

**Environmental Compliance Management Programs for  
Small Industrial Facilities**

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## INTRODUCTION

The environmental compliance process can be an overwhelming task that is made even more difficult with the threat of increased Federal and State enforcement activity. The burden of proof has now shifted to high level corporate officials and facility owners to certify continuous compliance at their industrial facilities. Yet, many small industrial facilities cannot justify the expense of an on-site environmental professional to stay abreast of regulatory developments and ongoing environmental compliance activities. This paper addresses the methodology for the development and implementation of an environmental compliance management program for facilities with no dedicated environmental professionals. The compliance program becomes a system and tool for assessing the compliance status of a facility, and allows upper management to certify continuous compliance with a high degree of certainty.

The starting point for an environmental compliance program is the Environmental Compliance Assessment (Assessment) to evaluate facility operations, current compliance management systems (if any), facility compliance with environmental regulations, and facility compliance with recommended environmental management practices. This is followed by the development of an Environmental Compliance Management Plan (ECMP) which includes a detailed summary of regulatory requirements and a compliance calendar that chronologically identifies tasks and deadlines. Once the ECMP has been established, the plan must be implemented. A program of plan implementation is established whereby personnel are trained to conduct the ongoing compliance duties, with specific tasks scheduled to be performed by an outside consultant. To ensure that the ECMP is up-to-date, there needs to be a minimum of an annual update to account for process changes and revised/new regulatory requirements.

## BACKGROUND

Small businesses and industrial facilities represent a last frontier.<sup>1</sup> The U. S. Environmental Protection Agency (EPA) and state regulatory agencies can reach big business to let them know about the latest developments in regulations. But small businesses and industrial facilities, which represent 95 percent of the American economy, have remained beyond the easy reach of EPA. Part of the reason is the immense diversity of small businesses--there is no single, universal solution to the problem of how to communicate with them about their environmental responsibilities.

Once a facility is within the regulated community, compliance is not optional. Civil and criminal penalties for noncompliance bring home this point. As awareness and knowledge about environmental issues has grown, so has the complexity of environmental regulatory programs. Take the 1990 Clean Air Act Amendments (CAAA) as an example. If facilities have any chemicals on the 112(r) list in quantities over the thresholds, regardless of the number of employees, they will be subject to the regulation for risk management planning. This involves preparation of a hazard assessment, an accident prevention program, and an emergency response program. Many facilities would be able to avoid this regulatory requirement by reducing the amount of a hazardous chemical used, or substituting a less hazardous chemical that is not on the list. But these facilities might not even be aware of the need for, and available options for, risk management planning. Furthermore, the general duty clause of the 1990 CAAA does not let small businesses off the hook. The clause states that regardless of the size of a facility or the number of employees, if it has a hazardous substance on site, it has the responsibility to operate safely, regardless of the quantity of a substance, regardless of the substance's inclusion on or exclusion from the list.

One place to turn for guidance on environmental regulations is A Guidebook for Explaining Environmental Regulations to Small Businesses<sup>2</sup> published in October, 1993, by EPA's Control Technology Center. The document helps answer questions related to regulatory applicability and where to go for help.

Compliance concerns and fear of enforcement are ever present for many small businesses that do not understand the increasingly complex federal and state environmental regulatory requirements. Most states have small business assistance programs to help them assess their environmental obligations. For example, a new Illinois program encourages small businesses to assess environmental compliance and work with the Illinois Environmental Protection Agency (IEPA) to identify and correct violations without the fear of enforcement. The Illinois Environmental Amnesty Program, a cooperative effort between the IEPA and the Illinois Department of Commerce and Community Affairs (DCCA), provides amnesty in the form of an enforcement shield in order to improve compliance among small businesses.<sup>3</sup>

Larger companies will have a dedicated staff of environmental professionals to establish environmental programs, provide training to plant personnel, and perform all reporting and recordkeeping duties. They also typically have access to various environmental software programs to manage air pollution, track chemical inventories, generate material safety data sheets, generate Tier I/II reports, track hazardous waste, generate labels and waste manifests, and even help meet training requirements.<sup>4</sup>

However, the expense and training on use of these software tools, as well as the manpower needed to maintain the applications, cannot easily be justified for small facilities. What is needed is a system whereby a small industrial facility establishes an Environmental Compliance Management Program through the use of a qualified environmental consultant that identifies and assesses all of their regulatory requirements, establishes best management practices, and schedules all activities to be performed throughout the year. Once a program is prepared, the facility management can work with their consultant to determine the responsible party for each activity. The compliance calendar, created as part of the program, will identify who is doing what, and when the activity must occur.

