, business relationships, technology, and expertise), the assembly of the components and their business-specific characteristics provides definite challenges. Once in place and functioning, the system is still sensitive to these matters. Because an organization's business environment is dynamic and technology is constantly evolving, the maintenance of an EDI system is a significant activity. The long-term maintenance of a production system must be understood and considered prior to its implementation and throughout its life cycle.

PURPOSE OF THIS REPORT

This report outlines the key components of a production EDI system and provides general information about their maintenance. It specifically develops the primary maintenance issues related to the backbone of any EDI system — the transaction set and convention document (Sections 3 and 4). These two documents provide the mechanism for the automated systems of trading partners to exchange data. Because they are of such critical importance and involve a set process for development, a detailed description of these components, along with their related maintenance, is provided. Appendix B supplements the detailed description of these maintenance activities.

Because an EDI system is a composite of several parts, each is addressed separately. General information about what the component is, how it is integrated with the other parts, and the typical maintenance issues are outlined (Section 5). A glossary of terms is found in Appendix A.

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REPORT ON MAINTENANCE ISSUES ASSOCIATED WITH THE EIIP EDI X12 CONVENTION DOCUMENT

April 1997

Prepared by:
Technology Planning & Management Corporation
DynCorp Information & Engineering Technology

Prepared for:
Data Management Committee
Emission Inventory Improvement Program

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REFERENCES

Electronic Commerce Strategies, Inc., *Buyer's Guide to Electronic Commerce*, Electronic Commerce Strategies, Inc., 1995 edition.

EDI World Magazine, *1996 EDI Software Directory*, EDI World, Inc., 1996 edition.

Phillips Business Information, Inc., *1996 EDI Yellow Pages*, Phillips Business Information, Inc., 1996 edition.

Ravi Kalakota and Andrew B. Whinston, *Frontiers of Electronic Commerce*, Addison-Wesley Publishing Company, Inc. 1996.

Richard Bort and Gerald R Bielfeldt, *Handbook of EDI*, "EDI Management Software", Warren, Gorham & Lamont, 1996 edition.

Mike Witter, *The EDI Project Planner*, EDI Strategies, Inc, 1989.

6. The proposed version of the translator software must be in production at multiple users sites. After bid opening and prior to award, the bidder must provide a minimum of three references.

7. Maps, profiles, and other user-defined tables are migratable from one X12 version to another without having to manually reenter the information.

8. Has built-in virus protection.

9. Has automatic recovery in the event of a system shutdown.

10. Upgrades and enhancements shall be provided at no extra charge during the contract term. Software upgrades, including new versions/releases of the standards, are to be provided within 90 days of publication.

III. TRAINING REQUIREMENTS

The *(organization)* will require a minimum of two days of on-site training. Training shall be provided for two people and shall be conducted on dates mutually agreed upon between the contractor and the *(organization)*

IV. SUPPORT REQUIREMENTS

The contractor shall provide telephone support for one year following the acquisition of the software. Telephone support shall be available Monday through Friday, 8:00 AM to 5:00 PM, EST, excluding *(State)* observed holidays.

V. CONTRACT REQUIREMENTS

The contractor agrees to comply with **Attachment A, Provisions for *(State)* Contracts**, as attached.

VI. HOLD HARMLESS

The contractor shall be responsible for and agrees to indemnify and hold harmless the *(State)* from and against damages to property or injuries (including death) to any persons ans other losses, damages, expenses, claims, demands, suits, and actions by any party against the *(State)* in connection with the work performed by the contractor.

13. Flexible error processing conditions. Provide a variety of reports that describe and diagnose errors.

14. Supports reports on document types, document numbers, control numbers, file names, error status, acknowledgment status, and transaction volume statistics based on user-selected criteria.

15. Ability to archive all intermediate input and output data files.

C. Mapping

1. Flat file format can be user-defined for any transaction set type regardless of trading partner differences.

2. Ability to view the map definitions on-line.

3. Allowances for multiple conditional processing. This is the ability to use multiple data elements from a transaction set to generate a single data element for the output flat file and vice versa.

D. Database

1. Allows database definitions, operations, algorithms, and other processing rules to be defined through dynamic, table-driven tools. All tables should not be imbedded in code - only program functions should be in the executables.

E. Ease of Use

1. Straight-forward, well-organized, intuitive user interface.

2. Customizable on-line context-sensitive help.

3. Table-driven utilities to modify/create transactions, trading partner data, and maps.

4. Ability to copy maps, profiles, and job processes.

5. Has point-and-click Graphical User Interface (GUI).

F. Other

1. Ability to add new trading partners within 24 working hours.

2. Ability to implement new transaction sets within 40 working hours.

3. On-line document tracking providing statistics and other data on networks, trading partners, and other transaction sets.

4. Password, Personal Identification Number (PIN), menu and access type security.

5. Proven track record in EDI.

1. Supports all connections to multiple VANs or direct connects to trading partners.
2. Supports multiple communications protocols including async, bisync, and X.400/X.25.
3. Operates in Windows NT and/or Windows 95.
4. Automatically notifies user when errors occur.
5. Allows customizing of core translation and error notification scripts.
6. Is flexible in defining pre- and post-communication processes which could include interface routines, programs, and command procedures.
7. Keeps detailed history logs of all processes performed to determine error status and track processing activity.
8. Allows option of EDI transactions over Internet, including appropriate security measures.
9. Able to perform scheduled or manual file purging.
10. Able to work with a TCP/IP compliant dial-up security product (DECs Tunneling Product)

B. Translation

1. Supports ASCX12 standards, all current and future versions, releases and implementations.
2. Supports all X12 transaction sets.
3. Includes predefined tables of standard transactions, segments, and elements.
4. Has ability to copy standard tables to create customized standards.
5. Has ability to define cross reference tables. These tables are used to reconcile codes if trading partners use different codes from recipient and/or the standard.
6. Automatically generates 997 Functional Acknowledgments for inbound transactions.
7. Ability to customize the editing criteria for the 997.
8. Audit trail reports automatically match inbound and outbound functional acknowledgments with their associated outbound transaction set.
9. Inbound transactions can be printed or viewed on-line in a human readable format.
10. Supports manual data entry of outbound EDI data through data entry screens.
11. Supports batch downloads from an application interface linking the translation software to an Oracle database.
12. Ability to import from and export to flat file formats.

APPENDIX C
EXAMPLE TRANSLATOR SOLICITATION

EXAMPLE TRANSLATOR SOLICITATION SPECIFICATIONS

The following is an example solicitation package for the procurement of EDI translation software. It is intended to provide insight to the hypothetical translator needs and requirements for an organization. It is not a comprehensive document for use with a specific translator procurement. Prior to embarking on such a procurement, an organization must not only identify the technical requirements to be solicited, but any procurement policies/regulations that must be adhered to.

The information provided below are the technical criteria that are required of a candidate vendor. This specifications sheet is typically preceded by an official invitation for bid proposal document that would be specified by the contracting organization.

SPECIFICATIONS

I. SCOPE OF WORK

The *(organization)* is seeking to obtain Electronic Data Interchange (EDI) translator software and a single user license. The software will run on a 586 Pentium with 32 MB RAM running Windows NT version 3.51. If not, the software will be run on a 486 Pentium with 16 MB RAM running Windows 95. The PC is a front end to an Oracle relational database residing on a DEC VAX cluster.

Prior to acceptance of the software, the *(organization)* reserves the right to conduct a 30-day test of the translator software using an implementation of ASC X12-841, version 3060. The result must be successful inbound and outbound transactions as described in the program's EDI implementation guideline available from the *(organization)*. Bidders may obtain copies of this guide by contacting *(point of contact)* at *(point of contact telephone number)*. The purpose of this test is to allow the *(organization)* to evaluate how the proposed translator software will conform to the requirements as described below. The intent of this bid is to provide off-the-shelf software as opposed to custom software.

Any questions concerning the technical aspects of this bid should be direct to *(point of contact)* at *(point of contact telephone number)*. Questions concerning the contracting or bidding procedures should be directed to *(point of contact)* at *(point of contact telephone number)*.

II. SOFTWARE REQUIREMENTS

A. Communications and Process Control

Does is support a wide range of printers and work when the printer is off?				
Does is support multiple versions of ANSI X12 standards?				
Does is operate in the background so the computer can perform other tasks?				
Does is allow transaction edit function to reduce functional acknowledgment rejects?				
Does it provide audit trails?				
Does it provide password security for a variety of functions and applications?				
Is it Table Driven for ease of upgrading standards?				
Will the vendor provide source code?				
Can it be customized to meet specific needs?				
Can the software be tested internally?				
VENDOR SUPPORT	**Vendor 1:**		**Vendor 2:**	
	YES	**NO**	**YES**	**NO**
Is the vendor experienced in your industry?				
Has vendor received any applicable industry EDI guidelines and is system compatible?				
Does the vendor provide a customer service hotline?				
Does the vendor offer on-site training?				
Does the vendor provide software upgrades?				
Does the vendor offer ongoing software enhancements?				
Is the vendor's reputation recommendable?				
Does the vendor supply a maintenance contract?				

APPENDIX B
TRANSLATOR COMPARISON WORKSHEET

EDI TRANSLATOR SOFTWARE COMPARISON WORKSHEET

The following is a checklist of typically desirable EDI translator software features. It is intended to assist with comparing products from EDI software vendors for use with the EIIP EDI System. The checklist can be customized to include any special feature that were identified through the internal evaluation process. In addition, any specific evaluation points outlined in Section 4 that are of importance to an individual implementation and are not otherwise included should be considered.

Software	**Vendor 1:**		**Vendor 2:**	
Basic cost of software:				
Annual maintenance contract:				
Period of license (years)				
Any additional vendor support costs:				
	YES	**NO**	**YES**	**NO**
Does the software operate in your computer environment?				
Does the software support your performance requirements?				
Does the software support the EDI standards to be used?				
Are all needed transaction sets available?				
Does the software support the version/release(s) required?				
Is the package operating in your industry?				
Does the package offer features to support the specific needs of your industry?				
Is communications capability built in?				
Are the required communications protocols and systems supported?				
Does the translator support Internet connection?				
Is the communications automated to enhance security?				
Is an application-link generator built in?				
Is a tutorial or demo available for installation ease?				

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EPA, The abbreviation for the United States Environmental Protection Agency. Established in 1970 by presidential executive order, it brings together parts of various government agencies involved with the control of pollution. Note that some state environmental authorities may be called EPA also, as in Illinois EPA.

Functional Acknowledgment, A transaction set (997) transmitted by the receiver of an EDI transmission to the sender, indicating receipt and syntactical acceptability of data transmitted according to the ASC X12 standards. The functional acknowledgment allows the receiving party to report back to the sending party problems encountered by the syntax analyzer as the data is interpreted. It is not intended to serve as an acknowledgment of data content.

Implementation Guideline, Instructions on the use of EDI for an individual business use of EDI. Guidelines provide additional information about conducting EDI and may provide assistance on how to implement EDI.

Standards, The technical documentation approved by ASC X12, including transaction sets, segments, data elements, codes and interchange control structures. Standards provide the structure for ASC X12.

Third-Party Services, Organizations that provide value-added communication/transmission services. Also see VAN.

Trading Partner, The sending and/or receiving party involved in the exchange of electronic data interchange transmissions.

Transaction Set, A semantically meaningful unit of information exchanged between trading partners.

VAN, The abbreviation for Value-Added Network. Also see Third-Party Services.

Version/Release, Identifies the publication of the standard being used for the generation or the interpretation of data in the X12 standard format (e.g., Version 003040 is Version 3 Release 4).

Data Model, A description of the principles of organization of a database, including data entities, attributes, relationships, and data specifications.

Data Set, The grouping of data that is being exchanged between the automated systems of trading partners via EDI.

DISA, The abbreviation for the Data Interchange Standards Association. A non-profit organization which serves as the Secretariat for X12.

DMC, The abbreviation for the Data Management Committee of the Emission Inventory Improvement Program responsible for the administration of issues related to air emission modeling data.

EIIP, The abbreviation for the Emission Inventory Improvement Program which is chartered to address the collection and use of air emission inventory/modeling information.

EDI, The abbreviation for electronic data interchange. Commonly defined as "the computer-to-computer exchange of business information in a standard format." An EDI transmission is a highly structured message intended for automated processing by a computer. It is meant to be machine-readable so that it doesn't require human intervention to be interpreted and understood. EDI is primarily used for intercompany communication. All references to EDI under U.S. EPA programs refers to the utilization of ASC X12 standards.

EDI Translation, The conversion of application data to and from the X12 standard format.

EDI Translator, Computer software used to perform the conversion of application data to and from the X12 standard format.

EDI Translator Configuration, The activity of inputting trading partner and EDI system specifications into the EDI Translation Software. This process provides the translator with essential information needed for translation and transmission of data. This information is often documented in the Implementation Guideline and/or the Trading Partner Agreement.

EDI Translator Overlay, The computer code designed in the EDI translator which reflects the requirements of the convention document and is consistent with the ASC X12 standards. It functions to translate the data set to or from the required X12 format.

EDI Translator Overlay Mapping, The development of the overlay within the EDI translation software in accordance with the requirements of the translator characteristics, the ASC X12 standards and the convention document.

APPENDIX A
GLOSSARY

ADF, The abbreviation for A Data Format. A textual description, usually in the form of a table, that specifies the structure and data content of the flat file that is the input to or output from the EDI translator. It is a technical document that is use in designing the application program interface between the EDI translation software and the database system.

ANSI, The abbreviation for the American National Standards Institute (ANSI). The national coordinator for standards in the United States.

API, The abbreviation for the application program interface (API). A computer program that functions between the EDI translation software and the database system associated with the data being exchanged.

ASC X12, The abbreviation for Accredited Standards Committee (ASC) X12. It is comprised of a non-profit clearing house and coordination body for voluntary data standards activities in U.S. The purpose is to develop uniform standards for the electronic interchange of business transactions for submission to ANSI for subsequent approval and dissemination. X12 is the subcommittee responsible for the development and maintenance of standards for Electronic Data Interchange (EDI).

Communications, The transport of information in an EDI environment that may be by physical (i.e., magnetic tape or courier service) or telecommunication (i.e., public or private telecommunications system) means.

Convention Document, Common practices and/or interpretations of the use of the ASC X12 standards, as agreed upon by two or more trading partners. Conventions define what is included in a specific implementation of an ASC X12 standard.

Convention Document Mapping, The development of the convention document by selecting the appropriate X12 structures for implementation in accordance with the requirements of the ASC X12 standards and the business process.

Database System, In this usage, it is the automated data storage mechanism (i.e., database, spreadsheet, etc.) for data being exchanged within an EDI system. Also referred to as Automated System.

Data Element, A data element can represent a qualifier, a value, or text (such as a description).

The level of effort associated with these maintenance points is typically minimal if they are associated with a vendor that the organization has a standing relationship with and are planned for. They are generally carried out as a routine activity by the EDI coordinator.

The cost of translator maintenance, as with many other aspects of the translator and overall EDI system, is related to the individual organization. The cost is linked to the translator that is selected for use, the number of licenses held, and the level and period of support required. As a result, financial information must be obtained from the vendor selected to support the organization's implementation. As stated previously, the costs of translators vary from free of charge to several hundreds of thousands of dollars depending upon the functionality, quality, and support included in the package.

Apart from these, typically software-related maintenance issues, unplanned maintenance events may also occur. The scope and impact of these issues is not possible to judge until they occur. However, if the EDI system is relied upon for heavy production use or the exchange of mission critical data, these maintenance activities often have dramatic impacts on the organization. As a contingency for unplanned maintenance, it is essential that the organization have a system failure/back-up plan to activate as situation arise.

- If the organization modifies its implementation or convention documentation to allow for changes in a business application, the mapping of the translator (overlay) must be modified accordingly.

- If the organization expands its use of EDI in such a way that additional convention documents are created, the additional associated translator mappings (overlays) must be included to support the new implementations.

- If the organization changes to employ new or different information systems and technology, the translator may also need to be enhanced or modified to function in the new computing environment.

As with routine management activities, these activities are often the responsibility of the EDI coordinator and/or EDI technician. However, as many of the matters are related to changes to the organization, business processes, or overall implementation, management must also play a role. The level of effort and associated staff and financial resources associated with this management share the same variables stated for above. As a result, the actual cost of this management is also a factor of the organization's characteristics.

EDI TRANSLATOR MAINTENANCE

Planned translator maintenance is performed more routinely and often in a more definitive manner. It is often driven by forces outside the immediate organization and is related to those parties that support the organization's implementation. Some of the factors that constitute this maintenance include, but are not limited to, the following items.

- Upgrades to new releases of the resident software that are provided by the vendor. These upgrades typically include enhancements to the overall functionality of the software or increases in performance. They also include updated EDI-related details, such as transaction sets, segment and element structures, and code tables, which are generated through ANSI/ASC X12 activities. The period that these upgrades are provided is typically stipulated as part of the software licensing agreement.

- Renewal of maintenance/support agreements with the vendor. These agreements are typically renewed annually, but are usually available for extended periods.

- Renewal of software licensing agreements. As with support agreements, these typically have a one year term, but are usually extendable.

related issues; and

- Various other internal coordination activities with the users of the translated data.

These routine, administrative activities are typically part of a EDI coordinator and/or EDI technician's responsibilities. As such, they should be evaluated in a manner similar to other information systems management activities. The level of effort and associated staff and financial resources are a function of a combination of the following factors and many interrelated variables.

- Organization's management goals and support (as it , drives the implementation);
- Size and complexity of the overall implementation and EDI system (as it impacts the translator used);
- Quality and functionality of the translator; and
- Level of expertise and experienced provided by the staff.

As each of these variables, and others that are associated, are directly related to the implementing organization, actual dollar amounts will vary. In order to effectively project the long-term cost of this type of translator management, the organization must have a well defined understanding of the environment in which it will perform, the business function that it will support, and the goals it must achieve. Once this understanding is gained, cost/benefit analysis can be performed based on initiatives of similar scope, either inside or outside the immediate organization, and the actual costs associated with the software and hardware. This research, as it will be performed relative to the actual characteristics of the implementing organization will yield the most accurate information. It should be noted that, even with such information, a definite result from cost/benefit analysis is difficult to obtain because the use of EDI is often related to other initiatives such as business process reengineering.

Management for Programmatic Dynamics

Another form of translator management is that which arises out of programmatic changes. This sort of management is performed as situations demand adjustments to the functionality or application of the software. Although the actual activities for a specific translator are not able to be fully identified until it is selected, installed, and functional, a number of general impacts and activities are likely. These action points include, but are not limited to, those outlined below.

- As trading partners are added or removed from the organization's EDI program, modifications to the software configuration (e.g., trading partner profiles, telecommunication information, etc.) that must be performed.

5
MANAGEMENT AND MAINTENANCE

To ensure that EDI translation software continues to perform in the manner required by the program, it must be managed and maintained. The successful implementation of an EDI system is not a one-time investment. Translation software must be viewed as a dynamic tool that adapts to changes in the organization, business applications, information systems, technology, users, and trading partners.

The management and maintenance of an EDI translator is multifaceted and variable. As discussed previously, the environments in which translators operate and the functions they provide vary widely. As a result, so do the requirements for their management and maintenance. The level of use, the complexity of the implementation, the quality of the translator, and a number of other factors, dictate the amount of effort and support that must be invested in a translator.

EDI TRANSLATOR MANAGEMENT

An EDI system is intended to be an integrated component of a business process. As a result, it must be managed in a manner similar to any other automated system that supports the process. Some of these activities are routine while others occur with changes to the business process. Because the EDI translator software is major component of the overall EDI system, it shares these types of management necessitates.

Routine System/Software Administration

The management associated with routine, production-related activities include those things that are generated by EDI traffic. The magnitude and frequency of these activities varies widely based on the overall level of system performance and the software that is being used. However, some of the more typical activities may include, but are not limited to:

- The administration of the performance of the overall EDI system and translation software;
- Observation and evaluation of transmission activity (incoming and outgoing);
- Generation and review of system administration and transmission activity reports;
- Coordination with trading partners and software vendors regarding translator-

- *Are there any "add-on" charges?*

  The vendor should be able to provide documentation regarding pricing schedules for all supported aspects of the translator.

OTHER INFORMATION

- *How long has the translator software been in use?*

  This will provide an indication of the vendor's presence in the EDI community and the general ability for the translator to support user needs.

- *What is the distribution of the translator?*

  This information will provide insight about the industries that use the translator, the size of organizations using it, and its overall acceptance in the marketplace. This information will illustrate whether the vendor supports the exchange of environmental data.

- *What is the performance of the translator?*

  Although a relatively subjective question, the answer may provide insight as to the strengths and weaknesses of the software.

- *Is the EDI version and transaction set to be used currently in production and functioning?*

  This information will indicate whether the software is actually being implemented and functioning in a production environment. It will provide a measure of the viability of the software.

- *Are references available?*

  References should be provided freely by the vendor. The other users will provide information about the actual performance of the software and the vendor support.

- *Will the translator software be supported by a telephone hotline?*

  This is an essential feature when immediate personal technical assistance is needed.

- *Will the translator software be supported by an Internet on-line "help" function?*

  This is an essential feature for technical assistance when personal interaction is not required.

- *Will the translator include an on-line "help" module?*

  This is an essential feature for technical assistance when personal interaction is not required.

- *Will the vendor supply training?*

  The vendor must offer this support if specified through the internal evaluation.

- *Will the vendor supply software and software upgrades?*

  This is a basic essential factor in the evaluation of a vendor.

- *Will the vendor supply copies of the technical documentation?*

  This is a basic essential factor in the evaluation of a vendor.

- *Will the vendor supply copies of end-user documentation?*

  This is a basic essential factor in the evaluation of a vendor.

ADMINISTRATION

Cost

- *What is the cost of yearly license renewal or maintenance fees?*

  This an obvious factor to consider. The vendor should be able to provide documentation regarding pricing schedules for all supported aspects of the translator.

Data Entry/User Interface

- *Will the translator support manual data entry through data entry screens?*

  Although not intended for use with the prototype efforts, this may be a useful feature for importing test data or special transmissions where data will not be retrieved from an automated system.

- *Will the translator automatically notify the user of errors?*

  This feature is helpful in the reduction of error introduction and reduce quality assurance time during the testing activities.

- *Will the translator allow transactions to be printed or viewed on-line in a human readable format?*

  This feature assists with quality assurance activities as the data set can be reviewed prior to being transmitted or introduced into the automated system.

- *Is the translator user interface logical, well-organized, and intuitive?*

  This feature assists in overall use and management of the system as it makes the software more user friendly and understandable.

- *Will the translator provide table-driven utilities to modify/create configurations?*

  Again, this feature assists in overall use and management of the system as it makes the software more user friendly and understandable.

- *Will the translator have a point-and-click graphical user interface?*

  Again, this feature assists in overall use and management of the system as it makes the software more user friendly and understandable.

User Support/Documentation

- *What level of user support is offered by the vendor?*

  The vendor must offer the level of support specified through the internal evaluation.

- *Will the translator support the import and export of flat file formats?*

  This is essential for the prototype efforts as it will assist with system testing and test transmission processing.

- *Will the translator allow flexible report generation?*

  This may be a useful function if customized report generation is needed at the point of translation.

Security

- *Will the translator have built-in security options (e.g., password protected, personal identification number (PIN))?*

  Although not a requirement for the prototype efforts, this may be an essential feature for future program initiatives involving sensitive or mission critical data.

- *Will the translator support security measures at various levels (e.g., menu, tables, code lists)?*

  Although not a requirement for the prototype efforts, if the translator is to operate in a secure environment, this may be an essential feature.

- *Will the translator have built-in virus protection?*

  This may be an essential feature if the translator operates on a stand-alone station or other environment that does not have similar functionality to protect the associated systems.

- *Will the translator have automatic recovery in the event of a system shutdown?*

  Although not a requirement for the prototype efforts, this may be an essential feature for future program initiatives involving sensitive or mission critical data.

Although not specified for the prototype efforts at this time, any communication connection should be supported if required for future initiatives.

- *Will the translator allow communication sessions be performed concurrently?*

  This feature is essential in a production system that is heavily used or exchanges mission critical data as it allows increased activity to occur.

MANAGEMENT/SECURITY

Data Management

- *Will the translator keep detailed history logs of all processes performed to determine error status and track processing activity?*

  Although not a requirement for the prototype efforts, this is an essential feature for a production environment.

- *Will the translator be able to perform records management activities (e.g., file purging)?*

  Although not a requirement for the prototype efforts, this is an essential feature for a production environment.

- *Will the translator generate audit trail reports that automatically match inbound and outbound functional acknowledgments with their associated outbound transaction set?*

  Although not a requirement for the prototype efforts, this is an essential feature for a production environment.

- *Will the translator support batch downloads from an application interface?*

  This may be a useful feature that will allow data to be retrieved from the translator.

- *Will the translator support reports on document types, document numbers, control numbers, file names, error status, acknowledgment status, and transaction volume statistics based on user-selected criteria?*

  This may be a useful feature that will allow information about translation volume and overall management to be collected for analysis.

The definition of a flat file format is an essential component in the development of an application program interface (API) and as such is an important feature.

- *Will the translator be flexible in defining pre- and post-communication processes which could include interface routines, programs, and command procedures?*

  Although the prototype is employing an application program interface (API) to perform these functions, if an individual organization implements the EIIP EDI system without an API, this feature would be necessary.

- *Will the translator support the customizing of core translation and error notification scripts?*

  This feature is essential when specialized translation and reporting functions are required beyond the functionality pre-programmed with the software.

- *Will the translator allow the mapping to be viewed on-line?*

  This feature often assists in trouble-shooting errors and viewing data in lieu of report generation.

- *Will the translator maps, profiles, and other user-defined tables be able to be migrated?*

  This feature is essential if the an organization were to change translators. It also allows implementation-specific information to be maintained without the necessity of redefining or developing maps, profiles, and other related components.

Communication

- *Will the translator allow multiple communications protocols (e.g., asynchronous, bisynchronous, etc.)?*

  Although not specified for the prototype efforts at this time, each communications protocol should be supported if required for future initiatives.

- *Will the translator allow the option of EDI transactions over the Internet, including appropriate security measures?*

  This is an essential feature, as the Internet may be used for data transfer with future initiatives.

- *Will the translator allow all connections to multiple VANs or direction connects?*

specialized implementations. In such a case, the flexibility to copy and customize the standards tables may be necessary.

- *Will the translator be able to define cross reference tables to reconcile codes between different trading partners?*

  Although not a requirement for the prototype efforts, when an organization uses different codes from those used by the recipient and/or standard, cross reference tables assist in automatically reconciling the associated business information.

- *Will the translator automatically generate the 997 Functional Acknowledgments Transaction Set for inbound transactions?*

  Although not a requirement for the prototype efforts, future implementations of the EIIP EDI project may require return acknowledgments. As such, this function should be specified.

- *Will the translator allow the editing criteria for the 997 Functional Acknowledgments Transaction Set to be customized?*

  Although not a requirement for the prototype efforts, future implementations of the EIIP EDI project may require return acknowledgments. These implementations may require specialized use of the transaction set to meet business needs.

Translator Coding/Mapping

- *Will the vendor create the overlay?*

  Due to the expertise of the vendor, the availability of the vendors support to map the overlay may be a valuable feature. If internal expertise is limited, this feature may be essential to the project.

- *Will the vendor customize the translator?*

  Although the prototype is using an ASC X12 standard that is fully supported by most translators, future initiatives may require specialized implementations. In such a case, the flexibility to customize the software may be necessary.