## **ENVIRONMENTAL COMPLIANCE MANAGEMENT PROGRAMS**

The overall environmental compliance management program for a small industrial facility begins with their commitment to recognize environmental management as a high priority, followed by the establishment of policies, programs and practices for conducting operations in an environmentally sound manner.<sup>5</sup> These policies, programs and practices should then be fully integrated into the business activities as an essential element of its operations. Employees will need to be educated to conduct their activities in an environmentally responsible manner. Facility operations must be conducted in a manner that takes into account the efficient use of energy and materials, minimization of adverse environmental impacts, and regulatory compliance.

The steps involved in the establishment of an environmental compliance management program are:

1. *Retain the services of a qualified environmental consultant.* The facility owner should closely examine the qualifications of any consultant considered for the work. What type of system can they establish? How can they best work for you? Pay a visit to the consultant's office and meet the personnel directly involved in environmental compliance management programs. What is the experience of the personnel that will be involved with your particular facility?
2. *Arrange for the Environmental Compliance Assessment.* This is the starting point for evaluating facility operations and determining applicable regulations, as well as an evaluation of the current compliance status of the facility.
3. *Prepare the Environmental Compliance Management Plan.* The ECMP should put the environmental obligations of the facility in perspective, and establish a compliance calendar of tasks that must be performed to achieve and maintain compliance. This includes the development of a management system to track compliance activities.
4. *Implementation of the ECMP.* Performing the environmental assessment and developing the ECMP is essential, but it does not ensure compliance. The tasks identified in the ECMP must be performed. The ECMP can be set up to allow the facility to perform all compliance tasks, or various tasks can be assigned to the consultant to perform. A consultant should be retained on a T&E basis, as needed, to support ongoing compliance work.
5. *Annual Update.* As a minimum, the ECMP should be updated annually to ensure that the plan is up-to-date with new and revised regulations.

### **Environmental Compliance Assessment**

An environmental compliance assessment is a review of facility operations, plant equipment, raw material storage and usage, waste management activities, environmental permit conditions, reports and recordkeeping obligations in order to identify applicable environmental regulations. The EPA's voluntary environmental self-policing and self-disclosure policy, promulgated December 18, 1995, will completely eliminate gravity-based penalties for companies that voluntarily identify, disclose and correct violations according to specified conditions.<sup>6</sup> EPA will not recommend to the Department of Justice that criminal charges be brought against a company acting in good faith to identify, disclose, and correct violations.

The assessment begins with a complete facility inspection. For instance, at a manufacturing facility, the assessment includes an examination of all processes from raw material receiving through final product shipping, chemical storage and handling, waste management, and emission sources. This is followed by a review of environmental permits, records, and other documentation required by regulations. Facility representatives are involved throughout the assessment process to ascertain their roles in daily compliance activities, as well as to provide the consultant with additional insight into the processes.

Some of the areas investigated include air emission sources (e.g. storage tank vents, boilers, control equipment), chemical storage and use (including hazardous chemicals), wastewater treatment and discharges, stormwater discharges, hazardous and solid waste management practices, underground and

aboveground storage tanks, polychlorinated biphenyls (often found in electrical equipment), and asbestos containing building materials and insulation.

Following completion of the assessment, a confidential written report is prepared to discuss the findings.

### **Environmental Compliance Management Plan (ECMP)**

Using information gathered during the environmental compliance assessment, a site-specific ECMP is developed to address only applicable compliance requirements and recommended management practices. The plan considers only those items derived from federal, state, and local regulations and permit conditions. The ECMP sets up a schedule for tracking compliance dates, requirements, reporting, recordkeeping, facility inspections, employee training, and other activities in a simplified manner. The ECMP could be made available in a written form, with the associated compliance calendar, or a more sophisticated computerized version which allows facility personnel on-line access to the compliance calendar and a compliance staff (see ENVIRONMENTAL COMPLIANCE MANAGEMENT SYSTEM discussed later in this paper).

### **ECMP Implementation**

Once an assessment has been completed and the ECMP has been developed, the day to day tasks must still be performed. Every compliance task should be assigned to a responsible person or department to ensure that it has been completed. Instructions for completion of the task should be readily available to enable the task to be completed with minimal difficulty. Plan implementation should be coordinated to fit in easily with the facility's organizational structure. When necessary, an environmental consultant should be contacted to answer questions, help with completion of various compliance tasks, assist with training, and help manage possible emergency situations (e.g, oversee a spill clean-up).