- *Will the translator support the development of a flat file format that can be user-defined for any transaction set regardless of trading partner differences?*

- *Will the translator perform on the other platforms and operating systems?*

  As this is a prototype effort, actual implementation at future stages of the project may require the use of other platforms or systems. As such, this information should be considered.

EDI Standards

- *Does the translator support ANSI/ASC X12 standards?*

  The prototype efforts use the ANSI/ASC X12 standards. Therefore, the translator needs to support these standards. However, if the trading partner intends to use the translator for international data exchange, it should support EDIFACT.

- *Does the translator support all past, current and future versions/releases of the ANSI/ASC X12 standards?*

  The prototype efforts use the 3060 version/release, however upgrading is likely. Therefore the translator must support this requirement.

- *Does the translator support the ASC X12 841-Specifications/Technical Information Transaction Set?*

  The prototype efforts use the ASC X12 841-Specifications/Technical Information Transaction Set, therefore the translator must support it fully.

- *Will the translator support multiple transaction sets?*

  Although the prototype efforts are only using a single transaction set, future implementations may require the use of more. As a result, this feature should be considered.

- *Will the translator include predefined tables of standard transactions, segments, and elements?*

  This feature is important because the EIIP EDI project is complying with the ASC X12 standards and the translator should have these standards predefined for use.

- *Will the translator be able to copy standard tables in order to create customized standards?*

  Although the prototype is using the ASC X12 standards, future initiatives may require

Magazines such as *EDI World* also provide informative annual supplements discussing and comparing EDI translator software products. Other resources such as the *EDI Yellow Pages* may also provide other sources of information. The Internet is also an excellent source of product and contact information.

Some of the basic questions that should be asked of potential translator vendors are outlined below. Because this report is intended for use by EIIP EDI trading partners, only those research points that may be applicable to the EIIP EDI project are presented. Along with the pertinent questions, a brief rational or description of the importance of the reference feature is given. The examples/explanations that are included with the rationales are based on the current EIIP EDI prototype activities. These examples are provided for informational purposes and are intended to give potential users some insight regarding the scope of the current project. The specifications that are presented may change as the project develops.

This information will help guide the user through the selection process for a translator for use with the EIIP EDI initiative. If a translator is to be used for other implementations there may be other questions that may be required to identify the required additional functionality.

As with the internal evaluation, it should also be noted that some questions have answers that are dependant upon the unique characteristics of the implementing organization. Therefore they can only be answered within the context of the specific organization that will use the software. These points are indicated accordingly and are provided as a guideline only. The specific answers and corresponding functional criteria must be ascertained by the user.

INFORMATION SYSTEMS

Operating Environment/Configuration

- *Will the translator perform on the required platforms and operating systems?*

  The software must support the overall operating environment and configuration specified through the internal evaluation step. As the prototype effort does not stipulate a single environment or configuration, this specification is unique to the individual trading partner.

- *Will the translator support the system performance specifications that are required?*

  Although specific performance specifications are determined through evaluating the system configuration, some variance may be a reality and should be clarified with the vendor. In some cases, if the performance requirements for software do not match the system's current configuration, some adjustment to the system may be necessary. Again, this specification is unique to the individual trading partner.

4
EDI TRANSLATOR SELECTION

SELECTING AN EDI TRANSLATOR

The features, functionality, and vendor support vary widely between translator software packages. Some translators are expensive, but may be more user friendly and provide a multitude of functional and support options. Other less expensive options may not offer as much flexibility or user ease, but may be more appropriate for intended level of use of the system.

The answers to the internal evaluation questions outlined in Section 3 will generate essential information about the type and features required of a candidate translator. However, identifying the actual translator and collecting the necessary information about it is another step in the selection process.

Each EDI translator software package varies widely in what functionality they offer. The software is dependant upon the environment in which it functions and the features it offers. Many may be applicable for one organization's implementation, but would not be suitable for use by another. As a result, a trading partner must research candidate translators relative to the results of their own internal evaluation. Through the process of matching the available translators with the functional requirements obtained from the internal evaluation, the user will focus their search on only those translators that most closely meet their needs. Ultimately, the translation software package selected for implementation should fully support the needs and requirements of the organization.

The primary source for specific information about individual translators can be obtained directly from the developers and/or vendors of the software. Other useful and practical information may be gained from other parties currently using or familiar with the software for similar implementations. These organizations or individual users can be identified through resources like the *EDI Yellow Pages* that is available from Phillips Business Information, Inc. or through EDI user groups. These groups are also identified in the *EDI Yellow Pages* and can often be located on the Internet. Another source of information regarding EDI translators, users, and user groups is the Data Interchange Standards Association (DISA). This organization is the secretariat for ASC X12 and provides varied resources to users of EDI.

Identifying translators and their vendors, as well as identifying other important information such as user groups and individual users, can be done though referencing various EDI publications. Books such as *Buyer's Guide to Electronic Commerce* published by Electronic Commerce Strategies, Inc. can provide valuable insight regarding the selection of an EDI translator.

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- *Will on-site training be required?*

  Depending upon the user's level of experience and expertise with EDI and the translator, as well as the organization's needs, it must be determined whether on-site training would be affective.

ADMINISTRATION

Licensing

- *What are the terms required for the license(s) needed?*

  The number of translator licenses, and the associated terms and period of performance, must be determined. This determination must be made relative to the expected level of use of the translator and the number of users for an organization.

Cost

- *What funding is available (i.e., what is affordable)?*

  Although funding is often initiated by identifying the cost of a service or product, a general idea of budget limitations should be considered. Translators range in cost from being free of charge to several hundreds of thousands of dollars. The wide variance is dependant upon the quality and functionality of the software and its support. As with all other points, the needs and limitations of the user should be identified and considered.

Staff

- *Are staff resources available to use and maintain the translator?*

  Adequate staff resources must be available to use and maintain the translator. This includes individual with expertise in not only the software but the system(s) with which it is integrated.

- *Will the data populate the database using an API?*

  For the prototype efforts, data will be loaded into the database system using an API. Some translators have special functionality that can be programmed to serve this function. The necessary functionality should support the requirements that best suit the user's environment.

Security

- *What is the sensitivity of the data being transferred?*

  If confidential or sensitive information is intended to be transferred it must be considered. Although it does not directly impact the translator, it may affect the type of communication used. Therefore, the translator selected must support the communication type that will accommodate any security requirements.

- *Are there any policies/regulations associated with the security of the data?*

  If there are any policies or regulations (i.e., Federal, state, organizational) that impact the data to be transferred or the systems it will reside in, they must be considered. Although it does not directly impact the translator, they may affect the type of communication used. Therefore, the translator selected must support the communication type that will accommodate any security requirements.

Data Entry/User Interface

- *Will data be input to the translator manually or through an automated system?*

  For the prototype efforts, the data will be retrieved from and stored in an automated system. As a result, data entry will not occur on-line at the translator. If this functionality is desired, a translator must be selected that supports this requirement.

User Support/Documentation

- *What level user support is required (e.g., seven days per week, 24 hours per day)?*

  Depending upon the user's level of experience and expertise with EDI and the translator, the level of user support necessary to ensure success must be identified.

For the prototype efforts, point-to-point data transfer will be used. Although this is used for the prototype, other forms of communication may be considered for future initiatives. The type of communication must support the requirement that best suit the user's environment.

- *If a network is used, will the data transfer use a third-party service?*

  For the prototype efforts, as point-to-point (direct connection) is being used, the Internet or a VAN will not be employed. However, if the use of a network is selected for future initiatives, it should support the requirements that best suit the user's environment.

MANAGEMENT/SECURITY

Data Management

- *If you are sending data, what database will data be retrieved from?*

  For the prototype efforts, participating trading partners will exchange data from existing database systems. The location of the data to be transmitted must be identified to ensure successful access to the data.

- *Will the data be retrieved using an application program interface (API)?*

  For the prototype efforts, data will be retrieved from trading partner database systems using an API. Some translators have special functionality that can be programmed to serve this function. The necessary functionality should support the requirements that best suit the user's environment.

- *If you are receiving data, what database will data be stored in?*

  For the prototype efforts, the EPA will store the exchanged data in a database system specifically developed for the prototype initiative. The location for the storage of the data to be received must be identified to ensure successful access to the data.

version/release 3070 in order to incorporate future enhancements. All trading partner systems must accommodate at least version/release 3060 at this time.

- *What ANSI/ASC X12 Transaction Set will be employed?*

  The selection of the appropriate transaction set is dependant upon the business application to be implemented. For the prototype efforts, the ANSI/ASC X12 841-Specifications/Technical Information Transaction Set will be used. If other business applications or data sets are expected to be implemented, this flexibility must be factored into the selection process.

Translator Coding/Mapping

- *Will the translator be an "off-the-shelf" package or custom designed?*

  For the prototype efforts, a commercially available software package will be used. As the program is using a standard that is commonly supported by commercial software vendors, the translator will be acquired from a vendor. However, if the implementation suits the modification of a package currently in use, this point should be considered.

- *Will the translator be customized by the vendor?*

  For the prototype efforts, the translator will not be customized. The functionality is included with the translator is sufficient for the prototype. However, if the implementation suits the modification of a package currently in use, this point should be considered.

- *Will the translator be mapped (i.e., develop overlay) by the user or by the vendor?*

  For the prototype efforts, the translator overlay is being developed by the vendor. Due to their experience, it is most efficient to employ their services. However, if the user has experience with overlay development, this factor should be considered.

Communication

- *What communications protocol will be used (asynchronous, bisynchronous, etc.)?*

  The communications protocol for the prototype efforts has not been determined at this time. The translator selected should support the requirement that best suits the user's environment. Most PC-based translators will support either protocols.

- *Will the data transfer be point-to-point or through a network?*

- *What is the central processing unit (e.g., 80486 - 66MHz, Pentium - 100MHz)?*

  For the prototype efforts, the PC to be employed is expected to be a Pentium - 100 MHZ or above. This is not a requirement and the translator selected should support the requirement that best suits the user's environment. Most PC-based translators with enhanced functionality require machines with increased processing speed (above a 80486 - 33MHz).

- *What is the computer memory (e.g., 4MB or 8MB RAM)?*

  For the prototype efforts, the PC to be employed is expected to have 4MB or greater. This is not a requirement and the translator selected should support the requirement that best suits the user's environment. Most PC-based translators with enhanced functionality require machines with increased memory.

- *What is the size of the hard drive (e.g., 60MB or 80MB)?*

  For the prototype efforts, the PC to be employed is expected to have 80MB or greater hard drive space. This is not a requirement and the translator selected should support the requirement that best suits the user's environment. Most PC-based translators with enhanced functionality require machines with increased hard drive size.

Business Applications

- *What data will be transferred?*

  For the prototype efforts, modeling inventory data will be exchanged. If the translator is expected to be used for other business applications or data sets, this flexibility must be factored into the selection process.

EDI Standards

- *What EDI standard will be employed?*

  For the prototype efforts and other EPA initiatives, the national ANSI/ASC X12 standards for EDI will be used. If the organization is planning to perform international EDI, the use of EDIFACT may be necessary. If the translator is expected to be used in this manner, this flexibility must be factored into the selection process.

- *What version of the ANSI/ASC X12 standard will be used (e.g., 3060, 3070)?*

  For the prototype efforts, version/release 3060 will be used. The program will upgrade to

It should be noted that the answers to some of the questions are dependant upon the unique characteristics of the implementing organization and can not be determined in this forum. Therefore they can only be answered within the context of the specific organization being evaluated. These points are indicated accordingly.

As appropriate, a rationale for the question is provided to assist in developing a response. This information is intended to provide a guideline only. The specific answers and corresponding functional criteria must be ascertained by the user. The rationales include examples/explanations based on the current EIIP EDI prototype activities. This information is provided for informational purposes and is intended to give potential users some insight regarding the scope of the current project. The specifications that are presented may change as the project develops.

INFORMATION SYSTEMS

Operating Environment/Configuration

- *Will the translator software reside on a mainframe, a networked computer, or a stand-alone workstation?*

  For the prototype efforts, the translator is a networked PC. This is not a requirement and the translator selected should support the requirement that best suits the user's environment.

- *Will the translator software reside on a hard drive or a network?*

  For the prototype efforts, the translator is PC-based and resides on the hard drive of the PC to be used in the implementation. This is not a requirement and the translator selected should support the requirement that best suits the user's environment.

- *What platform will the translator operate on (e.g., Macintosh, IBM)?*

  For the prototype efforts, the translator will operate on a PC compatible platform. This is not a requirement and the translator selected should support the requirement that best suits the user's environment.

- *What is the computer operating system (e.g., DOS, Window NT, Windows 95)?*

  For the prototype efforts, the translator will function in a Windows 95 or Windows NT environment. This is not a requirement and the translator selected should support the requirement that best suits the user's environment.

3
EDI TRANSLATOR CRITERIA

DETERMINING EDI TRANSLATOR FUNCTIONAL CRITERIA

The selection of the appropriate translator is essential for the successful implementation of an EDI system. Before an EDI translator can be selected, the user must evaluate the intended operating environment, business limitations, and a host of other organization-specific considerations. These "internal" factors must be identified, evaluated, and defined prior to pursuing the selection and procurement of the actual translator. This information is essential because it will dictate the required functional criteria and often limit the number of translators that may be applicable.

The internal characteristics that must be addressed include, but not limited to, funding availability, expertise and experience of system users, the computer environment in which the translator will function, and the level of internal technical support. The areas of concern can be divided into a few general topics, including information systems, management/security, and administration.

Within each of these general topics, there are specific questions that each organization planning to implement EDI with the EIIP EDI project should asked themselves. This internal evaluation will form the foundation for determining the functional requirements that a translator must have (relative to the organization's specific needs) in order to perform effectively under the EIIP EDI project. This is a critical step in the selection of an EDI translator for two reasons: Each organization is different and has unique needs and requirements and There are numerous translators, each with unique functions and abilities. To search for a translator in an effective, efficient manner, the characteristics of the environment in which it will ultimately function must be well defined. Then the characteristics of the translator can be evaluated against the organization's requirements.

The results of the internal evaluation will define the minimum functional criteria that the translator must have. In other words, once completed, the results of the evaluation will assist in focusing the population of applicable translators to only those that have the specific features and functionality that are necessary for successful implementation of the EIIP EDI project with an individual organization.

Some of the basic questions that must be answered prior to launching the EDI translation software selection process are outlined below. Because this report is intended for use by EIIP EDI trading partners, EIIP-specific answers/requirements that have already been defined by the program are indicated. This information will help guide the user through the evaluation.

Standards Maintenance

As ANSI/ASC X12 standards are enhanced and updated, the EDI translation software also needs to be updated. This update function, although accommodated by the software, must be initiated by the user. This function is directly related to the organization's decision to upgrade to a new version/release of the X12 standard. EDI translation software must support and be able to recognize which version of the X12 standards is being used by a trading partner and respond appropriately.

Administration

In some cases, depending upon the EDI translation software functionality, data regarding transactions can be queried for special administrative reporting. Additionally, some software packages have utilities that support reporting related to internal performance (i.e., overlays, trading partner configurations, etc.). All of these administrative functions assist in the management of the translator and the EDI system.

Each of these functions has different characteristics between sending and receiving operations. To accomplish these functions the EDI translation software package typically contains a communications module to control the modem and establish the dialogue with the trading partner's computer, and a database of trading partner profiles. The software uses these profiles in the translation process to distinguish among trading partners. In addition, the software must provide the ability to add trading partner profiles to the database and to maintain the database with new data on existing trading partners.

Generation

The software accepts data from the application's internal format and translates that data into an ANSI/ASC X12 format for transmission to a trading partner. This activity is the reverse of interpretation (see below).

Interpretation

The software accepts data transmitted from a trading partner in an ANSI/ASC X12 format and translates that data into the receiving application's internal format for processing. This activity is the reverse of generation (see above).

Functional Acknowledgment

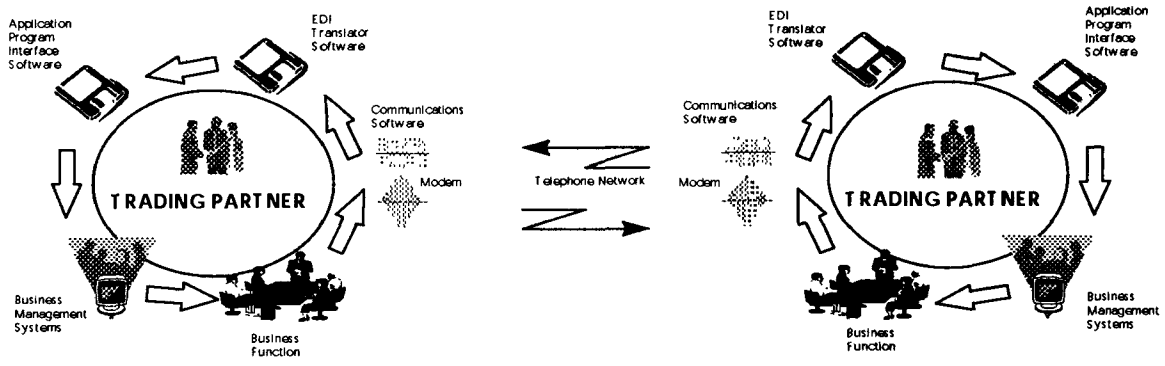
A function acknowledgment message from the receiver of a document is sent back to the sender by the EDI translation software. The functional acknowledgment informs the sender that the document was received, and the receiver is able to interpret it. It does not address the content of the transaction or whether it can be processed. The functional acknowledgment is similar to a registered mail receipt of the U.S. Postal System. It is recommended that all transaction sets be accompanied by a functional acknowledgment.

Enveloping

When generating, the software groups all documents of the same type (transaction set) and destination (trading partner) into an electronic envelope. The software then groups multiple envelopes of different document types into an interchange envelope. Finally, the software places a communications envelope (identifying protocols, line speeds, etc.) around the interchange envelope.

Transmission Management

Interchange control tracks functional acknowledgments coming back from trading partners and reports on an exception basis. It assumes that, if a transmission is sent out, then a functional acknowledgment can be expected within a reasonable time (for example, the next business day).



THE EDI CYCLE

A graphical representation of the information flow for typical EDI System is displayed below. In order to exchange data efficiently, each EDI relationship must have at least two trading partners. Each trading partner must have its own EDI system. Although the specific components and actual implementation may be different, the basic functionality must be present in both. Although the hardware, software, and communications components may be different, the key to a successful EDI system is the use of the same X12 standard format by each trading partner. The EIIP is using the ANSI/ASC X12 841 - Specifications/Technical Information Transaction Set

EDI TRANSLATION SOFTWARE

Translation of business-related data to the standard X12 format is an integral part of the overall EDI solution. In performing the translation of data to or from the ANSI/ASC X12 format, EDI translation software performs several other essential functions. These functions are the actual activities that allow a data transmission to be sent and received in a manner that is consistent, predictable, and traceable. These functions include:

2
EDI TRANSLATION SOFTWARE

EDI SYSTEM OVERVIEW

An Electronic Data Interchange system is comprised of a number of interrelated components, each designed to work harmoniously to accomplish the goals of the user. In general, an EDI system contains the data system that stores the data, a software program that is the interface between that system and the EDI translation software, the translation software, and a communications mechanism.

On the sending end, data is retrieved from the database system containing the data set to be exchanged. This retrieval is accomplished by the application program interface (API). The API arranges the data set in a manner that is specified by the EDI translator. This format known as the ADF or A Data Format. The data is then translated in the translation software into the X12 standard format. The data set, in the standard format, is able to be communication to the receiving trading partner.

Performance of the communications portion can occur in several different ways. Data can be transferred in a physical manner (i.e., via diskette or tape) or using some sort of communication network. Telecommunication may be the use of dedicated line, the use of the Internet, or connection to a third-party service provider (e.g., Value-Added Network (VAN)). A dedicated line connects trading partners directly, which allows them to transmit data point-to-point without interaction with other parties. The Internet is also a viable data transfer option that provides relatively easy connection between partners. Data transfer can also be facilitated by a third-party service provider, such as a VAN. However, unlike the Internet, a VAN offers additional services that support specific trading partner needs.

As production EDI environments are designed to be integrated and minimize human interaction, access between trading partners is typically achieved automatically using telecommunications. In any case, the communication function, which can be part of the translation software or a separate application, connects to the application system maintaining the data to the telecommunication system being used for the transmission. Because the communications system is an essential component of the overall EDI system, the issues related to its selection and maintenance should be addressed as a specific issue/topic.

Upon the completion of the transmission, the receiver's translator will "reconvert" the data from the X12 standard format to a format meeting the requirements, as specified by the recipient's ADF, of their API. The API then loads the data into their database system for use.

The information is presented with examples/explanations based on the current EIIP EDI prototype activities. These examples are provided for informational purposes and are intended to give potential users some insight regarding the scope of the current project. The specifications that are presented may change as the project develops.

EIIP Background

The Emission Inventory Improvement Program (EIIP) is a joint effort of state and local air quality monitoring agencies and the United States Environmental Protection Agency (EPA). The program is organized for the purpose of improving the quality of the emissions inventory data collected and the way the data are transferred and shared among users. The EIIP Data Management Committee (DMC) is developing and testing a common data transfer format to facilitate data sharing within the emission inventory community.

The DMC has developed the *EIIP Phase I Core Data Model* to help organize and standardize the transfer of data within the emission inventory community. The data model is the basis for a common data transfer format for use among industry, state and local agencies, EPA and other organizations to share emission inventory data.

The DMC is developing and applying Electronic Data Interchange (EDI) to facilitate the exchange of data for the program. The American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 standards for EDI will be used for this implementation.

The EPA has provided guidance for the use of EDI specifically for environmental reporting. The Agency published the notice in the September 4, 1996 Federal Register, Volume 61, Number 172, FRL-5601-4. The notice is entitled *Notice of Agency's General Policy for Accepting Filing of Environmental Reports via Electronic Data Interchange (EDI)* and provides an overview of the EPA perspective for the use of EDI, the history of EDI within the EPA, and how to use EDI for reporting to the EPA.

1
INTRODUCTION

OVERVIEW

Electronic Data Interchange (EDI) is the automated flow of business information between the computer systems of trading partner organizations. Typically, each trading partner has a different information system architecture and therefore, the data to be exchanged are stored as unique, proprietary data sets. The differences between the systems make sharing the information difficult. This communication of data between dissimilar automated systems, that otherwise can not interact, is accomplished through the use of a standard EDI data format.

In an integrated EDI system, data is retrieved from the automated system of the sending trading partner, translated into the EDI format, and transmitted to the receiving partner. Upon receipt, the reverse process occurs, with the data being translated from the EDI format and then loaded into the appropriate automated system. An essential step in this process is the translation to and from the EDI format. This step is performed by specialized EDI translation software that is integrated and maintained with each trading partner's EDI system. The software is designed to convert data between varied, proprietary data formats and the standard EDI format being used to exchange the data.

The role and performance of EDI translation software is critical to the success of an EDI system. The software must not only support the data transfer needs of the organization employing it, but it must also be suited for the organization's unique characteristics. To ensure that the requirements of different users and implementations are met, EDI translation software and its vendor support are available with a wide range of features and functionality.

PURPOSE OF THIS REPORT

This report is intended to provide potential EIIP EDI trading partners with information to assist them in identifying the most appropriate translation software for the purpose of EIIP data transfer. Information that will be detailed includes: an overview of EDI translation software (Section 2); the necessity for, and general content of, a preliminary internal evaluation to define the functional criteria for an EDI translator (Section 3); a general overview of EDI translator evaluation points to assist in comparing EDI translation products (Section 4); an overview of management and maintenance issues associated with EDI translators (Section 5); a glossary of terms (Appendix A); a worksheet to assist EDI translator evaluation (Appendix B); and an example translator solicitation package (Appendix C).

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REPORT ASSESSING THE PROCUREMENT AND MANAGMENT OF EDI TRANSLATORS

April 1997

Prepared by:
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Prepared for:
Data Management Committee
Emission Inventory Improvement Program

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At a minimum, FTP is demonstrated using simple FTP protocol. If time permits, using a graphical FTP interface such as Rapid Filer or Netscape is desirable. Minimal technical requirements include the following:

- FTP software
- A network connection
- The file(s) to be transmitted

DATA COMPRESSION REQUIREMENTS

Data compression is generally useful on larger file to compress them prior to file transfer, thereby reducing transmission time. The proof of concept examines when file compression is advantageous. Minimally, data compression is tested and results are reported. However, upon request, data compression is demonstrated as part of the prototype demonstration.

Data compression requirements include the following:

- Large EIIP formatted data file(s) or a set of duplicated smaller files
- PKWARE file compression software (shareware versions are readily available)
- Testing the transmission of compressed versus non-compressed files

4. Examine the file after executing the macro

5. Write the EIIP formatted file from Lotus

Processing

Database Loading at the EPA node is implemented through a series of manipulations using Oracle database tools. SQL*Loader is used to load the EIIP formatted data into the database. SQL*Plus is used to insert lookup table information into the database, to incorporate the data into the database structure, and to view information once in the database structure. SQL*Plus is also used to extract data from the database in the form of Translator 4.

Once the AIRS data are extracted from the database, the AIRS file is read into a Lotus spreadsheet. Translation from the AIRS format to the EIIP format is provided by executing a spreadsheet macro written to perform the conversion. Similar to Translator 1, the Translator 5 macro includes a spreadsheet which incorporates lookup table information needed to populate the EIIP formatted file. Once converted to EIIP format, the file is written out to be viewed.

TRANSFER PROTOCOL REQUIREMENTS

The prototype uses and compares two protocols to transfer the data. One protocol mechanism is a PC based communication package; and, the other transfer mechanism is FTP based. Many survey respondents use PC based communication packages such as ProComm or Crosstalk and significant interest was shown in using FTP and the Internet.

Crosstalk is the EPA standard for PC communications and it is used for the prototype demonstration. The minimal requirements are as follows:

- Crosstalk for Windows software
- Dial-up capabilities via a modem or a network connection
- A Crosstalk transmission script
- The file(s) to be transmitted

Inputs

The EIIP formatted file is mapped as input to the database. All corresponding lookup table information is inserted into the database. The mapping is used to create a SQL*Loader script that relates each field to the database. The SQL*Loader script, or Database Loader (Translator 3) is executed to insert the contents of the EIIP formatted file into the database. An SQL*Plus script is executed to incorporate the loaded data into the database structure.

The database provides input to create an AIRS formatted file. The input is extracted from the database into the AIRS format using SQL*Plus: this is Translator 4. Subsequently, the AIRS formatted data are translated into the EIIP format using Translator 5, conversion from AIRS to EIIP using a Lotus spreadsheet macro.

Sequencing

EPA Node as Receiver (Translator 3).

1. Examine the file prior to loading it into the database

2. Manually map the contents of the EIIP formatted file to the database

3. Manually insert the supporting lookup table information into the database

4. Execute the SQL*Loader script to load the EIIP data

5. Execute the SQL*Plus script(s) to incorporate the loaded data into the database

6. Examine the data in its database format

EPA Node as Source (Translator 4).

1. Execute the SQL*Plus script to build the AIRS formatted data file

2. Examine the AIRS formatted file

EPA Node Conversion from AIRS to EIIP (Translator 5).

1. Read the AIRS formatted file into Lotus

2. Examine the file prior to executing the macro

3. Execute the Lotus macro

EPA NODE (RECEIVER) REQUIREMENTS

Translator 3, actually the "Database Loader," loads the content of the EIIP formatted file into the database. Various Oracle tools are used to perform this function. Translator 3 has the following requirements:

- The EIIP formatted file from the local node
- An Oracle account with appropriate privileges
- Build database tables
- Build lookup tables
- SQL*Loader to load the file into Oracle
- SQL*Plus and PL/SQL to incorporate the loaded information into the database
- SQL*Plus, Oracle Report, or Oracle Data Browser to view the database entries

A separate translator extracts records from the database and creates an AIRS formatted file. It requires the following:

SQL*Plus or Oracle Report to write an output file in AIRS format

Translator 5 demonstrates translating to the EIIP format from the AIRS format. This is implemented using a spreadsheet macro similar in scope to Translator 1 and requires the following:

- Lotus 1-2-3 for Windows software
- Data file in AIRS format created by Translator 4
- Lookup tables incorporated into the File Conversion Macro
- File Conversion Macro

If difficulties arise writing the spreadsheet macro or SQL*Loader script to convert between formats, then writing third generation language (3GL) programs, such as C, FORTRAN, or COBOL, may be required.

State Node (Translator 2).

1. Examine the file prior to loading it into the temporary database table

2. Execute the SQL*Loader script to load the locally formatted data into the temporary table

3. Execute the SQL*Plus script(s) to build the EIIP formatted data file

4. Delete the temporary table

5. Examine the file in the EIIP format

6. Transfer the file

Processing

Processing at the local or state nodes is implemented by reading the local file, translating it into the EIIP data format, and writing it out to be transmitted to the EPA node. Two translation methods are demonstrated: using a Lotus spreadsheet macro and using Oracle Tools.

At one of the source nodes, reading and writing the local and EIIP formatted files are accomplished using the menu driven options from within Lotus. Translation from one format to the other is provided by executing a spreadsheet macro written to perform the conversion. This macro includes a spreadsheet which incorporates lookup table information needed to populate the EIIP formatted file.

Alternatively, processing at the other source node is implemented by inserting the locally formatted data into a temporary database table. The temporary table is translated into the EIIP format using a SQL*Plus script, at which point the temporary table is discarded. The data are viewed before and after translation. Neither viewing nor storing of the data takes place while it resides in the temporary database table. Implementing the EIIP data format into a database is demonstrated at the EPA node and is therefore not repeated at either source node.

Translator 2 may be implemented using a number of Oracle tools to be demonstrate an alternative conversion method to Translator 1. This translator requires the following:

- Data file in local format
- An Oracle account with appropriate privileges
- Base database requirements built
- SQL*Loader to load the file into Oracle
- SQL*Plus or Oracle Report to write an output file in local format

If difficulties arise writing the spreadsheet macro or SQL*Loader script to convert from the local formats to the EIIP format, then writing third generation language (3GL) programs, such as C, FORTRAN, or COBOL, may be required.

Inputs

The local files need to be mapped to the EIIP data format and provided by test participants, otherwise, they can be built from sample data. In either case, sample data need to be provided to the prototype project. Since it provides a more robust test, the preference is to receive actual local files; however, these files will be trimmed down to limit the size and scope of required lookup tables.

For the source using Oracle Tools, the data are inserted into a temporary database table that matches the EIIP file structure using SQL*Loader. SQL*Plus is used to translate the information into the EIIP format.

Sequencing

Local Node (Translator 1).

1. Read the locally formatted file into Lotus
2. Examine the file prior to executing the macro
3. Execute the Lotus macro
4. Examine the file after executing the macro
5. Write the EIIP formatted file from Lotus
6. Transfer the file

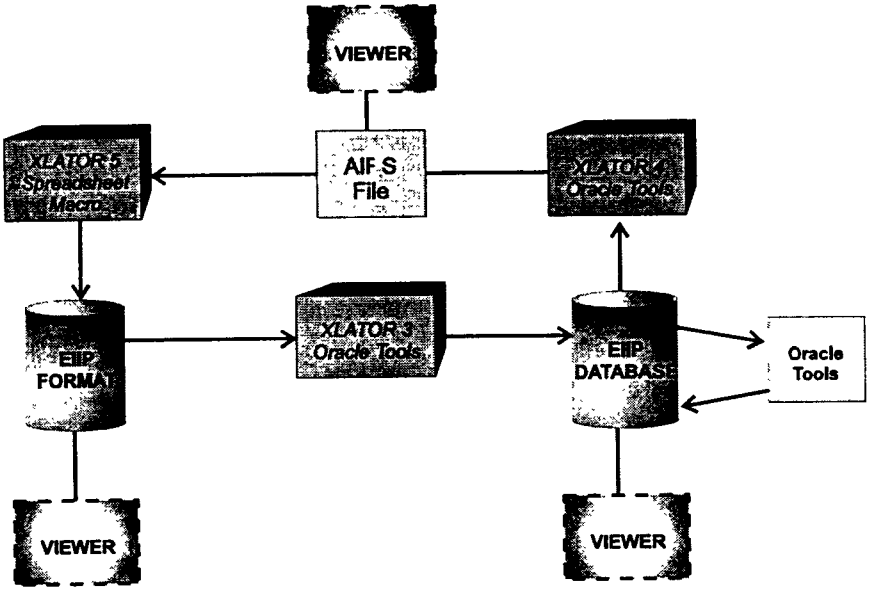

Figure A-3: **Receiver Data Flow**

PROTOTYPE FUNCTIONAL REQUIREMENTS

STATE/LOCAL NODE (SOURCES) REQUIREMENTS

Translator 1 is implemented using a spreadsheet macro to convert the locally formatted file into an EIIP formatted file. Lotus is used to perform this conversion and implies the following requirements:

- Lotus 1-2-3 for Windows software
- Data file in local format
- Lookup tables incorporated into the File Conversion Macro
- File Conversion Macro

data are transferred to the EPA node. Optionally, data are viewed before and after the translation. The diagram below depicts the local and state nodes represented in the prototype.

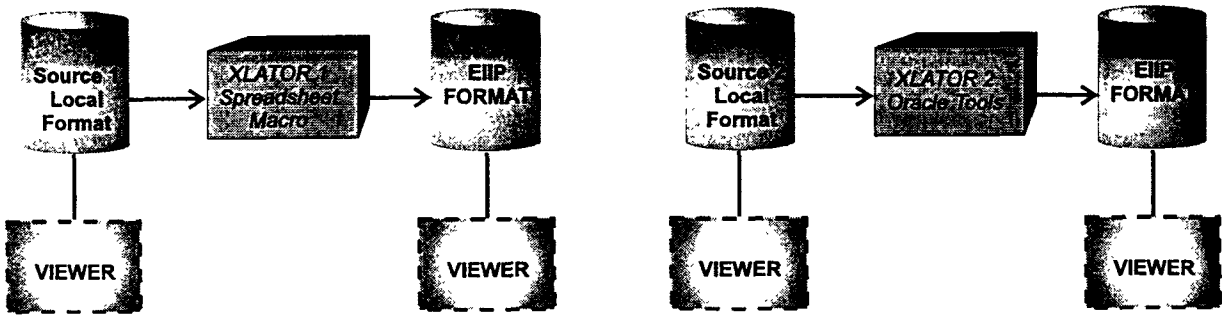

Figure A-2: **Sources Data Flow**

EPA Node (Receiver) Data Flow

The purpose of the EPA node is to illustrate receipt of emissions inventory data in the EIIP transfer format and conversion or translation of the data into the EPA AIRS transaction format. The EPA node receives the EIIP formatted data generated by and transmitted from the local node. After receipt of the data file, the EPA node loads or translates the data into the EIIP formatted database. The database contains the information from each dataset it receives. This process demonstrates the ability to translate the EIIP data format into a database.

The data from the EIIP database is unloaded or translated into an AIRS transaction file. Subsequently, the AIRS formatted file is processed or translated into the standard EIIP file transfer format. This process demonstrates the ability to create an AIRS formatted file from the database, and create an EIIP formatted file to and from the AIRS format.

Optionally, the data and files are viewed prior to and after each translations. Numerous viewing and processing alternatives exist as a result of holding the data in the form of a database: these are limited to viewing and reporting with Standard Query Language (SQL) based tools.

FUNCTIONAL FLOW

Data from two local or state agencies is translated from their local format into the EIIP data format and then transferred to the receiving (EPA) node. The EPA node receives the data and consolidates it in the database. Next, the EPA node translates an EIIP formatted file into an AIRS formatted file. The diagram below represents the functional flow of data between and within the various emission inventory data sources and receivers.

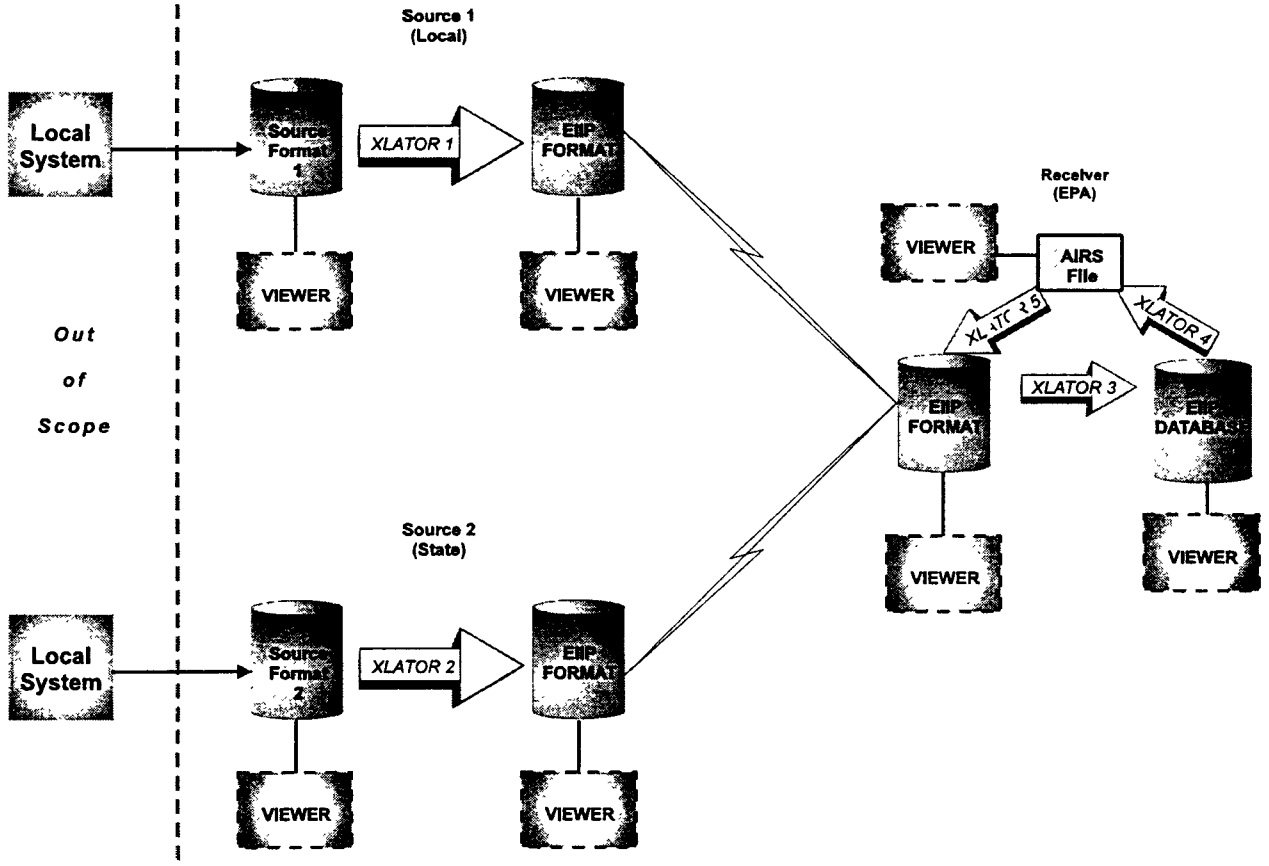

Figure A-1: **Functional Flow**

State/Local Node (Sources) Data Flow

The purpose of the local and state data flow is to illustrate translating locally formatted emissions inventory data into a common format (EIIP file transfer format), and transferring or sending the data to a receiving participant, such as EPA. The state/local node represents the first data source of the prototype. Each local or state node uses a local translator to convert the emissions inventory data. After conversion or translation, the EIIP formatted

to file transfer, thereby reducing transmission time. The proof of concept examines when file compression is advantageous. Desired file sizes are created and used to evaluate compression alternatives.

The proof of concept prototype contains an Oracle database that is representative of the EIIP data transfer format. The database may be viewed as a repository for EIIP formatted data. The database is a subset of the complete data model but is sufficient to demonstrate file transfer. The database contains a limited set of values in code or lookup tables.

To support the proof of concept prototyping effort, members of the EIIP community are mapping their databases and local data formats into the EIIP data transfer format. These mappings will provide the logical basis for the specific prototype translators in sufficient detail for implementation.

The technology used to implement the proof of concept prototype is typical of the responses from the EIIP data transfer survey. Survey respondents indicated that a majority use a minimum of 486 class processors in the Windows environment. They also used PC based communication packages such as ProComm or Crosstalk; significant interest was shown in using FTP and the Internet. The proof of concept prototype uses 486 class processors, PC based communication packages, and FTP.

EIIP Proof of Concept Data Flow

Concepts

The EIIP proof of concept consists of three components that represent local, state, and federal agencies. Each component is capable of sending or receiving emissions inventory data. In the prototype, two components (state or local data sources) transfer their EIIP formatted data files to the database. The third component (EPA) converts the EIIP data format to an AIRS format file. In addition, the EPA component, is chosen for the prototype location of the database to receive and consolidate state and local data.

INTRODUCTION

PURPOSE

The purpose of this proof of concept prototype is to demonstrate an improved transfer mechanism for sharing emissions inventory air data. The data transfer mechanism is consistent with the EIIP Data Transfer Survey Results and Analyses, and the Phase I EIIP Core Data Model.

BACKGROUND

The Emissions Inventory Improvement Program (EIIP) was formed as a joint effort of state/local agencies, industry, and the Environmental Protection Agency (EPA) for the purpose of improving the quality of emissions inventory data, and the transfer and sharing of that among users. The EIIP is developing and coordinating recommendations for data collection, and a data transfer protocol for the emissions inventory community. This proof of concept prototype investigates the use of high performance computer communications for its ability to enhance the transfer and sharing of data by state and local agencies, EPA, industry and public analysts.

SCOPE

The EIIP proof of concept prototype is a limited system designed to demonstrate data sharing techniques using the EIIP data file transfer format. The proof of concept prototype consists of three partners or components that share emissions inventory data. The components represented in this prototype are local, state, or federal (EPA) agencies. The prototype uses and compares two protocols to transfer the data. One protocol mechanism is a PC based communication package; and, the other transfer mechanism is Internet based via FTP (File Transfer Protocol). The source data formats are representative of local, state, and federal usage.

The proof of concept prototype requires development of data format translators. Each translator changes the physical representation of the data. Two translators convert data from the local file format into the EIIP data transfer format. A second pair of translators will process the EIIP data format into and out of a database. Another translator converts data from the AIRS transaction format into the EIIP data format. A number of data viewers are used to examine the data. These viewers are not an integral part of the prototype, but are used to examine the data before and after translations. The viewers consist of editors, spreadsheets, reports, and word processors.

Another aspect of the proof of concept prototype is examining data compression of files that are transferred. Data compression is generally useful on larger file to compress them prior

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APPENDIX

Preliminary Design
for
EIIP Proof of Concept Prototype

6. Transmit EIIP data format to remote database

7. Provide a basis for demos and education to interested parties in the concept

8. Document prototype steps, experience and results for the EIIP community

PROVIDE ASSISTANCE IN IMPLEMENTING THE RECOMMENDED EIIP DATA FORMAT AND DATA TRANSFER PROCEDURES.

Other areas where the EIIP/DMC plans to assist the emissions inventory user community are provided below.

EIIP Data Management Products and Documentation Available as 'Primers'

The DMC can develop primers and documentation to assist understanding and implementation of data management objectives by the emissions inventory community. Some examples of items that can be provided are listed below:

Standard EIIP Data Format/Data Model. The work on the data format should be completed and user oriented documentation provided describing its use and implementation.

Data Transfer Prototype Proof-of-Concept Demonstration and Results. The lessons learned from the prototype proof-of-concept should be documented and made available as primers. The Approach Study deliverable should be completed so that users can effectively plan their implementation of the data transfer protocol.

Internet Home-page. An EIIP Internet home page can be established describing these concepts in broad terms and directing the users to the detailed primer documents through hypertext. These can be made available through Net browsing software such as Netscape or Mosaic.

Information Available Over CHIEF Bulletin Board. The DMC will continue to publish and promote all of our primer material and concept documentation through CHIEF.

FY96 Grant Funds for (EIIP) Data Delivery Project

The FY96 105 Grant Funds have been allocated by EPA, and include a project for (EIIP) Data Delivery. These funds are intended to position state and local agencies with a choice in implementing the data management recommendations of the EIIP. It is expected that those choices will be based on DMC products and documentation (as described herein) that are made available to the inventory community through the first quarter of FY96.

5

NEXT STEPS

Many participants of the emissions inventory community are not involved with information technology skills as their primary responsibility. Although many are familiar with the use of PC packages, other topics discussed here may be foreign to our audience. These topics include, for example, the widespread use of Internet, the new EIIP data format including EDI X.12 considerations, and the ideas of data modeling, translation and repositories. The DMC will focus on education and promotion of the advantages of the new approaches in order to obtain buy-in, understanding, and hopefully enthusiasm from the emission inventory community.

IMPLICATIONS AND FOLLOW-UP USING PROTOTYPE

Based on the concept described above, the DMC has prepared an initial proof-of-concept design that will form the basis for implementing a prototype. The final project plan and scope of the prototype still remains to be finalized. For example, source and receiver formats need to be chosen and the mapping (conversion) of those formats to the EIIP data format needs to be provided. Listed here are the current objectives and scope of the proof-of-concept for prototype demonstration. (Please refer to Appendix for the initial proof-of-concept design.)

OBJECTIVES AND SCOPE OF THE PROTOTYPE PROJECT

1. Prove out the technological support of the concepts described in this paper

2. Evaluate mapping and test conversion of EIIP data format to/from specific State/local fixed formats and to/from AIRS format. (Mapping to be provided by EIIP pilot participants and programmatic groups).

3. Evaluate ease of programming for EIIP data format

4. Investigate and test operational characteristics of using EIIP data format over high speed modems

5. Investigate and test operational characteristics of using EIIP data format over Internet by FTP

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compression can outweigh the benefits, so PKZIP-type approaches should be used with discretion.

Encryption involves scrambling the data using secret keys and/or algorithms. Anybody obtaining the scrambled transmission must not be able to decipher it without the key and/or algorithm. This approach is very secure, and is used for Automated Teller Machine (ATM) Personal Identification Numbers (PIN secret codes). It is also quite expensive and may be used only where strong security requirements exist.

Another encryption technique that is receiving much attention by Internet users is the Public Key approach. Here again the algorithm is published, but now there are multiple keys for each set of sharing partners. At least two keys are required for each source/receiver pair, one required at the source for encryption of the data, and a different key at the receiver allowing deciphering of the transmission.

Other alternatives that are not quite so secure are security boxes that encode/decode the transmitted message at the modem, so that anything traveling over the transmission lines is encrypted according to keys stored directly in the boxes, but all data in the source and receiver processors are not encrypted.

Authentication

Authentication means verifying that the sender or receiver of the data is really who you think he/she is, and that the data has not been modified. Assuming that the passwords and keys are held secret, the above methods of access control and encryption can be viewed as authentication techniques since the senders and receivers are the only individuals knowing the password or key code. A less expensive technique than encryption, but more selective than access control, is known as Message Authentication Coding (or MACing). This technique again uses a secret code known only to the sender and receiver. Rather than encoding the whole message, however, an algorithm is used based on the text in the message and the secret code to generate a MAC which is added to the end of the message. Messages are transmitted as clear text, but the MAC can verify that the message has not been changed and is from the expected sender. MACing as a technique is much less complicated and requires much less processing time than DES or Public Key encryption.

COMPRESSION OF DATA MAY REDUCE TRANSMISSION TIME AND STORAGE REQUIREMENTS

The EIIP data format is expected to compress the data by removing redundancies and not transmitting null values. Further compression may be achieved using publicly available software such as PKZIP. This will reduce transmission time and/or band-width requirements for transmission. Further, if the data to be transmitted is stored locally at the source and or the receiver, then storage requirements are likewise reduced. For small files the cost of

OTHER APPLICATIONS CHARACTERISTICS IMPORTANT TO THE DATA TRANSFER CONCEPT

MUST BE SIMPLE TO USE, NOT INVOLVING TIME-CONSUMING OPERATIONS AND SET-UP

Given the variable frequency of transmission and the fact that use of this data is often less than a full-time responsibility for someone not always well versed in information technology, any recommendations or tool development from EIIP projects must bear in mind simplicity in operations.

SENSITIVE DATA

Over a third of the survey respondents indicated that they transmitted sensitive emissions inventory data. As more industry partners enter the emissions inventory data arena, security considerations can be expected to increase. The EIIP data transmission concept may accommodate security in the ways described below:

Control of Access to a Computer Processor From a Network

This is the technique that most users will already be familiar with. The most widely accepted approach uses a logon identification and a password known only to the user. The approach is only as secure as the secrecy with which the password is held.

Automatic dial back (to a phone number at which the receiver should be located) is another approach to access control which is feasible using some types high-speed dialed modems available now. Once the receiver has dialed in, the receiver hangs up and the source modem automatically calls the receiver back. The source has then verified the number at which the receiver is located.

Control of Access to Individual Data and Applications Within a Computer Processor

Once a user has accessed a particular processor, he/she may have access to any data and applications residing within that processor. The administrator of the particular system must design and construct "firewalls" such that data and applications which external users have no business accessing are totally unavailable to them. Within a given application different levels of security may exist. For example, access to confidential data may need to be restricted to authorized individuals. Logon with userid and password to a database package may provide a sufficient level of protection by data entity or data set, and should be investigated according to individual project needs.

Encryption

- **High-speed communications file transfer.** Three methods of data transmission are being considered in the initial concept:

  — **Minimum 14.4 Kbps modems over dialed phone lines.** Almost all respondents to the survey already have this level of high-speed modem, many have or are contemplating purchase of 28.8 Kbps modems.

  — **Internet FTP**

  — **Internet linked WWW home page use**

- **Transmission volumes to be supported.** We recommend the following techniques based on the volumes from the survey. The vast majority of transmissions appear to be in the middle range. Use of the EIIP data format and file compression software (such as PKZIP) can potentially decrease these volumes.

  — **Less than 1M** - floppy disks or high-speed communications file transfer

  — **1M to 10M** - High-speed communications file transfer

  — **Greater than 10M** - High-speed communications file transfer or consider magnetic tape usage

- **Transmission frequencies to be supported.** The frequencies indicated in the survey and recommended solutions under the concept are as follows:

  — **Daily or more frequent - prefer use of Internet dedicated access.** At this level of frequency the vagaries and operational characteristics of dialed phone lines may be replaced by a dedicated access line to Internet. Internet is not without performance problems at peak times, and if volumes are large, thought should be given to scheduling transmissions at off-peak.

  — **Concept designed around monthly to twice per week frequency - relatively intermittent.** The typical frequency from the survey was in the monthly to twice weekly range. Internet FTP of high-speed dialed modems both have operational characteristics suitable for this frequency.

PROPOSED TECHNOLOGICAL INFRASTRUCTURE

From our survey, the current technology available to emissions inventory sharing partners has become clear. This is described below and forms the basis for the concept development, as well as the proof-of-concept project. These are the initial proposed hardware and software requirements for implementing the concept.

- **Hardware and systems software.** A part of the EIIP data transfer concept is the minimum prerequisite hardware and software configuration on which the concept is designed to operate. In general, this specification is built around the results of the data transfer survey, and is shown in the subsections below.

  — **IBM PC compatible 486 or better.** Most EIIP participants already have 486 class processors in the 50 MHz and above power range. Some already have Pentiums, many are planning their purchase. 80% of respondents in our survey indicated that they were willing to increase their processing power as a direct result of the EIIP recommendations.

  — **Windows family of operating systems.** This is the clear system of choice among survey participants.

  — **Transmission software.** ProComm or Crosstalk for modem transmission is recommended but not required. Most of the survey respondents have one of these software packages. Any transmission software used should support Zmodem and Kermit file transmission protocols for reliable data transmission.

  — **FTP for simple file transmission over Internet.** The prototype proof-of-concept will test FTP transmission. Anonymous FTP appears particularly well suited to the needs of receivers retrieving data from working repositories at sources. Almost all participants in the survey already have Internet FTP access.

  — **Netscape or Mosaic for Internet WWW implementation.** Further consideration will be given to World-Wide -Web (WWW) implementations on Internet during continued development of the concept. Tools such as Netscape and Mosaic make browsing the Web for emissions inventory data very simple. On-line help via linked home pages for additional documentation on data availability and metadata could serve the EIIP user well, and encourage and simplify use and retrieval of data.

DISTRIBUTED REPOSITORY TOPOLOGIES

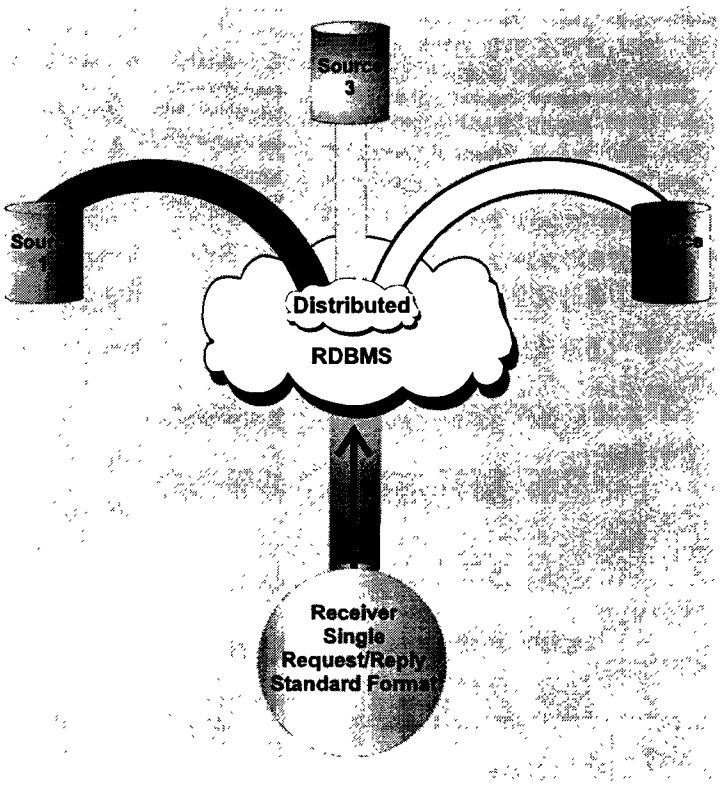

Figure 4-4. **Repository Topologies - Distributed**

The capabilities for distributed databases provided with modern Relational Data Base Management Systems (RDBMS) such as Oracle or Sybase, allow distribution of data to owning sources. This approach is shown in figure 4-4 above. The receiver issues a single data base request to the RDBMS, just as if the data was stored locally. The RDBMS has tables indicating the location of individual data items in remote data bases. The RDBMS takes responsibility for retrieving (and if necessary controlling updates to) multiple remote source locations. This approach requires that all of the participating organizations use a common RDBMS, and that some central group then acts as data base administrator (this requires maintaining the tables indicating where individual data attributes are located). Using this type of approach, limited processing and update can be performed directly on the remote data bases as if they were located locally. Performance and design considerations for a distributed data base are paramount and not easy to overcome. The big advantages of this type of approach is first making programming for the applications programmer accessing the data very simple, and secondly putting responsibility for access, storage and control of the source data back at each source location.