The typical ongoing support services that may be required from a consultant include:

- Technical assistance in report preparation and permit applications
- Sampling and testing of waste streams
- Integrity testing for underground and aboveground storage tanks and tank management
- Air emissions testing, reporting, and recordkeeping
- Maintenance and quality assurance evaluations of emissions monitoring equipment
- Periodic facility inspections
- Periodic regulatory updates to inform the site of new, or proposed, requirements
- Expert testimony at hearings and meetings with agency personnel
- Training services

The economics of retaining a consultant, versus the hiring of staff environmental professionals, must be evaluated on a case-by-case basis. For smaller facilities, an environmental consultant's annual time and expenses will almost always be significantly less than the expense of hiring an in-house expert, or experts. Furthermore, a company may invest a great deal of time and expenses in developing their own in-house environmental expert, only to have the person leave the company a year or two later.

### **Annual Update**

As a minimum, the ECMP should be reviewed and revised on an annual basis to determine which new regulations are applicable to a given facility, as well as update the environmental compliance calendar. The annual update also includes a review of the regulatory requirements for proposed plant modifications. For larger facilities with Title V operating permits, the scope of this activity can be expanded to include assistance in the preparation of compliance certifications required by the Clean Air Act Permit Program.

### **ENVIRONMENTAL COMPLIANCE MANAGEMENT SYSTEM**

The key to ensuring ongoing environmental compliance is to make sure all tasks are completed as prescribed, and the documentation must be kept on site for agency inspection. Of the hundreds of software packages available today in the marketplace, none of them are immediately available to be specific to one's own facility. An early version of an environmental compliance management system was presented at the Computing in Environmental Management specialty conference using Lotus Notes® software.<sup>7</sup>

There are numerous advantages to using Notes software. Notes-based information can be shared across any distance, and at any time. Multiple users can access a shared database, track permit requirements, create and respond to action items, and even attach or link documents, spreadsheets, drawings, graphics, and scanned images. A facility's compliance database is maintained on the consultant's Notes Server, with a replica copy of the database stored on the facilities own computer system. Periodic replication commands will automatically synchronize the databases so that updates from the consultant are transferred to the facility's copy, and updates from the facility are transferred to the consultant's copy.

To ensure the integrity and security of the system, safeguards are available to limit access control and provide daily back-ups of the database. Furthermore, a facility using Lotus Notes® would not be held hostage to software developers that will charge heavily for system design modifications. If the source was unhappy with the performance of their environmental consultant, the database could be easily copied and managed on another server.

### **Lotus Notes®**

Lotus Notes® (Notes) is used for three basic types of applications: (1) disseminating information such as action items, news and reference materials, (2) routing information via mail and forms, and (3) interactive applications for workgroups.

As discussed in the Notes on-line help manual, Notes consists of two primary programs--the Notes server and the Notes workstation. The Notes server is a computer running OS/2® which provides services to Notes workstation users and other Notes servers, including storage of shared databases and mail routing.

The Notes workstation is typically a personal computer running Windows which communicates with Notes servers so the user can access shared databases, read mail, and send mail.

The basic units of information in Notes are databases, the documents they contain, and the fields within documents. A database generally contains information in a single area of interest, such as Permit Tracking, which can be used by an individual, shared among a few people, or used by everyone in a company. To optimize the features of Notes, most databases are shared by multiple users. Through the use of security measures such as a server access and database access (discussed later), database managers can define who can use a database and to what extent.

Although it is beyond the scope of this paper, Notes has a powerful mail system which is capable of transmitting not only "mail" text, but also complete data files (e.g., spreadsheets, documents, presentation graphics), scanned images, and even sound. With Notes mail, one can forward or receive documents from any Notes database. Gateways are also available to communicating with cc:Mail, other Vendor Independent Messaging (VIM) compliant mail systems, and the INTERNET.

**The Notes Workspace.** Notes is accessed on a computer via the workspace. A database can be stored locally on the user's hard disk, or on the server for access by others. Each shared database added to the user's workspace, although physically stored on a Notes server, is represented on the workspace as an icon as shown in Figure 1. When the user is in Notes, one will see either a window containing the workspace, a database view, or a database document.

**Documents.** One adds information to a Notes database by composing a new document, or editing an existing one. The document can include text, tables, numerical data, graphics, scanned images, objects, and voice messages. Under Windows, one can also link or embed data from other Windows programs using dynamic data exchange (DDE) capabilities. The database designer can create forms to control how data is entered into documents and how, and when, it is displayed. The designer also creates views to display lists of documents contained in the database.

**Views.** Notes views are like tables of contents for a database, except that a view does not necessarily list all documents in the database. A single database will typically have multiple views, each organizing the documents differently. For example, the environmental management database could have views sorted by facility location, by due date (for action items), and by cognizant engineer (responsible for action item). Private views could also be created by individuals that would only display lists of documents that are applicable to that individual. For instance, a manufacturing engineer at your site may want to display only those items which pertain to his or her specific line, rather than the entire facility. Whereas, on the plant-wide level, the facility manager would want to see all items for the entire plant.

Each line (row) in a view represents a single document. The database designer can write a selection formula for each view that picks which documents will be displayed in that view. Each column in the view represents one type of information available in the documents, such as plant site, permit name, cognizant engineer, regulatory citation, or due date.

Notes also has extensive full text search capabilities in a query builder that will allow selection of documents that contain user specified text within each document. Advanced full text query features also allow the user to perform exclusive type searches. Some advanced search features include wild cards (e.g. a query for "perm\*" finds permit, permits, permitting, permission, etc.), hyphenated words (e.g., a

query for "start-up" finds start-up, startup, and start up), multiword phrases, logical operators, and field operators (e.g., DueDate > 9/30/96).

**Security.** Notes protects information in several ways. First, users are granted or denied access to Notes servers through the certificates stored in their User ID's. Each Notes database contains an Access Control List detailing the people, servers, and group names of those who can open the database, and what they can do to its information. An example is shown in Figure 2. In addition, information can be encrypted so that only specific users can decrypt it.

**Networks and Modems.** Notes servers and workstations can be on a single local area network (LAN), or a wide-area network (WAN). Notes servers and workstations on different LANs can communicate through many media, including network bridges/routers, modem and telephone lines, null modems, or satellite. Notes servers and workstations are simply nodes on the network. One can also access shared databases (and one's own mail database) from a remote location, such as a home computer.

**Database Replication.** As touched on earlier, one of the most desirable features of Notes is the ability to create local database replicas on a remote computer. A replica database is identical to the original server-based database. Working with a replica allows the user to access the contents of the database, make updates, changes, generate reports, etc., without being connected on-line to the server. This is especially useful if one is working remotely via modem. The remote user can control the documents which replicate, including limiting the number of documents in the replica, specifying replication options, and setting up selective replication.

Once a replica has been created on a remote computer, the user can exchange information periodically with the server database using the Tools-Replicate option shown in Figure 3. Tools-Replicate will allow the user to send changes made on the replica database to the server (original) database, and concurrently receive new and modified documents from the server. Modifications to the database template could also be transferred via replication. The option for background replication allows the user to perform other work while replication is taking place.

### **Environmental Compliance Management Systems for Small Industrial Facilities**

The goals in the development of a typical environmental compliance management system are: (1) to provide up-to-date permitting status information, (2) to allow for creation and distribution of action items associated with the various permits, (3) to track key permit reporting and recordkeeping requirements, as well as other activities, necessary for compliance, (4) to make the system accessible to all required personnel, (5) implement security measures to ensure that unauthorized personnel cannot access the data, (6) make the system accessible via modem link from remote locations, and (7) have frequent back-ups of the database file to ensure that data will not be lost.

**Compliance Tasks.** The essential data fields used to track environmental compliance tasks are the facility name, task category (e.g, air emissions, chemical storage and handling), due date, action item, responsible person (or responsible party), reason for action, regulatory citation, instructions, completed by, date completed, comments, and file attachments. Additional data fields could be added to further enhance the value of the system. For example, a new field called "Line" could be added for a manufacturing facility to identify compliance tasks associated solely for the given manufacturing line.

Each task is derived from the requirements in the ECMP. A typical view showing excerpts of all compliance tasks for a hypothetical ABC Company is shown in Figure 4, with the actual document shown in Figure 5. View selection formulas could easily be written to show only those tasks due within the next 60 days, or possibly all uncompleted tasks plus those tasks due within the next 30 days.

Upon completion of the task, the name of the person completing the task, comments, and a completion date are inserted into the document. An electronic signature feature is available that clearly identifies the name of the person, date, and time that the document was last edited. When needed, the file attachments rich text field could be used to attach a copy of an actual document, spreadsheet, letter, report, or scanned image to serve as the back-up file copy. A completed action task can be seen in Figure 6.

The full system has numerous options available that are beyond the scope of this paper. But suffice to say that features could be quickly added and modified to suit a facility's needs. This may include a tracking system for employee training, E-MAIL to inquire about environmental issues, and an electronic library of the compliance assessment report and other compliance information.

At the end of the quarter, or at the end of a year, the facility can easily generate a summary of completed tasks to document that they have performed all assigned compliance tasks. Any documents without completion dates will have been flagged throughout the year to minimize delays in completion of tasks. The consultant can also monitor the facility's implementation of the ECMP by viewing the database, and he or she would be able to follow-up on any deficiencies via E-MAIL, phone, FAX, or letter to the facility.