REMOTE AT SOURCES

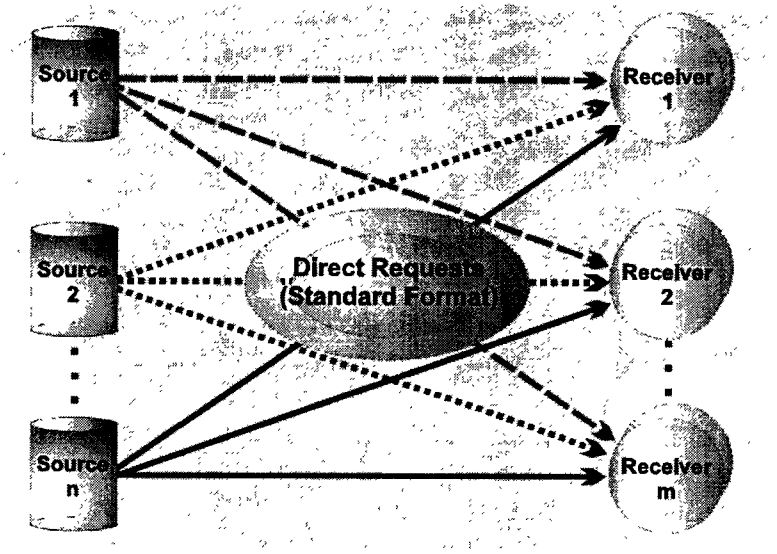

Figure 4-3. **Repository Topologies - Remote at Sources**

This configuration is shown in figure 4-3. In this approach each source accepts the responsibility and cost of making their own data available in the standard EIIP data format. Receivers must know the location of the data that they require, but then can request from the source at any convenient time. An example of this approach is the use of Internet anonymous FTP at multiple source locations.

CENTRAL

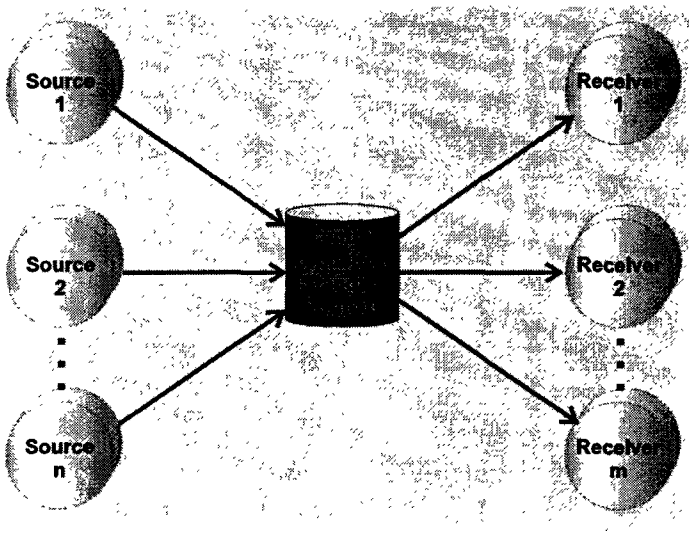

Figure 4-2. **Repository Topologies - Central**

With a central data repository, sources send their data periodically to a central location which makes the data available to all authorized receivers. This approach is shown in figure 4-2 above. For example, some states that are regionally related for air quality modeling purposes, are using such a "centralized" database approach to compile and share data. This approach makes life simple for sources because they only have to send their data once in the standard EIIP data format. Likewise receivers can retrieve at any time and vary their requests as necessary. However some group must take responsibility for the cost, operation and security of the central data repository.

standard EIIP data format as the "source" or "receiver" format.

One of the expected operating similarities between the X.12 format and the EIIP data format is the reduction of data redundancy in multiple records, and subsequent transmission of only valid fields, i.e., not null values. This can often result in significant compression of the data in conversion into these formats. The end effect is to reduce the transmission time required for the data set, thus allowing more data or smaller bandwidth (or modem speed) to be used in the same amount of transmission time.

OVERVIEW OF DATA REPOSITORY CONSIDERATIONS

Any two participating sites can use the concept described above. The data can be made available by the source in the EIIP data format on a timeframe suitable for the receiver without involving any type of long term database. As remarked earlier, the transmission can be initiated by either the source or the receiver. The data is required to exist in EIIP data format only when it is made available by the source or until it is translated to a local processing format by the receiver. Though the EIIP data transfer concept does not require a data repository, it is compatible with a data repository. As part of the proof-of-concept, the standard EIIP data format will be processed into a data base providing a repository that can consolidate and hold EIIP formatted data sets. This will allow an illustration of data availability for access and potential use of the data.

While data repository considerations are not a focal point of either the data format project or the data transfer study, it is important to understand how a data repository might fit into the concept. There is no requirement to adopt a single topology and/or database for all emissions inventory data. Different programmatic needs have different organizational and operational characteristics. The flexibility of our repository consideration allows each programmatic area to choose their own approach, which may be combined into a common database with other programmatic needs where this makes sense from an organizational, procedural or cost standpoint. The following examples consider some of the factors regarding the topology of the repository, and are provided for general understanding and comparison. The topology means how the data is distributed physically around multiple locations. Using the concepts described in this paper does not tie the emissions inventory data to a single structure for a repository database. The data base may be centralized at a single location, remotely located at the sources, or distributed through the use of advanced relational database products.

format is probably not the format that will be used locally at the source and receiver for processing, this satisfies the users requirement to store the data, independently, in formats for a variety of tools including:

- Flat files for other application formats (e.g. AIRS)
- Lotus and Excel spreadsheets
- Word or WordPerfect text files
- User-friendly PC databases (Paradox, FoxPro, dBase, Access)
- Advanced relational databases (e.g. Oracle and Sybase) - capable of distributed data repository systems.

The EIIP data format is analogous to an Import/Export format from a spreadsheet. The spreadsheet cannot process the Import/Export files directly, but the use of the standard Import/Export format allows for transfer between different versions of the spreadsheet with unlike formats, and even between different spreadsheets, or spreadsheets and other packages such as word processors and databases. The EIIP data format allows the data to be "exported" from the source and "imported" to any receiver understanding and able to convert the EIIP data format for local use. The ability for unlike systems to convert, or "map", to the EIIP data model/format is a very critical and non-trivial task, and one that is basic to the concept. Developing data format translators that can convert from a local source format to the common EIIP data format may be a relatively modest effort for some, or a more difficult and resource-intensive effort for others.

X.12 SCIENTIFIC FORMAT FRIENDLY

The EIIP data format hopes to provide a structural approach that may accommodate the ANSI standard for Electronic Data Interchange (EDI) X.12. This format is a more general standard that can be used for transmission of environmental data, but is not receiving wide use for that purpose at this time. The EDI X.12 format is currently being used more in industry and governmental entities for exchanging business information. Although the EDI X.12 format may appear complex at first sight, the complexities can be hidden through translation software so that they only need be considered one time by the developer of the conversion software. There are commercially available packages for X.12 format conversion, and there are investigations regarding the use and suitability of these packages for translating environmental data formats. The DMC, through its industrial and governmental representation may engage in a pilot investigation of EDI X.12 based on the

DEFINITION OF SOURCE AND RECEIVER FILE TRANSFER CONCEPT

The basic concept for the EIIP data transfer recommendations is based on file transfer from a 'source' (that has created or stored emissions data for use by others) to a 'receiver' which desires to process emissions data from other sources (potentially in addition to local source emissions data). Two types of program-specific users are defined, sources and receivers. EIIP participants are often likely to be both sources and receivers for different emissions data.

The transmission may be initiated by either the source or the receiver. In one implementation a particular source may have to send data on a regular basis, for example once per month, to a specific receiver. The source performs the conversion to the EIIP data format and initiates the data transfer to the receiver. The central receiver then saves the data transmitted and converts and processes the data on a schedule at the receiver's discretion. In a second implementation it may make sense for the source to convert the data and make it available to a group of receivers on an as needed basis. The source may use an anonymous FTP server, for example, located at the source containing a set of data in the EIIP data format. Then any receiver needing the data can investigate what is available, and initiate retrieval of only what that receiver needs.

In either case, the source converts and makes available or sends emissions data file in EIIP data format, which the receiver can then retrieve or accept, and subsequently convert to a local format appropriate to his/her use. The scheduling and data processing of the data at the source or the receiver is entirely independent of the file transmission.

FLEXIBLE TRANSLATION TO AND FROM SOURCE AND RECEIVER FORMATS

The EIIP data format gives both source and receiver a great deal of latitude in operating within their own local formats. Below we highlight some of the reasons for this.

THE EIIP DATA FORMAT DECOUPLES USE AND FORMAT AT SOURCE FROM THAT AT RECEIVER

File transmission in the EIIP data format is uncoupled from local use and application dependencies at both the source and receiver. The EIIP data format focuses on the format to be used for data transmission. Both the source and the receiver are free to choose whatever local tools they wish to process and store the data. They use whatever format and data structures they need for the particular type of processing they require. For example data formats used at a receiver for GIS applications are likely to be very different from data formats used in the statistical analysis of point-specific sample data. Since the EIIP data

Two types of program-specific users are defined, sources and receivers. 'Sources' are emissions inventory data providers. They have data that is useful and desired by other 'Receiver' emissions inventory data processors. By providing a common data transfer format, the individual source or receiver need only concern itself with converting the shared data to or from a standard EIIP data format (data translation). This approach will promote data sharing because once the format has been converted to the EIIP data format, it will be available for all other users that can process that same common format. The concept simplifies and streamlines the data transfer process by acknowledging standard transmission techniques using Internet and dialed access for initiating data flow. The process is based on using existing, commercially available packages - as far as possible - for processing, data translation and data transmission.

DATA TRANSFER ISSUES

Two data transfer issues that are being addressed in the development of the EIIP data transfer format are described below. The first provides for a transmitted file to contain an identifying file header, and the second to allow the data attributes to a real extent to be self defining.

FILE HEADER TO INDICATE DATA CONTENTS, SOURCE AND RECEIVER

A file header can be transmitted as the first record of every emissions inventory data transmission. This header will self-identify the data that follows. It will provide date of creation, and source and receiver of the data. In this way the receiving application can track which data sets it has received. Double processing of a file can be avoided. If data is received on a regular basis, missing transmissions can be identified. This adds significantly to the quality assurance of the processing of transmitted data.

NEED FOR METADATA OR INFORMATION ON USABILITY OF DATA

Metadata is data about data and includes such items as the method used to collect the data, the precision of the data, the units used to measure the data, and the typing of the data (numeric, exponential, character, etc.). By including these type of attributes in the EIIP data format, quality assurance of the use of the data at once becomes possible, and improper use of the data is discovered before significant time has elapsed or expenditure made on analysis. Usually the metadata for a particular attribute will be a constant for that source, and will be known at that source. It can therefore be added relatively easily during the data translation process, and becomes part of the quality assurance at the source and receiver for the data being shared if it is explicitly stated in the data being transmitted.

4

DESCRIPTION OF CONCEPT

INTRODUCTION

The purpose of the concept described here is to promote, streamline, and simplify data exchange and sharing of emissions inventory data. Today, many independent data bases containing emissions inventory data exist, especially at the state/local level. These independent logical databases use a variety of physical tools for support, from word processors (such as WordPerfect and MS Word), spreadsheets (such as EXCEL and Lotus 1-2-3), PC data bases (such as FoxPro, Paradox, Access and dBase) to specially programmed systems. Each independent data base has its own data format and may or may not contain specific data elements available in another database, or required by a specific application.

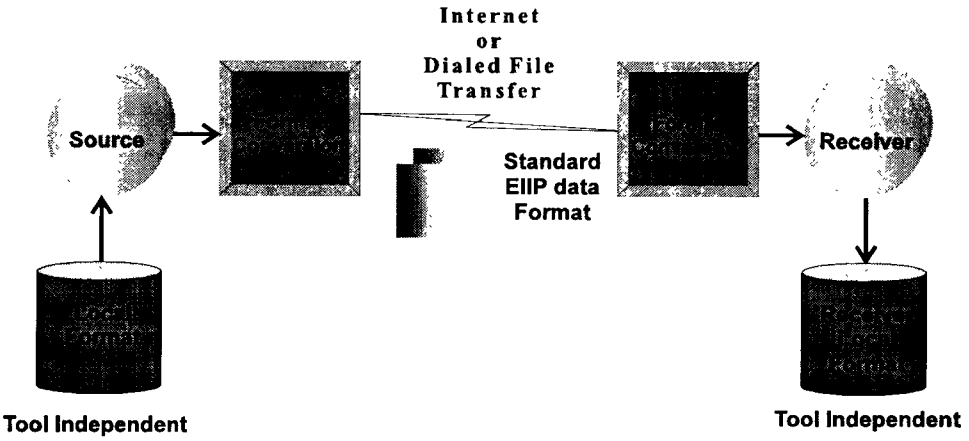

Figure 4-1: **Overview of EIIP Concept**

The concept recommended here is shown in Figure 4-1 above, and separates the program-specific use and storage of the emissions inventory data from the transmission and sharing of the data. At the program specific level the user is free to choose whatever tool and format is most suitable for his/her processing purposes. To facilitate the data exchange, a standard EIIP data format is being proposed. The EIIP common data format is the key to ensuring the quality of the data being transmitted, and improving the ability to exchange data between unlike systems.

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- **Internet access available and increasing.** Internet access is available to or planned by almost all respondents in the survey. Of the Internet users, all indicated that they had FTP capabilities, and almost all users indicated that they had access to, or plan to have access, to the World-Wide Web ("Mosaic").

- **Little use of other value-added networks.** Of the individuals using "direct network access", it is clear that the Internet and the EPA NDPD SNA network are the only significant wide area networks in use. The Value Added Networks (CompuServe, Prodigy, etc.) were virtually non-existent in the results. Respondents in the survey using EPA NDPD SNA connections expect a decline in planned usage over the next two years from 36% to 15%.

- **Almost all respondents have high speed modems for data transfer.** The most common current speeds are 9600 and 14.4 Kbs, though the majority of respondents plan to upgrade to 28.8 Kbs. Almost all respondents having high speed modems have access to data transfer software (primarily ProComm and Crosstalk) that includes de facto file transfer standard techniques such as Xmodem, Ymodem, Zmodem, and Kermit.

- **Data transfer volume and frequency variable.** Volumes and frequency of data transfer varied widely among respondents. The mean of volumes being transmitted is in the half megabyte to 10 megabyte range. Only 13% of respondents indicated an average transmission range that exceeded 10 Mbytes. Only 10% of respondents indicate an average transmission volume that was less than 500K. The frequency of transmissions for the majority of respondents is in the once per month to twice per week range.

subsequent interpretation by the DMC, have helped to define the average computer processing and telecommunication capabilities, current or planned in the participating community. Understanding and establishing that baseline medium has lead to initial recommendations regarding procedures that may be used to improve data transfer. The full results and conclusions have been documented in deliverable "EIIP Data Transfer Survey Results and Analyses". This document is available through the CHIEF bulletin board (on EPA's Technology Transfer Network), as document "ANALYSES.WP". A summary of the conclusions from the survey is given below.

- **Use of paper and floppy disks.** Though general use of paper and floppy disks was noted by all, survey participants expected the use of paper for data transfer to decline by 30% in terms of the number of users including these media in their two year plans. The analysis of the survey results addresses alternative technologies available that can improve the quality and generate automated data associated with these manual transfer techniques. At this time there are no further DMC projects associated with these manual recommendations.

- **Predominance of powerful IBM-compatible PCs.** The Intel 486-series was, by a wide margin, the most prevalent type of PC workstation in use by the survey respondents. Other responses mentioned UNIX workstations, UNIX servers, Unisys A16, Mac Quadra, Sun SPARC 29, Novell LAN, Hewlett-Packard model 9000 series 735/125 and a HP755 workstation. Some responses indicated that they were either using, or intending to purchase, the new Pentium series of processors.

- **ASCII file format.** A very high percentage of respondents use ASCII files for transferring inventory data. No other file type can be considered significant. Spreadsheets (split almost equally between Lotus and Excel with some Quatro Pro) and word processors (split almost equally between Word and WordPerfect) are used by over half the respondents. Overall, the responses to this group of questions suggests that a wide range of file formats are being used by individual groups. Popular data base formats that were indicated are primarily dBase derivatives or user-oriented relational databases including dBase, Paradox, MS Access, and FoxPro.

- **AIRS, and "other" record formats heavily used.** Record format responses revolved, for the most part, around AIRS (64%), "Other" (31%), and EPS-input (26%). We believe that this mix reflects the current range of applications that are used to store or process emissions data, with AIRS being the most predominant. However, the wide range of formats in the "Other" category indicates that there are a number of other applications (mostly PC databases) that are storing or manipulating emissions data.

3

PURPOSE AND BASIS OF THE CONCEPT PAPER

PURPOSE OF CONCEPT PAPER

The concept paper explains the basis for the initial recommendations from the DMC, and provides the inventory community the opportunity to understand and comment as their input toward the final recommendations. Specific objectives of the concept paper are to:

- Interpret the conclusions from the survey, by taking into consideration what the emission inventory community is capable of technologically, based upon their responses to the survey.
- Present the conceptual basis for the recommendations from the DMC, by abstracting from the detailed survey findings to a set of overall concepts that will be used as the basis for subsequent projects.
- Provide an integrated and organized view of data format activities within a proposed data transfer protocol, bringing together the diverse activities that have been pursued by the EIIP/DMC.
- Provide a basis for the initial proof-of-concept design that will be implemented and tested in the prototype project.
- Seek input from the emission inventory community in order to refine the initial recommendations through discussion before they are finalized.

The results and analysis of the data transfer survey provide, in part, the foundation for the concept. The survey findings are summarized as follows.

DATA TRANSFER SURVEY RESULTS

The intent of the DMC data transfer survey was to query a representative sample of the emissions inventory community regarding their current and future capabilities for transferring inventory data. Questions were asked regarding the frequency and quantity of emissions data transfer. Also the survey attempted to determine the file and record formats used during data transfer and individual *preferences* regarding formats and transfer methods. Of secondary concern was determining the general nature of the hardware and software currently used by those individuals who transfer emissions inventory data. The survey results, and their

The EIIP data model/data format should be developed and approved for use as soon as possible. The EIIP data format is the key to ensuring the quality of the data being transmitted, and improving the ability to exchange data between unlike systems at participating sites (i.e., state/local, industry, EPA). The ability for unlike systems to convert, or "map", to the EIIP data model/format is acknowledged to be a very critical and non-trivial task, and one that is basic to the described community concept. Developing data format translators that can convert from a local source format to the EIIP format can be a relatively modest effort for some, or a more difficult and resource-intensive effort for others. The emission inventory community will be requested to actually conduct a "mapping" exercise as part of their review of the EIIP data model. Such an intensive review is necessary to help confirm that the EIIP data format will be practical and feasible for use by the broad community. The translation step will also be demonstrated in the prototype.

2

PROPOSED APPROACH FOR IMPROVING DATA EXCHANGE

This paper describes some concepts that can be beneficial to improving the quality and efficacy of emission inventory data transfer through automated transmission. The EIIP is promoting the community's technological capabilities toward electronic transmission by developing this data transfer concept for implementation. In this concept, the program-specific use and storage of the emissions inventory data is separated from the transmission and sharing of the data. Cost, timely availability, and quality of data, are some of the considerations of this approach. To standardize and establish an improved data transfer protocol by the means described here, may require some adjustments to data management philosophies, and to operating infrastructure. The EIIP only intends to promote a data management strategy that is demonstrated and considered achievable by the emission inventory community.

A full and systematic investigation is being performed to understand how the availability and sharing of emission inventory data may be improved for the user community. This holistic approach is intended to proceed through a logical and disciplined sequence of events, which are reflected in the current and planned DMC activities. While this investigation is considered timely and necessary, it is also acknowledged to be a very ambitious consideration for the emission inventory community. The inventory community is being provided review and comment opportunities in order to assess and understand the possible improvements. Inherent in this process, is the necessity that the participating community validate the concepts being promoted, the approach being taken, and the potential for success of establishing an improved data transfer protocol.

It is key that the prospective users of these concepts understand the benefits that they provide and their proper use. To this end an initial proof-of-concept design has been developed *(Appendix)* to supplement and illustrate an implementation of the described concept. This proof-of-concept system may then be used as the basis for demonstrations, user education, and promotion of the EIIP recommendations. Aspects which will be demonstrated include:

- Translation of local user formats to the common EIIP data format
- Use of Internet FTP (File Transfer Protocol) to transmit the EIIP data format
- Demonstration of other high-speed dialed file-transfer transmission techniques for the EIIP data format

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Data Transfer Concept Paper

The concept paper describes a practical and effective operating procedure that may improve the availability and exchange of emission inventory data between state/local agencies, EPA, and industry. It proposes a consolidated approach that integrates and promotes the use of the EIIP common data format with efficient data transfer techniques. Included is a preliminary proof-of-concept design that may be used to test and demonstrate the concept.

Prototype Demonstration

A prototype will be designed and implemented as a pilot project in order to test the concept, i.e., proof-of-concept. The steps taken for implementing the prototype, and the results, will be documented for demonstration purposes.

Approach Study

As a concluding activity, the DMC will formulate its recommendations for the emission inventory community in the form of an approach study. The approach study is intended to capture and document the experience from implementing the prototype using the EIIP data format. The approach study will provide an effective planning tool for the community.

management recommendations for the emission inventory community. The DMC activities specifically include the following:

Development of Data Model/Common Data Transfer Format

In order to establish a consistent and common format for data transfer, the initial emphasis for the DMC has been to develop a robust core data model (core model containing basic set of data elements. The data model is being constructed based on input provided by the EIIP point, area, mobile, biogenic and quality assurance committees. The approach taken with the EIIP data model includes some provision for flexible data entities and attributes, thereby making the model amenable to updates in an efficient, timely, and cost-effective manner. Code tables will be used to operate the flexible attributes, making it possible to accommodate data from all types of emissions inventory programs and to store the data in a consistent format. The flexible attributes require the source of the data to be specific about the content, and also define for the receivers the data they are getting.

The EIIP data model / format is being developed in three phases. Each phase is expected to build upon previous phases, emphasizing the extensible nature of the data model. The three phases are:

- **Phase I Core Data Model** - The primary focus of this data model development is to support regional air quality modeling. The goal of this phase is to facilitate data transfer between state/local agencies and the EPA. This phase of the data model development is currently underway. A draft of the Phase I core data model will be available on the CHIEF Bulletin Board in early August 1995.
- **Phase II** - The focus of this phase will be to incorporate additional emission inventory data elements that overlap into other program areas, for example; Title V permits related data, and Title III toxics data. The data model will be developed to a greater level of detail than the Phase I model and will support additional data transfer between states and between industrial facilities and state agencies. Some aspects of the data model development for Phases I and II are occurring concurrently.
- **Phase III** - The focus of the Phase III model is the implementation of complete data set transfer between facilities and state agencies. Additional data elements will be incorporated, as necessary to improve data transfer from facility-to-state and state-to-state.

Data Transfer Survey

The DMC has conducted a survey with the emission inventory community as a means of gauging the user capabilities for data transfer. The analysis of those survey results form, in part, the basis for this concept paper and the supplemental proof-of-concept design document (included as Appendix to this document).

1

BACKGROUND

EIIP/DMC MISSION

The Clean Air Act Amendments of 1990 (CAAA) require that many state and local agencies collect emission inventory data as a basis for planning and demonstrating attainment with National Ambient Air Quality Standards (NAAQS). Emission inventories are a basic component to air quality modeling and other air pollution management analyses which are used to demonstrate that proposed air pollution control strategies are sufficient to attain the state/local and federal air quality standards. This data is an essential part of the infrastructure in managing environmental air pollution at the local, state, regional and federal levels.

The Emission Inventory Improvement Program (EIIP) has been formed as a joint effort of state and local air agencies and EPA for the purpose of improving the quality of the emissions data collected as well as the way the data is transferred and shared among users. The EIIP is developing standard procedures for collecting, calculating, storing, and reporting of emissions data. The ultimate goal of the EIIP is to provide cost-effective, reliable inventories by improving the quality of emissions data collected and providing for uniform reporting of this information within the emission inventory community.

EIIP/DATA MANAGEMENT COMMITTEE

The EIIP Data Management Committee (DMC) is developing and coordinating recommendations for technology and procedures to be used in sharing data among the emissions inventory community. The primary goals of the DMC are:

- to develop a recommended standard EIIP data format for organizations to use in sharing emission inventory data; and
- to recommend methods for transferring emissions data among State/local air agencies, EPA, and other organizations.

DATA MANAGEMENT COMMITTEE ACTIVITIES

The Data Management Committee has, on behalf of the EIIP, undertaken a number of diverse but related activities. These activities are expected to culminate in a series of data

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EIIP Data Transfer Concept Paper

Efficiency and Efficacy of Emissions Inventory Data Transfer Through Automation

August 1995

Prepared by:
Technology Planning & Management Corporation

Prepared for:
Data Management Committee
Emission Inventory Improvement Program

EIIP goals and objectives are being addressed through the production of seven guidance and methodology volumes. These seven are:

- Volume I: Introduction and Use of EIIP Guidance for Emissions Inventory Development
- Volume II: Point Sources Preferred and Alternative Methods
- Volume III: Area Sources Preferred and Alternative Methods
- Volume IV: Mobile Sources Preferred and Alternative Methods
- Volume V: Biogenics Sources Preferred and Alternative Methods
- Volume VI: Quality Assurance Procedures
- Volume VII: Data Management Procedures

The purpose of each volume is to evaluate the existing guidance on emissions estimation techniques, and, where applicable, to identify the preferred and alternative emission estimation procedures. Another important objective in each volume is to identify gaps in existing methods, and to recommend activities necessary to fill the gaps. The preferred and alternative method findings are summarized in clear, consistent procedures so that both experienced and entry-level inventory personnel can execute them with a reasonable amount of time and effort. Sufficiently detailed references are provided to enable the reader to identify any supplementary information. Users should note that the number of source categories or topics covered in any volume is constantly expanding as a function of EIIP implementation and availability of new information.

It is anticipated that the EIIP materials will become the guidance standard for the emission inventory community. For this reason, the production of EIIP volumes will be a dynamic, iterative process where documents are updated over time as better data and scientific understanding support improved estimation, QA, and data management methods. The number of individual source categories addressed by the guidance will grow as well over time. The EIIP welcomes input and suggestion from all groups and individuals on how the volumes could be improved.

PREFACE

As a result of the more prominent role given to emission inventories in the 1990 Clean Air Act Amendments (CAAA), inventories are receiving heightened priority and resources from the U.S. Environmental Protection Agency (EPA), state/local agencies, and industry. More than accountings of emission sources, inventory data are now providing the prime basis for operating permit fee systems, State Implementation Plan (SIP) development (including attainment strategy demonstrations), regional air quality dispersion modeling assessments, and control strategy development. This new emphasis on the use of emissions data will require significantly increased effort by state/local agencies to provide adequate, accurate, and transferrable information to meet various agency and regional program needs.

Existing emission inventory data collection, calculation, management, and reporting procedures are not sufficient or of high enough quality to meet all of these needs into the next century. To address these concerns, the Emission Inventory Improvement Program (EIIP) was created. The EIIP is a jointly sponsored endeavor of the State and Territorial Air Pollution Program Administrators/Association of Local Air Pollution Control Officials (STAPPA/ALAPCO) and the U.S. EPA, and is an outgrowth of recommendations put forth by the Standing Air Emissions Work Group (SAEWG) of STAPPA/ALAPCO. The EIIP Steering Committee and technical committees are composed of state/local agency, EPA, industry, consultant, and academic representatives. In general, technical committee participation is open to anyone.