## **CONCLUSION**

A small industrial facility has many options available to achieve and maintain compliance with environmental regulations. Once the commitment is made to comply with regulations, the facility does not have to hire a staff of environmental professionals keep abreast of environmental regulations. Development of a plant-specific Environmental Compliance Management Program is a good starting point.

Every facility must evaluate their own compliance needs on a case-by-case basis. When the decision is made to utilize an environmental consulting firm, the facility will want to select a qualified firm that is able to provide the desired level of support.

User configurable software is available to help track all compliance activities. Security features in software, such as Lotus Notes®, will limit access to sensitive compliance data by unauthorized users. And when an inspector from the regulatory agency arrives at a facility, documentation in the environmental compliance management system will be immediately available for review.

## **ACKNOWLEDGMENTS**

All screen shots ©1996 Lotus Development Corporation. Lotus Notes is a registered trademark of Lotus Development Corporation, Cambridge, Massachusetts.

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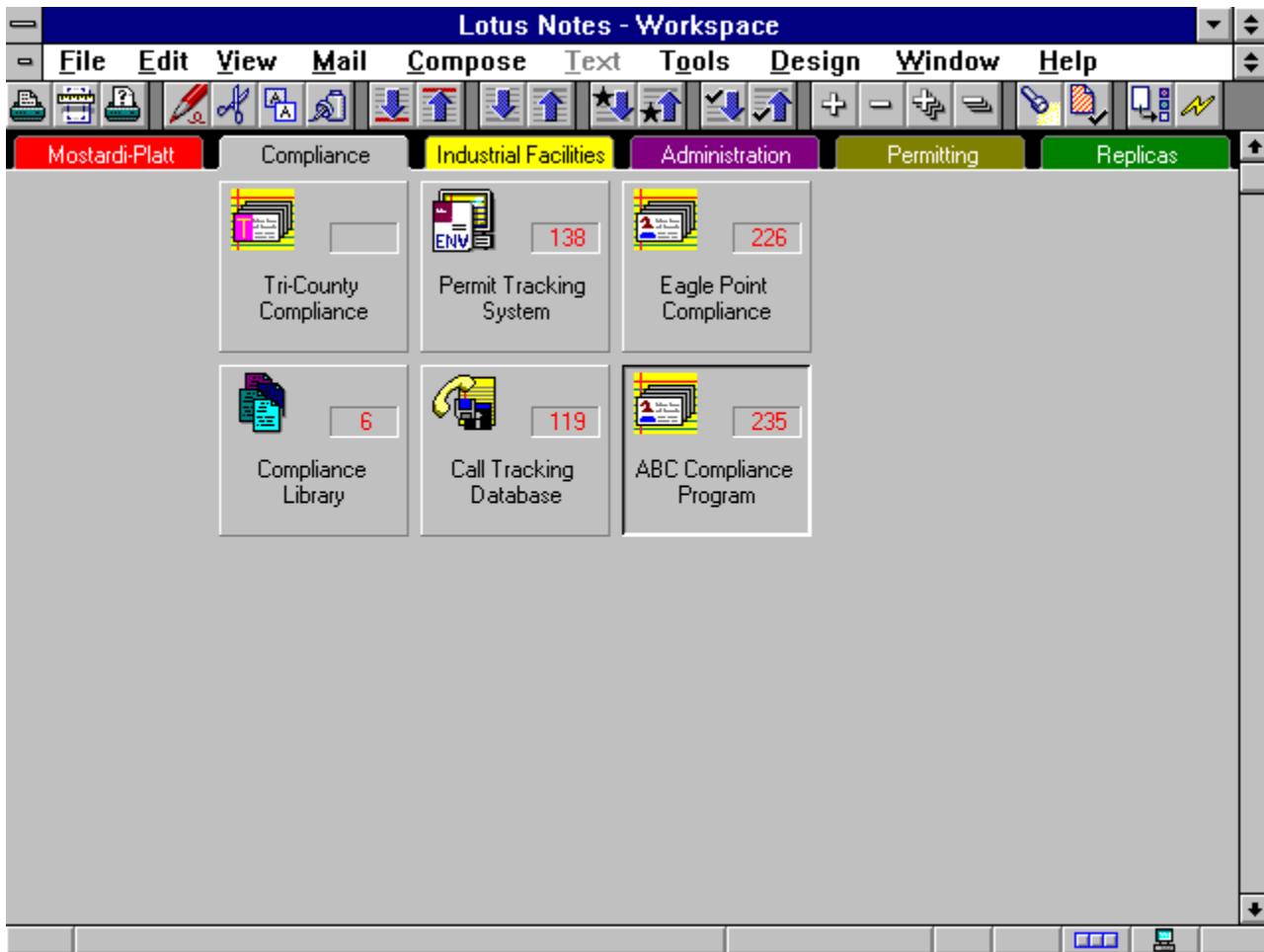


Figure 1. Example of a Lotus Notes Workspace.