The EIIP is defined as a program to develop and use standard procedures to collect, calculate, store, and report emissions data. Its ultimate goal is to provide cost-effective, reliable, and consistent inventories through the achievement of the following objectives:

- Produce a coordinated system of data measurement/calculation methods as a guide for estimating current and future source emissions;
- Produce consistent quality assurance/quality control (QA/QC) procedures applicable to all phases of all inventory programs;
- Improve the EPA/state/local agency/industry system of data collection, reporting, and transfer; and
- Produce an integrated source data reporting procedure that consolidates the many current reporting requirements;

Segment: **SE** **Transaction Set Trailer**
Position: 003
Loop:
Level: Summary
Usage: Mandatory
Max Use: 1
Purpose: To indicate the end of the transaction set and provide the count of the transmitted segments (including the beginning (ST) and ending (SE) segments)
Syntax Notes:
Semantic Notes:
Comments: 1 SE is the last segment of each transaction set.
Notes: 1. This segment is an X12 transaction set requirement only.

2. Segment Example:

SE*154*0001~
< provide for 154 total segments within transaction set 0001 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	SE01	96	**Number of Included Segments** Total number of segments included in a transaction set including ST and SE segments	M	N0	1/10
>>	SE02	329	**Transaction Set Control Number** Identifying control number that must be unique within the transaction set functional group assigned by the originator for a transaction set	M	AN	4/9

	specification
05	Calculated based on ratio in order to measure pollutant
06	Calculated based on pilot bench study
07	State Stack Test
08	State Material Balance
09	State Efficiency of Control Device
10	Company Material Balance
11	Company Efficiency of Control Device
12	Continuous Emission Monitoring
13	Calculated based on AP-42 emission factor
14	Calculated based on state/local agency emission factor
15	New construction, not yet operational - emissions are zero
16	Operations ceased- emissions are zero
17	Calculated based on FIRE emission factor
18	Calculated based on user-supplied emission factor
19	Calculated based on EPA speciation factor
20	Calculated based on state/local agency speciation factor
21	Calculated based on trade association emission factor
22	CO Stack Test Approved by State
23	Other CO Stack Test Approved by State
24	State Factor Used by State
25	State VOC Calculation
26	Company SCC Factor
27	Company VOC Calculation
28	Other miscellaneous emission method code
A	AIRS Rating A
B	AIRS Rating B
C	AIRS Rating C
D	AIRS Rating D
E	AIRS Rating E
F	AIRS Rating F

Segment: **REF** **Reference Identification**
Position: 755
Loop: STA
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment only applies when CID04 (prior segment) is "EF" or "ES".

3. This segment provides estimated emission method codes, emission factor method codes, and DARS quality rating score associated with STA02 (prior segment).

4. Segment Example:

REF*C3*02~
< estimate based on material balance using engineering knowledge of the process >*~

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element indicates the type of information being reported in this iteration of the loop. Select one from the following list: C3 Customer specification number Indicates the estimated emission method code or emission factor method code. D0 Data Reliability Code Indicates the DARS data quality rating score.	**M ID 2/3**
	REF02	127	**Reference Identification** Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier 1. When REF01 is "C3", this element contains the applicable method code associated with the code ("EF" or "ES") specified in CID04 (prior segment). Select one from the following numeric list: 2. When REF01 is "D0", this element contains the appropriate DARS data quality score associated with the code ("EF" or "ES") specified in CID04 (prior segment). If a DARS data quality score is not provided select one of the AIRS ratings from the following alphabetic list: 01 Calculated based on source test or other emission measurement 02 Calculated based on material balance using engineering knowledge of the process 03 Calculated based on best guess/engineering judgment 04 Calculated based on vendor emission factor	**X AN 1/30**

Power to which a unit is raised

1. This element is only applied when CID04 (prior segment) code is "ES".

2. This element contains the exponent allowing the formulation of the complex expression that is required as the unit of measure associated with STA02.

3. When applying a complex expression (e.g., kilograms per day), apply the exponent of "-1" as per the example noted in STA03.

STA07	**741**	**Range Maximum**	**O**	**R**	**1/20**

The value specifying the maximum of the measurement range

STA08	**935**	**Measurement Significance Code**	**O**	**ID**	**2/2**

Code used to benchmark, qualify or further define a measurement value

31	Calculated
	Indicates allowable
71	Low
	Indicates hourly
76	Medium
	Indicates daily
85	High
	Indicates annual

1. This element contains the value associated with the emission specified in SPI03.

STA03 C001 **Composite Unit of Measure** O

To identify a composite unit of measure (See Figures Appendix for examples of use)

1. This composite is only applied when CID04 (prior segment) code is "ES".

2. When CID04 (prior segment) is "ES", this composite provides the unit of measure associated with STA02.

3. Units of measure that are complex expressions must be expressed in a manner similar to the following example: kilogram per day = *KG:::DA:-1*

4. This note pertains to POINT, AREA, MOBILE, and NONROAD ENGINE SOURCE only: Unit of measure associated with emission factor (CID04 code is "EFI") are not reported with this transaction set. These units will be derived from the units associated with estimated emission (STA03) and activity (throughput) (MEA04 from HL loop "C").

>> C00101 355 **Unit or Basis for Measurement Code** M ID 2/2

Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken

1. This element is only applied when CID04 (prior segment) code is "ES".

2. When CID04 (prior segment) is "ES", this element contains the second unit in the complex unit of measure expression associated with STA02. Select one from the following list:

2U	Megagram Unit of mass
59	Parts Per Million
61	Parts Per Billion
CO	Cubic Meters (Net)
F5	MOL
GR	Gram
KG	Kilogram
LB	Pound
M5	Microcurie
MP	Metric Ton
P1	Percent
TN	Net Ton (2,000 LB).

C00104 355 **Unit or Basis for Measurement Code** O ID 2/2

Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken

1. This element is only applied when CID04 (prior segment) code is "ES".

2. When CID04 (prior segment) is "ES", this element contains the second unit in the complex unit of measure expression associated with STA02. Select one from the following list:

DA	Days
DK	Kilometers
YR	Years

C00105 1018 **Exponent** O R 1/15

Segment: **STA** **Statistics**
Position: 751
Loop: STA
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To provide summary statistics related to a specific collection of test result values
Syntax Notes:
Semantic Notes:
Comments:
Notes:

1. This segment only applies when CID04 (prior segment) is "EF" or "ES".

2. This loop provides the following information:

- pollutant-specific estimated emissions
- pollutant-specific emission factors
- estimated emission method code
- emission factor method code
- DARS data quality score associated with estimated emission data

3. When CID04 (prior segment) is "EF" or "ES", this segment provides emission factor or estimated emissions, respectively.

4. This note pertains to BIOGENIC SOURCE only. This segment is only used to report information associated with CID04 (prior segment) code "ES".

5. Loop (segments STA, REF) Example:

STA*30*200*59~
REF*C3*02~
< an average of 200 parts per million with the quantity arrived at by an estimate based on material balance using engineering knowledge of the process >~

6. Segment Example: 02

STA*30*200*59~
< an average of 200 parts per million >~

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	STA01	950	**Statistic Code** A code specifying the specific statistic being reported 1. This element indicates the type of measurement being reported with this iteration of the loop. Select one from the following list: 15 Maximum Average Indicates the provision of an actual value 16 Process Capability Upper Indicates the provision of a potential value 30 Average	M ID 2/2
>>	STA02	739	**Measurement Value** The value of the measurement	M R 1/20

following alphabetic list:

01	Calculated based on source test or other emission measurement
02	Calculated based on material balance using engineering knowledge of the process
03	Calculated based on best guess/engineering judgment
04	Calculated based on vendor emission factor specification
05	Calculated based on ratio in order to measure pollutant
06	Calculated based on pilot bench study
07	State Stack Test
08	State Material Balance
09	State Efficiency of Control Device
10	Company Material Balance
11	Company Efficiency of Control Device
12	Continuous Emission Monitoring
A	Area Source Questionnaire
C	Direct calc. of emissions by solvent use, all solvents emitted in time period
D	80% - Default value
E	Source in compliance due to irreversible process that eliminates solvent use
H	90% - Default- enhance monitoring
L	Local category-specific rule effectiveness factor - not EPA regulated
M	Continuous emission factor
N	Source not subject to regulation
P	Point Source Questionnaire
S	EPA Single Source Category Determination Protocol Study
U	Uncontrolled emission

Segment: **REF** **Reference Identification**
Position: 745
Loop: MEA
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment only applies when CID04 (prior segment) is "CE".

3. When MEA01 (prior segment) is "AG" or "AH", this segment provides method codes for rule effectiveness or aggregate capture/control efficiency, respectively.

4. Segment Example:

REF*C3*06~
< calculation based on a pilot bench study >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. REF01 code "C3" is only applied when MEA01 (prior segment) is "AH". 2. REF01 code "ZZ" is only applied when MEA01 (prior segment) is "AG". 3. This element indicates the type of aggregate control information being reported with this iteration of the loop. Select one from the following list: C3 Customer specification number Indicates aggregated control information calculation method 1. When applying this code, MEA01 must be "AH". ZZ Mutually Defined Indicates a regulation identifier for rule effectiveness 1. When applying this code, MEA01 must be "AG".	M ID 2/3
	REF02	127	**Reference Identification** Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier 1. When REF01 is "C3", this element contains an appropriate method code associated with MEA01 (prior segment) code "AH". Select one from the following numeric list: 2. When REF01 is "C3", this element contains an appropriate method code associated with MEA01 (prior segment) code "AG". Select one from the	X AN 1/30

			AH	Gross Compliance Total **Indicates the level of total capture/control efficiency**			
			PM	Permitted The condition or activity approved by the appropriate regulatory agency **Indicates the level of rule penetration**			
	MEA03	739	**Measurement Value** The value of the measurement **1. This element contains the value associated with the code specified in MEA01**		**X**	**R**	**1/20**
	MEA04	C001	**Composite Unit of Measure** To identify a composite unit of measure (See Figures Appendix for examples of use) **1. This composite provides the unit of measure associated with MEA03:**		**X**		
>>	C00101	355	**Unit or Basis for Measurement Code** Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken **1. This element contains the unit of measure associated with MEA03:**		**M**	**ID**	**2/2**
			PI	Percent			
	MEA07	935	**Measurement Significance Code** Code used to benchmark, qualify or further define a measurement value **1. This element indicates the type of measurement being reported with this iteration of the loop. Select one from the following list:**		**O**	**ID**	**2/2**
			22	Actual			
			23	Predicted			
			31	Calculated			

Segment: **MEA** **Measurements**
Position: 741
Loop: MEA
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify physical measurements or counts, including dimensions, tolerances, variances, and weights (See Figures Appendix for example of use of C001)
Syntax Notes:
1 If MEA05 is present, then MEA04 is required.
2 If MEA06 is present, then MEA04 is required.
3 Only one of MEA08 or MEA03 may be present.
4 If MEA07 is present, then at least one of MEA03 MEA05 or MEA06 is required.
5 At least one of MEA03 MEA05 MEA06 or MEA08 is required.
Semantic Notes:
1 MEA04 defines the unit of measure for MEA03, MEA05, and MEA06.
Comments:
1 When citing dimensional tolerances, any measurement requiring a sign (+ or -), or any measurement where a positive (+) value cannot be assumed, use MEA05 as the negative (-) value and MEA06 as the positive (+) value.

Notes:

1. This loop/segment does not apply with BIOGENIC SOURCE reporting.

2. This segment only applies when CID04 (prior segment) is "CE".

3. This loop provides the following information:

- rule effectiveness
- total capture/control efficiency
- rule penetration
- aggregate control efficiency method code
- rule effectiveness method code

4. When CID04 (prior segment) is "CE", this segment provides rule effectiveness, total capture/control efficiency, rule penetration.

5. Loop (segments MEA, REF) Example:

MEA*AH**82*P1***3 1~
REF*C3*06~
< total capture/control efficiency of 82 percent based on a calculation arrived at through the performance of a pilot bench study >

6. Segment Example:

MEA*AH**82*P1***31~
< total capture/control efficiency of 82 percent based on a calculation >

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
MEA01	737	**Measurement Reference ID Code** Code identifying the broad category to which a measurement applies 1. This element indicates the type of aggregate control information is being reported with this iteration of the loop. Select one from the following list: AG Compliance Total Indicates the level of rule effectiveness	O ID 2/2

Segment: **TMD** **Test Method**
Position: 729
Loop: CID
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To describe the nature of the test performed
Syntax Notes: 1 If TMD09 is present, then TMD02 is required.
2 If either TMD02 or TMD03 is present, then the other is required.
Semantic Notes: 1 TMD07 is the date of the test method as assigned by the issuing organization.
2 TMD08 is the document revision number.
Comments: 1 TMD09 specifies the individual code list of the agency specified in TMD02.
Notes: 1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment indicates whether the emission factor or estimated emission associated with STA02 (following segment) is reported on a controlled or uncontrolled basis.

3. Segment Example:

TMD**EP*U~
< an uncontrolled pollutant selected from a list maintained by the EPA>

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
TMD02	559	**Agency Qualifier Code** Code identifying the agency assigning the code values 1. This element identifies the agency maintaining the code values applied with this segment. EP United States Environmental Protection Agency (EPA)	X ID 2/2
TMD03	751	**Product Description Code** A code from an industry code list which provides specific data about a product characteristic 1. This element indicates whether the emission factor or estimated emission is associated with STA02 (following segment) is reported on a controlled or uncontrolled basis. Select one from the following list: C Controlled U Uncontrolled	X AN 1/12

1. This element identifies the agency maintaining the code values applied with this segment.

EP	United States Environmental Protection Agency (EPA)

CID04	**751**	**Product Description Code**	**X**	**AN**	**1/12**

A code from an industry code list which provides specific data about a product characteristic

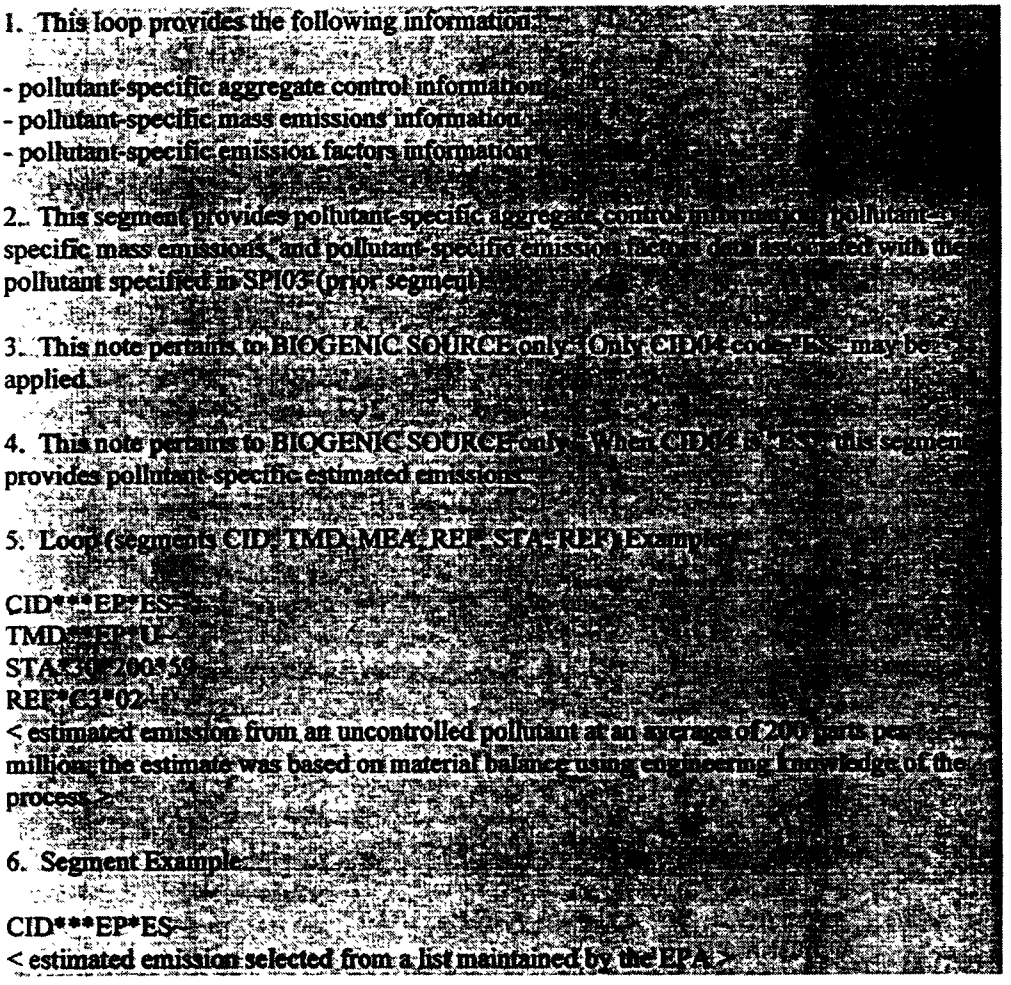
1. This note pertains to BIOGENIC SOURCE only. Only code "ES" may be applied.

2. This element indicates the information being reported with this iteration of the loop. Select one from the following list:

CE	Aggregate Control Information
EF	Emission Factor
ES	Estimated Emissions

Segment: **CID** Characteristic/Class ID
Position: 725
Loop: CID
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify the general class or specific characteristic upon which test results are being reported or are to be taken
Syntax Notes:
1 If CID06 is present, then both CID03 and CID04 are required.
2 If CID07 is present, then at least one of CID04 or CID05 is required.
3 If either CID03 or CID04 is present, then the other is required.
4 At least one of CID01 CID02 CID04 or CID05 is required.
Semantic Notes:
Comments:
1 CID06 specifies the individual code list of the agency specified in CID03.
2 CID07 refers to whether or not the characteristic identified in CID04 or CID05 or both is affected by the product change. If it is affected, the value is "Y". A value of "N" is used when it is known that it will not be affected. Any other value indicates it is indeterminate.

Notes:



1. This loop provides the following information:

- pollutant-specific aggregate control information
- pollutant-specific mass emissions information
- pollutant-specific emission factors information

2. This segment provides pollutant-specific aggregate control information, pollutant-specific mass emissions, and pollutant-specific emission factors data associated with the pollutant specified in SPI03 (prior segment).

3. This note pertains to BIOGENIC SOURCE only. Only CID04 code "ES" may be applied.

4. This note pertains to BIOGENIC SOURCE only. When CID04 is "ES", this segment provides pollutant-specific estimated emissions.

5. Loop (segments CID, TMD, MEA, REF, STA, REF) Example:

CID***EP*ES~
TMD**EP*UL~
STA*30*200*59~
REF*G3*02~
< estimated emission from an uncontrolled pollutant at an average of 200 parts per million; the estimate was based on material balance using engineering knowledge of the process >

6. Segment Example:

CID***EP*ES~
< estimated emission selected from a list maintained by the EPA >

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
CID03	559	**Agency Qualifier Code** Code identifying the agency assigning the code values	X ID 2/2

		05	Physical		
		06	Process		
PID08	**1073**	**Yes/No Condition or Response Code**	**O**	**ID**	**1/1**
		Code indicating a Yes or No condition or response			
		1. This segment does not apply with BIOGENIC SOURCE reporting.			
		2. This element indicates whether the control strategy indicated in MSG01 (prior segment) applies to the level specified PID04. Select one from the following list:			
		N	No		
		Y	Yes		

Segment: **PID** **Product/Item Description**
Position: 661
Loop: PID
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To describe a product or process in coded or free-form format
Syntax Notes:
1 If PID04 is present, then PID03 is required.
2 If PID07 is present, then PID03 is required.
3 If PID08 is present, then PID03 is required.
4 At least one of PID04 or PID05 is required.
Semantic Notes:
1 Use PID03 to indicate the organization that publishes the code list being referred to.
2 PID04 should be used for industry-specific product description codes.
3 PID08 describes the physical characteristics of the product identified in PID04. A ``Y" indicates that the specified attribute applies to this item. A ``N" indicates it does not apply. Any other value is indeterminate.
Comments:
1 If PID01 = ``F", then PID05 is used. If PID01 = ``S", then PID04 is used. If PID01 = ``X", then both PID04 and PID05 are used.
2 Use PID06 when necessary to refer to the product surface or layer being described in the segment.
3 PID07 specifies the individual code list of the agency specified in PID03.
Notes:
1. This loop/segment does not apply with BIOGENIC SOURCE reporting.

2. This loop/segment provides the level to which the control strategy specified in MSG01(prior segment) applies.

3. Loop/Segment Example:

PID*S**EP*04~
< information referring to control strategies that is reported from a structured code list maintained by the EPA, which in this instance indicates that the strategy applies at the site/source-level >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	**PID01**	**349**	**Item Description Type**	**M**	**ID**	**1/1**
			Code indicating the format of a description			
			1. This element indicates the format in which the information in this segment is being presented.			
			S Structured (From Industry Code List)			
	PID03	**559**	**Agency Qualifier Code**	**X**	**ID**	**2/2**
			Code identifying the agency assigning the code values			
			1. This element identifies the agency maintaining the code values applied within this segment.			
			EP United States Environmental Protection Agency (EPA)			
	PID04	**751**	**Product Description Code**	**X**	**AN**	**1/12**
			A code from an industry code list which provides specific data about a product characteristic			
			1. This element indicates which level is being reported with this iteration of the loop. Select one from the following list:			
			04 Site/Source			

Segment: **MSG** **Message Text**
Position: 655
Loop: SPI
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To provide a free form format that would allow the transmission of text information
Syntax Notes:
Semantic Notes:
Comments: 1 MSG02 is not related to the specific characteristics of a printer, but identifies top of page, advance a line, etc.
Notes: 1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment contains the control strategy description (e.g., rule/regulation name, permit requirements, etc.) associated with the pollutant specified in SPI03 (prior segment).

3. Segment Example:

MSG*Annual reporting of the emission is required~
< a control strategy requirement of annual reporting >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	MSG01	933	**Free-Form Message Text** Free-form message text	M AN 1/264

		8D	Chemical Abstract Service Number		
		I9	Pollutant		
SPI03	**127**	**Reference Identification**		**X**	**AN** **1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. When SPI02 is "8D", this element contains a Chemical Abstract Service (CAS) number.

2. When SPI02 is "I9", this element contains a pollutant code. Select one from the following list:

CO	Carbon monoxide
HC	Hydrocarbons
ISO	Isoprene
MONO	Monoterpines
NMHC	Nonmethane hydrocarbons
NMOC	Nonmethane organic compounds
NMOG	Nonmethane organic gases
NO	Nitric oxide
NOX	Nitrogen oxides
NOY	Nitrogen oxides plus secondary compounds
OVOC	Other volatile organic compounds
PB	Lead
PM	Particulate matter
PM10	Particulate matter >= 10
PM25	Particulate matter >= 2.5
ROG	Reactive organic gases
SOX	Sulfur oxides
TOG	Total organic gases
VOC	Volatile organic compounds

Segment: **SPI** **Specification Identifier**
Position: 639
Loop: SPI
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To provide a description of the included specification or technical data items
Syntax Notes: **1** If either SPI02 or SPI03 is present, then the other is required.
Semantic Notes:
Comments:
Notes: 1. This loop provides the following information:

- confidentiality indicator
- emission-specific Chemical Abstract Service (CAS)/pollutant code
- control strategy information

2. This segment provides the confidentiality indicator, Chemical Abstract Service (CAS) Number, and pollutant code.

3. This segment must be applied at least one (1) time to provide either SPI02 code "8D" or "I9" and the associated information.

4. Loop (segments SPI, MSG) Example:

SPI*00*I9*CO~
MSG*Annual reporting of the emission is required.~
< information that is non-classified, associated with carbon monoxide with respect to a control strategy requirement of annual reporting >~

5. Segment Example:

SPI*00*I9*CO~
< information that is non-classified, associated with carbon monoxide >~

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	SPI01	786	**Security Level Code** Code indicating the level of confidentiality assigned by the sender to the information following 1. This element contains the confidentiality indicator associated with the data in this loop/level. Select one from the following list: 00 Company Non-Classified 02 Company Confidential 90 Government Non-Classified 92 Government Confidential	M ID 2/2
	SPI02	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element must be applied at least one (1) time to provide either code "8D" or "I9". 2. This element indicates the type of pollutant-specific identifier being reported with this iteration of the loop. Select one from the following list:	X ID 2/3

STA*30*200*59~
REF*C3*02~
< information that is non-classified, associated with an uncontrolled carbon monoxide estimated emission of an average of 200 parts per million; the estimate was based on material balance using engineering knowledge of the process >

5. Segment Example:

HL*40*20*9*0~
< fortieth HL loop is subordinate to the twentieth HL loop of this transaction set. fortieth HL loop contains emission-level information and has no subordinate loops >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	HL01	628	**Hierarchical ID Number** A unique number assigned by the sender to identify a particular data segment in a hierarchical structure 1. This element contains a unique number used to identify this iteration of the HL loop	M	AN	1/12
	HL02	734	**Hierarchical Parent ID Number** Identification number of the next higher hierarchical data segment that the data segment being described is subordinate to 1. This note pertains to POINT/AREA/NONROAD SOURCE only. This element indicates that this level of the transaction set points to the HL loop parent containing the HL03 code for emission level data. 2. This note pertains to MOBILE SOURCE only. This element indicates that this level of the transaction set points to the HL loop parent containing the HL03 Code '9' for process level data.	O	AN	1/12
>>	HL03	735	**Hierarchical Level Code** Code defining the characteristic of a level in a hierarchical structure 1. This element indicates that this level of the transaction set contains emission-level data. 9 Line Detail Code identifying the supporting detail associated with the charge or group Indicates emission level data	M	ID	1/2
	HL04	736	**Hierarchical Child Code** Code indicating whether if there are hierarchical child data segments subordinate to the level being described 0 No Subordinate HL Segment in This Hierarchical Structure	O	ID	1/1

Segment: **HL** **Hierarchical Level**
Position: 635
Loop: HL
Level: Detail
Usage: Mandatory
Max Use: 1
Purpose: To identify dependencies among and the content of hierarchically related groups of data segments
Syntax Notes:
Semantic Notes:
Comments:

1 The HL segment is used to identify levels of detail information using a hierarchical structure, such as relating line-item data to shipment data, and packaging data to line-item data.
2 HL01 shall contain a unique alphanumeric number for each occurrence of the HL segment in the transaction set. For example, HL01 could be used to indicate the number of occurrences of the HL segment, in which case the value of HL01 would be "1" for the initial HL segment and would be incremented by one in each subsequent HL segment within the transaction.
3 HL02 identifies the hierarchical ID number of the HL segment to which the current HL segment is subordinate.
4 HL03 indicates the context of the series of segments following the current HL segment up to the next occurrence of an HL segment in the transaction. For example, HL03 is used to indicate that subsequent segments in the HL loop form a logical grouping of data referring to shipment, order, or item-level information.
5 HL04 indicates whether or not there are subordinate (or child) HL segments related to the current HL segment.

Notes:

1. This level/loop (HL9) provides emission-level data, including:

- confidentiality indicator
- emission-specific Chemical Abstract Service (CAS)/pollutant code
- control strategy information
- rule effectiveness
- total capture/control efficiency
- rule penetration
- aggregate control efficiency method code
- rule effectiveness method code
- pollutant-specific estimated emissions
- pollutant-specific emission factors
- estimated emission method code
- emission factor method code
- DARS data quality score associated with estimated emission data

2. This loop must be applied one (1) time for each Chemical Abstract Service (CAS) number or pollutant code.

3. This note pertains to BIOGENIC SOURCE only. This loop provides estimated emission data only.

4. Loop (segments HL, SPI, MSG, PID, CID, TMD, MEA, REF, STA, REF) Example:

```
HL*40*20*9*0~
SPI*00*I9*CO~
CID***EP*ES~
TMD**EP*U~
```

Segment: **REF** **Reference Identification**
Position: 597
Loop: STA
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides an activity (throughput) schedule line item associated with the schedule specified in CID04 (prior segment) code "S".

3. Segment Example:

REF*72*06~
< adjustment factor time periods associated with a modeling episode

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier**	M ID 2/3
			Code qualifying the Reference Identification	
			1. This element indicates the activity (throughput) schedule line item.	
			72 Schedule Reference Number	
			Identifies a number for a program schedule (for example, a logic type of network) or working schedule to complete a specific task or set of tasks	
			Indicates activity (throughput) schedule line item	
	REF02	127	**Reference Identification**	X AN 1/30
			Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier	
			1. This element indicates the activity (throughput) schedule line item being reported with this iteration of the loop. Select one from the following list:	
			01 Ozone Season	
			02 Peak Ozone Season	
			03 CO Season	
			04 Peak CO Season	
			05 Particulate Matter Season	
			06 Modeling Episode	
	REF03	352	**Description**	X AN 1/80
			A free-form description to clarify the related data elements and their content	
			1. This element contains a description associated with the code specified in REF02.	

DTM06	**1250**	**Date Time Period Format Qualifier**	**X**	**ID**	**2/3**
		Code indicating the date format, time format, or date and time format			
		UN Unstructured			
DTM07	**1251**	**Date Time Period**	**X**	**AN**	**1/35**
		Expression of a date, a time, or range of dates, times or dates and times			
		1. This element is only applied when DTM01 is "239".			
		2. This element contains the value associated with DTM01 code "239". Select the code corresponding to the typical day of the week being reported from the following list:			
		01			
		02			
		03			
		04			
		05			
		06			
		07			

Segment: **DTM** Date/Time Reference
Position: 595
Loop: STA
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify pertinent dates and times
Syntax Notes: 1 If either DTM06 or DTM07 is present, then the other is required.
2 At least one of DTM02 DTM03 or DTM06 is required.
Semantic Notes:
Comments:
Notes: 1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides the typical day information and beginning and end dates for each applicable season/episode associated with the schedule or adjustment specified in CID04 (prior segment) codes "S" and "A" respectively.

3. Segment Example:

DTM*196*950101~
DTM*197*950331~
< an adjustment factor time period starting January 1, 95 and ending March 31, 95 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	DTM01	374	**Date/Time Qualifier** Code specifying type of date or time, or both date and time 1. This element indicates the beginning and end dates for each applicable season/episode associated with the schedule or adjustment specified in CID04 (prior segment) codes "S" and "A" respectively. Select code from the following list: 196 Start 197 End 239 Baseline The baseline or original plan that progress is measured against Indicate typical da	M ID 3/3
	DTM02	373	**Date** Date (YYMMDD) 1. This element is only applicable when DTM01 is "196" or "197". 2. This element contains the year, month, and day in DTM01 code "196" or "197". 3. The format for reporting the applicable information is as follows: (YY represents the year in which the month falls) December —— YY1201 March —— YY0301 June —— YY0601 September —— YY0901	X DT 6/6

	Des.	Element	Name	Attributes
>>	STA01	950	**Statistic Code**	M ID 2/2
			A code specifying the specific statistic being reported	
			1. When code "ZZ" is applied in STA01, C00101 must be "P1".	
			2. This element indicates the type of measurement being reported with this iteration of the loop. Select one from the following list:	
			30 Average	
			ZZ Mutually Defined	
			Indicates percent	
			1. When applying this code, C00101 must be "P1".	
>>	STA02	739	**Measurement Value**	M R 1/20
			The value of the measurement	
			1. This element contains the value associated with the code ("A" or "S") specified in CID04 (prior segment).	
	STA03	C001	**Composite Unit of Measure**	O
			To identify a composite unit of measure (See Figures Appendix for examples of use)	
			1. This composite provides the units of measure associated with STA02.	
			2. Units of measure that are complex expressions must be expressed in a manner similar to the following example: hours per week = *HR*WK-1*.	
>>	C00101	355	**Unit or Basis for Measurement Code**	M ID 2/2
			Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken	
			1. This element contains the first unit in the complex unit of measure expression associated with STA02. Select one from the following list:	
			DA Days	
			HR Hours	
			P1 Percent	
			WK Week	
	C00104	355	**Unit or Basis for Measurement Code**	O ID 2/2
			Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken	
			1. This element contains the second unit in the complex unit of measure expression associated with STA02. Select one from the following list:	
			DA Days	
			HR Hours	
			YR Years	
	C00105	1018	**Exponent**	O R 1/15
			Power to which a unit is raised	
			1. This element contains the exponent allowing the formulation of the complex expression that may be required as the unit of measure associated with STA02.	
			2. When applying a complex expression (e.g., hours per week), apply the exponent of "-1" as per the example noted in STA03.	

Segment: **STA** Statistics
Position: 593
Loop: STA
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To provide summary statistics related to a specific collection of test result values
Syntax Notes:
Semantic Notes:
Comments:
Notes:

1. This loop/segment does not apply with BIOGENIC SOURCE reporting.

2. This loop provides the following information:

- activity (throughput) schedule information
- seasonal activity (throughput) adjustment factor information
- typical day information
- activity (throughput) schedule line item information

3. This segment is used to provide activity (throughput) schedule or seasonal activity (throughput) adjustment factor information associated with CHOICE (prior segment) codes "S" and "A" respectively.

4. Loop (segments STA, DTM, REF) Example:

STA*ZZ*15*PI~
DTM*196*950101~
DTM*197*950331~
STA*ZZ*60*PI~
DTM*196*950401~
DTM*197*950630~
STA*ZZ*15*PI~
DTM*196*950701~
DTM*197*950930~
STA*ZZ*10*PI~
DTM*196*951001~
DTM*197*951231~
REF*72*06~
< a seasonal activity (throughput) adjustment factor of 15 percent reported for the time period starting January 1, 95 and ending March 31, 95; a seasonal activity (throughput) adjustment factor of 60 percent reported for the time period starting April 1, 95 and ending June 30, 95; a seasonal activity (throughput) adjustment factor of 15 percent reported for the time period starting July 1, 95and ending September 30, 95; a seasonal activity (throughput) adjustment factor of 10 percent reported for the time period starting October 1, 95and ending December 31, 95; the adjustment factor time periods are associated with a modeling episode >

5. Segment Example:

STA*ZZ*15*PI~
< a seasonal activity (throughput) adjustment factor of 15 percent

Data Element Summary

Ref.	Data

Segment: **DTM** **Date/Time Reference**
Position: 585
Loop: MEA
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify pertinent dates and times
Syntax Notes: 1 If either DTM06 or DTM07 is present, then the other is required.
2 At least one of DTM02 DTM03 or DTM06 is required.
Semantic Notes:
Comments:
Notes: 1. This segment provides the beginning and end dates and times associated with the meteorological parameter specified in the MEA segment (prior segment).

2. Segment Example:

DTM*196*950101***19~
DTM*197*951231***19~
< a meteorological time period starting January 1, 95 and ending December 31, 95 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	DTM01	374	**Date/Time Qualifier** Code specifying type of date or time, or both date and time 1. This element indicates the beginning and end dates and times associated with the meteorological parameter specified in the MEA segment (prior segment). Select one from the following list: 196 Start 197 End	M ID 3/3
	DTM02	373	**Date** Date (YYMMDD) 1. This element contains the date value associated with the code specified in DTM01.	X DT 6/6
	DTM03	337	**Time** Time expressed in 24-hour clock time as follows: HHMM, or HHMMSS, or HHMMSSD, or HHMMSSDD, where H = hours (00-23), M = minutes (00-59), S = integer seconds (00-59) and DD = decimal seconds; decimal seconds are expressed as follows: D = tenths (0-9) and DD = hundredths (00-99) 1. This element contains the time value associated with the code specified in DTM01.	X TM 4/8
	DTM05	624	**Century** The first two characters in the designation of the year (CCYY) 1. This element contains the hundred year designation associated with the DTM02.	O N0 2/2

		per second), apply the exponent of "-1" as per the example noted in MEA04.			
C00107	**355**	**Unit or Basis for Measurement Code**	**O**	**ID**	**2/2**
		Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken			
		1. This element contains the second unit in the complex unit of measure expression associated with MEA03.			
		03 Seconds			
C00108	**1018**	**Exponent**	**O**	**R**	**1/15**
		Power to which a unit is raised			
		1. This element contains the exponent allowing the formulation of the complex expression that may be required as the unit of measure associated with MEA03.			
		2. When applying a complex expression (e.g., square miles per hour per meter per second), apply the exponent of "-1" as per the example noted in MEA04.			
MEA05	**740**	**Range Minimum**	**X**	**R**	**1/20**
		The value specifying the minimum of the measurement range			
MEA06	**741**	**Range Maximum**	**X**	**R**	**1/20**
		The value specifying the maximum of the measurement range			

			BR	Brightness			
				Indicates visible radiation			
			R7	Speed			
				Indicates wind speed			
			RA	Relative Humidity			
			TC	Temperature			
			ZZZ	Mutually Defined			
				Indicates cloud cover			
	MEA03	**739**	**Measurement Value**		**X**	**R**	**1/20**
			The value of the measurement				
			1. This element contains the value associated with the code specified in MEA02.				
	MEA04	**C001**	**Composite Unit of Measure**		**X**		
			To identify a composite unit of measure (See Figures Appendix for examples of use)				
			1. This composite provides the units of measure associated with MEA03.				
			2. Units of measure that are complex expressions must be expressed in a manner similar to the following example: square miles per hour per meter per second = *HM:2::MR:-1::03:-1*.				
>>	**C00101**	**355**	**Unit or Basis for Measurement Code**		**M**	**ID**	**2/2**
			Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken				
			1. This element contains the first unit in the complex unit of measure expression associated with MEA03. Select one from the following list:				
			CE	Centigrade, Celsius			
			F5	MOL			
			FA	Fahrenheit			
			HM	Miles Per Hour			
			P1	Percent			
	C00102	**1018**	**Exponent**		**O**	**R**	**1/15**
			Power to which a unit is raised				
			1. This element contains the exponent allowing the formulation of the complex expression that may be required as the unit of measure associated with MEA03.				
			2. When applying a complex expression (e.g., square miles per hour per meter per second), apply the exponent of "-1" as per the example noted in MEA04.				
	C00104	**355**	**Unit or Basis for Measurement Code**		**O**	**ID**	**2/2**
			Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken				
			1. This element contains the second unit in the complex unit of measure expression associated with MEA03.				
			MR	Meter			
	C00105	**1018**	**Exponent**		**O**	**R**	**1/15**
			Power to which a unit is raised				
			1. This element contains the exponent allowing the formulation of the complex expression that may be required as the unit of measure associated with MEA03.				
			2. When applying a complex expression (e.g., square miles per hour per meter				

Segment: **MEA** **Measurements**
Position: 583
Loop: MEA
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify physical measurements or counts, including dimensions, tolerances, variances, and weights (See Figures Appendix for example of use of C001)
Syntax Notes:
1 If MEA05 is present, then MEA04 is required.
2 If MEA06 is present, then MEA04 is required.
3 Only one of MEA08 or MEA03 may be present.
4 If MEA07 is present, then at least one of MEA03 MEA05 or MEA06 is required.
5 At least one of MEA03 MEA05 MEA06 or MEA08 is required.
Semantic Notes:
1 MEA04 defines the unit of measure for MEA03, MEA05, and MEA06.
Comments:
1 When citing dimensional tolerances, any measurement requiring a sign (+ or -), or any measurement where a positive (+) value cannot be assumed, use MEA05 as the negative (-) value and MEA06 as the positive (+) value.
Notes:
1. This loop provides meteorological data.

2. This segment provides meteorological data associated with CID04 (prior segment) code "W".

3. Loop (segments MEA, DTM) Example:

MEA*EN*AD*25*FA
DTM*196*950101*19
DTM*197*951231*19
< a diurnal temperature change of 25 degrees Fahrenheit recorded for the time period starting January 1, 95 and ending December 31, 95 >

4. Segment Example:

MEA*EN*AD*25*FA
< a diurnal temperature change of 25 degrees Fahrenheit >

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
MEA01	737	**Measurement Reference ID Code** Code identifying the broad category to which a measurement applies 1. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list: EN Environmental Conditions The data values to be reported reflect the environmental conditions surrounding a situation including but not limited to test environments	O ID 2/2
MEA02	738	**Measurement Qualifier** Code identifying a specific product or process characteristic to which a measurement applies 1. This element indicated the meteorological parameter being reported with this iteration of the loop. Select one from the following list: AD Ambient Temperature Indicates diurnal temperature change.	O ID 1/3

< a diurnal temperature change of 25 degrees Fahrenheit recorded for the time period starting January 1, 95 and ending December 31, 95; a seasonal activity (throughput) adjustment factor of 15 percent reported for the time period starting January 1, 95and ending March 31, 95; a seasonal activity (throughput) adjustment factor of 60 percent reported for the time period starting April 1, 95 and ending June 30, 95; a seasonal activity (throughput) adjustment factor of 15 percent reported for the time period starting July 1, 95and ending September 30, 95; a seasonal activity (throughput) adjustment factor of 10 percent reported for the time period starting October 1, 95and ending December 31, 95; the adjustment factor time periods are associated with a modeling episode >~

5. Segment Example:

CID***EP*M~
< meteorological data >~

CID***EP*A~
< a seasonal activity (throughput) adjustment factor data >~

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
CID03	559	**Agency Qualifier Code**	X ID 2/2
		Code identifying the agency assigning the code values	
		1. This element identifies the agency maintaining the code values applied with this segment.	
		EP United States Environmental Protection Agency (EPA)	
CID04	751	**Product Description Code**	X AN 1/12
		A code from an industry code list which provides specific data about a product characteristic	
		1. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list:	
		A Seasonal Activity (Throughput) Adjustment Factor	
		M Meteorological	
		S Activity (Throughput) Schedule	

Segment: **CID** Characteristic/Class ID
Position: 567
Loop: CID
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify the general class or specific characteristic upon which test results are being reported or are to be taken
Syntax Notes:
1 If CID06 is present, then both CID03 and CID04 are required.
2 If CID07 is present, then at least one of CID04 or CID05 is required.
3 If either CID03 or CID04 is present, then the other is required.
4 At least one of CID01 CID02 CID04 or CID05 is required.
Semantic Notes:
Comments:
1 CID06 specifies the individual code list of the agency specified in CID03.
2 CID07 refers to whether or not the characteristic identified in CID04 or CID05 or both is affected by the product change. If it is affected, the value is "Y". A value of "N" is used when it is known that it will not be affected. Any other value indicates it is indeterminate.

Notes:
1. This loop provides the following information:

- activity (throughput) schedule information
- seasonal activity (throughput) adjustment factor information
- meteorological data
- typical day information
- activity (throughput) schedule line item information

2. This note pertains to POINT, AREA, MOBILE, and NONROAD ENGINE SOURCE only. This segment provides activity (throughput) schedule, seasonal activity (throughput) adjustment factor information, and meteorological information associated with the activity (throughput) specified in the REF segment (prior segment).

3. This note pertains to BIOGENIC SOURCE only. When CID04 is "W", this segment provides meteorological parameters associated with a biogenic activity.

4. Loop (segments CID, MEA, DTM, STA, DTM, REF) Example:

```
CID***EP*M~
MEA*NC*AD*25*FA~
DTM*196*950101***19~
DTM*197*951231***19~
CID***EP*A~
STA*ZZ*15*P1~
DTM*196*950101~
DTM*197*950331~
STA*ZZ*60*P1~
DTM*196*950401~
DTM*197*950630~
STA*ZZ*15*P1~
DTM*196*950701~
DTM*197*950930~
STA*ZZ*10*P1~
DTM*196*951001~
DTM*197*951231~
REF*72*06~
```

HAND	Handled
IAD	In Adhesive Applied
ICT	In Coating
IINF	In Influent
IINK	In Ink
INOC	Inoculated
INPT	Input
IOPP	In Operation
LEAK	Leaked
LIQF	Liquified
LOAD	Loaded
MELT	Melted
MILL	Milled
MINE	Mined
MIX	Mixed
OPRG	Operating
PICK	Pickled
PLAT	Plated
PRDT	Product
PROC	Processed
PROD	Produced
PRODCAP	Production Capacity
PUMP	Pumped
RECD	Received
REDU	Reduced
REMD	Removed
ROAS	Roasted
SAW	Sawed
SHIP	Shipped
SHPRCD	Shipped or Received
SMOK	Smoked
SPUN	Spun
STOR	Storage
STRP	Stripped
TFRD	Transferred
THRU	Throughput
TPRT	Transported
TRAV	Traveled
TRTD	Treated
UNLD	Unloaded
USED	Used

REF04 C04002 lack an appropriate code, this element contains an activity (throughput) description. This description must include the identification of both a product and a process.

	REF04	C040	**Reference Identifier**	O		

To identify one or more reference numbers or identification numbers as specified by the Reference Qualifier

1. When REF01 is "PG", this composite provides an activity process.

2. This composite must be applied in conjunction with REF01 code "PG" and an appropriate REF02 alpha-numeric code in order to identify an activity (throughput).

3. As the process is being identified in a composite, the component elements must be separated by a ":" rather than an "*" as they would be outside the composite. The composite must be expressed in a manner similar to the following example: *SU:APPLIED*

>>	C04001	128	**Reference Identification Qualifier**	M	ID	2/3

Code qualifying the Reference Identification

1. This element indicates an activity process.

SU	Special Processing Code Unique code identifying the special handling requirements for the claim Indicates an activity process

>>	C04002	127	**Reference Identification**	M	AN	1/30

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains a code associated with C04001. Select one from the following list:

ADD	Added
APPL	Applied
AREA	Area
BAKE	Baked
BLOW	Blown
BURN	Burned
CAP	Capacity
CAST	Cast
CHAR	Charbroiled
CHRG	Charge(d)
CLND	Cleaned
COAT	Coated
CONS	Consumed
CRSH	Crushed
DGRS	Degreased
DRIL	Drilled
DRY	Dried
EMIT	Emitted
FEDD	Fed into Dryer
FEED	Feed
GIN	Ginned
GRAN	Granulated

STRCH	Starch
STYR	Styrene
SULF	Sulfer 100%
SULFAC	Sulfuric Acid
SUMP	Sump
SURF	Surface
TCBZN	1,2,4-Trichlorobenzene
TCELN	Trichloroethylene
TCELNFR	Trichloroethylene Fresh
TCEN	1,1,1-Trichlorothane
TDI	TDI
TETHLD	Tetraethyl Lead
TIRE	Tires
TNT	TNT
TOLN	Toluene
TONE	Toner
TOPSL	Topsoil
TPLCAC	Terephthalic Acid Crude
TRCKHL	Trucks Haul
UREA	Urea
VAC	Vacuum
VEHCL	Vehicles Light/Medium
VNLC	Vinyl Chloride
VNLCM	Vinyl Chloride Monomer
VNLDC	Vinyldiene Chloride
WATCO	Water Cooling
WAX	Wax
WFR	Wafers/Chips
WFRBRD	Waferboard
WOOD	Wood
WOODDF	Wood Dry Flakes
WOODDR	Wood Dried
WSTE	Waste
WSTWTR	Wastewater
XLN	Xylene(s)
XLNM	m-Xylene
XLNO	o-Xylene
XLNT	Xylene(s) Total
ZINC	Zinc
ZINCOX	Zinc Oxide

REF03 352 Description X AN 1/80

A free-form description to clarify the related data elements and their content

1. When REF01 is "TX", this element contains a detailed description of the source, reference, or other applicable information associated with the numeric code specified in REF02.

2. When REF01 is "PG" and REF04 C04001 is "SU" and REF02 and/or

POLY	Polymer
POM	POM
PROD	Product
PRODDR	Product Dry
PRODFN	Product Finished
PRODSA	Product Surface Area
PRPLYN	Propylene
PULP	Pulp
PULPADB	Pulp Air-Dried Bleached
PULPADU	Pulp Air-Dried Unbleached
RAYN	Rayon
REF	Refinery
RESD	Residues/Skimmings
RESN	Resin
RESNPA	Resin Polyester/Alkyd
RESNTN	Resin Thinned
ROCK	Rock
SALT	Salt
SAND	Sand
SAWDST	Sawdust
SBR	SBR
SCMNGS	Silicomanganese
SCRP	Scrap
SCRPRS	Scrapers
SEAL	Seals
SHOT	Shot
SINT	Sinter
SLAG	Slag
SLBLKL	Solids Black Liquor
SLDG	Sludge
SLDGDR	Sludge Dried
SOLNCT	Solution Coating
SOLNFRM	Solution 37% Formaldehyde
SOLV	Solvent
SOLVCT	Solvent Coating
SOLVFR	Solvent Fresh
SOLVIN	Solvent in Ink
SOLVMU	Solvent Make-Up
SOLVRC	Solvent Reclaimed
SOLVTN	Solvent Thinned
SOUR	Sour Gas
STEL	Steel
STELSP	Steel Specialty
STM	Steam
STON	Stone
STOR	Storage

MEAT	Meat
MERC	Mercury
METL	Metal
METLHT	Metal Hot
METLSPR	Metal Sprayed
MLCAHD	Meleic Anhydride
MTHCFRM	Methyl Chloroform
MTHCHL	Methylene Chloride
MTHCLFR	Methylene Chloride Fresh
NAPT	Naphthalene
NEOP	Neoprene
NICK	Nickel
NITELST	Nitrile Elastomer
NTRBZN	Nitrobenzene
OCRSL	0-Cresol
OIL	Oil
ORE	Ore
ORECON	Ore Concentrated
OVRBUR	Overburden
P205	P205
PAINT	Paint
PAPR	Paper
PCB	PCB
PCE	PCE
PCECC	PCE & CC14
PCETCE	PCE & TCE
PCETH	Perchloroethlyene
PCETHFR	Perchloroethylene Fresh
PCPHNL	Pentachlorophenol
PELLT	Pellets
PEST	Pesticide
PHNL	Phenol
PHSGN	Phosgene
PHSPH	Phosphate
PHSPHRK	Phosphate Rock
PHSPRS	Phosphorous
PIGIRN	Pig Iron
PIGMNT	Pigment
PILE	Pile
PIPE	Pipe
PIPECST	Pipe Cast
PLCANHD	Phthalic Anhydride
PLSTC	Plastic
PLYWD38	Plywood 3/8 inch
PM	PM
POLVNL	Polyvinyl

FDNHCO	Feed NaHCO3 Dry
FEED	Feed
FEEDDR	Feed Dry
FEEDFR	Feed Fresh
FEEDMT	Feed Material
FELTST	Felt Saturated
FERT	Fertilizer
FIBR	Fiber
FISH	Fish
FISHML	Fish Meal
FISHRW	Fish Raw
FISHSC	Fish Scrap
FLC1112	Fluorocarbon 11/12
FLC22	Fluorocarbon 22
FLSP	Fluorspar
FORM	Formaldehyde
FORM37	37% Formaldehyde
FRMGS	Ferromanganese
FRSH	Fresh
FUEL	Fuel
GAS	Gas
GLSS	Glass
GLSSBD	Glass Beaded
GLYET	Glycol Ethers
GRAD	Graders
GRIT	Grit
GRN	Grain
GYPCR	Gypsum Crude
HAMB	Hamburger
HCL	Hydrochloric Acid
HEATIN	Heat Input
HXCBNZ	Hexachlorobenzene
HYC	Hydrocarbons Total
INK	Ink
IRON	Iron
LAB	LAB
LEAD	Lead
LEADOX	Lead Oxide
LIME	Lime
LIMHYD	Lime Hydrated
LIMSTN	Limestone
LOG	Logs
MATL	Material
MATLRW	Material Raw
MCBNZ	Monochlorobenzene
MEAL	Meal

CLNK	Clinker
CLOT	Clothes
COAL	Coal
COALSTG	Coal Storage
COAT	Coating
COKE	Coke
COKEFR	Coke Free
COKERW	Coke Raw
CON	Concrete
COPLY	Copolymer
CORE	Cores
COREOL	Core Oil
COTT	Cotton
COW	Cattle
CTET	Carbon Tetrachloride
CU	Copper
CULL	Cullet
CUM	Cumene
CURR	Current
CUSC	Copper Scrap
DBZF	Dibenzofuran
DCB	1,4-Dichlorobenzene
DCE	1,2-Dichloroethane
DIST	Distance
DMF	DMF
DMTP	Dimethyl Terephthalate
DRAN	Drains
DRUM	Drums
EAFDT	EAF Dust
EDC	EDC
EDCVC	EDC-VC
ELEC	Electricity
ELECRD	Electrode
ENER	Energy
EPCH	Epichlorohydrin
ETCSOL	Etching Solution
ETH	Ethylene
ETHBNZ	Ethylbenzene
ETHBST	Ethylbenzene/Styrene
ETHCL	Ethyl Chloride
ETHDB	Ethylene Dibromide
ETHDC	Ethylene Dichloride
ETHOX	Ethylene Oxide
EXP	Exposed
EXTFC	Extractor Feed Cake
FABR	Fabric

ACRNL	Acrylonitrile
ACROL	Acrolein
ADH	Adhesive
ADN	ADN
ADPN	Adipronitrile
AGNT	Agent
ALLY	Alloy
ALMA	Alumina
ALMO	Aluminum Molten
AMM	Ammonia
ANILN	Aniline
ASB	Asbestos
ASP	Asphalt
ASPSL	Asphalt Shingle
BATT	Batteries
BAUX	Bauxite
BEAN	Beans
BEANGR	Beans Green
BEETRW	Beets Raw
BNZN	Benzene
BOD	Bodies
BORD	Board
BRED	Bread
BRIK	Brick
BUTDN	Butadiene
BUTDN13	1,3-Butadiene
CAD	Cadmium
CAN	Cans
CAPLM	Caprolactam
CAR	Car(s)
CARTOT	Cargo Total
CAST	Castings
CATL	Catalyst
CBLK	Carbon Black
CC14	CC14
CEM	Cement
CFC133	CFC-133
CHAR	Charcoal
CHRMORE	Chromite Ore
CHXN	Cyclohexene
CIG	Cigarettes
CL	Chlorine
CLAY	Clay
CLBNZ	Chlorobenzene(s)
CLFRM	Chloroform
CLMET	Chloromethane(s)

		IX	Item Number Indicates a throughput method code 1. This code applies with POINT SOURCE reporting only.		
		PG	Product Group Indicates an activity product 1. When this code is applied, REF04 must also be applied.		
REF02	**127**	**Reference Identification**		**X**	**AN 1/30**
		Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier 1. When REF01 is "D0", this element contains the appropriate value. 2. When REF01 is "IX", this element contains the appropriate method code value. Select one from the following numeric (01-17) list: 3. When REF01 is "PG" is applied, REF04 must be used in conjunction in order to identify an activity (throughput). 4. When REF01 is "PG", this element contains the appropriate product code value. Select one from the following alpha-numeric list:		
		01	Calculated based on physical principles		
		02	Estimated based on expert judgment		
		03	Calculated based on manufacturer-specified throughput capacity		
		04	Calculated based on direct continuous measurement of an activity surrogate		
		05	Calculated based on direct intermittent measurement of an activity		
		06	New construction, not yet operational. Emissions are zero.		
		07	Operations ceased. Emissions are zero.		
		08	Calculated based on modeling activity		
		09	Derived from Highway Performance Monitoring System (HPMS) data		
		10	Derived from census data		
		11	Derived from trade association/industry group data		
		12	State agency generated data		
		13	Local agency generated data		
		14	Federal agency generated data		
		15	Proprietary database		
		16	Based on survey results		
		17	Calculated based on statistical method		
		ABR	Abrasive		
		ABSP	ABS Polymer		
		ACEAL	Acetaldehyde		
		ACID	Acid		
		ACIDFN	Acid Final		
		ACIDPR	Acid Pure		

Segment: **REF** Reference Identification
Position: 553
Loop: LX
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:

1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides the DARS quality rating score associated with the activity (throughput), throughput method code, and activity (throughput) identification (product and process identification).