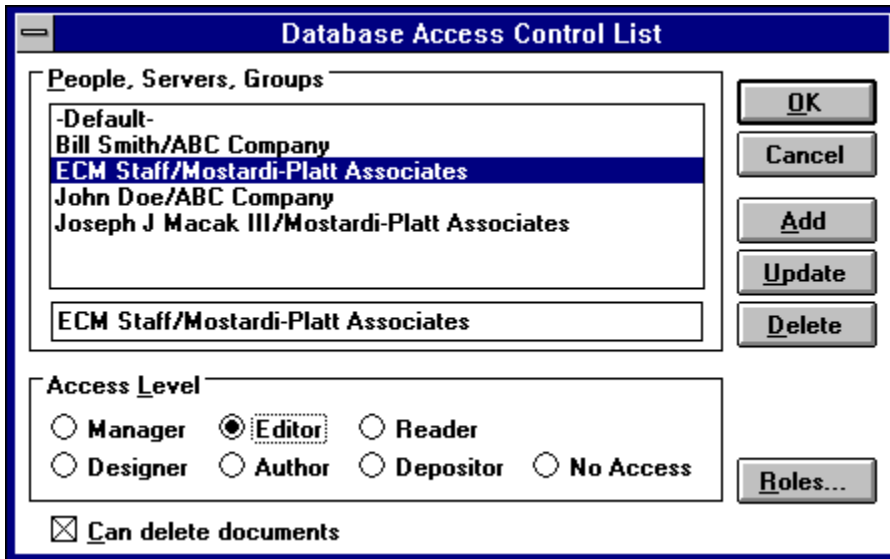


Figure 2. Example Access Control List for ABC Company’s Compliance Management System.

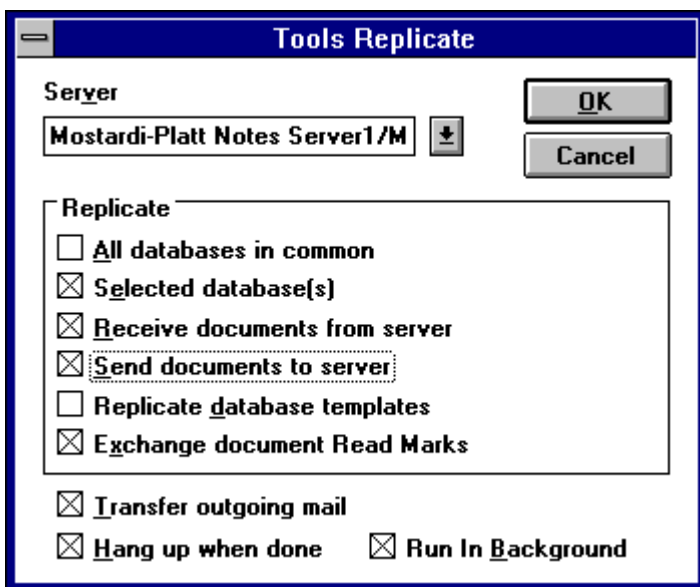


Figure 3. Example of the Tools Replicate Command .

The screenshot shows a Lotus Notes window titled "Lotus Notes - ABC Compliance Program - All Action Items\By Project, Resp. Part". The menu bar includes File, Edit, View, Mail, Compose, Text, Tools, Design, Window, and Help. The toolbar contains various icons for editing and navigation. The main content area is a table with two columns: "Due Date" and "Action Item".