3. REF01 code "PG" (i.e., product) and REF04 (process) must be applied in conjunction in order to identify an activity (throughput).

4. To report an activity (throughput), create the appropriate product/process by selecting REF01 code "PG" and then selecting the appropriate product from the REF02 code list. Then select REF04 C04001 code "SU" and select the process term from the REF04 C04002 code list. An example of a product/process combination that can be identified is coal burned, where coal is the product (REF02 C04002 code "COAL") and burned is the process (REF04 C04002 code "BURN"). If an appropriate product/process combination can not be created, enter the activity (throughput) in REF03 in the form of a text comment.

5. Segment Example:

REF*PG*COAL**SU:BURN~
REF*D0*5~
REF*DX*02~
< an activity (throughput) of coal burned with the associated data having a DARS quality score of 5 and being estimated based on expert judgement >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification	M ID 2/3

1. The code "DX" apply with POINT SOURCE reporting only.

2. When code "PG" is applied, REF04 must also be applied in order to identify an activity (throughput).

3. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list:

D0	Data Reliability Code Indicates a DARS quality rating score associated with the activity (throughput)

Segment: **DTM** **Date/Time Reference**
Position: 551
Loop: LX
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify pertinent dates and times
Syntax Notes: 1 If either DTM06 or DTM07 is present, then the other is required.
2 At least one of DTM02 DTM03 or DTM06 is required.
Semantic Notes:
Comments:
Notes:

1. This segment does not apply with BIOGENIC SOURCE reporting.
2. This segment provides the beginning and end dates and times associated with the activity (throughput) specified in the REF segment (following segment) code "PG".
3. Segment Example:
DTM*196*950101***19~
DTM*197*951231***19~
<an activity (throughput) time period starting January 1, 1995 and ending December 31, 1995>

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	DTM01	374	**Date/Time Qualifier**	**M**	**ID**	**3/3**
			Code specifying type of date or time, or both date and time			
			1. This element indicates the beginning and end dates and times associated with the activity (throughput) specified in the REF segment (following segment). Select one from the following list:			
			196 Start			
			197 End			
	DTM02	373	**Date**	**X**	**DT**	**6/6**
			Date (YYMMDD)			
			1. This element contains the date value associated with the code specified in DTM01.			
	DTM03	337	**Time**	**X**	**TM**	**4/8**
			Time expressed in 24-hour clock time as follows: HHMM, or HHMMSS, or HHMMSSD, or HHMMSSDD, where H = hours (00-23), M = minutes (00-59), S = integer seconds (00-59) and DD = decimal seconds; decimal seconds are expressed as follows: D = tenths (0-9) and DD = hundredths (00-99)			
			1. This element contains the time value associated with the code specified in DTM01.			
	DTM05	624	**Century**	**O**	**N0**	**2/2**
			The first two characters in the designation of the year (CCYY)			
			1. This element contains the hundred year designation associated with the DTM02.			

which a measurement has been taken

1. This element contains the second unit in the complex unit of measure expression associated with MEA03. Select one from the following list:

HR	Hours
MR	Meter
YR	Years

C00105	1018	**Exponent**	O	R	1/15

Power to which a unit is raised

1. This element contains the exponent allowing the formulation of the complex expression that may be required as the unit of measure associated with MEA03.

2. When applying a complex expression (e.g., square kilometers per hour per second), apply the exponent of "-1" as per the example noted in MEA04.

C00107	355	**Unit or Basis for Measurement Code**	O	ID	2/2

Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken

1. This element contains the third unit in the complex unit of measure expression associated with MEA03. Select one from the following list:

03	Seconds

C00108	1018	**Exponent**	O	R	1/15

Power to which a unit is raised

1. This element contains the exponent allowing the formulation of the complex expression that may be required as the unit of measure associated with MEA03.

2. When applying a complex expression (e.g., square kilometers per hour per second), apply the exponent of "-1" as per the example noted in MEA04.

MEA06	741	**Range Maximum**	X	R	1/20

The value specifying the maximum of the measurement range

1. This element is used to indicate maximum throughput

FT	Foot
GA	Gallon
GE	Pounds per Gallon
HJ	Horsepower
HM	Miles Per Hour
HQ	Hectare
HR	Hours
IE	Person
IN	Inch
K7	Kilowatt Measure of electrical power
KG	Kilogram
KK	100 Kilograms
LB	Pound
LT	Liter
MJ	Minutes
MM	Millimeter
MR	Meter
NX	Parts Per Thousand
P1	Percent
SB	Square Mile
SF	Square Foot
T6	Thousand Gallons
TH	Thousand
TM	Thousand Feet (Board)
TN	Net Ton (2,000 LB).
TQ	Thousand Feet
TS	Thousand Square Feet
TZ	Thousand Cubic Feet
X5	Head

C00102 1018 Exponent O R 1/15

Power to which a unit is raised

1. This element contains the exponent allowing the formulation of the complex expression that may be required as the unit of measure associated with MEA03.

2. When applying a complex expression (e.g., square kilometers per hour per second), apply the exponent of "-1" as per the example noted in MEA04.

C00103 649 Multiplier O R 1/10

Value to be used as a multiplier to obtain a new value

1. This element contains the multiplier allowing the formulation of the complex expression that may be required as the unit of measure associated with MEA03.

2. When applying a complex expression (e.g., square kilometers per hour per second), apply the multiplier of "n" as per the example noted in MEA04.

C00104 355 Unit or Basis for Measurement Code O ID 2/2

Code specifying the units in which a value is being expressed, or manner in

manner similar to the following example: square kilometers per hour per second = *DK:2::HR:-1::03:-1*

>> C00101 355 **Unit or Basis for Measurement Code** **M ID 2/2**

Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken

1. This element contains the first unit in the complex unit of measure expression associated with MEA03. Select one from the following list:

1A	Car Mile One freight car moving one mile
2I	British Thermal Units (BTUs) Per Hour British thermal units per hour
2L	Cubic Feet Per Minute Rate of flow
2U	Megagram Unit of mass
4I	Meters Per Second Measure of linear speed
4U	Pounds Per Hour Rate of flow
4W	Ton Per Hour Rate of flow
68	Ampere
86	Joules
AC	Acre
BA	Bale
BQ	Brake horse power Quantity of product ordered for shipment but not available so a replenishment stock has been ordered
BR	Barrel
BU	Bushel
BZ	Million BTU's
CE	Centigrade, Celsius
CF	Cubic Feet
CH	Container
CM	Centimeter
CY	Cubic Yard
DA	Days
DH	Miles
DK	Kilometers
DR	Drum
EA	Each
F5	MOL
FA	Fahrenheit
FC	1000 Cubic Feet
FM	Million Cubic Feet
FS	Feet Per Second Measure of linear speed

Segment: **MEA** **Measurements**
Position: 545
Loop: LX
Level: Detail
Usage: Mandatory
Max Use: >1
Purpose: To specify physical measurements or counts, including dimensions, tolerances, variances, and weights (See Figures Appendix for example of use of C001)
Syntax Notes:
1 If MEA05 is present, then MEA04 is required.
2 If MEA06 is present, then MEA04 is required.
3 Only one of MEA08 or MEA03 may be present.
4 If MEA07 is present, then at least one of MEA03 MEA05 or MEA06 is required.
5 At least one of MEA03 MEA05 MEA06 or MEA08 is required.
Semantic Notes:
1 MEA04 defines the unit of measure for MEA03, MEA05, and MEA06.
Comments:
1 When citing dimensional tolerances, any measurement requiring a sign (+ or -), or any measurement where a positive (+) value cannot be assumed, use MEA05 as the negative (-) value and MEA06 as the positive (+) value.
Notes:
1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides individual activity (throughput) data associated with the activity (throughput) specified in the REF segment (following segment) code "PG".

3. This segment may only be applied one (1) time for each activity-level loop.

4. The symbol "??" indicates a code value that is to be assigned in a future version/release of the X12 standard.

5. Segment Example:

MEA*TR**1000*TN::YR~
< an activity (throughput) of 1000 tons per year >

Data Element Summary

Ref. Des.	Data Element	Name	Attributes
MEA01	737	**Measurement Reference ID Code** Code identifying the broad category to which a measurement applies 1. This element indicates individual activity (throughput) data associated with the activity (throughput) specified in the REF segment (following segment). TR Test Results Indicates that the data to follow are the results test measurements Indicates activity (throughput) data	O ID 2/2
MEA03	739	**Measurement Value** The value of the measurement 1. This element contains the value associated with MEA01.	X R 1/20
MEA04	C001	**Composite Unit of Measure** To identify a composite unit of measure (See Figures Appendix for examples of use) 1. This composite provides the unit of measure associated with MEA03. 2. Units of measure that are complex expressions must be expressed in a	X

Segment: **LX** Assigned Number
Position: 539
Loop: LX
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To reference a line number in a transaction set
Syntax Notes:
Semantic Notes:
Comments:
Notes:

1. This loop/segment does not apply with BIOGENIC SOURCE reporting.

2. This loop provides the following information:

- activity (throughput) information
- DARS quality rating score associated with activity (throughput)
- throughput method code
- activity (throughput) identification

3. This segment is an X12 syntactical requirement only.

4. Loop (segments LX, MEA, DTM, REF) Example:

LX*20~
MEA*TR**1000*TN~YR~1~
DTM*196*950101***19~
DTM*197*951231***19~
REF*PG*COAL**SU:BURN~
REF*D0*5~
REF*EX*02~
< an activity (throughput) of 1000 tons of coal burned per year for the year starting January 1, 1995 and ending December 31, 1995; the reported activity (throughput) data has a DARS data quality score of 5 and was estimated based on >

5. Segment Example:

LX*20~
< twentieth iteration of this LX loop within this transaction set >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	LX01	554	**Assigned Number** Number assigned for differentiation within a transaction set	M	N0	1/6

Segment: **SPI** **Specification Identifier**
Position: 481
Loop: SPI
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To provide a description of the included specification or technical data items
Syntax Notes: **1** If either SPI02 or SPI03 is present, then the other is required.
Semantic Notes:
Comments:
Notes:

1. This loop/segment does not apply with BIOGENIC SOURCE reporting.

2. This loop/segment provides the confidentiality indicator.

3. Loop/Segment Example:

SPI*00~
<information that is non-classified>~

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	**SPI01**	**786**	**Security Level Code** Code indicating the level of confidentiality assigned by the sender to the information following **1. This element contains the confidentiality indicator associated with the data in this loop/level. Select one from the following list.**	**M ID 2/2**

00	Company Non-Classified
02	Company Confidential
90	Government Non-Classified
92	Government Confidential

1. This note pertains to POINT, AREA, and NONROAD SOURCE only. This element indicates that this level of the transaction set points to the HL loop parent containing the HL03 code "6" for process-level data.

2. This note pertains to MOBILE and BIOGENIC SOURCE only. This element indicates that this level of the transaction set points to the HL loop parent containing the HL03 code "5" for physical-level data.

>> **HL03** **735** **Hierarchical Level Code** **M ID 1/2**

Code defining the characteristic of a level in a hierarchical structure

1. This element indicates that this level of the transaction set contains activity-level data.

C	Date
	Indicates activity-level data

HL04 **736** **Hierarchical Child Code** **O ID 1/1**

Code indicating whether if there are hierarchical child data segments subordinate to the level being described

1. This HL loop/level may not have any subordinate levels depending upon the application of the transaction set.

0	No Subordinate HL Segment in This Hierarchical Structure
1	Additional Subordinate HL Data Segment in This Hierarchical Structure

MEA*TR**1000*TN:::YR:-1~
DTM*196*950101***19~
DTM*197*951231***19~
REF*PG*COAL**SU:BURN~
REF*D0*5~
REF*IX*02~
CID***EP*M~
MEA*EN*AD*25*FA~
DTM*196*950101***19~
DTM*197*951231***19~
CID***EP*A~
STA*ZZ*15*P1~
DTM*196*950101~
DTM*197*950331~
STA*ZZ*60*P1~
DTM*196*950401~
DTM*197*950630~
STA*ZZ*15*P1~
DTM*196*950701~
DTM*197*950930~
STA*ZZ*10*P1~
DTM*196*951001~
DTM*197*951231~
REF*72*06~
< information that is non-classified, associated with an activity (throughput) of 1000 tons of coal burned per year for the year starting January 1, 1995 and ending December 31, 1995; the reported activity (throughput) data has a DARS data quality score of 5 and was estimated based on expert judgment; a diurnal temperature change of 25 degrees Fahrenheit was recorded during that same time period; a seasonal activity (throughput) adjustment factor of 15 percent was reported for the time period starting January 1, 95 and ending March 31, 95; a seasonal activity (throughput) adjustment factor of 60 percent was reported for the time period starting April 1, 95 and ending June 30, 95; a seasonal activity (throughput) adjustment factor of 15 percent was reported for the time period starting July 1, 95 and ending September 30,95; a seasonal activity (throughput) adjustment factor of 10 percent was reported for the time period starting October 1, 95 and ending December 31, 95; the adjustment factor time periods are associated with a modeling episode >

5. Segment Example:

HL*30*20*C*1~
< thirtieth HL loop is subordinate to the twentieth HL loop of this transaction set. thirtieth HL loop contains activity-level information and has subordinate loops >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	HL01	628	**Hierarchical ID Number** A unique number assigned by the sender to identify a particular data segment in a hierarchical structure 1. This element contains a unique number used to identify the iteration of an HL loop	M AN 1/12
	HL02	734	**Hierarchical Parent ID Number** Identification number of the next higher hierarchical data segment that the data segment being described is subordinate to	O AN 1/12

Segment: **HL** Hierarchical Level
Position: 477
Loop: HL
Level: Detail
Usage: Mandatory
Max Use: 1
Purpose: To identify dependencies among and the content of hierarchically related groups of data segments
Syntax Notes:
Semantic Notes:
Comments:

1 The HL segment is used to identify levels of detail information using a hierarchical structure, such as relating line-item data to shipment data, and packaging data to line-item data.
2 HL01 shall contain a unique alphanumeric number for each occurrence of the HL segment in the transaction set. For example, HL01 could be used to indicate the number of occurrences of the HL segment, in which case the value of HL01 would be "1" for the initial HL segment and would be incremented by one in each subsequent HL segment within the transaction.
3 HL02 identifies the hierarchical ID number of the HL segment to which the current HL segment is subordinate.
4 HL03 indicates the context of the series of segments following the current HL segment up to the next occurrence of an HL segment in the transaction. For example, HL03 is used to indicate that subsequent segments in the HL loop form a logical grouping of data referring to shipment, order, or item-level information.
5 HL04 indicates whether or not there are subordinate (or child) HL segments related to the current HL segment.

Notes:

1. This level/loop (HLC) provides activity-level data, including:

- confidentiality indicator
- activity (throughput) information
- DARS quality rating score associated with activity (throughput)
- throughput method code
- activity (throughput) identification
- activity (throughput) schedule information
- seasonal activity (throughput) adjustment factor information
- meteorological data
- typical day information
- activity (throughput) schedule line item information

2. This loop must be applied one (1) time for each activity as specified in the LX loop (following segment).

3. The DTM segment (position 551) within the LX loop of this level (indicating activity (throughput) is the dominant date/time interval for all data located in subordinate segments and HL loops/levels. All data reported in elements subsequent to this position, must be associated with an appropriate DTM segment containing date/time data identical that reported in the DTM in the LX loop.

4. Loop (segments HL, SPI, LX, MEA, DTM, REF, CID, MEA, DTM, STA, DTM, REF) Example:

HL*30*20*C*1~
SPI*00~
LX*20~

PROD	Produced
PRODCAP	Production Capacity
PUMP	Pumped
RECD	Received
REDU	Reduced
REMD	Removed
ROAS	Roasted
SAW	Sawed
SHIP	Shipped
SHPRCD	Shipped or Received
SMOK	Smoked
SPUN	Spun
STOR	Storage
STRP	Stripped
TFRD	Transferred
THRU	Throughput
TPRT	Transported
TRAV	Traveled
TRTD	Treated
UNLD	Unloaded
USED	Used

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element contains a code associated with C04001. Select one from the following list:

ADD	Added
APPL	Applied
AREA	Area
BAKE	Baked
BLOW	Blown
BURN	Burned
CAP	Capacity
CAST	Cast
CHAR	Charbroiled
CHRG	Charge(d)
CLND	Cleaned
COAT	Coated
CONS	Consumed
CRSH	Crushed
DGRS	Degreased
DRIL	Drilled
DRY	Dried
EMIT	Emitted
FEDD	Fed into Dryer
FEED	Feed
GIN	Ginned
GRAN	Granulated
HAND	Handled
IAD	In Adhesive Applied
ICT	In Coating
IINF	In Influent
IINK	In Ink
INOC	Inoculated
INPT	Input
IOPP	In Operation
LEAK	Leaked
LIQF	Liquified
LOAD	Loaded
MELT	Melted
MILL	Milled
MINE	Mined
MIX	Mixed
OPRG	Operating
PICK	Pickled
PLAT	Plated
PRDT	Product
PROC	Processed

			VAC	Vacuum			
			VEHCL	Vehicles Light/Medium			
			VNLC	Vinyl Chloride			
			VNLCM	Vinyl Chloride Monomer			
			VNLDC	Vinyldiene Chloride			
			WATCO	Water Cooling			
			WAX	Wax			
			WFR	Wafers/Chips			
			WFRBRD	Waferboard			
			WOOD	Wood			
			WOODDF	Wood Dry Flakes			
			WOODDR	Wood Dried			
			WSTE	Waste			
			WSTWTR	Wastewater			
			XLN	Xylene(s)			
			XLNM	m-Xylene			
			XLNO	o-Xylene			
			XLNT	Xylene(s) Total			
			ZINC	Zinc			
			ZINCOX	Zinc Oxide			
	REF03	**352**	**Description**		**X**	**AN**	**1/80**
			A free-form description to clarify the related data elements and their content				
			1. When REF01 is "72", this element contains a description associated with the numeric code specified in REF02.				
			2. When REF01 is "PG" and REF04 C04001 is "SU" and REF02 and/or REF04 C04002 lack an appropriate code, this element contains an activity (throughput) description. This description must include the identification of both a product and a process.				
	REF04	**C040**	**Reference Identifier**		**O**		
			To identify one or more reference numbers or identification numbers as specified by the Reference Qualifier				
			1. When REF01 is "PG", this composite provides an process activity.				
			2. This composite must be applied in conjunction with REF01 code "PG" and an appropriate REF02 alpha-numeric code in order to identify an activity (throughput).				
			3. As the process is being identified in a composite, the component elements must be separated by a ":" rather than an "*" as they would be outside the composite. The composite must be expressed in a manner similar to the following example: *SU:APPLIED*				
>>	**C04001**	**128**	**Reference Identification Qualifier**		**M**	**ID**	**2/3**
			Code qualifying the Reference Identification				
			1. This element indicates a process activity.				
			SU	Special Processing Code Unique code identifying the special handling requirements for the claim **Indicates a process activity**			
>>	**C04002**	**127**	**Reference Identification**		**M**	**AN**	**1/30**

SBR	SBR
SCMNGS	Silicomanganese
SCRP	Scrap
SCRPRS	Scrapers
SEAL	Seals
SHOT	Shot
SINT	Sinter
SLAG	Slag
SLBLKL	Solids Black Liquor
SLDG	Sludge
SLDGDR	Sludge Dried
SOLNCT	Solution Coating
SOLNFRM	Solution 37% Formaldehyde
SOLV	Solvent
SOLVCT	Solvent Coating
SOLVFR	Solvent Fresh
SOLVIN	Solvent in Ink
SOLVMU	Solvent Make-Up
SOLVRC	Solvent Reclaimed
SOLVTN	Solvent Thinned
SOUR	Sour Gas
STEL	Steel
STELSP	Steel Specialty
STM	Steam
STON	Stone
STOR	Storage
STRCH	Starch
STYR	Styrene
SULF	Sulfer 100%
SULFAC	Sulfuric Acid
SUMP	Sump
SURF	Surface
TCBZN	1,2,4-Trichlorobenzene
TCELN	Trichloroethylene
TCELNFR	Trichloroethylene Fresh
TCEN	1,1,1-Trichlorothane
TDI	TDI
TETHLD	Tetraethyl Lead
TIRE	Tires
TNT	TNT
TOLN	Toluene
TONE	Toner
TOPSL	Topsoil
TPLCAC	Terephthalic Acid Crude
TRCKHL	Trucks Haul
UREA	Urea

PAINT	Paint
PAPR	Paper
PCB	PCB
PCE	PCE
PCECC	PCE & CC14
PCETCE	PCE & TCE
PCETH	Perchloroethlyene
PCETHFR	Perchloroethylene Fresh
PCPHNL	Pentachlorophenol
PELLT	Pellets
PEST	Pesticide
PHNL	Phenol
PHSGN	Phosgene
PHSPH	Phosphate
PHSPHRK	Phosphate Rock
PHSPRS	Phosphorous
PIGIRN	Pig Iron
PIGMNT	Pigment
PILE	Pile
PIPE	Pipe
PIPECST	Pipe Cast
PLCANHD	Phthalic Anhydride
PLSTC	Plastic
PLYWD38	Plywood 3/8 inch
PM	PM
POLVNL	Polyvinyl
POLY	Polymer
POM	POM
PROD	Product
PRODDR	Product Dry
PRODFN	Product Finished
PRODSA	Product Surface Area
PRPLYN	Propylene
PULP	Pulp
PULPADB	Pulp Air-Dried Bleached
PULPADU	Pulp Air-Dried Unbleached
RAYN	Rayon
REF	Refinery
RESD	Residues/Skimmings
RESN	Resin
RESNPA	Resin Polyester/Alkyd
RESNTN	Resin Thinned
ROCK	Rock
SALT	Salt
SAND	Sand
SAWDST	Sawdust

GAS	Gas
GLSS	Glass
GLSSBD	Glass Beaded
GLYET	Glycol Ethers
GRAD	Graders
GRIT	Grit
GRN	Grain
GYPCR	Gypsum Crude
HAMB	Hamburger
HCL	Hydrochloric Acid
HEATIN	Heat Input
HXCBNZ	Hexachlorobenzene
HYC	Hydrocarbons Total
INK	Ink
IRON	Iron
LAB	LAB
LEAD	Lead
LEADOX	Lead Oxide
LIME	Lime
LIMHYD	Lime Hydrated
LIMSTN	Limestone
LOG	Logs
MATL	Material
MATLRW	Material Raw
MCBNZ	Monochlorobenzene
MEAL	Meal
MEAT	Meat
MERC	Mercury
METL	Metal
METLHT	Metal Hot
METLSPR	Metal Sprayed
MLCAHD	Meleic Anhydride
MTHCFRM	Methyl Chloroform
MTHCHL	Methylene Chloride
MTHCLFR	Methylene Chloride Fresh
NAPT	Naphthalene
NEOP	Neoprene
NICK	Nickel
NITELST	Nitrile Elastomer
NTRBZN	Nitrobenzene
OCRSL	0-Cresol
OIL	Oil
ORE	Ore
ORECON	Ore Concentrated
OVRBUR	Overburden
P205	P205

DBZF	Dibenzofuran
DCB	1,4-Dichlorobenzene
DCE	1,2-Dichloroethane
DIST	Distance
DMF	DMF
DMTP	Dimethyl Terephthalate
DRAN	Drains
DRUM	Drums
EAFDT	EAF Dust
EDC	EDC
EDCVC	EDC-VC
ELEC	Electricity
ELECRD	Electrode
ENER	Energy
EPCH	Epichlorohydrin
ETCSOL	Etching Solution
ETH	Ethylene
ETHBNZ	Ethylbenzene
ETHBST	Ethylbenzene/Styrene
ETHCL	Ethyl Chloride
ETHDB	Ethylene Dibromide
ETHDC	Ethylene Dichloride
ETHOX	Ethylene Oxide
EXP	Exposed
EXTFC	Extractor Feed Cake
FABR	Fabric
FDNHCO	Feed NaHCO3 Dry
FEED	Feed
FEEDDR	Feed Dry
FEEDFR	Feed Fresh
FEEDMT	Feed Material
FELTST	Felt Saturated
FERT	Fertilizer
FIBR	Fiber
FISH	Fish
FISHML	Fish Meal
FISHRW	Fish Raw
FISHSC	Fish Scrap
FLC1112	Fluorocarbon 11/12
FLC22	Fluorocarbon 22
FLSP	Fluorspar
FORM	Formaldehyde
FORM37	37% Formaldehyde
FRMGS	Ferromanganese
FRSH	Fresh
FUEL	Fuel

BOD	Bodies
BORD	Board
BRED	Bread
BRIK	Brick
BUTDN	Butadiene
BUTDN13	1,3-Butadiene
CAD	Cadmium
CAN	Cans
CAPLM	Caprolactam
CAR	Car(s)
CARTOT	Cargo Total
CAST	Castings
CATL	Catalyst
CBLK	Carbon Black
CC14	CC14
CEM	Cement
CFC133	CFC-133
CHAR	Charcoal
CHRMORE	Chromite Ore
CHXN	Cyclohexene
CIG	Cigarettes
CL	Chlorine
CLAY	Clay
CLBNZ	Chlorobenzene(s)
CLFRM	Chloroform
CLMET	Chloromethane(s)
CLNK	Clinker
CLOT	Clothes
COAL	Coal
COALSTG	Coal Storage
COAT	Coating
COKE	Coke
COKEFR	Coke Free
COKERW	Coke Raw
CON	Concrete
COPLY	Copolymer
CORE	Cores
COREOL	Core Oil
COTT	Cotton
COW	Cattle
CTET	Carbon Tetrachloride
CU	Copper
CULL	Cullet
CUM	Cumene
CURR	Current
CUSC	Copper Scrap

Indicates a process product

1. When this code is applied, REF04 must also be applied.

REF02	**127**	**Reference Identification**	**X**	**AN**	**1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. When REF01 is "72", this element contains the operating schedule line item being reported with this iteration of the loop. Select one from the following numeric (01 - 06) list:

2. When REF01 is "PG", REF04 must be used in conjunction in order to identify a throughput.

3. When REF01 is "PG", this element contains the appropriate product code value. Select one from the following alpha-numeric list:

01	Ozone Season
02	Peak Ozone Season
03	CO Season
04	Peak CO Season
05	Particulate Matter Season
06	Modeling Episode
ABR	Abrasive
ABSP	ABS Polymer
ACEAL	Acetaldehyde
ACID	Acid
ACIDFN	Acid Final
ACIDPR	Acid Pure
ACRNL	Acrylonitrile
ACROL	Acrolein
ADH	Adhesive
ADN	ADN
ADPN	Adipronitrile
AGNT	Agent
ALLY	Alloy
ALMA	Alumina
ALMO	Aluminum Molten
AMM	Ammonia
ANILN	Aniline
ASB	Asbestos
ASP	Asphalt
ASPSL	Asphalt Shingle
BATT	Batteries
BAUX	Bauxite
BEAN	Beans
BEANGR	Beans Green
BEETRW	Beets Raw
BNZN	Benzene

Segment: **REF** Reference Identification
Position: 439
Loop: STA
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.