Due Date	Action Item
03-22-96	Review, sign, and submit monthly wastewater discharge report to the local POTW.
	<b>Aboveground Storage Tanks</b>
03-26-96	Inspect all ASTs at the facility monthly for signs of leaks or spills of stored materials. Record observations.
	<b>Underground Storage Tanks</b>
03-26-96	Inspect all USTs at the facility monthly for signs of leaks or spills of stored materials. Record observations.
	<b>Hazardous Waste</b>
03-27-96	Document the types and amounts of wastes generated at the facility on a monthly basis.
	<b>Air Quality</b>
04-01-96	Determine whether new air emission source or control equipment is planned to be installed at the facility.
04-01-96	Begin preparation of Annual Emission Report for actual air emissions from the facility over the past year.
	<b>Wastewater</b>
04-01-96	Monthly wastewater discharge monitoring report due to local POTW.
	<b>Air Quality</b>
04-02-96	Inspect air emission source operations and equipment to assure proper operation. Keep records of all monitoring.
	<b>Stormwater</b>
04-05-96	Prepare annual NPDES storm water discharge report for submission to the IEPA.
	<b>Wastewater</b>
04-10-96	Prepare monthly wastewater discharge monitoring report for submittal to the local POTW.
	<b>Air Quality</b>
04-11-96	Inspect continuous monitoring equipment and afterburner to assure that they are operated in accordance with permit.
	<b>Air Quality</b>
04-15-96	Review, sign, and submit Annual Emission Report to IEPA.
	<b>Stormwater</b>
04-15-96	Review, sign, and submit annual NPDES storm water discharge report. Maintain copies of annual NPDES report.
	<b>Hazardous Waste</b>
04-17-96	Interview hazardous waste haulers and/or disposal/recycling facilities to assure they are properly licensed.
	<b>Wastewater</b>
04-22-96	Review, sign, and submit monthly wastewater discharge report to the local POTW.

Figure 4. Sample View of Compliance Tasks.

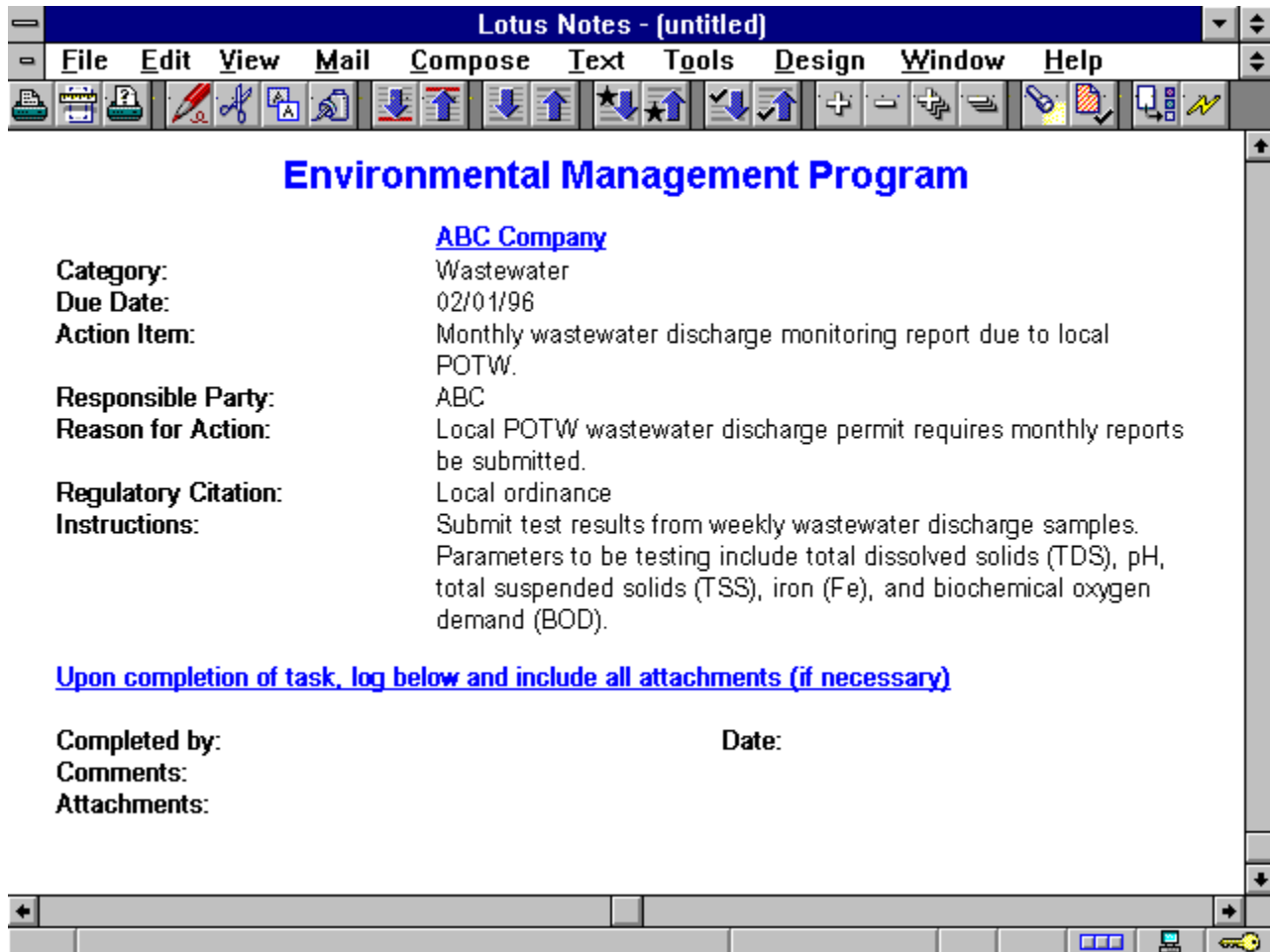


Figure 5. Sample Document of a Wastewater Compliance Task.

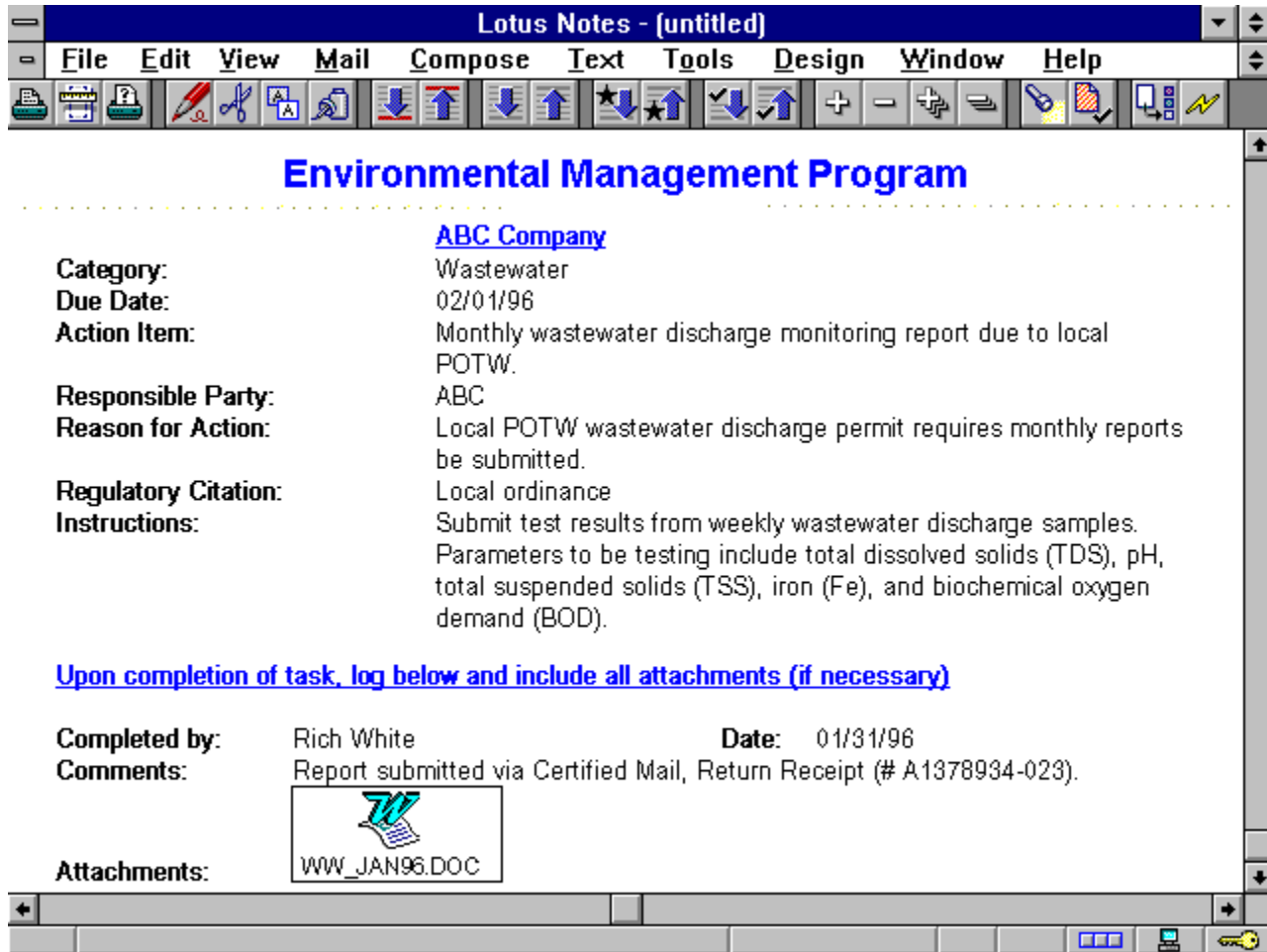


Figure 6. Completed Wastewater Task with File Attachment.