Semantic Notes:
Comments:
Notes:

1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides an operating schedule line item associated with the schedule and the process characteristic information specified in the CID segment (prior segment).

3. REF01 code "PG" (i.e., product) and REF04 (i.e., process) must be applied in conjunction in order to identify an activity (throughput).

4. To report an activity (throughput), create the appropriate product/process terminology by selecting REF01 code "PG" and then selecting the appropriate product term from the REF02 code list. Then select REF04 C04001 code "SU" and select the appropriate process term from the REF04 C04002 code list. An example of an activity (throughput) that can be identified is coal burned, where coal is the product (REF02 code "COAL") and burned is the process (REF04 C04002 code "BURN"). If an appropriate product/process combination can not be created, enter the activity (throughput) in REF03 in the form of a text comment.

5. Segment Example:

REF*72*06~
< a schedule associated with a modeling episode >

REF*PG*COAL**SU:BURN~
< an process characteristic of coal burned >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. When code "PG" is applied, REF04 must also be applied to identify a process. 2. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list: 72 Schedule Reference Number Identifies a number for a program schedule (for example, a logic type of network) or working schedule to complete a specific task or set of tasks Indicates the operating schedule line item PG Product Group	M ID 2/3

Segment: **DTM** Date/Time Reference
Position: 437
Loop: STA
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify pertinent dates and times
Syntax Notes: 1 If either DTM06 or DTM07 is present, then the other is required.
2 At least one of DTM02 DTM03 or DTM06 is required.
Semantic Notes:
Comments:
Notes: 1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides the beginning and end dates for each applicable season/episode associated with the schedule or adjustment factor specified in the CID segment (prior segment).

3. Segment Example:

DTM*196*960501~
DTM*197*960930~
< a schedule time period beginning May 1, 96 and ending September 30, 96 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	DTM01	374	**Date/Time Qualifier** Code specifying type of date or time, or both date and time 1. This element indicates the beginning and end dates for the applicable season/episode associated with the schedule or adjustment factor specified in the CID segment (prior segment). Select one from the following list: 196 Start 197 End	M ID 3/3
	DTM02	373	**Date** Date (YYMMDD) 1. This element contains the values associated with the code specified in DTM01. 2. The format for reporting the applicable information is as follows (YY represents the year in which the month falls): December —— YY1201~ March —— YY0301~ June —— YY0601~ September —— YY0901~	X DT 6/6

		WK	Week		
		YR	Years		
C00105	1018	**Exponent**		O R	1/15
		Power to which a unit is raised			
		1. This element contains the exponent allowing the formulation of the complex expression that may be required as the unit of measure associated with STA02.			
		2. When applying a complex expression (e.g., million btu per gallon), apply the exponent of "-1" as per the example noted in STA03.			
C00106	649	**Multiplier**		O R	1/10
		Value to be used as a multiplier to obtain a new value			
		1. This element contains the multiplier allowing the formulation of the complex expression that may be required as the unit of measure associated with STA02.			
		2. When applying a complex expression (e.g., million btu per gallon), apply the multiplier of "n" as per the example noted in STA03.			

>>	STA02	739	**Measurement Value** The value of the measurement **1. This element contains the value associated with the code specified in the CID segment (prior segment).**	M	R	1/20
	STA03	C001	**Composite Unit of Measure** To identify a composite unit of measure (See Figures Appendix for examples of use) **1. This composite provides the units of measure associated with STA02.** **2. The unit of measure associated with the value in STA02 when STA01 is "34" and CID04 (prior segment) is "HC" must be reported in the REF segment (following segment).** **3. Units of measure that are complex expressions must be expressed in a manner similar to the following example: million btu per gallon = *BY::10:GA:-1***	O		
>>	C00101	355	**Unit or Basis for Measurement Code** Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken **1. When STA01 is "ZZ", or STA01 is "34" and CID04 (prior segment) is "SC" or "AC", "P1" must be applied.** **2. This element contains the first unit in the complex unit of measure expression associated with STA02. Select one from the following list:** BY British Thermal Unit (BTU) DA Days HR Hours P1 Percent WK Week	M	ID	2/2
	C00103	649	**Multiplier** Value to be used as a multiplier to obtain a new value **1. This element contains the multiplier allowing the formulation of the complex expression that may be required as the unit of measure associated with STA02.** **2. When applying a complex expression (e.g., million btu per gallon), apply the multiplier of "n" as per the example noted in STA03.**	O	R	1/10
	C00104	355	**Unit or Basis for Measurement Code** Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken **1. This element provides the second unit in the complex unit of measure expression associated with STA02. Select one from the following list:** 5I Standard Cubic Foot One cubic foot of gas measured at a fixed temperature and pressure; the value used for the temperature and pressure varies depending on the type of gas being measured BR Barrel DA Days GA Gallon T6 Thousand Gallons TN Net Ton (2,000 LB).	O	ID	2/2

Segment: **STA** Statistics
Position: 435
Loop: STA
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To provide summary statistics related to a specific collection of test result values
Syntax Notes:
Semantic Notes:
Comments:
Notes: 1. This loop/segment does not apply with BIOGENIC SOURCE reporting.

2. This loop provides the following information:

- process operating schedule
- seasonal operation adjustment factor information
- operating schedule line item information
- process characteristic information

3. This segment provides operating schedule, seasonal operational adjustment
process characteristic information as specified in the CID (segment 1).

4. Loop (segments STA, DTM, REF) Example:

STA*30*24*HR*DA~
DTM*196*960501~
DTM*197*960930~
REF*72*06~
< schedule that averages 24 hours per day for
September 30, 96 and associated with a modeling

5. Segment Example:

STA*30*24*HR*DA~
< schedule that averages 24 hours per day

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	STA01	950	**Statistic Code** A code specifying the specific statistic being reported 1. When CID04 (prior segment) is "P1", [illegible] must be applied. 2. This element indicates the type of measurement being [illegible] iteration of the loop. Select one from the following list:	M ID 2/2
			30 Average	
			34 Calculated	
			Indicates process specification	
			ZZ Mutually Defined	
			Indicates percent.	
			1. When applying this code, C00101 must be "P1".	

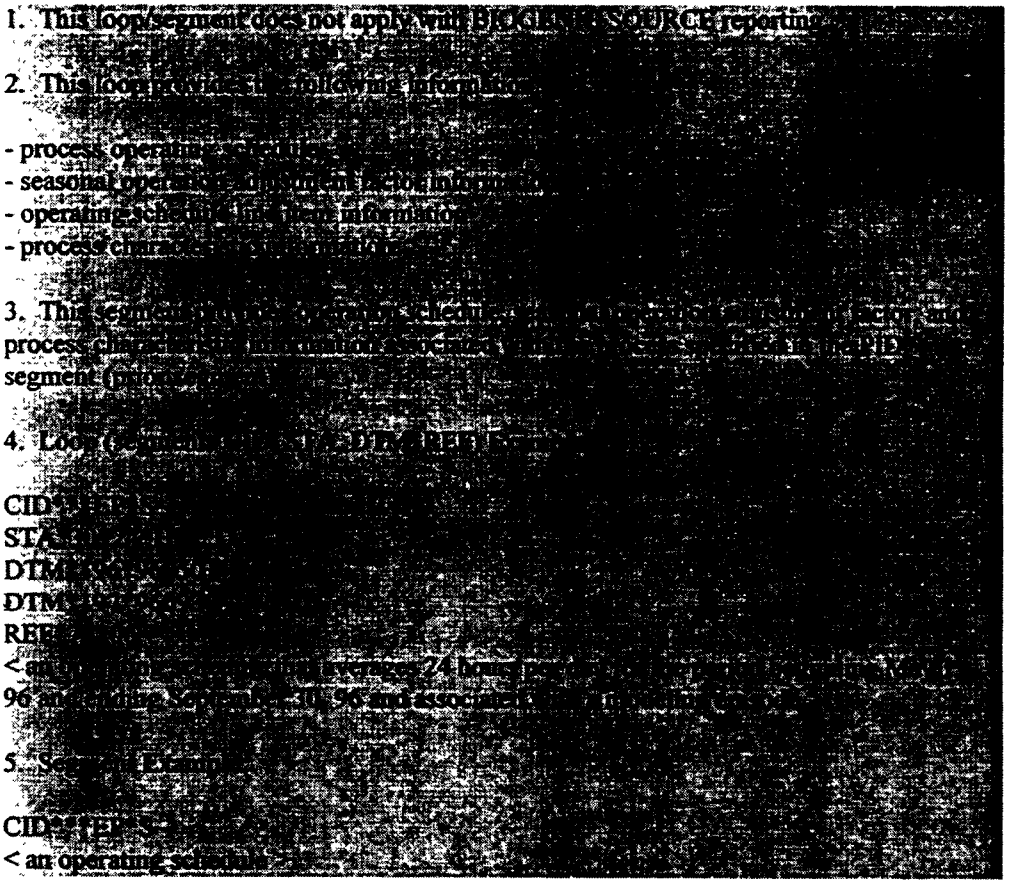
		EP	United States Environmental Protection Agency (EPA)		
CID04	**751**	**Product Description Code**		**X**	**AN 1/12**

A code from an industry code list which provides specific data about a product characteristic

1. This element indicates the type of information being reported with this iteration of the loop. Select one from the following list:

A	Seasonal Operating Adjustment Factor
AC	Ash Content
HC	Heat Content
S	Operating Schedule
SC	Sulfur Content
T	Maximum Actual Throughput

Segment: **CID** **Characteristic/Class ID**
Position: 409
Loop: CID
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify the general class or specific characteristic upon which test results are being reported or are to be taken
Syntax Notes:
1 If CID06 is present, then both CID03 and CID04 are required.
2 If CID07 is present, then at least one of CID04 or CID05 is required.
3 If either CID03 or CID04 is present, then the other is required.
4 At least one of CID01 CID02 CID04 or CID05 is required.
Semantic Notes:
Comments:
1 CID06 specifies the individual code list of the agency specified in CID03.
2 CID07 refers to whether or not the characteristic identified in CID04 or CID05 or both is affected by the product change. If it is affected, the value is "Y". A value of "N" is used when it is known that it will not be affected. Any other value indicates it is indeterminate.
Notes:



Data Element Summary

Ref. Des.	Data Element	Name	Attributes
CID03	559	**Agency Qualifier Code**	**X ID 2/2**
		Code identifying the agency assigning the code values	
		1. This element identifies the agency maintaining the code values applied with this segment	

Segment: **REF** **Reference Identification**
Position: 395
Loop: LX
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides growth factor reference text associated with the process specified in the MEA segment (prior segment).

3. Segment Example:

REF*ZZ**This process was dynamic~
< a process growth factor description indicating that the process was dynamic >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element indicates process growth factor reference text. ZZ Mutually Defined Indicates process growth factor reference text.	M ID 2/3
	REF03	352	**Description** A free-form description to clarify the related data elements and their content 1. This element contains the entry associated with REF01.	X AN 1/80

Segment: **DTM** Date/Time Reference
Position: 393
Loop: LX
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To specify pertinent dates and times
Syntax Notes: 1 If either DTM06 or DTM07 is present, then the other is required.
2 At least one of DTM02 DTM03 or DTM06 is required.
Semantic Notes:
Comments:
Notes: 1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides the time period associated with the process growth factor data in the MEA segment (prior segment).

3. Segment Example:

DTM*196****CY*1997~
DTM*575****CY*1998~
<a process growth factor time period starting in 1997 and ending in 1998>

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	DTM01	374	**Date/Time Qualifier**	M	ID	3/3
			Code specifying type of date or time, or both date and time			
			1. This element indicates the start and end dates associated with a process growth factor. Select one from the following list:			
			196 Start			
			575 Projected Action End Date			
	DTM06	1250	**Date Time Period Format Qualifier**	X	ID	2/3
			Code indicating the date format, time format, or date and time format			
			1. This element specifies the format in which the value associated with DTM01 must be presented.			
			CY Year Expressed in Format CCYY			
	DTM07	1251	**Date Time Period**	X	AN	1/35
			Expression of a date, a time, or range of dates, times or dates and times			
			1. This element contains the value associated with the code specified in DTM01.			

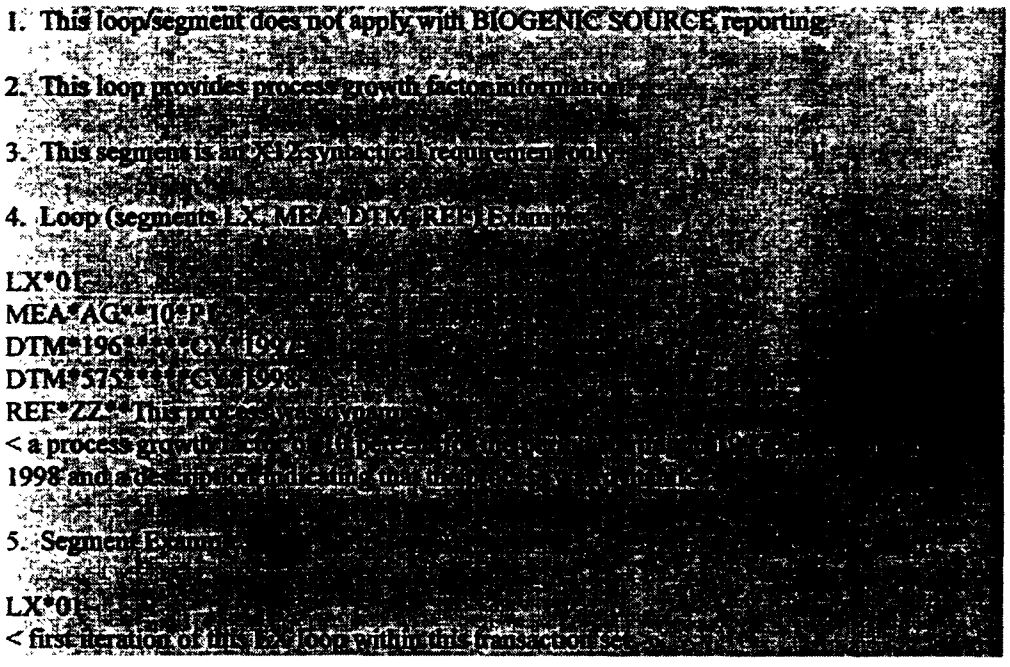
Segment: **MEA** **Measurements**
Position: 387
Loop: LX
Level: Detail
Usage: Mandatory
Max Use: >1
Purpose: To specify physical measurements or counts, including dimensions, tolerances, variances, and weights (See Figures Appendix for example of use of C001)
Syntax Notes:
1 If MEA05 is present, then MEA04 is required.
2 If MEA06 is present, then MEA04 is required.
3 Only one of MEA08 or MEA03 may be present.
4 If MEA07 is present, then at least one of MEA03 MEA05 or MEA06 is required.
5 At least one of MEA03 MEA05 MEA06 or MEA08 is required.
Semantic Notes:
1 MEA04 defines the unit of measure for MEA03, MEA05, and MEA06.
Comments:
1 When citing dimensional tolerances, any measurement requiring a sign (+ or -), or any measurement where a positive (+) value cannot be assumed, use MEA05 as the negative (-) value and MEA06 as the positive (+) value.

Notes:
1. This segment does not apply with BIOGENIC SOURCE reporting.
2. This segment provides process growth factor data associated with the process specified in the PID segment (prior segment).
3. Segment Example:
MEA*AG**10*P1~
< a process growth factor of 10 percent >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
	MEA01	737	**Measurement Reference ID Code** Code identifying the broad category to which a measurement applies 1. This element indicates process growth factor data. AG Compliance Total Indicates process growth factor data	O ID 2/2
	MEA03	739	**Measurement Value** The value of the measurement 1. This element contains the value associated with MEA01.	X R 1/20
	MEA04	C001	**Composite Unit of Measure** To identify a composite unit of measure (See Figures Appendix for examples of use) 1. This composite provides the unit of measure associated with MEA03.	X
>>	C00101	355	**Unit or Basis for Measurement Code** Code specifying the units in which a value is being expressed, or manner in which a measurement has been taken 1. This element contains the unit of measure associated with MEA03. P1 Percent	M ID 2/2

Segment: **LX** **Assigned Number**
Position: 381
Loop: LX
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To reference a line number in a transaction set
Syntax Notes:
Semantic Notes:
Comments:
Notes:



Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	LX01	554	**Assigned Number** Number assigned for differentiation within a transaction set	M	N0	1/6

Segment: **REF** **Reference Identification**
Position: 371
Loop: REF
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To specify identifying information
Syntax Notes:
1 At least one of REF02 or REF03 is required.
2 If either C04003 or C04004 is present, then the other is required.
3 If either C04005 or C04006 is present, then the other is required.
Semantic Notes:
Comments:
Notes:
1. This loop/segment does not apply with BIOGENIC SOURCE reporting.
2. This loop/segment provides Standard Industry Classification (SIC) code associated with the process specified in the PID segment (prior segment).
3. Loop/Segment Example:
REF*IJ*33~
< an SIC code of 33 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	REF01	128	**Reference Identification Qualifier** Code qualifying the Reference Identification 1. This element indicates a Standard Industry Classification (SIC) code. IJ Standard Industry Classification (SIC) Code	M	ID	2/3
	REF02	127	**Reference Identification** Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier 1. This element contains the value associated with REF01.	X	AN	1/30

1. This code applies with AREA, MOBILE, and NONROAD ENGINE SOURCE reporting only.

SC Source

Indicates the Source Classification Code (SCC).

PID03 559 Agency Qualifier Code X ID 2/2

Code identifying the agency assigning the code values

1. Code "AG" applies with AREA, MOBILE, and NONROAD ENGINE SOURCE reporting only.

2. This element identifies the agency maintaining the code values applied with this segment. Select one from the following list.

AG State Agency Assigned

1. This code applies with AREA, MOBILE, and NONROAD ENGINE SOURCE reporting only.

EP United States Environmental Protection Agency (EPA)

PID04 751 Product Description Code X AN 1/12

A code from an industry code list which provides specific data about a product characteristic

1. This element contains the value associated with the code specified in PID02.

PID06 752 Surface/Layer/Position Code O ID 2/2

Code indicating the product surface, layer or position that is being described

1. This element applies with [illegible] reporting only.

2. This element indicates that the code provided in PID02 is a secondary emission process code.

R2 Relative Position 2

Indicates a secondary emission process code.

Segment: **PID** **Product/Item Description**
Position: 345
Loop: PID
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To describe a product or process in coded or free-form format
Syntax Notes:
1 If PID04 is present, then PID03 is required.
2 If PID07 is present, then PID03 is required.
3 If PID08 is present, then PID03 is required.
4 At least one of PID04 or PID05 is required.

Semantic Notes:
1 Use PID03 to indicate the organization that publishes the code list being referred to.
2 PID04 should be used for industry-specific product description codes.
3 PID08 describes the physical characteristics of the product identified in PID04. A ``Y" indicates that the specified attribute applies to this item. A ``N" indicates it does not apply. Any other value is indeterminate.

Comments:
1 If PID01 = ``F", then PID05 is used. If PID01 = ``S", then PID04 is used. If PID01 = ``X", then both PID04 and PID05 are used.
2 Use PID06 when necessary to refer to the product surface or layer being described in the segment.
3 PID07 specifies the individual code list of the agency specified in PID03.

Notes:
1. This loop/segment does not apply with BIOGENIC SOURCE reporting.

2. This loop/segment provides emission process codes.

3. This segment must be applied at least one (1) time to provide the emission process code (PID04).

4. Loop/Segment Example:

PID*S*SC*EP*Z234**R2~
< process data being reported in a structured format indicating a secondary emission process code that is an SCC of Z234 >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	**PID01**	**349**	**Item Description Type** Code indicating the format of a description 1. This element indicates the format the identification of emission process code is being presented in. S Structured (From Industry Code List)	**M ID 1/1**
	PID02	**750**	**Product/Process Characteristic Code** Code identifying the general class of a product or process characteristic 1. Code "12" applies with AREA, MOBILE, and NONROAD ENGINE SOURCE reporting only. 2. This element indicates the type of emission process code information being reported with this iteration of the loop. Select one from the following list: 12 Type and/or Process Indicates the AIRS Area and Mobile Sources (AMS) or Area Source Category (ASCT) code	**O ID 2/3**

Segment: **MSG** Message Text
Position: 339
Loop: SPI
Level: Detail
Usage: Optional
Max Use: >1
Purpose: To provide a free form format that would allow the transmission of text information
Syntax Notes:
Semantic Notes:
Comments: 1 MSG02 is not related to the specific characteristics of a printer, but identifies top of page, advance a line, etc.
Notes: 1. This segment does not apply with BIOGENIC SOURCE reporting.

2. This segment provides a process-level message.

3. This note pertains to POINT SOURCE only. This segment provides material and material descriptions.

4. Segment Example:

MSG*This is a controlled proc
<message indicating that the process is controlled

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	MSG01	933	Free-Form Message Text Free-form message text	M	AN	1/264

Code qualifying the Reference Identification

1. This element applies with POINT SOURCE reporting only.

2. This element must be applied at least one (1) time to provide code "2I".

3. This element indicates the type of process identifier being reported with this iteration of the loop. Select one from the following list:

2I	Tracking Number
	Indicates the Federal identification code for a segment number.
IX	Item Number
	Indicates comments for a process
PE	Plant Number
	Indicates the Federal identification code for a process
WF	Locally Assigned Control Number
	Indicates the local identification code/description for a process

SPI03 **127** **Reference Identification** **X AN 1/30**

Reference information as defined for a particular Transaction Set or as specified by the Reference Identification Qualifier

1. This element applies with POINT SOURCE reporting only.

2. When SPI02 is "2I" or "PE", this element contains the appropriate code value.

3. When SPI02 is "IX", this element contains a number associated with a specific entry in SPI05.

4. When SPI02 is "WF", this element may contain either a number associated with a specific entry in SPI05, or the appropriate code value.

SPI05 **791** **Entity Purpose** **O AN 1/80**

The reason for the existence of the data item specified by the electronic data item independent of its presence in an EDI transaction

1. This element applies with POINT SOURCE reporting only.

2. When SPI02 is "IX" or "WF", this element contains the entry associated with the identification number in SPI03.

Segment: **SPI** **Specification Identifier**
Position: 323
Loop: SPI
Level: Detail
Usage: Optional
Max Use: 1
Purpose: To provide a description of the included specification or technical data items
Syntax Notes: **1** If either SPI02 or SPI03 is present, then the other is required.
Semantic Notes:
Comments:
Notes: 1. This loop/segment does not apply with BIOGENIC SOURCE reporting.

2. This loop provides the following information:

- confidentiality indicator
- process identification information
- process-level message
- materials and materials description (point source only)

3. This segment provides the confidentiality indicator for process identification information.

4. This note pertains to POINT SOURCE only. This segment is used one (1) time to provide the Federal identification code (for example, if the code is "2E").

5. Loop (segment SPI, MSG) example:

SPI*00~
MSG*This is a process
<information that is associated with a process that is
Federal Agency
>~

6. Segment Example:

SPI*00~
<information that is not classified, associated with a process
Federal Agency

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
>>	SPI01	786	**Security Level Code** Code indicating the level of confidentiality assigned by the sender to the information following 1. This element contains the confidentiality indicator associated with the data in this loop/level. Select one from the following table:	M	ID	2/2
			00 Company Non-Classified 02 Company Confidential 90 Government Non-Classified 92 Government Confidential			
	SPI02	128	**Reference Identification Qualifier**	X	ID	2/3

DTM*575*****CY*1998~
CID***EP*S~
STA*30*24*HR:::DA:-1~
DTM*196*96050I~
DTM*197*960930~
REF*72*06~
< information that is non-classified, associated with a process that is identified with a Federal segment code of 1234567, is being reported in a structured format indicating an SCC of Z234 and an SIC code of 33; has a process growth factor of 10 percent for the period starting in 1997 and ending in 1998; has an operating schedule that averages 24 hours per day for the period beginning May 1, 96 and ending September 30, 96 and associated with a modeling episode >

5. Segment Example:

HL*10*02*6*1~
< tenth HL loop iteration that is subordinate to the second HL loop of this transaction set that contains physical-level information and has subordinate loops >

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
>>	HL01	628	**Hierarchical ID Number**	M AN 1/12
			A unique number assigned by the sender to identify a particular data segment in a hierarchical structure	
			1. This element contains a unique number used to identify the iteration of an HL loop.	
	HL02	734	**Hierarchical Parent ID Number**	O AN 1/12
			Identification number of the next higher hierarchical data segment that the data segment being described is subordinate to	
			1. This note pertains to POINT, AREA, and NONROAD SOURCE only. This element indicates that this level of the transaction set points to the HL loop parent containing the HL03 code "5" for physical-level data.	
			2. This note pertains to MOBILE SOURCE only. This element indicates that this level of the transaction set points to the HL loop parent containing the HL03 Code "C" for schedule (activity)-level data.	
>>	HL03	735	**Hierarchical Level Code**	M ID 1/2
			Code defining the characteristic of a level in a hierarchical structure	
			1. This element indicates that this level of the transaction set contains process-level data.	
			6 Sub-Category	
			Code identifying a further breakdown of the category	
			Indicates process-level data	
	HL04	736	**Hierarchical Child Code**	O ID 1/1
			Code indicating whether if there are hierarchical child data segments subordinate to the level being described	
			1 Additional Subordinate HL Data Segment in This Hierarchical Structure	

Segment: **HL** **Hierarchical Level**
Position: 319
Loop: HL
Level: Detail
Usage: Mandatory
Max Use: 1
Purpose: To identify dependencies among and the content of hierarchically related groups of data segments
Syntax Notes:
Semantic Notes:
Comments:

1 The HL segment is used to identify levels of detail information using a hierarchical structure, such as relating line-item data to shipment data, and packaging data to line-item data.
2 HL01 shall contain a unique alphanumeric number for each occurrence of the HL segment in the transaction set. For example, HL01 could be used to indicate the number of occurrences of the HL segment, in which case the value of HL01 would be "1" for the initial HL segment and would be incremented by one in each subsequent HL segment within the transaction.
3 HL02 identifies the hierarchical ID number of the HL segment to which the current HL segment is subordinate.
4 HL03 indicates the context of the series of segments following the current HL segment up to the next occurrence of an HL segment in the transaction. For example, HL03 is used to indicate that subsequent segments in the HL loop form a logical grouping of data referring to shipment, order, or item-level information.
5 HL04 indicates whether or not there are subordinate (or child) HL segments related to the current HL segment.

Notes:

1. This loop does not apply with BIOGENIC SOURCE reporting. For BIOGENIC SOURCE reporting, proceed to next HL loop (HLC).

2. This level/loop (HL6) provides process-level data, including:

- confidentiality indicator
- process identification information
- process-level message and/or materials and materials description (point source only)
- emission process information (SCC, AMS, and ASCT codes)
- Standard Industry Classification (SIC) code
- process growth factor information
- process operating schedule
- seasonal operation adjustment factor information
- operating schedule line item information
- process characteristic information

3. This loop must be applied one (1) time for each emissions proc

4. Loop (segments HL, SPI, MSG, PID, REF, LX, MEA, DTM, REF, CID, SPA, DTM, REF) Example:

```
HL*10*02*6*1~
SPI*00*2I*1234567~
PID*S*SC*EP*Z234~
REF*LI*33~
LX*01~
MEA*AG**10*P1~
DTM*196*****CY*1997~
```

		Indicates that a unit remains on site with no possibility of reuse			
REF03	352	Description	X	AN	1/80
		A free-form description to clarify the related data elements and their content			
		1. This element contains a textual description associated with REF02.			